

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

**Report Period January 1 – January 31, 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 of 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 December 1, 2017.

## **MONITORING REPORT**

### **1.0 PROJECT STATUS**

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

As of the end of November 2016 (December 1 data date), MTACC reported that the overall engineering effort was 99.3% complete, based on Earned Value for Design Deliverables, compared with a planned status of 100.0%. MTACC's Cost Report (November 2016) shows that 94.1% of the overall "EIS and Engineering" category has been invoiced and 94.3% 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. The building owner, Rudin Management Corporation (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 it started work in August 2016. The utility relocations are currently 60% complete. The GEC is reviewing shop drawings for coordination with the CM015 work scope and are not signing-off on shop drawings. Change Order (PCO-127) work for the GEC has been completed and involves revisions to the entrance façade, sitework, sidewalk, utility connections and provision of fire-rated construction for future basement retail space. 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, and is now forecast for February 28, 2017. Delays through 2016 and into 2017 will be 7 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. The PMOC notes that Amtrak had previously advised MTACC that Amtrak had committed to reviewing the 90% CH058A package after they had completed their review of the FHA03 package, which has not occurred yet but is nearing completion. This has delayed Amtrak's review of the CH058A package. As of January 31, 2017, MTACC continued to await Amtrak review comments on the 90% submission.

Contract CH058B will include construction of the East Bound Re-route. The GEC is developing the scope of work for finalizing the tunnel design based on a cut-and-cover construction method. The final design for package CH058B has been awaiting the completion of a rail traffic simulation study for Harold Interlocking. The first part of the study, operations without Temporary Eastbound LIRR Passenger (TELP) Track, has been completed, and the results indicate minimal impact to Harold Interlocking under peak load conditions. Based on this result and the fact that the TELP Track would have significant cost and schedule impacts to the planned CIL cutovers, the PMT has recommended to LIRR that the GEC complete the CH058B design without the TELP Track. The GEC and PMT have also recommended that the tunnel be constructed using the cut-and-cover method. LIRR has approved the construction method and the GEC PCO to make this change was finalized in January 2017. LIRR has agreed to the track outages required to support the cut-and-cover construction but has requested additional rail traffic simulations. The simulation proposal was submitted on November 29, 2016, and the simulations are now in progress. The rail traffic simulation outcomes will not impact Contract CH058B. MTACC has directed that ESA proceed with design finalization of CH058B based on using the cut-and-cover tunnel construction method and without the TELP Track.

The Contract CQ033, Mid-Day Storage Yard Facility, bid package has been completed and the contract was advertised in October 2016. Work continues on resolving remaining issues, which are listed below. Any resultant design or specification changes will be included, as required, in bid addenda.

- Regarding the Arch Street Yard tie-in, resolution has been achieved between MTACC and LIRR for final determination on the scope of LIRR Force Account (FA) work.
- Work on PCO C176 has been completed.

- 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. As of January 31, 2017, however, the NYSDOT response is still pending. The PMOC notes that 7 months have elapsed since MTACC submitted the request.
- 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.
- MTACC has received formal approval from NYCT on overhead clearance beneath the No. 7 Line elevated structure over the proposed LIRR tracks.

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 twice and is currently forecast for February 17, 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. Labor clearance has been requested from LIRR.

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 have been returned. The scope of this change order included a refresh of the package and changes control of Plaza Interlocking from Penn Station Control Center to the GCT Train Operations Center. The ESA-PMT had previously advised that this change originated with LIRR operations acting through the ESA/LIRR Special Projects Group and that the change was approved by the Change Control Committee. The scope of work of PCO C184 does not include PTC. Based on when LIRR completes the PTC design, the PTC scope will be added to the CS086 contract by addendum 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.

#### 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 was, and continues to be, an area of focus for the Contract CS179 project team. While there has been some reduction of the backlog of submittal reviews and RFI responses; this issue remains as a concern to MTACC, the contractor, and the PMOC. The contractor continues to assert that overdue responses on design submittals and Requests for Information (RFIs) are impacting its ability to complete design work in accordance with 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. In several of its 2016 Monthly Progress Reports (MPRs), the MTACC indicated that the contractor's Control System Designs would be completed by December 2016; nine months later than originally scheduled and two months later than that reported by the PMOC in its September 2016 Quarterly Report. However, as of the end of January 2017, the MTACC's goal to complete the final designs of the ten Control Systems by the end of 2016 was not achieved, as several of the system designs must be re-submitted for further review and approval and one other final design (the CCTV and SMS) has yet to be discussed in a final design review meeting due to unresolved design issues. Any further delay in the resolution of the design issues for the CCTV and SMS systems could jeopardize the timely completion of this contract. Further, the PMOC notes that the MTACC has yet to receive any "formal acceptance" or "final approval" of any of the Control Systems final designs from the LIRR. In addition to the "Control" system designs, the contractor is also responsible for the design, installation, and testing of 19 "Non-Control" systems. In its November 2016 MPR, MTACC notes 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 (**Note:** The information presented for this CS084 contract comes from discussions at a mid-February 2017 Progress Meeting that reviewed contract progress for January 2017), the contractor's work on the L3 electrical service is complete, the LIRR has yet to fully use the service to energize all its signal huts because there is some additional work (the installation of panel heaters, a transformer, and lightning arrestors that must take place). The contractor continues to perform site surveys and submit design documentation. MTACC has yet to begin negotiations on a contract modification to address the SCADA sensor point issue previously reported; and internal MTA discussions continue on the merits of issuing a contract modification to include additional SCADA equipment in the contract scope of work. The contractor continues to contend that the lack of clarity on SCADA has caused delays to its contract schedule. In its November 2016 MPR, the MTACC cites a March 2020 Substantial Completion date; indicating that the additional schedule slippage from February 2020 to March 2020 is due to the LIRR's continuing inability to provide timely comments on design submittals.

As previously noted, the approval of critical facility designs and the GEC's completion of re-designs to address design issues identified in various locations continue to be items the contractor cites as critical schedule issues. Additionally, the extended length of time taken to approve substation layout and equipment designs, including clarification of Supervisory Control and Data Acquisition (SCADA) requirements, enabled the contractor to assert that contract Milestone Nos. 1, 2, 3, 4, 6, and 7 are already delayed and will continue to be delayed on a day-to-day basis 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.

Contract VS086, Systems Package 3 – Signal Equipment Procurement, is a contract for procurement of Signal equipment and systems for installation under the future CS086 Tunnel Systems Package 2 – Signal Installation contract. Design of the various equipment and systems has been underway since NTP was given in September 2014. Progress, however, on the interim design milestones on this contract is significantly behind schedule; although the substantial completion (SC) date of October 14, 2019, remains unchanged from the original contractual date. 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; and, the 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 November 2016, showed that total procurement activity for the project was 89.3% complete, with \$9.09 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 has been extended from January 19, 2017, to December 22, 2016, and then to February 17, 2017. The bid date delay is now nearly two months. This contract will be an Invitation for Bid (IFB) procurement. Total bid advertisement delay during 2016 was six 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; Bid due date TBD. Total bid advertisement delay since January 1, 2016, is six 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 November 2016 Progress Report (December 1, data date) that total construction progress reached 66.8% complete versus 71.2% planned.

**CM005 - Manhattan South Structures:** MTACC had retroactively declared Substantial Completion (SC) for the CM005 contract 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 remaining work, and the pending transfer of 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 December 1, 2016, MTACC slightly decreased its Forecast at Completion for CM006 to \$355,777,988. The MTACC forecast for Substantial Completion remained at June 1, 2017. Actual construction progress for November 2016 was 1.3% versus 1.6% planned. Cumulative progress through December 1, 2016, was 90.0% actual versus 92.6% planned.

Construction Progress: During January 2017, the CM006 contractor continued rehabilitation/remediation work at the 63<sup>rd</sup> St. Tunnels and Structures, items include: CMU walls, doors, slabs, conduit bench and crash wall extension. The contractor continued arch construction at the GCT 3 Crossover Cavern, arch construction and duct bench construction continued in Tunnel WB3. The CM006 contractor also continued wall and arch concrete construction at the 55<sup>th</sup> St. Vent Facility, grouting work at the 50<sup>th</sup> St. Air Plenum, and wall construction at the Cross Flue.

**CM007 - GCT Station Caverns and Track:** As of December 1, 2016, 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. ESA reports this contract to be 4% complete.

Construction Progress: During January 2017, the CM007 contractor continued to process submittals for review. The contractor continued mezzanine slab construction at the East and West Caverns south back of house. The CM007 contractor also continued East and West Cavern construction: exterior concrete wall construction, closure wall construction, precast beams and panel installation, and drilling elevator piston shafts. The precast subcontractor continued production casting of beams and panels at their upstate NY facility. The start of pneumatically applied concrete (PAC) installation is pending MTA approval of PAC Mockup. Work to complete takeover of the temporary ventilation systems continued. There were no track construction activities this month, as materials & installation are pending MTA and LIRR review and approval. . The seventh monthly Construction Progress Meeting was held on January 12, 2017. 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 impact by allowing remediation work to begin.

**CM014A – Concourse and Facilities Fit-Out Early Work:** MTACC reports that, through December 1, 2016, the project forecast cost at completion has increased to \$57,984,365 from the previous \$57,717,875. 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 scheduled to be reported as February 1, 2017. Cumulative construction progress increased minimally to 97.1% from the previous 97.0% versus 100.0% planned. This has generally remained the same throughout 4Q2016 into 1Q2017, and indicates that there has been very little progress since June 2016.

Construction Progress: Through January 31, 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 with the SCADA communication with 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. This 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 CM014B HVAC system 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 December 1, 2016, the forecast cost at completion remained at \$463,617,500. The 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 are underway. Ongoing delays impacting the original August 18, 2018, Substantial Completion date have included late critical structural steel submittals, fabrication and delivery; late removal of existing unforeseen obstructions by MNR, and issues with the availability of subcontractors to perform finish work in the 4 Wellways. Actual construction progress for November 2016 was 1.4% versus 2.6% planned. Cumulative progress through December 1, 2016, was 27.0% actual versus 69.7% planned.

Construction Progress: Through January 31, 2017, surveying in the concourse continued and will be on-going throughout this contract.

Milestone #1 (Complete Terminal Management Center, Communication Room C-2 & Communication Closet C-5) – Architectural work is complete, along with punch list work. A purge system for the FM200 fire suppression still remains to be designed and constructed. This area has been turned over to the CS179 contractor and door locks have been changed.

Milestone #2 (50th St Room CR102, Tunnel Fan Room, Electrical Room #126 & ICC Room), June 4, 2016; now April 2017 – The Elevator #9 shaft corrective work, which was delaying this milestone, is complete. The affected room was the Tunnel Fan Control Room and the contractor has resumed work to complete this room. Punch List work is complete in the Electrical Room and the ICC. Access to these 2 rooms has been given to the CS179 contractor.

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. Three of the UPS units for these rooms will have to be “right sized” once the submittals are received. Communication Closet CC-C7 has been determined to be too small. Design solutions are currently under review.

Milestone #5 (Completion of 44th St. Ventilation Building), June 4, 2017; now December 13, 2017 – The contractor continues with contract work.

Milestone #5A (Completion of 48th St. Entrance) November 25, 2016 – This is being delayed until October 2, 2017 (previously March) due to previous delays in demolition of the MTA Building in the Concourse and transfer of personnel to the new 52<sup>nd</sup> St. Entrance. The personnel transfer is complete and the 48th St. construction access has been closed. Demolition of the MTA Building

and access stair is complete. MTACC is considering transferring some of the scope of this milestone to the upcoming CM015 contract. Also impacting this delay is the added scope of addressing a deteriorated structural beam for MNR. This added scope will replace the existing beam 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 building columns and related structures in Madison Yard) continue throughout. 3rd Party Inspections continue for concrete, shotcrete, rebar, masonry, bolting, welding, and firestops. Painting of concrete block continues in Zone #1 and #2. Electricians continue to install Con Ed switches in the Meter Room, along with grounding and conduit and wiring installation throughout. Plumbers completed the pre-test of the Fire Stand Pipe in Zone 1 along the east and west walls and continued to install overhead piping and rough-in piping in available bathrooms.

Header work continues in Zones 3-5. The header work takes place along the perimeter south, east and west UA walls using shotcrete to close openings between block walls and the arches in the existing structure.

Three - Story Building: Construction of building foundations began. This structure will serve as the police facility for this part of ESA.

Shaft #3 (Elevators #1, #2 & Stair 22): Layout and drilling for Stair 22 was completed. Installation of the stairs began.

Biltmore Connection: Conduit relocation continues on the Concourse Level during the day.

Wellways: The proposed work sequence has drastically changed in the Wellways. Under this proposed change, the existing scaffolding in Wellways #1 and #2 will be removed. The VM014 contractor, Schindler, will come in and install the escalators. Once the new escalators are installed and are operational, CM014B will return, re-install the scaffolding, and complete the arch ceiling and wall finish work. Previously, this work sequence was prohibited by LIRR/VM014. The work sequence for Wellways #3 and #4 will remain the same. It will take 2 weeks to remove each set of scaffolding. This re-sequencing of the work has not yet been agreed upon by CM014B and Schindler, and discussions for an agreement are ongoing. This decision will have a significant impact on the schedule.

A mockup has been installed in Wellway #3 for the glass wall tile.

There is a Buy-America issue with the specified speakers. The contractor is submitting product cuts for alternative speakers. This must be approved by LIRR, as they selected the specified speakers.

Dining Concourse Connection: Installation of permanent steel has resumed. Construction of stairs, escalator pit, and erection of Back of House (BOH) Dining Rooms began.

Elevator T-01: Installation of concrete block began.

East 48<sup>th</sup> St. Entrance: Drilling of rock anchors was completed at the NE and SE corners. Abatement of the abutment wall and street level beams began.

44<sup>th</sup> St. Vent Building: Erection of the remaining 2nd Floor steel was completed and encasement of beams began. The VM014 contractor began drilling for the elevator piston.

45th St. Entrance/Cross Passageway: Schindler began mobilization to drill the elevator piston. This work extends the existing elevator down to the new Concourse.

East 50<sup>th</sup> St. Vent Building: Corrective work in the Elevator #9 Shaft is complete. Installation of the transformer and generator were completed.

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 - (Note: The information presented for this CS084 contract comes from discussions at a mid-February 2017 Progress Meeting that reviewed contract progress for January 2017).**

Status: In its November 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 October 2016 MPR, the MTACC cited a February 2020 SC date; a two-month delay from the December 2019 SC date reported in its September 2016 MPR. Now, in its November 2016 MPR, the MTACC reports that, due to lack of progress on the C08 substation design, there is an additional 30-day slippage in the SC date to March 24, 2020. The contractor's latest monthly schedule update, with data through the end of January 2017, cites a SC date of March 11, 2020. In its October 2016 ESA MPR, the MTACC included a progress curve for the CS084 contract that presented actual progress as 11.4% versus a planned 59.0%. In its November 2017 MPR, the MTACC shows actual progress still at 11.4% versus planned progress of 61.2%; a 2.2% increase in planned work from the October MPR. 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. 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. In its latest monthly schedule update (data as of the end of January 2017), the contractor continues to indicate that six of seven contract Milestones (Nos. 1, 2, 3, 4, 6, and 7) 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. An analysis of the status of the work activities shown on the schedule is necessary to determine the status of the progress of physical work on this contract. The PMOC continues to recommend that, to make tracking of actual versus planned progress more useful as a management tool, the MTACC and the contractor may want to 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. As noted in previous PMOC reports, the contractor continues to assert that previous delays in receiving comments back from the MTACC on the C05 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. The ESA CS084 CM previously acknowledged that these comments were taking too long to process and worked with LIRR senior management and the General Engineering

Consultant (GEC) to, as the PMOC acknowledged in its December 2016 report, achieve a significant reduction in the backlog of submittal responses. Despite this improvement, two open design issues, one regarding SCADA-related requirements and the other dealing with the switchgear approval for the C08 substation, remain as open items impacting the contract schedule. The PMOC previously reported that the LIRR and MTACC reached an agreement on the required number of SCADA sensors and that the contractor was requested to submit a cost proposal to modify the SCADA design accordingly. It was also reported that the MTACC and the LIRR were discussing the LIRR's request for additional SCADA equipment. The MTACC indicated that there would be two contract modifications issued to address this modified SCADA work. One modification would address the number of SCADA sensor points, agreed upon several months ago, and the other would address the newly identified additional equipment that was requested. As of the end of January 2017, the MTACC has yet to produce an Engineer's estimate for the SCADA sensor work; so, negotiations with the contractor on this important design change have not started. Additionally, MTACC and the LIRR are still discussing the merits of having the contractor provide additional SCADA 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. In December 2016, the contractor reported that it had persuaded the substation fabricator to progress the design of the pre-fabricated C08 substation building despite not having MTA approval of the switchgear that would go inside the building. The contractor advised that the C08 substation design, which was already overdue, could not be completed without MTA approval of all the interior equipment and requested that the MTACC provide the approval of the switchgear by the end of December 2016 to enable it to submit the final C08 substation design in early January 2017. However, as of the end of January 2017, the approval of the switchgear remains as an open item and the contractor advises that this lack of approval is negatively impacting the contract's substantial completion date. 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 and designs to resolve the various 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. There was some concern that the additional work to install and test the transformer would generate an issue with union electricians, as the transformer manufacturer cited warranty issues if its personnel (non-union) did not perform the work. That concern is no longer an issue as the contractor worked with all parties to develop an installation and testing plan to satisfy all parties. 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. Work in the Vernon (C05) facility cannot begin until all water infiltration issues at the facility are resolved by the CS179 contractor; the last of which (remediation of water leakage through an access hatch) is being planned. The 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. At the mid-February 2017 CS084 Progress meeting, the

MTACC was unable to confirm that access to this room would occur in February 2107. In its October 2016 ESA MPR, the MTACC indicated that a transfer of construction work scope from this contract to the CS179 contract was being considered to address the installation of positive and negative DC traction power cabling for the C08 substation. This cabling, which can only be installed once another ESA contractor (possibly CH058A) completes the installation of ductwork between the C08 substation and the track, is necessary to perform the testing of the C08 substation and the integrated and dynamic testing of all the CS084 substations. The CS084 contract schedule calls for the testing to be performed before the ductwork is installed under the CH058A 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 – in this case the CS179 contract.

**CS179 – Systems Package No. 1:** Despite stating in its November 2016 Monthly Progress Report (MPR) that the CS179 contract Forecast is within the Budget, the MTACC shows in that report a Forecast of \$618,176,930 (a decrease from \$619,044,937 in its October 2016 report) versus a Budget of \$606,938,540; a variance of \$11,238,390. There is no explanation from MTACC in its MPR as to why the Forecast was decreased; or, why the MTACC continues to assert in the text of its Monthly Reports that “the Forecast is within the Budget”. In its November 2016 MPR, MTACC shows a progress curve for the CS179 contract that presents actual cumulative contract progress as 20.8% versus a planned 52.7%; figures that are based on actual versus projected costs, not physical construction efforts. As presented, these progress numbers continue to imply that the contract is significantly behind schedule. MTACC is continuing its evaluation of the contractor’s monthly schedule updates; however, a comprehensive analysis of the contractor’s schedule cannot be made until the schedule update includes an “approved” Integrated System Testing Plan (ISTP) and ISTP schedule. In January 2017, the contractor submitted a revised draft ISTP and MTACC and the contractor continue to exchange comments on the draft Plan. The contractor continues to develop the ISTP schedule; however, no date for final approval of that schedule, and the entire ISTP, is available at this time. 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. The MTA’s reported Substantial Completion (SC) date for this contract remains, as previously reported, 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. As of the end of January 2017, all but two of the seven required Contract Options (Option Nos. 4 and 5) were exercised. The ESA CS179 CM indicated that these remaining two contract Options will be exercised in later in 2017 in accordance with the schedule identified in Contract Modification No. 18. 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. However, the waiver request letter for the video display panels is still under review by MTA Legal staff. MTACC was unable to forecast a date for when the MTA Legal staff will complete its review. One additional potential Buy/Ship America issue was recently identified; that of the contract-specified Public Address (PA) speakers that were once USA-made but are now manufactured in China. The contractor believes there is a compliant USA-made alternative PA speaker and will submit product data to the MTA for approval to use that speaker on the ESA project.

Design Progress: The CS179 contractor continues to work on the design development of the various contractually required systems. As noted in previous reports, the reduction of the backlog of submittal and RFI reviews remains as an issue and, despite some limited improvement resulting from action by MTACC, continued focus on reducing the backlog and ensuring timely responses on future submittals and RFIs is needed. In its October 2016 MPR and again in its November 2016 MPR, MTACC indicated that the contractor's Control System Designs would be completed by December 2016; nine months later than originally scheduled and two months later than that reported by the PMOC in its September 2016 Quarterly Report. However, as of the end of January 2017, MTACC's goal to complete the final designs of the ten Control Systems by the end of 2016 was not achieved, as several of the system designs must be re-submitted for further review and approval and one other final design (the CCTV and SMS) has yet to be discussed in a final design review meeting due to unresolved design issues. Further, of the ten (10) Control System designs, two (2) are statused by MTACC as "Proceed as Noted", while three (3) are statused as "Proceed as Noted – Revise". This means that the MTA had some comments on the designs and is requiring the contractor to make some type of corrections or modifications to the design as presented. One (1) is statused as "Proceed as Noted – Revise and Resubmit"; meaning that work may not proceed until a revised design is submitted and approved; leaving only four (4) of the ten (10) designs statused as "Proceed" – a status where the contractor can proceed with the work without re-submission of the design. At this time, the LIRR has not provided any "formal" notification to MTACC that any of the Control System final designs are "accepted" or "approved". 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 CCTV and SMS 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 the 19 "Non-Control" systems. In its November 2016 MPR, MTACC notes 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 requested that the ESA CS179 CM provide progress data on each of these systems to identify the extent and impact of any reported delays. In December 2016, the subcontractor responsible for system designs, equipment assembly, and system 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. The contractor also 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. 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 appears to be effective; however, new water infiltration areas in the 23<sup>rd</sup> and 29<sup>th</sup> Street facilities are now apparent and the leaking access hatch at the Vernon facility still needs remediation. MTACC and the contractor are discussing a potential contract modification that would, once again,

extend the completion date for contract Milestone No. 1 (complete all work in Vernon). The completion of this interim milestone will enable the CS084 (Traction Power Systems) contractor to gain access to the facility and begin its work; access that per the baseline schedule, contractually was to occur in mid-October 2015, then was deferred to June 2016 and further to December 2016, and is currently forecast for February 2017. Upcoming work includes demolition work at the 2<sup>nd</sup> Avenue facility and the build out of the communications room in the Yard Service building. 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. The PMOC notes that, while MTACC contends that some of the Control System designs have been "approved" by the LIRR, it has yet to receive any "formal" acceptance" or "final approval" of any of the Control Systems final designs from the LIRR. 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. Currently, there continue to be seven Stop Work Orders (SWOs) on this contract. One SWO is related to the requirement for an Undercar Deluge System at GCT and another is related to the requirement for a transformer at 43rd Street. These two original work scope items will be deleted from the CS179 contract via a contract modification. All five of the remaining SWOs need to be resolved by MTACC; and, while the GEC is still working on designs and solutions to these SWOs, no date is available for the completion of the designs or the rescinding of the SWOs.

**Contract VS086, Systems Package 3, Signal Equipment Procurement:** In its November 2016 ESA Monthly Progress Report, MTACC indicates that both the Forecast and Budget for this contract remain at \$21,835,022. While the forecasted SC date remains the same as that established at contract award (October 14, 2019), 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. However, the PMOC cautions that whatever new schedule is agreed upon needs to include all the currently known outstanding design issues (see Design discussion below) to ensure that the schedule can be an effective management tool.

Design Progress: 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 indicates that the design of the Plaza Interlocking Central Instrument Room (CIR) is a critical design that needs to be completed without delay and that there are several other design issues that require 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 need to be established to facilitate the Factory Integrated Acceptance Testing (FIAT) of some of the signal equipment as any delay in the receipt of this software will seriously impact the scheduled FIAT. Finally, the LIRR recently requested that the contractor replace the incandescent lights in the signal units with Light Emitting Diodes (LEDs) and changes to the contract requirements and to designs are already underway. Replacement of the lights could pose significant delays to the completion

of the signal designs. The MTA needs to determine if this potential contract change is warranted; and, if it is, quickly progress a contract modification so as to minimize any impact to the design completion date.

### **Queens Contracts:**

**CQ032 – Plaza Substation and Queens Structures:** As of December 1, 2016, MTACC reported that the Forecast at Completion for CQ032 increased slightly to \$265,424,777. MTACC reports the Forecast for Substantial Completion (SC) slipped to March 2, 2017. ESA advised that the SC has slipped two months due to additional grouting work at the former Early Access Chamber (EAC) and TBM Launch Block areas. Actual construction progress for December 2016 was 0.7% versus 0.7% planned. Cumulative progress through December 1, 2016, was 99.2% actual versus 99.4% planned.

Construction Progress: During January 2017, the CQ032 contractor continued finish work in the Yard Services Building and next month expects to complete all floor, lighting and finish work. Work continued on miscellaneous civil site work items, to be followed next month with fence, curb installation, and final Con-Ed approval and activation of the gas line service connection. The contractor completed Phase 2 water remediation activity by additional internal grouting in the old Early Access Chamber and Launch Block areas. 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 vents shafts on west side of 23<sup>rd</sup> St. and 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 curb cut at Northern Blvd. existing NYCT vent.

### **Harold Interlocking Contracts:**

**CH057 – Harold Structures Part III:** MTACC's Forecast at Completion for the CH057 contract increased slightly to \$92,873,634 during November 2016. The MTACC forecast for Substantial Completion was shortened by 11 weeks to July 5, 2017. Actual construction progress for November 2016 was 5.9% versus 4.4% planned. Cumulative progress through November 30, 2016, was 65.0% actual versus 79.6% planned (although MTACC decided not to exercise Options 1 thru 9 earlier).

Construction Progress: During January 2017, the CH057 contractor completed all tunnel construction required by the Tunnel D base contract and Option 10 and began backfill of the entire area to prepare for construction of new LIRR ML4 Track. Additionally, the contractor began installation of permanent panels in the 48-S2 retaining wall and continued sewer line construction and retaining wall construction at the 39-S6 retaining wall.

**CH057A – Part 3 Westbound Bypass:** MTACC's Forecast at Completion for the CH057A contract increased to \$160,992,751 during November 2016. The MTACC forecast for Substantial Completion was extended by 6 weeks to January 24, 2018. Actual construction progress for November 2016 was 0.5% versus 4.0% planned. Cumulative progress through November 30, 2016, was 43.2% actual versus 47.4% planned (based on cost incurred rather than actual construction).



Construction Progress: During January 2017, the CH057A contractor continued to place re-bar and sidewall concrete in the East Approach Structure (east of Honeywell St. only) and West Approach Structure of the Westbound Bypass (WBY). Additionally, the contractor completed excavation at the WBY pump station and began to install the remaining secant piles around the perimeter. The “jacked box” tunnel shield did not resume operation during January 2017 as the ESA PMT and the contractor continue to disagree on the cause(s) of its original misalignment problems and potential solutions. There has been no tunnel shield progress in the 6 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 November 2016. The MTACC forecast for Substantial Completion was extended by one month to February 21, 2017. Actual construction progress for November 2016 was 0.0% versus 0.0% planned (the work package was originally supposed to be complete by now). Cumulative progress through November 30, 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 former Stage 1 construction during January 2017.

**FHA02 – Harold Stage 2 Amtrak:** MTACC’s Forecast at Completion remained at \$60,150,231 during November 2016. The MTACC forecast for Substantial Completion remained at May 20, 2018. Actual construction progress for November 2016 was 0.2% versus 0.0% planned. Cumulative progress through November 30, 2016, was 85.3% actual versus 81.0% planned (based on cost incurred rather than actual construction).

Construction Progress: Amtrak Electric Traction personnel continued construction of catenary wire assemblies to provide AC operation over the existing Eastward Long Island Passenger and new RPR (Relocated Primary Route) Tracks during January 2017. Amtrak C&S personnel began installation of 91.6Hz signal power cable into the “F2E” signal hut during January 2017.

**FQA65 – Loop Interlocking Amtrak:** MTACC’s Forecast at Completion for FQA65 remained at \$33,287,863 during November 2016. The MTACC forecast for Substantial Completion remained at July 16, 2023. Actual construction progress for November 2016 was 0.2% versus 1.4% planned. Cumulative progress through November 30, 2016, was 20.0% actual versus 59.2% planned (based on cost incurred rather than actual construction).

Construction Progress: During January 2017, Amtrak Track personnel resumed installation of concrete ties and continuous welded rail (CWR) for the new Loop 1A Track between the new #743B turnout and the existing #749 turnout.

**FHL01 – Harold Stage 1 LIRR:** MTACC’s Forecast at Completion for FHL01 remained at \$24,379,363 during November 2016. The MTACC forecast for Substantial Completion was extended by one month to June 27, 2017. Actual construction progress for November 2016 was 0.0% versus 0.0% planned. Cumulative progress through November 30, 2016, was 88.6% actual versus 100.0% planned (based on cost incurred rather than actual construction).

Construction Progress: LIRR 3<sup>rd</sup> Rail personnel continued to install conduit for 3<sup>rd</sup> rail breakers #70 and #70T71 and feeder switch #71 at the new G02 Substation during January 2017.

**FHL02 – Harold Stage 2 LIRR:** MTACC’s Forecast at Completion for FHL02 remained at \$92,932,559 during November 2016. The MTACC forecast for Substantial Completion remained at April 15, 2020. Actual construction progress for November 2016 was 1.3% versus 1.3% planned. Cumulative progress through November 30, 2016, was 97.4% actual versus 100.0% planned (based on cost incurred rather than actual construction).

Construction Progress: During January 2017, LIRR Signal personnel continued to install cables for six snow melter units in Harold Interlocking, make ESA501 (GEC designation) signal revisions at existing Locations 23 and 30, Harold, and new “H5” CILs, make ESA603 (GEC designation) signal revisions at existing Harold and Location 23 (along with ESA604 revisions), install signal conduit at “H1” CIL, install signal power cables and signal transformers at “H2” CIL and the #24WC location, make signal revisions for snow melters at “H3” CIL, pre-test signal circuits at “H5” CIL, and make N70A signal revisions at the N41 and N47 locations at Woodside and M544 signal revisions at Locations 37 and 45 to comply with civil restrictions. Additionally, LIRR High Tension personnel energized the signal power separation system between Tower numbers 36 and 40. This was a partial energization of the signal power system in Harold Interlocking. Total energization in Harold will occur when it is extended from Tower number 36 westward to Substation No. 44 (43rd St. to Honeywell Ave). Although the PMOC does not believe that further delay is likely, nonetheless, any additional delay to this extension could have a negative impact on the CIL cutovers, scheduled for 2018.

#### **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 will be on CH057 (scheduled for February 01, 2017). The following QOs took place in January 2017:

- CM014B – January 31, 2017
- CQ032 – January 27, 2017

**CM005:** Punchlist work appears to have stopped on site. It is anticipated that the remaining punchlist work will be handed over to the CM007 team, though arrangements for this have yet to be formalized. Approximately ten (10) NCRs remain open.

**CM006:** There are approximately fifty-one (51) open NCRs, half of which relate to Pneumatically Applied Concrete (PAC) placement, which the contractor is attempting to consolidate.

**CS179:** There are no major quality concerns. ESA has appointed an additional member to its quality staff, who will provide much needed support in covering this contract, as well as CS084 and VS086.

**CH053:** The final NCR (no.94) was formally closed out in January, though the related work had been completed previously. No NCRs remain open on the contract.

**CH061A:** Quality Kickoff Meeting for the contract was held on January 05, 2016, one day after the Construction Kickoff. The Quality Plan and other initial submittals are currently under ESA Quality Staff review.





Table 2.2, below, shows the current IPS critical path of work through Harold contracts and has changed somewhat since the previous update. The changes are described in further detail below the table.

**Table 2-2: December 1, 2016 IPS Critical Path**

<b>Contract &amp; General Activities</b>	<b>Duration (CDs)</b>	<b>Start</b>	<b>Finish</b>
FHL02: ARINC Resequencing Screen Shot Changes	81	01-Dec-16	20-Feb-17
FHL02: CIL Cutovers Pre-Testing and Cutovers	453	21-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	30	14-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 fabrication and installation of a hatch on a transformer for the completion of signal power separation, to the ARINC resequencing screen shots.

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, while the light blue squares represent planned progress for each IPS update analyzed.

Path through Signal Power Separation:

The PMT reports that one of the paths of work controlling the critical path as of the December 1, 2016 IPS update runs through the completion of LIRR signal power separation. 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	
				OCT	NOV	DEC	JAN	FEB
FHL02-30200: Fabricate hatch - By contractor through CH057	1-Nov	8/26/2016 A	11/11/2016	█	█			
	1-Dec	8/26/2016 A	11/19/2016 A	█	█			
FHL02-30240: Install Hatch (2 weekends) - By contractor through CH057	1-Nov	11/12/2016	11/13/2016		█			
	1-Dec	1/7/2017	1/8/2017				█	
FHL02-30220: Install Transformer	1-Nov	11/14/2016	11/18/2016		█			
	1-Dec	1/9/2017	1/13/2017				█	
FHL02-31180: 91 6 Hz Power to H1/H2/H5/H6 CIL's - To be isolated from Sub 44	1-Nov	N/A	N/A					
	1-Dec	1/14/2017	1/14/2017				█	
FHL02-2220: Implementing Cut-over Sequencing Plan - Phase I	1-Nov	11/21/2016	12/19/2016		█			
	1-Dec	N/A	N/A					
FHL02-5140: Implementing Cut-over Sequencing Plan - Phase II	1-Nov	12/20/2016	1/20/2017			█		
	1-Dec	N/A	N/A					
FHL02-30140: Implementing Cut-over Sequencing Plan - Phase III	1-Nov	1/23/2017	2/17/2017				█	
	1-Dec	N/A	N/A					
FHL02-3260: LIRR Cutover MG SPS (SPS Complete) w/o EO Control	1-Nov	-	2/17/2017					█
	1-Dec	N/A	N/A					
FHL02-CSR1160: Pre-Testing - H1/H2/H5/H6/Loc 30	1-Nov	2/20/2017	5/4/2018					█
	1-Dec	2/21/2017	5/4/2018					█

Analyzing the progress of this work as reported in the December 1, 2016 IPS shows that the planned path of work through signal power separation has changed over the update period █. The following four activities that were contained in the previous month’s IPS update were removed from the current IPS update, and are therefore no longer involved with driving that path of work:

- FHL02-2220: Implementing Cut-over Sequencing Plan – Phase I;
- FHL02-5140: Implementing Cut-over Sequencing Plan – Phase II;
- FHL02-30140: Implementing Cut-over Sequencing Plan – Phase III; and
- FHL02-3260: LIRR Cutover MG SPS (SPS Complete) w/o EO Control.

The PMT’s IPS Report for December 1, 2016 does not address the removal of these previously critical activities from the IPS, or the change to the controlling work of the Program-critical CIL pre-cutover testing. The lack of explanation for changes to Program-critical activities is PMOC concern No. 4, listed at the end of this Section.

Path through ARINC Screen Shots:

The PMT reports that the path of work controlling the Program critical path as of the December 1, 2016 IPS update runs through 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	
				OCT	NOV	DEC	JAN	FEB
FHL02-CSR1180: H5/H6/L30 Arinc Resequencing screen shot changes	1-Nov	10/29/2016 A	1/31/2017	█	█	█	█	█
	1-Dec	10/29/2016 A	2/1/2017	█	█	█	█	█
FHL02-CSR210: Arinc Resequencing screen shots on site installation/Test/Resolve issues	1-Nov	2/1/2017	2/17/2017				█	█
	1-Dec	2/2/2017	2/20/2017				█	█
FHL02-CSR290: Ready to start testing / Revision	1-Nov	-	2/17/2017					█
	1-Dec	-	2/20/2017					█
FHL02-CSR1160: Pre-Testing - H1/H2/H5/H6/Loc 30*	1-Nov	2/20/2017	5/4/2018					█
	1-Dec	2/20/2017	5/4/2018					█

\*This activity was previously identified as FHL02-CSR300 in previous IPS updates

As can be seen above, this path of work made expected progress over the reporting period and is still on schedule to complete in time for the start of CIL pre-cutover testing on February 20, 2017.

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

Table 2-3, below, shows important 90 day Look-Ahead milestone dates reported in the December 1, 2016 IPS.

**Table 2-3: Critical Milestones 90 Day Look-Ahead (from ESA December 1, 2016 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 December 1, 2016 IPS added more information and detail to the Manhattan/Systems portion of work, with the inclusion of the approved CM007 baseline schedule. The PMT reports that the controlling work for the Manhattan/Systems portion of the Program is led by the 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). The forecasted completion of CS179 [REDACTED] [REDACTED] remained unchanged at July 1, 2020 [REDACTED].

**Upcoming Contract Procurements:**

Table 2-4, below, shows the status of current and upcoming Contract procurements, as reported in the December 1, 2016 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>	5/23/2016 (A)	08/2/2016 (A)	01/27/2017	16 Months	05/29/2018
<b>CQ033 Mid-Day Storage Yard</b>	10/20/2016 (A)	12/30/2016	02/22/2017	40 Months	06/22/2020
<b>CM015 48<sup>th</sup> Street Entrance</b>	01/31/2017	04/25/2017	06/06/2017	33 Months	03/09/2020
<b>CS086 Systems Package 2: Signal Installation</b>	01/26/2017	03/24/2017	05/24/2017	38 Months	07/01/2020
<b>QMP-1 Civil / Neighborhood Beautification</b>	10/20/2016 (A)	01/05/2017	1/17/2017	10 Months	11/07/2017
<b>QMP-2 Lighting / CCTV Security</b>	02/23/2017	04/12/2017	05/30/2017	13 Months	07/02/2018

All 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 will have a duration of 16 months, with expected Substantial Completion on May 29, 2018.

The Advertise Date for CQ033: Mid-Day Storage Yard was reported to have actually occurred on October 20, 2016. However, the forecast Bid Date has been delayed approximately two months, first from December 22, 2016 to January 19, 2017 and then to February 17, 2017. The planned remaining milestone dates related to the procurement of CQ033 stayed the same in the December 1, 2016 IPS compared to the previous update.

The forecasted dates for the procurement of CM015: 48<sup>th</sup> Street Entrance were delayed over the update period. The planned Advertise Date was delayed by approximately three weeks, while the Bid Date was delayed approximately six weeks, with the forecasted date for NTP delayed a little over four weeks. Building upon these delays, the expected duration for CM015 expanded, from 30 months shown in the November 1, 2016 IPS Report, to 33 months shown in the current update. The cumulative effect of these delays has delayed the planned Substantial Completion of CM015



by almost five months – from October 18, 2019, to March 9, 2020. The PMT commented on the delays to the bid date in its IPS Report, but did not explain or acknowledge the significant change to the expected duration and/or the Substantial Completion date of the contract.

The planned dates for the Advertise, Bid, and NTP dates of future contract CS086 - Systems Package 2, Signal Installation, were delayed approximately two weeks since the previous IPS update. However, the PMT has reported that the planned duration of the contract and the expected Substantial Completion date remained the same.

The remaining forecasted procurement dates for QMP-1: Civil/Neighborhood Beautification were all delayed by one week over the update period. 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 continues to note a trend in Force Account Work not being completed as scheduled, due to a lack of LIRR and Amtrak resource personnel needed to perform the work. Due to the concern that this work may continue to have an adverse impact on the Project, the PMOC has been tracking this work and is planning to incorporate an analysis of any noted delays in future reports.
2. The PMOC is very concerned that the PMT does not have a defined scope of work related to the CIL pre-cutover testing that is forecasted to occur soon, and occupy the Program's critical path for a long period of time. The PMT was not able to tell the PMOC what percentage of this testing would be able to be performed under the new "localized pre-testing" activity compared with the total amount of testing needed. Furthermore, the "localized pre-testing" activity added to the IPS a few updates prior has been removed without explanation. This lack of definition, and the fact that the IPS continues to show changes to this work related to added activities and changed relationships, which causes the controlling critical work leading up to the CIL pre-Cutover testing to change, is a major concern to the PMOC. The PMT has stated that it has not been provided this information from LIRR, but this does not alleviate the PMOC's concern.

In its December 1, 2016 IPS Report, the PMT stated that the reduction of the planned duration for the critical CIL pre-cutover testing will be evaluated once it receives more information from LIRR, and that this could result in an assessment of any potential impact. The PMOC is concerned that the reduction of the duration for this work is not based on objective information, but rather, to maintain current forecasted critical dates within the IPS [REDACTED].

3. The PMOC is concerned regarding the delay to the forecasted SC date for CM015: 48<sup>th</sup> Street Entrance. The planned completion of CM015 has been delayed by approximately five months over this update period. Looking back over the previous six months, the forecasted Substantial Completion date for CM015 has been delayed by approximately ten months. As of the June 1, 2016 IPS, the forecasted Substantial Completion date for CM015 was January 3, 2019, while it is currently planned for March 9, 2020. CM015 is logically connected to CS179 in the IPS and therefore,

4. the delayed completion of work on CM015 may impact turnover to allow CS179 to complete its work.
5. 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 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.

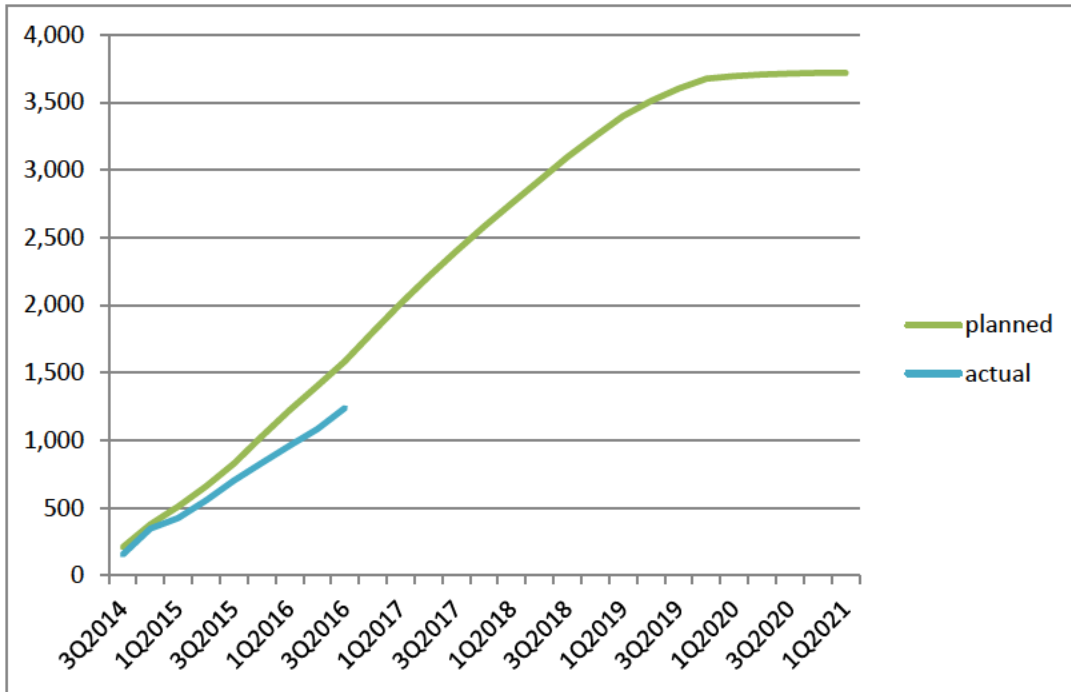
### 3.0 COST DATA

**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 November 2016 Progress Report (December 1 data date) shows that the actual total project progress was 67.1% versus 70.0% planned against the Current Baseline Budget (CBB) of \$10.178 billion. Total actual construction progress was 66.8% versus 71.2% 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**

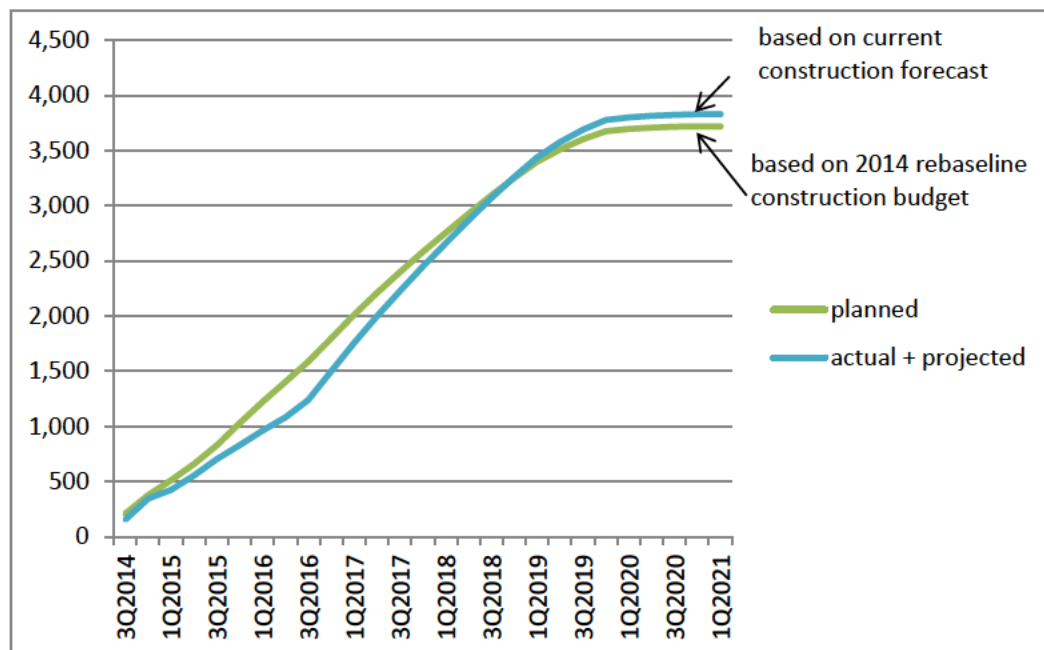
The "planned" curve shows construction cash flow that was planned by ESA at the 2014 re-baselining in order to reach revenue service by the 1Q2021. The vertical axis is \$million, starting at \$0 at the time of the re-baselining. The "actual" curve, up to the 3Q2016, shows actual construction spending 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 for December 2016 and January 2017.

- [Redacted]

[Redacted]

[Redacted]

[Redacted]

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 January 2017, ESA reported that the ESA Capital Fund Amendment has been postponed to the 2<sup>nd</sup> quarter of 2017, with possible longer duration and uncertain approval outcome. ESA has not received 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]

**PMOC Concerns:**

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

- [REDACTED]



PMOC on October 26, 2016. Through January 2017, MTA continued to work with both the FTA and the FRA to monitor and resolve FRA grant funding drawdown issues.

The PMOC has continuing concerns regarding the impact to the ESA Harold work due to the Amtrak program to harden East River Tunnel (ERT) Lines 3 and 4 in preparation for extended outages for ERT Lines 1 and 2 to complete Hurricane Sandy damage-related reconstruction work now planned for 2019. There is concern, shared by both the PMOC and MTACC, that significant 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. However, no noticeable impacts to availability of Amtrak force account resources during the October 2016 to January 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 to GCT for LIRR service. 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 their 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 concluded that the CMP is acceptable and provided the FTA with the comment close-out details in November 2016. The FTA subsequently notified MTACC accordingly.

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

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

**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, 23<sup>rd</sup> Street, and 29<sup>th</sup> Street facilities. To determine the effectiveness of the remediation efforts, MTACC plans to inspect the affected

facilities on a bi-monthly basis and after each significant rainfall. The PMOC believes that this is a positive approach.

**Contract CS179:** As noted in previous reports, the PMOC remains highly 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 schedule. To date, only one of the two 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.

The PMOC remains concerned that late completion of reviews of contractor design submittals by MTA has caused the design completion date to slip over ten months and is especially concerned that resolution of design issues for the CCTV and SMS Control Systems, (detailed in section 1.0c, CS179, above), 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. The 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 so as to preclude any further impact to substation design and fabrication.

**Contract VS086:** The PMOC is concerned that the 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.

[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 primary concerns include: continued delay trending on force account work completion and changes to what is driving the Program's critical path.

### **Risk Management:**

This 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 VS08, 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 January 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.

The PMOC notes that due to insufficient support from Amtrak, ESA has been unable to develop a sustainable schedule for the remaining Harold Interlocking work that can be achieved despite the most recent full re-plans in 2013-2014 and again in 2015 as the "ESA First" Harold Re-Sequencing. ESA had to complete another Harold re-plan effort in 2016 that reflects the continued lack of Amtrak support with regard to force account resources and track outages for ESA work. The PMOC notes that the situation has deteriorated significantly since the current baseline was established just 30 months ago in July 2014:

- [REDACTED]
- The Harold critical path has now become the ESA Program Critical Path and leads the secondary Manhattan/Systems critical path by approximately three months;
- Amtrak's decision to take ERT Line 2 out of service first for an extended outage of one year or more will not support the current ESA planning to complete all of the remaining Harold work, including the High Speed Rail work, by 2021. The PMOC does note, however, that MTACC believes that Amtrak's decision about ERT Line 2 will not impact the remaining work in Harold Interlocking required to provide LIRR service to Grand Central Terminal;
- Amtrak had planned to start total track replacement and other "hardening" efforts in ERT Lines 3 and 4 structures during 4Q2016 to increase these two lines' reliability in preparation for the extended outages for ERT Lines 1 and 2 starting in 2019. Although there is no evidence that this work has started, the PMOC expects that when the effort does commence, it may adversely impact the availability of force account resources for the remaining ESA work; and,
- Additional constraints developed during 3Q2016 involving less availability of future priority weekend track outages and increasing demand for track foremen to provide access and protection to the third-party construction contractors.

## **APPENDIX A - ACRONYMS**

AFI	Allowance for Indeterminates
ARRA	American Recovery and Reinvestment Act
BLS	Bureau of Labor Statistics
BOH	Back of House
BAFO	Best and Final Offer
C&S	Communication and Signals
CCC	Change Control Committee
CCM	Consultant Construction Manager
CIL	Central Instrument Location
CIR	Central Instrument Room
CLSM	Controlled Low Strength Material
CM	ESA Construction Manager assigned to each contract
CMP	Cost Management Plan
CMU	Concrete Masonry Unit
ConEd	Consolidate Edison Company
CPM	Critical Path Method
CPOC	Capital Program Oversight Committee
CPP	Contract Packaging Plan
CPR	Contractor Proposal Request
CPRB	Capital Program Review Board
ELPEP	Enterprise Level Project Execution Plan
ERT	East River Tunnel
ESA	East Side Access
ET	Electric Traction
FA	Force Account
FDR	Final Design Review
FFGA	Full Funding Grant Agreement
FRA	Federal Railroad Administration
FTA	Federal Transit Administration
GCT	Grand Central Terminal
GEC	General Engineering Consultant



HSR	High Speed Rail
IEC	Independent Engineering Consultant (to MTA)
IFB	Invitation for Bid
IPS	Integrated Project Schedule
IST	Integrated System Testing
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
NTP	Notice to Proceed
NYAR	New York and Atlantic Railroad
NYCT	New York City Transit
OCIP	Owner Controlled Insurance Program
PAC	Pneumatically Applied Concrete
PCO	Proposed Change Order
PDR	Preliminary Design Review
PEP	Project Execution Plan
PMOC	Project Management Oversight Contractor (Urban Engineers)
PMP	Project Management Plan
PMT	ESA Project Management Team
PQM	Project Quality Manual
PVS	Plaza Vent Structure
PWE	Project Working Estimate
QA	Quality Assurance
QPR	Quarterly Progress Report
RAMP	Real Estate Acquisition Management Plan
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
RTU	Remote Terminal Unit
SC	Substantial Completion
SCADA	Supervisory Control and Data Acquisition
SCC	Standard Cost Category
SDR	Second Design Review
SMP	Schedule Management Plan
SMU	Snow Melter Unit
SOE	Support of Excavation
SSMP	Safety and Security Management Plan
SWO	Stop Work Order
TCC	Technical Capacity and Capability
TELP	Temporary Eastbound LIRR Passenger
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 October 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%	7229.1	64.46%
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%	6611.5	64.96%
Total Project Cost		\$ 10,922	90.73%					
Federal Share	\$ 2,683		36.33%	\$ 1,148	\$ 2,699	24.07%	1965.6	72.83%
Federal Share		\$ 2,683	22.29%					
5309 New Starts share	\$ 2,632		35.63%	\$ 1,098	\$ 2,437	21.73%	1703.5	69.90%
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%	4645.9	62.12%
Local Share		\$ 8,239	68.44%					

**Table 3: Project Budget and Invoices as of November 30, 2016**

Elements	Baseline Total Budget (June 2014)	Current Baseline Budget (November 2016)	Actual Awards (November 2016)	Paid to Date (November 2016)	Actual % Budget Paid
Construction	\$ 7,379,296,706	\$ 7,491,580,185	\$ 6,625,010,061	\$ 4,826,982,664	64.43%
Soft Costs					
Subtotal	\$ 2,798,474,304	\$ 2,686,190,825	\$ 1,962,036,675	\$ 1,820,260,013	67.76%
Engineering	\$ 720,615,810	\$ 723,521,828	\$ 699,196,546	\$ 685,106,616	94.69%
OCIP	\$ 282,613,620	\$ 282,613,620	\$ 282,613,620	\$ 282,195,276	99.85%
Project Mgmt.	\$ 972,168,644	\$ 972,168,644	\$ 862,759,840	\$ 736,963,887	75.81%
Real Estate	\$ 182,076,230	\$ 178,049,776	\$ 117,466,669	\$ 115,994,234	65.15%
Rolling Stock	\$ 202,000,000	\$ 202,000,000	\$ -	\$ -	0.00%

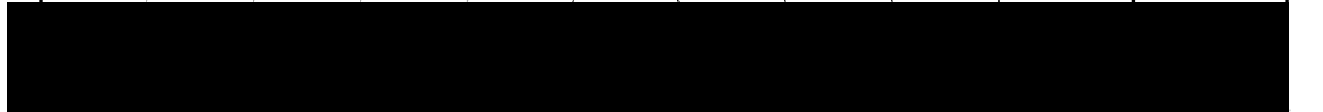
Note: ESA is currently carrying the Rolling Stock Reserve as an off-line cost, not in the Budget.

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

Standard Cost Category (SCC) No.	FFGA SCC baseline (YOE \$) M	Amended FFGA SCC baseline (YOE \$) M	June, 2014 Re-Plan (YOE \$)	3Q 2015	4Q 2015	1Q 2016	2Q 2016	3Q 2016	CBB Variance from FFGA %	CBB Variance from Amended FFGA %
10	1,989	3,353	3,405	3,421	3,420	3,443	3,467	3,475	74.71%	3.64%
20	1,169	2,327	2,238	2,339	2,338	2,314	2,326	2,325	98.89%	-0.09%
30	356	451	474	473	472	472	473	472	32.58%	4.66%
40	205	562	611	593	593	594	594	592	188.78%	5.34%
50	619	628	606	565	566	569	568	582	-5.98%	-7.32%
60	165	192	220	219	218	216	215	215	30.30%	11.98%
70	494	880	210	210	210	210	210	210	-57.49%	-76.14%
80	1,184	1,809	1,975	1,975	1,976	1,977	1,978	1,978	67.06%	9.34%



100	1,036	1,116	1,036	1,036	1,036	1,036	1,036	1,036	0.00%	-7.17%
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**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)**

\$1,000s

Standardized Cost Category	FFGA	Amended FFGA	May 2012 Re-Baseline	June 2014 Re-Plan	Awarded Value (September 2016)	Paid To Date (September 2016)
10- Guideway & Track Elements	\$1,988,742	\$3,353,399	\$2,943,165	\$3,405,463	\$3,205,253	\$2,501,899
20- Stations, Stops, Terminals, Intermodal	\$1,168,655	\$2,326,752	\$1,513,998	\$2,238,235	\$2,166,389	\$1,266,504
30- Support Facilities, Yards, Shops, Admin Buildings	\$356,264	\$450,757	\$384,583	\$474,177	\$230,535	\$209,910
40- Site Works and Special Conditions	\$205,105	\$562,461	\$491,341	\$610,570	\$476,921	\$469,729
50- Systems	\$619,343	\$627,657	\$698,296	\$605,592	\$448,050	\$327,427
60-ROW, Land, Existing Improvements	\$165,280	\$192,225	\$203,639	\$219,397	\$154,788	\$153,274
70- Vehicles	\$493,982	\$879,530	\$674,372	\$209,938	\$7,838	\$5,549
80- Professional Services	\$1,184,000	\$1,808,989	\$1,648,606	\$1,975,398	\$1,843,199	\$1,677,164
Estimated Financing Cost	\$1,036,100	\$1,116,454	\$1,116,000	\$1,036,000	\$617,607	\$617,607

**Table 7: ESA Core Accountability Items**

<b>Project Status:</b>		<b>Original at FFGA</b>	<b>Amended FFGA</b>	<b>Current*</b>	<b>ELPEP **</b>
<b>Cost</b>	Cost Estimate	\$7.386B	\$10,922B	\$10.178B	\$8.119B
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
<b>Schedule</b>	RSD	December 31, 2013	December 31, 2023	December 2022	April 30, 2018
<b>Total Project Percent Complete</b>		Based on Invoiced Amount		66.8% actual vs 71.2% planned (ESA Figure)	
<b>Project Performance Rate(Since 2014 ESA "Re-Plan")</b>		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.	
<b>Major Issue</b>	<b>Status</b>			<b>Comments</b>	
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>▪ 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	<p>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.</p>			<p>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.</p>	

\*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.