

PMOC COMPREHENSIVE MONTHLY REPORT

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

Report Period December 1 to December 31, 2018

PMOC Contract No. DTFT60D1400017

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PMOC Lead: **b(6)**

Length of time on project: Ten 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 FTA or the project sponsor, in accordance with the purposes as described below.

For projects funded through 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.

EXECUTIVE SUMMARY

This summary highlights key events and important issues for the 4th Quarter 2018.

	3Q2018	4Q2018	Notes
Program Status ¹	72.9% actual 72.7% as-planned	74.9% actual 74.9% as-planned	Meeting April 2018 spending plan.
Construction Status	76.0% actual 75.7% as-planned	77.9% actual 78.2% as-planned	Behind April 2018 spending plan. ²
Construction Issues	CM014B, CS084, VS086, CS179.	CM014B, CS084, VS086, CS179.	No change.
Funding	\$10,335 m	\$10,335 m	No change.
Cost/ Budget Contingency	b(4)		
IPS Schedule	Target RSD Feb. 2022 Manh./Systems = CP	Target RSD Feb. 2022 Manh./Systems = CP	No change.
Risk Management	11 major risks	12 major risks	One new risk - 270 Park Ave. added in 4Q2018.
Construction Safety	1.61 LTI 3.23 RI	0.39 LTI 0.78 RI	Safety ratios improved in 4Q2018.
ELPEP Compliance	20 CDs > ELPEP min. \$545 m > ELPEP min.	27 CDs > ELPEP min. \$487 m > ELPEP min.	Schedule contingency close to minimum.
Buy America	Three issues	One issue	2 issues resolved 4Q2018
<u>Contracts Awarded/Completed:</u>	CS086 awarded and CH061A completed during 3Q2018. CH058A awarded during 4Q2018.		
<u>Harold Interlocking:</u>	All Northeast Quadrant (NEQ) trackwork completed during 3Q2018. #6197 Southeast Quadrant (SEQ) crossover installed and new G02 Substation placed in service during 4Q2018.		
<u>Key Stakeholder Issues:</u>	Late LIRR completion of Positive Train Control design, late approvals for CS179 final control and non-control systems designs, CS084, Amtrak continuing Force Account availability, and MTACC Change Order processing all remained issues during 3Q and 4Q2018. JPMC development of 270 Park Ave. was the only new issue added during 4Q2018.		
<u>Project Management Plan:</u>	MTACC to update PMP and Sub-plans during 3Q2018. Drafts for Sub-plans SMP, CMP, and RMP submitted during 4Q2018.		
<u>Organization:</u>	Executive VP/Sr. Program Executive – ESA retired during 3Q2018; replaced during 4Q2018. New Program Manager – Project Controls started during 4Q2018.		

All Project Sponsor cost and schedule data included in this report is based on the MTACC East Side Access Monthly Progress Report for October 2018, referenced in this report as the ESA October 2018 MPR, which has a cost and schedule data date of November 1, 2018. Unless otherwise noted, all progress percentages in this report are based on invoiced costs and not actual construction.

¹ Based on invoice cost and April 2018 EAC forecast.

² 106,428 (17.2%) fewer construction hours worked during 4Q2018 than during 3Q2018.

REPORT FORMAT AND FOCUS

This report is submitted in compliance with the terms of the Federal Transit Administration (FTA) Contract No. DTFT60D1400017, Task Order No. 0002. Its purpose is to provide information and data to assist the FTA as it continually monitors the Sponsor's technical capability and capacity to execute a project efficiently and effectively, and hence, whether the Sponsor continues to be ready to receive federal funds for further project development. This report covers the project and quality management activities on the East Side Access (ESA) Mega-Project managed by MTA Capital Construction (MTACC) with MTA as the Sponsor and financed by the FTA FFGA.

QUARTERLY SUMMARY**1. PROJECT DESCRIPTION**

The East River tunnels in Manhattan are at capacity. The ESA project is anticipated to improve LIRR tunnel capacity constraints and enable the growth of the overall system. The project comprises a 3.5 mile commuter rail extension of the Long Island Rail Road (LIRR) service from Sunnyside, Queens, to Grand Central Terminal (GCT), Manhattan, utilizing the existing 63rd St. Tunnel under the East River and new tunnels in Manhattan and Queens, including new power and ventilation facilities. The project includes a new eight track terminal constructed below the existing GCT and a new surface rail yard in Queens for daytime train storage. Future ridership forecast is 162,000 daily riders (27,300 new riders). The project will provide increased capacity for the commuter rail lines of the LIRR and direct access between suburban Long Island and Queens and a new passenger terminal in GCT in east Midtown Manhattan.

2. CHANGES DURING 4th QUARTER 2018**a. Engineering/Design Progress**

In the ESA October 2018 MPR, the PMT reported the overall engineering effort at 84.4% complete compared to planned completion of 85.1%. Since the ESA July 2018 MPR, the PMT calculates summary Engineering progress as a percentage of the \$871.8 million April 2018 EAC forecast of engineering costs.

b. New Contract Procurements

Contract CH058A, Harold Structures Part 3A, B/C Approach Structure, was awarded on October 25, 2018, and NTP was issued on December 7, 2018.

c. Construction Progress

In the ESA October 2018 MPR, MTACC reported that total construction progress reached 77.9% complete compared with planned progress of 78.2%. Since the ESA July 2018 MPR, the PMT calculates summary Construction progress as a percentage of the \$8,014 million April 2018 EAC forecast of construction costs.

d. Continuing and Unresolved Issues

Harold Re-Sequencing Plan (“ESA First”): During 2016, the ESA First Harold Re-sequencing Plan was adjusted to accommodate railroad force account constraints. The impacts caused by insufficient Amtrak support were reduced during 2016 through 2018, but not totally eliminated, by ESA frequent program re-planning and re-sequencing. Amtrak access and protection for third-party contractors improved measurably during 3Q2018 and 4Q2018. Further improvement is needed for Amtrak direct labor work in order to meet all ESA requirements.

Amtrak Preparation for Extended East River Tunnel Outages: The PMOC has continuing concerns regarding the impact to the ESA Harold work due to the Amtrak program to repair and harden the East River Tunnels (ERT) to complete Hurricane Sandy reconstruction work. The work had been planned for 2019 but was rescheduled for 2025. The risk remains that reliability or safety issues might require Amtrak to make emergency repairs at any time until the Public RSD of December 2022. The PMOC’s position is based on Amtrak’s historic reactions to service disruptions in the tunnels, which have resulted in suspending ESA work until the tunnel disruptions are resolved.

LIRR Positive Train Control (PTC): There are three potentially significant impacts of PTC implementation.

1. A potential risk that may be realized in the near future is the impact that LIRR installation of Positive Train Control (PTC) in Harold Interlocking may have on the remaining Harold Critical Path work. LIRR originally submitted a waiver request to the FRA in early October 2017 to have the December 31, 2018, deadline extended. In response to the FRA's May 2, 2018 request, LIRR submitted its proposed revised PTC implementation schedule on November 29, 2018. If the waiver is denied, PTC installation may take precedence over the ESA work in Harold.
2. Another risk is that LIRR may divert some level of force account resources away from support for the ESA work to provide support for LIRR's system-wide, i.e., non-ESA, PTC work that is currently underway.
3. The required PTC design changes for the associated ESA Contracts VS086, CS086, and CS179 cannot be finalized until LIRR completes the PTC design, which is now expected in January 2019, almost one year late. MTACC has already acknowledged that the contract modification for incorporation of PTC requirements will impact the substantial completion date for Contract VS086.

Late Design Approval and RFI Closure on Contracts CS179, CS084, and VS086: The PMOC has been reporting delays in the process of GEC/LIRR review and approval of the contractor final designs and RFI closure. Periodic improvements have been noted, but increased attention to this issue continues to be needed. Based on the original baseline schedule, full CS179 design completion of the 10 control systems is now delayed 32 months.

Manhattan/Systems Performance Risk: The PMOC remains concerned that delays in completing the Manhattan/Systems work may impact the completion of the overall ESA program and the start of revenue service. The scope of the Manhattan/Systems work on the ESA primary critical path has changed from the prior IPS schedule with the appearance of the 45th Street Entrance. Additionally, there are significant scope elements that need to be fully modeled in the schedule.

Advancement of the MTACC Plan for Incremental Integrated Systems Testing: Due to increasing schedule pressure, MTACC has decided to implement the IST program incrementally, i.e., starting portions of the IST program prior to final completion of all systems installation and local testing. The original plan for IST would have started after all systems installation work and local testing was complete and would have lasted between 15 and 22 months. The PMOC notes that Incremental IST had been scheduled to start in April 2019, but is now delayed until September 16, 2019, due to late completion of the Train Operations Center. The PMOC also notes that the technical discussions about Incremental IST among MTACC, LIRR, the CS179 general contractor, and electrical and systems integrator subcontractors have progressed very slowly and are impeding the timely completion and approval of contract modifications for CS179 as well as for CM007, CM014B, CQ033, CS084, CS086, and VS086.

e. New Cost and Schedule Issues

MTACC has updated the ESA program budgets to incorporate the April 2018 EAC forecast, which addresses interim program funding through December 2020. In 2019, MTACC will request additional funds, based on contemporary budget forecasts in the 2020–2024 Capital Plan, to obtain approximately \$956 million in additional local funding for the ESA program.

MTACC continues to refine and use the alternative methodology for the IPS 111 schedule. The forecast Target RSD date is February 14, 2022, with activity finish dates on all three ESA program paths tracking near to the IPS 110 forecast. The Manhattan/Systems finish date extended approximately 6 months due to the inclusion of the Issue Contingency activity as a predecessor to

CS179 substantial completion. The PMOC notes that the Issue Contingency duration is 261 CDs in IPS 111, an increase of approximately 190 CDs from IPS 110.

3. PROJECT STATUS SUMMARY AND PMOC ASSESSMENT

a. Sponsor Management Capacity and Capability

The Executive VP/Sr. Program Executive – ESA retired and left the project on September 28, 2018. The new Program Executive joined the project in early October 2018. The Program Manager – Project Controls left the project and a new manager started in November 2018.

The PMOC remains concerned as to the ability of MTACC to manage the GEC's and LIRR's timely review of systems designs by the CS179 contractor and the prompt response to systems contracts RFIs and field change requests. This impacts program costs and schedules due to work stoppages resulting from the lack of contract modifications needed for continued progress. The PMOC is also concerned about the increase in incidents where work of one contractor is either incomplete or improperly executed, thus delaying the follow-on contractor. This raises a concern that MTACC may have an insufficient number of field inspectors to ensure that the contractor work is properly completed as required.

Additionally, the time to process and approve contract modifications program-wide has been excessive. The PMOC notes that MTACC continues implementing organization and process changes to improve these issues and to minimize their recurrence, which have reduced the time needed for contract modification approvals. The PMOC believes that continued, long-term effort is required to reduce the backlog and prevent recurrence of this problem.

b. Real Estate Acquisition

In its ESA October 2018 MPR, ESA reported that MTA Real Estate continued to work with Metro North Railroad (MNR) and JP Morgan Chase (JPMC) to develop and determine the potential impacts that JPMC's new building at 270 Park Avenue will have on ESA construction of the new LIRR concourse and train halls, as well as the existing MNR train shed. Additionally, MTA Real Estate continued to progress plans modifications for the 47th Street entrance to the LIRR ESA concourse.

c. Engineering/Design

The GEC and PMT continue missing target dates to complete design and re-designs due to scope transfers between contract packages, the inability to provide definitive requirements, late responses to contractor RFIs, and other issues involving MTA and outside stakeholders.

Additionally, LIRR has been late completing design reviews on CS179 Facilities Systems, VS086 Signal Equipment Procurement, and CS084 Traction Power Systems contracts. Project-wide, late MTACC responses to RFIs and Change Requests and MTACC's long processing time for contract modifications do not support construction schedules. The PMOC notes that MTACC recognizes that extended time executing modifications has affected progress. MTACC instituted a Change Management Group, which is prioritizing change orders based on schedule needs. The backlog of outstanding contract changes for CM007, CM014B, and CS179 has decreased slightly, since new modifications are being created as others are executed or closed.

d. Procurement

The ESA October 2018 MPR shows that total procurement for the ESA Program is 84.2% complete, with total awards at \$9,376 million. Since the ESA July 2018 MPR, the PMT calculates summary procurement progress as a percentage of the \$11,133 million April 2018 EAC forecast of all ESA program costs. Contract CM015, 48th Street Entrance, is on hold

pending an agreement between MTA and the owner of 415 Madison Avenue. Active procurements include:

- **CH058A Harold Structures Part 3A, B/C Approach Structure:** The contract was awarded October 25, 2018. NTP was issued on December 7, 2018.

e. Railroad Force Account (Support and Construction)

During December 2018, LIRR Electric Traction personnel successfully cutover the new G02 Substation and began a 60-day burn-in period, after which the existing G02 Substation will be decommissioned and demolished. Additionally, LIRR ET and Signal personnel continued to install snow melting equipment for NEQ and SEQ turnouts and began to install electric traction and signal conduits for Tunnel B/C Quadrant Prep turnouts. Amtrak Electric Traction personnel began limited reconfiguration of the overhead catenary system for B/C Prep work.

f. Third-Party Construction and Procurement

Manhattan

CM006 Manhattan North Structures: During 4Q2018, the CM006 contractor continued to progress activity toward achieving SC.

CM007 GCT Station Caverns and Track: Construction continued for the north and south back of house facilities on all levels of the East and West Caverns. Track construction continued in the Caverns and Tunnel tracks. Qualification testing of special trackwork components continued.

CM014B GCT Concourse & Facilities Fit-Out: In Wellways #3 and #4, finish work continued for ceiling panel and wall tile installation. Through December 31, 2018, concourse structural steel erection was 74% complete by piece and 68% by weight. The steel/metal deck work is now on the contract second critical path and continues to move very slowly.

VM014 Vertical Circulation Elements: All CM014B escalators and elevators have been fabricated and delivered either to the site or the warehouse. On CM007, 3 of the 6 elevators and 6 of the 16 escalators have been delivered to the site.

Queens

CQ032 Plaza Substation and Queens Structures: During 4Q2018, the CQ032 contractor continued to progress activity toward achieving SC.

CQ033 Mid-Day Storage Yard Facility: Work continued on the following during 4Q2018: yard street utilities, yard lighting construction, catenary structure work, ductbank construction, personnel access bridge structure work, and various building and car appearance maintenance platform construction. Traction power cable pulls continued. Signal CIL installation began in November 2018.

Harold Interlocking

CH057D – Harold Track Work Part 3: In December 2018, the contractor installed the #6197 SEQ crossover and placed the #6199W turnout during a 10-day LIRR ML2 Track outage and resumed construction of the Westbound Bypass Track from 43rd Street to 39th Street.

CH058A – Harold Structures Part 3 – Tunnel B/C Approach Structure: The contractor began mobilization activities during December 2018.

Systems

CS179 – Systems Facilities Package No. 1: During 4Q2018, the contractor continued installing conduit, cable, equipment, fire stopping, fire standpipe, lighting, and etc. in the tunnels and at the various facilities where there were no SWOs and where access was obtainable. Water infiltration,

Buy America, and access restraint issues continue and must still be remedied. The completion of FD for all 10 control systems, once scheduled for completion 32 months ago, has not occurred yet, and the completion of FD for all 19 non-control systems is also delayed. Additionally, the contractor contends that a significant number of NOC submissions, with potential for cost and design impacts, remain open and are already impacting progress. MTACC's inability to develop and issue promised CPRs on a timely basis for the NOCs is a significant issue that is impacting progress and, while the PMT is attempting to reduce the number of open NOCs, those attempts are often tied to a lengthy contract modification process. A previously noted Buy/Ship America issue that could impact design and construction completion also remains unresolved.

CS084 Traction Power Systems Package 4: During 4Q2018, installation work in the Vernon (C05) substation continued, but was again limited due to obstructions from CS179 work. Every one of the remaining six regular substation facilities (C01/C02, C03, C04, and C06/C07) has some level of noted deficiencies or coordination issues precluding the start of significant construction (see Appendix L). Progress on the issues is severely limited as a significant number involve coordination with other contracts including contract modifications for those contracts. There are major open issues related to the delivery of equipment, the installation of traction power cables, and incomplete work by other ESA contractors that pose significant concerns for the timely completion of this contract. Off-site fabrication of the C08 substation continues, with delivery still forecast in May 2019. The two major quality issues – one related to the failure of substation transformers during testing and the other the appearance of damage to MTA-supplied inductive reactors – remain as open issues.

VS086, Systems Package 3 – Signal Equipment Procurement: As previously reported, MTACC advised that, in the absence of decisions from the LIRR on two critical open design issues, the contractor would proceed with the signal design using the TRU-III track circuit equipment and would provide signal heads using incandescent bulbs rather than LEDs. The LIRR continues to test the TRU-III track circuit equipment and has yet to make a decision regarding the use of this equipment on its property. MTA has yet to incorporate PTC in this contract. A design scope package was sent to LIRR for approval, but a date for LIRR's response is unknown. The design scope package must be approved by LIRR before MTACC can prepare a CPR to the contractor for the work. It is unclear at this time how incorporation of PTC into the signal design will impact the substantial completion date and cost of the contract.

Contract CS086, Tunnel Systems Package 2 – Signal Installation: In December 2018, the contractor submitted a Safety Work Plan and began development of a Quality Plan. MTACC provided its comments on the contractor's preliminary work schedule and the contractor used those to submit its Baseline Schedule for MTACC Review. Currently, the Substantial Completion date is shown as February 21, 2021.

g. Vehicles

On December 12, 2018, LIRR received responses to its Phase I (Qualifications) advertisement for the ESA M-9A vehicles. LIRR determined that there was adequate competition to proceed to the Phase II (Cost/Schedule) portion of the procurement, which it intends to issue in January 2019. LIRR believes that successful completion of both phases will allow it to issue a contract award in June 2019. The PMOC will not be able to fully evaluate potential impacts on ESA's RSD, however, until LIRR develops an updated procurement schedule.

h. Commissioning and Start-Up

Discussion in this report related to the commissioning and startup of the ESA revenue service is based on information obtained during the most recent Operational Readiness briefing, which was

held on November 8, 2018 and subsequent meetings with LIRR personnel. Commissioning of the work and startup of ESA service is dictated by an ESA Rail Activation Plan (RAP) that is currently being developed by the ESA Operational Readiness Group; a group consisting of 11 Task Working Groups (TWGs).

i. Project Schedule

The IPS 111 (data date November 1, 2018) update shows that the Target RSD forecast date – February 14, 2022 – improved by one week since IPS 108, with the primary critical path running through Manhattan/Systems work. During August, September, and October of 2018, the Manhattan/Systems and the Harold program paths both lost time. The Manhattan/Systems path was lengthened by approximately 6.6 months because the Issue Contingency activity was included on this path. Although the reordering of these critical activities changed CS179 substantial completion to a later date, it did not delay the target RSD forecast. The Harold path lost approximately 2 months.

Table 1 provides a summary of critical milestone dates including PMOC and Sponsor forecasts.

Table 1: Summary of Critical Dates

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

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

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

*** Source – Amended FFGA, August 2016

j. Project Cost

Table 2 provides a summary of FFGA budgets and MTA April 2018 interim budgets and expenditures through October 2018.

Table 2: Project Budget/Cost Table

(Cost shown in millions)

	FFGA			MTA Current Budget (Interim)			Expenditures October 2018	
	Original FFGA	Amended FFGA	Pct. of FFGA	Obligated	CBB	Pct. of CBB	Expenditures	Pct. of CBB
Grand Total	7,386.0	12,038.5	100.0%	9,872.9	11,451.5	100.0%	8,789.6	76.8%
Financing Cost	1,036.0		14.0%	617.6	1,116.5	9.7%	617.6	55.3%
		1,116.5	9.3%					
Total Project Cost	6,350.0		86.0%	9,255.3	10,335.1	90.3%	8,172.0	79.1%
		10,922.0	90.7%					
Total Federal Share	2,683.0		36.3%	2,698.8	2,698.8	23.6%	2,698.8	99.9%
		2,698.8	22.4%					
5309 New Starts share	2,632.0		35.6%	2,436.7	2,436.7	21.3%	2,436.8	99.9%
		2,632.1	21.9%					
Non New Starts share	51.0		0.7%	66.6	66.6	0.6%	66.6	99.9%
		66.6	0.6%					
ARRA	0.0	195.4	1.6%	195.4	195.4	1.7%	195.4	99.9%
Local Share	3,667.0		49.6%	6,556.5	7,636.2	66.7%	5,473.2	71.7%
		8,223.2	68.3%					

k. Project Risk

The Manhattan/Systems program schedule path remains the ESA Program Schedule critical path. The ESA Program Schedule critical path major risks include: the Incremental IST plan and schedule that still requires finalization and agreement by MTACC, LIRR, CS179, and other affected contractors; inadequate construction progress on CM014B and CS084; and completion of negotiations, agreement, and contract modifications for revised schedule milestones on critical contracts. The PMOC remains concerned about progress of the ESA program. Although the programmatic float experienced a modest improvement at the end of the fourth quarter of 2018, future changes are likely since there are significant unknowns on the program primary critical path through Manhattan/Systems work. The PMOC is now also concerned about potential schedule risks resulting from the impacts that the development of the new building located at 270 Park Avenue could have on the ESA program, especially with regard to the ongoing construction of the new LIRR Concourse at GCT.

l. FTA Quarterly Review Meeting

The FTA Quarterly Review Meeting for East Side Access and Second Avenue Subway (Phase 1) was held on October 31, 2018. Highlights of the ESA discussion include:

- The FTA will work with MTACC on the Recovery Plan required by the FFGA based on MTACC's forecast that the project will exceed the Amended FFGA's Baseline Cost Estimate of \$10.925 billion, not including the financing costs.
- MTACC provided additional details regarding the Contract CS179 modifications for incorporating Incremental IST and supporting the target RSD in February 2022:
 - Incremental IST is scheduled to start in May 2019 and reach SC in November 2021.
 - Negotiations on the revised contract schedule/milestones to support Incremental IST and the target February 2022 RSD were completed in mid-October 2018. The revised schedule includes acceleration and risk mitigations.

- Another Time Impact Analysis will be completed based on the revised schedule.
- Modifications will not be completed for MTA Board action in November 2018.
- MTACC noted that, going into 2019, Amtrak support needs will be as great as ever due to: Tunnel B/C Approach Structure; Mid-Day Storage Yard; and Supervision of CH063. MTACC stated that Amtrak has obtained the associated labor clearances from the railroad unions to support Contract CH063.
- MTA confirmed that there is sufficient current funding capacity to award all the remaining construction contracts, to cover all forecast soft costs and railroad force account costs, and to complete all planned third-party construction work, in accordance with the current IPS through December 2020.
- LIRR terminated the original M-9A railcar procurement and re-released the RFP in October 2018. Changes included: total vehicles increased from 160 to 460, inclusive of 100 vehicle option; LIRR moved 30 M-9 vehicles into the M-9A procurement. LIRR stated that it cannot be determined at this time if the procurement will meet the planned ESA RSD needs because this will depend on which company is awarded the contract, either the current M-9 railcar builder or a new builder.
- MTACC provided an update regarding the planned new JP Morgan Chase (JPMC) Building at 270 Park Avenue:
 - JPMC has decided to replace its existing headquarters at 270 Park Avenue with a new building at the same location that is taller and one million SF larger.
 - Foundation work for the new building will impact the new ESA built LIRR Concourse as well as the existing MNR train shed that is also in need of repair work.
 - The overarching goal for MTA, related to this situation, includes 3 requirements: no additional cost to MTA; no delay to the East Side Access Revenue Service Date of December 2022; and no impact to ongoing MNR rail service.
 - The current agreement with JPMC provides 100% cost reimbursement to the MTA for all of its efforts to develop architectural/engineering solutions to minimize impacts to the new LIRR Concourse and the existing MNR train shed.
 - MTACC has advised JPMC that the foundation work cannot have any impact on the Concourse passenger flow model that has been accepted by MTA, LIRR, and MNR.

MONTHLY UPDATE

The information contained in the body of this report is in accordance with Oversight Procedure 25, to “inform the FTA of the most critical project occurrences, issues, and next steps, as well as professional opinions and recommendations”.

ELPEP COMPLIANCE SUMMARY

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

- **Technical Capacity and Capability:** MTACC indicated that it will review the Technical Capacity and Capability (TCC) Plan and propose revisions, if required, to reflect the current status of the Program. MTACC updated the TCC Plan in 3Q2017. In April 2018, FTA advised MTACC to incorporate its current updates and commence with a subsequent revision that addresses management changes resulting from the MTACC Six-Point Plan for ESA. All aforementioned updates will be consolidated in a draft that was anticipated, but not met, in December 2018. The draft TCC Plan update is now expected during 1Q2019.
- **Continuing ELPEP Compliance:** The ESA project should continue to make additional improvements in the following areas: Management Decision; Design Development;

Change Control Committee (CCC) Process and Results; Stakeholder Management; Procurement; and Risk-Informed Decision Making. The PMOC continues to note progress in two previously identified areas – Issues Management and Timely Decision Making, particularly when responding to new issues arising from the railroads’ Force Account resource availability, track outages, and other issues regarding the remaining work in Harold Interlocking.

- **Project Management Plan:** MTACC is using the current version of the PMP, Rev. 10, that the PMOC reviewed and the FTA accepted earlier in 2017.
- **Cost/Schedule Contingency:** MTACC, FTA and the PMOC agree on the ELPEP minimum cost and schedule contingency hold points, levels, and drawdowns. MTACC continues to report the cost and schedule contingency levels against the ELPEP minimums in its quarterly reports to the FTA. The PMOC notes that MTACC has reported that the Schedule Contingency remains only 27 CDs above ELPEP minimum.

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

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

The ESA PMT is preparing draft updates of the Project, Cost, Schedule, Risk Management, Contract Packaging, and Technical Capacity and Capability Plans. These will document the changes called for by the incorporation of the MTACC Six-Point Plan for ESA to reduce future programmatic risks. MTACC issued updated drafts for the CMP, SMP, and RMP in December 2018, with the updates for the PMP, TCC, and CPP to follow in 1Q2019.

Revisions to the ELPEP Document: MTACC submitted an updated ELPEP with suggested revisions in 3Q2017. In April 2018, FTA advised MTACC to re-evaluate its proposed updates in consideration of the revised EAC, budget, and IPS, as well as organizational, management, and process changes resulting from implementation of the MTACC Six-Point Plan to reduce risk on the ESA project.

1.0 SPONSOR'S CAPABILITIES AND APPROACH

1.1 Management Capacity and Capability

a. Organization

The PMOC has not noted any significant change in the Sponsor's ability to generally maintain the required level of Management Capacity and Capability. The PMOC, however, has observed continuing problems in the following areas:

- GEC and LIRR support of the review and approval process for the contractors' final designs for systems and equipment submittals under Contracts CS179, CS084, and VS086 has not been adequate to meet the program schedule needs.
- ESA-PMT/CM has not effectively coordinated many of the Manhattan/Systems contractors' activities to avoid conflicts and delays.
- Earlier construction problems have resulted in current as-built issues that impact the scope of work for the follow-on contracts. Resolution and correction of many of these problems is delaying follow-on construction work.
- GEC's responsiveness to RFIs and Field Change Requests on contracts has often been slow and has impacted construction progress.
- Processing and approval of construction contract modifications is taking too long and this creates cost and schedule impacts.

Although management focus on all of these issues has resulted in some improvements, the PMOC notes that these issues have continued to significantly challenge the ESA Program through 4Q2018. The MTACC president, together with the ESA Executive VP/Sr. Program Executive and the ESA-PMT/CM, have made significant changes to the ESA project organization, management, and operational processes to better focus efforts on improving the effectiveness of management decision making, execution of critical required actions, and coordination with LIRR, the primary project stakeholder. The transition to the new ESA project organization and operation continued through 4Q2018.

b. Staffing

The Executive VP/Sr. Program Executive, ESA retired and left the project on September 28, 2018. The new Program Executive joined the project in early October 2018 as a new manager with MTACC and with only limited experience on the East Side Access Project obtained through a previous assignment with a consulting firm. Additionally, the Program Manager – Project Controls left the project and a new manager started in November 2018.

The PMOC has no specific concerns or recommendations about the Sponsor's staffing at this time other than to note that capacity limitations caused by insufficient staffing might be one contributing factor to the issues discussed above in Section a.) Organization, above, and may become an issue now that the CS086 and CH058A contracts have been awarded. The PMOC notes that correcting issues with regard to GEC and LIRR support of the review and approval of submittals for the CS179, CS084, and CS086 contracts and timely processing and approval of construction contract modifications may require additional staffing adjustments to those recently completed through 3Q2018.

1.2 Project Management Plan

a. History of Performance

The MTACC has re-planned the ESA program three times since the 2006 FFGA, resulting in higher budgets and longer schedules. The June 2014 re-plan budget was \$10,177 million and the Public RSD was December 2022. The PMOC notes that, since that time, ESA has encountered schedule set-backs primarily due to: lack of funding for award of contracts and systems contract options; poor performance by the CM006 and CM014B contractors; insufficient progress on CS179, CS084, and VS086; late NTP for CM007 and CQ033; significant delays to complete CM015 and CS086 design; and ongoing challenges in Harold Interlocking caused by lack of adequate railroad force account support. As a result, MTACC and the ESA-PMT completed a program re-assessment in April 2018 as a fourth “re-plan” that determined the need to increase the EAC to \$11,133 million and extend the Target RSD to February 2022, with no change to the Public RSD in December 2022. Until full funding is available in the 2020–2024 Capital Plan, the ESA program is working with an interim budget of \$10,334 million, which was funded in Budget Amendment 3 to the 2015-2019 Capital Plan.

b. PMP

MTACC is using Revision 10.0 to the East Side Access Project Management Plan, dated June 2016, which was accepted by the FTA in early 2017. MTACC will issue an update to the PMP during 1Q2019 to reflect the recent changes in the ESA project organization, management, and operational processes.

1.3 Project Controls

a. Schedule

MTACC re-baselined the ESA program schedule in June 2014 with a Public RSD of December 2022, which had a 22 month Program level contingency from the February 2021 Target RSD. The PMT submitted a draft schedule contingency drawdown plan and hold point values in December 2014 as required by the ELPEP agreement.

The ESA program IPS 111 has a February 14, 2022 Target RSD, an improvement of 7 CDs from IPS 108. The program level schedule contingency is 302 CDs, which is 27 CDs above the 275 CD ELPEP minimum and 692 CDs less than the 994 CDs as established in the July 1, 2014 IPS re-baseline. The alternative IPS methodology is MTACC’s effort to capture schedule issues and unknowns and which resulted in the creation of an Issue Contingency activity (currently 8.6 months). However, there are significant issues – incremental IST and 270 Park – whose effects on the program critical path are not fully depicted in the IPS. The resolution of these issues is likely to consume up to 9 months of the remaining 40 months to the target RSD.

b. Cost

In June 2014, the MTACC re-baselined the ESA program with a budget of \$10,177 million (excluding financing costs and Rolling Stock Reserve). MTACC completed a reassessment in April 2018 that identified the ESA program estimate-at-completion as \$11,133 million, approximately \$956 million above the June 2014 budget. The PMOC notes that the April 2018 EAC forecast exceeds the amended FFGA Baseline Cost Estimate (BCE) of \$10,922 million by approximately \$211 million (1.9%). MTACC continues to comply with the minimum cost contingency as agreed with the FTA/PMOC and to report on the contingency drawdowns in their Quarterly Progress Reports to the FTA. ELPEP FTA Hold Point 1A was achieved and the minimum contingency is \$260 million. Currently, construction is 90.2% bid (awarded), 84.2% complete (invoiced), and has total contingencies of \$747.5 million (allocated and unallocated).

Since the ESA July 2018 MPR, the PMT calculates summary construction metrics as a percentage of the \$8,014 million April 2018 EAC forecast of construction costs.

1.4 Federal Requirements

a. FFGA

The amended FFGA incorporates a Baseline Cost Estimate of \$10,922 million and the Revenue Operation Date in December 2023. MTACC reassessed the ESA program in April 2018, revised the EAC forecast to \$11,133 million and held the December 2022 Public RSD. The PMOC notes that the new EAC exceeds the amended FFGA BCE by \$211 million (1.9%), but did not change the amended FFGA operations date. The MTACC has discussed the forecast with the FTA and will issue a draft recovery plan for the ESA program in January 2019.

b. Federal Regulations

As a Full Funding Grant recipient, MTA is required to meet the requirements of the Buy America Act. The PMOC outlines current and new issues regarding this requirement in this section with additional details in Section 2.3 and Appendix G. On Contract CS179, Systems Package 1, there is currently one potential Buy/Ship America issue affecting proposed mechanical equipment.

1.5 Safety and Security

a. Safety and Security Certification Process

The 3Q2018 Operational Readiness Briefing was delayed and held on November 8, 2018. The status briefing for activities in the remainder of the 4Q2018 (early November thru the end of December) has yet to occur. During 3Q2018, MTACC continued to catch up on the Safety and Security Certification processes; with several more design and construction contracts reviewed, and safety and security elements identified for future validation upon completion of design and construction phases of the contracts. The draft LIRR ESA Emergency Action Plan remains under review by the ESA stakeholders. Construction Safety Certifications for nine contracts that have reached Substantial Completion are complete and uploaded into document control. The table below summarizes the status of the Design Security Certifications as of the November 8, 2018, 3Q2018 Operational Readiness Briefing.

ESA Design Security Certification Summary Update	Number
Design Security Certification Complete	33
GEC to Submit Security Certification Package to LIRR	0
GEC to Present Package to LIRR (Pre-Meeting)	1
Zero Certifiable Elements in Security Package	11
Total	45

b. Project Construction Safety Performance

Through November 2018, ESA project safety statistics for lost time accident and recordable injuries on active construction contracts continued to trend below the Bureau of Labor Statistics (BLS) national average with a CY2018 project wide ratio of 1.11 versus 1.70 (2018 BLS average) lost time accidents per 200,000 work hours. The ESA recordable ratio for CY2018 was 2.03 versus 2.8 (2018 BLS average). ESA safety performance for November 2018 was 0.00 lost time and 1.39 for recordable injuries.

c. Security

ESA did not report any significant security issues in its ESA October 2018 MPR.

1.6 Project Quality

Quarterly Quality Oversight (QO) Audits (QOAs): The QOA Audits completed by ESA include: CQ033 [2Q2018], audit rating 96%; CS197 [3Q2018], audit rating 88% (provisional). ESA is planning to perform audits on CM014B and CM007 during 1Q-2019.

Nonconformance Reports (NCRs): Table M located in the Appendix provides a summary of NCR status on the major active contracts for ESA, as per the December 2018 contractor NCR logs. The table shows closed NCRs, NCRs open for less than 90 days, and NCRs open for over 90 days for each ESA contract over the past four quarters.

The PMOC has continuing concerns regarding the new traction power substation transformers being manufactured by the CS084 contractor and the MTA provided inductive reactors that the CS084 contractor will install as part of the new traction power systems for ESA. See Section 7.0 for details. **[ESA-130-Sep18]**

This month, the PMOC is adding two new quality concerns:

1. Potential out of tolerance as-built railcar clearances with the newly constructed bench wall in the ESA tunnels. See Section 7.0 for details. **[ESA-131-Dec18]**
2. Potential out of tolerance as-built conditions for the new track monuments that house the conduits for the traction power cables at the track connection locations. See Section 7.0 for details. **[ESA-132-Dec18]**

1.7 Stakeholder Management

a. Railroads

MTACC's East Side Access Project involves nearly \$500 million in construction in Harold Interlocking performed by third-party contractors requiring railroad access and protection provided by both Amtrak and LIRR. In addition, Amtrak and LIRR track, signal, and traction power construction work totaling over \$400 million will be accomplished using railroad Direct Force Account labor. Construction progress requires an extraordinary level of detailed planning, coordination, and communication for which MTACC has assumed the risk. Significant current challenges are summarized below:

Long Island Rail Road

As the agency that will operate the new ESA facilities, LIRR is the primary project stakeholder. The project is now in the next phase of construction to complete the GCT station facility, install all the trackwork and systems, and complete the testing, start-up, and commissioning. LIRR's level of direct involvement with the ESA project has increased and will continue to do so through commencement of revenue service. LIRR will need to commit the resources and management availability to work with MTACC in support of the ESA project needs and to provide timely decisions in response to design, construction, or operational issues.

During 4Q2018, several key ESA issues involving LIRR continued to challenge the project:

- The Qualification Testing (QT) of the Special Trackwork Direct Fixation Fastener (STDF) assemblies was completed in October 2018 with partial failing results. Re-testing will start on receipt of replacement units.
- Review and concurrence by LIRR of the final designs for the 10 control systems (Contract CS179) has progressed much slower than scheduled. MTACC management indicates that 8 of the control system final designs are approved. As of December 31, 2018, completion

and approval of all 10 Control System final designs is 32 months late compared to the original contract baseline schedule.

- Fabrication of some CS084 equipment is only partially complete, as it is missing PLC equipment installations. Once all the issues regarding PLC programming are resolved, this equipment will need to have the PLC equipment installed and tested before delivery to ESA field locations.
- Although MTACC directed VS086 to progress the signal circuit design to include the TRU-III track circuit equipment, LIRR continues to test this equipment on its property and a final decision regarding use of this specialized track circuit equipment remains outstanding and unresolved.
- LIRR's plan for Positive Train Control (PTC) design, installation, testing, and commissioning has presented a number of challenges to ESA for planning the remaining work in Harold Interlocking and incorporation of PTC in the ESA tunnels and GCT terminal. LIRR transmitted a waiver request in October 2017 and a subsequent revision to the FRA in December 2017; which, based on Harold Interlocking's continuing status as an active construction area, requested an exemption from the FRA requirement to implement PTC in Harold Interlocking by December 31, 2018. LIRR received the FRA's response on May 2, 2018. LIRR was required to submit to the FRA, within 90 days on August 2, 2018, the revised PTC Implementation Plan with LIRR's proposed alternate schedule. LIRR submitted its proposed revised PTC implementation schedule on November 29, 2018. The PMOC notes that LIRR's final PTC design was not completed as previously forecast and is now not expected to be completed until January 2019.
- The 2018 LIRR direct construction work plan was significantly greater than during previous years, required a substantial commitment of LIRR Force Account personnel, and included:
 - Placing the new GO2 Substation into service (planned 1Q2018; burn-in/final LIRR acceptance period started 4Q2018). **Partially Accomplished.**
 - Completing all CIL pre-cutover activities in June 2018. **Accomplished.**
 - Completing cutovers for the remaining 5 CILs (planned May 2018; now July 2018). **Accomplished.**
 - Completing all Harold NE Quadrant trackwork (planned June/July 2018; now August 2018). **Accomplished.**
 - Completing all Harold SE Quadrant trackwork (planned September 2018; now October 2018). **Accomplished.**
 - Completing all track/signal/3rd rail/catenary modifications in preparation for the Tunnel B/C Approach Structure work (planned for 3Q and 4Q2018). Work started in 4Q2018; completion is delayed.
 - The PMOC observed that LIRR successfully accomplished most of the planned goals without impacting the Harold Interlocking sub-program longest schedule path.

Amtrak

As the agency that jointly, with LIRR, operates and maintains Harold Interlocking in Long Island City, Queens, Amtrak is a key project stakeholder. Based on Amtrak's continued inability to provide sufficient force account support, especially Electric Traction (ET) personnel, ESA has significantly revised the Harold construction schedule twice since 2014. As a result, the ESA PMT produced the "ESA First" construction schedule which re-prioritized work elements in Harold to operate new LIRR service into GCT and delayed some of the FRA-funded work not required to

operate into GCT. Some improvements through December 2018 were achieved and noticeable improvements have taken place, especially in providing access and protection to the third party contractors.

In 2016, Amtrak announced plans to reconstruct, starting in 2019, its East River Tunnels (ERT) Line 1 and Line 2 that were damaged by Superstorm Sandy in 2012, but later postponed it until 2025. This work does, however, remain a potential risk based on the necessary predecessor work to harden ERT Lines 1 and 4 in preparation for the extended tunnel outages for ERT Lines 1 and 2. Operational reliability or safety issues as well might require Amtrak to make emergency repairs on either Lines 1, 2, or 4 at any time between now and the forecast RSD of December 2022.

The PMOC recognizes MTACC's efforts to work with Amtrak to develop specific mitigations for certain risks and to deal with these issues as they arise. The PMOC also recognizes MTACC's development of a resource loaded schedule for all regional force account commitments, including Amtrak and LIRR, to assist in both short-term and long-term resource allocation decisions. This has been useful in enabling ESA to better execute planned work in Harold Interlocking. Continued force account resource shortcomings, particularly with respect to direct construction work for all of ESA's daily requirements, will continue to challenge the current Harold schedule that has been subject to changes and delays outside of MTACC's direct control. The PMOC recommends that the PMT continue to actively engage executive management in MTACC and the MTA to assist with resolution of such problems.

Other Stakeholders

ESA placed the new LIRR G02 Substation in service in mid-December 2018. As a result, Consolidated Edison's (ConEd's) participation to energize the substation is complete.

Foundation systems required for the planned new JP Morgan/Chase (JPMC) building at 270 Park Avenue may impact the LIRR Concourse at GCT as well as the MNR train shed. Ongoing MTA, MTACC-ESA, and JPMC discussion continued through December 2018. Potential impacts to the ESA design and construction work are potentially significant. Without better definitions of the scopes of work, however, schedule impacts cannot be accurately forecast at this time. More detailed information from ESA-PMT is expected during 1Q2019. [ESA-133-Dec18]

1.8 Local Funding

a. MTA/New York State (Capital Plan)

Potential and forecast cost overruns were identified by MTACC in the April 2018 EAC forecast. MTA CPOC approved a Capital Program Budget Amendment to provide the program with additional local funds through December 2020 based on the reassessment. Going forward, MTACC will submit a 2020-2024 Capital Plan budget to obtain additional local funding of approximately \$956 million to complete the ESA program. Until the 2020-2024 Capital Plan is approved and incorporated in ESA budgets, the PMT will use contingencies to cover budget gaps as necessary. The PMOC is concerned about potentially significant impacts that this risk could have on the ESA program budget and schedule as well as the target RSD.

b. Other Sources

The total FTA funding commitment for the ESA program is \$2,698.8 million, of which all of the funds have been effectively drawn down.

1.9 Project Risk Monitoring and Mitigation

a. Risk Management Plan (RMP)

The current MTACC RMP, Rev. 2, is a sub-plan within the ESA Project Management Plan (PMP), which was updated to incorporate FTA/PMOC comments to bring it into compliance with ELPEP principles and requirements. It was conditionally accepted by the FTA on March 4, 2013. ESA submitted the updated Risk Management Plan in 4Q2017. In April 2018, the FTA advised MTACC to incorporate its current updates and commence with a subsequent revision that addresses any changes resulting from implementation of the MTACC Six-Point Plan for ESA. In December 2018, MTACC resubmitted the RMP, which is under review by the PMOC.

b. Monitoring

The ESA Risk Manager continues to update, track, and issue program level risk updates to the Risk Register on a regular basis. Now that the Harold schedule path is no longer the ESA Program Critical Path, MTACC is focusing on project activities through the current ESA Program critical path along the Manhattan/Systems schedule path.

c. Mitigation

ESA continues to identify and implement risk mitigation strategies in a number of project areas. The PMOC anticipates that risk mitigation will focus on activities through the current ESA Program critical path along the Manhattan/Systems schedule path. MTACC plans on completing a comprehensive risk review of the ESA project once agreement is reached with the CS179 contractor regarding the Incremental Integrated System Test plan, which will serve as the primary basis for the ESA Program schedule from now through revenue service.

2.0 PROJECT SCOPE

2.1 Engineering/Design and Construction Phase Services

In the ESA October 2018 MPR, the PMT reported the overall Engineering effort as 84.4% complete compared to planned completion of 85.1%. Since the ESA July 2018 MPR, the PMT calculates summary engineering progress as a percentage of the \$871.8 million April 2018 EAC forecast of engineering costs.

Status of Construction Packages Advertised

CH058A Harold Structures Part 3A, B/C Approach Structure: The contract was awarded October 25, 2018, and NTP was issued on December 7, 2018.

Status of Construction Packages Not Advertised

CM015 (48th Street Entrance): MTA notified the building owner that construction of the 48th St. Entrance will be deferred, which subsequently deferred negotiations to finalize the corresponding Work and Easement Agreements and further design work.

Alternate 47th Street Entrance (CM014B additional work): MTACC-ESA developed an alternative LIRR GCT entrance at 47th Street. The GEC submitted 100% FIO drawings for the CS179 (systems) scope for the proposed entrance. The PMT completed the CS179 (systems) design changes based on LIRR approval and no further comments from MNR. The CM sent the 47th Street Entrance CPR to the CM014B contractor in September 2018 and negotiations were completed in October 2018. The GEC provided the signed/sealed plans/specifications on October 4, 2018. The CM014B contract modification was executed on November 11, 2018.

FQA33A, Mid-Day Storage Yard Facility – Amtrak F/A, includes provision for west end yard access to the Amtrak mainline through a connection from Sub 4 to Line 2. All yard exit options

have been considered by ESA, Amtrak, and LIRR. The design package was completed, which incorporated LIRR comments. Based on Amtrak's proposal for an elevated turnout, MTACC and the GEC developed alternatives to the plan and identified two options. The options are currently on hold pending MTACC decision on LIRR request for an alternative yard exit route, Option E. The CQ033 Construction Manager completed his evaluation of Option E on November 7, 2018, and LIRR is reviewing it, with comments expected in January 2019. Upon LIRR approval, Option E will be submitted to Amtrak for review. This will be the only exit route from the MDSY that will be provided under the ESA Program.

FQA33B, Mid-Day Storage Yard Facility – Amtrak F/ A, includes provision for a second west end yard access to the Amtrak mainline through a connection from Sub 3 to Line 4. The FQA33B 100% design package remains temporarily on hold pending finalization and approval of the Sub 4 to Line 2 connection Option E, the primary exit, to be built under FQA33A (see above). Although this second exit route was earlier planned to be constructed by Amtrak after Contract CQ033 completes the MDSY and upon arranging the funding source from LIRR, LIRR might decide that this is not required based on the operational advantages offered by Option E under FQA33A.

FQ033, Mid-Day Storage Yard Facility – LIRR F/A, provides LIRR force account construction support for CQ033 and includes the West End Yard changes. The GEC has incorporated all LIRR final comments and LIRR has approved the package. The GEC provided the signed and sealed package to the CQ033 CM and the contractor was approved to commence work on November 30, 2018.

CH063 Electric Traction Catenary Work, 3rd Party, will be a negotiated RFP procurement. The contract includes design-build ET catenary relocation work for the Mid-Day Storage Yard and completion of all the remaining catenary work required for operational readiness in Harold Interlocking. The RFQ advertisement date was forecast for December 7, 2019, but was not met. The forecast Notice to Proceed date is April 20, 2019.

Positive Train Control Design by LIRR

The MOU between MTACC and LIRR for the implementation of Positive Train Control (PTC) on ESA was executed and the Technical Concurrence Document has been agreed upon by MTACC and LIRR. MTACC will be installing, testing, and commissioning PTC for all track and signal systems built under the ESA Program.

- LIRR had been expected to complete the PTC design by March 31, 2018, but this was not achieved. MTACC now reports that LIRR will not complete the PTC design until January 2019.
- The GEC has prepared initial scope design modifications to Contracts CS179, VS086, and CS086, which will provide for the LIRR designed PTC overlay onto the ESA systems. The GEC has provided LIRR with the proposed changes for PTC on these contracts at the various design stages to insure coordination with the LIRR PTC requirements. The PMOC notes, however, that these changes cannot be finalized until LIRR completes the PTC design. MTACC has already acknowledged that the contract modification for incorporation of PTC requirements will impact the substantial completion date for Contract VS086.
- In early October 2017, LIRR formally requested the FRA to waive the requirement to have PTC operational in the Harold Interlocking by December 31, 2018, based on the interlocking's status as an active construction area. LIRR subsequently submitted a revised waiver request to the FRA in late December 2017 and received the FRA's response on May

2, 2018. As a result, LIRR was required to submit to the FRA, within 90 days from the date of the FRA's letter, August 9, 2018, the revised PTC Implementation Plan with LIRR's proposed alternate schedule. LIRR submitted its proposed revised PTC implementation schedule on November 29, 2018.

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

CS179 System Package 1 - Facilities Systems:

The CS179 contractor continues to work on the completion of the final designs of the various contract required systems; a process that, as of the end of 4Q2018, is 32 months late. Additionally, the PMOC is aware of LIRR's formal approval of only eight of the ten Control System Final Designs (FDs) as of the end of 4Q2018. Further, the contractor advises that the resolution of a number of NOCs submitted, but still unresolved, could further impact design completion and is already impacting progression of equipment and rack fabrication.

CS084 Tunnel Systems Package 4 – Traction Power:

The CS084 contractor, while continuing to transmit contractual submittals, also continues to assert that previous delays related to design submittals and access restraints were caused by MTA and have impacted its ability to meet its own original design, procurement, fabrication, and installation schedules. Numerous issues related to coordination with other ESA contractors remain unresolved and the contractor contends that the contract schedule continues to be delayed due to access restraints that may result in potential redesign efforts for the subject rooms.

VS086 Systems Package 3 – Signal Equipment Procurement:

One major design issue, the incorporation of PTC into the signal design, has the potential to impact the timely progression and cost of the contract work. The design cannot be accomplished until the LIRR completes its design of PTC and a contract modification is developed and issued to the VS086 contractor. The continued absence of an accurate and comprehensive schedule that shows all required contract activities is an impediment to MTACC's ability to effectively manage this contract.

PMOC Overall Engineering/Design/CPS Observations

Since the June 2014 re-baselining, the GEC and PMT have frequently missed target dates for completion of planned design activities that have caused procurement and construction start delays, some very significant, for many contracts. The PMOC acknowledges that some of the delays resulted from excessive time needed for outside stakeholder reviews and final approvals, particularly with Amtrak and LIRR. The result is that schedule float is used during procurement and is not available during construction, when it is needed to mitigate future risks. The PMOC notes that the GEC and PMT are challenged to provide adequate Construction Phase Services (CPS) to support the ever increasing project demands that result from needed redesigns, contractor RFIs, and coordination among the contractors.

PMOC Overall Engineering/Design/CPS Concerns and Recommendations

MTACC needs to focus on achieving intermediate milestones in a timely fashion and to work closely with all parties to achieve this. MTACC management needs to more effectively engage outside stakeholders such as building owners, Amtrak, and the LIRR to resolve lingering design issues. The PMOC remains concerned about potential impacts to the CS179, VS086, and CS084 contract schedules that may result from the lack of timely design decisions and the lengthy turn-around time to review and respond to contractor design submittals and contractor inquiries. The PMOC notes the ESA PMT and senior management's increased efforts to resolve issues related to Systems design reviews with GEC and LIRR management. More improvement and continued

focus is needed, however. The PMOC anticipates that the new project organization and operation will show process improvements that address these concerns. [Ref: ESA-125-Sep16].

2.2 Procurement

The ESA October 2018 MPR shows that total procurement for the ESA Program is 84.2% complete, with total awards at \$9,376 million. Since the ESA July 2018 MPR, the PMT calculates summary procurement progress as a percentage of the \$11,133 million April 2018 EAC forecast of all ESA program costs.

Status: The current active procurements during 4Q2018 include:

- CH058A Harold Structures Part 3A, B/C Approach Structure, was advertised on May 8, 2018. Six bids were opened on August 9, 2018. The award and NTP had been forecast for September 25, 2018, but this was delayed due to uncertainty about the schedule for LIRR to complete required preparation work prior to contractor mobilization. The contract was awarded October 25, 2018 and the NTP was issued on December 7, 2018.

Concerns and Recommendations:

The PMOC anticipates that the MTACC will update the current version of the CPP, Rev. 12.0, during 1Q2019. This update needs to account for the remaining third-party contracts and railroad force account packages, along with all anticipated scope/scope transfers and a procurement timeline.

2.3 Construction

The PMT reported in the October 2018 MPR that the total construction progress reached 77.9% complete compared with 78.2% as-planned. Since the ESA July 2018 MPR, the PMT calculates summary construction progress as a percentage of the \$8,014 million April 2018 EAC forecast of construction costs. The percentage of work complete, as shown throughout this report, is calculated using invoiced costs to represent construction progress. The current contract and force account budgets equal the amounts allocated in the MTA Impact accounting system and are used for percentage calculations for individual contracts. Refer to Appendix J for the budget, cost, and schedule status of each contract and force account package discussed below.

Manhattan Contracts

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

	Current Budget	Appr'd Contract	Rem Budget	Invoice Cost	EAC	Planned Comp	Invoice Comp	Current BL SC	Forecast SC	Notes
CM006	361.6	350.2	11.4	346.0	356.0	100.0%	98.8%	6/1/17	12/31/18	1
	nc	nc	nc	nc	nc	nc	nc	nc	nc	
	361.6	350.2	11.4	346.0	356.0	100.0%	98.8%	6/1/17	12/31/18	
CM007	712.3	662.6	49.7	385.8	725.0	57.5%	58.2%	1/28/20	3/12/20	
	nc	nc	nc	+60.8	(-7.1)	+5.2%	+9.1%	nc	(-36cd)	
	712.3	662.6	49.7	325.0	732.1	52.3%	49.1%	1/28/20	4/17/20	
CM014B	484.7	462.7	22.1	302.7	531.7	95.1%	65.4%	8/18/18	7/27/20	
	+21.1	+15.7	+5.5	+27.0	+13.0	+1.0%	+3.7%	nc	+48cd	
	463.6	447.0	16.6	275.7	518.7	94.1%	61.7%	8/18/18	6/9/20	
VM014	46.9	34.9	12.0	26.1	47.8	NA	74.8%	10/25/19	3/23/20	
	+0.7	nc	+0.7	+0.3	+0.8	NA	+1.0%	nc	(-207cd)	
	46.2	34.9	11.3	25.8	47.0	NA	73.8%	10/25/19	10/16/20	

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

Please refer to the contract narratives for additional information.

1. Substantial completion not declared.

CM006 – Manhattan North Structures

Schedule: MTACC continued to forecast Milestone MS#3, Substantial Completion, by December 31, 2018, and forecasts Milestone MS#4, Final Completion, by March 31, 2019.

Construction Progress: The contractor continued work in December 2018 on: minor base contract work and open NCR work. Remediation of remaining leaks will be transferred to another contract. The Dispute Resolution Board (DRB), assisting with the determination of SC, resolved in favor of the contractor on scope transfers disputes. SC was not achieved in 4Q2018.

Observations/Analysis: ESA reported that SC remains pending completion of all base contract work and open Non-Conformance Reports (NCRs). ESA and the contractor seem to be making progress toward achieving Substantial Completion.

Concerns and Recommendations: The PMOC is concerned that the forecast SC and FC dates continue to slip.

CM007 - GCT Station Caverns and Track

Schedule: Milestone #4 (Track & 3rd Rail Work Complete) is forecast to December 10, 2019 (-125 CDs; the TIA/recovery schedule is still under review); Milestone #5 (Substations US1 and US2 Complete) is forecast to November 28, 2018 (-75 CDs; not achieved); Milestone #5A (Caverns Ready for Integrated Systems Testing) is forecast to October 9, 2019 (-63 CDs); Milestone #6 (All Caverns and Tunnel Work Complete) is forecast to March 12, 2020 (-87 CDs); and, Milestone #6A (Substantial Completion) is forecast to March 12, 2020 (-44 CDs).

Construction Progress: North and South Back of House, East and West: Continued electrical installation at mezzanine and lower levels and continued MEP work upper and lower levels.

Cross Passages #5 and #6: Continued topping slab installation.

East and West Caverns: Continued track curb construction and continued lower level platform topping slab installation. Continued electrical installation and continued upper level MEP. Continued escalator #51 and #55 and elevator #6 installations in the East Cavern and escalator #59 and #63 elevator #19 installations and glass installation at elevator #8 in the West Cavern.

Precast beams, decks, and precast platform walls and deck panels are complete.

Track: Continued trackwork construction in the Caverns (upper) and in the Tunnel Track areas. Continued third rail installation. Continued turnout installation. Continued qualification testing of Special Trackwork DFF assemblies.

Observations/Analysis: ESA and the contractor appear to be working well together.

Concerns and Recommendations: The PMOC recommends that ESA and the contractor complete negotiations regarding delays in track assembly qualification testing so that a realistic schedule is available to track construction progress.

CM014B – GCT Concourse & Facilities Fit-Out

Schedule: Milestone #8 (Substantial Completion) August 18, 2018; now July 27, 2020.

Milestone #5 (44th Street Vent Building) originally June 4, 2017, now December 31, 2018, although not achieved. CS179 continues joint occupancy.

Through December 11, 2018, the structural steel erection was 74% complete by piece and 68% by weight. As previously reported, this work is proceeding very slowly and is impacting the schedule and the CS179 contract. Cumulative metal ceiling deck progress remained at 23% complete. Through December 11, 2018, CM014B reports that CMU work is complete.

Construction Progress: Electricians continued with installation of overhead racks/conduit in various zones, light fixtures, and work in the Chiller Plant Room. Plumbers continue testing domestic water and installing plumbing fixtures throughout the Concourse. Installation of seismic angles has begun in zones. Mechanical work continues with the installation of branch piping and ductwork. Painting of block walls and columns continues throughout Zones 1-4. Painting of Fire Stand Pipe continues throughout the Concourse. Installation of the marble stone wall finish is ongoing in public areas from south to north. Installation of the suspended ceiling system continues throughout the Concourse.

Biltmore Connection: Track #41 has been returned to MNR. Track #42 work nears completion. Erection of the Gantry has begun at Tracks #39-40.

Wellways: Escalator maintenance is ongoing, one day every 2 months. In Wellway #1, glass tile installation is continuing. Sprinkler installation nears completion. In Wellway #2, glass curtainwall construction continues and CS179 is installing light fixtures and PA system. In Wellway #3, escalator truss installation nears completion. In Wellway #4, escalator truss installation is complete and truss alignment and splicing continues. Machine Room work continues.

47th Street Cross Passage: All work is on hold per Stop Work Order due to the pending design change of the area. At Elevator #13, installation is scheduled to begin in February 2019.

50th Street Vent Facility: This area continues in full fit-out mode. Work includes installation of parallel switchgear, associated conduit, and the beginning of punch list work.

VM014 –Vertical Circulation Elements (Escalators & Elevators)

Schedule: Although this contract includes milestones covering fabrication and delivery of escalators and elevators, the actual schedule for those areas is driven by the respective schedules and access dates provided by the CM014B and CM007 contractors. For CM007, as of December 31, 2018, 3 of the 6 elevators and 6 of the 16 escalators have been delivered to the site. For CM014B, all 22 escalators have been fabricated and delivered. All elevator fabrication has been completed, with the exception of El #10 (50th St. Vent Building) and EL #22 (Biltmore Connection). Installation of Elevators #1 and #2 is beginning.

Construction Progress: For CM014B, the temporary work deck is being installed for Elevators #1 and #2. At Elevator #17 (TMC), the hydraulic jack is installed and being plumbed and hydraulic piping installation is underway. For CM007, through December 2018, elevator and escalator sections continue to be delivered to East and West Caverns site and installation continues.

Other Issues: Water has accumulated in Elevator #12 (44th St. Vent Bldg.) and Elevator #20 (48th St. Entrance) shafts. The contractor is using sump pumps as temporary fixes to the problem. The Elevator #13 piston has been replaced. The contractor unable to advance work in Elevators #13 and #20 due to shaft issues requiring completion or correction.

Observations/Analysis: Throughout the course of this contract, there have been issues with the various elevator accessways/shafts constructed by separate contractors. This has resulted in the CM014B vertical circulation work falling considerably behind the work in CM007.

Concerns and Recommendations: The PMOC is concerned that, in the CM014B contract, the delays in elevator access and installation will delay the commencement of the Integrated System Schedule and overall IST.

Queens Third-Party Contracts

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

	Current Budget	Appr'd Contract	Rem Budget	Invoice Cost	EAC	Planned Comp	Invoice Comp	Current BL SC	Forecast SC	Notes
CQ032	265.4	262.2	3.2	261.5	263.7	100.0%	99.8%	9/6/16	12/31/18	1
	nc	+0.7	(-0.8)	+0.9	+6.4	nc	+0.1%	nc	nc	
	265.4	261.5	4.0	260.6	257.3	100.0%	99.7%	9/6/16	12/31/18	
CQ033	325.0	307.8	17.1	145.1	345.5	40.9%	48.6%	8/18/18	10/25/20	
	+17.0	+11.9	+5.0	+38.9	(-1.7)	+4.6%	+12.7%	(-723cd)	+42cd	
	308.0	295.9	12.1	106.2	347.2	36.3%	35.9%	8/10/20	9/13/20	

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

Please refer to the contract narratives for additional information.

1. Substantial completion not declared.

CQ032 – Plaza Substation and Queens Structures

Schedule: MTACC continued to forecast achievement of Milestone MS#6 SC by December 31, 2018, and forecasts Milestone MS#7, Final Completion, by March 31, 2019.

Construction Progress: The contractor continued work in December 2018 on: work regarding closure of NCRs, work to eliminate water infiltration conditions, documentation, and other commercial items. SC was not achieved in 4Q2018 and is now forecast for 1Q2019. Of concern remain seven NCRs related to tunnel duct bench clearance as-built deviations from plan which may require selective bench reconstruction to meet train operation clearance requirements.

Observations/Analysis: SC remains pending contractor completion of all open Non-Conformance Reports (NCRs). ESA reported that SC will likely push into 1Q2019.

Concerns and Recommendations: ESA and the contractor appear to be making progress toward achieving SC, but were unable to meet the December 31, 2018 forecast date for MS#6 (SC).

CQ033 – Mid-Day Storage Yard Facility

Schedule: MTACC reports that Milestones MS#1, MS#2, MS#3, and MS#4 have been achieved. Milestones MS#4A (Start Integrated Testing), MS#5 (YS Track Completion), and MS#6 (Substantial Completion) are impacted by the delay of Access Restraints AR#1 and AR#2. AR#1 requires Amtrak to remove rail located at the west end of the Mid-Day Storage Yard (MDSY). AR#2 requires the installation of new catenary poles and Amtrak wire transfers, and pole locations are obstructed by an Amtrak signal trough. The contractor requires both AR#1 and #2 to install underground duct banks to complete the YS Track, followed by Integrated Testing. MTACC currently forecasts Milestone MS#6, Substantial Completion (SC) for November 2, 2020, -84 days.

Construction Progress: The contractor continued work in December 2018 on: fire line installation, water main, storm pipe installation, and duct bank construction. Other activities: Car Appearance Maintenance (CAM) platform work, Cart Storage Building CMU wall construction, foundation construction for Storage and Toilet Service Buildings, Building #8 asbestos abatement prior to demolition, ballast retainer work, Yard Lighting construction, catenary structure work, and traction power cable pulls. Carload delivery of rail has commenced and turnouts are in production. Also, began setting spans of the Pedestrian Access Bridge.

Observations/Analysis: ESA and the contractor continued to work well together.

Concerns and Recommendations: Access Restraints #1 and #2 remain impacted by required Amtrak work. Both ESA and the contractor continued to pursue constructive options to reduce schedule impacts by developing a mitigation plan with design modifications and by the contractor performing out of sequence work tasks.

Systems Contracts

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

	Current Budget	Appr'd Contract	Rem Budget	Invoice Cost	EAC	Planned Comp	Invoice Comp	Current BL SC	Forecast SC	Notes
CS179	606.9	572.5	34.5	450.2	646.7	81.5%	78.0%	7/1/20	11/25/21	1
	nc	+7.1	(-7.0)	+39.6	(-0.1)	+4.0%	+6.0%	nc	+177cd	
	606.9	565.4	41.5	410.6	646.8	77.5%	72.0%	7/1/20	6/1/21	
CS084	79.7	73.5	6.3	20.8	83.2	85.1%	28.3%	12/2/19	4/23/21	1
	nc	+0.1	nc	+6.6	+0.1	+2.2%	+8.9%	nc	+123cd	
	79.7	73.4	6.3	14.2	83.1	82.9%	19.4%	12/2/19	12/21/20	
CS086	60.9	53.0	7.9	--	60.9	--	--	2/21/21	2/21/21	
	+60.9	+53.0	+7.9	NA	+60.9	NA	NA	NA	NA	
	NA	NA	NA	NA	NA	NA	NA	NA	NA	
VS086	21.8	19.9	1.9	11.8	22.1	NA	59.0%	10/14/19	10/31/19	1
	nc	nc	nc	+1.9	(-0.2)	NA	+9.2%	nc	+17cd	
	21.8	19.9	1.9	9.9	22.3	NA	49.8%	10/14/19	10/14/19	
VH051	30.2	29.7	0.5	29.5	30.2	NA	99.6%	4/30/15	5/31/21	
	nc	+0.2	(-0.2)	+0.2	nc	NA	+0.4%	nc	+1,107cd	
	30.2	29.5	0.7	29.3	30.2	NA	99.2%	4/30/15	5/20/18	

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

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

VH051 (Part 1) – Harold and Point Central Instrument Locations

Observations/Analysis: All signal equipment necessary for the cutovers of the 6 CILs has been installed. Since these CILs are in service, the PMOC will no longer report on this contract after this report.

Concerns and Recommendations: The PMOC has no concerns or recommendations.

CS179 Systems Package 1 – Facilities Systems

Design Progress: The backlog of needed reviews and decisions remains as a serious issue and contributes to delay of change orders needed to progress work and to facilitate the design of the Control and Non-Control Systems. MTACC management indicates that 8 of the Control system final designs (FDs) are approved. Further, completion of the FDs for two of the Control Systems (Security and CTC) is on hold pending the lifting of MTACC-issued Stop Work Orders (SWOs) resulting from revised LIRR requirements. As of the end of 4Q2018, the completion and approval of all 10 Control System final designs is 32 months late. Progress on Non-Control Systems designs is also delayed and the contractor continues to assert that open issues and NOCs that remain unaddressed are responsible for delaying its ability to complete these designs and continue with equipment rack production. The delays in the finalization of the designs for the Control and Non-Control Systems have the potential to impact the timely completion of the contract. Additionally, one previously reported Buy/Ship America issue with Systems equipment remains unresolved. (See Appendix G for details).

Construction Progress: In 4Q2018, the contractor continued work on conduit, cable, fire stopping, fire standpipe, equipment, lighting, etc., in the tunnels and substation facilities to which it had access and where there were no SWOs impacting the work. The resolution of coordination issues with other contractors that are working or have worked in CS179 contract facilities continues to be an issue impacting the progression of work on multiple contracts. Resolutions require stakeholder decisions, some GEC design efforts, and MTACC's processing of multiple contract modifications; all lengthy processes. The contractor continues to advise MTACC that the numerous SWOs (due to water infiltration, as-built site conditions, scope transfers, etc.) and access restraints are severely impacting the progress of construction work. Water infiltration into various work areas continues to be an issue impacting construction progress. Equipment rack production continues to be delayed due to NOCs that remain as open issues.

Incremental Integrated Systems Testing Plan: During 1Q2018, MTACC identified the need to implement IST incrementally to meet the schedule requirements for RSD. This approach is different than originally planned by Contract CS179. The new Incremental IST Plan requires an agreement on the plan and schedule among the ESA PMT, LIRR, the CS179 contractor, and other contractors installing systems-type equipment. It will also require associated contract modifications for the CS179, CS084, VS086, CS086, and CQ033 contracts. Incremental IST was previously forecasted to commence in September 2018, most recently in July 2019, and now has slipped to start in September 2019. The PMOC notes that progress toward a final, agreed-upon Incremental IST plan and schedule has been slow. [Ref: ESA-129-Jun18]

Concerns and Recommendations: The PMOC remains concerned about the lack of a realistic schedule for this contract that details all remaining work and durations; including new activities that may result from the NOCs and delays due to SWOs. The PMOC also has significant concerns about the unresolved Buy/Ship America issue, as delays in acquiring a suitable alternative could have an adverse impact on the schedule. Additionally, the PMOC remains concerned about late completion of design reviews and approvals. The PMOC notes that, despite the appearance in the above table that the contract's Actual progress is essentially the same as the Planned progress, actual progress of this contract is significantly behind schedule. Only one of the ten milestones scheduled for completion by the end of September 2018 was achieved. The progress percentages presented in the table are based on actual versus projected costs, not physical design or construction efforts. Discussions continue between the contractor and the ESA PMT regarding the development of a comprehensive system test plan, including the Incremental IST of all the Systems. The continuing delay in the start of the Incremental IST, along with the fact that the Incremental IST Plan remains incomplete and without agreement by all parties, leaves the PMOC with concerns about MTACC's ability to complete the contract work in time to meet the current forecast ESA Revenue Service Date. MTACC/ESA needs to continue working with LIRR and the CS179 general contractor, electrical sub-contractor, and systems integration sub-consultant to expedite finalization and approval of the Incremental IST Plan and schedule.

CS084 Tunnel Systems Package 4 – Traction Power

A comparison of actual and planned completion percentages in the Table above indicates that this contract is significantly behind schedule and has trended behind each month. Lack of access to facilities and non-approval of equipment designs impacting equipment procurement and fabrication contributed to the contractor's inability to make progress. Until the access restraint issues are resolved, physical work progress will be delayed and the actual work completion percentages in the Table relative to the physical progress of work on the contract will continue to significantly lag the planned progress values. As of the end of 4Q2018, the contractor has fabricated a significant amount of equipment and has either delivered it to the work site –primarily

the C05 (Vernon) facility – or to a storage facility until equipment rooms in the other substation locations are ready for installations.

Design Progress: The contractor asserts that additional information from the MTA related to the Programmable Logic Controllers (PLCs) is required for it to be able to complete its design work. A number of equipment cabinets that house the PLC equipment are already fabricated and were shipped to storage facilities to make space on the factory floor for other fabrications. Once the PLC equipment is fabricated, it must then be installed in the vacant space in the cabinets. Discussions are being initiated between MTACC and the contractor to determine the logistics of this installation work, as the contractor asserts this is now unanticipated extra work. Work progress is also being hampered by the need for additional design work by the GEC to address resolutions to site obstructions or unfinished work; both involving other ESA contractors and the development and issuance of contract modifications.

Construction Progress: During 4Q2018, equipment installations on MTA property continued to be severely limited due to SWOs and obstructions from other contractor's equipment installations. Unresolved water issues in traction power equipment rooms also continue to impact work progress. The contractor continues to reject the commencement of work in areas turned over by other contracts and continues to provide MTACC with a list of its concerns regarding unfinished work or obstructions in those areas; many of which have remained outstanding for several months without any apparent resolution action by MTACC. That list (See Appendix P) is updated each month and discussed at the monthly progress meeting. MTACC advised that a major issue affecting the traction power cable installation from C08 to the tracks in Harold Interlocking is being addressed under the CH058A contract; so, schedule coordination between that contract and the CS084 contract will be extremely important for the CS084 contractor to complete all the substation testing requirements. The coordination of C01/C02 substation equipment deliveries with the installation of trackage throughout the tunnels and in the tail track area, an issue that can potentially impact the schedule, remains unresolved. Other significant issues regarding missing floor penetrations, doorway enlargements, and the re-design of the lifting beam for the transformer installations at the C06/C07 substation location in Plaza Interlocking were previously identified in 1Q2018 and remain open. All three of these issues at the C06/C07 location require contract modifications as well as cost and schedule adjustments to the contract – the full extent of which is unknown at this time. The PMOC previously reported significant Quality issues occurred related to two of the 18 required substation transformers while undergoing hi-pot testing during which there were 3 transformer failures related to foreign debris in the windings. The transformer manufacturer has agreed to replace all the coils in the transformer in which two failures occurred and re-test the transformer. Also, during 3Q2018, an additional quality-related issue was identified; that of potential damage to the twenty-six MTA-supplied inductive reactors. In 4Q2018, the contractor took delivery of two of these reactors and installed one at the Vernon substation. The installation of the second reactor needed for this location was deferred due to obstructions at the site from another ESA contractor. Further inspection of the extent of any damage to the remaining 24 reactors in the MTA warehouse remains as an unresolved issue. **[ESA-130-Sep18]**

In 4Q2018, the contractor identified, and MTACC verified, specification non-conformance issues with several track monuments (conduit turn ups at track level for routing of traction power cables). There are approximately 453 track monument locations throughout the ESA territory. In December 2018, MTACC and contractor personnel inspected 6 of the 453 locations and found all 6 to be out of conformance with LIRR specifications.

Concerns and Recommendations: At contract meetings, the PMOC continues to inquire about verification of manhole and conduit systems at CS084 substation locations to avoid a repeat of the issue that exists at C08. It appears that these manhole and conduit systems have yet to be surveyed. The need for a process modification for fabrication of the transformers that resulted from the testing failures raised questions and concerns from the PMOC and MTA personnel regarding the long-term viability of the 10 transformers built before the modified fabrication process was implemented. The LIRR and MTACC continue discussions related to those concerns. The PMOC remains concerned about several issues, including:

1. Equipment delivery methodology (means and methods);
2. Installation of the C08 traction power cables due to missing conduit and manholes;
3. Long-term viability of transformers assembled before implementation of revised processes;
4. Verification of existing conduit and manholes in several substations;
5. Coordination with other contractors;
6. Extent of possible damage to the 24 remaining MTA-provided inductive reactors due to improper storage and handling by MTA;
7. Extent of non-conformance of track monuments; and
8. Unresolved water issues impacting site access and equipment installations.

VS086 Systems Package 3 – Tunnel Signal Procurement

Design Progress: During 4Q2018, the Factory Acceptance Testing (FAT) of Plaza Interlocking was performed and, after correction of some minor issues identified during the FAT, the Plaza Interlocking equipment was delivered to the CS086 storage facility. An inspection of the delivered equipment found that, due to improper packaging, significant damage to the equipment occurred in transit and CS086 refused to accept the equipment. The VS086 contractor will arrange for transport of the damaged equipment back to its facilities for repairs. A Factory Integrated Acceptance Testing (FIAT) is performed after the FAT and tests the interlocking designs and equipment as a composite systems package. Design data from the CS179 contractor is required to perform the FIAT and MTACC continues to indicate that this design data is still under development by CS179 and the test has not been scheduled. Four other issues need resolution or direction: 1) PTC design and incorporation; 2) Electromagnetic Interference (EMI) testing requirements; 3) signal light-out protection; and, 4) a methodology to protect equipment in “open-type” equipment racks from water infiltration. MTACC has yet to incorporate PTC into this contract to meet FRA requirements. A design package was sent to LIRR for approval and a date for LIRR’s response is unknown. The design package must be approved by LIRR before MTACC can prepare a CPR for the work. It is unclear at this time how incorporating PTC into the signal design will impact the SC date and cost of the contract.

Concerns and Recommendations: The PMOC remains concerned about the number of unresolved items with potential cost and schedule impacts. Since time to make and implement decisions for open issues is not in the schedule, the PMOC is concerned about the validity of contract and MTACC schedule completion dates.

CS086 Tunnel Systems Package 2 – Signal Installation

In December 2018, the contractor submitted a Safety Work Plan and began discussions with MTACC Quality representatives regarding the development and submission of a Quality Plan. As of mid-December 2018, the contractor provided 42 submittals and 12 RFIs for MTACC review and comment. The contractor received MTACC comments on its Preliminary schedule and submitted its Baseline Schedule for review.

Work Activities: The contractor contends that, despite MTACC assurances, one of the Plaza Interlocking rooms where it needs to install equipment continues to have water infiltration issues. The contractor continues to request that, since there appears to be water infiltration and adjacent contractor coordination/obstruction issues at various work locations, surveys of the work sites by a team consisting of the contractor, MTACC, GEC, and any other contractor personnel working in specific work sites be conducted to determine potential access opportunities. MTACC will develop a plan for this effort to begin in January 2019.

The contractor continues to request as-built drawings and equipment assembly and testing instructions from the VS086 contractor and conformed CS086 contract documents from MTACC. During 4Q2018, MTACC advised the contractor that some contract scope changes were under internal discussion and that a CPR was under development to address the scope changes. Further, the contractor advised MTACC that some of the MTACC-supplied contract drawings were incomplete. MTACC will set up a meeting with the GEC and IT personnel to address this complaint.

Harold Interlocking Contracts

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

	Current Budget	Appr'd Contract	Rem Budget	Invoice Cost	EAC	Planned Comp	Invoice Comp	Current BL SC	Forecast SC	Notes
CH057D	29.6	22.4	7.2	11.5	30.3	14.5%	51.3%	1/31/19	5/30/19	
	nc	+3.2	(-3.2)	+11.5	+0.7	+14.5%	+51.3%	nc	+119cd	
	29.6	19.2	10.4	--	29.6	nc	nc	1/31/19	1/31/19	
CH061A	42.0	36.4	5.6	33.5	39.0	99.5%	91.0%	5/28/18	8/16/18	1
	nc	+0.8	(-0.8)	+4.0	(-0.6)	+3.7%	+8.3%	nc	nc	
	42.0	35.6	6.4	29.5	39.6	95.8%	82.7%	5/28/18	8/16/18	

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

1.Substantial completion declared.

CH057D – Harold Trackwork Part 3

Construction Progress: In December 2018, the CH057D contractor installed the #6197 SEQ crossover and the #6199W turnout during a 10-day LIRR ML2 Track outage. Afterward, the contractor resumed construction of the Westbound Bypass Track from 43rd Street to 39th Street.

Observations/Analysis: The PMOC continued to make frequent site visits during December 2018 and noted that the CH057D contractor and the ESA PMT continued to work together to accomplish program goals.

Concerns/Recommendations: As a result of the contractor and PMT continuing good working relationship and accomplishments, the PMOC is no longer concerned about their capabilities. The PMOC is concerned that plans to schedule major track work during the upcoming winter months may not be as successful as hoped. The PMOC recommends that the PMT and contractor continue to work together as before to meet the challenges ahead.

CH058A – Harold Structures Part 3 – Tunnel B/C Approach Structure

Construction Progress: The contract NTP was issued on December 7, 2018, and the contractor began mobilization activities. Construction is expected to begin in late 1Q2019 or early 2Q2019.

Observations/Analysis: The ESA Construction Manager conducted a site walk-through with several members of the contractor’s team on December 20, 2018, and has already started a close

working relationship with them. The ESA CM also managed the prior CH057 contract, which he brought to a successful conclusion. The PMOC believes that the ESA CM and the contractor will be able to bring this contract to a similar successful conclusion.

Concerns/Recommendations: The PMOC has no concerns about this contract at this time and recommends that the parties continue to work together to continue the momentum from their excellent start on this contract.

Railroad Force Account Contracts

Costs and substantial completion dates are tabulated below for active Force Account packages. Railroad force account agreements do not contain schedule requirements, so the PMOC will not report on schedule progress in this section.

	Current Budget	Appr'd Contract	Rem Budget	Invoice Cost	EAC	Invoice Comp	Actual Comp	Current BL SC	Forecast SC	Notes
FHA01	18.8 nc 18.8	18.8 nc 18.8	-- nc --	18.6 nc 18.6	18.8 nc 18.8	100.0% nc 100.0%	99.0% nc 99.0%	2/4/16 nc 2/4/16	11/3/19 +197cd 4/20/19	1
FHA02	60.9 +0.7 60.2	60.8 +0.6 60.2	0.1 +0.1 --	60.3 +1.4 58.9	60.5 (-4.6) 65.1	100.0% nc 100.0%	99.0% +1.1% 97.9%	8/15/17 nc 8/15/17	10/25/20 +501cd 6/12/19	1
FHL01	29.1 +1.8 27.3	29.0 +1.7 27.3	0.2 +0.2 --	27.3 +0.4 26.9	34.9 (-0.2) 35.1	100.0% nc 100.0%	93.6% (4.8%) 98.4%	4/9/15 nc 4/9/15	3/13/19 +28cd 2/13/19	1
FHL02	114.8 +18.2 96.6	113.2 +16.6 96.6	1.7 +1.7 --	113.2 +26.2 87.0	124.4 +3.6 120.8	100.0% nc 100.0%	98.6% +8.6% 90.0%	11/25/16 nc 11/25/16	8/30/21 +369cd 8/26/20	1

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

1. Budgets for Force Account work are made on an annual basis. Invoice percent complete is calculated using the approved contract value rather than total budget.

FHA01 Harold Stage 1 – Amtrak F/A

Construction Progress: Amtrak completed all of its former Stage 1 construction during November 2018. As a result, the PMOC will no longer report on FHA01.

Concerns/Recommendations: The PMOC has no concerns or recommendations at this time.

FHA02 Harold Early Stage 2 – Amtrak F/A

Construction Progress: During December 2018, Amtrak Electric Traction (ET) personnel began overhead catenary reconfiguration work east of 39th Street necessary for future construction of the B/C Tunnel Approach Structure.

Observations/Analysis: Amtrak continued to struggle to provide sufficient ET personnel to fulfill all ESA requests during December 2018, but the PMOC notes that, when given clear direction with a fixed deadline, Amtrak does what is necessary to meet ESA deadlines (e.g. contact wire replacement over the LIRR PW1 NEQ Track).

Concerns/Recommendations: Because ESA will always be concerned with Amtrak ET support, the PMOC recommends that ESA senior management continue to work with Amtrak senior management to make needed arrangements to accomplish ESA goals, such as development of the future CH063 contract to supplement Amtrak support with third party ET support.

FHL01 Harold Stage 1 – LIRR F/A

Construction Progress: On December 17, 2018, LIRR Electric Traction personnel cutover the new G02 Substation and began a 60-day “burn-in” period which will lead to the de-commissioning and demolition of the existing G02 Substation. This concluded LIRR’s former Stage 1 construction. The PMOC will no longer report on FHL01.

Observations/Analysis: Although it has taken much longer than originally scheduled, the new G02 Substation is now on line and worked successfully for the remainder of December 2018.

Concerns/Recommendations: The PMOC is only slightly concerned that the new substation will not successfully complete its burn-in period, but will continue monitoring it through completion.

FHL02 Harold Early Stage 2 – LIRR F/A

Construction Progress: During December 2018, LIRR Track and Signal personnel supported the contractor to install the #6197 SEQ crossover during a 10-day LIRR ML2 track outage. Also, LIRR Signal and Electric Traction personnel continued to install snow melter equipment for NEQ and SEQ turnouts and began installing conduits for turnouts for B/C Prep construction.

Observations/Analysis: LIRR continued to work very closely with the CH057D contractor to successfully start SEQ construction. LIRR, Amtrak, and the ESA contractors have all made major contributions to make 2018 the most successful year for Harold construction.

Concerns/Recommendations: Although the PMOC maintains concerns about future Harold construction, previous concerns have been greatly tempered by the knowledge that ESA and the railroads can and will do what is necessary to accomplish the work. The PMOC recommends that the ESA PMT continue to work closely with LIRR to bring the project to completion.

2.4 Operational Readiness

Status: The most recent quarterly update Operational Readiness (OPR) briefing was held on November 8, 2018, and the status of work by the individual Task Working Groups (TWGs) was presented. The next Quarterly update (4Q2018) has yet to be scheduled; thus limiting information regarding current status. Details of the progress of the Rail Activation Plan (RAP) and specific TWGs are contained in Appendix Q.

Observations and Analysis: The structure of the TWGs working on the Operational Readiness Group’s Rail Activation Plan (RAP) under development by TWG #1 was previously modified to provide more stakeholder input and direction. LIRR managers now co-lead every TWG and report directly to a senior-level management team comprised of the VP of MTA stakeholder groups. One deliverable required by the RAP is a Comprehensive Systems Test Plan (CSTP). A draft partial plan was prepared several years ago and was updated in August 2017. Further updates and finalization of the CSTP depend on an acceptable (Incremental) IST Plan, which is being developed by CS179. The CS179 IST Plan is still under discussion, with no forecasted completion date available. In the 2Q2018 briefing, MTACC advised that a revised ESA Revenue Service Plan (RSP) was needed because certain infrastructure may not be available by the RSD and because Amtrak work might interfere with ESA work. At the 3Q2018 briefing, MTACC confirmed that final development of the revised RSP will take about 9 more months, putting the completion somewhere around the end of August 2019. The revised RSP could impact new railcar procurement and LIRR staffing and training requirements. Information about the procurement of railcars is noted in Section 2.5. The LIRR’s plan for staffing and training is, because of the need for a revised RSP, still a work in progress.

2.5 Vehicles

Status: LIRR procurement of M-9A vehicles is a concurrent effort with its sister MTA agency, Metro North Rail Road (MNR), to provide sufficient new vehicles for future planned service expansion. The acquisition of these vehicles is being financed using both New York State and federal funding. Two similar vehicles will be procured, designated M-9 and M-9A. The M-9 cars have already been purchased by MNR using New York State funding. The M-9A cars, which will be modified M-9 cars for use on LIRR, will be purchased using federal funds.

LIRR issued a new two-step RFP for procurement of M-9A vehicles in October 2018. This new RFP had major changes including: revised requirements for the M-9A vehicles; increase of total vehicles from 160 to 460, inclusive of 100 vehicle option; LIRR moved 30 M-9 vehicles into the M-9A procurement; the addition of locomotive-hauled unpowered married pair (LHMP) coaches and de-commissioning of existing M-3 equipment. LIRR received responses to the Phase I, “Qualifications”, step of this procurement on December 12, 2018, and determined that there was sufficient competition to proceed to Phase II, the “Cost/Schedule” step. LIRR intends to complete its review of Phase I and issue the Phase II solicitation by mid-January 2019, with intent to award in June 2019.

Observations/Analysis: Until a revised procurement schedule is developed, the PMOC will not be able to provide an analysis of the effects that this could potentially have on ESA’s Revenue Service Date, although the PMOC believes that there is a likelihood that vehicle delivery will extend beyond RSD. If that is the case, LIRR and the MTA would need to determine how to open revenue service without a full complement of new M-9A vehicles.

Concerns/Recommendations: The PMOC is concerned that this procurement may suffer future setbacks similar to the ones experienced after the original RFP was advertised, but is encouraged that responses to this Phase I solicitation were received on schedule. The PMOC recommends that LIRR and the MTA do everything possible to award this RFP in accordance with its projected schedule.

2.6 Property Acquisition and Real Estate

Status: In its ESA October 2018 MPR, ESA reported that MTA Real Estate continued to work with building owner JP Morgan Chase (JPMC) and Metro North Railroad (MNR) to determine what the impacts on ESA will be of JPMC’s decision to demolish its existing building at 270 Park Avenue in order to build a larger building on the same site. Additionally, MTA Real Estate continues to work on expanding LIRR terminal egress capacity at 47th Street due to deferral of the 48th Street Entrance construction.

Observations/Analysis: The PMOC believes that MTA Real Estate continues to perform its responsibilities on behalf of the ESA Project in an entirely effective manner.

Concerns/Recommendations: The PMOC has no concerns or recommendations for MTA Real Estate at this time.

2.7 Community Relations

Status: The ESA October 2018 MPR indicates that Community Relations outreach included notification to Queens Community Boards about project related street closures, assistance to produce a film documentary about the engineering achievements associated with the ESA Project, and press releases concerning the start of the CH058A contract to construct the Tunnel B/C Approach Structure.

Observations/Analysis: The PMOC believes that the MTACC Community Relations staff continues to perform its outreach campaign in an entirely effective manner.

Concerns/Recommendations: The PMOC has no concerns or recommendations about ESA Community Relations at this time.

3.0 PROJECT MANAGEMENT PLAN AND SUB PLANS

Status: MTACC's current version of the Project Management Plan (PMP), Revision 10, is acceptable to the FTA.

Observations: MTACC plans to update several PMP sections for the next revision, including: Risk Management, Procurement, Operational Readiness, and Systems Testing and Startup. MTACC had earlier planned to issue the draft of the next revision to the PMP during 3Q2018, but was delayed to late in the 4Q2018 and is now forecast to be issued during 1Q2019.

3.1 PMP Sub-Plans

MTACC plans to update many of the PMP Sub-Plans to document changes called for by the implementation of the MTACC President's Six-Point Plan for reducing the ESA programmatic risks.

Status: The PMOC completed its evaluation of the current revisions of both the Cost Management Plan (CMP) and Schedule Management Plan (SMP), concluded that the CMP and SMP are acceptable, and the FTA notified MTACC that they are acceptable.

Over the last year, MTACC has updated the following PMP Sub-Plans:

- Technical Capacity and Capability Plan (TCCP)
- Risk Management Plan (RMP)
- ESA Project Quality Manual (PQM)

In April 2018, the FTA advised MTACC to incorporate its current updates and commence with a subsequent revision that addresses changes resulting from the MTACC Six-Point Plan for ESA. MTACC issued updated drafts for the CMP, SMP, and RMP in December 2018 with the updates for the PMP, TCC, and CPP to follow in 1Q2019.

Observations: MTACC is using the most recently revised Project, Cost, and Schedule Management Plans as accepted by the FTA/PMOC.

Concerns and Recommendations: MTACC should continue to ensure that the proper candidate revisions are prepared and presented to the CCC for approval before any changes are incorporated into these plans.

3.2 Project Procedures

Status: The revised PMP Sub-Plans may require updates to referenced Project Procedures. MTACC plans to create a new procedure for the management processes being used by the newly formed PMO Analytics Group.

Observations: During 4Q2018, MTACC continued development of the new Project Procedure for the PMO Analytics Group.

Concerns and Recommendations: There are no significant concerns at this time.

4.0 PROJECT SCHEDULE

4.1 Integrated Project Schedule

The schedule information in this report is based on IPS 111 (data date November 1, 2018) and IPS Progress Report. The forecast for the Target Revenue Service Date (RSD) is February 14, 2022

Zone 4 device installation and SIT for systems including: fire alarm, security/CCTV, PA/VMS, telephone, field network devices, BMS, radio. From this point, Phase 3/Zone 4 local testing and network connectivity is completed and Phase 3/Zone 4 IST proceeds including TOC, BMS, and FLSS systems. A CS179 Issue Contingency comprises the final eight to nine months of the Manhattan/Systems path, ending in November 2021. At this point, the path runs through LIRR final testing and previews and concludes with the Target RSD on February 14, 2022.

Table 4.2 shows the work and contracts that comprise the Manhattan/Systems work path through the Public RSD along with forecast start and finish dates as reported in IPS 111.

Table 4.2 – Primary Critical Path

Activity Name	Duration	Start	Finish
CM014B GCT Concourse & Facilities Fit-Out			
45 th St Entrance structure construction	231	02-Oct-18 A	20-May-19
Mechanical work at Tile 3124 and 45 th St Entrance	675	25-Sep-17	31-Jul-19
Finish Tile 3124, 3115 and 3125 stonework	565	8-Jun-18	24-Dec-19
Finish Tile 3126, 3117 stonework and install Tile 3127 ceiling	162	24-Dec-19	2-Jun-20
CS179 System Package 1 – Facilities Systems			
Zone 3-5 Install, Terminate communication devices and perform SIT	144	2-Jun-20	23-Oct-20
Complete Phase 3 IST and TOC	139	23-Oct-20	10-Mar-21
b(4)	█	█	█
Program Activities			
LIRR Final Testing and Previews †	81	25-Nov-21	13-Feb-22
Target Revenue Service Date			14-Feb-22
b(4)	█	█	█
Public Revenue Service Date			13-Dec-22

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

CS084 work is near critical and is only two weeks off the Manhattan/Systems critical path. Important dates for each substation (including submittals, equipment fabrication and installation) are tabulated in Appendix L. The data shows that much of this work was delayed by two to three months during the quarter, and some (i.e. CO6 QP Main fabrication and follow-on dates) was delayed more than four months.

There are 36 coordination point milestones in IPS 108 that had early start dates scheduled to occur in August, September, or October 2018. All of these points except one are for Manhattan-/Systems contracts, although none are on the critical path. A review of IPS 111 showed that none of the points were achieved during the reporting period. The finish dates for 26 remaining coordination points were delayed approximately 2-3 months, and 8 points (between CM014B and CS179) were delayed approximately 9.5 months. The risk is that the lack of progress through coordination points will result in the need to perform more work concurrently leading up to and during IST than had been planned, which will further complicate and impede progress. (Refer to Appendix F, ESA Coordination Point Changes.)

Sub Program Longest Path – Harold Interlocking

IPS 111 shows that the Harold Interlocking work path is the second longest program path. The Harold Interlocking work path concludes on May 25, 2021, in IPS 111, 56 calendar days later than

it did in IPS 108. However, float increased to 184 CDs (33 CDs more than 151 CDs in IPS 108) due to rescheduling of the Manhattan work path. The Harold Interlocking path begins with force account work in the southeast quadrant; followed by prep, demolition, and track work by CH057D, and, then force account catenary work and CIL commissioning, predicated on track outages in January 2019 to perform this work in advance of Track B/C approach construction. Work continues with the release of AR 1 for CH058A 39th Street Track B/C Approach Structure construction until March 2021, followed by force account switch, signal, and cutovers through the end of May 2021. At the completion of construction, the Harold work path has 184 CDs of float to the LIRR final testing activity at which point the path joins the ESA program critical path (Manhattan/Systems work).

Sub Program Longest Path – Queens

The finish date for the Queens (Mid-Day Storage Yard) longest path in November 2020 has held from IPS 108 to IPS 111. Float increased to more than eight months due to rescheduling of the Manhattan/Systems path. Progress along the beginning of the Queens path is constrained by the CQ033 work necessary to resolve a conflict between an existing Amtrak signal trough and a proposed catenary pole at the end of March 2019. The path then runs through CQ033 signals and power systems; trackwork; signal installation; commissioning the MID-8 CIL and battery hut; and, ending in November 2020 at the conclusion of Midday Storage Yard integrated testing. At the completion of the construction, the Queens path has 255 CDs of float to the LIRR FRA testing activity, after which the path joins the ESA program critical path for the LIRR final testing activity.

4.3 90-Day Look-Ahead of Important Activities

An ESA program look-ahead schedule (refer to Appendix F) shows milestones and significant activities that are forecast for the next 90 days on active contracts. Table 4.3 lists upcoming procurement milestones that are forecast to occur through 1Q2019, as reported by the PMT.

Table 4.3 – Upcoming Contract Procurement Milestones

Contract Description	Advertise Date	Bid Date	NTP	Project Period	Substantial Completion
CH058A B/C Tunnel	5/4/18A	8/9/18A	12/7/18A	27 months	3/1/21
CH063 ET Catenary Work – 3 rd Party	12/7/18	3/5/19	4/30/19	23 months	3/5/21

PMOC Observations, Analysis, and Concerns

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

1. Concerns continue about the Manhattan/Systems work path. Until MTACC works through the uncertainties concerning Incremental IST, the 47th Street Entrance, and redevelopment of 270 Park Avenue, future schedules may show the shifts in the critical path, further delays, and reduction of the Issues Contingency. **[Ref: ESA-128-Sep17]**
2. The PMOC has growing concerns about the significant schedule changes that resulted in major shifts among contracts on the Manhattan/Systems schedule path, which drives the ESA Program Critical Path. The fundamental issue is that MTACC does not have a final agreement among the contractors and LIRR for the Incremental IST schedule, which will exert a significant influence on the critical path. Until this schedule is locked down, the ability of the ESA programs to achieve the planned RSD is uncertain at best. The MTACC and CS179 contractor agreed on a syndicated IST schedule in November 2018, which will be incorporated in the IPS after execution of a contract modification.

3. The ESA program schedule contingency increased modestly to 302 CDs, which is only 27 CDs above the minimum required FTA ELPEP schedule contingency. The ability of the MTACC to maintain the FTA minimum until the next ELPEP hold point (95% constructed; 4Q2020) is at risk due to the uncertainties about the Manhattan/Systems schedule, the greatest of which is finalization of the plan for the Incremental IST.
4. Progress on CS084, Tunnel Systems Package 4 – Traction Power, is slow and is currently reported as 28.3% complete compared with 88.6% as-planned. The PMOC observes that much of the work has had day-for-day delays in each IPS update period. The PMT is working with the contractor to develop a realistic schedule; however, the PMOC believes that a revised schedule will incorporate delays in the delivery of equipment that will push out milestone dates. The PMOC recommends that ESA continue to analyze options to recover the schedule with a focus on major electrical equipment submittals and layouts, identifying major issues, and, determining corrective measures.
5. During August, September, and October of 2018, the Manhattan/Systems and the Harold program paths both lost time. The Manhattan/Systems path was lengthened by approximately 6.6 months because the Issue Contingency activity was included on this path. Although the reordering of these critical activities changed CS179 substantial completion to a later date, it did not delay the target RSD forecast. The Harold path lost approximately 2 months.
6. None of the 36 coordination points achieved their scheduled start dates during the August-October 2018 period. Although not on the critical path, 26 points on the Manhattan/Systems path experienced a finish delay of 2-3 months and 8 points experienced a 9-month delay. If not addressed and corrected, this situation could lead to serious “work/activity stacking” in many areas and may create significant time, access and resource constraints.

5.0 PROJECT COST

5.1 Budget/Cost

In the ESA October 2018 MPR, MTACC reported that total construction progress reached 77.9% complete compared with planned progress of 78.2%. Since the ESA July 2018 MPR, the PMT calculates summary construction progress as a percentage of the \$8,014 million April 2018 EAC forecast of construction costs. Individual contract and force account package completions continue to be calculated as a percentage of their current awarded value.

The MTACC established the revised budget of \$10,178 million (excluding the rolling stock reserve and financing costs) for the ESA project in June 2014. In April 2018, MTACC forecasted a new ESA program EAC of \$11,133 million, which is \$956 million above the June 2014 budget. The MTA has funded an interim budget of \$10,335 million for the program through December 2020, when it is anticipated that the EAC is incorporated in the 2020-2024 Capital Plan and the ESA program budgets. The June 2014 budgets, FFGA budgets, and current baseline budgets are shown by standard cost category in Table 5.1.

Table 5.1: Comparison of Standard Cost Categories: FFGA vs. CBB

(Cost shown in millions)

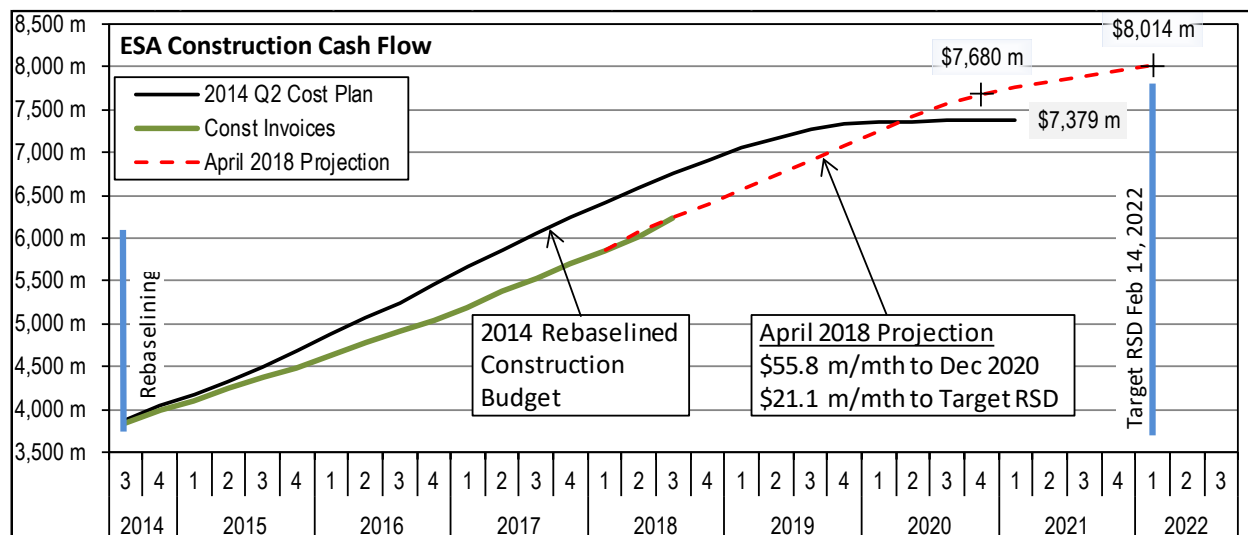
Standard Cost Category	FFGA Dec 2006	June 2014 Project Budget	Amend-ed FFGA	Aug 2018 CBB	Sep 2018 CBB	Oct 2018 CBB	CBB / FFGA Var.	CBB / Amend FFGA Var.
10 Guideway & Track Elements	1,989	3,405	3,353	3,408	3,403	3,403	71.1%	1.5%
20 Stations, Stops, Terminals, Intermodal	1,169	2,238	2,327	2,292	2,291	2,291	96.0%	-1.5%
30 Support Facilities (Yards, Shops, Admin)	356.3	474.2	450.8	531.4	558.6	558.6	56.8%	23.9%
40 Site Work and Special Conditions	205.1	610.6	562.5	549.8	525.7	525.6	156%	-6.5%
50 Systems	619.3	605.6	627.7	710.9	713.2	713.1	15.1%	13.6%
60 ROW, Land, Existing Improvements	165.3	219.4	192.2	162.3	162.3	162.3	-1.8%	-15.6%
70 Vehicles	494.0	209.9	879.5	15.4	15.4	15.4	-96.9%	-98.2%
80 Professional Services	1,184	1,975	1,809	2,115	2,115	2,115	78.6%	16.9%
b(4)								
Subtotal	6,350	10,178	10,922	10,335	10,335	10,335	62.8%	-5.4%
100 Financing Cost	1,036	1,036	1,116	1,116	1,116	1,116	7.8%	0.0%
Total	7,386	11,214	12,038	11,452	11,452	11,452	55.0%	-4.9%

5.2 Project Cost Management and Control

In the ESA October 2018 MPR, MTACC reported that total construction progress reached 77.9% complete compared with planned progress of 78.2%. Since the ESA July 2018 MPR, the PMT calculates summary Construction progress as a percentage of the \$8,014 million April 2018 EAC forecast of construction costs. Individual contract and force account package completions are calculated as a percentage of their current awarded value. Details of active contract budgets and expenditures are in Appendix J.

Cost trends have remained consistent since the 2014 re-baselining with actual expenditures less than planned. The planned construction cost curve has been updated to account for the April 2018 EAC forecast.

Table 5.2: Planned vs Actual Construction Cash Flow



To stay on plan for the April 2018 EAC forecast, the ESA program should maintain a monthly average of approximately \$55.8 million through December 2020, and then to average \$21.1 million through February 2021. Maintaining the projected average spending rates is contingent on concluding negotiations for open schedule issues (e.g. incremental IST). The chart reveals that cumulative construction costs are tracking the straight line projection for the April 2018 EAC forecast. The PMOC is concerned that MTACC’s inability to achieve the planned rate of construction spending may impact the timely achievement of revenue service.

Table 5.3 shows the ESA budgets along with current awards and invoiced costs. Note that the percentages shown are the invoiced percent of the current budget, not of the EAC forecast.

Table 5.3: Project Budget and Invoices
(Cost shown in millions)

Elements	Baseline Total Budget June 2014	April 2018 EAC Forecast	October 2018			
			Current Budget (interim)	Actual Awards	Invoiced Costs	Invoice Pct. of Budget
Construction Subtotal	7,379.3	8,014.1	7,536.6	7,228.9	6,244.4	82.9%
Soft Cost Subtotal	2,798.5	2,852.2	2,798.5	2,146.8	2,097.6	75.0%
Engineering	720.6	871.8	770.2	738.4	735.9	95.5%
OCIP	282.6	457.4	379.2	379.2	368.4	97.1%
Project Management	972.2	1,117.3	965.4	907.2	875.2	90.7%
Real Estate	182.1	203.7	124.9	119.2	117.8	94.3%
Rolling Stock	202.0	202.0	7.5	2.7	0.2	2.6%
Soft Cost Subtotal	439.0	267.0	551.2	--	--	--
Total (without financing)	10,177.8	11,133.3	10,335.1	9,375.6	8,342.0	80.7%

5.3 Change Orders

Table 5.4 lists the 25 contract modifications with magnitudes greater than \$100,000 that were executed during August, September, and October 2018. The net increase of these modifications was \$18.4 million. The PMOC reviewed several of these change orders and found that MTACC change order procedures were followed. Refer to Appendix N for further information.

Table 5.4: Change Order Log (>\$100,000)

Contract	Description / Mod No.	Amount
August 2018		
CH061A	DSC - Extra New Concrete Between New Walls and Piles (mod. 15)	180,000
CH061A	Demolition of a Portion of the 12kV Ductbank (mod. 16)	199,000
CM014B	Bid Item No. 15A (mod. 180)	660,000
CM014B	Add & Modify Stairways at the 47 th St. Node (CPR-092) (mod. 165)	690,000
CM014B	Modify Restrooms, Digital Signage Conduits (CPR-079 R2) (mod. 170)	1,612,875
CQ033	C1 Manhole and Ductbank (mod. 21)	241,000
CS179	Queens Plaza MER Room Changes (mod. 104)	126,500
CS179	2 nd Ave CMU Wall Bracing (mod. 109)	101,000
CS179	B10 FA Changes (mod. 106)	165,000
CS179	Deletion of FM-200 Systems from Communication Closets (mod. 87)	210,396
CS179	Tunnel SCADA Server Relocation (mod. 76)	575,000
September 2018		
CH061A	Ductbank for CS179 Backbone Communication System (mod. 18)	164,473
CM014B	Transformer House 9 Drainage (CPR-A040) (mod. 161)	154,600
CQ032	Additional Water Infiltration Remediation (mod. 82)	736,350
CQ033	Raising Arch Street Track (mod. 19)	236,000
CS179	General Electrical Panel Changes (mod. 85)	1,958,500
CS179	UL Rated Cable Replacement MHTN (mod. 94)	221,000
CS179	Plaza Fire Alarm Changes (mod. 115)	162,000
CS179	2nd Ave Metal Grating Supports (mod. 118)	117,000
CS179	ESA System Clock Changes (mod. 123)	203,223
October 2018		
40-01R	Updated Interface to MTA IT TIMACS III System (mod. 157)	112,413
CM014B	RFI #723 - CM014A TOC Elevation (CPR-093) (mod. 186)	236,000
CM014B	Substation B20: Alternative Temp Power (CPR-098) (mod. 188)	412,419
CQ033	CH053 Catenary Demolition Transfer (mod. 20)	703,000
CQ033	Extend Track D Approach - Option 10B from CH057 (mod. 23)	8,200,000

5.4 Project Funding

The MTACC has sufficient funds to continue the ESA program through December 2020 based on its estimates as provided in the 2015-2019 Capital Plan. Budget Amendment 3 added \$157 million (local funds) and increased the overall ESA program budget from \$10,178 million to \$10,335 million. In 2019, MTACC will request additional funds, to be based on contemporary forecasts, in the 2020–2024 Capital Plan to obtain approximately \$956 million in additional local funding to complete the ESA program.

Federal Funding: The total Federal funding commitment to the ESA project is \$2,698.8 million, of which all of the funds have been effectively drawn down as of November 1, 2018.

Local Funding: The budget for Local Funding is \$7,636.3 million, of which \$5,643.2 million was expended through November 1, 2018. Financing costs are funded separately by other local sources.

5.5 b(4)

[Redacted]

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[Redacted]

b(4)	[Redacted]	[Redacted]	[Redacted]	[Redacted]	[Redacted]
[Redacted]	[Redacted]	[Redacted]	[Redacted]	[Redacted]	[Redacted]
[Redacted]	[Redacted]	[Redacted]	[Redacted]	[Redacted]	[Redacted]
[Redacted]	[Redacted]	[Redacted]	[Redacted]	[Redacted]	[Redacted]
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6.0 RISK MANAGEMENT

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

Harold Interlocking – ESA Risk

Harold Re-Sequencing Plan (“ESA First”): To reduce the impacts of Amtrak’s force account resource constraints, especially limited Electric Traction (ET) personnel, ESA has re-sequenced its Harold construction schedule on three separate occasions and developed what is known as the

“ESA First” schedule as a result. Although this has helped to reduce the impact of insufficient Amtrak support, it has not eliminated it entirely and it continues to be a challenge for MTACC. The PMOC has noted improvements during 4Q2018 for Amtrak ET support.

Amtrak Preparation for Extended East River Tunnel Outages: The PMOC has continuing concerns regarding the impact to the ESA Harold work due to the Amtrak program to harden East River Tunnel (ERT) Lines 1 and 4 in preparation for extended outages for ERT Lines 1 and 2 to complete Hurricane Sandy damage-related reconstruction work, originally planned for 2019 and now deferred until 2025, starting with Line 2. The risk remains that tunnel systems reliability or safety issues might require Amtrak to make emergency repairs on either Line 1, 2, or 4 at any time between now and the RSD of December 2022.

Positive Train Control:

This risk has three distinct elements:

- a.) A potential risk that may be realized in the near future is the impact that LIRR installation of PTC in Harold Interlocking may have on the Harold critical path. Although LIRR submitted a waiver request in early October 2017 to have the FRA extend the December 31, 2018, deadline and subsequently revised the request in late December 2017, the possibility exists that FRA might not grant the waiver. If the waiver is denied, PTC installation may have a higher priority than ESA work in Harold. In its letter of May 2, 2018, FRA requested that LIRR resubmit an alternate PTC implementation plan and revised schedule by August 2, 2018. LIRR submitted its proposed revised PTC implementation schedule on November 29, 2018.
- b.) LIRR may divert some force account resources away from support for the ESA work to provide support for LIRR’s system-wide, i.e., non-ESA, PTC work currently underway.
- c.) LIRR was not able to complete PTC design in 1Q2018, as earlier projected, and design completion is now expected in January 2019. The PMOC is aware that ESA/GEC has been coordinating with LIRR regarding the required PTC design changes for the associated ESA Contracts VS086, CS086, and CS179. The PMOC notes, however, that the PMT/GEC acknowledges that the required associated design changes for ESA Contracts VS086, CS086, and CS179 cannot be completed until the PTC is finalized. MTACC has already acknowledged that the contract modification for incorporation of PTC requirements will impact the substantial completion date for Contract VS086. MTACC will be installing, testing, and commissioning PTC for all of the new track and signal systems built under the ESA Program.

Capital Funding Risk

MTACC has forecasted a need for approximately \$956 million in the 2020–2024 Capital Plan. The PMOC remains concerned that – until the 2020–2024 Capital Plan is approved – this potential future funding constraint may significantly impact the program budget and schedule as well as the start of Revenue Service. [Ref: ESA-127-Jun17]

ESA Vehicle Risk

The PMOC will remain concerned about the LIRR’s procurement of the M-9A vehicles until a schedule is developed based on results of its revised RFP. Late delivery of the vehicles could potentially have a negative effect on MTACC’s Revenue Service Date and the PMOC believes that any further delay in the procurement could likely bring this risk much closer to realization.

Manhattan/Systems Performance Risk

The PMOC remains concerned that continued delays in completing the Manhattan/Systems work may adversely impact the completion of the overall ESA program and the start of revenue service based on the following [Ref: ESA-128-Sep17]:

- Contract CS084 is reported at only 28.3% complete (actual) vs. 88.6% as-planned.
- Contract CM014B is reported at only 65.4% complete (actual) vs. 96.6% as-planned.
- Special Trackwork installation is significantly behind planned schedule.
- Contract CS086 received NTP in December 2018. Delays to the start of this contract have used significant schedule float.
- Unresolved issues: Incremental IST and 47th Street Entrance schedule impacts.
- A critical stakeholder issue with JPMC has developed involving its plans to construct a 70-story office tower replacing their existing office building at 270 Park Avenue. Impacts to the ongoing ESA construction of the new LIRR Concourse at GCT could be significant.
- Managing inter-contract handoffs and interfaces has become a significant issue that will be increasingly challenging and represents a significant MTACC-retained risk.
- Due to contractor work site time and access constraints, there is very limited opportunity for the contractors to make up the time lost to interface delays. Should delays continue to accumulate, a meaningful recovery would likely not be possible.

JP Morgan Chase Redevelopment at 270 Park Avenue

Foundation systems required for the planned new JP Morgan Chase (JPMC) building at 270 Park Avenue may impact the LIRR Concourse at GCT as well as the MNR train shed. Potential impacts to the ESA design and construction work are potentially significant. Without better definitions of the scopes of work, however, schedule impacts cannot be accurately forecast at this time. More detailed information from ESA-PMT is expected during 1Q2019. Ongoing MTA, MTACC-ESA, and JPMC discussion continued through December 2018. All MTA costs to date have been reimbursable by JPMC and all related MTACC-ESA work is being performed by a dedicated team so not to impact the management and technical services being provided for the ESA program. [ESA-133-Dec18]

6.1 Risk Process

Status/Observations: The PMOC observes that the ESA Risk Manager continues working to strengthen the ESA risk management process so that it serves as a key element for the PMT's decision making process. During 2017, the Risk Manager conducted a Contract CM014B Risk Refresh workshop and a comprehensive Risk Review for the remaining ESA work in Harold Interlocking that was facilitated by an experienced outside consultant. Also, the Risk Manager submitted a revised Risk Management Plan to the FTA and the PMOC during 4Q2017 and reissued a subsequent update in December 2018.

Concerns and Recommendations: The PMOC believes that the risk management process could be improved through increased involvement by the Construction Management staff to provide its input for development and implementation of more effective risk mitigation measures, especially with regard to coordination risks.

6.2 Risk Register

Status/Observation: The most recent Risk Register update was issued in October 2018 as the 3Q2018 update. The next Risk Register update for 4Q2018 is expected in January 2019.

Concerns and Recommendations:

1. ESA should continue to issue regularly scheduled updates of the Risk Register as called for in the Risk Management Plan.
2. The PMOC considers the major remaining risks for the East Side Access Program to be:
 - a) Program Funding – 2020-2024 Capital Plan potential risk of funding constraint [long-term risk under the 2020-24 Capital Plan remains significant];
 - b) Recovery of lost time due to significant schedule delays on Contracts CM014B, CS179, and CS084;
 - c) Successful execution of multiple hand-off interfaces across several contracts;
 - d) Contractor access and work area coordination in Manhattan;
 - e) Implementation/duration of the Incremental Integrated Systems Testing Plan;
 - f) Continued availability of adequate Amtrak and LIRR force account resources;
 - g) Continued availability of required track outages in Harold Interlocking;
 - h) Maintaining adequate schedule performance of the remaining work in Harold Interlocking;
 - i) Significant schedule path float has been used and Manhattan/Systems path now controls the critical path, specifically the risk of maintaining the IST schedule [risk realized in 2Q2018];
 - j) Coordination risk retained by MTACC in Manhattan and the ESA tunnels with regard to construction and testing interface management for the systems work;
 - k) CS084 equipment issues involving risk of possible LIRR rejection of 10 TPSS transformers fabricated prior to the 2nd of 3 “hi-pot” test failures and resolution of concerns about condition of MTACC provided inductive reactor equipment to be installed by the CS084 contractor; and
 - l) Foundation systems required for the new JP Morgan/Chase (JPMC) building at 270 Park Avenue may impact the ongoing ESA construction of the new LIRR Concourse at GCT as well as the existing MNR train shed. (New Risk)
3. Specific remaining risks for the Harold Interlocking work, previously identified by MTACC, include the following:
 - a) Positive Train Control in Harold: LIRR submitted a formal waiver request to FRA; LIRR was required to resubmit its revised PTC Implementation Plan/Schedule by August 2, 2018; LIRR submitted the revised PTC schedule on November 29, 2018.
 - b) LIRR Force Account Performance: Ability of LIRR force account resources to provide both a very high level of support for third-party contractor access and protection and adequate productivity for significantly increased direct labor work involving track, 3rd rail, and signals, in accordance with the current ESA schedule. [Risk now lower]
 - c) Northeast Quadrant Rail Work: [No longer a risk as of September 30, 2018]
 - d) LIRR CIL Cutovers: [No longer a risk as of July 31, 2018]
 - e) CH058A Preparation Work: Ability of Amtrak and LIRR force account resources to complete, in accordance with the current ESA schedule plan, all track, catenary, and third-rail work required prior to NTP for CH058A.
 - f) Funding: Funding constraints [risk realized in 2Q2017; long-term risk remains].
 - g) Amtrak Support: Ongoing/future Regional Projects requiring extensive Amtrak support.
 - h) Reconstruction of Existing Amtrak ERT Lines 1 and 2: Deferred until after the ESA program. The risk now is from the impact of unplanned emergency tunnel repairs.

6.3 Risk Mitigations

Current Risk Mitigation Efforts:

The PMOC notes that the PMT is implementing mitigation strategies for a number of the current identified risks. Examples include:

- Advancing procurement of the eight CILs for the Mid-Day Storage Yard;
- Actively engaging Amtrak and LIRR to develop some specific strategies to mitigate many of the identified risks;
- Labor clearance initiatives with Amtrak and LIRR to release selected ESA work normally claimed by the railroad unions to permit the work to be done by a third-party contractor;
- Implementation of the Harold schedule re-sequencing to support the “ESA First”;
- The Harold Management Team has consistently worked to effectively re-plan, re-schedule, and re-sequence both third-party contractor and force account work to reduce impacts of railroad personnel constraints;
- LIRR formally requested a waiver of the December 31, 2018, deadline for PTC implementation in Harold Interlocking from the FRA;
- Establishment and implementation of an integrated schedule for planning deployment of Amtrak and LIRR Force Account resources across all Regional capital and railroad projects. This schedule process allows different projects in the Metropolitan area to identify conflicts that affect their respective track outages well in advance, thus making it possible to mitigate negative impacts on each project and allows ESA to better execute planned work in the Harold Interlocking.
- The PMOC notes that the ESA project is currently transitioning to a new organization with revised operations and processes in order to better manage and mitigate current and future risks. These changes represent the implementation of the MTACC president’s ESA Six-Point Plan to reduce future risk.
- Foundation systems required for the planned new JPMC building at 270 Park Avenue may impact the ongoing ESA construction of the new LIRR Concourse at GCT as well as the existing MNR train shed. Ongoing MTA, MTACC-ESA and JPMC discussion continued through December 2018 in an effort to minimize changes to the ESA designs and to minimize impact to the ongoing ESA construction of the LIRR Concourse at GCT.

Concerns and Recommendations

1. The PMOC recognizes that MTACC and ESA have been proactive in dealing with railroad force account and track outage issues over a very long period of time and also recognizes ESA’s efforts to re-baseline the remaining work in Harold Interlocking to reflect more realistic expectations of Amtrak and LIRR support. Although recent improvements have been noted, the situation still needs to be very closely monitored and the PMOC recommends that the PMT continue to actively engage executive management in MTACC and MTA to assist with resolution of outstanding issues with Amtrak and LIRR. **[Ref: ESA-124-Jun16 (Amtrak)]**
2. The PMOC is concerned about current delays on the ESA Program critical path through Manhattan/Systems contracts and future contract coordination issues, especially with regard to the installation, integration, and testing of the 10 control systems, 19 non-control systems, train signal system, and the MDSY systems. Managing the many inter-contract turnovers and interfaces is increasingly a challenge and represents a significant MTACC retained risk. Mitigating schedule risk for work along the Manhattan/Systems path is particularly challenging because it involves three third-party contracts, a significant number of contract interfaces for room/area turnovers and the coordination of systems installation, testing, and integration. The PMOC had previously recommended that MTACC-ESA consider establishment of a dedicated

coordination team to work closely with the Construction Managers, Project Management Team, the GEC, and LIRR to assist with resolution of issues with minimum cost and schedule impacts. MTACC has acknowledged the need to address this situation and, during 3Q2018, started the transition to a new organization and new processes to manage and mitigate current and future risks. The PMOC recommends that the PMT complete the transition as quickly as possible and make any organizational, operational or procedural adjustments necessary to achieve the desired process outcomes and goals.

3. The PMOC is concerned about the potentially significant cost and schedule impacts resulting from construction of the required foundation systems for the planned new JP Morgan/Chase (JPMC) building at 270 Park Avenue that will affect the ongoing ESA construction of the new LIRR Concourse at GCT as well as the existing MNR train shed. The PMOC recommends that MTA and MTACC-ESA expedite the engineering and design technical discussions to arrive at a mutually agreeable solution with JPMC as soon as possible.

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APPENDIX A - LIST OF ACRONYMS

ARRA	American Recovery and Reinvestment Act	MNR	Metro-North Railroad
BIM	Building Information Management	MTA	Metropolitan Transportation Authority
CBB	Current Baseline Budget	MTACC	Metropolitan Transportation Authority Capital Construction
C&S	Communication and Signals	N/A	Not Applicable
CCC	Change Control Committee	NOC	Notice of Change
CCM	Consultant Construction Manager	NTP	Notice to Proceed
CM	ESA Construction Manager assigned to each contract	NYCT	New York City Transit
CMP	Cost Management Plan	NYSPTS	New York State Public Transportation Safety Board
CPOC	Capital Program Oversight Committee	OR	Operational Readiness
CR	Candidate Revision	PE	Preliminary Engineering
CIH	Central Instrument House (Amtrak designation)	PEP	Project Execution Plan
CIL	Central Instrument Location (LIRR designation)	PMOC	Project Management Oversight Contractor (Urban Engineers)
CPR	Contractor Proposal Request	PMP	Project Management Plan
CPRB	Capital Program Review Board	PMT	Project Management Team
CPP	Contract Packaging Plan	PQM	Project Quality Manual
CSTP	Comprehensive System Test Plan	PWE	Project Working Estimate
DCB	Detailed Cost Breakdown	QA	Quality Assurance
DFE	Direct Fixation Fasteners	RAMP	Real Estate Acquisition Management Plan
ELPEP	Enterprise Level Project Execution Plan	RAP	Rail Activation Plan
ERT	East River Tunnel	RFP	Request for Proposal
ESA	East Side Access	RMP	Risk Management Plan
ET	Electric Traction	ROD	Revenue Operations Date
F/A	Force Account	ROW	Right of Way
FFGA	Full Funding Grant Agreement	RSD	Revenue Service Date
FTA	Federal Transit Administration	RSP	Revenue Service Plan
GCT	Grand Central Terminal	RTB	Resilient Tie Block
GEC	General Engineering Consultant	SC	Substantial Completion
GUI	Graphic User Interface	SCC	Standard Cost Category
HTSCS	Harold Tower Supervisory Control System	SMP	Schedule Management Plan
IEC	Independent Engineering Consultant (to MTA)	SSMP	Safety and Security Management Plan
IFB	Invitation for Bid	SSOA	State Safety Oversight Agency
IPS	Integrated Project Schedule	SSPP	System Safety Program Plan
IST	Integrated System Testing	STRTB	Special Trackwork Resilient Tie Block
JPMC	JP Morgan Chase	TBD	To Be Determined
LIRR	Long Island Rail Road	TBM	Tunnel Boring Machine
LTA	Lost Time Accidents	TCC	Technical Capacity and Capability
MEP	Mechanical/Electrical/Plumbing	WBS	Work Breakdown Structure
		WBY	Westbound Bypass Tunnel

APPENDIX B - PROJECT OVERVIEW AND MAP

Project Overview and Map – East Side Access



MTA/LIRR East Side Access Project

Scope

Description: This project is a new commuter rail extension of the Long Island Rail Road (LIRR) service from Sunnyside, Queens to Grand Central Terminal (GCT), Manhattan, utilizing the existing 63rd Street tunnel under the East River and new tunnels in Manhattan and Sunnyside yard. Ridership forecast is 162,000 daily riders (27,300 new riders).

Guideway: This two-track project is 3.5 route miles long, it is below grade in tunnels and does not include any shared use track. In Harold interlocking, it shares ROW with Amtrak and the freight line.

Stations: This project will add a new 8 track major terminal to be constructed below the existing GCT. The boarding platforms and mezzanines of the new station will be located approximately 90 feet below the existing GCT lower level. A new passenger concourse will be built on the lower level of the terminal.

Support Facilities: New facilities will include: the LIRR lower level at GCT, new passenger entrances to the existing GCT, the East Yard at GCT, the Arch Street Shop and Yard, a daytime storage and running repair/maintenance shop facility in Queens, and ventilation facilities in Manhattan and Queens.

Vehicles: The scope and budget for the ESA project include the procurement of 160 new electric rail cars to support the initial service.

Ridership Forecast: MTA projects that, by 2020, the ESA project will handle approximately 162,000 daily riders to and from GCT. This Ridership projection is based on a 2005 study performed by DMJM/Harris (AECOM).

Original Schedule

9/98	Approval Entry to PE	12/10	Estimated Rev Ops at Entry to PE
02/02	Approval Entry to FD	06/12	Estimated Rev Ops at Entry to FD
12/06	FFGA Signed	12/13	Estimated Rev Ops at FFGA
8/16	Amended FFGA Signed	12/23	Estimated Rev Ops at Amended FFGA
08/19	Original Revenue Service Date (MTA schedule)		

Cost

\$4,300 million	Total Project Cost (\$YOE) at Approval Entry to PE
\$4,350 million	Total Project Cost (\$YOE) at Approval Entry to FD
\$7,386 million	Total Project Cost (\$YOE) at FFGA signed
\$11,936.0 million	Total Project Cost (\$YOE) at Revenue Operations
\$11,972.1 million	Total Project Cost (\$YOE) as of October 31, 2017, including \$1,036.1 million in Finance Charges & Regional Investment Program
\$11,133.3 million	Total Project Cost (\$YOE), as of April 2018, excluding Finance Charges and Regional Investment Program
\$10,335.1 million	Total Project Interim Cost (\$YOE) through December 2020, as of April 2018, excluding Finance Charges and Regional Investment Program
\$8,342.0 million	Amount of Expenditures as of October 31, 2018, of on the Interim Project Budget of \$10,335.1 million
74.9%	Percent Complete, based on the ESA April 2018 EAC forecast of \$11,133.3 million and invoices shown in the October 2018 MPR.
\$747.5 million	Total Project Contingency remaining (including \$551.2 million identified by ESA as Unallocated Contingency, which includes ESA Management Reserve).
77.9%	Construction Percent Complete vs. 78.2% as planned based on the ESA April 2018 EAC forecast of \$11,133.3 million shown in the October 2018 MPR.

APPENDIX C – LESSONS LEARNED

No.	Date	Phase	Category	Subject	Lessons Learned
1	Dec-12	Construction	Construction	Muck Handling	See below Lessons Learned: During cavern excavation, the CM019 contractor became muck-bound, which caused a project delay of several months. The PMOC recommended that the contractor make extraordinary effort to evacuate the muck. After several months, it finally did, but the schedule time could not be recovered by that point. Lesson learned was to develop a well thought out muck handling plan (including establishment of proper haul roads) before work begins and to follow it during excavation.
2	Dec-12	Construction	Management	Stakeholder Management	See below Lessons Learned: The CH053 contractor incurred many months of initial construction delay because Amtrak did not approve the Electric Traction design documents on the project's schedule. A major contributing factor to this was because the MTACC had not established a contractual working relationship with Amtrak prior to letting CH053. The PMOC recommended that the MTACC and GEC more closely design the project in accordance with the comments that Amtrak was submitting. To date, the MTACC has exhibited some improvement in this matter, but there are still 2+ Stages to construct, and improvement has not been fast enough or consistent over time. Lesson learned was to develop good working relationships with all project stakeholders before any contracts are awarded.
3	June-13	Construction	Planning/ Construction	Haul Roads	See below Lessons Learned: Haul roads to remove muck need to be passable (preferably paved with a mud slab) with locations pre-determined in areas of confined space such as caverns and tunnels. Deep, muck-filled haul roads contributed to the contractor's slow progress in removal of muck during construction. Lesson learned was to plan haul roads in advance and ensure that the muck haulers can travel at a specific rate of speed in order to meet production goals.
4	June-13	Construction	Training	Operator Skill with drill rigs	See below Lessons Learned: Lack of proper operator training contributed to inconsistent drilling of 10' deep blast holes which resulted in under/overbreak of excavated material, thus requiring rework to achieve desired results. Lesson learned was to ensure that drill rig operators are properly trained before being allowed to operate a production drill rig.
5	June-13	Procurement	Contract Development	Contract Packaging	See below Lessons Learned: Access to work sites, interface with other contracts, and contract staging must be considered when projects employ multiple contractors that may conflict with each other, particularly in confined spaces such as tunnels and caverns. Lesson learned is to carefully consider the access that each contractor may require, perhaps developing a scale model of the expected operation, so that expected operation of each contractor is included in its contractual requirements.

No.	Date	Phase	Category	Subject	Lessons Learned
6	June-13	Administration	Quality	Submittals	See below
<p>Lessons Learned: Identification and resolution of quality issues (e.g. As-Built drawings, NCRs, etc.) must be managed on a daily basis to avoid creation of a backlog. Lesson learned is for the owner to have a well-trained staff with a consistent, coordinated approach (including appropriate pre-approved corrective action) when obtaining contractually required documents from contractors.</p>					
7	June-13	Contract Specs/ Construction	Construction	Pneumatically Applied Concrete (PAC)/ Shotcrete	See below
<p>Lessons Learned: Use of PAC/Shotcrete involves consideration of site specific limitations on a case by case basis. Lesson learned is that projects which anticipate use of PAC/shotcrete should carefully examine all aspects of its use and that a careful engineering analysis of the expected use be made so that the approved use can be included in the contract documents for the project.</p>					
8	June-13	Procurement/ Construction	Procurement	Qualified Personnel	See below
<p>Lessons Learned: Ensure that project key personnel are properly qualified and experienced for the positions they will fill on the project. Lesson learned is that personnel not properly qualified, experienced, or possessing the requisite credentials can adversely impact construction progress and may cause delays. The owner should ensure that it is getting the contractor's best personnel when excavating a tunnel or cavern.</p>					
9	June-13	Scheduling	Construction	TBM Production	See below
<p>Lessons Learned: Project management should ensure that accurate, up-to-date, production rates for machinery are used when project schedules are developed. PMOC analysis has revealed that ESA schedules for the Manhattan Tunnel Boring Machines were based on a planned excavation rate of 53 linear feet/day. Actual TBM excavation averaged 34 LF/day, a difference of 35%. Lesson learned is that, depending on the length of excavation, inaccurate production rate estimates can have a significant impact on the project schedule.</p>					

APPENDIX D – SAFETY AND SECURITY CHECKLIST

Project Overview			
Project mode (Rail, Bus, BRT, Multimode)		Rail	
Project phase (Preliminary Engineering, Design, Construction, or Start-up)		Construction	
Project Delivery Method (Design/Build, Design/Build/Operate/Maintain, CMGC, etc.)		Primarily Design Bid/Build	
Project Plans	Version	Review by FTA	Status
Safety and Security Management Plan	12/2010 Rev. 2	2012	Sponsor has forwarded the revised SSMP directly to FTA.
Safety and Security Certification Plan	11/2008 Rev. 1		Is within the SSPP of LIRR.
System Safety Program Plan	11/2008 Rev. 1		N/A
System Security Plan or Security and Emergency Preparedness Plan (SEPP)	11/2010		Is within the SSPP of LIRR.
Construction Safety and Security Plan	3/2007 Rev. 1		Project Construction Safety and Security Plan, contractors' site specific safety and security plans.
Safety and Security Authority	Y/N	Notes/Status	
Is the Sponsor subject to 49 CFR Part 659 state safety oversight requirements?	Y		
Has the state designated an oversight agency as per Part 659.9?	Y	The New York State Public Transportation Safety Board (NYSPTSB) is the SSOA. The SSOA has stated that they will not interface with the safety certification process for ESA until such a time as it is signed and certified by LIRR.	
Has the oversight agency reviewed and approved the Sponsor's SSPP as per Part 659.17?	In Development	In 4Q2013, the SSOA has asked the FTA for guidance on approving the SSPP.	
Has the oversight agency reviewed and approved the Sponsor's Security Plan or SEPP as per Part 659.21?	In Development	The New York State Public Transportation Safety Board (NYSPTSB) is the SSOA. The SSOA has stated that they will not interface with the security review process for ESA until such a time as it is signed and certified by LIRR.	

Safety and Security Authority	Y/N	Notes/Status
Did the oversight agency participate in the last Quarterly Program Review Meeting?	N	The SSOA has no plans to attend these meetings. Sponsor to transmit SSMP to SSOA through the Sponsor's System Safety Dept., in accordance with new MAP- 21 provisions, the FTA recently audited the NYS SSOA. Preliminary FTA findings indicate a need for more funding in order for the SSOA to accomplish its mandate from FTA. Simultaneously, the SSOA was able to transfer an existing NYS employee into the SSOA. It is anticipated that the above events will lead to a greater ability for the SSOA to more effectively and efficiently accomplish its mission moving forward. The SSOA has stated that they will not interface with the safety certification process for ESA until such a time as it is signed and certified by LIRR.
Has the Sponsor submitted its safety certification plan to the oversight agency?	Y	The Sponsor has submitted its safety certification plan to the NYS SSOA.
Has the Sponsor implemented security directives issues by the Department Homeland Security, Transportation Security Administration?	N	The MTA unified threat vulnerability methodology was applied to the ESA design. A vulnerability log was developed for ESA based on the feedback from the applied methodology. Controls within the design have been implemented to reduce the relative risk of those vulnerabilities identified. Analysis indicated that the controls within design were adequate for the vulnerabilities identified.
SSMP Monitoring	Y/N	Notes/Status
Is the SSMP project-specific, clearly demonstrating the scope of safety and security activities for this project?	Y	
Sponsor reviews the SSMP and related project plans to determine if updates are necessary?	Y	Sponsor has forwarded the revised SSMP directly to FTA.

SSMP Monitoring	Y/N	Notes/Status
Does the Sponsor implement a process through which the Designated Function (DF) for Safety and DF for Security are integrated into the overall project management team? Please specify.	Y	The safety certification designee for MTACC, as well as the MTACC quality chief, meets regularly with the project management team. The CCM and the Sponsor's safety and security personnel are integrated into the management team. Integration is also achieved through implementation of ESA HASP, monthly project wide safety meetings, quarterly audits, OCIP inspections, weekly MTACC and contractor joint safety audits, and interface w/MTA Police and NYPD Infrastructure Protection Unit of the NYPD's Counter-Terrorism Division. The Sponsor has added a security function assessment to its internal quarterly contractor audit.
Does the Sponsor maintain a regularly scheduled report on the status of safety and security activities?	Y	Safety and Security are reported on during the monthly safety meetings and are incorporated into Sponsor's monthly project reports.
Has the Sponsor established staffing requirements, procedures and authority for safety and security activities throughout all project phases?	Y	Contained within the Sponsor's safety procedure documents.
Does the Sponsor update the safety and security responsibility matrix/organizational chart as necessary?	Y	To be incorporated into the next revision of the SSMP.
Has the Sponsor allocated sufficient resources to oversee or carry out safety and security activities?	Y	MTA, GEC, CCM, and contractors provide personnel and resources to carry out safety and security activities. Additionally, an MTACC consultant conducted a safety and security review of all MTACC projects. The consultant's report included programmatic and system security recommendations that are currently being reviewed by MTACC and MTA Police.
Has the Sponsor developed hazard and vulnerability analysis techniques, including specific types of analysis to be performed during different project phases?	Y	The Safety Certification Committee process is comprehensive and provides for this.
Does the Sponsor implement regularly scheduled meetings to	Y	Safety Certification committee meetings as well as project wide monthly safety meetings take place.

SSMP Monitoring	Y/N	Notes/Status
track to resolution any identified hazards and/or vulnerabilities?		
Does the Sponsor monitor the progress of safety and security activities throughout all project phases? Please describe briefly.	Y	Accomplished through daily audits by contractor and CCM and through the comprehensive SSMP Committee process.
Does the Sponsor ensure the conduct of preliminary hazard and vulnerability analyses? Please specify analyses conducted.	Y	The Safety Certification Committee process provides for TVRA, safety, and security analysis as well as input from subject matter experts on the SSMP Committee.
Has the Sponsor ensured the development of safety design criteria?	Y	The Safety Certification Committee has validated the safety design criteria developed by the GEC.
Has the Sponsor ensured the development of security design criteria?	Y	Accomplished through the SSMP Committee process.
Has the Sponsor ensured conformance with safety and security requirements in design?	Y	Achieved through the Safety Certification Committee process.
Has the Sponsor verified conformance with safety and security requirements in equipment and materials procurement?	Y	The Sponsor has not verified conformance for materials procured to date. Thus far, the Sponsor has relied on design specifications and manufacturers' quality controls for verification. The PMOC has advised that this course of action is insufficient and does not align with FTA established guidelines. The Sponsor is attempting to devise a workable solution. Since the 4th quarter of 2014, the Sponsor has begun to document said verifications by use of their Quality Department reports and CM inspection reports.
Has the Sponsor verified construction specification conformance?	Y	Through ongoing contract review.
Has the Sponsor identified safety and security critical tests to be performed prior to passenger operations?	N	Although the Sponsor has established preliminary hazard analysis (PHA) and a system test plan, the Sponsor needs to identify safety and security critical tests in its Test Program Plan. The Sponsor is working within the PMP to identify critical submittals relevant to system certification. PMOC has expressed concerns, both at meetings and in reports, about the non-linear pattern of completed construction vs. incomplete critical testing. Sponsor believes that all hazards listed on

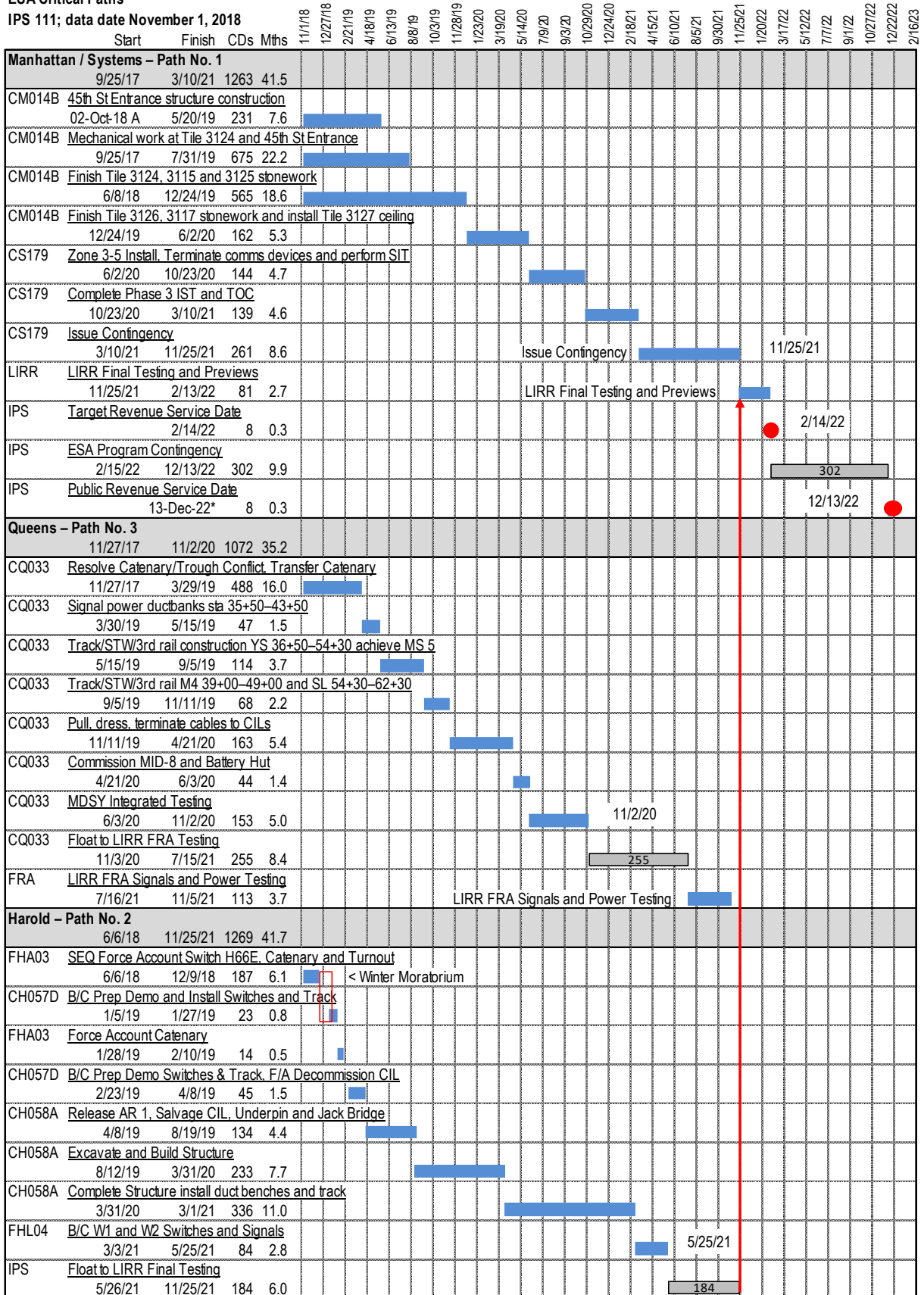
SSMP Monitoring	Y/N	Notes/Status
		the PHA log are either safety and/or security critical.
Has the Sponsor verified conformance with safety and security requirements during testing, inspection and start-up phases?	In Development	Project is not at these phases yet. The Sponsor is in the process of implementing requirements of the SSMP to conform to construction testing and integration requirements.
Does the Sponsor evaluate change orders, design waivers, or test variances for potential hazards and /or vulnerabilities?	In Development	Systems area design modifications not originally evaluated per the unified methodology are analyzed and controls are incorporated into the design. Controls have been put in place whereby the GEC verifies that any change orders and/or waivers do not affect the certification analysis process.
Has the Sponsor ensured the performance of safety and security analyses for proposed workarounds?	In Development	
Has the Sponsor demonstrated through meetings or other methods, the integration of safety and security in the following Activation Plan and Procedures Integrated Test Plan and Procedures Operations and Maintenance Plan Emergency Operations Plan	Y	An Emergency Preparedness Plan was promulgated by the Sponsor in 11/2010. The EAP operational readiness group has been finalized to include MNR, LIRR, MTAPD, and FDNY. The first meeting took place in March of 2013. A Safety Certification update has been incorporated into this meeting, with the MTACC Assistant Chief of Safety and Security providing regular status report. Task work group meetings have resulted in a white paper being formulated. The paper suggests that management hierarchy of GCT be presented as a single establishment (incorporating MNR and LIRR) in accordance with SIMS and NIMS requirements. The Sponsor has advised that the white paper reflecting the incident management hierarchy is being presented to the respective executives of each railroad, with the recommendation that LIRR and MNR's GCT incident commanders report to a unified incident commander from MTA Headquarters.
Has the Sponsor issued final safety and security certification?	N	Project is not at this stage.
Has the Sponsor issued the final safety and security verification report?	N	Project is not at this stage.

**APPENDIX E – ON-SITE PICTURES
(TRANSMITTED AS A SEPARATE FILE)**

APPENDIX F – ESA CRITICAL PATH

ESA Critical Paths

IPS 111; data date November 1, 2018



APPENDIX F - 90 DAY MILESTONE LOOK-AHEAD SCHEDULE – IPS 111

ACTIVITY ID	ACTIVITY DESCRIPTION	START	FINISH
CH053: Harold Structure - Part 1 & G.O.2 Substation			
CH053-5140	Con-Ed Energize High Voltage Service at GO2 Substation		14-Nov-18
CH053-6110	CH053 Handover GO2 Substation to LIRR		3-Dec-18
CH053FC	CH053 – Final Completion		3-Dec-18
CH061A: Tunnel A			
CH061A-2010	Complete Tunnel A and WBY Track Installation		28-Nov-18
CH061A-8218	CH061A MS#4 - Final Completion		28-Nov-18
CH058A: Harold Structures - B/C Structure/ Catenary Structure			
CH058A0000	NTP CH058A Contract		7-Dec-18
CH058B: Harold Structures - Eastbound Reroute Structure			
	No milestones forecasted for next 90 CDs		
FHL01: Harold Stage 1 - LIRR F/A			
FHL01-1210	Testing & Commissioning GO2 Substation	15-Nov-18	
FHL01.G02.2270	Completion of G02 conduits, cable pulls, feeder switches, DRIs and terminations		12-Nov-18
FHL02: Harold Stage 2 - LIRR F/A			
	No milestones forecasted for next 90 CDs		
FHL03: Harold Stage 3 - LIRR F/A			
	No milestones forecasted for next 90 CDs		
FHL04: Harold Stage 4 - LIRR F/A			
FHL04-1270	NTP FHL04 - LIRR Harold F/A Const Stage 4		1-Nov-18
FHL04-1060	Remove Switch 855W		6-Jan-19
FHL04-1100	Install Switch JD2 (5165E)		20-Jan-19
FHL04-1230	Remove Switch KS1 (821W)		27-Jan-19
FHL04-1240	Remove Switch KS2 (821E)		27-Jan-19
FHL04-1250	Remove Switch 855E		27-Jan-19
FHL04-1130	Install Switch JD1 (5165W)		12-Jan-19
FHA01: Harold Stage 1 - Amtrak F/A			
FHA01-1000	ET Catenary: Complete Catenary Work for Stage 1		3-Nov-18
FHA02: Harold Stage 2 - Amtrak F/A: Balance Work			
FHA02-1300-2	Install Switch DN2 (743B) - NO TRACK OOS - Remaining		4-Nov-18
FHA03: Harold Stage 3 - Amtrak F/A			
FHA03-CA5110	ET Catenary - X/O 5165 Catenary Shift		17-Jan-19
FHA04: Amtrak Harold F/A Construction Stage 4			
FHA04-1060	NTP FHA04 - Amtrak Harold F/A Const Stage 4	2-Jan-19	
VH051A (Part 1): Harold & Point CILs			
	No milestones forecasted for next 90 CDs		
VHA02: Procure Amtrak Materials Stage 2			
VHA02-SC	Substantial Completion		1-Nov-18
VHA03: Procure Materials for Harold Stage 3 - Amtrak F/A			
	No milestones forecasted for next 90 CDs		
VHA04: Procure Materials for Harold Stage 4 - Amtrak F/A			
	No milestones forecasted for next 90 CDs		
VHL02: Procure Materials for Harold Stage 2 - LIRR F/A			
VHL02-1010	Procure ZE Crossover		01-Nov-18
VHL03: Procure Materials for Harold Stage 3 - LIRR F/A			
	No milestones forecasted for next 90 CDs		
VHL04: Procure Materials for Harold Stage 4 - LIRR F/A			
	No milestones forecasted for next 90 CDs		

ACTIVITY ID	ACTIVITY DESCRIPTION	START	FINISH
CM005: Manhattan South Structures			
CM005-1050	Milestone 5 Final Completion - MS70 (May 6, 2016)		30-Nov-18
CM013A: 55th Street Vent Facility			
CM013A-280	CM13A - MS#3 Final Completion		1-Dec-18
CM004: 245 Park Ave. Entrance & 44th Street Vent Structure			
CM04-C0940	CM004 Contractual Final Completion (ML#2 Date 820 CDs from NTP)		1-Nov-18
CM006: Manhattan North Structures			
CM006-CS179-04	GCT-5 Rooms	5-Nov-18	
CM006-SC	Substantial Completion		31-Dec-18
CM006-CS179-05	Cross Flue	5-Nov-18	
CM007: GCT Caverns			
CM007-CS179.CIA.17B	Conduit from TOC ER W Cavern Mezz thru N Service Corridor to TOC Office E Cavern Mezz NBOH		21-Nov-18
CM007-CS179.CIA.19B	East Cavern Mezz Level - Comm Conduits		26-Nov-18
CM007-CS179.CIA.17A	Conduit from CR-M2 in W Cavern Mezz thru S Service Corridor to CR-M1 in E Cavern Mezz SBOH		13-Dec-18
CM007-CS179.CIA.19C	East Cavern Upper Level - Under Platform Conduits		23-Nov-18
CM007-CS179.CIA.18A	CR-M2 & Conduit from S Service Corridor to CR-M2 in W Cavern Mezz SBOH		20-Dec-18
CM007-CS179.CIA.20C	West Cavern Upper Level - Under Platform Conduits		12-Nov-18
CM007-CS179.CIA.20B	West Cavern Mezz Level - Comm Conduits		18-Dec-18
CM014B: GCT Concourse and Facilities Fit Out (BL)			
MS#5	MS #5 - 44th Street Ventilation Facility		18-Dec-18
PWR-99904	Unit Substation - #4 Connections & Terminations Complete		4-Jan-19
PWR-99903	Unit Substation - #3 Connections & Terminations Complete		4-Jan-19
CQ032: Plaza Substation & Queens Structures			
CQ032-MS06	MILESTONE #6 – SUBSTANTIAL COMPLETION		31-Dec-18
CQ033: Mid-Day Storage Yard Facility (Procurement Status TBD)			
ACR10	Access Restraint No. 1 - (Montauk Cutoff Area W. Thomson [119 CDs])	1-Nov-18	
ACR50	Access Restraint No. 5 - (39th St to 43rd St) [473 CDs]	1-Nov-18	
M80	Milestone No.8 - Complete All Work on Dwgs CQ033-CT-9401/9411/9412/9421/9425/9426 [457 CDs]		10-Dec-18
TP-SEC-3	Sec-3 Queens Blvd to Honeywell St-- Traction Power Ductbanks complete		7-Nov-18
CS084: Tunnel Systems Package 4 – Traction Power Systems			
90010	ACCESS RESTRAINT #2 - C04 TRACTION POWER SUBSTATION	1-Nov-18	
90040	ACCESS RESTRAINT #5 - C01 AND C02 TRACTION POWER SUBSTATION	1-Nov-18	
90050	ACCESS RESTRAINT #6 - C03 TRACTION POWER SUBSTATION	1-Nov-18	
CS179: System Package 1 - Facilities Systems*			
12-B07-600	12th St Vent Facility - B07 Substation - Elect - Queens/ B10 Coordination Study Approved	1-Nov-18	

ACTIVITY ID	ACTIVITY DESCRIPTION	START	FINISH
AR10A.4	Access Restraint No. 10A - GCT Concourse - Zone 1 - Column Line 1 to 6 (Day 808 / 15-Jun-16)	1-Nov-18	
AR11	Access Restraint No. 11 - Access Tunnel No. 1 (765 / 4-May-16)	1-Nov-18	
AR07B	Access Restraint No. 7B - Queens - Tunnel A - Sta 1203+00 to 1213+03 & to CR-124	24-Oct-18 A	
AR10C.4	Access Restraint No. 10C - Access to Comm Closets CC-3, CC-4, CC-7, CC-8	20-Nov-18	
VS086: System Package 3 - Signal Equipment Procurement			
000040	MS#3 Plaza Delivery		19-Nov-18
000110	Plaza - Signal & Junction Box Delivery		19-Nov-18
000120	GCT6 - Signal & Junction Box Delivery		14-Dec-18
000050	MS#4, GCT 6 Delivery		19-Dec-18

*MTACC-ESA and the CS179 Contractor currently disagree about the actual and/or forecasted milestone dates.

APPENDIX F – ESA COORDINATION POINT CHANGES

Activity ID	Activity Description	IPS 108 Finish	IPS 111 Finish	Delta CDs
CP-CM007-090-CS179	CS179 - Beg Pull BCS Trk 304/ Beg Comp E Cav Under Plat Cond	1-Aug-18	26-Jan-18A	†
CP-CM014B-190-CS179	CS179 - Concourse - Zone 2 Elect - Begin to Comp BMS Cond	10-Aug-18	23-May-19	+286
CP-CM014B-200-CS179	CS179 - Concourse - Zone 2 Elect - Begin to Comp F/O Cond	10-Aug-18	23-May-19	+286
CP-CM014B-210-CS179	CS179 - Concourse - Zone 2 Elect - Begin to Comp Field Network Cond to Devices	10-Aug-18	23-May-19	+286
CP-CM014B-220-CS179	CS179 - Concourse - Zone 2 Elect - Begin to Comp FA Cond	10-Aug-18	23-May-19	+286
CP-CM014B-230-CS179	CS179 - Concourse - Zone 2 Elect - Begin to Comp PA/VMS Cond	10-Aug-18	23-May-19	+286
CP-CM014B-240-CS179	CS179 - Concourse - Zone 2 Elect - Begin to Comp Radio Cond	10-Aug-18	23-May-19	+286
CP-CM014B-250-CS179	CS179 - Concourse - Zone 2 Elect - Begin to Comp Security/CCTV Cond	10-Aug-18	23-May-19	+286
CP-CM014B-260-CS179	CS179 - Concourse - Zone 2 Elect - Begin to Comp Tele Cond	10-Aug-18	23-May-19	+286
CP-CM014B-30-CS179	CS179 AR 13A - 50th Street Vent Phase 1	10-Aug-18	17-Apr-17A	†
CP-CM014B-60-CS179	CS179 AR 10C.4 - Access to Communication Closets CC-3, 4, 7, 8	20-Aug-18	20-Nov-18	+92
CP-CM014B-80-CS179	CS179 AR 10C.4 - Access to Communication Closets CC4, 8	20-Aug-18	9-Nov-18	+81
CP-CS179-390-IST	IST - 38th Street Vent Facility - Mech - HVAC / DDC / TEC Testing	24-Aug-18	27-Nov-18	+95
CP-CH061A-20-CS179	CS179: Install Equipment in Tunnel A	27-Aug-18	27-Nov-18	+92
CP-CM014B-110-CS179	CS179 - Concourse - Zone 1 Elect - Begin to Comp BMS Cond	30-Aug-18	26-Nov-18	+88
CP-CM014B-120-CS179	CS179 - Concourse - Zone 1 Elect - Begin to Comp F/O Cond	30-Aug-18	26-Nov-18	+88
CP-CM014B-130-CS179	CS179 - Concourse - Zone 1 Elect - Begin to Comp Field Network Cond to Devices	30-Aug-18	26-Nov-18	+88
CP-CM014B-140-CS179	CS179 - Concourse - Zone 1 Elect - Begin to Comp FA Cond	30-Aug-18	26-Nov-18	+88
CP-CM014B-150-CS179	CS179 - Concourse - Zone 1 Elect - Begin to Comp PA / VMS Cond	30-Aug-18	26-Nov-18	+88
CP-CM014B-160-CS179	CS179 - Concourse - Zone 1 Elect - Begin to Comp Radio Cond	30-Aug-18	26-Nov-18	+88
CP-CM014B-170-CS179	CS179 - Concourse - Zone 1 Elect - Begin to Comp Security/CCTV Cond	30-Aug-18	26-Nov-18	+88
CP-CM014B-180-CS179	CS179 - Concourse - Zone 1 Elect - Begin to Comp Tele Cond	30-Aug-18	26-Nov-18	+88
CP-CS179-130-IST	IST - Factory Acceptance Testing (FAT) – BLS	30-Aug-18	15-Nov-18	+77
CP-CS179-280-IST	IST - Factory Acceptance Testing (FAT) – VCS	30-Aug-18	15-Nov-18	+77
CP-CM014B-70-CS179	CS179 AR 16 - Access to 44th Street Vent	31-Aug-18	4-Dec-18	+95
CP-CM007-060-CS179	CS179 - Begin Civil/Electrical Work in CR-M4/CR-L3/CR-L4	5-Sep-18	21-Nov-18	+77
CP-CM007-100-CS179	CS179 - Begin to Comp East Cavern Mezz Conds & Pull Cable	12-Sep-18	26-Nov-18	+75
CP-CM007-050-CS179	CS179 - Begin Civil/Electrical Work in CR-M1/CR-M2/CR-L1/CR-L2	12-Sep-18	13-Dec-18	+92
CP-CM007-110-CS179	CS179 - Begin to Comp East Cav Under Plat Conds & Pull Cable	14-Sep-18	23-Nov-18	+70
CP-CM007-070-CS179	CS179 - Begin Civil/Electrical Work in CR-C2 & CR-M2	19-Sep-18	20-Dec-18	+92
CP-CM007-140-CS179	CS179 - Begin to Comp West Cav Upper Level Conds & Pull Cable	20-Sep-18	12-Nov-18	+53
CP-VQ033-30-CQ033	VQ033: FAT Testing and Delivery - MID3 CIL	20-Sep-18	16-Nov-18	+57
CP-CM007-130-CS179	CS179 - Begin to Comp West Cav Mezz Level Conds & Pull Cable	21-Sep-18	18-Dec-18	+88
CP-VS086-10-CS086	CS086: Install Signals – Plaza	21-Sep-18	19-Nov-18	+59
CP-VS086-20-CS086	CS086: Install Signals - GCT 6	26-Oct-18	19-Dec-18	+54
CP-CS179-220-IST	IST - Factory Acceptance Testing (FAT) - SC	30-Oct-18	31-Jan-19	+93

Notes: † Milestone achieved retroactively.

**APPENDIX G – MTA EAST SIDE ACCESS PROJECT –
BUY AMERICA STATUS SUMMARY (As of December 2018)**

Contract CS179

Equipment	Current Status
Small HVAC Units for Equipment Rooms	The contractor asserts that the specified low-profile HVAC unit is not available from any US-based HVAC manufacturer and that the manufacturer of the specified unit (Mitsubishi) cannot manufacture the unit in the USA. MTACC advised that documentation to substantiate a Buy America waiver request was sent to the FTA as of the end of October 2016. In May 2017, the FTA requested some cost information related to these HVAC units. MTA provided that information in June 2017 and is waiting for a decision regarding the approval of the waiver request.
Video Display Panels	RESOLVED. MTACC determined that the proposed equipment meets the requirements of Buy/Ship America.
Public Address System Speakers	RESOLVED. MTACC determined that the proposed equipment meets the requirements of Buy/Ship America.

**APPENDIX H – AMTRAK REMAINING ESA ELECTRIC TRACTION
(CATENARY) CONSTRUCTION*
Start and Finish Dates from IPS 111 Data Date November 1, 2018**

IPS Identifier	Scope	IPS Early Start	IPS Early Finish	Status
CH057A2 See IPS Narrative Analysis	Install 7,100 LF CA WBY Track	4/30/19	6/4/21	Only 8 of 35 catenary poles required for this task have been installed as of December 31, 2018.
FHA03-1800	Re-install CAs at three CH057D Turnout locations ¹	9/12/18A	11/12/18	Amtrak completed restoration of catenary over these CH057D NEQ turnouts on November 20, 2018.
FHA03-8122	Relocate cross catenary east of 39th St. as result of const. of Tunnels A, B/C, and D	6/23/18	2/7/19	Amtrak began limited Tunnel B/C predecessor catenary work during December 2018. Amtrak will complete CA work after all Tunnel B/C track construction is completed.
CPR-025-50	Install 1,000 LF (est.) CA MDSY Sub 3 to North Runner	2/1/19	3/29/19	The CQ033 contractor began catenary demolition for the MDSY during 4Q2017, but, to date, has not begun to install the catenary poles necessary for the Sub 3 to North Runner connection. Amtrak will transfer wires after CQ033 completes installation of the catenary poles.
CH058B SC	Install 2,180 LF CA EBRR Track	2/20/23	5/16/25	CH058B to construct Eastbound Re-Route (EBRR) Track has not advertised yet. CH058B to install 10 catenary poles prior to Amtrak installation of CAs.
FHL02.SI.00084	Install CAs 1 Turnout location ² FHL02		3/23/19	LIRR to install the #3234W turnout. Amtrak will install CAs after LIRR installs the turnout.
FHL04-1120	Install CAs 6 Tunnel B/C Turnout locations ³ FHA04		11/30/20	CH057D contractor to install 6 Tunnel B/C turnouts prior to Amtrak installation of CAs. Tunnel B/C turnout installation scheduled to begin during 1Q2019.
CH063 - 1730	Complete Loop 1A Electrification	7/24/20	8/13/20	Amtrak Loop 1A Track construction partially complete. Amtrak ET will install CAs after Amtrak track construction is complete.
CH057- 3221	Install CAs 14 Turnout locations ⁴ in Loop and T Interlockings – FQA65	1/28/20	12/7/20	Turnout procurement for Loop and T “on hold” by MTACC since early 2016. Amtrak ET will install catenary assemblies after all turnouts are procured and installed. (Late finish = 3/28/23)
FHA03-1050	XO5165 Catenary Shift(formerly PW2 Overrun)	2/21/18A	1/17/19	Amtrak began catenary construction of PW2 Overrun in February 2018 and has worked on it sporadically since then.

CA = Catenary Assembly, CP = Catenary Pole, TO = Turnout, XO= Crossover

* This table is a high level summary of the remaining Electric Traction construction program. The PMOC will maintain details for FTA review.

1. #1121W (CH057D-0240), #1121E, #1112E (CH057D-0250), #1112W, and #1123W (CH057D-0260)

2. #3234W (FHL0207110)

3. #5165W (FHL04-1630), #5165E (FHL04-1390), #4145 (FHL04-1020), #2254 (FHL04-1150), #5155 (FHL04-1710), and #2155 (FHL04-1170)

4. All 14 Loop and “T” Interlocking Turnouts

APPENDIX I – REMAINING HAROLD INTERLOCKING CONSTRUCTION PROGRESS SCHEMATICS

The purpose of Appendix I is to depict, in schematic fashion, the major ESA Force Account and 3rd Party construction elements that remain in Harold Interlocking. At present, three such items will be included in the PMOC's Quarterly Comprehensive Reports. As additional elements are identified, they will be added to the reports. The original three are

Schematic #1: Remaining Amtrak Harold Overhead Contact System (OCS) to be Installed

This diagram depicts the tracks, crossovers, and turnouts over which Amtrak Force Account Electric Traction personnel will install catenary system components (overhead contact system) in order to operate Amtrak trains through the reconfigured Harold Interlocking. New overhead catenary to be installed is shown in bold red.

Schematic #2: Remaining Harold Third Rail System (3rd Rail) to be Installed

This diagram depicts the tracks, crossovers, and turnouts adjacent to which LIRR and 3rd Party contractors will install Third Rail and components in order to operate expanded LIRR service into the new Grand Central Terminal (GCT). New 3rd Rail to be installed is shown in bold red.

Schematic #3: Status of Harold Interlocking Turnouts and Crossovers to be Installed

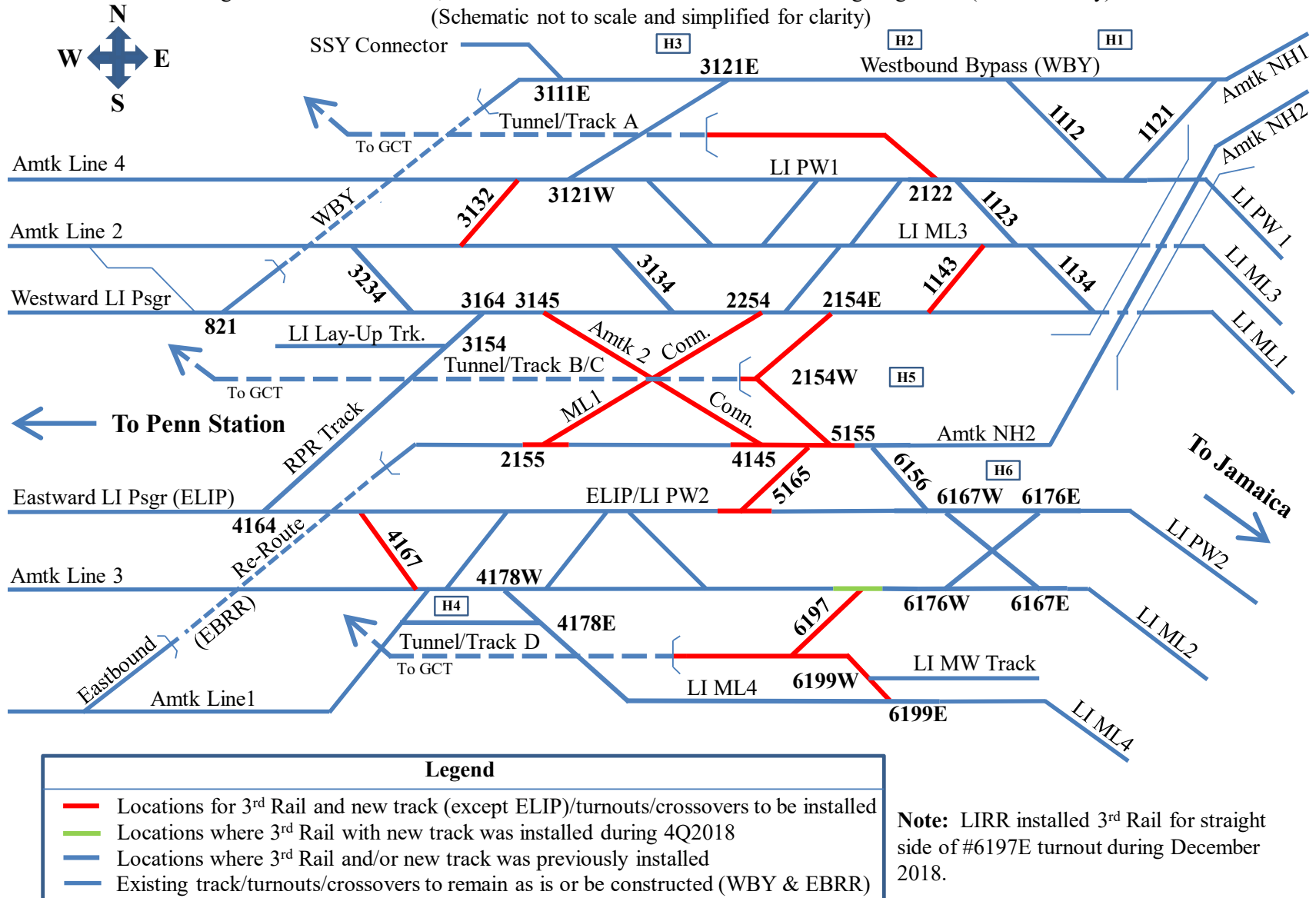
This diagram depicts, along with existing tracks, crossovers, and turnouts that will not be renewed, the present construction status of ESA constructed tracks, crossovers, and turnouts that have been or will be installed to make LIRR service into GCT possible. Existing trackage that will not be renewed is shown in non-bold, new crossovers and turnouts already installed by LIRR ESA forces are shown in bold green, and new tracks, crossovers, and turnouts scheduled, but not yet installed, are shown in bold red.

The information shown on these schematics will be updated with each PMOC Quarterly Comprehensive Report and will trace construction progress for that quarter.

Appendix I: Harold Progress Monitoring Schematic

Schematic #2: Remaining Harold Third Rail System (3rd Rail) to be Installed

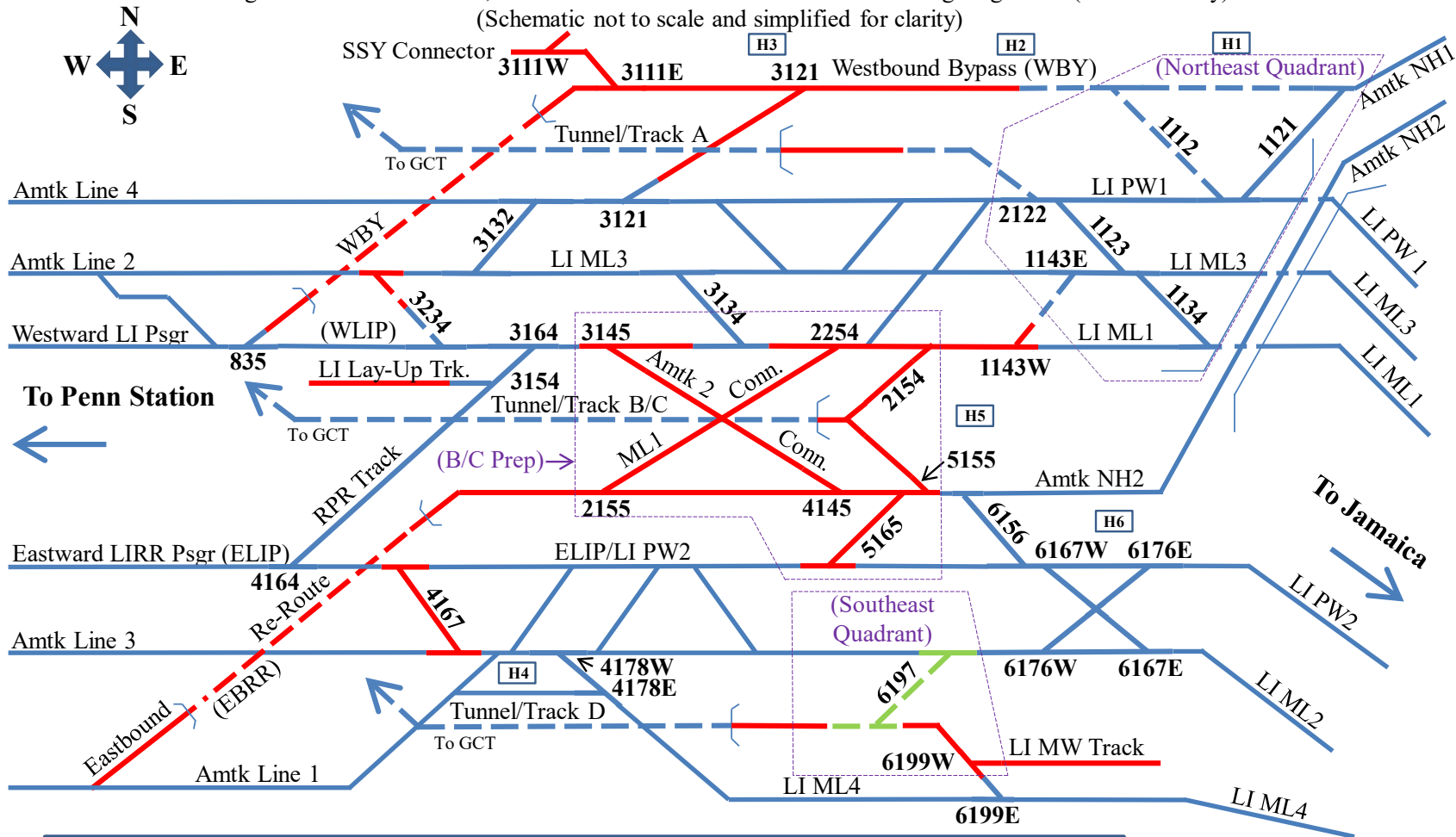
Progress as of December 31, 2018 - based on ESA 14-4 Harold Interlocking Alignment (main line only)
 (Schematic not to scale and simplified for clarity)



Appendix I: Harold Progress Monitoring Schematic

Schm. #3: Status of Harold Interlocking Turnouts, Crossovers, and Tracks to be Installed

Progress as of December 31, 2018 - based on ESA 14-4 Harold Interlocking Alignment (main line only)
 (Schematic not to scale and simplified for clarity)



Legend	
	ESA turnouts/track to be installed
	ESA turnouts/crossovers/track installed during 4Q2018
	New Turnouts/Track previously installed
	New Turnouts/Track installed, not in service
	Existing Turnouts/Track to remain as is

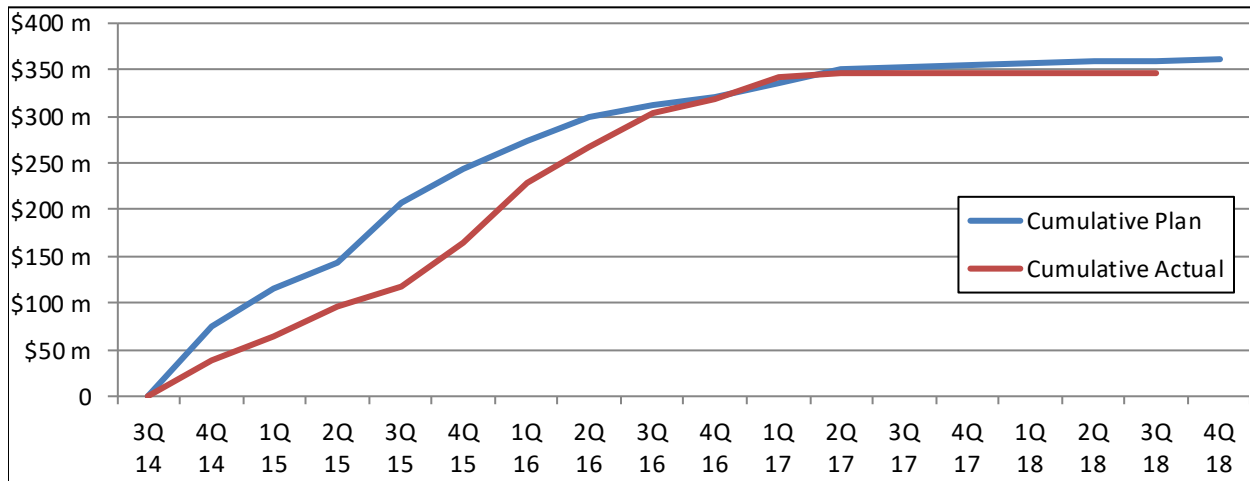
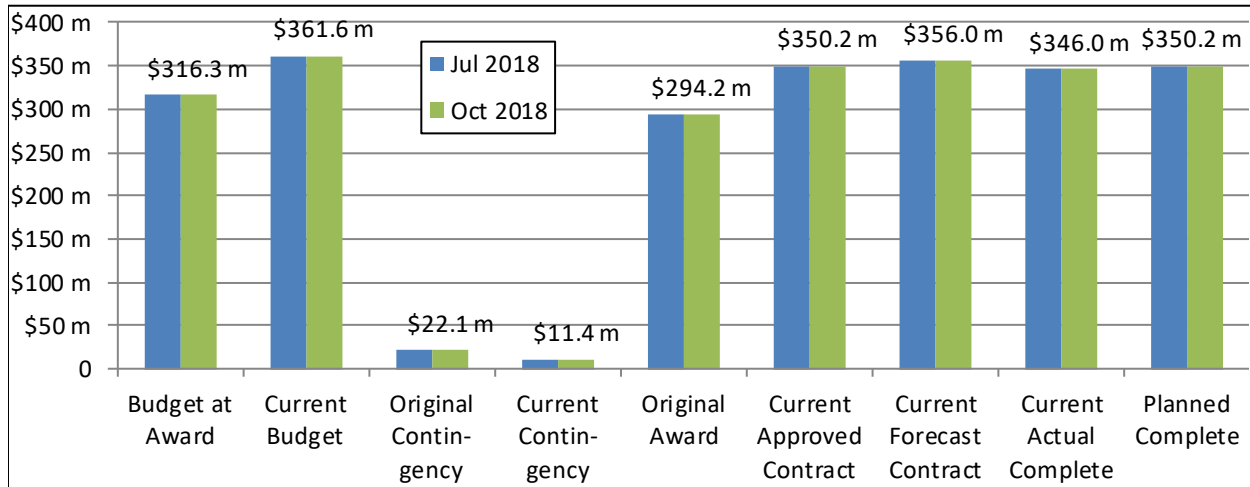
Note: The #6197 crossover was installed and the #6199W turnout was set in place during 4Q2018.

APPENDIX J – COST PERFORMANCE

CM006 Manhattan North Structures

Oct 2018

Budget at Award	Current Budget	Change from Original to Current	Contract at Award	Current Approved Contract	Change from Original to Current	Current Forecast	Change from Current Forecast to Budget at Award
\$316.3	\$361.6	(2-1) \$45.3	\$294.2	\$350.2	(5-4) \$56.0	\$356.0	(7-1) \$39.7
Percent Complete		Actual Prog Last 12 Mths		Actual Prog Last 6 Mths		Average Required Progress to reach forecast SC 0.40% per month	
Planned	Actual	Total	Avg/Mth	Total	Avg/Mth		
100.0%	98.8%	0.0%	0.0%	0.0%	0.0%		

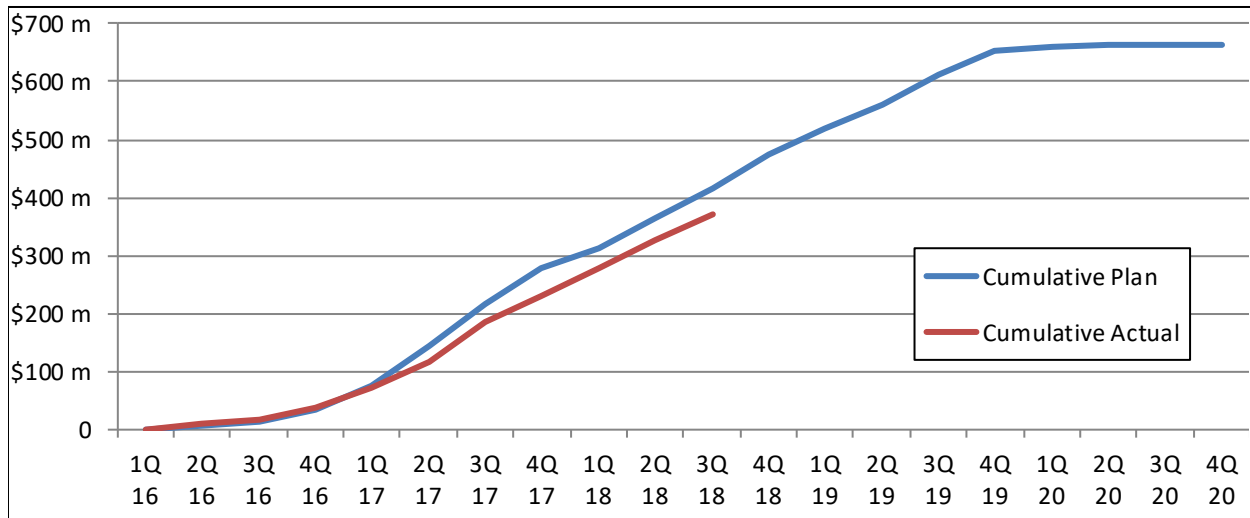
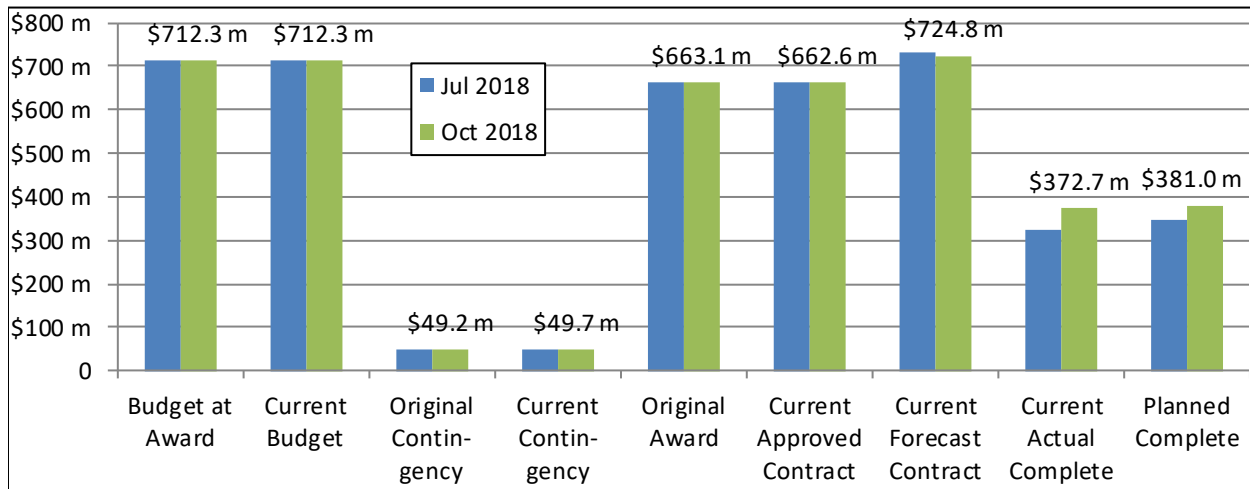


APPENDIX J – COST PERFORMANCE

CM007 GCT Caverns

Oct 2018

Budget at Award	Current Budget	Change from Original to Current	Contract at Award	Current Approved Contract	Change from Original to Current	Current Forecast	Change from Current Forecast to Budget at Award
\$712.3	\$712.3	(2-1) \$0.0	\$663.1	\$662.6	(5-4) (\$0.5)	\$724.8	(7-1) \$12.5
Percent Complete		Actual Prog Last 12 Mths		Actual Prog Last 6 Mths		Average Required Progress to reach forecast SC 2.58% per month	
Planned	Actual	Total	Avg/Mth	Total	Avg/Mth		
57.5%	56.2%	28.1%	2.3%	14.3%	2.4%		

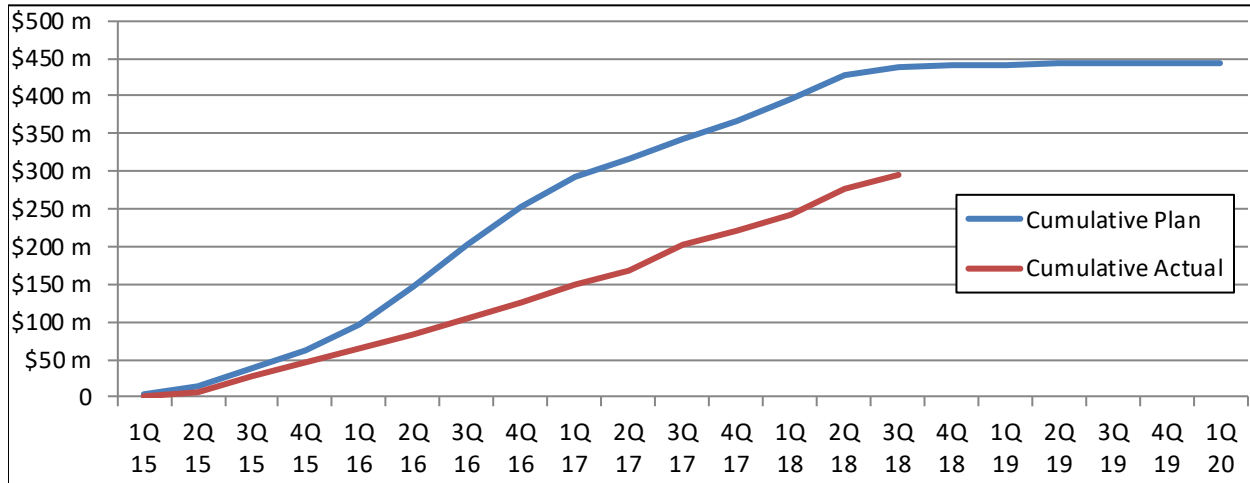
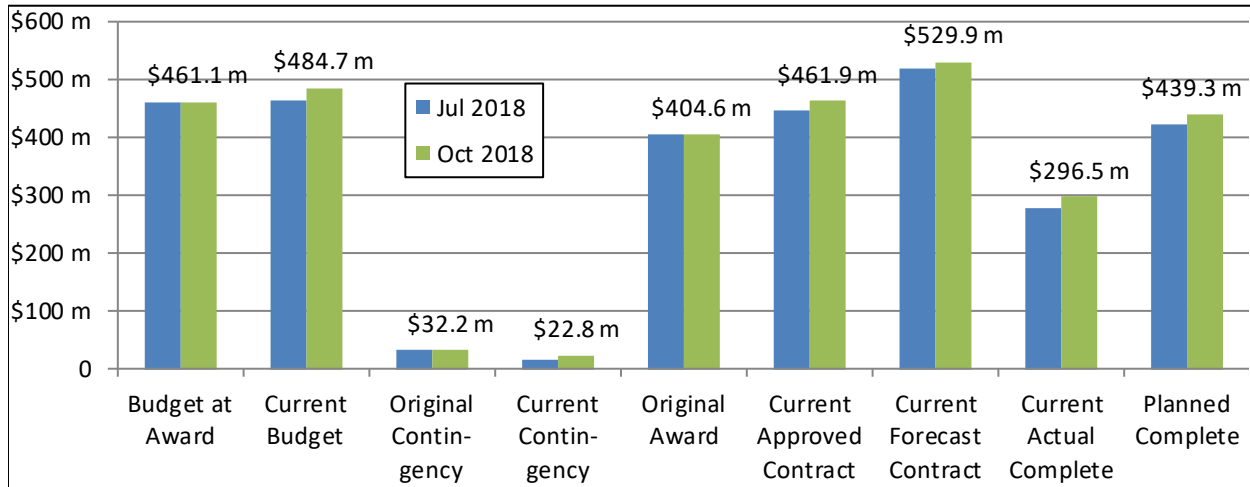


APPENDIX J – COST PERFORMANCE

CM014B GCT Concourse & Facilities Fit Out

Oct 2018

Budget at Award	Current Budget	Change from Original to Current	Contract at Award	Current Approved Contract	Change from Original to Current	Current Forecast	Change from Current Forecast to Budget at Award
\$461.1	\$484.7	(2-1) \$23.6	\$404.6	\$461.9	(5-4) \$57.3	\$529.9	(7-1) \$68.8
Percent Complete		Actual Prog Last 12 Mths		Actual Prog Last 6 Mths		Average Required Progress to reach forecast SC 1.63% per month	
Planned	Actual	Total	Avg/Mth	Total	Avg/Mth		
95.1%	64.2%	18.7%	1.6%	9.9%	1.7%		

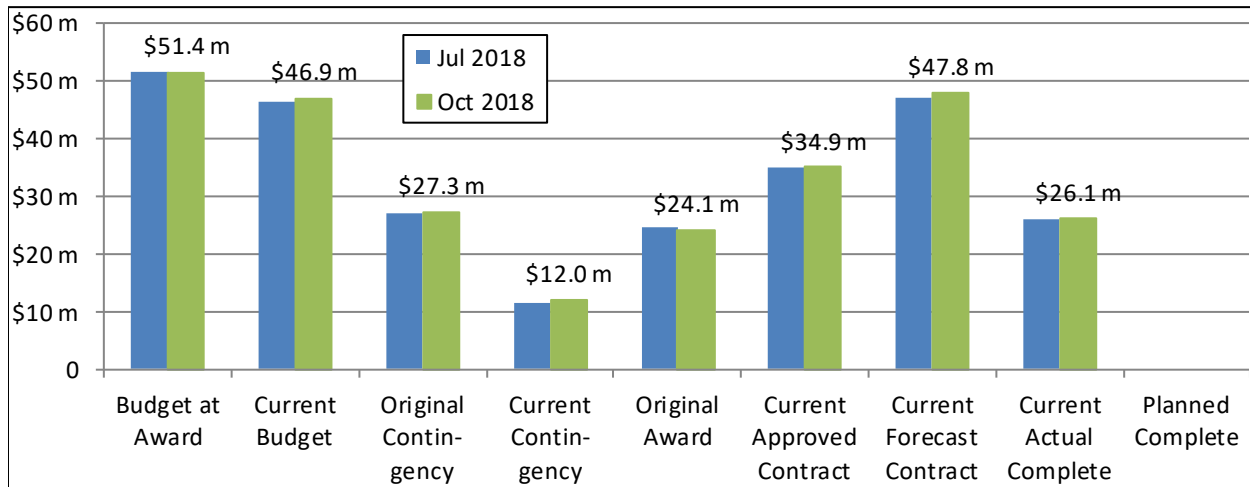


APPENDIX J – COST PERFORMANCE

VM014 Vertical Circulation Elements (Escalators & Elevators)

Oct 2018

Budget at Award	Current Budget	Change from Original to Current	Contract at Award	Current Approved Contract	Change from Original to Current	Current Forecast	Change from Current Forecast to Budget at Award
\$51.4	\$46.9	(2-1) (\$4.5)	\$24.1	\$34.9	(5-4) \$10.8	\$47.8	(7-1) (\$3.6)
Percent Complete		Actual Prog Last 12 Mths		Actual Prog Last 6 Mths		Average Required Progress to reach forecast SC	
Planned	Actual	Total	Avg/Mth	Total	Avg/Mth		
NA	74.8%	15.9%	1.3%	7.9%	1.3%	1.40% per month	

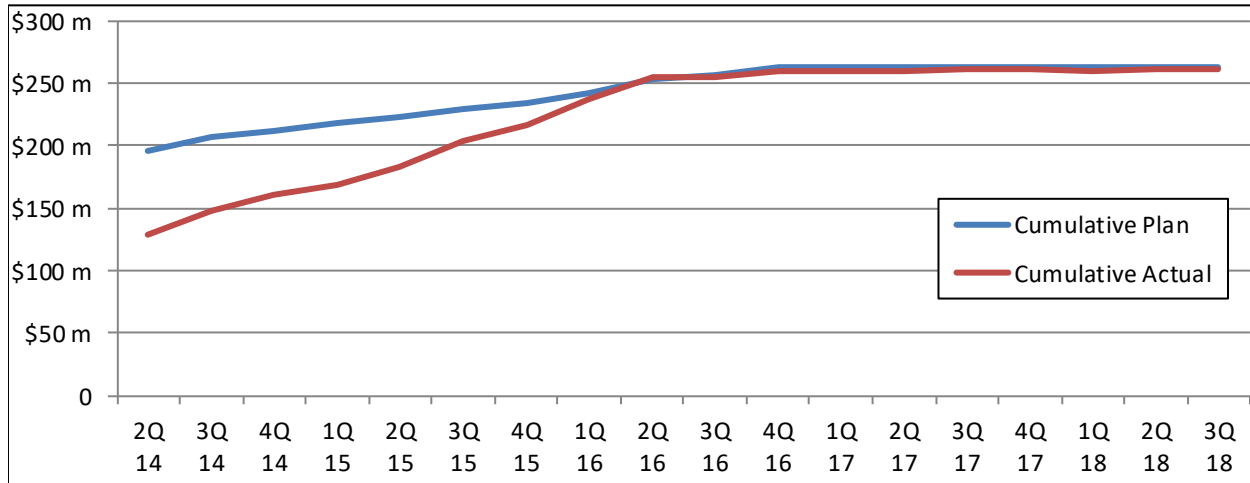
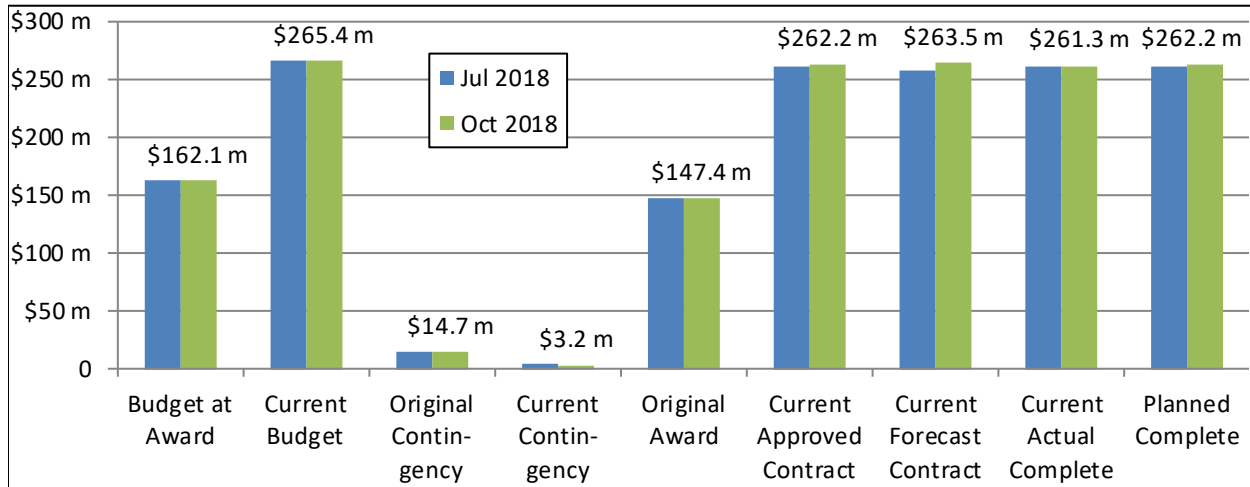


APPENDIX J – COST PERFORMANCE

CQ032 Plaza Substation & Queens Structures

Oct 2018

Budget at Award	Current Budget	Change from Original to Current	Contract at Award	Current Approved Contract	Change from Original to Current	Current Forecast	Change from Current Forecast to Budget at Award
\$162.1	\$265.4	(2-1) \$103.3	\$147.4	\$262.2	(5-4) \$114.8	\$263.5	(7-1) \$101.4
Percent Complete		Actual Prog Last 12 Mths		Actual Prog Last 6 Mths		Average Required Progress to reach forecast SC 0.13% per month	
Planned	Actual	Total	Avg/Mth	Total	Avg/Mth		
100.0%	99.6%	0.3%	0.0%	0.0%	0.0%		

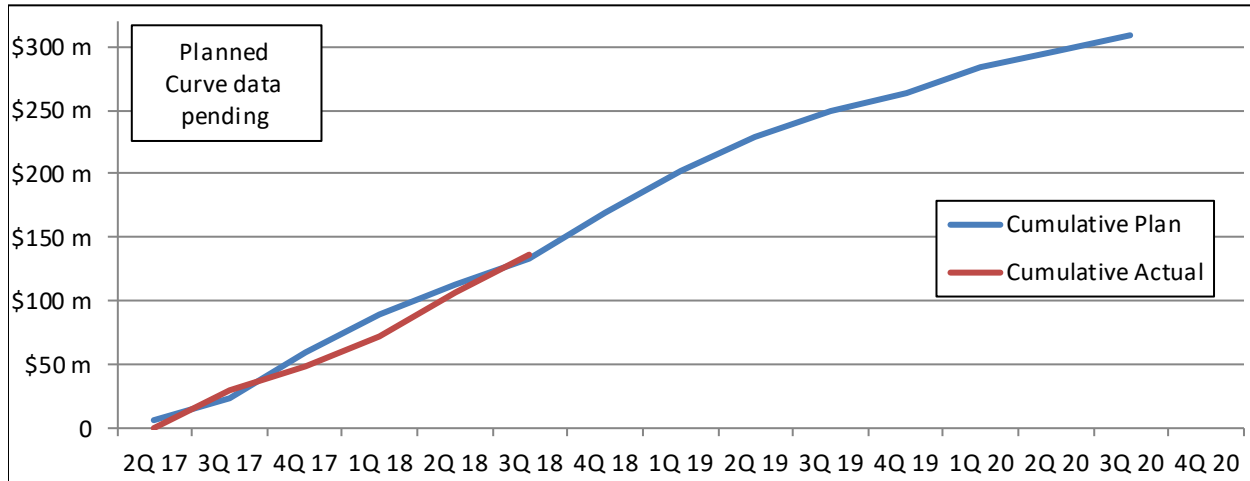
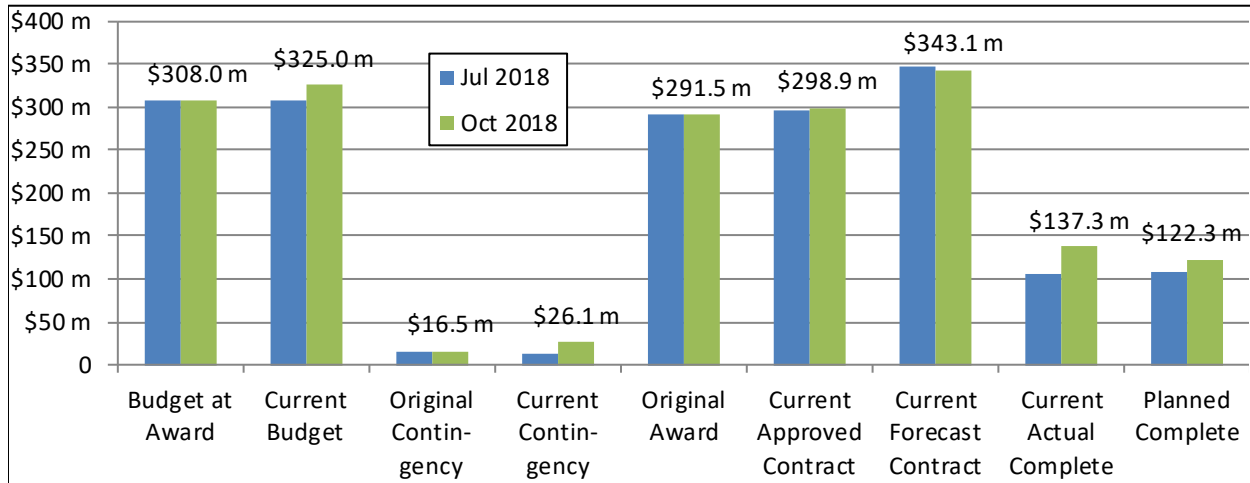


APPENDIX J – COST PERFORMANCE

CQ033 Mid-Day Storage Facility

Oct 2018

Budget at Award	Current Budget	Change from Original to Current	Contract at Award	Current Approved Contract	Change from Original to Current	Current Forecast	Change from Current Forecast to Budget at Award
\$308.0	\$325.0	(2-1) \$17.0	\$291.5	\$298.9	(5-4) \$7.4	\$343.1	(7-1) \$35.1
Percent Complete		Actual Prog Last 12 Mths		Actual Prog Last 6 Mths		Average Required Progress to reach forecast SC 2.16% per month	
Planned	Actual	Total	Avg/Mth	Total	Avg/Mth		
40.9%	46.0%	35.8%	3.0%	21.3%	3.6%		

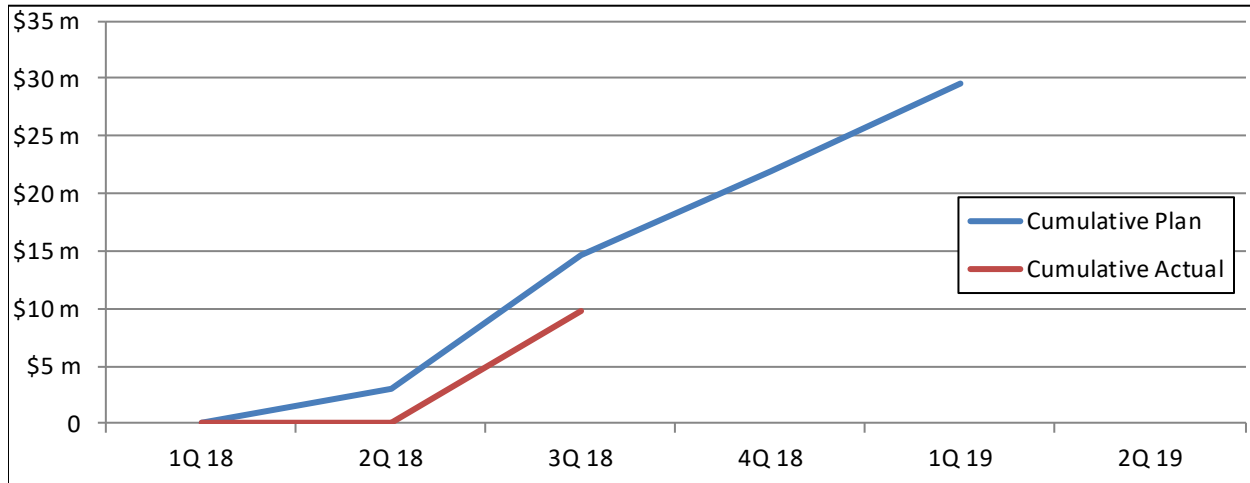
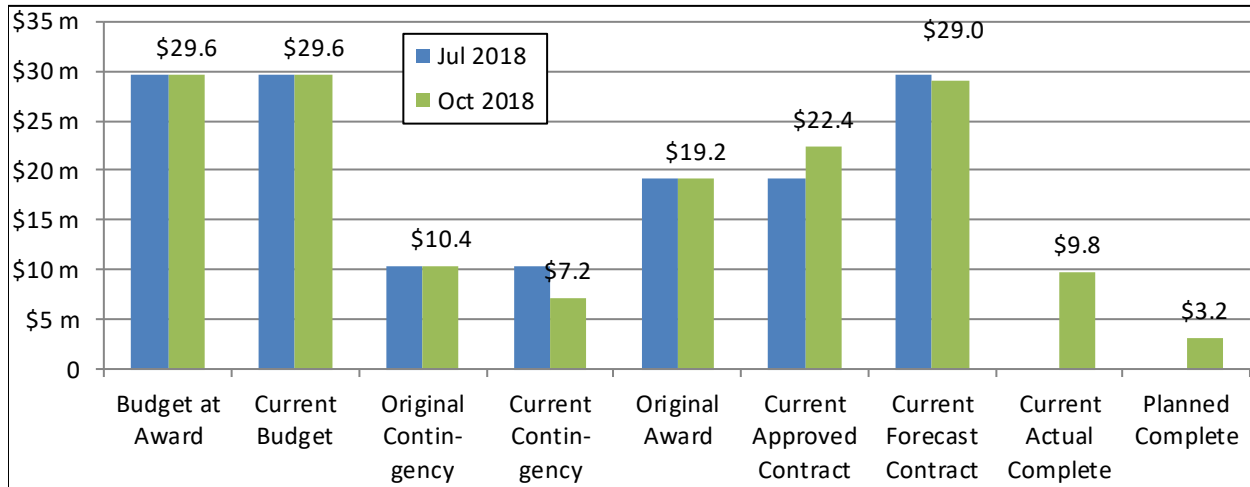


APPENDIX J – COST PERFORMANCE

CH057D Track A Cut and Cover Structure

Oct 2018

Budget at Award	Current Budget	Change from Original to Current	Contract at Award	Current Approved Contract	Change from Original to Current	Current Forecast	Change from Current Forecast to Budget at Award
\$29.6	\$29.6	(2-1) \$0.0	\$19.2	\$22.4	(5-4) \$3.2	\$29.0	(7-1) (\$0.6)
Percent Complete		Actual Prog Last 12 Mths		Actual Prog Last 6 Mths		Average Required Progress to reach forecast SC	
Planned	Actual	Total	Avg/Mth	Total	Avg/Mth	7.01% per month	
14.5%	43.9%	43.9%	3.7%	43.9%	7.3%		

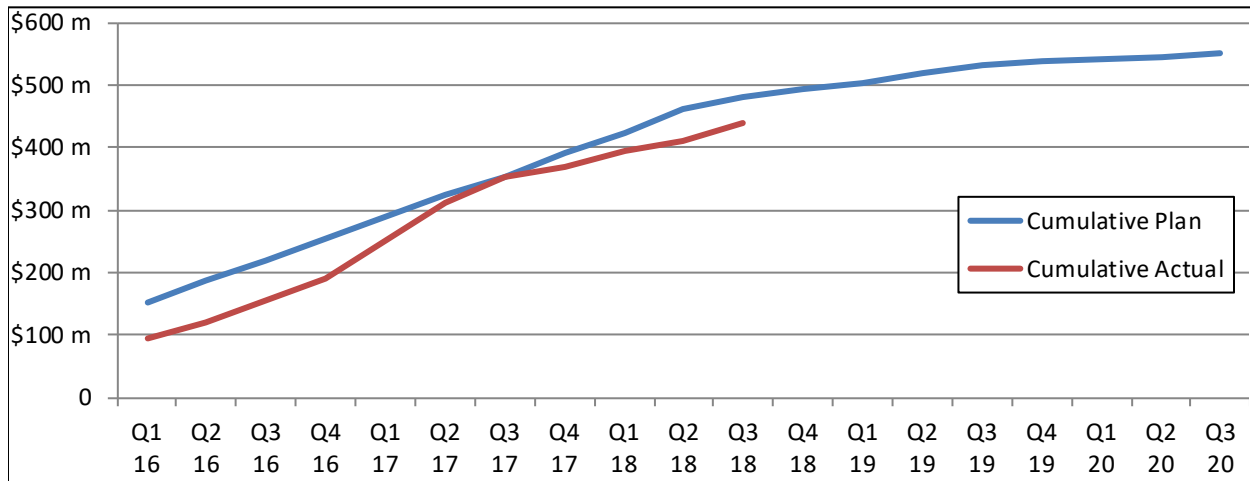
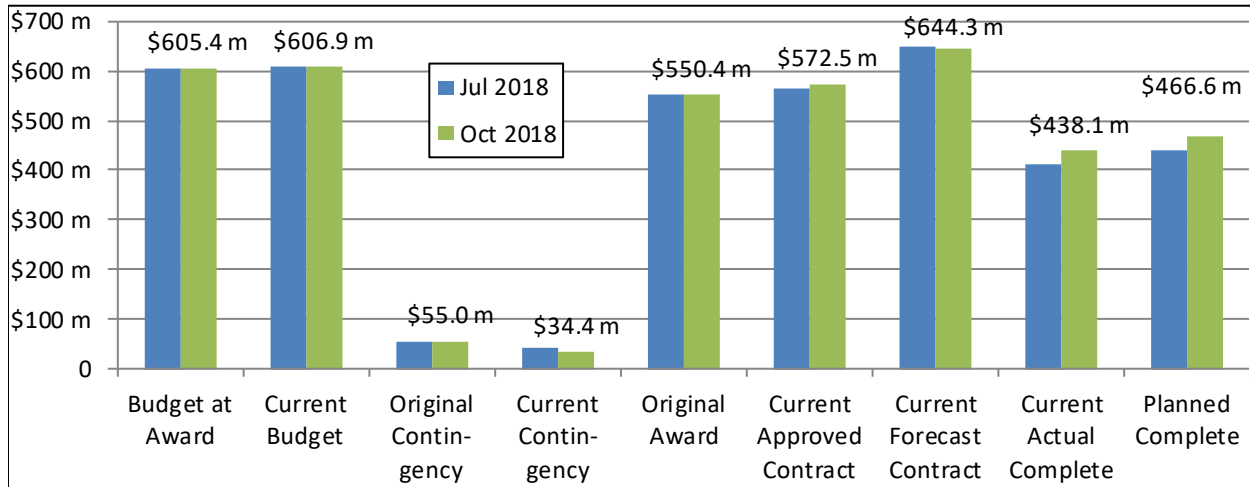


APPENDIX J – COST PERFORMANCE

CS179 Systems Package 1 – Facilities Systems

Oct 2018

Budget at Award	Current Budget	Change from Original to Current	Contract at Award	Current Approved Contract	Change from Original to Current	Current Forecast	Change from Current Forecast to Budget at Award
\$605.4	\$606.9	(2-1) \$1.5	\$333.6	\$572.5	(5-4) \$238.9 <small>(options+mods)</small>	\$644.3	(7-1) \$38.9
Percent Complete		Actual Prog Last 12 Mths		Actual Prog Last 6 Mths		Average Required Progress to reach forecast SC 0.71% per month	
Planned	Actual	Total	Avg/Mth	Total	Avg/Mth		
81.5%	76.0%	12.0%	1.0%	6.4%	1.1%		

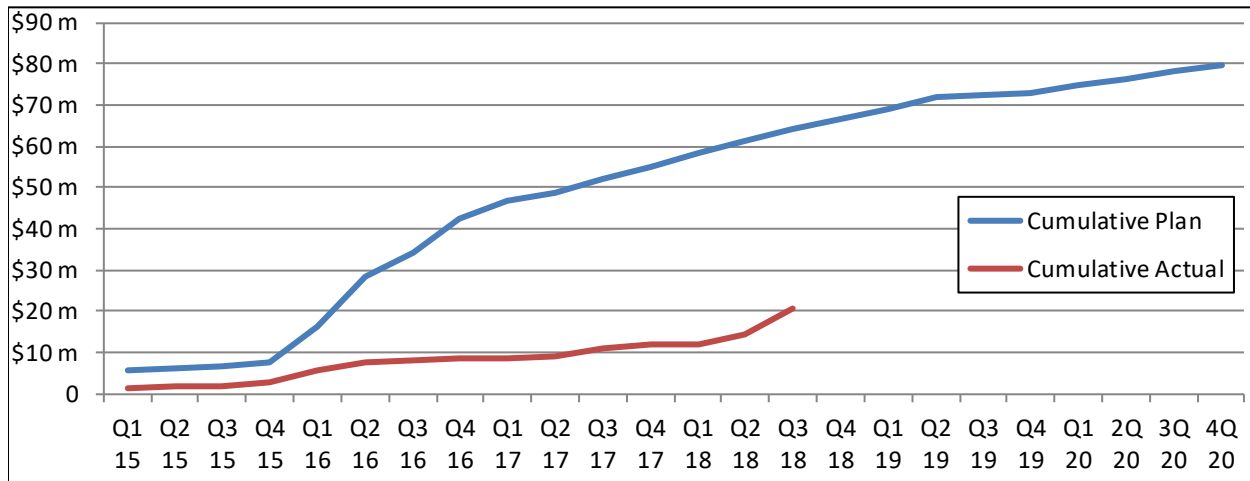
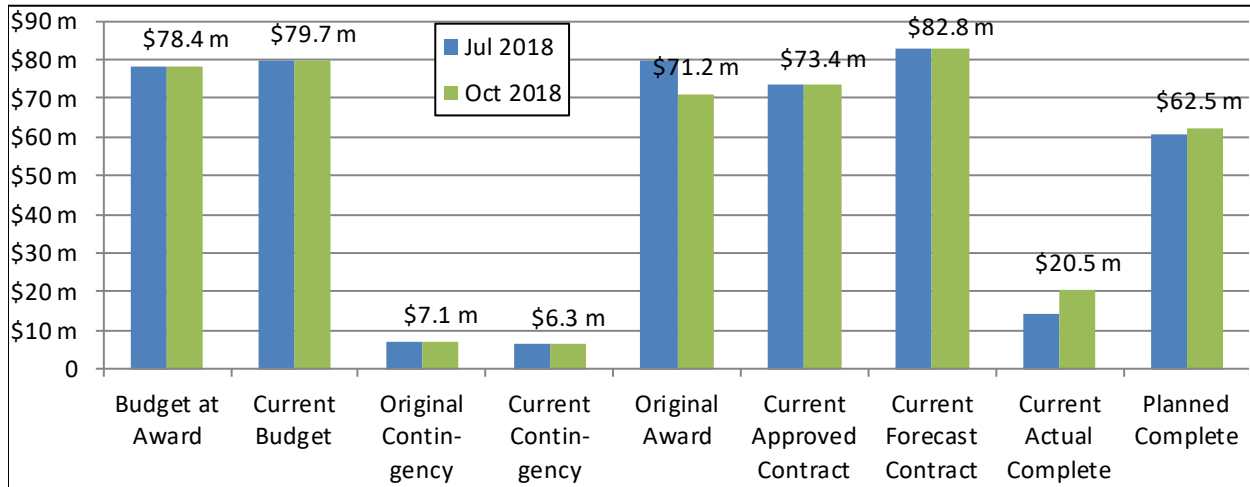


APPENDIX J – COST PERFORMANCE

CS084 Tunnel Systems Package 4 – Traction Power

Oct 2018

Budget at Award	Current Budget	Change from Original to Current	Contract at Award	Current Approved Contract	Change from Original to Current	Current Forecast	Change from Current Forecast to Budget at Award
\$78.4	\$79.7	(2-1) \$1.3	\$71.2	\$73.4	(5-4) \$2.2	\$82.8	(7-1) \$4.4
Percent Complete		Actual Prog Last 12 Mths		Actual Prog Last 6 Mths		Average Required Progress to reach forecast SC	
Planned	Actual	Total	Avg/Mth	Total	Avg/Mth	2.40% per month	
85.1%	28.0%	12.8%	1.1%	11.8%	2.0%		

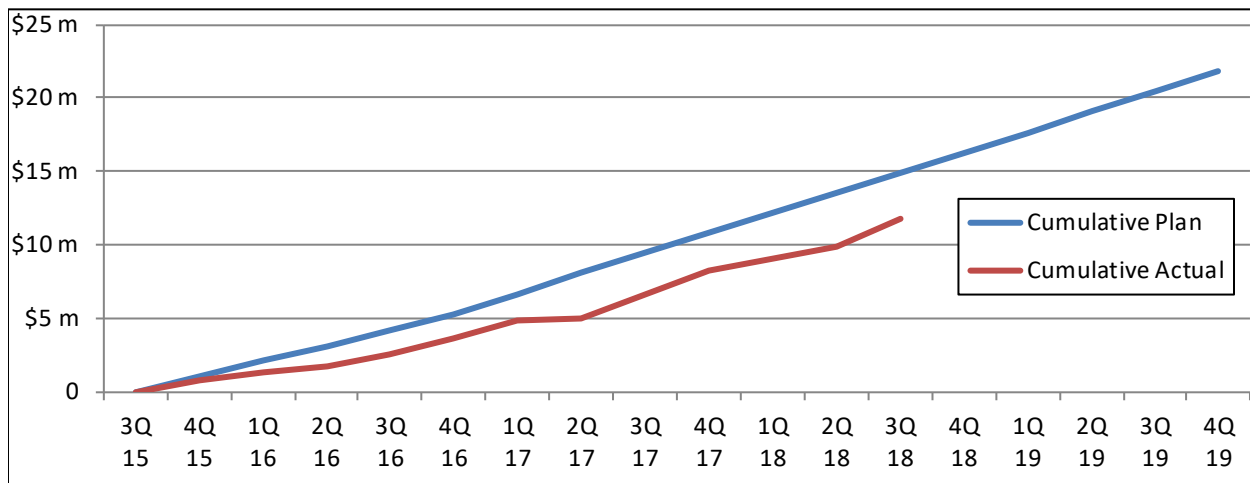
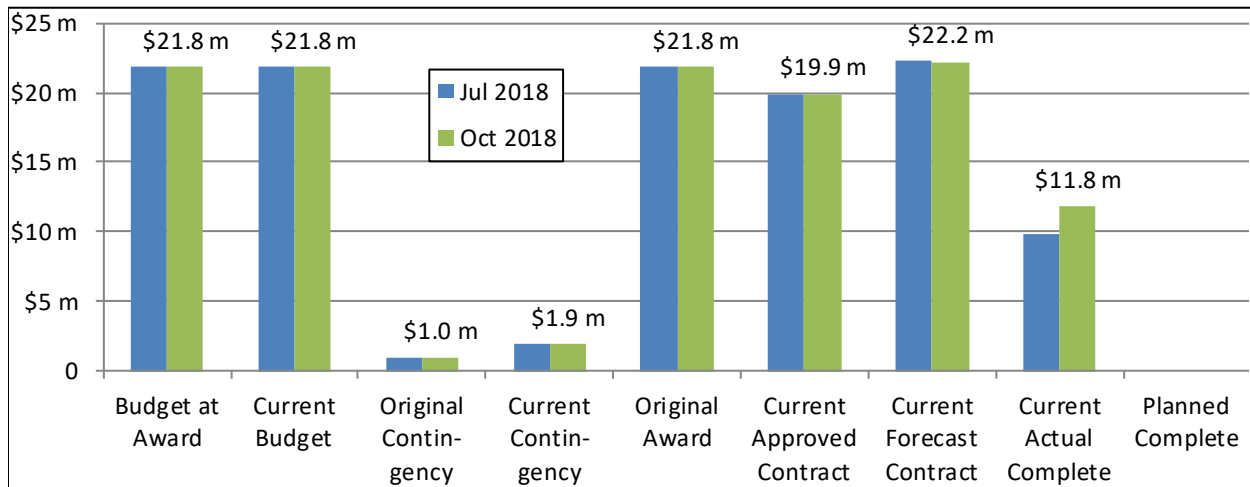


APPENDIX J – COST PERFORMANCE

VS086 Systems Package 3 – Signal Equipment Procurement

Oct 2018

Budget at Award	Current Budget	Change from Original to Current	Contract at Award	Current Approved Contract	Change from Original to Current	Current Forecast	Change from Current Forecast to Budget at Award
\$21.8	\$21.8	(2-1) \$0.0	\$21.8	\$19.9	(5-4) (\$1.9)	\$22.2	(7-1) \$0.4
Percent Complete		Actual Prog Last 12 Mths		Actual Prog Last 6 Mths		Average Required Progress to reach forecast SC 3.42% per month	
Planned	Actual	Total	Avg/Mth	Total	Avg/Mth		
NA	59.0%	25.9%	2.2%	13.5%	2.3%		

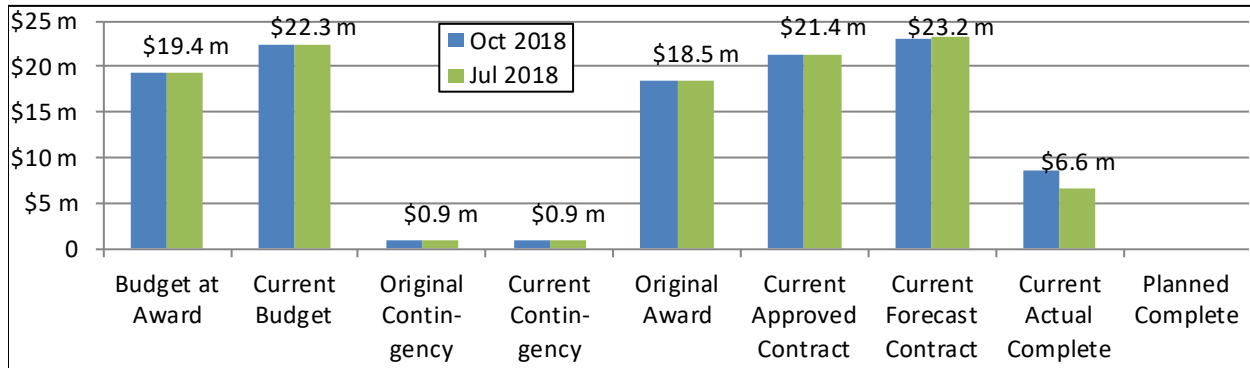


APPENDIX J – COST PERFORMANCE

VQ033 Midday Storage Yard CILs

Oct 2018

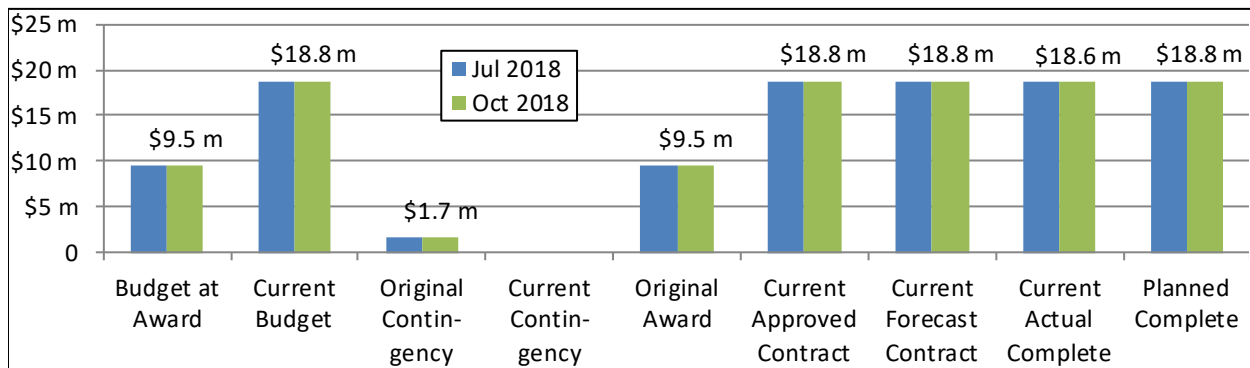
Budget at Award	Current Budget	Change from Original to Current	Contract at Award	Current Approved Contract	Change from Original to Current	Current Forecast	Change from Current Forecast to Budget at Award
\$19.4	\$22.3	(2-1) \$2.9	\$18.5	\$21.4	(5-4) \$2.9	\$23.1	(7-1) \$3.7
Percent Complete		Actual Prog Last 12 Mths		Actual Prog Last 6 Mths		Average Required Progress to reach forecast SC	
Planned	Actual	Total	Avg/Mth	Total	Avg/Mth	3.54% per month	
NA	39.9%	15.9%	1.3%	11.1%	1.9%		



FHA01 Harold Stage 1 – Amtrak F/A

Oct 2018

Budget at Award	Current Budget	Change from Original to Current	Contract at Award	Current Approved Contract	Change from Original to Current	Current Forecast	Change from Current Forecast to Budget at Award
\$9.5	\$18.8	(2-1) \$9.3	\$9.5	\$18.8	(5-4) \$9.3	\$18.8	(7-1) \$9.3
Percent Complete		Actual Prog Last 12 Mths		Actual Prog Last 6 Mths		Average Required Progress to reach forecast SC	
Planned	Actual	Total	Avg/Mth	Total	Avg/Mth	0.15% per month	
100.0%	99.0%	0.1%	0.0%	0.0%	0.0%		

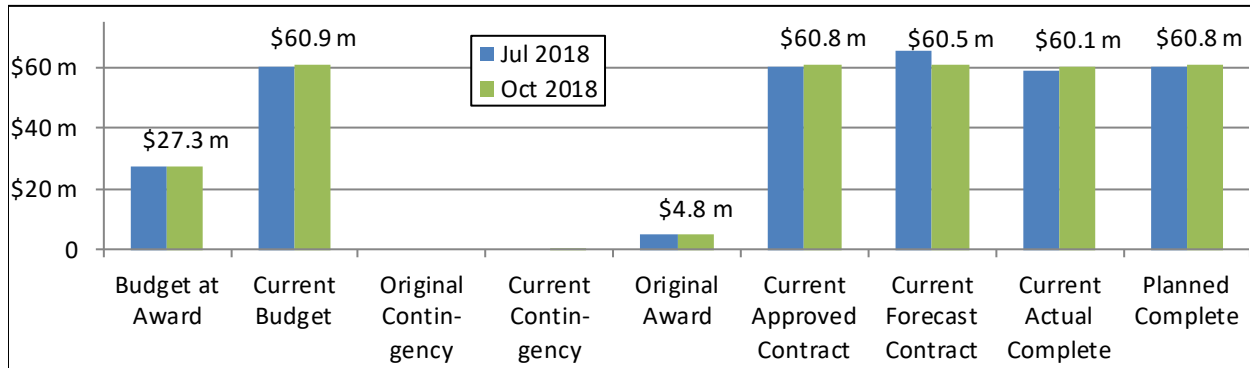


APPENDIX J – COST PERFORMANCE

FHA02 Harold Stage 2 – Amtrak F/A

Oct 2018

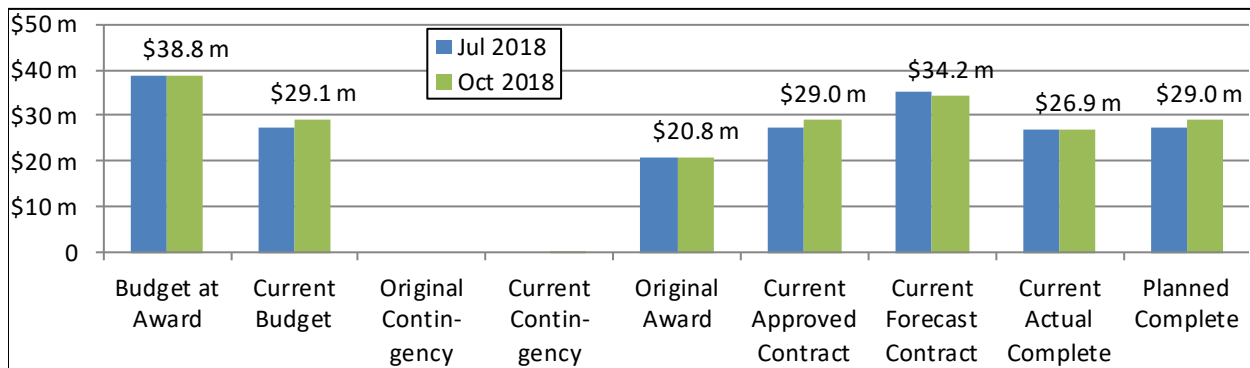
Budget at Award	Current Budget	Change from Original to Current	Contract at Award	Current Approved Contract	Change from Original to Current	Current Forecast	Change from Current Forecast to Budget at Award
\$27.3	\$60.9	(2-1) \$33.6	\$4.8	\$60.8	(5-4) \$56.0	\$60.5	(7-1) \$33.2
Percent Complete		Actual Prog Last 12 Mths		Actual Prog Last 6 Mths		Average Required Progress to reach forecast SC	
Planned	Actual	Total	Avg/Mth	Total	Avg/Mth	0.14% per month	
100.0%	98.7%	8.5%	0.7%	4.9%	0.8%		



FHL01 Harold Stage 1 – LIRR F/A

Oct 2018

Budget at Award	Current Budget	Change from Original to Current	Contract at Award	Current Approved Contract	Change from Original to Current	Current Forecast	Change from Current Forecast to Budget at Award
\$28.8	\$29.1	(2-1) \$0.3	\$20.8	\$29.0	(5-4) \$8.2	\$34.2	(7-1) \$5.4
Percent Complete		Actual Prog Last 12 Mths		Actual Prog Last 6 Mths		Average Required Progress to reach forecast SC	
Planned	Actual	Total	Avg/Mth	Total	Avg/Mth	1.10% per month	
100.0%	92.3%	-7.7%	-0.6%	-5.0%	-0.8%		

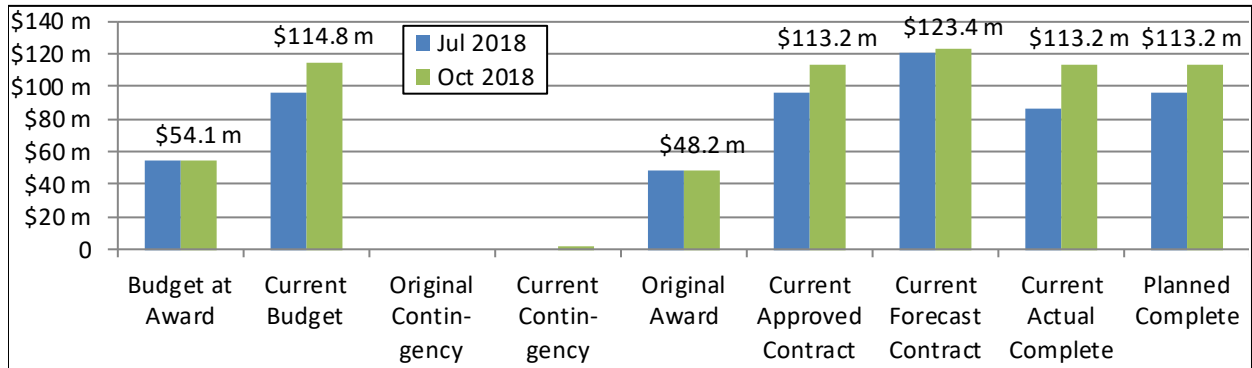


APPENDIX J – COST PERFORMANCE

FHL02 Harold Stage 2 – LIRR F/A

Oct 2018

Budget at Award	Current Budget	Change from Original to Current	Contract at Award	Current Approved Contract	Change from Original to Current	Current Forecast	Change from Current Forecast to Budget at Award
\$54.1	\$114.8	(2-1) \$60.7	\$48.2	\$113.2	(5-4) \$65.0	\$123.4	(7-1) \$69.3
Percent Complete		Actual Prog Last 12 Mths		Actual Prog Last 6 Mths		Average Required Progress to reach forecast SC 0.05% per month	
Planned	Actual	Total	Avg/Mth	Total	Avg/Mth		
100.0%	98.6%	4.1%	0.3%	-1.3%	-0.2%		



APPENDIX K – 3rd PARTY CONTRACT MILESTONE METRICS

As of IPS 111 November 1, 2018 Schedule

Mile-stone	Activity Description	IPS Baseline Date ¹ June 2014	Appr Cont Baseline Date ²	Current Contract Date ³	Current ESA Forecasted Date ⁴	Delta ⁵ IPS BL to Forecast	Notes
CM006: Manhattan Structures North							
NTP	Notice to Proceed	3/31/14A	N/A	N/A	3/31/14A	0	No change over the quarter.
SC	Substantial Completion	11/30/16	N/A	6/1/17	12/31/18	761	
FC	Final Completion	2/28/17	N/A	8/30/17	3/31/19	761	
CM007: GCT Caverns							
NTP	Notice to Proceed	4/19/16	4/11/16A	N/A	4/11/16A	-8	Approved baseline in Feb. 1, 2017 IPS.
4	Trackwork & 3rd Rail Work Complete (excludes STW @ GCT4, GCT6 & Plaza West)	N/A	10/3/19	8/7/19	12/10/19	68	Delta is measured against the Approved Contract Baseline Date for all milestones.
5	Substations US1 and US2 Complete	N/A	6/27/18	6/27/18	11/28/18	154	
5A	Caverns Ready for Integrated Systems Testing	4/11/19	8/7/19	8/7/19	10/9/19	63	2 month forecasted delay over the quarter.
6	All Caverns and Tunnel Work Complete	N/A	12/16/19	12/16/19	3/12/20	87	1 month forecasted delay over the quarter.
6A	Substantial Completion	7/19/19	1/28/20	1/28/20	3/12/20	44	
6B	Punchlist Completion	N/A	4/27/20	4/27/20	6/5/20	39	
7	Integrated System Testing Completion	N/A	6/1/20	6/1/20	6/17/20	16	
CM014B: GCT Concourse and Facilities Fit Out							
NTP	Notice to Proceed	11/2/14	2/2/15A	N/A	2/2/15A	92	Approved baseline in Nov. 1, 2016 IPS.
1	TMC/ CC-C5/ CR-C2 Comm Room & F/O Backbone Route from TMC-CRC2	12/3/15	6/1/16A	N/A	6/1/16A	181	
2	50th St. Comm Room CR102, Tunnel Fan Control Room, Electrical RM #126 & ICC (Room Ready)	3/3/16	4/17/17	N/A	4/17/17A	410	
3	Comm Room CR-C1/ Comm Closet CC-C1/ C2 & C6 & F/O Backbone from CR-C2 to CR-C1	5/3/16	11/30/16	N/A	12/3/16A	214	
4A	Comm Closets CC-C1, CC-C2 & CC-C5	5/3/16	11/30/16	4/15/18	9/21/18A	871	
4B	Comm Closets CC-C3, CC-C7 & Room B3265	12/2/16	3/5/17	5/20/18	9/21/18A	658	
5	44th St Vent Facility Complete	3/3/17	7/2/17	6/4/17	11/14/18	621	2.5 month forecasted delay over the quarter.
5A	Complete all work at 48th St Entrance	2/15/18	3/20/17	10/2/17	5/14/18A	88	
6	Comm Closets CC-C4 and CC-C8	5/12/17	5/20/18	5/20/18	9/21/18A	497	
7	Completion of 50th Street 2nd Phase	10/26/17	1/27/18	1/27/18	8/14/19	657	
8	Substantial Completion	7/24/19	1/21/19	8/18/18	7/27/20	369	1.5 month forecasted delay over the quarter.
8A	Punchlist Complete	5/17/18	5/21/19	12/16/18	11/24/20	922	1.5 month forecasted delay over the quarter.
9	Integrated Systems Testing Completed	7/24/19	3/23/20	10/25/19	5/30/21	676	1.5 month forecasted delay over the quarter.
9A	Ready for Integrated Systems Testing	5/17/18	10/2/18	5/20/18	1/16/20	609	2 month forecasted delay over the quarter.

Mile-stone	Activity Description	IPS Baseline Date ¹ June 2014	Appr Cont Baseline Date ²	Current Contract Date ³	Current ESA Forecasted Date ⁴	Delta ⁵ IPS BL to Forecast	Notes
10	Shaft 4	N/A	7/1/18	7/1/18	9/1/19	427	Delta is measured against the Approved Baseline Date for this milestone only.
CQ032: Plaza Substation and Queens Structures							
NTP	Notice to Proceed	8/10/11A	8/10/11A	N/A	8/10/11A	-	
6	Substantial Completion	10/8/15	N/A	9/6/16	12/31/18	1180	No change over the quarter.
7	Final Completion	1/7/16	N/A	12/5/16	3/31/19	1179	No change over the quarter.
CQ033: Mid-Day Storage Yard							
NTP	Notice to Proceed	7/4/15	N/A	N/A	4/11/17A	-	Approved baseline in Nov. 1, 2017 IPS.
1	Precondition Site Survey	N/A	6/10/17	6/10/17	9/29/17A	-111	
2	Temporary Construction Fence Along Arch St. Access Route	N/A	6/10/17	6/10/17	10/9/17A	-121	
3	RWIC Trailer	N/A	7/10/17	7/10/17	6/19/17A	21	
4	Submission of Integrated Test Plan	N/A	4/11/18	4/11/18	4/11/18A	0	
4A	Ready for Integrated Testing MDSY	N/A	3/11/20	3/11/20	6/3/20	84	
5	YS Track Completion	N/A	4/11/18	4/11/18	9/5/19	512	
6	Substantial Completion	10/25/18	8/10/20	8/10/20	11/2/20	739	Delta measured against Current Cont Date for all milestones except 6: SC.
8	Completion of Plaza Work	N/A	7/12/18	7/12/18	10/10/18	90	
9	Complete Option 1 - Demo Amtrak Buildings	N/A	5/27/20	5/27/20	7/26/19	-306	
CH057D: Harold Trackwork Part 3 – NEQ & SEQ							
1	Submittals for NEQ	N/A	6/27/18	6/27/18	6/27/18A	0	
2	Demolition of PW1 Track	N/A	7/28/18	7/28/18	7/28/18A	0	
3	NEQ Special Track Work	N/A	8/20/18	8/20/18	8/30/18A	10	
4	NEQ WBY Track	N/A	9/2/18	9/2/18	11/14/18	73	
5	Submittals for SEQ	N/A	9/5/18	9/5/18	9/28/18A	23	
6	PW2, ML2 & Special Track Work	N/A	10/15/18	10/15/18	3/30/19	166	
7	SEQ, TM2 & 6199	N/A	10/26/18	10/26/18	3/30/19	155	
8	Substantial Completion	N/A	1/31/19	1/31/19	5/30/19	119	
9	Final Completion	N/A	4/30/19	4/30/19	8/27/19	119	
CH061A: Harold Structures Part 3 - Track A Cut and Cover Structure							
NTP	NTP CH061A - A Approach	7/5/16	1/27/17A	N/A	1/27/17A	206	
1	PW2 Catenary Structures	N/A	9/7/17	9/7/17	2/12/18A	158	
2	Montauk Cutoff Catenary Structures	N/A	9/11/17	9/11/17	12/1/17A	81	
3	Substantial Completion	9/20/17	5/28/18	5/28/18	6/12/18A	15	
4	Final Completion	N/A	8/27/18	8/27/18	11/28/18	93	

Mile-stone	Activity Description	IPS Baseline Date ¹ June 2014	Appr Cont Baseline Date ²	Current Contract Date ³	Current ESA Forecasted Date ⁴	Delta ⁵ IPS BL to Forecast	Notes
CS179: Systems Package 1 - Facilities Systems							
NTP	Facilities Systems Package 1 NTP	3/31/14A	3/31/14A	N/A	3/31/14A	-	Approved baseline in Oct. 1, 2016 IPS.
1	C05 TPSS Room Ready for CS084 Work at Vernon Blvd. Vent Facility	10/16/15	12/30/16	2/15/17	10/10/17A	725	Actualized with a 2017 date.
3	Completion of Multiple Rooms (CIR, Sig. Reactor, Interlocking 1D, TPSS C06 and C07)*	10/13/16	12/31/16	5/22/17	11/1/18	749	3 month forecasted delay over the quarter.
4A	C04 TPSS Room (Level P1) Ready for CS084 Work at 2nd Ave. Vent Facility	5/5/16	2/1/17	2/1/17	11/1/18	910	3 month forecasted delay over the quarter.
5	GCT 6 CIR Ready for CS086 (orig CS086) Installation	10/17/16	4/14/17	4/30/17	11/1/18	745	3 month forecasted delay over the quarter.
6	B10 Permanent Power Energized (Precedes Energization of B05, B06,B08, B09, B11 & B13)	6/24/16	4/28/17	4/22/17	11/1/18	860	3 month forecasted delay over the quarter.
7	GCT 5 CIR Ready for CS086 (orig CS086) Installation	2/17/17	5/27/17	4/30/17	11/1/18	622	3 month forecasted delay over the quarter.
8	GCT 4 CIR Ready for CS086 (orig CS086) Installation	5/2/17	6/27/17	4/30/17	11/1/18	548	3 month forecasted delay over the quarter.
9	C01 & C02 TPSS Room Ready for CS084 at Tail Tracks	8/7/17	6/8/17	6/8/17	11/1/18	451	3 month forecasted delay over the quarter.
10	GCT 3 CIR Ready for CS086 (orig CS086) Installation	11/6/17	9/6/17	9/6/17	11/1/18	360	3 month forecasted delay over the quarter.
11	C03 TPSS Room Ready for CS084 at 55th St. Vent Facility	2/20/18	2/27/18	3/25/18	2/6/19	372	
12A	Integrated System Testing Start (TOC & All Permanent Power Complete)	5/2/18	12/8/18	9/1/18	8/21/19	950	10 month forecasted delay over the quarter.
12B-1	Complete IST of All Systems Equip Installed by CM007	10/22/19	7/1/20	3/23/20	3/28/21	550	1 month forecasted savings over the quarter.
12B-2	Complete IST of All Systems Equip Installed by CM014A	7/24/19	7/1/20	3/23/20	3/28/21	635	
12B-3	Complete IST of All Systems Equip Installed by CM014B	7/24/19	7/1/20	3/23/20	12/24/20	635	4 month forecasted delay over the quarter.
13	Substantial Completion Including Completion of IST	12/9/19	7/1/20	7/1/20	6/29/21	717	5 month forecasted delay over the quarter.
CS084: Tunnel Systems Package 4 - Traction Power Systems							
NTP	CS084 NTP	9/5/14	10/29/14A	N/A	10/29/14A	54	Contract approved baseline in the Jan 1, 2016 IPS.
1	Energize Traction Power Substation C08	5/26/17		5/6/18	7/13/20	1144	3.5 month forecasted delay over the quarter.
2	Energize Traction Power Substation C04 and C05	6/20/18	12/14/18	10/3/18	7/21/20	762	2.5 month forecasted delay over the quarter.
3	Energize Traction Power Substation C06 and C07	10/2/18	3/2/19	3/2/19	12/25/20	815	2 month forecasted delay over the quarter.
4	Energize Traction Power Substation C01 and C02	10/30/18	1/30/19	2/5/19	8/6/20	646	1.5 month forecasted delay over the quarter.
5	Energize Traction Power Substation C03	12/28/18	5/16/19	5/16/19	9/22/20	634	1.5 month forecasted delay over the quarter.
6	Complete Local testing of all substation	1/11/19	7/30/19	7/30/19	1/29/21	749	2.5 month forecasted delay over the quarter.
7	Substantial completion & Final Completion	10/21/19	11/25/19	12/2/19	4/23/21	550	2.5 month forecasted delay over the quarter.

Mile-stone	Activity Description	IPS Baseline Date ¹ June 2014	Appr Cont Baseline Date ²	Current Contract Date ³	Current ESA Forecasted Date ⁴	Delta ⁵ IPS BL to Forecast	Notes
CS086: Tunnel Systems Package 2 – Signal Installation							
2	Complete WB1 - Plaza to GCT4; WB3 - GCT5 to thru GCT3	11/19/19	11/19/19	11/19/19	11/19/19	0	
3	Complete Tunnel A - Plaza thru A1198+19	12/29/19	12/29/19	12/29/19	12/29/19	0	
4	Complete Tunnel B/C - Plaza thru B/C1203+54	7/9/20	7/9/20	7/9/20	7/9/20	0	
5	Complete Tunnel D - Plaza thru D1203+27	12/28/19	12/28/19	12/28/19	12/28/19	0	
6	Complete All Work, except for Integrated Testing	11/28/20	11/28/20	11/28/20	11/28/20	0	
7	Substantial Completion	2/21/21	2/21/21	2/21/21	2/21/21	0	
8	Final Completion	5/22/21	5/22/21	5/22/21	5/22/21	0	
VQ033: Mid-Day Storage Yard CIL Procurement							
NTP	Notice To Proceed (NTP) Actual 1/15/16 by JPS	N/A	1/15/16A	N/A	1/15/16A	-	Contract not in the June 2014 Re-baseline IPS.
1	Mid-3 CIL (NTP+549d)*	N/A	7/21/17	5/2/19	5/2/19	650	Approved baseline in May 1, 2016 IPS.
2	Mid-6 CIL (NTP+855d)*	N/A	5/23/18	8/13/19	8/13/19	447	Delta measured against Approved Contract Baseline Date for all milestones.
3	Mid-8 CIL (NTP+1158d)*	N/A	11/22/18	9/10/19	9/6/19	288	
SC	Substantial Completion (NTP+1216d)	N/A	5/19/19	3/6/20	3/3/20	289	
VS086: Systems Package 3 - Tunnel Signal Equipment							
NTP	VS086 NTP	7/7/14	9/30/14A	N/A	9/30/14A	85	Approved baseline in Dec. 1, 2016 IPS.
1	Furnish Catalog Cuts for Tunnel Sig. Equip and CIR Layouts (NTP+300CD)	5/6/15	6/5/17	5/8/17	1/17/18A	987	
2	Complete and Provide Final Design for Entire Tunnel Signal System (NTP+420CD)	9/5/15	9/19/17	7/7/17	8/31/18A	1091	Actualized over the quarter.
3	Furnish Tunnel Signal Equip. & Hardware for Plaza CIR (NTP+582CD)	2/18/16	6/29/17	4/28/17	11/19/18	1005	2 month forecasted delay over the quarter.
4	Furnish Tunnel Signal Equip. & Hardware for GCT5 & GCT6 CIRs (NTP+650CD)	4/26/16	1/9/18	11/13/17	1/25/19	1004	1.5 month forecasted delay over the quarter.
5	Furnish Tunnel Signal Equip. & Hardware for GCT3 & GCT4 CIRs (NTP+730CD)	7/17/16	6/5/18	3/16/18	5/13/19	1030	1 month forecasted delay over the quarter.
SC	Substantial Completion (NTP+1840CD)	12/9/19	10/14/19	10/14/19	10/31/19	-39	

Notes

General - Contract Milestones shown are current, and may not have been in the June 2014 Rebaseline IPS; An "A" after a date indicates an actualized date. Any delay or savings noted is over the previous quarter.

1 IPS Baseline Date - June 2014 IPS Update, data date July 1, 2014, referred to as the "2014 Re-Baseline"

2 Approved Contract Baseline Schedule - Refers to the IPS Update in which the Contractor's Approved CPM Baseline schedule was incorporated into the IPS

3 Current Contract Date - Contract dates adjusted for modifications, etc. are from tables in the ESA IPS 111 Report. (data date November 1, 2018).

4 Current ESA Forecast Date - Date shown in current IPS 111 Monthly Update (data date November 1, 2018).

5 Delta - Difference between Current ESA Forecast Date and a baseline Date. The baseline will typically be the IPS Baseline Date (June 2014), unless otherwise noted. A positive number represents a delay and a negative number represents a savings.

APPENDIX L – CS084 - TRACTION POWER SYSTEMS PACKAGE 4 – QUARTERLY SCHEDULE METRICS

Major Electrical Equipment *3	Approve Submittals			Approve Layout Drawings			Fabricate			Start Factory Witness Test (FAT)			Delivery to ESA Site		
	Base-line *4	Current Update *1	Delta (mths) *2	Base-line *4	Current Update *1	Delta (mths) *2	Base-line *4	Current Update *1	Delta (mths) *2	Base-line *4	Current Update *1	Delta (mths) *2	Base-line *4	Current Update *1	Delta (mths) *2
CO1 Tail Tracks 38 th St	2/16/16	11/7/18	-92	1/18/17	11/29/18	-118	9/13/16	4/1/19	-28	2/23/17	4/30/19	-35	2/9/18	5/20/19	-35
CO2 Tail Tracks 38 th St	2/16/16	12/6/18	-92	5/24/16	11/7/18	-92	9/13/16	5/9/19	-52	2/20/17	5/29/19	-55	2/9/18	6/18/19	-55
CO3 55 th Street	2/23/16	1/14/19	30	6/1/16	12/6/18	-92	9/13/16	8/21/19	-47	3/13/17	9/20/19	-53	8/2/18	10/10/19	-43
CO4 2 nd Avenue	2/18/16	11/29/18	-93	11/21/16	8/7/17A	0	9/13/16	11/29/18	-93	10/5/16	1/22/18A	0	3/13/17	2/12/18A	0
CO5 Vernon	2/18/16	8/18/17A	0	5/26/16	6/7/17A	0	9/13/16	5/1/18A	0	10/5/16	8/28/17A	0	11/8/16	5/5/18A	0
CO6 QP Main	2/18/16	1/14/19	-96	5/26/16	8/7/17A	0	9/30/16	6/7/19	-137	11/21/16	7/3/19	-134	6/13/17	7/25/19	-135
CO7 QP Yard	2/18/16	1/24/19	-94	5/26/16	11/7/18	-92	9/13/16	6/13/19	-59	1/12/17	7/15/19	-62	8/17/17	8/2/19	-59
CO8 43 rd St Pre-fab Bldg	1/21/16	10/23/18 A	-82	5/12/16	8/16/17A	0	9/12/16	3/7/19	-23	10/25/16	5/29/19	-72	12/6/16	6/19/19	-75

*Notes1 - Current Update = IPS 111 with Data Date 11/1/18.

2 - Delta = Change over the quarter, from IPS 108 with data date 8/1/18, in calendar days. Positive values represent improved planned dates; negative values represent slippage in planned dates.

3 - Major Electrical Equipment = There are many components included in this category. The dates shown in this table for Submittals, Fabricate, FAT, and Delivery are the latest date for all Major Electrical Equipment at each substation and includes the SCADA Controls & Screens. The comments column notes which Equipment is controlling that date.

4 - The Baseline date refers to the Contractor's approved CS084 Baseline CPM Schedule with data date 10/29/14.

5 - The dates indicated in Appendix L are from ESA Reports. It is the PMOC's experience based on information it receives in progress meetings that the dates shown could represent the start of the activity but not necessarily the completion.

Major Electrical Equipment *3	Install Elec Equip & All Other Items *5			ConEd Insp / Test Rpts			Local Testing *7			Energize / Place in Serv (CS084 Milestones)			Integrated Testing *6		
	Installation Complete			Complete			Testing Complete			Work Complete			Testing Complete		
	Base-line *4	Current Update *1	Delta (mths) *2	Base-line *4	Current Update *1	Delta (mths) *2	Base-line *4	Current Update *1	Delta (mths) *2	Base-line *4	Current Update *1	Delta (mths) *2	Base-line *4	Current Update *1	Delta (mths) *2
CO1 Tail Tracks 38 th St	11/6/18	2/24/20	-35	12/27/18	4/14/20	-35	1/21/19	5/5/20	-35	2/4/19	7/8/20	-35	12/2/19	5/7/21	-86
CO2 Tail Tracks 38 th St	11/14/18	3/31/20	-54	12/24/18	5/13/20	-54	1/22/19	6/3/20	-54	2/5/19	8/6/20	-52	12/2/19	5/7/21	-86
CO3 55 th Street	3/1/19	5/19/20	-54	N/A	N/A	N/A	5/6/19	7/22/20	-54	5/16/19	9/22/20	-54	12/2/19	5/7/21	-86
CO4 2 nd Avenue	4/27/18	2/10/20	-75	7/6/18	4/17/20	-70	8/7/18	5/18/20	-70	8/21/18	7/21/20	-70	12/2/19	5/7/21	-86
CO5 Vernon	6/8/18	4/23/19	-6	N/A	N/A	N/A	9/19/18	1/14/20	-4	10/3/18	3/17/20	-49	12/2/19	5/7/21	-86
CO6 QP Main	9/10/18	8/21/20	-133	N/A	N/A	N/A	1/3/19	12/11/20	-133	1/17/19	12/25/20	-133	12/2/19	5/7/21	-86
CO7 QP Yard	10/22/18	8/11/20	-60	N/A	N/A	N/A	2/15/19	12/2/20	-58	3/1/19	12/16/20	-58	12/2/19	5/7/21	-86
CO8 43 rd St Pre-fab Bldg	9/12/17	5/6/20	-72	12/8/17	5/29/20	-72	2/1/18	5/8/20	-72	2/15/18	7/13/20	-74	12/2/19	5/7/21	-86

1. Current Update = IPS 111 with Data Date 11/1/18.

2 - Delta = Change over the quarter, from IPS 108 with Data Date 8/1/18, in calendar days. Positive values represent improved planned dates; negative values represent slippage in planned dates.

3 - Major Electrical Equipment = There are many components included in this category. The dates shown in this table for Submittals, Fabricate, FAT, and Delivery are the latest date for all Major Electrical Equipment at each substation and includes the SCADA Controls & Screens. The comments column notes which Equipment is controlling that date.

4 - The Baseline date refers to the Contractor's approved CS084 Baseline CPM Schedule, with data date 10/29/14.

5 - Work includes installation of major Electrical Equipment and all other components in the TPSS, including conduit, cable tray, cabinets, panels, bus duct, and the pulling and termination of cables. Includes cable from TPSS to track.

6 - Work includes five System-Wide tests in the CS084 Contractor's CPM Schedule: Train Acceleration Test; Short Circuit Verification Test; Load Capacity Verification Test; Third Rail and High Tension EO Switch Test; and Emergency Trip Verification Test. The date shown represents the last test - the Emergency Trip Verification Test - and aligns with Contract Milestone No. 7 (Substantial Completion).

7 - This represents the completion of Field Acceptance Tests, typically the last testing shown at each substation. It should be noted that CO8 has a later activity, entitled "Finalize Local Testing," which occurs as the last activity, after energization - which is not tracked in this table

8 - The dates indicated in Appendix L are from ESA Reports. It is the PMOC's experience based on information it receives in progress meetings that the dates shown could represent the start of the activity but not necessarily the completion.

APPENDIX M – NCR AGING SUMMARY

Contract	Criteria	1Q2018	2Q2018	3Q2018	4Q2018
CM007	< 90 days Open	11	30	9	9
	> 90 days Open	41	31	36	37
	Total Open	52	61	45	46
	Total Closed	46	62	86	87
	Total NCRs	98	123	131	133
CM014B	< 90 days Open	7	12	16	5
	> 90 days Open	4	15	11	15
	Total Open	11	12	27	20
	Total Closed	34	40	42	55
	Total NCRs	45	52	69	75
CQ032	< 90 days Open	6	6	2	1
	> 90 days Open	8	1	9	9
	Total Open	14	12	11	10
	Total Closed	106	114	118	120
	Total NCRs	122	126	129	130
CH053	< 90 days Open	0	0	0	0
	> 90 days Open	0	0	0	0
	Total Open	0	0	0	0
	Total Closed	91	91	91	91
	Total NCRs	91	91	91	91
CH057	< 90 days Open	0	0	0	0
	> 90 days Open	0	0	0	0
	Total Open	0	0	0	0
	Total Closed	26	26	26	26
	Total NCRs	26	26	26	26
CH061A	< 90 days Open		5	4	0
	> 90 days Open		1	2	0
	Total Open		6	6	0
	Total Closed		10	12	18
	Total NCRs		16	18	18
CS179	< 90 days Open	5	4	7	6
	> 90 days Open	12	14	14	14
	Total Open	17	18	21	20
	Total Closed	37	39	43	47
	Total NCRs	54	57	64	66
CS084	< 90 days Open	1	1	0	1
	> 90 days Open	0	1	0	0
	Total Open	1	2	0	0
	Total Closed	4	4	6	6
	Total NCRs	5	6	6	7
CQ033	<90 days Open	0	0	3	0
	>90 days Open	2	0	0	0
	Total Open	2	0	3	0
	Total Closed	0	11	11	14
	Total NCRs	2	11	14	14

APPENDIX N – CONSTRUCTION CONTRACT CHANGE MANAGEMENT

MTACC's ESA Project Management Plan states that a key CM responsibility is for the initiation, processing, negotiation, and resolution of construction change orders, subject to the MTACC change control process. MTACC procedures AD.11, Construction Contract Modification Approval, and PCA-036, Construction Contract Modifications for ESA (updated on December 18, 2017) provide guidance for this process.

The ESA project executed a total of 25 contract modifications having magnitudes in excess of \$100,000 during the period from July 2018 through October 2018. These modifications represent a total net cost increase of \$18.4 million. The PMOC reviewed the staff summary sheets of select modifications to check compliance with the guidelines as shown below.

CQ032 had 1 modification executed during the review period that resulted in an aggregate increase of \$0.1 million. The PMOC reviewed modification 82, Additional Water Infiltration Remediation, with a value of \$736 thousand and dated September 6, 2018. The PMOC observed that the CM followed the project procedures.

CQ033 had 5 modifications executed during the review period that resulted in an aggregate increase of \$10.4 million. The PMOC reviewed modification 15, Raised Platform for Amtrak's 4.6 Case, with a value of \$1.0 million and dated July 10, 2018. The PMOC observed that the CM followed the project procedures.

CM014B had 16 modifications executed during the review period that resulted in an aggregate increase of \$15.1 million. The PMOC reviewed modification 164, Revisions for Future 45th Street Entrance (CPR-090), with a value of \$2.0 million and dated July 30, 2018. The PMOC observed that the CM followed the project procedures.

CH061A had 3 modifications executed during the review period that resulted in an aggregate increase of \$0.5 million. The PMOC reviewed modification 18, Ductbank for CS179 Backbone Communication System, with a value of \$164 thousand and dated September 6, 2018. The PMOC observed that the CM followed the project procedures.

CS179 had 15 modifications executed during the review period that resulted in an aggregate increase of \$5.6 million. The PMOC reviewed modification 97, Addition of Pull Box Covers, with a value of \$740 thousand and dated July 23, 2018. The PMOC observed that the CM followed the project procedures.

Professional GEC Services had 1 modification executed during the review period that resulted in an aggregate increase of \$0.1 million. The PMOC reviewed modification 157, Updated Interface to MTA IT TIMACS III System, with a value of \$112 thousand and dated October 16, 2018. The PMOC observed that the CM followed the project procedures.

**APPENDIX O – CM007- DIRECT FIXATION –
 QUALIFICATION TESTING & TRACKWORK CONSTRUCTION
 CM007 - Direct Fixation Qualification Testing***

Direct Fixation Fasteners (DFF)

Direct Fixation Fastener (DFF) Assemblies	Standard DFF	High Attenuation DFF (HADFF)	Special Trackwork DFF (STDFF)
DFF Qualification Testing Status	See Note #1 below	Done	Completed October 2018, requires re-testing

Note #1: Contractor has elected to use HADFF in locations where Standard DFF was specified.

Resilient Tie Blocks (RTB)

Resilient Tie Block (RTB) Assemblies	Standard RTB	High Attenuation RTB (HARTB)	Special Trackwork RTB (STRTB)
RTB Qualification Testing Status	Done	Done	Done

*As reported at ESA Monthly CM007 Progress Meeting December 13, 2018

CM007 - Direct Fixation Trackwork Construction*

Direct Fixation Fasteners (DFF)

Direct Fixation Fastener (DFF) Assemblies	Standard DFF	High Attenuation DFF (HADFF)
DFF Installation Status	Progressing using permanent rail plates	Progressing using permanent rail plates
Actual Progress	See Note #1 below	46.5%
Planned Progress	See Note #1 below	74.2%

*Progress Data from December 30, 2018 ESA Progress Summary: Track & Third Rail - RTB.

Note #1: Contractor has elected to use HADFF in locations where Standard DFF was specified.

Resilient Tie Blocks (RTB)

Resilient Tie Block (RTB) Assemblies	Standard RTB & High Attenuation RTB (HARTB)
RTB Installation Status	Progressing
Actual Progress	47.0%
Planned Progress	86.7%

*Progress Data from December 30, 2018 ESA Progress Summary: Track& Third Rail – RTB.

Special Trackwork (turnouts)

S T Assemblies	Special Trackwork RTB (STRTB)	Special Trackwork DFF (STDFF)
Installation Status	Progressing	Not started
Actual Progress	18.2%	
Planned Progress	75.2%	

*Progress Data from December 30, 2018 ESA Progress Summary: Track & Third Rail & Special Trackwork

APPENDIX P – CONTRACT CS084 – TRACTION POWER SUBSTATIONS

Contractor's Issues by Substation

General Issues

1. Development of accurate schedule
2. Equipment fabrication delays (C06/C07 DC Switchgear, C08)
3. Transformer FAT failures (C05n once & C03 twice)
4. Track access coordination with CM007
5. SCADA equipment delivery & software programming proposal

C01/C02 (Tail Track)

1. DC cable to track (blocked ceiling penetration by CS179)
2. Coordination: interferences from CS179 (fire alarms, light fixtures, conduit blocking ceiling penetrations, etc.)
3. Equipment delivery issue still unresolved
4. GCT coordination/access

C03 (55th Street)

1. Not ready for handover from CS179 – access date unknown
2. Coordination interferences with CS179
3. Water condition (drain) needs resolution by CS179 (CS179 contract modification needed)

C04 (2nd Avenue)

1. Water infiltration remediation by CS179 (ConEd ductbank and plenum)
2. Coordination: interferences from CS179 (fan, fire alarm control panel, light fixtures, etc.)
3. Replacement of galvanized pull boxes installed by CS179 in lieu of fiberglass/ Field Change Request for cables

C05 (Vernon)

1. CM007 damaged ducts to monument pads – missing concrete encasement – CM007 to repair
2. Removal of PVC duct in concrete conduits – requires ConEd approval
3. Switch room/Control room relocation required – need CPR
4. Still have water infiltration issue
5. CPRs needed for various other coordination issues

C06/C07 (Plaza)

1. Missing penetrations in floor and on bench level for bus duct (CQ032 was to provide) – contract modification issued – work needs to progress
2. CS179 conduit at bench level blocking wall penetrations
3. Doorway needs to be enlarged for delivery/installation of reactors (mod to CS179 needed)
4. Coordination: interferences from CS179 (light fixtures and ductwork)

C08 (43rd Street)

1. Conduit duct banks between C08 vault and tracks (shown on contract drawings as existing) are missing and no schedule established by MTA to provide them – no conduit and manholes means no traction power to the tracks.
2. Construction schedule
3. Mobilization for structural supports

APPENDIX Q – OPERATIONAL READINESS

Rail Activation Plan & Task Working Groups (TWG) – 3Q2018 Status

NOTE: The Quarterly update for 3Q2018 was held on November 8, 2018.

The Rail Activation Plan (RAP) is being developed through the use of 11 separate Task Working Groups (TWGs) that each focus on specific separate aspects of the RAP. An inter-agency ESA Operational Readiness Core Group meets on a weekly basis to review the progress of the OPR tasks required to commence ESA operations. Should any of the OPR activities be found to be lagging in progress, the Core Group identifies corrective action required to bring these lagging activities back into conformance with the ESA Integrated Project Schedule (IPS). In response to an inquiry by the PMOC on the status of the Comprehensive System Test Plan (CSTP), one of the RAP deliverables, MTACC indicated that completion of the CSTP was dependent on the formulation of an acceptable Integrated System Test Plan (ISTP) still under development on the ESA CS179 contract. The development and completion of this CSTP is an on-going effort; and, although MTACC stated that it would like to complete it by the end of 2018, this goal was not achieved by that date.

(PMOC Note: The CSTP delineates standardized guidelines for managing and conducting test activities. The Plan is presented in two parts: Volume I describes the management approach to all phases of the test program. It defines the test program objectives, test elements, methodology, management approach, and organization. It also provides guidelines for the tests that are contractually required to be performed by Contractors at the subsystem and system levels. Volume II provides a list of the systemwide integrated tests required to be conducted. These tests include factory test, field tests, integration tests, pre-revenue service tests and emergency preparedness drills. Volume II is a living document which is being updated as the project progresses.)

TWG No.1 – Operational Readiness:

- This TWG has the responsibility to monitor and verify the Rail Activation Plan (RAP) activities. There were 915 tasks and activities identified as of early November 2018 that must be completed to successfully implement full ESA revenue service. Of those 915 RAP tasks and activities, 185 were already complete and 84 were in progress as of the 3Q2018 briefing. The remaining 646 were not scheduled to start yet.
- Several of the tasks and activities that were currently in progress were overdue. They are: 1) the development of an Emergency Action Plan (EAP) for ESA service; 2) the completion of Volume #3 of the RAP; and 3) completion of the LIRR’s plan for hiring and training locomotive engineers, train conductors, and signalmen. MTACC advised that the EAP and Volume #3 of the RAP would be completed by the end of 2018; a goal that was not met. The development and approval of LIRR’s hiring and training plan is a work in progress that is under re-evaluation as a result of the need for a revised ESA Service Plan; and consequently, there is no identified completion date. The hiring and training plan is discussed later in this Trip Report under TWG Nos. 2 and 6.

MTACC advised that MTA needs to declare “Operational Readiness” by June 30, 2022, to meet the current December 2022 RSD.

TWG No.2 – Train Service and Operations:

- MTACC reports that for activity planning purposes (e.g., hiring and training personnel, procurement of railcars and other vehicles, procurement of a training simulator, development of operating and emergency action plans, etc.), MTA will utilize the requirements set forth in its “original” F2 Service Plan. That Plan called for 24 trains during Peak hours to operate into and out of Grand Central Terminal (GCT).

- As a result of several critical factors that have the potential to affect the viability of that original F2 Service Plan, MTA is developing a revised ESA Service Plan. LIRR determined that the F2 Service Plan is “non-current” primarily based on two primary factors: unavailability of the Westbound By-Pass and Eastbound Re-Route on the RSD and concerns about the continued availability of all of Amtrak’s East River Tunnels, Lines 1 through 4, due to damage sustained during Superstorm Sandy in 2012 and resultant emergency and long-term repairs. LIRR indicates that the revised Plan should be complete in approximately nine months. This 9-month time frame, ending in August 2019, is contingent on LIRR having all the necessary updated information regarding infrastructure availability while developing the new Plan.
- Development of a new Service Plan also impacts other elements and activities related to the implementation of ESA revenue service. For example, to begin with what might be limited revenue service, staffing resources and railcar availability may not need to be as high as originally envisioned for the implementation of the original F2 Service Plan. Both of these specific elements are time-sensitive; as staff resources need to be hired and trained in advance of any ESA RSD; and, railcar procurements need to be appropriately timed so as to have the correct number of railcars available to provide the service. As a result, MTA is re-evaluating the timing of hiring personnel to fulfill the locomotive engineer and conductor requirements based on the timely progression of activities in the ESA Project’s IPS. Should any of the activities affecting the RSD or earlier “training or testing” dates be identified as being, or potentially being, delayed then the schedule for hiring and training of essential personnel will be adjusted accordingly.
- The development of the Mid-Day Storage Yard Operations Plan continues; however, its completion is also tied to the development of the new revenue service plan that must be developed. Consequently, no completion date for this Plan is available.

TWG No. 3 – Infrastructure, Systems, and Engineering:

- MTACC reported that LIRR support of the contractor submittal and review process had improved over the previous Quarter. The PMOC noted that some improvement was noted; but continued improvement is needed.
- The MTACC Asset Management Group (TWG No. 4) is working with TWG No. 3 personnel to incorporate Global Positioning Satellite (GPS) labeling data for assets installed under the ESA Project. This information will be incorporated into the Asset Management database for ease of identification of assets.

MTACC and LIRR are holding discussions to determine if current warehousing and other storage facilities are efficiently located and of sufficient capacity to support the increased ESA service.

TWG No. 4 – Asset Management:

- MTACC continues to work with the various contractors to identify new assets and incorporate them into the Asset Management database. As of the 3Q2018 briefing, there were 249 assets under interim maintenance out of a projected total of 15,533 when the ESA Project is finished.
- MTACC indicated that progress on identifying assets on the CS179 Systems contract – the ESA contract with the most new assets – has slowed because the original contractor representative assigned to this coordination effort was no longer employed by the contractor. The contractor was seeking a replacement for this individual.

TWG No. 5 – Grand Central Terminal:

- MTACC indicated that the approval to award a contract for Cellular & Wireless coverage in GCT would be presented to the MTA Board before the end of 2018.
- One other major activity of this TWG is to implement part of MTA’s “One MTA” seamless passenger experience in GCT. A number of activities are required to fully implement this objective. Of special note is the requirement to negotiate changes to various labor contracts for MTA personnel working in GCT; and, to develop plans and procedures for 24/7 operations in a facility (GCT) that currently has limited or no access during early morning hours.

TWG No.6 – Staffing and Training:

- While the final levels of LIRR personnel required for any revised ESA Service must still be determined, LIRR is utilizing the original F2 Service Plan to determine its total needs.
- The hiring and training of new personnel is being strategically evaluated to ensure that new personnel are not hired so soon that they would be unassigned after training, and would, therefore, be a burden on the LIRR Operating Budget. The consideration is also being given to ensure that any new personnel are hired and trained in time so as not to negatively impact ESA Revenue Service. There is a delicate balance between these two objectives that needs to be reached.
- LIRR indicated that it currently needs 188 days from time of hire to train and qualify a locomotive engineer; and, that it can only train 12 locomotive engineers at a time. By using these numbers and the original requirement of 133 new locomotive engineers identified in the F2 Service Plan, LIRR should have started the hiring and training process in August 2017 to have all the new locomotive engineers trained and qualified by the current ESA RSD. As that did not occur, alternative hiring and training plans and resource requirements need to be identified and evaluated.
- One notable item regarding training is that locomotive engineer training is not just limited to new hires required for implementation of ESA Service; but rather, it must include all the current LIRR qualified locomotive engineers. This is because of agreements in labor contracts regarding work assignments and changing of jobs. LIRR’s stated goal here is to have 80% of all locomotive engineers trained before the ESA RSD.
- LIRR has already started the process to acquire personnel to manage the ESA areas in GCT. Those personnel will be used to help develop Operating Plans, training requirements, etc. for the ESA service. The process being utilized to fill these extra positions is advertising job opportunities within the MTA Agencies (looking for experienced personnel) and through outside recruitment efforts.

TWG No.7 – Safety and Security:

- This TWG completed a draft Emergency Action Plan (EAP) and it is under review by all ESA stakeholders for comments before being finalized.
- During 3Q2018, MTACC continued to catch up on the Safety and Security Certification processes; with several more design and construction contracts reviewed, and safety and security elements identified for future validation upon completion of design and construction phases of the contracts.

TWG No. 8 – Public Information and Marketing:

- As a result of several field surveys in GCT by LIRR, MNR, and MTACC-ESA personnel, a number of gaps in customer signage between what was proposed in the ESA Project and what

MNR has in its GCT signage upgrade contract plans for signage were identified. Discussions are on-going between the parties to determine how to address these gaps and how to fund any contract additions to either the ESA Project or the MNR contract. A decision on what action to take was projected to occur before the end of 2018.

- This TWG developed and circulated a newsletter to all LIRR employees to let them know what ESA is all about and the current status. The PMOC questioned why this newsletter wasn't distributed to MNR personnel, as there has been and will be a significant impact in GCT – MNR's main terminal. LIRR indicated that future quarterly editions of the newsletter would be circulated to both LIRR and MNR employees. The PMOC requested MTACC to provide a copy of the 1st newsletter.

TWG No. 9 – Agreements:

- MTACC indicated that there are several more labor agreements than originally anticipated that need to be revised to effectively implement ESA service. The PMOC asked that MTACC provide a copy of the list of Agreements that must be revised once that list is compiled.
- LIRR and NYCT planned to meet in November 2018 to discuss access requirements for shared locations / facilities.

TWG No. 10 – Finance and Administration:

- LIRR advised that it is planning to award a contract for the development and installation of the locomotive engineer Training Simulator by the end of 2019 to meet the training requirements dictated by the current ESA RSD.
- Requirements for the procurement of other material and equipment for ESA service are being established and evaluated.

TWG No. 11 – Fleet Readiness:

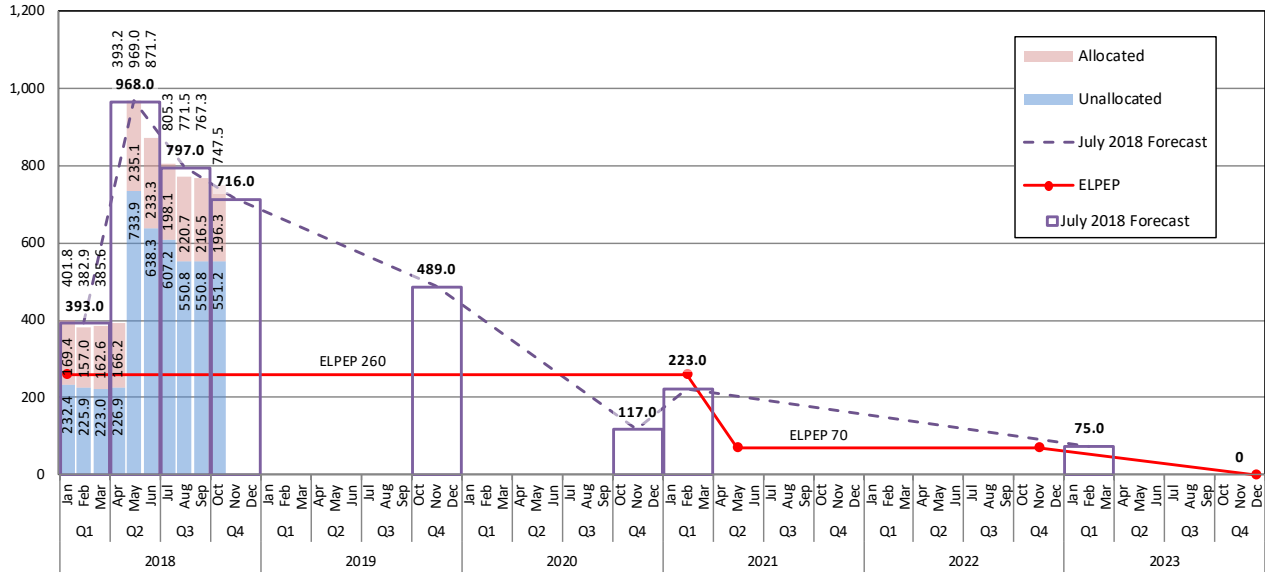
- This TWG focuses on the procurement of fleet-oriented equipment (railcars, locomotives, simulators, etc.) necessary for the final implementation and operation of the ESA Service.
- MTACC indicated that an additional “mode” must be added to the Tunnel Ventilation System to provide the proper ventilation in the ESA tunnels should a diesel-powered “protect locomotive” be required to enter a tunnel. This will require some design changes to the existing Tunnel Ventilation System design and the Tunnel SCADA system.
- LIRR advised that responses to the re-advertised 1st Phase RFP for the M-9A railcars are due on November 28, 2018. Once those responses were received and evaluated, LIRR would issue the 2nd Phase RFP documents requesting pricing information. As of the 3Q2018 briefing, LIRR's plan was to award a contract for the M-9A railcars by the end of 2Q 2019. The PMOC, based on LIRR's previous railcar procurement efforts and the PMOC's experience, believes that this projected award date is very optimistic.

LIRR indicated that it would maintain 110 of its M-3 railcars and equip 72 of them with Positive Train Control (PTC) apparatus. Upon inquiry from the PMOC as to why all of the 110 M3 cars would not be PTC-equipped, LIRR indicated that the remaining 38 M-3 cars would be utilized, but not as the lead railcar; and, those trains with M-3 cars that did not have PTC equipment would be used on branches of the LIRR other than ESA. In the PMOC's opinion, this operation strategy will require extra effort on the part of the LIRR to ensure that non-PTC equipped cars are not on the head end of any train consist.

APPENDIX R – ESA CONTINGENCY TRACKING

ESA Contingency Tracking
(Costs shown in millions)

Jan 29, 2019



APPENDIX S - ESA CORE ACCOUNTABILITY ITEMS

Project Status:		Original at FFGA	Amended FFGA	Current	ELPEP **
Cost	Cost Estimate	\$7,386 m	\$10,922 m	\$10,335 m*	\$8,119 m
	b(4)				
Schedule	Revenue Service Date (RSD)	Dec 31, 2013	Dec 31, 2023	Dec. 2022	April 30, 2018
Total Project % Complete		Based on Invoiced Amount		74.9% actual vs. 74.9% planned (ESA calc. †)	
Project Performance Rate since 2014 “Re-Plan”		Based on Earned Value		81.8% (PMOC calculation of construction spending at 3Q2018 planned vs. actual since re-baselining)	
Contracts	Total contracts awarded to date		\$9,375.6 m	84.2% (PMOC calculation†)	
	Total construction contracts awarded to date		\$7,228.9 m	90.2% (PMOC calculation†)	
Major Issue	Status		Comments		
Project Funding and Budget	b(4)				
Project Cost	The ESA PMT updated the ESA program budgets based on the approval of Budget Amendment 3 for the 2015-2019 Capital Plan. The April 2018 EAC is \$11,133 million. The Amended FFGA Baseline Cost Estimate is \$10,922 million.		If the 2020-2024 Capital Plan is not approved for the required ESA funds, then there may be significant impacts to the completion of current contracts, award of remaining contracts, and/or completion of railroad force account work.		
Project Schedule	The primary critical and near-critical paths to target RSD, including float, are: b(4) The target RSD forecast is February 14, 2022, 7 CDs earlier than the previous IPS update. The public RSD remains December 13, 2022. The Amended FFGA Revenue Operations Date is December 2023.				
Manhattan/-Systems Schedule Path	IPS 111 shows that the ESA Program Critical Path runs through the Manhattan/Systems contracts. This work path has several major open/unresolved issues having potentially significant schedule impacts: incremental IST; 47th Street Entrance; and, the major redevelopment of 270 Park Avenue.		Concerns continue for the ESA program Manhattan/Systems critical path. The Manhattan/-Systems path completion date changed to November 25, 2021, in IPS 111. CM014B construction of the 45 th Street Entrance replaced CS084 work on the path. This schedule has significant unresolved issues. Acceptable work progress along this schedule path relies heavily on the effectiveness of MTACC/ESA coordination efforts across the seven area contracts.		

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

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

† ESA April 2018 EAC forecast: Construction Engineering \$8,014.1 million; \$871.8 million; Soft Cost \$1,980.4 million; b(4); and, Total \$11,133 million.