PMOC COMPREHENSIVE MONTHLY REPORT

East Side Access (MTACC-ESA) Project

Metropolitan Transportation Authority
New York, New York

Report Period March 1 to March 31, 2018

PMOC Contract No. DTFT60D1400017

Task Order No. 0002, Project No. DC-27-5287, Work Order No.8

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

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EXECUTIVE SUMMARY

This summary highlights key events and important issues for the 1st Quarter 2019.

	Q4 2018	Q1 2019	Notes
Program Status[1]	74.9% actual 74.9% as-planned	76.5% actual 76.5% as-planned	Meeting April 2018 spending plan.
Construction Status	77.9% actual 78.2% as-planned	79.7% actual 80.3% as-planned	Behind April 2018 spending plan.
Construction Progress Issues	CM014B, CS084, VS086, CS179.	CM014B, CS084, VS086, CS179.	No change.
Funding	$10,335 m	$10,335 m	No change.
Cost/ Budget Contingency	$747.5 m ($551.2 unallo./$196.3 m allocated)	$724.2 m ($551.3 unallo./ $173.0 m allocated)	Behind April 2018 draw down plan.
IPS Schedule	Target RSD Feb. 2022 Manh./Systems = Crit.	Target RSD Feb. 2022 Manh./Systems = Crit.	No change to date.
Risk Management	12 major risks	12 major risks	One new risk - 270 Park Ave. added in Q4 2018.
Construction Safety	0.39 LTI 0.78 RI	1.09 LTI 1.09 RI	Safety ratios increased in Q12019.
ELPEP Compliance	27 CDs > ELPEP min. $487 m > ELPEP min.	27 CDs > ELPEP min. $464 m > ELPEP min.	Schedule contingency close to ELPEP min.
Buy America	Three issues	One issue	2 issues resolved 4Q2018; 1 new potential issue Q1 2019.

Contracts Awarded/Completed:	Contract CH057D achieved Substantial Completion during Q1 2019. No contract awarded/completed in Q1 2019.
Harold Interlocking:	Eastern section of the Westbound Bypass Track, along with #3121 Crossover, completed, and all track, 3rd rail, and signal removals to allow Tunnel B/C construction ("B/C Prep") to start were completed.
Key Stakeholder Issues:	b(4) [redacted]
Project Management Plan:	Drafts for Sub-plans SMP, CMP, and RMP submitted during Q4 2018. Revised CPP issued Q12019
Organization:	During March 2019, the Senior Vice President Program Executive Harold Systems and Start-Up, announced his retirement effective July 1, 2019, and the Program Manager Systems left the project as of March 31, 2019.

[1] Based on invoice cost and April 2018 EAC forecast.

All Project Sponsor cost and schedule data included in this report is based on the MTACC East Side Access Monthly Progress Report for January 2019, referenced in this report as the ESA January 2019 MPR, which has a cost and schedule data date of February 1, 2019. Unless otherwise noted, all progress percentages in this report are based on invoiced costs and not actual construction.

REPORT FORMAT AND FOCUS

This report is submitted in compliance with the terms of the Federal Transit Administration (FTA) Contract No. DTFT60D1400017, Task Order No. 0002. Its purpose is to provide information and data to assist the FTA as it continually monitors the 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 1st Quarter 2019

a. Engineering/Design Progress

In the ESA January 2019 MPR, the PMT reported the overall engineering effort at 85.7% complete compared to planned completion of 86.0%. Since the ESA July 2018 MPR, the PMT calculates summary Engineering progress as a percentage of the $871.8 million April 2018 engineering EAC forecast.

b. New Contract Procurements

CH063 Electric Traction Catenary Work, 3rd Party, will be a negotiated RFP procurement. RFQ advertised online on January 4, 2019; documents were originally due on February 27, 2019, but MTACC extended the deadline to March 13, 2019, due to many vendor questions. During March 2019, MTACC received several proposals which it continued to review during the remainder of the month. MTACC intends to progress this procurement to the next step in April 2019, although it had not forecasted a specific date as of the end of March 2019.

c. Construction Progress

In the ESA January 2019 MPR, MTACC reported that total construction progress reached 79.7% complete compared with planned progress of 80.3%. Since the ESA July 2018 MPR, the PMT calculates summary Construction progress as a percentage of the $8,014 million April 2018 construction EAC forecast.

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 resource 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 the second half of 2018 and continues to be very good through Q1 2019. Further improvement is needed for Amtrak direct labor construction 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 originally been planned for 2019, was later rescheduled for 2025 and, during March 2019, MTACC indicated that Amtrak may advance ERT Line 2 reconstruction to 2023, although this

has not been formalized yet. The risk remains that tunnel reliability or safety issues might require Amtrak to make emergency repairs at any time until the Public RSD of December 2022. The PMOC's concern is based on Amtrak's historic reactions to service disruptions in the tunnels, which have resulted in suspending ESA Harold work until the service disruptions are resolved.

LIRR Positive Train Control (PTC): There had been three potentially significant impacts of PTC implementation. The first risk was resolved during Q1 2019.

A potential risk that might have been realized in the near future is the impact that LIRR installation of Positive Train Control (PTC) in Harold Interlocking might 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 reply, LIRR submitted its proposed revised PTC implementation schedule on November 29, 2018. MTACC reported that, as of February 25, 2019, there is currently no known risk to the ESA Program due to this issue. Accordingly, the PMOC will delete this risk as a concern going forward.

- 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.
- The required PTC design changes for the associated ESA Contracts VS086, CS086, and CS179 cannot be finalized until LIRR completes the PTC design, which remains incomplete and is now over 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 35 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 contract CM007. 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 had 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 earlier been scheduled to start in April 2019, but has most recently been reported delayed until early 2020. During Q1 2019, the ESA-PMT, working with testing technical managers and stakeholders, made important changes to the testing plan to reduce the risk of regression testing. The changes represent a shift in the testing approach and this required additional changes to the testing schedule. Overall, 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 continue to impede the timely completion and approval of the associated contract modifications for CS179, as well as for the CM007, CM014B, CQ033, CS084, CS086, and VS086 contracts.

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 $800 million in additional local funding for the ESA program.

MTACC continues to refine and use the alternative methodology for the IPS 114 schedule. The forecast Target RSD remained February 14, 2022, and the Late RSD remained December 13, 2022, over Q1 2019. The Manhattan/Systems finish date remained the same, and contingency along this path of work increased 48 CDs over Q1 2019. Both the Harold and Queens paths of work lost float over Q1 2019, and the Queens path of work became more critical than the Harold path of work in IPS 114.

3. PROJECT STATUS SUMMARY AND PMOC ASSESSMENT

a. Sponsor Management Capacity and Capability

During March 2019, the Senior Vice President Program Executive Harold Systems and Start-Up announced his retirement effective July 1, 2019, and the Program Manager Systems left the project as of March 31, 2019.

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. Delays in these areas have adversely impacted 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 the work performed by earlier contractors 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 in accordance with the contract plans and specifications.

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. During Q1 2019, MTACC issued a procedure to address Field Modifications to ESA contracts. The PMOC believes that continued, long-term effort is required to reduce the backlog and prevent recurrence of this problem.

b. Real Estate Acquisition

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, including LIRR.

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 the 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 the schedule needs to achieve the forecast RSD. The backlog of outstanding contract changes for CM007, CM014B, and CS179 has been decreasing slowly, however, since the rate that new modifications are being created is similar to the rate that existing modifications are executed or closed.

d. Procurement

The ESA January 2019 MPR shows that total procurement for the ESA Program is 84.7% complete, with total awards at $9,432 million. Since the ESA July 2018 MPR, the PMT calculates summary procurement progress as a percentage of the $11,133 million ESA program April 2018 EAC forecast. Contract CM015, 48th Street Entrance, is on hold pending an agreement between MTA and the owner of 415 Madison Avenue.

Active procurements include:

CH063 Electric Traction Catenary Work, 3rd Party, will be a negotiated RFP procurement. RFQ advertised online on January 4, 2019; documents were originally due on February 27, 2019, but MTACC extended the deadline to March 13, 2019, due to many vendor questions. During March 2019, MTACC received several responses to its RFP which it continued to review during the remainder of the month. MTACC intends to progress this procurement to the next step in April 2019, although it had not forecasted a specific date as of the end of March 2019.

e. Railroad Force Account (Support and Construction)

During March 2019, LIRR Electric Traction (ET) personnel continued to decommission the existing G02 Substation and remove equipment and other gear from the substation. ET and Signal personnel also continued to install ET and signal cables and equipment to melt snow at the recently installed Northeast and Southeast Quadrant turnouts. Additionally, both departments completed removal of their respective appurtenances along the LIRR Westward Freight Track so that the track could be removed for construction of Tunnel B/C. Amtrak ET personnel completed removal of the catenary wires over the LIRR Westward Freight Track in support of Tunnel B/C construction and began catenary wire reconfiguration in Q Interlocking to support future MDSY construction. Amtrak C&S personnel continued limited installation of signal trough around the Loop Tracks.

f. Third-Party Construction and Procurement

Manhattan

CM006 Manhattan North Structures: During Q1 2019, 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 resumed in Q1 2019. Architectural finish work for floors, walls, and ceilings is underway.

CM014B GCT Concourse & Facilities Fit-Out: In its January 2019 MPR MTACC reports that January progress was 0.0% vs 0.6% planned. Cumulative progress was 69.0% vs. 97.3% planned. The contractor continued to install various utility components in Wellways #1 and #4, continued painting in the Biltmore Connection, continued to install utility components in LIRR back of house area and began to modify the steam tunnel at the 47th Street entrance.

VM014 Vertical Circulation Elements: For CM007, as of March 18, 2019, 3 of the 6 elevators and 8 of the 16 escalators to be installed between the mezzanines and upper and lower levels of the train halls have been delivered to the site; 3 escalators are in storage, 2 are in transit, and 3 will be delivered by the end of March 2019. For CM014B, all 22 escalators for the concourse have been fabricated and delivered. All elevator fabrication has been completed, with the exception of EL #10 (50th St. Vent Building). EL #22 (Biltmore Connection) delivery is scheduled for May 2019.

Queens

CQ032 Plaza Substation and Queens Structures: During Q1 2019, the CQ032 contractor continued to progress activity toward achieving SC.

CQ033 Mid-Day Storage Yard Facility: Construction continued on: yard and street utility work, yard lighting, catenary structure work, ductbank work, personnel access bridge structure work, and various building and car appearance maintenance platform work. Track and turnout construction started during Q1 2019. Traction power cable pulls continued. Signal CIL installation continued.

Harold Interlocking

CH057D – Harold Track Work Part 3: During March 2019, the contractor completed installation of the #3121E turnout and removal of the LIRR Westbound Freight Track. The contractor achieved Substantial Completion on March 20, 2019. During SC, the contractor also continued to surface track and flash butt rail ends on the NEQ, SEQ, and Westbound Bypass Tracks.

CH058A – Harold Structures Part 3 – Tunnel B/C Approach Structure: During March 2019, the contractor continued mobilization activities, completed clearing and grubbing its worksite, completed removal of the B-931 catenary poles and K-frames adjacent to the 39th Street bridge, and began test excavations in various worksite locations.

Systems

CS179 – Systems Facilities Package No. 1: During Q1 2019, the contractor continued installing conduit, cable, equipment, fire stopping, fire standpipe, lighting, etc., in the tunnels and at the various facilities where there were no SWOs and where access was obtainable. Testing of installed equipment and cable splicing was also performed. Water infiltration, Buy America, and access restraint issues continue and must still be remedied. The completion of FD for all 10 control systems, originally scheduled for completion 35 months ago, has not occurred yet, and the completion of FD for all 19 non-control systems is also delayed. Additionally during Q1 2019, the contractor continued to contend that a significant number of NOC submissions with the potential for cost and design impacts remained open and are impacting progress on the execution and completion of contract work. MTACC's inability to develop and issue promised CPR approvals on a timely basis for the NOCs continues to be 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. During Q1 2019, another potential Buy/Ship America issue related to motors on a small ventilation fan was identified and is undergoing investigation.

CS084 Traction Power Systems Package 4: During Q1 2019, installation work in the Vernon (C05) substation continued, but could not be completed 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 any 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. Three major quality issues – one related to the failure of substation transformers during testing, another related to the appearance of damage to MTA-supplied inductive reactors, and the third involving compliance of track monuments to LIRR specifications – remain as open issues.

VS086, Systems Package 3 – Signal Equipment Procurement: As previously reported, in the absence of decisions from the LIRR on critical open design issues, MTACC directed the contractor to proceed with the signal design using the proposed TRU-III track circuit equipment. 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 and completed PTC design is unknown, as LIRR is waiting to evaluate the contractor's Application Logic designs for two of the Interlockings before moving forward with its PTC design completion. The LIRR's PTC design and scope of work package must be completed by LIRR before MTACC can prepare a CPR to the contractor for the additional work to add PTC. MTACC acknowledges that the addition of PTC to this contract will impact the substantial completion date and cost of the contract; but the extent of that impact is unclear at this time. One other design issue could have a significant impact on the completion of the signal design under this contract – that of "light out protection". LIRR is not in agreement with the methodology being used by the contractor to provide this protection and discussions between the parties are on-going. The contractor indicates that any changes to the proposed (completed) design will require extensive design changes and delays to the further delivery of equipment.

CS086, Tunnel Systems Package 2 – Signal Installation: In Q1 2019, the contractor began surveys of the various work sites to determine the condition of sites and if access for work was possible. While a completed list of site issues is still being prepared, numerous issues regarding site accessibility and equipment layouts have already been identified by the contractor as possible items delaying its commencement of work on the contract. Issues noted thus far include water infiltration, equipment layout conflicts, and other obstructions inconsistent with existing contract drawings. MTACC indicates that a significant amount of revised or additional contract drawings will be forwarded to the contractor to address additional requirements to the CS086 contract; however, those documents have yet to be provided. The contractor indicates that it cannot procure some materials (e.g., signal cables) until it has a full understanding of the total amount of work required for this contract; therefore, material procurements are being held until the additional documents and contract requirements are made available

g. Vehicles

During March 2019, LIRR continued to await vendors' responses to its Phase II (the second of two phases), Cost/Schedule, portion of its procurement for the M-9A vehicles. Vendors' responses are due on April 17, 2019. LIRR continues to believe that successful completion of both phases (the first phase was completed in Q4 2018) of this procurement will allow it to issue a contract award in June 2019. The PMOC believes that this is overly optimistic and that full evaluation of the potential impacts on ESA's RSD will not be possible until LIRR develops a revised procurement schedule based on the successful vendor's response.

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 February 12, 2019, 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 114 (data date February 1, 2019) update shows that the Target RSD forecast date, February 14, 2022, has not changed since IPS 111, and the primary critical path still runs through Manhattan/Systems work. During November and December, 2018, and January 2019, the Manhattan/Systems path held its completion date and float; the Harold path lost 49 CDs of float; and the Queens path lost 132 CDs of float.

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 (F) 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 January 2019.

Table 2: Project Budget/Cost Table

(Cost shown in millions)

	FFGA			MTA Current Budget (Interim)			Expenditures January 2019	
	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%	8,952.3	78.2% 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%	8,334.7	80.6%
		10,922.0	90.7%					
Total Federal Share	2,683.0		36.3%	2,698.8	2,698.8	23.6%	2,698.8	100.0%
		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	100.0%
		2,632.1	21.9%					
Non New Starts share	51.0		0.7%	66.6	66.6	0.6%	66.6	100.0%
		66.6	0.6%					
ARRA	0.0	195.4	1.6%	195.4	195.4	1.7%	195.4	100.0%
Local Share	3,667.0		49.6%	6,556.5	7,636.2	66.7%	5,635.9	73.8%
		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; and inadequate construction progress on CM014B and CS084. The PMOC remains concerned about progress of the ESA program [redacted] B(4) [redacted]

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 Enterprise Level Project Execution Plan (ELPEP) components is summarized as follows:

- **Technical Capacity and Capability:** MTACC indicated that it will review the Technical Capacity and Capability (TCC) Plan and propose revisions, if required, to reflect the current status of the Program. MTACC updated the TCC Plan in Q3 2017. In April 2018, FTA advised MTACC to incorporate its current updates and commence with a subsequent revision that addresses management changes resulting from the MTACC Six-Point Plan for ESA. All aforementioned updates will be consolidated in a draft that was anticipated, but not met, in December 2018. The draft TCC Plan update is now expected in April 2019.
- **Continuing ELPEP Compliance:** The ESA project should continue to make additional improvements in the following areas: Management Decision; Design Development; Change Control Committee (CCC) Process and Results; Stakeholder Management; Procurement; and Risk-Informed Decision Making. The PMOC continues to note progress in two previously identified areas – Issues Management and Timely Decision Making, particularly when responding to new issues arising from the railroads' Force Account resource availability, track outages, and other issues regarding the remaining work in Harold Interlocking.
- **Project Management Plan:** MTACC is using the current version of the PMP, Rev. 10, that the PMOC reviewed and the FTA accepted in 2017.
- **Cost/Schedule Contingency:** MTACC, FTA, and the PMOC agree on the planned ELPEP minimum cost and schedule contingency hold points, levels, and drawdowns. MTACC continues to report the cost and schedule contingency levels against the ELPEP minimums in its quarterly reports to the FTA. The PMOC notes that MTACC has reported that the Schedule Contingency remains only 27 CDs above ELPEP minimum. The total Cost Contingency is $464.2 million above the ELPEP minimum contingency of $260 million.

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 Q4 2017. In April 2018, the FTA advised MTACC to incorporate its current updates and then commence with a subsequent revision that addresses any changes resulting from the MTACC Six-Point Plan for ESA. An updated draft was issued in December 2018.
- **Project Quality Manual:** ESA submitted the updated Project Quality Manual in February 2018. In April 2018, FTA advised MTACC to incorporate its current updates and then commence with a subsequent revision that addresses any changes resulting from the MTACC Six-Point Plan for ESA.

The updates of the Project, Cost, Schedule, Risk Management, Contract Packaging, and Technical Capacity and Capability Plans will document the changes called for by the incorporation of the MTACC Six-Point Plan for ESA to reduce future programmatic risks. MTACC issued updated drafts for the CMP, SMP, and RMP in December 2018 as well as the CPP in January 2019. Updates for the PMP and TCC are expected to follow in the early Q22019 timeframe.

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

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 sufficient to adequately 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 and deficiencies 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 and increased costs.
- Processing and approval of construction contract modifications is taking too long and this creates cost and schedule impacts. The PMOC acknowledges recent improvements in this area, but continued effort is required to continue to reduce approval times.

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 Q1 2019. 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 performance of the new ESA project organization and operation through Q1 2019 has demonstrated where adjustments are needed. ESA continues to evaluate and adjust processes to improve its effectiveness in achieving identified program goals.

b. Staffing

During March 2019, the Senior Vice President Program Executive Harold Systems and Start-Up announced his retirement effective July 1, 2019, and the Program Manager Systems left the project. Replacements have not been named for either as of the end of March 2019.

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, VS086, CS084, and CS086 contracts and timely processing and approval of construction contract modifications may require additional staffing adjustments.

The PMOC does note, however, a new issue that may become a concern in the near future. It is unclear yet what the ESA vendors' reactions are going to be to the letter that MTA issued on February 22, 2019, titled, "MTA Enterprise-Wide Cost Reduction Initiative", which unilaterally directed all ESA professional service vendors to reduce their direct labor costs by 10%. It is possible that this issue, depending on the individual vendors' responses, could result in salary reductions for ESA professional services personnel under contract to MTA. If that occurs, it could correspondingly lead to a loss of critical staff personnel.

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 June 2014, 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 designs; 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 can be obtained in the 2020–2024 Capital Plan, the ESA program is working with an interim budget of $10,335 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 is planning to update the PMP during Q2 2019 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 schedule contingency drawdown plan and hold point values in December 2014 as required by the ELPEP agreement.

The ESA program IPS 114 has a February 14, 2022 Target RSD, which has remained unchanged since IPS 111. The program level schedule contingency is 302 CDs, which is 27 CDs above the 275 CD ELPEP minimum and 692 CDs less that 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, which resulted in the creation of an Issues Contingency activity. The Issue Contingency, having a 10.2-month duration, is assigned to contract CS179 and drives its substantial completion date. b(4) [redacted]

the PMOC's opinion, the resolution of these issues could likely consume a significant amount of the remaining 36 months to the target RSD.

The controlling work on the critical path for the ESA program, as reported in the IPS, continues to change almost every month, between Contracts CM007 and CM014B. ESA continues to revise and update the IPS with new activities, milestones, and logic, which contributes to a lack of defined critical path work. ESA has noted that this will likely continue to occur until negotiations between ESA and Contracts CS179, CM014B, CM007, and CS084 are complete.

b. Cost

In June 2014, 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 forecasted 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 requirements 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, the ESA program is 84.7% bid ($9,432.2 million awarded) and 76.5% complete ($8,518.4 million invoiced). Total ESA program contingencies are $724.2 million (allocated plus unallocated). Since the ESA July 2018 MPR, the PMT calculates summary progress as a percentage of the $11,133 million ESA program April 2018 EAC forecast.

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 retained the December 2022 Public RSD. The PMOC notes that the new EAC exceeds the amended FFGA BCE by $211 million (1.9%). The MTACC reassessment held both the December 2022 Public RSD date and the amended FFGA Revenue Operations Date. The MTACC has discussed the forecast with the FTA and is planning to issue a draft recovery plan for the ESA program in May 2019. b(4) [redacted]

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 and one potential new issue.

1.5 Safety and Security

a. Safety and Security Certification Process

The Q4 2018 Operational Readiness Briefing was delayed and held on February 12, 2019. The status briefing for Q1 2019 (January thru the end of March 2019) has yet to be scheduled. During Q4 2018, 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.

b. Project Construction Safety Performance

Through February 2019, 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 CY2019 project wide ratio of 1.09 versus 1.5 (2019 BLS average) lost time accidents per 200,000 work hours. The ESA recordable ratio for CY2019 was 1.09 versus 2.5 (2019 BLS average). ESA safety performance for February 2019 was 1.15 lost time and 1.15 for recordable injuries.

c. Security

ESA did not report any significant security issues in its ESA January 2019 MPR.

1.6 Project Quality

Quarterly Quality Oversights (QQOs): The Q1 2019 QQO audits completed by ESA include: CM007 [for Q42018], audit rating 91%.

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 March 2019 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 3 quality issues:

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

<u>Long Island Rail Road</u>

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 Q1 2019, several key ESA issues involving LIRR continued to challenge the project:

- The Qualification Testing (QT) of the Special Trackwork Direct Fixation Fastener (STDFF) assemblies re-started after receipt of replacement units; testing is behind schedule.
- LIRR review of quality issues with as-built locations of track monuments traction power duct turn-up concrete pedestals installed by previous construction contracts.
- 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 March 31, 2019, completion and approval of all 10 Control System final designs is 35 months late compared to the original contract baseline schedule.
- Fabrication of some CS084 equipment is only partially complete, as it is still missing PLC equipment installations. Once all the issues regarding PLC programming are resolved, this equipment will need to have the PLC equipment installed. The installation of the PLC equipment, either at the ESA field locations or in the contractor's factory, will depend on the timeliness of implementation of the resolved issues and the execution of any contract modifications that may be necessary.
- 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. MTACC reported the following as of February 25, 2019:
    - FRA has apparently not commented on the LIRR revised PTC implementation schedule.
    - FRA approved the LIRR test waiver for Harold Interlocking and Construction Zone Transponders will be used in the interim.
    - MTACC and LIRR will coordinate installation of PTC in Harold to mitigate risks to the remaining ESA construction work in the interlocking.
    - MTACC concludes that there is currently no known risk to the ESA Program due to this issue. Accordingly, the PMOC will delete this risk as a concern going forward.

- The required PTC design changes for the associated ESA Contracts VS086, CS086, and CS179 cannot be finalized until LIRR completes the PTC design, which remains incomplete and is now over 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.
- 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 Q1 2018; burn-in/final LIRR acceptance period started Q4 2018). **Accomplished February 17, 2019**.
  - 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 Q3 and Q4 2018). Work started in Q4 2018; **Accomplished March 17, 2019.**
  - The PMOC observed that LIRR successfully accomplished all of the planned goals for calendar year 2018 (as of March 31, 2019) without impacting the Harold Interlocking sub-program longest schedule path. Since all work has now been accomplished, the items listed are no longer project risks. As a result, PMOC will no longer report on the 2018 LIRR direct construction work.

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 historical 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, categorized as Regional Investment, not specifically required for LIRR operation into GCT. Through March 2019, 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 l and Line 2 that were damaged by Superstorm Sandy in 2012, but later postponed it until 2025. During March 2019, MTACC indicated that Amtrak may advance ERT Line 2 reconstruction to 2023, although this has not been formalized yet. 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 required 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's concern is based on Amtrak's historic reactions to service disruptions in the tunnels which have resulted in suspending ESA Harold work until service disruptions are resolved.

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 planning and decision-making. This has been very useful in enabling ESA to better execute planned work in Harold Interlocking. Historical force account resource shortcomings, particularly with respect to direct construction work for all of ESA's daily requirements, challenged the current Harold schedule through Q2 2018, and have caused changes and delays outside of MTACC's direct control. To address this, ESA worked with both LIRR and Amtrak to develop 3rd party contracts (e.g. CH057D and CH063) specifically designed to address force account shortcomings. Through Q1 2019, this approach has allowed ESA to complete the NEQ, SEQ, and "B/C Tunnel Approach Structure Prep" aspects of its program and to complete execution of the entire 2018 ESA track work program. Nonetheless, 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, and it successfully completed its commissioning process during February 2019. As a result, Consolidated Edison's (ConEd's) participation to energize the substation is complete.

b(4)

[redacted]

1.8 Local Funding

a. MTA/New York State (Capital Plan)

MTACC apprised the MTA board at the April 2018 meeting of a new forecast EAC to complete the ESA program in the amount of $11,133 million. The MTA approved additional local funds in Budget Amendment 3 (2015-2019 Capital Plan) to increase the ESA program funding to a total of $10,335 million, which is sufficient for MTACC forecasts through December 2020. In 2019, MTACC will request further additional local funds in the 2020-2024 Capital Plan to provide a total of approximately $11,133 million for 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 future funding 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 Q4 2017. 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. The 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. Risk mitigation efforts are focused on activities through the current ESA Program critical path along the Manhattan/Systems schedule path [redacted] MTACC plans on completing a comprehensive risk review of the ESA project once agreement is reached with the CS179 contractor regarding the Integrated System Test plan, which will serve as the primary basis for the ESA Program schedule through revenue service.

2.0 PROJECT SCOPE

2.1 Engineering/Design and Construction Phase Services

In the ESA January 2019 MPR, the PMT reported the overall Engineering effort as 85.7% complete compared to planned completion of 86.0%. Since the ESA July 2018 MPR, the PMT calculates summary engineering progress as a percentage of the $871.8 million April 2018 engineering EAC forecast.

Status of Construction Packages Advertised

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. RFQ advertised online on January 4, 2019 and proposals were submitted on March 13, 2019.

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. Construction work commenced during Q4 2018 and continued through March 2019.

FQA33A, Mid-Day Storage Yard Facility – Amtrak F/A, includes provision for west end yard access to the Amtrak mainline through a connection from Sub 4 to Line 2. As a result of the approval that MTACC received from the CCC in March 2019 (as described in FQA33B below), this option has been deferred indefinitely.

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

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 originally expected to complete the PTC design by March 31, 2018, but this was not achieved. The PTC design was not completed as of March 31, 2019.
- The GEC has prepared initial scope design modifications to Contracts CS179, VS086, and CS086, which will provide for the LIRR designed PTC overlay onto the ESA systems. The GEC has provided LIRR with the proposed changes for PTC on these contracts 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.

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 Q1 2019, is 35 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 Q1 2019. Further, the contractor continues to contend that the resolution of a number of NOCs submitted, but still unresolved, could further impact design completion and is continuing to impact progression of equipment and rack fabrication.

CS084 Tunnel Systems Package 4 – Traction Power:

Design work for equipment needed under the CS084 contract is, with the exception of SCADA, PLC equipment and some bus ducts, essentially complete and the approved designs were released for fabrication of the equipment. Design work for the SCADA/PLC equipment remains as an on-going item with no forecasted completion date identified. The CS084 contractor 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, impacting the completion of bus duct design, access to work sites, and installation of equipment.

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 for the addition of PTC to the VS086 signal system design cannot be accomplished until the LIRR completes its design of PTC and a contract modification is developed and issued to the VS086 contractor. LIRR contends that it cannot finish its PTC design until the VS086 Application Logic for the GCT-3 and GCT-4 Interlockings is approved. In Q1 2019, the contractor submitted the Application Logic designs for the two interlockings, but LIRR rejected them. The contractor has asked for a meeting to resolve the comments

on the Application Logic submittals. Another major design issue was identified in Q1 2019, that of "light-out" protection for the signal system. LIRR rejected the contractor's design approach for this portion of the overall signal design, indicating that the proposed methodology used to provide this protection is not what it wants. The contractor contends that its approach is in compliance with the contract requirements and that the proper protection is provided with its current design. The contractor has indicated that any revision that may be required will cause a significant impact to the completion of the signal design and major changes to Application Logic for the various interlockings. This issue is now being discussed internally within the MTA to determine if a change in design is warranted.

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 updating and 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, CS084, and CS086 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 efforts to resolve issues related to Systems design reviews with GEC and LIRR management; however, more improvement and continued focus is needed. The PMOC anticipates that the revised project organization and operation will show process improvements that address these concerns. **[Ref: ESA-125-Sep16]**.

2.2 Procurement

The ESA January 2019 MPR shows that total procurement for the ESA Program is 84.7% complete, with total awards at $9,432 million. Since the ESA July 2018 MPR, the PMT calculates summary procurement progress as a percentage of the $11,133 million April 2018 ESA program EAC forecast.

Status: The current active procurements during Q4 2018 include:

- 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. RFQ advertised online on January 4, 2019; documents were originally due on February 27, 2019, but MTACC extended the deadline to March 13, 2019, due to many vendor questions. MTACC received several proposals which it continued to review during the remainder of March 2019. MTACC intends to progress this procurement to the next step in April 2019, although it had not forecasted a specific date as of the end of March 2019.

Concerns and Recommendations:
MTACC updated the Contract Packaging Plan and submitted Revision 13 in January 2019. This update needs to account for all of the remaining third-party contracts and railroad force account packages, along with all anticipated scope transfers and a procurement timeline.

2.3 Construction

The PMT reported in the January 2019 MPR that the total construction progress reached 79.7% complete compared with 80.3% as-planned. Since the ESA July 2018 MPR, the PMT calculates summary construction progress as a percentage of the $8,014 million April 2018 construction EAC forecast. 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%	6/3/17	3/30/19	1
	nc	nc	nc	nc	nc	nc	nc	nc	+58 cd	
	361.6	350.2	11.4	346.0	356.0	100.0%	98.8%	6/3/17	1/31/19	
CM007	712.3	664.8	47.5	421.0	722.5	74.0%	63.3%	1/28/20	5/7/20	
	nc	+2.2	(-2.2)	+13.3	(-1.3)	+16.5%	+1.8%	nc	+30 cd	
	712.3	662.6	49.7	407.7	723.8	57.5%	61.5%	1/28/20	4/7/20	
CM014B	484.7	466.8	17.9	321.7	584.2	97.3%	68.9%	11/26/18	11/10/20	
	nc	+0.1	(-0.1)	+7.6	+31.5	+2.2%	+1.6%	nc	+13 cd	
	484.7	466.7	18.0	314.1	552.7	95.1%	67.3%	11/26/18	10/28/20	
VM014	46.9	34.9	12.0	27.2	48.7	NA	78.0%	10/25/19	3/23/20	
	nc	nc	nc	nc	+0.6	NA	nc	nc	nc	
	46.9	34.9	12.0	27.2	48.1	NA	78.0%	10/25/19	3/23/20	

Notes: Costs in millions; line 1 = current value; line 2 = period change; nc = no change; and, line 3 = prior value.
Please refer to the contract narratives for additional information.
1. Substantial completion not declared.

CM006 – Manhattan North Structures

Schedule: The ESA January 2019 MPR projects Milestone MS#3, Substantial Completion (SC), by March 30, 2019, and MS#4, Final Completion, by June 28, 2019. Substantial Completion was not achieved as of March 31, 2019.

Construction Progress: The CM006 contractor continued the following activities in March 2019: minor base contract work and open NCR work. Sixteen NCRs remain open. Remediation of remaining water leaks will be transferred to contract CM007. ESA and contractor upper management continued to meet regarding the Substantial Completion date.

Observations/Analysis: SC remains pending completion of all base contract work and open Non-Conformance Reports (NCRs).

Concerns and Recommendations: Forecast SC and FC dates continued to slip.

CM007 - GCT Station Caverns and Track

Schedule: The ESA January 2019 MPR projects Milestone #4 (Track & 3rd Rail Work Complete) by December 26, 2019 (-141 CDs; the TIA/recovery schedule is still under review); Milestone #5 (Substations US1 and US2 Complete) is forecast for March 22, 2019 (-21 CDs; not achieved and likely to be delayed again); Milestone #5A (Caverns Ready for Integrated Systems Testing) is forecast for October 30, 2019 (-84 CDs); Milestone #6 (All Caverns and Tunnel Work Complete) is forecast for May 7, 2020 (-142 CDs); and, Milestone #6A (Substantial Completion) is forecast for May 7, 2020 (-99 CDs).

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

GCT 6: Ramp access to allow hi-rail equipment to get on track for access to cavern and tunnel areas via lower level track was constructed.

East Cavern: Continued lower level light fixture installation; Continued lower and upper level platform and mezzanine level topping slab placements; Continued track curb construction; Continued mezzanine level sprinkler piping; Continued steel framing for walls, stairs and escalators; Continued installation of escalator 53 and installation of elevator 18.

West Cavern: Continued lower level light fixture and mezzanine level electrical installation; Continued steel framing and painting for walls, stairs, elevators, and escalators; Continued installation of elevators 8 and 19, and installation of escalators 62, 63, and 64.

Track: Continued track construction in the upper level Caverns and lower level Tunnel Track; Continued third rail installation. Continued turnout construction. Continued qualification testing of Special Trackwork DFF assemblies. As of March 24, 2019, ESA reports overall Track Construction at 51.9% completion.

Architectural Elements: Through March 31, 2019, Architectural Wall work was approximately 14.9% complete. Work includes framing for gypsum board walls and application of CMU filler/primer. Architectural Ceiling progress was at approximately 15.4% and includes acoustic ceiling, unistrut grid support system for drop ceiling panels, and continuous framing for cove panel ceilings. Architectural Floor progress was approximately 15.4% complete and consisted of installation of 6"x6"wire reinforcing and placement of 4,000 psi topping slab at various levels.

MEP – Mechanical: Through March 31, 2019, HVAC duct progress was 78.2% complete. HVAC piping progress was 75.3% complete.

MEP – Fire Protection (FP) and Plumbing: Through March 31, 2019 FP progress was 69% complete. Plumbing progress was 93.1% complete.

MEP – Electrical: Through March 31, 2019 electric conduit installation was approximately 62.4% complete. Electric fixtures were approximately 16.8% complete.

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

Concerns and Recommendations: The PMOC is concerned about the length of time it is taking ESA and the contractor to negotiate a revised CPM schedule that includes resolution of outstanding track and systems issues. The PMOC recommends that the parties complete this negotiation as soon as possible to avoid unnecessary delay to the project.

CM014B – GCT Concourse & Facilities Fit-Out

Schedule: In its January 2019 MPR, MTACC reports that January progress was 0.0% vs 0.6% planned. Cumulative was 69.0% vs 97.3% planned.

Milestone #5 (44th Street Vent Building) originally June 4, 2017, now December 31, 2018, although not achieved. CS179 continues joint occupancy. The CCM has advised the PMOC that declaration of Substantial Completion and turnover of the facility to CS179 is pending.

Milestone #7 (50th St. Vent Building) January 27, 2018, now February 3, 2020, due to the required revisions to the Pump Room layout.

Milestone #8 (Substantial Completion) August 18, 2018; then July 27, 2020; now November 10, 2020.

Through March 26, 2019, the structural steel erection was 75% complete by piece and 69% by weight. As previously reported, this work is proceeding very slowly and is impacting the schedule and the CS179 contract. Cumulative metal deck progress was 28% complete. CMU work is complete.

Construction Progress: Electricians continued with installation of Secondary Switchgear for B-20 Substation breaker and controls, rough-in, and overhead racks. Plumbers continued installation of domestic water piping and gutter drains throughout the Concourse. Installation of seismic angles continued in Zones. 1-4. Mechanical work continued with the installation of AHU/FCUs in available area ducts and 8" sprinkler main**.** Installation of the marble stone wall finish is ongoing in public areas from south to north. Installation of the suspended ceiling system continued throughout the Concourse from south to north.

Biltmore Connection: Current work includes installation of beam 4005-175A, construction of track level partition and dance floor at Track 39, and delivery of temporary and permanent steel. This work continues on the tertiary critical path for the contract.

Wellways: In the Wellways, escalator maintenance is ongoing, one day every 2 months. In Wellway #1, installation of the glass tile curtainwall continued. Installation of the stainless steel (SS) reveals nears completion. In Wellway #2, sprinkler splices near completion. In Wellway #3, Machine Room installation and escalator build up continued and are scheduled to be completed in June 2019. In Wellway #4, Machine Room installation and escalator build up continues and are scheduled to be completed in May 2019.

47th Street Cross Passage: At Elevator #13, installation continues. Preparations are underway for the removal of a section of the MNR Express Track for the construction of the area needed to install Escalator #32 into the cross passage.

50th Street Vent Facility: The Vent Building continued in full fit-out mode. Work includes installation of ceilings in select rooms, installation of CMU walls in 1st Basement Level, and punchlist work.

b(4) [redacted]

Observations/Analysis: The PMOC observes that the work to bring a new entrance into the Concourse, by a separate contractor, from the new 1 Vanderbilt Building at East 42nd Street and Vanderbilt is ongoing.

Concerns and Recommendations: b(4) [redacted]

VM014 –Vertical Circulation Elements (Escalators & Elevators)

Schedule: In its January 2019 MPR, MTACC reports that January 78% of the contract value was invoiced and 74.5% paid. 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 March 18, 2019, 3 of the 6 elevators and 8 of the 16 escalators have been delivered to the site; 3 escalators are in storage, 2 are in transit, and 3 will be delivered the end of March 2019. 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). EL #22 (Biltmore Connection) delivery is scheduled for May 2019.

Construction Progress: CM014B Installation - The contractor is working on an accelerated schedule to complete Elevators #1 and #2. This will allow for removal of the Alimak in Shaft 5. At Elevator #17 (TMC), hoistway equipment installation continues. The Rigging Plan is submitted for Escalators #1 and #2 (Biltmore). In-Contract Maintenance – Elevators #9, #12, and #21, Escalators #30 and #31.

CM007 Installation - Elevator #6 moving platform is complete and the CM007 contractor is completing shaft work. Mobilization began for Elevator #8. Hoistway mechanical/electrical work is ongoing at Elevator #18. Elevator #19 cab is installed. Anticipated completion of door installation is April 1, 2019. Trusses are installed for Escalator #55. Bolt torque tests are underway. In-Contract Readiness Review for Escalator #59 was completed on March 6, 2019. Balustrade installation is underway at Escalator #60. Bolt torque test complete at Escalator #61.

Observations/Analysis: Throughout the course of this contract, there have been alignment issues with the various elevator accessways/shafts constructed by other contractors. This has resulted in the CM014B vertical circulation work falling considerably behind schedule for 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 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	261.8	263.7	100.0%	99.8%	9/6/16	3/31/19	1
	nc	nc	nc	+0.3	nc	nc	nc	nc	nc	
	265.4	262.2	3.2	261.5	263.7	100.0%	99.8%	9/6/16	3/31/19	
CQ033	325.0	311.7	13.3	173.3	345.7	61.6%	55.6%	8/10/20	4/4/21	
	nc	+3.6	(-3.6)	+10.9	(-1.2)	+4.4%	+2.9%	nc	+48 cd	
	325.0	308.1	16.9	162.4	346.9	57.2%	52.7%	8/10/20	2/15/21	

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

1. Substantial completion not declared.

CQ032 – Plaza Substation and Queens Structures

Schedule: The ESA January 2019 MPR projects Milestone MS#6, Substantial Completion (SC), during Q2 2019, and forecasts Milestone MS#7, Final Completion, by June 30, 2019.

Construction Progress: The CQ032 contractor continued the following activities in March 2019: work regarding closure of Non-Conformance Reports (NCRs), work to eliminate water infiltration conditions, punch list items, and other commercial items. Completion of water remediation work may

be performed under another contract. Of concern remain eight NCRs related to tunnel duct bench remediation of as-built track clearance deviations. Remediation details are under GEC review, and the contractor will provide a corrective action plan to address bench installation discrepancies.

Observations/Analysis: SC remains pending completion of all open NCRs.

Concerns and Recommendations: Forecast SC and FC dates continued to slip.

CQ033 – Mid-Day Storage Yard Facility

Schedule: MTACC reports that Milestones MS#1, MS#2, MS#3, and MS#4 have been achieved. Milestones MS#4A (Start Integrated Testing), MS#5 (YS Track Completion), and MS#6 (Substantial Completion) are impacted by the delay of Access Restraints AR#1 and AR#2. AR#1 requires Amtrak to remove rail located at the west end of the Mid-Day Storage Yard (MDSY). AR#2 requires the installation of new catenary poles and Amtrak wire transfers, and pole locations are obstructed by an Amtrak signal trough. The contractor requires both AR#1 and #2 to install underground duct banks to complete the YS Track, followed by Integrated Testing. The ESA January MPR projects Milestone MS#6 Substantial Completion (SC) for April 4, 2021, -237 days.

Construction Progress: The contractor continued the following activities in March 2019: water, fire line, and storm pipe installation. Other activities: Car Appearance Maintenance (CAM) platform work, foundation construction for Storage and Toilet Service Buildings, Track underdrain installation, Yard Lighting construction, catenary structure work, duct bank construction, and traction power cable pulls. Work at Tunnel D approach continued: piles, excavation, lagging. Track and turnout construction started mid-March 2019 for the new Arch Street Track; Ballast and sub-ballast placement continued. Preparations for roof installation of the Pedestrian Access Bridge continued. Preparation work for CIL building installations continued.

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. To mitigate delays, the contractor has worked out of sequence tasks to reduce critical path impacts. A contract modification was approved to re-sequence the Mid-Day Storage Yard track construction to reduce schedule impacts.

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	590.8	16.2	473.7	658.2	86.5%	80.2%	7/1/20	11/25/21	1
	nc	+4.8	(-4.7)	+5.7	+6.6	+5.0%	+0.4%	nc	nc	
	606.9	586.0	20.9	468.0	651.6	81.5%	79.8%	7/1/20	11/25/21	
CS084	79.7	73.8	6.0	21.8	83.2	91.6%	29.5%	12/2/19	4/15/21	1
	nc	+0.1	nc	nc	nc	+6.5%	nc	nc	(-8 cd)	
	79.7	73.7	6.0	21.8	83.2	85.1%	29.5%	12/2/19	4/23/21	
CS086	60.9	53.0	7.9	0.5	60.9	TBD	0.8%	2/21/21	2/21/21	
	nc	nc	nc	+0.5	nc	NA	+0.8%	nc	nc	
	60.9	53.0	7.9	--	60.9	nc	nc	2/21/21	2/21/21	
VS086	21.8	19.9	1.9	14.8	21.8	NA	74.2%	10/14/19	12/23/19	1
	nc	nc	nc	+1.3	(-0.3)	NA	+6.5%	nc	+34 cd	
	21.8	19.9	1.9	13.5	22.1	NA	67.7%	10/14/19	11/19/19	
VH051	30.2	29.7	0.5	29.6	30.2	NA	99.7%	4/30/15	7/13/21	
	nc	nc	nc	nc	nc	NA	nc	nc	+43 cd	
	30.2	29.7	0.5	29.6	30.2	NA	99.7%	4/30/15	5/31/21	

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

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

CS179 Systems Package 1 – Facilities Systems

Design Progress: The backlog of needed reviews and decisions continues to remain as a serious issue and contributes to delay of change orders needed to progress work and to facilitate the design completion of the Control and Non-Control Systems. MTACC management indicates that 8 of the 10 Control system final designs (FDs) are approved. As of the end of Q12019, the completion and approval of all 10 Control System final designs is 35 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, and complete, 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 and, in Q1 2019, another potential Buy/Ship America issue was identified and is under further investigation. (See Appendix G for details).

Construction Progress: In Q1 2018, 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. Testing of installed equipment (e.g., ventilation fans) and splicing and termination of fiber optic cables also occurred. 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. However, some progress on resolving these issues is being made as a result of decisions rendered at weekly coordination meetings between the CS179 and other affected contractors. The contractor continues to advise MTACC that the numerous open SWOs (19 as of the end of Q1 2019) and access restraints (due to water infiltration, as-built site conditions, etc.) 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 Q1 2018, MTACC identified the need to implement Integrated Systems Testing (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. The Incremental IST was previously forecasted to commence in September 2018 but, as of the end of Q1 2019, this has not occurred. Presently, MTACC indicates that a recovery schedule that contains a revised testing plan for the Systems equipment will be presented to the MTA Board in April 2019 for approval. **[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, and about the outcome of the evaluation of the newly identified potential Buy/Ship America issue with the small ventilation fans. 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. The progress percentages presented in the table are based on actual versus projected costs, not physical design or construction efforts. MTA's approval of a comprehensive system test plan, including any Incremental Integrated Testing of the Systems, remains as an open issue. The continuing delay in the start of the IST, along with an uncertainty that any proposed Incremental IST Plan will work, or that an agreement by all parties on the implementation of any proposed Incremental IST Plan has been made, raised 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, the electrical sub-contractor, the systems integration sub-consultant, and other contractors installing systems-type equipment 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; a trend that has been noted 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 continue to be delayed and the actual work completion percentages in the Table relative to the physical progress of work on the contract will continue to lag the planned progress values. As of the end of Q1 2019, the contractor had 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 installation.

Design Progress: The contractor continues to assert 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

continue between MTACC and the contractor to determine the logistics of this installation work, as the contractor asserts this is unanticipated extra work. Work progress is also being hampered by the need for additional design work 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 Q1 2019, 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. That list (See Appendix P) is updated each month and discussed at the monthly progress meeting. MTACC indicated that it is planning on addressing many of these outstanding concerns through the use of a newly instituted Field Modification procedure that is intended to streamline the contract modification process. MTACC continues to advise 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. The coordination of C01/C02 substation equipment deliveries with the installation of track throughout the tunnels and in the tail track area, an issue that can potentially impact the schedule, remains unresolved. Other significant issues regarding 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 Q1 2018 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 related to 2 of the 18 required substation transformers (those for the C03 and C05 substations) in which there were 3 failures related to foreign debris in the windings while undergoing hi-pot testing. The contractor replaced all of the high voltage windings in the C03 and C05 transformers, but only the C05 transformer passed its second hi-pot test. After the 2nd failure of the C03 transformer, the contractor replaced all of the windings (high and low voltage) in the C03 transformer and it is scheduled for the next high-pot test in April 2019. As previously reported, during Q3 2018, an additional quality-related issue was identified; that of potential damage to the 26 MTA-supplied inductive reactors. In Q4 2018, the contractor accepted two of the reactors and installed one in 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. Significant schedule impacts could result if LIRR rejects the transformers built before the test failures and/or if any of the remaining 24 inductive reactors is determined to be unacceptable for use. **[ESA-130-Sep18]**

In Q4 2018, 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 monuments on this contract and, of the 63 monuments that were inspected as of the end of Q12019, only 13% of them were constructed in accordance with LIRR standards.

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 modification of the fabrication process for 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 many 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

At present, there is no approved contract schedule by which MTACC or the PMOC can accurately gauge progress on this contract. The progress numbers shown in the chart above represent progress as a function of invoiced costs rather than physical progress of the contract work. MTACC acknowledges that another schedule milestone modification to this contract is needed but is waiting to perform that action until the scope of work for addition of PTC to the contract work is established. That scope of work cannot be completed until the LIRR's PTC design is completed. The addition of a requirement to include PTC design as part of the VS086 contract work will extend the contract completion date and increase the cost of the contract.

Design Progress: During Q4 2018, 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 six (6) of the equipment racks occurred in transit and the CS086 contractor refused to accept those racks. Three of the six racks were severely damaged and the other three had minor or just cosmetic damage. In Q1 2019, the VS086 contractor transported the damaged equipment back to its facilities to completely replace the three severely damaged racks and make repairs to the other three racks. All six of the repaired/replaced racks were delivered to the MTA by the end of Q1 2019. The Factory Acceptance Test (FAT) for the GCT3 Interlocking equipment was performed in February 2019 and the equipment was delivered at the end of March 2019. The FAT for the GCT4 Interlocking equipment is scheduled to take place in April 2019. A Factory Integrated Acceptance Test (FIAT) is performed after the FAT to test 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 design issues continue to 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. As noted above, MTACC has yet to incorporate PTC into this contract to meet FRA requirements. Discussions between the parties continue on the other three design issues, with no forecasted completion/resolution dates identified.

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 the forecast contract and MTACC schedule completion dates.

CS086 Tunnel Systems Package 2 – Signal Installation

In Q1 2019, MTACC advised the contractor that, while the activities noted in its Baseline Schedule were approved, the contractor still needed to submit cost breakdowns to achieve full approval of a Baseline schedule. The first monthly schedule update submitted already shows a three-month delay to the baseline schedule based on the contractor's contention that existing site conditions are preventing the it from commencing work as it originally planned.

Work Activities: In Q1 2019, the contractor began surveys of the various work sites to determine the condition of sites and if access for work was possible. While a completed list of site issues is still being prepared, numerous issues regarding site accessibility and equipment layouts have already been identified by the contractor as possible items delaying its commencement of work on the contract. Issues noted thus far include water infiltration, equipment layout conflicts, and other obstructions inconsistent with existing contract drawings. MTACC previously indicated that a significant amount of revised or additional contract drawings would be forwarded to the contractor to address additional requirements to the CS086 contract; however, those documents have yet to be provided. The contractor indicates that it cannot procure some materials (e.g., signal cables) until it has a full understanding of the total amount of work required for this contract; therefore, material procurements are being held until the additional documents and contract requirements are made available. The contractor continues to request as-built drawings and equipment assembly and testing instructions from the VS086 contractor.

Harold Interlocking Contracts

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

	Current Budget	Appr'd Contract	Rem Budget	Invoice Cost	EAC	Planned Comp	Invoice Comp	Current BL SC	Forecast SC	Notes
CH057D	29.6	23.0	6.6	18.9	30.5	99.4%	82.4%	1/31/19	3/30/19	
	nc	+0.2	(-0.2)	+3.7	(-0.2)	+11.1%	+16.0%	nc	+27 cd	
	29.6	22.8	6.8	15.2	30.7	88.3%	66.4%	1/31/19	3/3/19	
CH058A	68.7	62.4	6.4	2.7	75.0	TBD	4.3%	3/17/21	3/17/21	
	nc	+2.2	(-2.2)	+2.2	+3.3	NA	+3.5%	nc	nc	
	68.7	60.2	8.6	0.5	71.7	TBD	0.8%	3/17/21	3/17/21	

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

CH057D – Harold Trackwork Part 3

Construction Progress: During March 2019, the CH057D contractor installed the east end of the #3121 Crossover, which completed construction of the east end of the Westbound Bypass (WBY) Track (the west end will be completed by a future contract). The contractor also completed removal of the Westbound LIRR Freight Track, thus allowing the CH058A contract to begin construction. Milestone #8, Substantial Completion for CH057D, was achieved on March 10, 2019, after which the contractor continued to surface track and flash butt rail ends in the NEQ, SEQ, and Tunnel B/C Prep Quadrants.

Observations/Analysis: The PMOC observed that ESA and the contractor continued to work very well together through Q1 2019 and the parties were able to accomplish all goals set for them, including completion of WBY construction, removal of the LIRR Westward Freight Track, and achievement of Substantial Completion.

Concerns/Recommendations: The PMOC currently has no concerns about or recommendations for this contract.

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

Construction Progress: During March 2019, the contractor continued mobilization activities, completed clearing and grubbing throughout the worksite, and removed all four B-931 catenary structures including K-frames. The contractor was able to achieve Milestone #1, Obtain Underpinning Design Approval from NYCDOT, 4 months early in January 2019. Additionally, contract Access Restraint #1, Access to B/C Approach Work Site, was lifted 1 month early in mid-March 2019.

Observations/Analysis: The PMOC observes that the contractor and ESA PMT are working very well together, which has resulted in a rapid and smooth progression from mobilization into construction. The contractor appears well prepared to begin its first construction activity to underpin the 39th Street overhead bridge during April 2019.

During March 2019, ESA also announced that it intends to issue a contract modification to the CH058A contractor to begin installation of soldier piles and catenary structures for the East Approach Structure of the Eastbound Re-Route (EBRR) tunnel. The east end of the EBRR will be immediately adjacent to the west end of CH058A excavation. ESA believes that it will be more economical and less time-consuming for CH058A to do the work than a new contract would be. ESA also wants to have this work performed before Amtrak begins its work in the East River Tunnels in 2023.

Concerns/Recommendations: The PMOC has no concerns about this contract at present and recommends that the parties continue to work together to build on 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
FHA02	60.9	60.8	0.1	60.8	60.9	100.0%	99.9%	8/15/17	1/10/21	1
	nc	nc	nc	nc	nc	nc	nc	nc	nc	
	60.9	60.8	0.1	60.8	60.9	100.0%	99.9%	8/15/17	1/10/21	
FHL02	114.8	114.8	--	114.8	124.4	100.0%	100%	11/25/16	8/30/21	1
	nc	+1.6	(-1.7)	+1.6	+0.5	nc	+1.4%	nc	nc	
	114.8	113.2	1.7	113.2	123.9	100.0%	98.6%	11/25/16	8/30/21	

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

1. 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.

FHA02 and FHA03 Harold Early Stage 2 and Stage 3 – Amtrak F/A

Construction Progress: During March 2019, Amtrak Electric Traction (ET) personnel completed removal of all catenary wires over the LIRR Westward Freight Track that previously obstructed the start of CH058A's Tunnel B/C construction. Additionally, ET personnel began catenary re-configuration over Sub 3 and Sub 4 Tracks in "Q" Interlocking in support of Contract CQ033 Mid-Day Storage Yard construction. Amtrak C&S personnel continued limited installation of signal trough around the Loop Tracks between Loop and "T" Interlockings.

Observations/Analysis: During Q1 2019, Amtrak ET personnel were able to successfully progress direct force account catenary work on behalf of ESA in several locations, while at the same time providing sufficient personnel to meet all ESA Access and Protection requirements. While the PMOC believes that Amtrak will never be able to fully satisfy ESA ET personnel requirements, nonetheless Amtrak has been able to make significant strides in this regard. The PMOC further believes that Amtrak will be able to continue this improvement for the foreseeable future. ESA's announcement that it will advertise the CH063 contract will also provide additional relief to this historical issue.

Concerns/Recommendations: The PMOC no longer has any particular concerns about the Amtrak ET availability issue, although it will continue to monitor it closely. The PMOC recommends that ESA and Amtrak continue to work together to keep their construction momentum building.

FHL02 and FHL03 Harold Early Stage 2 and Stage 3 – LIRR F/A

Construction Progress: During March 2019, LIRR Electric Traction personnel continued to remove traction power equipment from the old G02 Substation to de-commission it, continued to install traction power and snow melting equipment to turnouts installed in the NEQ, SEQ, and B/C Prep Quadrants, and completed removal of 3rd rail on the LIRR Westward Freight Track for Tunnel B/C Approach Structure construction. LIRR Signal personnel continued to install snow melting equipment and signal apparatus to the NEQ, SEQ, and B/C Prep Quadrants, continued to make signal revisions in several of the Harold CILs, and completed removal of signal equipment on the LIRR Westward Freight Track.

Observations/Analysis: During March 2019, LIRR continued to work closely with the ESA PMT and the CH057D contractor to maintain the momentum that had been building since March 2018. LIRR's commitment and strong participation during the past year have resulted in the on schedule completion of all signal, 3rd rail, and trackwork for the NEQ, SEQ, and Tunnel B/C track reconfigurations that subsequently allowed the CH058A contract for construction of the Tunnel B/C Approach Structure to begin on time.

Concerns/Recommendations: The PMOC has no particular concerns about LIRR Force Account support of Harold construction at this time, but it will continue to monitor future work closely. The PMOC recommends that ESA continue to work closely with LIRR to build on the present construction momentum that the project has.

2.4 Operational Readiness

Status: The most recent quarterly update Operational Readiness (OPR) briefing, held on February 12, 2019, was for Task Working Group (TWG) status up to the end of December 2018. The next Quarterly update (Q2 2019) 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; and are based on information provided at the Q4 2018 briefing.

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. One element of the re-structuring was to establish a LIRR Senior ESA Transition Team to identify activities needed to implement and maintain ESA service. While a few members are in place, others are needed for this purpose and for the development of a revised Revenue Service Plan (RSP). MTACC previously advised that a revised ESA RSP was needed because certain infrastructure may not be available by the RSD and because Amtrak work might interfere with ESA work. A revised RSP could impact new railcar procurement and LIRR staffing and training requirements. At the Q4 2018 briefing, MTACC confirmed that, while final development of the revised RSP remained projected for the end of August 2019, a general hiring freeze is impacting MTA's ability to put a fully-complemented Transition Team in place which could

jeopardize the forecasted completion of the RSP. 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 IST Plan (incremental or otherwise), which is being developed by CS179. As of the Q4 2018 OPR briefing, the CS179 IST Plan remained under discussion, with no forecasted completion date available. However, MTACC recently indicated during the latest CS179 Monthly Progress meeting that a recovery schedule that included a revised IST Plan would be presented to the MTA Board for approval in April 2019. 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.

In September 2018, LIRR terminated the first M-9A procurement in order to issue a new procurement which included Locomotive Hauled Married Pair (LHMP) units and decommissioning of the existing M-3 railfleet in addition to the M-9A railcars. In October 2018, LIRR issued a new two-step RFP for procurement of M-9A vehicles, which included the additions noted above. LIRR received potential vendors' responses to step one of the new RFP, "Qualifications", on December 12, 2018, after which LIRR determined that there was sufficient competition to proceed to step two, "Cost/Schedule". This was issued in January 2019. LIRR originally intended to receive responses for step two during March 2019, but this was extended until April 17, 2019, due to the many vendors' questions it received. LIRR maintains that it will award the M-9A contract in June 2019.

Observations/Analysis: Until a revised procurement schedule based on the successful vendor's response is developed, it will not be possible to analyze the impacts that this delay in vehicle procurement may have on RSD. The PMOC believes LIRR's plan to award this contract in June 2019 is overly optimistic and that, in turn, it is likely that complete M-9A vehicle delivery will extend beyond RSD. If that does occur, LIRR and the MTA would need to determine how to begin revenue service without a full complement of M-9A vehicles.

Concerns/Recommendations: The PMOC is concerned that, given the nature and history of vehicle procurements, this one may also suffer setbacks similar to LIRR's original M-9A advertisement. Although the PMOC is encouraged that this procurement appears to be going smoothly so far, nonetheless, with only three months until June 2019, it is aware that it could take LIRR several additional months to formally execute a contract. The PMOC recommends that LIRR and the MTA do everything possible to award this contract in accordance with its projected schedule.

2.6 Property Acquisition and Real Estate

b(4) [redacted] 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 continued 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 January 2019 MPR indicates that Community Relations continued to notify adjacent property owners in Queens and Manhattan of future construction and overnight activities and street closures.

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 Q3 2018, but was delayed to late Q4 2018 and is now forecast to be issued during Q2 2019.

3.1 PMP Sub-Plans

MTACC is updating several 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 in use by ESA 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 and the CPP in January 2019.

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: MTACC submitted the new ESA Procedure PIP 4.01 on February 22, 2019.

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

4.0 PROJECT SCHEDULE

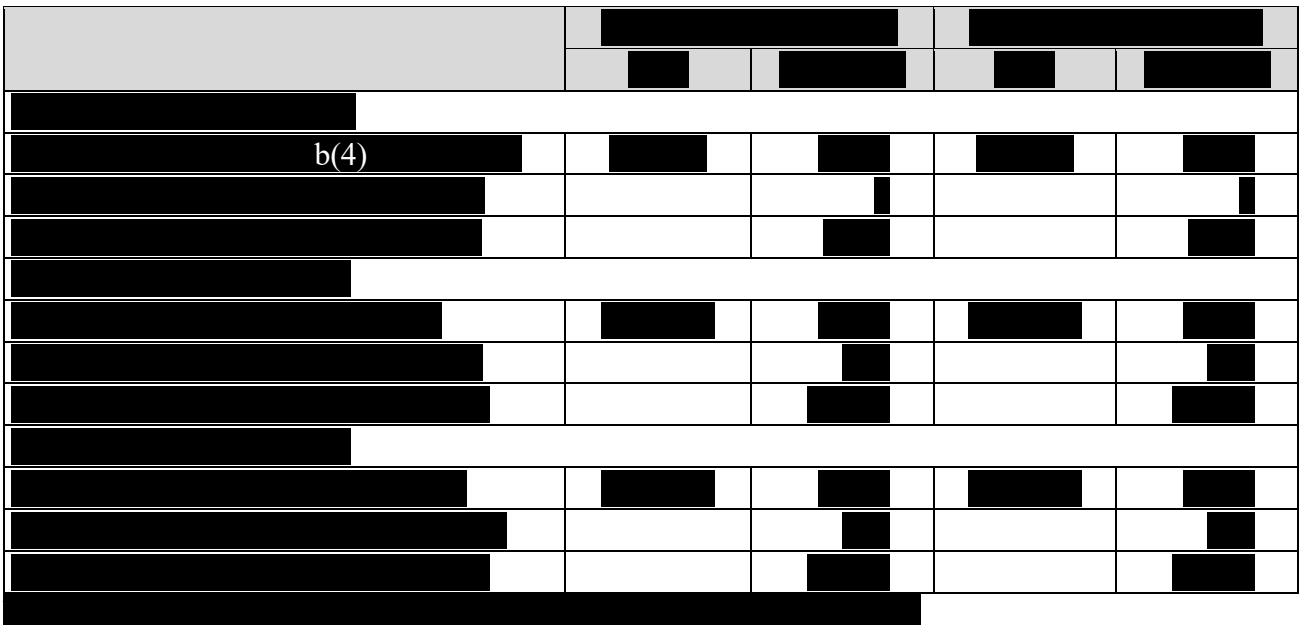
4.1 Integrated Project Schedule

The schedule information in this report is based on IPS 114 (data date February 1, 2019) and the IPS Progress Report. The forecast for the Target Revenue Service Date (RSD) remains February 14, 2022, and the Public RSD remains December 13, 2022. All IPS schedules prepared during Q1 2019 were prepared using the MTACC alternative IPS procedure.

In IPS 114, the Manhattan/Systems work path has no float and it remains the most critical path of the ESA program. As shown in Appendix F, ESA Critical Path Chart, the float on the paths through the three main ESA program work areas are: 1) Manhattan/Systems (no float); 2) Queens b(4)

Both the Target RSD and the Public RSD remained as previously forecast on February 14, 2022 and December 13, 2022, respectively b(4)

b(4)



4.2 Primary Critical Path

IPS 114 forecasts that the finish date for the Manhattan/Systems longest path is November 25, 2021 (no float), which is as it was forecast in IPS 111. During the intervening time, the scope that comprises the beginning of the path changed substantially from the GCT concourse in IPS 111, to the 45th Street entrance in IPS 112, to the B20 substation in IPS 113, and, currently, to the GCT caverns.

The Manhattan/Systems path now runs first through CM007 construction of west cavern upper level conduit and fixtures for communications, fire alarm, smoke exhaust, facility power, and ceiling finishes; then through CS179 construction of east cavern upper level conduit, wire, and local testing for communications systems, and completion of local testing for Phase 3 Zone 1. The path continues with Phase 3 Zone 1 IST of the BCS and interfacing systems to achieve the BCS IST milestone; followed by Phase 3 IST of the fire alarm system and interfaces to complete Phase 3 IST. The CS179 Issue Contingency comprises the final ten months of the Manhattan/Systems path, ending in November 2021. From 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 114.

Table 4.2 – Primary Critical Path

Activity Name	Duration	Start	Finish
CM007 - GCT Station Caverns and Track			
West cavern upper conduit, circuits for communications, FA, smoke, and ceilings	541	11-Jun-18A	3-Dec-19
CS179 System Package 1 – Facilities Systems			
East Cavern Upper conduit, wire, and Phase 3 Zone 1 local testing for communications systems to completion	228	3-Dec-19	17-Jul-20
GCT Phase 3 Zone 1 IST complete BCS interface testing	75	17-Jul-20	29-Sep-20
GCT Phase 3 IST for Fire Alarm complete	114	29-Sep-20	20-Jan-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.

Contract CM014B has activities that are 12 days off the critical path, including installation of: steel framing and decking; electrical panels and equipment; architectural finishes; conduit hangers and supports; conduit; fireproofing; and leak detection systems throughout the GCT concourse. Contract CS084 has work that is four 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 CO1 experienced the most delay, losing two to three months during Q1 2019. Other substations lost some time on earlier activities like equipment submittal approvals and fabrication, but only translated into a week delay to later activities such as installation, testing, and energization. There were also new activities added to the schedule for each substation, "Field Installation Layout Drawings."

The Manhattan/Systems path had 56 coordination point milestones in IPS 111 with dates scheduled for completion in the period from November 2018 to January 2019. A review of IPS 114 showed that of these milestones, 3 were achieved within the 3-month period, 8 were noted as having been achieved before the 3-month period, and 45 were rescheduled to dates after February 1, 2019. There is a risk that the lack of progress through coordination points will result in the need for more concurrent work in the period leading up to and during IST than had been planned, which may complicate and impede progress. (Refer to Appendix F, ESA Coordination Point Changes.)

Sub Program Longest Path – Queens

IPS 114 shows that the Queens (Mid-Day Storage Yard) work path became the second longest program path. The finish date for the Queens path is April 4, 2021, in IPS 114, a loss of 5-months from the November 2, 2020, date in IPS 111 and the float on the path decreased by approximately 4.3 months. Progress along the beginning of the Queens path continues to be constrained by CQ033 work necessary to resolve a conflict between an existing Amtrak signal trough and a planned catenary pole. Additionally, work was added to the schedule to relocate catenary wires at Q tower by Amtrak force account that pushed the AR 2 release date back approximately 4 months to mid-July 2019. The CQ033 contractor has performed work out of sequence to mitigate field issues that prohibit the installation of the AC/YS track to the Arch Street Shop. The Queens path then runs through CQ033 track and signal construction, cabling CILs and the battery Hut, testing, and commissioning; and ends on April 4, 2021, at the conclusion of Mid-day Storage Yard integrated systems testing. From the end of the Queens path, there are 40 calendar days of float to the LIRR FRA testing activity, which is followed by an additional 85 calendar days of float to the LIRR final testing activity on the ESA program critical path (Manhattan/Systems work). The total float on this path is 155 calendar days.

Sub Program Longest Path – Harold Interlocking

IPS 114 shows that the Harold Interlocking work path is the longest ESA program path. The Harold Interlocking work path concludes on July 13, 2021, in IPS 114, 49 calendar days later than the date of May 25, 2021, in IPS 111. This caused the float to decrease to 136 calendar days (48 calendar days less than the 184 calendar days in IPS 111). The Harold Interlocking path begins with force account and third party prep, track work, and catenary work to release AR 1 for CH058A 39th Street Track B/C Approach Structure construction until June 2021, followed by force account switch, signal, and cutovers through the end of July 2021. At the completion of construction, the Harold work path has 136 calendar days of float to the LIRR final testing activity, at which point the path joins the ESA program critical path (Manhattan/Systems work).

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 Q2 2019, as reported by the PMT.

Table 4.3 – Upcoming Contract Procurement Milestones

Contract Description	Advertise Date	Bid Date	NTP	Project Period	Substantial Completion
CH063 ET Catenary Work – 3rd Party	1/4/19 A	5/1/19	8/21/19	23 months	7/23/21

PMOC Observations, Analysis, and Concerns

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

[redacted] Concerns continue about the Manhattan/Systems work path. [redacted] b(4)

2. The PMOC has ongoing concerns about the schedule changes that resulted in shifts in scope on the Manhattan/Systems schedule path, which drives the ESA Program Critical Path. The fundamental issue is that the 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. MTACC and the contractors have completed the cost negotiations related to IST with CS179 and CM014B, and they are processing contract modifications whose execution they anticipate shortly. MTACC and the CS179 contractor agreed on a preliminary IST schedule, which will be incorporated in the IPS after execution of the contract modification. Retroactive modifications have been issued to overcome some of these delays.
3. The ESA program schedule contingency remains at 302 calendar days, which is only 27 calendar days above the minimum required FTA ELPEP schedule contingency. The ability of MTACC to maintain the FTA minimum until the next ELPEP hold point (95% constructed; Q4 2020) is at risk due to the uncertainties about the Manhattan/Systems schedule.
4. Progress on CS084, Tunnel Systems Package 4 – Traction Power, is slow and is currently reported as 29.5% complete compared with 91.6% as-planned. 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 improving the start of major electrical equipment installation at each substation site, if possible.
5. During the period from November 2018 to January 2019, the Harold and Queens program paths both lost time. The Harold path now ends 7 weeks later in mid-July 2021, and the Queens path now ends 22 weeks later in April 2021. Since neither of these delays was on the ESA program critical path, they did not delay the target RSD forecast.
6. The PMOC is concerned about the lack of progress in completing coordination point milestones to advance IST as scheduled. This indicates the developing character of the schedule, which needs to be finalized so that it can be a reliable management tool. There were 59 coordination point milestones in IPS 111 with dates scheduled to occur in the period from November 2018 to January 2019. 56 of these points are for Manhattan/Systems contracts. A review of IPS 114 showed that, of the 59 milestones planned for completion, 4 were achieved within the 3-month period, 8 were noted as having been achieved before the 3-month period, and 47 were rescheduled to dates after February 1, 2019. There is a risk that the lack of progress in achieving coordination points will result in the need for more concurrent work in the period leading to and during IST than had been planned, which may complicate and impede progress.

5.0 PROJECT COST

5.1 Budget/Cost

In the ESA January 2019 MPR, MTACC reported that total construction progress reached 79.7% complete compared with planned progress of 80.3%. Since the ESA July 2018 MPR, the PMT calculates summary construction progress as a percentage of the $8,014 million April 2018 construction EAC forecast. 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 will be 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	Nov 2018 CBB	Dec 2018 CBB	Jan 2019 CBB	CBB / FFGA Var.	CBB / Amend FFGA Var.
10 Guideway & Track Elements	1,989	3,405	3,353	3,403	3,403	3,403	71.1%	1.5%
20 Stations, Stops, Terminals, Intermodal	1,169	2,238	2,327	2,291	2,290	2,290	96.0%	-1.6%
30 Support Facilities (Yards, Shops, Admin)	356.3	474.2	450.8	558.6	558.6	558.6	56.8%	23.9%
40 Site Work and Special Conditions	205.1	610.6	562.5	525.6	525.6	525.4	156.2%	-6.6%
50 Systems	619.3	605.6	627.7	713.1	713.6	713.6	15.2%	13.7%
60 ROW, Land, Existing Improvements	165.3	219.4	192.2	162.3	162.3	162.3	-1.8%	-15.6%
70 Vehicles	494.0	209.9	879.5	15.4	15.4	15.4	-96.9%	-98.2%
80 Professional Services	1,184	1,975	1,809	2,115	2,115	2,115	78.6%	16.9%
[redacted] b(4)	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
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 January 2019 MPR, MTACC reported that total construction progress reached 79.7% complete compared with planned progress of 80.3%. Since the ESA July 2018 MPR, the PMT calculates summary Construction progress as a percentage of the $8,014 million April 2018 construction EAC forecast. 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.

The cost curve for planned construction based on the 2014 re-baselining cost curve has been updated to include the April 2018 EAC forecast. The chart reveals that cumulative construction costs are tracking the straight line projection for the April 2018 EAC forecast. To remain on plan for the April 2018 EAC forecast expenditures, the ESA program needs to maintain a monthly average of approximately $55.8 million through December 2020, and then average $21.1 million through February 2022. b(4) The PMOC is concerned about the MTACC's ability to sustain the planned rate of construction spending, which could impact the timely achievement of revenue service.

Table 5.2: Planned vs Actual Construction Cash Flow

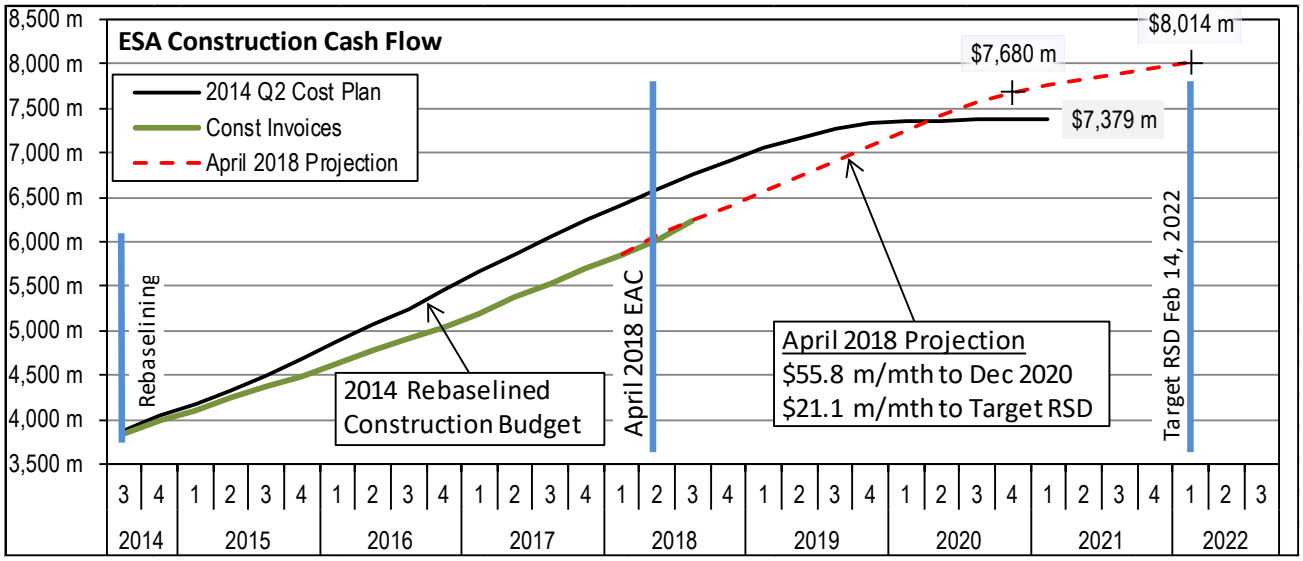


Table 5.3 shows the ESA budgets along with current awards and invoiced costs. Note that the percentages shown are invoiced percent of the current budget, not of the April 2018 EAC forecast.

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

Elements	Baseline Total Budget June 2014	April 2018 EAC Forecast	January 2019			
			Current Budget (interim)	Actual Awards	Invoiced Costs	Invoice Pct. of Budget
Construction Subtotal	7,379.3	8,014.1	7,536.6	7,255.2	6,386.1	84.7%
Soft Cost Subtotal	2,798.5	2,852.2	2,798.5	2,177.0	2,132.4	76.2%
Engineering	720.6	871.8	770.2	766.4	747.2	97.0%
OCIP	282.6	457.4	379.2	379.2	372.5	98.2%
Project Management	972.2	1,117.3	965.4	909.5	894.6	92.7%
Real Estate	182.1	203.7	124.9	119.2	117.9	94.3%
Rolling Stock	202.0	202.0	7.5	2.7	0.2	2.9%
Soft Cost Subtotal	439.0	267.0	551.3	--	--	--
Total (without financing)	10,177.8	11,133.3	10,335.1	9,432.2	8,518.4	82.4%

5.3 Change Orders

Table 5.4 lists the 32 contract modifications with magnitudes greater than $100,000 that were executed during the period from November 2018 through January 2019. The net increase of these modifications was $50.7 million. The PMOC reviewed several of these change orders and found that MTACC change order procedures were generally followed. Refer to Appendix N for further information.

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

Contract	Description / Mod No.	Amount
	November 2018	
CM014B	Add Stairway at 47th Street Node - Package #2 (CPR-097) (mod. 185)	3,329,168
CQ033	G02 Substation Negative Return to Substation 44 (mod. 28)	180,000
CS179	LIRR FON (mod. 119)	2,317,800
CS179	Change in IP Addresses (mod. 132)	2,560,000
CS179	Plaza Ceiling Opening in MCC Room (mod. 133)	204,500
CS179	Increase in Bid Item 9 - Cleaning and Finishing (mod. 145)	250,000
	December 2018	
CH053	Time Impact Resolution (mod. 170)	2,043,800
CH057D	Installation of Turnouts at ML1 and ML3 Tracks (mod. 3)	444,800
CM014B	Shaft 4 Wireless Conduits (CPR-099) (mod. 189)	485,150
CS084	VRN Duct Banks (mod. 13)	245,104
CS179	Tunnel SCADA Clarifications and Changes (mod. 89)	2,815,865
CS179	RSVI Modifications to Stair Pressurization Fans (mod. 130)	116,788
CS179	Plaza Trolley Beams (mod. 134)	277,500
CS179	Fire Detection Devices in Power Substations (mod. 136)	254,376
GEC	Additional Funding for Construction Phase Services (mod. 151)	28,000,000
	January 2019	
CH057D	Highway-Rail Vacuum Truck Rental for LIRR (mod. 4)	132,759
CM007	FM200 and Associated Changes (mod. 37)	585,000
CM007	Deletion of MC Cables for Public Emergency Telephones (mod. 55)	(173,041)
CM007	Added Security Boxes & Raceways in Lower Level (mod. 61)	205,000
CM007	Added Security Boxes & Raceways - Upper Level and Mezz. (mod. 62)	217,546
CQ033	Track Re-sequencing (mod. 29)	1,550,000
CS179	2nd Ave Sidewalk Repair and Street Work (mod. 135)	286,000
CS179	2nd Ave Demolition of Abandoned Elements (mod. 141)	175,000
CS179	23rd St Concrete Beams and FPSS Floor (mod. 143)	299,000
CS179	23rd Street Concrete Repairs (mod. 144)	528,000
CS179	GCT 3 & 6 Electrical Modifications (mod. 146)	371,442
CS179	Hardwire Controls for Tunnel Fans (mod. 158)	952,717
CS179	TVS Instrument Panel Inconsistencies (mod. 159)	975,000
CS179	44th Non-Existent Vitalink Cable Specified (mod. 161)	349,285
CS179	55th Street Emergency Power Room Changes (mod. 164)	413,000
CS179	Signal System Cable Changes (mod. 170)	123,500

5.4 Project Funding

The MTACC has sufficient funds to continue the ESA program through December 2020 as funded 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 $800 million in additional local funding to complete the ESA program. The funding request, which was previously reported as $956 million, was reduced to account for MTA's intent to restore $157 million to the Regional Investment program directly from the 2020-2024 Capital Plan rather than via the ESA program, as had been planned.

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 February 1, 2019.

Local Funding: The budget for Local Funding is $7,636.4 million, of which $5,819.7 million was expended through February 1, 2019. Financing costs are funded separately from other local sources.

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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 Q4 2018 and through Q1 2019 for Amtrak ET support, however.

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 then later deferred until 2025, starting with Line 2. During March 2019, MTACC indicated that Amtrak may advance ERT 2 reconstruction to 2023, although this has not yet been formalized. The risk remains that tunnel systems reliability or safety issues might require Amtrak to make emergency repairs on either Line 1, 2, or 4 at any time between now and the RSD of December 2022. The PMOC's concern is based on Amtrak's historic reactions to service disruptions in the tunnels, which have resulted in suspending ESA Harold work until the service disruptions are resolved. Should this occur, the remaining ESA construction work in Harold Interlocking, as well as the systems testing, start-up, and commissioning for Tracks A, B/C, and D could be delayed and potentially impact the MTACC RSD of December 2022. There is less likelihood, however, that this could impact the FFGA ROD of December 2023 that is 12 months later than the MTACC RSD.

Positive Train Control:

This risk has three distinct elements:

a.) A potential risk that might have been realized is the impact that LIRR installation of PTC in Harold Interlocking might have had 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, there was the possibility that FRA might not grant the waiver. If the waiver had been denied, PTC installation might have had 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. MTACC reported the following as of February 25, 2019:

- FRA has apparently not commented on the LIRR revised PTC implementation schedule.
- FRA approved the LIRR test waiver for Harold Interlocking and Construction Zone Transponders will be used in the interim.

- MTACC and LIRR will coordinate installation of PTC in Harold to mitigate risks to the remaining ESA construction work in the interlocking.
- MTACC concludes that there is currently no known risk to the ESA Program due to this issue. Accordingly, the PMOC will delete this risk as a concern going forward.

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.) MTACC will be installing, testing, and commissioning PTC for all of the new track and signal systems built under the ESA Program. LIRR did not complete PTC design in either Q1 2018, as earlier projected, or January 2019, as more recently projected, due to resolution of GEC/LIRR comments on the GCT3 and GCT4 application logic submittals and the Wayside Interface Units. This delay continued through March 2019. The GEC acknowledges that the required associated design changes for ESA Contracts VS086, CS086, and CS179 cannot be completed until the PTC design is finalized. The PMOC continues to monitor this situation regarding schedule risk to the three cited ESA contracts and also to finalization of the CS179 Integrated System Testing Plan and Schedule. MTACC has already acknowledged that the contract modification for incorporation of PTC requirements will impact the substantial completion date for Contract VS086.

Capital Funding Risk

MTACC has forecasted a need for approximately $800 million in the 2020–2024 Capital Plan. The PMOC remains concerned that – until the 2020–2024 Capital Plan is approved – this potential future funding constraint may significantly impact the program budget and schedule as well as the start of Revenue Service. **[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 that is the ESA Program Critical Path 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 29.5% complete (actual) vs. 91.6% as-planned.
- Contract CM014B is reported at only 69.0% complete (actual) vs. 97.3% 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.
- [redacted] b(4) [redacted]. 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.

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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. Over the past 22 months, 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 Q4 2017 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 construction coordination risks.

6.2 Risk Register

Status/Observation: The most recent Risk Register update was issued in February 2019 as the Q4 2018 update.

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:
    1. Program Funding – update of the program budgets and inclusion in the MTA Capital Plan (long term risk realized in Q2 2018);
    2. Recovery of lost time due to significant schedule delays on CM014B and CS084;
    3. Successful execution of multiple hand-off interfaces across several contracts;
    4. Contractor access and work area coordination in Manhattan;
    5. Duration of integrated systems testing and effectiveness of Incremental IST;
    6. Continued availability of adequate Amtrak and LIRR force account resources;
    7. Continued availability of required track outages in Harold Interlocking;
    8. Maintaining adequate schedule performance of the remaining work in Harold Interlocking (Improved performance noted through March 2019);
    9. Remaining schedule path float will be used in the near future and Manhattan/Systems path will become critical (risk realized in April 2018);
    10. Coordination risk retained by MTACC in Manhattan and the ESA tunnels with regard to construction and testing interface management for the systems work;
    11. CS084 equipment issues involving transformers, 3 hi-pot test failures, and final resolution of concerns about MTACC provided inductive reactor equipment;

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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. Based on the February 25, 2019 update, MTACC has concluded that there is currently no known risk to the ESA Program due to this issue. [No longer a risk as of February 28, 2019]
    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 greatly reduced]
    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. [No longer a risk as of March 31, 2019]
    f) Funding: Funding constraints [risk realized in Q2 2017; 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: Earlier deferred until 2025 after the ESA program; now possibly rescheduled to 2023, just after ESA RSD. The risk now is from the impact of unplanned emergency tunnel repairs.

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" initiative to prioritize work need for LIRR access to GCT;
- 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; MTACC has deemed that this is no longer a risk as of February 25, 2019.
- 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.

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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. **[Ref: ESA-128-Sep17]** 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 Q3 2018, started the transition to a new organization and new processes to manage and mitigate current and future risks. The PMOC recommends that the PMT thoroughly evaluate the results to date of their efforts to mitigate current and future risks. Based on this evaluation, the PMT should make any organizational, operational, or procedural adjustments necessary to achieve the desired process outcomes and goals.

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APPENDIX A - LIST OF ACRONYMS

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

APPENDIX B - PROJECT OVERVIEW AND MAP

Project Overview and Map – East Side Access

East Side Access Project Map

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
$8,518.4 million	Amount of Expenditures as of January 31, 2019, of the Interim Project Budget of $10,335.1 million
76.5%	Percent Complete, based on the ESA April 2018 EAC forecast of $11,133.3 million and invoices shown in the January 2019 MPR.
$724.2 million	Total Project Contingency remaining (including $551.3 million identified by ESA as Unallocated Contingency, which includes ESA Reserves).
79.7%	Construction Percent Complete vs. 80.3% as planned based on the ESA April 2018 EAC construction forecast of $8,014.1 million shown in the January 2019 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
	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.				
7	June-13	Contract Specs/ Construction	Construction	Pneumatically Applied Concrete (PAC)/ Shotcrete	See below
	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.				
8	June-13	Procurement/ Construction	Procurement	Qualified Personnel	See below
	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.				
9	June-13	Scheduling	Construction	TBM Production	See below
	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.				

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 Devel-opment	In Q42013, 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 Devel-opment	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

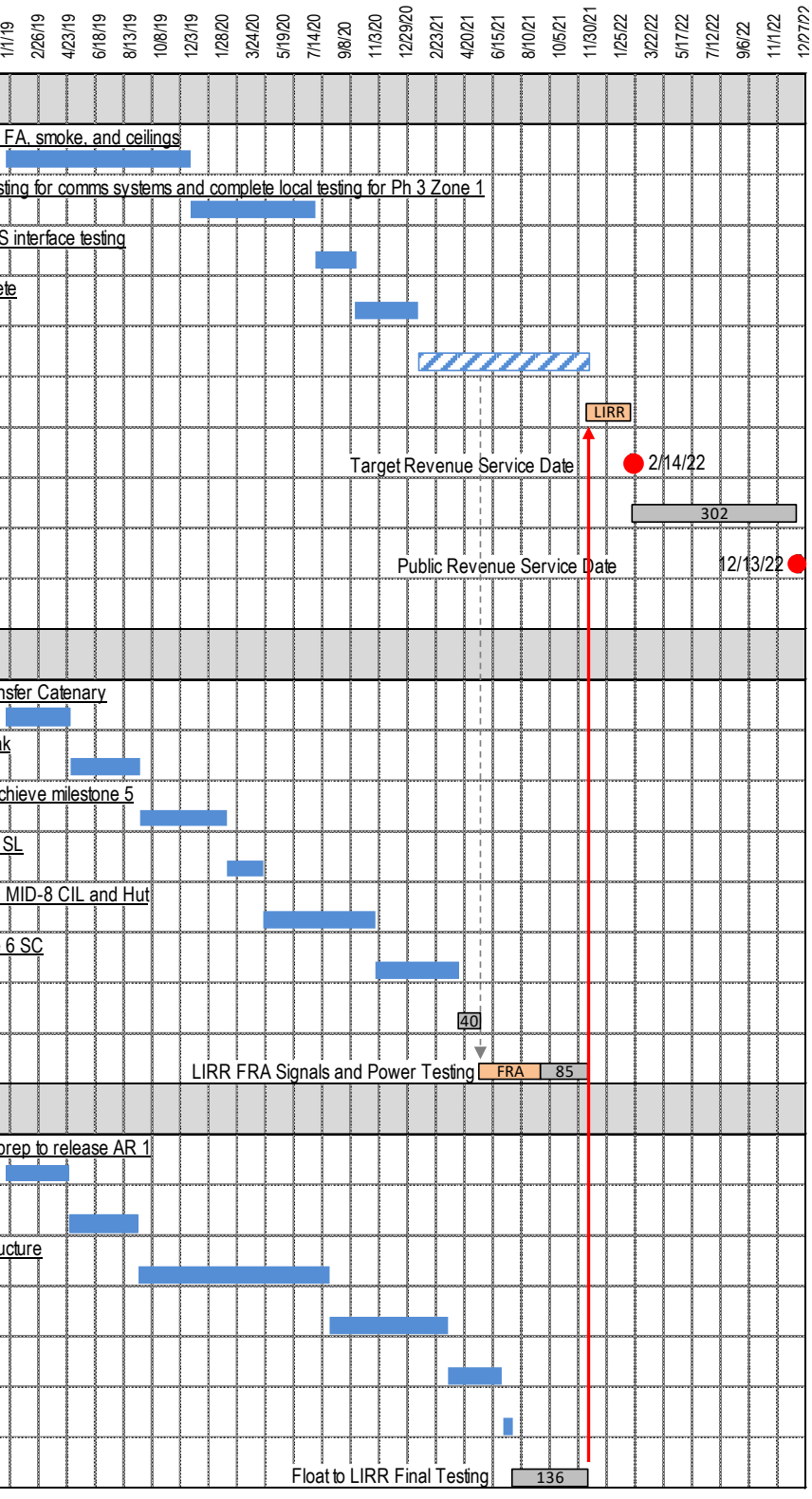
SSMP Monitoring	Y/N	Notes/Status
		the PHA log are either safety and/or security critical.
Has the Sponsor verified conformance with safety and security requirements during testing, inspection and start-up phases?	In Devel-opment	Project is not at these phases yet. The Sponsor is in the process of implementing 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 Devel-opment	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 Devel-opment	
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 114; data date February 1, 2019

		Start	Finish	CDs	Mths
Manhattan / Systems – Path No. 1		6/11/18	11/25/21	1264	41.5
CM007	W. Cav. upper cond. circuits for comms, FA, smoke, and ceilings	11-Jun-18 A	12/3/19	541	17.8
CS179	E. Cav. Upper cond., wire, and local testing for comms systems and complete local testing for Ph 3 Zone 1	12/3/19	7/17/20	228	7.5
CS179	GCT Phase 3 Zone 1 IST complete BCS interface testing	7/17/20	9/29/20	75	2.5
CS179	GCT Phase 3 IST for Fire Alarm complete	9/29/20	1/20/21	114	3.7
CS179	Issue Contingency	1/20/21	11/25/21	310	10.2
LIRR	LIRR Final Testing and Previews	11/25/21	2/13/22	81	2.7
LIRR	Target Revenue Service Date	2/14/22	2/14/22	7	0.2
IPS	ESA Program Contingency	2/15/22	12/13/22	302	9.9
IPS	Public Revenue Service Date	12/13/22	13-Dec-22*	7	0.2
Queens – Path No. 2		11/27/17	4/4/21	1225	40.2
CQ033	Resolve Catenary/Trough Conflict, Transfer Catenary	27-Nov-17 A	4/26/19	516	17.0
FHA03	Q Tower Catenary relocations by Amtrak	4/28/19	9/2/19	128	4.2
CQ033	Trackwork construction YS and AC to achieve milestone 5	9/2/19	2/6/20	158	5.2
CQ033	Trackwork and signals for Tracks M4 & SL	2/6/20	4/13/20	68	2.2
CQ033	Cabling for CILs 1 and 4–8, commission MID-8 CIL and Hut	4/14/20	11/3/20	204	6.7
CQ033	MDSY Integrated Testing and Milestone 6 SC	11/4/20	4/4/21	152	5.0
IPS	Float to LIRR FRA Testing	4/4/21	5/13/21	40	1.3
FRA	LIRR FRA Signals and Power Testing	5/13/21	9/2/21	113	3.7
Harold – Path No. 3		12/7/18	7/13/21	950	31.2
CH058A	F/A & CH057D, track, signal, catenary prep to release AR 1	07-Dec-18 A	4/25/19	140	4.6
CH058A	Install 39th St Bridge unperpinning	4/25/19	8/28/19	126	4.1
CH058A	Jack bridge and build B/C approach structure	8/29/19	8/12/20	350	11.5
CH058A	B/C Duct Benches & Trackwork	8/13/20	3/17/21	217	7.1
CH063	Release AR 2, Install Catenaries	3/18/21	6/23/21	98	3.2
FHL04	Force Account Cutovers	6/26/21	7/13/21	18	0.6
IPS	Float to LIRR Final Testing	7/13/21	11/25/21	136	4.5



APPENDIX F - 90 DAY MILESTONE LOOK-AHEAD SCHEDULE – IPS 114

ACTIVITY ID	ACTIVITY DESCRIPTION	START	FINISH
CH057D: Harold Track Work Part 3			
MS #6	PW2, ML2, & Special Track Work		10-Feb-19
MS #7	SEQ TM2 & 6199		16-Feb-19
MS #8	Substantial Completion		30-Mar-19
CH058A: Harold Structures - B/C Structure/ Catenary Structure**			
	No milestones forecasted for next 90 CDs		
FHL01: Harold Stage 1 - LIRR F/A			
FHL01-1990	Ready for Decomissioning G02		27-Feb-19
FHL01-1020	Complete FHL01		13-Mar-19
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			
FHL04-1140	Install Switch LK2 (5155E)		16-Mar-19
FHL04-1200	Cutover: Switch JD1/JD2 (5165) - (3D)		17-Mar-19
FHL04-1090	Remove Switch 813		24-Mar-19
FHL04-1220	Remove Switch 811E		6-Apr-19
FHL04-1210	Remove Switch 811W		13-Apr-19
FHA01: Harold Stage 1 - Amtrak F/A			
	No milestones forecasted for next 90 CDs		
FHA02: Harold Stage 2 - Amtrak F/A: Balance Work			
	No milestones forecasted for next 90 CDs		
FHA03: Harold Stage 3 - Amtrak F/A			
	No milestones forecasted for next 90 CDs		
FHA04: Amtrak Harold F/A Construction Stage 4			
	No milestones forecasted for next 90 CDs		
VH051A (Part 1): Harold & Point CILs			
	No milestones forecasted for next 90 CDs		
VHA02: Procure Amtrak Materials Stage 2			
VHA02-SC	Substantial Completion		1-Feb-19
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-Feb-19
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		
CM006: Manhattan North Structures			
MS #3	Substantial Completion		30-Mar-19
CM007: GCT Caverns			
CS179-CM007.CIA.11B	EB4 (Upper) West of GCT-5 to East of GCT-3		1-Feb-19
CM007-CS179.CIA.19C	East Cavern Upper Level - Under Platform Conduits		11-Feb-19
CM007-CS179.CIA.20C	West Cavern Upper Level - Under Platform Conduits		12-Feb-19
CM007-CS179.CIA.17B	Conduit from TOC ER W Cavern Mezz thru N Service Corridor to TOC Office E Cavern Mezz NBOH		21-Feb-19

ACTIVITY ID	ACTIVITY DESCRIPTION	START	FINISH
MS05	Milestone No.5 - Substations US1 and US2 [1026 CCDs] - 02/01/2019		22-Feb-19
CM007-CS179.CIA.19B	East Cavern Mezz Level - Comm Conduits		25-Feb-19
CM007-CS179.CIA.17A	Conduit from CR-M2 in W Cavern Mezz thru S Service Corridor to CR-M1 in E Cavern Mezz SBOH		28-Feb-19
CM007-CS179.CIA.20B	West Cavern Mezz Level - Comm Conduits		4-Mar-19
CM007-CS179.CIA.18A	CR-M2 & Conduit from S Service Corridor to CR-M2 in W Cavern Mezz SBOH		21-Mar-19
CM014B: GCT Concourse and Facilities Fit Out (BL)*			
STL-Erect-3610A	Steel Erection START - Tile 3610	1-Mar-19	
CQ032: Plaza Substation & Queens Structures			
CQ032-MS06	MILESTONE #6 – SUBSTANTIAL COMPLETION		31-Mar-19
CQ033: Mid-Day Storage Yard Facility (Procurement Status TBD)			
A81410	Tower 33 and B949C- N Demo		1-Feb-19
MS #8	Completion of Plaza Work		11-Mar-19
MV71836	Complete Medium Voltage Ductbank		22-Feb-19
CS084: Tunnel Systems Package 4 – Traction Power Systems			
90010	ACCESS RESTRAINT #2 - C04 TRACTION POWER SUBSTATION	1-Feb-19	
90040	ACCESS RESTRAINT #5 - C01 AND C02 TRACTION POWER SUBSTATION	1-Feb-19	
90050	ACCESS RESTRAINT #6 - C03 TRACTION POWER SUBSTATION	1-Feb-19	
CS179: System Package 1 - Facilities Systems*			
CM007-CS179.CIA.19C	CM007-CS179 - East Cavern Upper Level - Under Platform Conduits	12-Feb-19	
CM007-CS179.CIA.19B	CM007-CS179 - East Cavern Mezz Level - Comm Conduits	25-Feb-19	
CM007-CS179.CIA.17A	CM007-CS179 - Conduit from CR-M2 in W.Cavern Mezz thru So Service Corridor to CR-M1 in E.Cavern Mezz SBOH	1-Mar-19	
2ND-B04- FPT-220	2nd Ave Vent Facility - Substation B04 - Elect - Coordination Study Approved	4-Mar-19	
CM007-CS179.CIA.20B	CM007-CS179 - West Cavern Mezz Level - Comm Conduits	5-Mar-19	
CS179-CM007.CIA.10B	WB3 (Upper) West of GCT-5 to East of GCT-3		5-Mar-19
CM007-CS179.CIA.18A	CM007-CS179 - CR-M2 & Conduit from So Service Corridor to CR-M2 in W.Cavern Mezz SBOH	22-Mar-19	
CS179-CM007.CIA.11B	EB4 (Upper) West of GCT-5 to East of GCT-3		29-Mar-19
CM014B-1030	CM014B To Complete Conduits & Infrastructure Sufficient for CS179 to Start Work - Zone 2 - Need-By Date		2-Apr-19
VS086: System Package 3 - Signal Equipment Procurement			
000060	MS#4, GCT 5 Delivery		7-Feb-19
000070	MS#5, GCT 3 Delivery		5-Apr-19
000080	MS#5, GCT 4 Delivery		15-Apr-19
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	11/1/18 IPS Date	2/1/19 IPS Date	Delta CDs
CP-CM007-250-CS086	CS086: GCT 4 - Install Wayside Signal Equipment	7-Nov-18	1-Feb-19	+86
CP-CM014B-80-CS179	CS179 AR 10C.4 - Access to Communication Closets CC4, 8	12-Nov-18	7-Sep-18A	†
CP-CM014B-140-CS179	CS179 - Concourse - Zone 1 Elect - Begin to Comp FA Cond	12-Nov-18	30-Sep-19	+322
CP-CS179-130-IST	IST - Factory Acceptance Testing (FAT) – BLS	15-Nov-18	18-May-18	†
CP-CS179-280-IST	IST - Factory Acceptance Testing (FAT) – VCS	15-Nov-18	18-May-18	†
CP-VQ033-030-CQ033	VQ033: FAT Testing and Delivery - MID3 CIL	16-Nov-18	16-Nov-18A	0
CP-VS086-10-CS086	CS086: Install Signals – Plaza	19-Nov-18	21-Dec-18A	+32
CP-CS179-260-IST	IST - Factory Acceptance Testing (FAT) – Telephone	19-Nov-18	19-Feb-19	+92
CP-CM014B-60-CS179	CS179 AR 10C.4 - Access to Comm Closets CC-3, 4, 7, 8	20-Nov-18	7-Sep-18A	†
CP-CS179-170-IST	IST - Factory Acceptance Testing (FAT) – FLN	20-Nov-18	20-Feb-19	+92
CP-CM007-060-CS179	Begin Civil/Electrical Work in CR-M4/CR-L3/CR-L4	21-Nov-18	7-Sep-18A	†
CP-CM007-110-CS179	Begin to Comp East Cav Under Plat Conds & Pull Cable	23-Nov-18	11-Feb-19	+80
CP-CM007-100-CS179	Begin to Comp East Cavern Mezz Conds & Pull Cable	26-Nov-18	25-Feb-19	+91
CP-CM014B-110-CS179	Concourse - Zone 1 Elect - Begin to Comp BMS Cond	26-Nov-18	30-Sep-19	+308
CP-CM014B-120-CS179	Concourse - Zone 1 Elect - Begin to Comp F/O Cond	26-Nov-18	30-Sep-19	+308
CP-CM014B-130-CS179	Concourse Zone 1 Begin to Comp Field Network Cond to Devices	26-Nov-18	30-Sep-19	+308
CP-CM014B-150-CS179	Concourse - Zone 1 Begin to Comp PA / VMS Cond	26-Nov-18	30-Sep-19	+308
CP-CM014B-160-CS179	Concourse - Zone 1 Begin to Comp Radio Cond	26-Nov-18	30-Sep-19	+308
CP-CM014B-170-CS179	Concourse - Zone 1 Begin to Comp Security/CCTV Cond	26-Nov-18	30-Sep-19	+308
CP-CM014B-180-CS179	Concourse - Zone 1 Begin to Comp Tele Cond	26-Nov-18	30-Sep-19	+308
CP-CS179-390-IST	IST - 38th Street Vent Facility - Mech - HVAC / DDC / TEC Testing	27-Nov-18	25-Feb-19	+90
CP-CH061A-20-CS179	CS179: Install Equipment in Tunnel A	27-Nov-18	27-Feb-19	+92
CP-CM014B-70-CS179	CS179 AR 16 - Access to 44th Street Vent	4-Dec-18	11-May-18A	†
CP-CM014B-90-CS179	CS179 AR 13B - 2nd Phase Access to 50th Street	13-Dec-18	17-Apr-19	+125
CP-CM007-050-CS179	CS179 - Begin Civil/Electrical Work in CR-M1/CR-M2/CR-L1/CR-L2	13-Dec-18	28-Feb-19	+77
CP-CM007-130-CS179	CS179 - Begin to Comp West Cav Mezz Level Conds & Pull Cable	18-Dec-18	4-Mar-19	+76
CP-VS086-20-CS086	CS086: Install Signals - GCT 6	19-Dec-18	7-Feb-19	+50
CP-CM007-070-CS179	CS179 - Begin Civil/Electrical Work in CR-C2 & CR-M2	20-Dec-18	21-Mar-19	+91
CP-VM014-430-IST	IST - VM014 Escalator & Elevator Deliveries for CM014B	27-Dec-18	27-Dec-18A	0
CP-CM007-180-CS086	CS086: GCT 5 - Install Wayside Signal Equipment Including Cases, Signals & Bonds	25-Jan-19	13-Mar-19	+47
CP-CM014B-270-CS179	Concourse - Zone 3 Begin to Complete BMS Conduit	25-Jan-19	16-Sep-19	+234
CP-CM014B-280-CS179	Concourse - Zone 3 Begin to Complete Fiber Optic Conduit	25-Jan-19	16-Sep-19	+234
CP-CM014B-290-CS179	Concourse - Zone 3 Begin to Comp Field Network Cond to Devices	25-Jan-19	16-Sep-19	+234
CP-CM014B-300-CS179	Concourse - Zone 3 Begin to Complete Fire Alarm Conduit	25-Jan-19	16-Sep-19	+234
CP-CM014B-310-CS179	Concourse - Zone 3 Begin to Complete PA / VMS Conduit	25-Jan-19	16-Sep-19	+234
CP-CM014B-320-CS179	Concourse - Zone 3 Begin to Complete Radio Conduit	25-Jan-19	16-Sep-19	+234
CP-CM014B-330-CS179	Concourse - Zone 3 Begin to Complete Security / CCTV Conduit	25-Jan-19	16-Sep-19	+234
CP-CM014B-340-CS179	Concourse - Zone 3 Begin to Complete Telephone Conduit	25-Jan-19	16-Sep-19	+234
CP-VS086-30-CS086	CS086: Install Signals - GCT 5	25-Jan-19	7-Feb-19	+13
CP-CS179-220-IST	IST - Factory Acceptance Testing (FAT) - SC	31-Jan-19	2-May-19	+91

Notes: † Milestone achieved retroactively.

Summary: There were 41 coordination point milestones planned to be achieved over the previous quarter, from November 1, 2018 to January 30, 2019. Of these 41 coordination points, 6 were reported to have been achieved retroactively; 3 were actualized over the quarter; and the remaining points were delayed. 16 coordination points between contracts CM014B and CS179 were delayed and forecasted to now occur later in 2019, resulting in an overall delay of between 234 and 322 calendar days.

APPENDIX G – MTA EAST SIDE ACCESS PROJECT – BUY AMERICA STATUS SUMMARY (As of March 2019)

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.
Cook Motor Fans	Buy/Ship America conformance under investigation.

APPENDIX H –REMAINING ESA ELECTRIC TRACTION (CATENARY) CONSTRUCTION*
Start and Finish Dates from IPS 114 Data Date February 1, 2019

IPS Identifier	Scope	IPS Early Start	IPS Early Finish	Status
CH057A2 See IPS Narrative Analysis	Install 7,100 LF CA WBY Track	Q1/20	Q1/23	Only 8 of 35 catenary poles required for this task have been installed as of March 31, 2019. MTACC notes that this work is not required for revenue service.
CH057D-B2150	Relocate catenary east of 39th St. in preparation for Tunnel B/C construction		3/3/19	Amtrak completed Tunnel B/C predecessor catenary work in March 2019.
CPR-025-50	Install 1,000 LF (est.) CA MDSY Sub 3 to North Runner	4/29/19	7/29/19	The CQ033 contractor installed 6 catenary poles at the east end of the North Runner Track during March 2019. The CH063 contractor will transfer the catenary wires after CQ033 installs all the necessary catenary poles.
CH058-1050	Install 2,180 LF CA EBRR Track	3/9/23	5/16/25	CH058B to construct Eastbound Re-Route (EBRR) Track has not advertised yet. CH058B to install 10 catenary poles prior to installation of CAs.
CH063 – 1.4	Install CAs 1 Turnout location[1] FHL02	2/5/20	6/23/21	LIRR to install the #3234W turnout. Amtrak will install CAs after LIRR installs the turnout.
CH063-1450 and CH063 – 1.4	Install CAs 4 Tunnel B/C Turnout locations[2] (W and V Crossovers)	2/5/20	6/23/21	LIRR to install 4 Tunnel B/C turnouts prior to Amtrak installation of CAs.
CH063 – 2.0	Complete Loop 1A Electrification	8/16/20	11/22/20	Amtrak Loop 1A Track construction partially complete. Amtrak ET will install CAs after Amtrak track construction is complete.
FQA65-8040	Install CAs 14 Turnout locations[3] in Loop and T Interlockings	1/9/14	4/12/26	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.
FHL04-2420	XO5165 Catenary Shift	2/21/18A	3/17/19	Amtrak installed catenary wires over #5165 crossover in January 2019.
CH063-1220	PW2 Overrun	2/24/20	4/27/20	Will be scheduled as time permits.

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. #3234W (CH063 – 1.4)
2. #4145, #2254, #5155, #2155 (CH063 – 1.4)
3. 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.

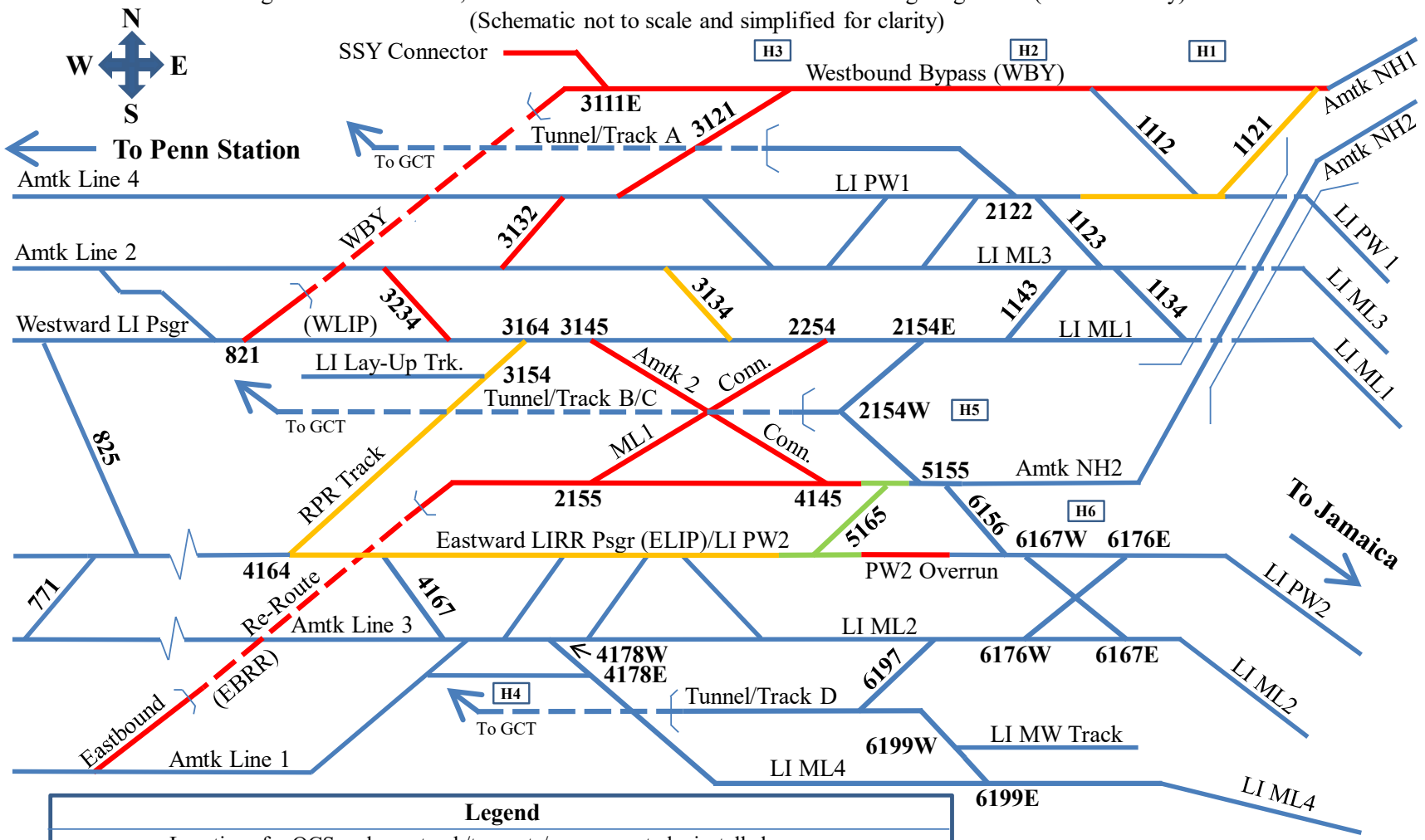
The information shown on these schematics will be updated with each PMOC Quarterly Comprehensive Report and will trace construction progress for that quarter.

Appendix I: Harold Interlocking Progress Monitoring Schematic

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

Progress as of March 31, 2019 - based on ESA 14-4 Harold Interlocking Alignment (main line only)

(Schematic not to scale and simplified for clarity)



Legend

- Locations for OCS and new track/turnouts/crossovers to be installed
- Locations where new OCS was installed during Q1 2019
- Locations where OCS was previously installed by ESA
- Locations where existing track/turnouts/crossovers were previously installed by ESA
- Locations where existing track/turnouts/crossovers will remain as is

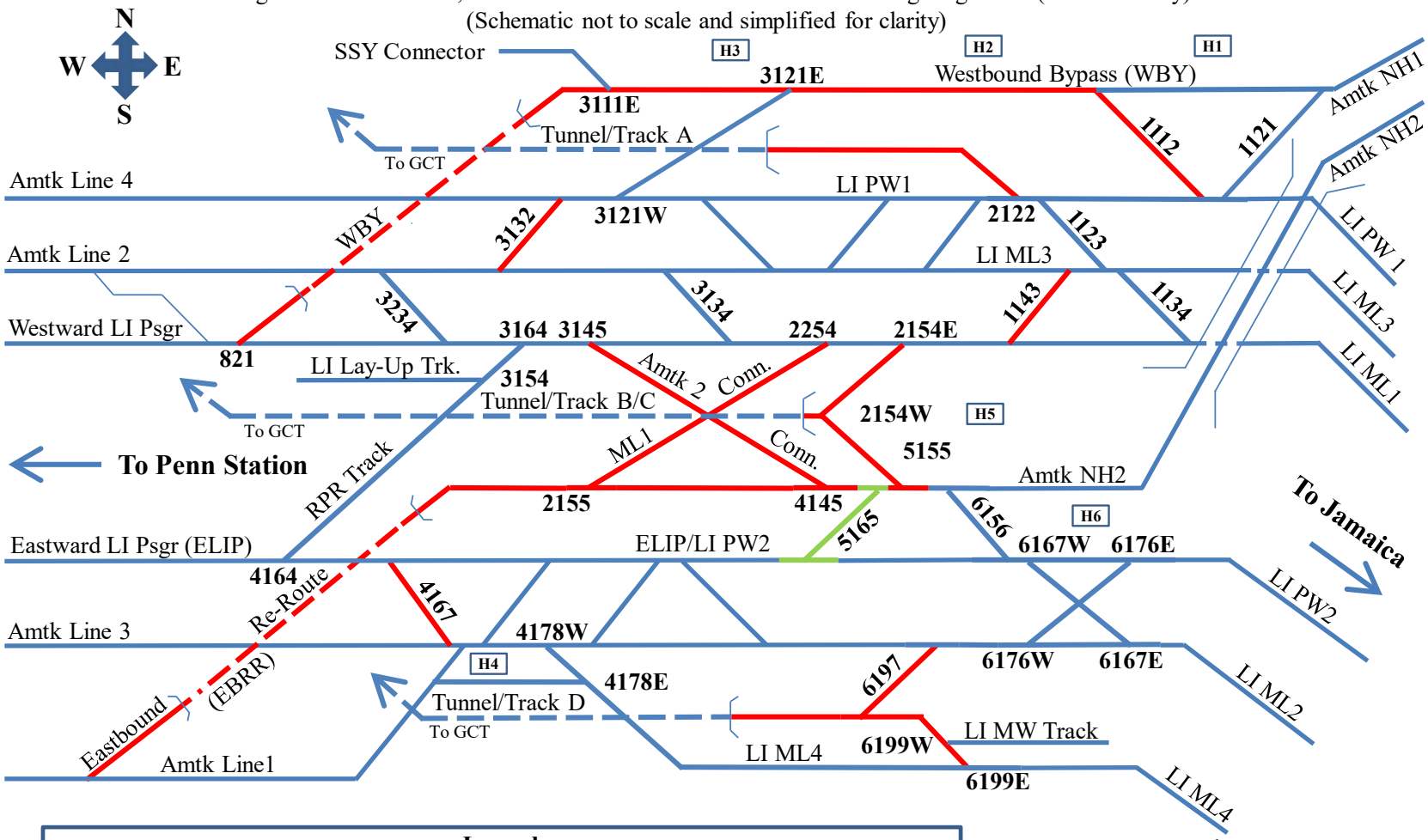
Note: Amtrak installed OCS over the new #5165 crossover and removed OCS over the former LIRR Westward Freight Track (not shown) during Q1 2019.

Appendix I: Harold Interlocking Progress Monitoring Schematic

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

Progress as of March 31, 2019 - based on ESA 14-4 Harold Interlocking Alignment (main line only)

(Schematic not to scale and simplified for clarity)



Legend

- Locations for 3rd Rail and/or new track/turnouts/crossovers to be installed
- Locations where 3rd Rail with new track was installed during Q1 2019
- Locations where 3rd Rail and/or new track was previously installed
- Existing track/turnouts/crossovers to remain as is or be constructed (WBY & EBRR)

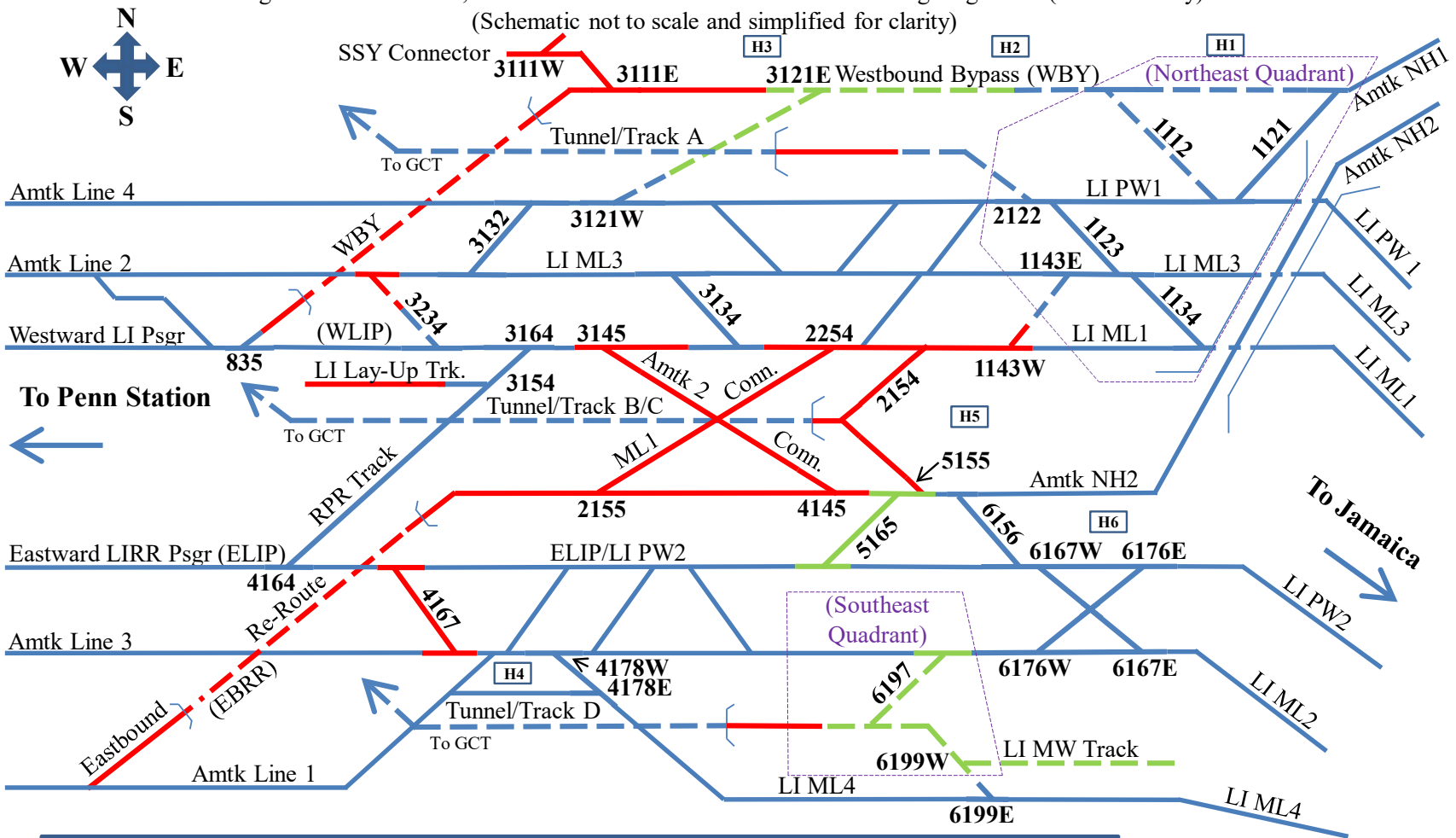
Note: LIRR installed 3rd rail on the new #5165 crossover and removed 3rd rail on the LIRR Westward Freight Track and the former #811 and #821 crossovers during Q1 2019.

Appendix I: Harold Interlocking Progress Monitoring Schematic

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

Progress as of March 31, 2019 - 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 Q1 2019
- New Turnouts/Track previously installed
- Dashed blue or green, installed not in service
- Existing Turnouts/Track to remain as is

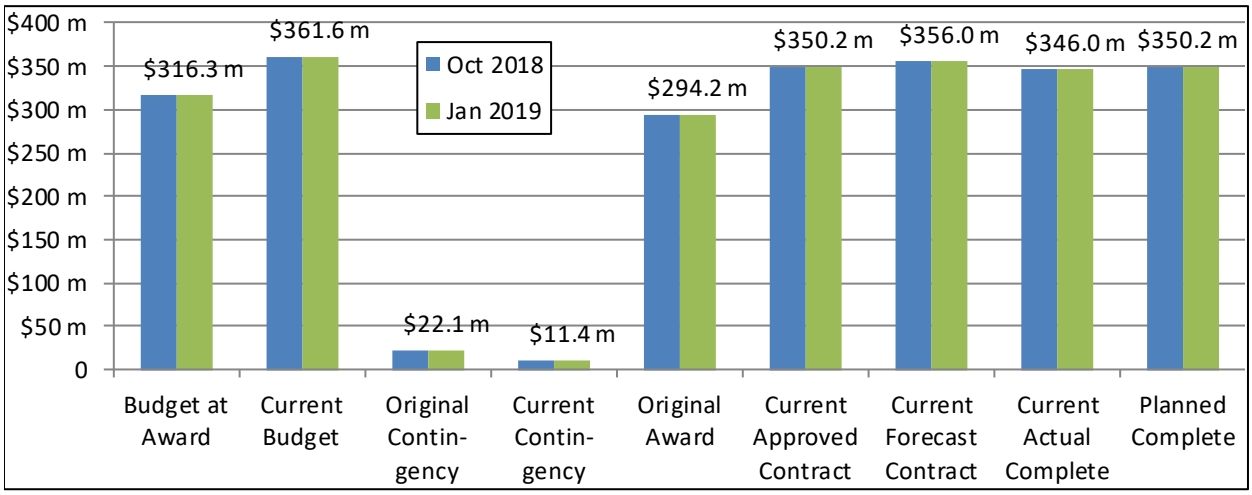
Note: The #5165 crossover and the #6199W and #3121E turnouts were installed during Q1 2019.

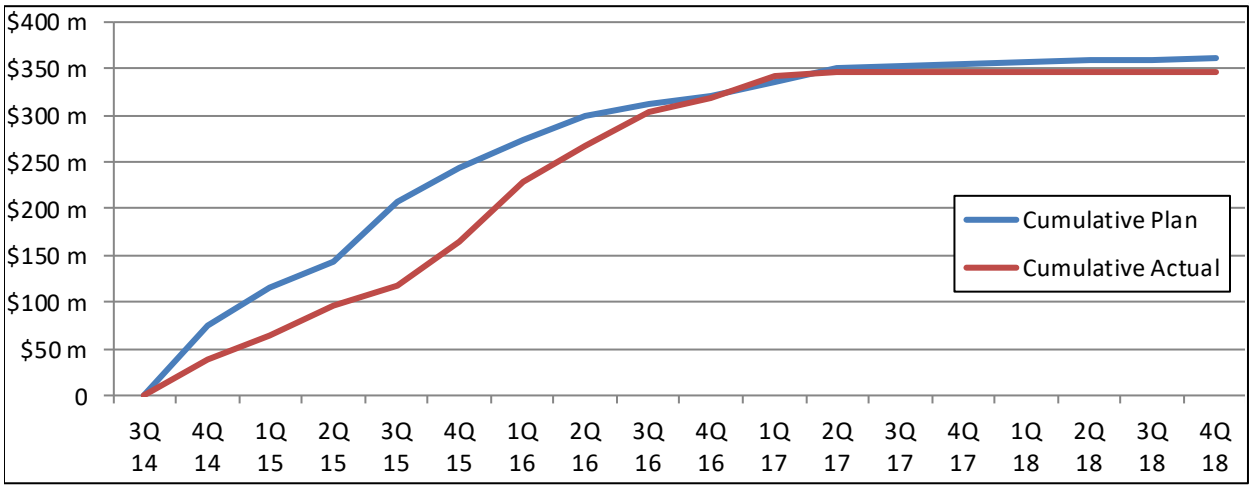
Appendix J – Cost Performance

CM006 Manhattan North Structures Jan 2019

Budget at Award	Current Budget	Change from Original to Current (2-1)	Contract at Award	Current Approved Contract	Change from Original to Current (5-4)	Current Forecast	Change from Current Forecast to Budget at Award (7-1)
$316.3	$361.6	$45.3	$294.2	$350.2	$56.0	$356.0	$39.7

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	
100.0%	98.8%	-0.5%	0.0%	0.0%	0.0%	0.40% per month

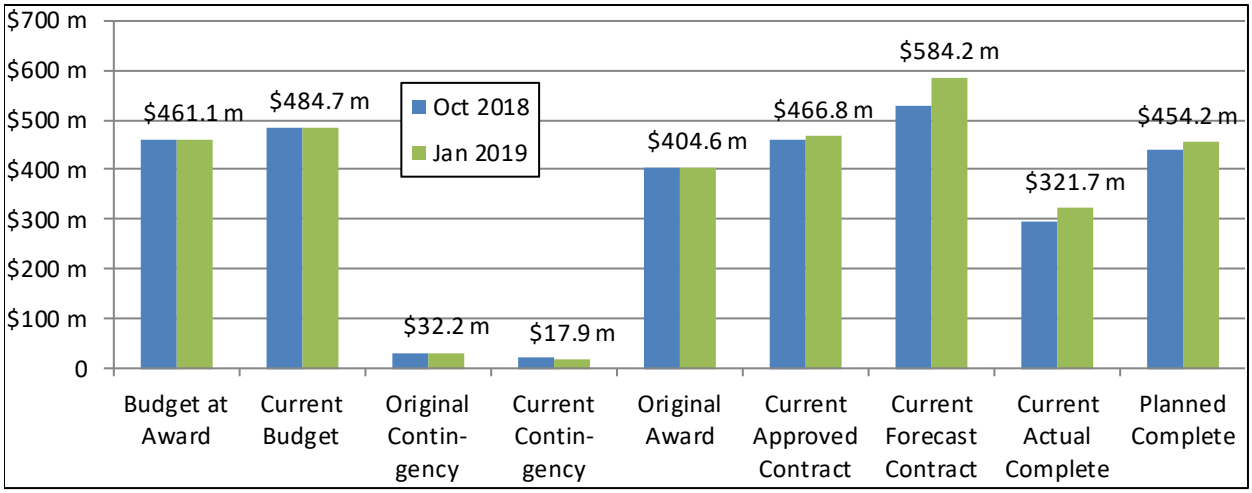


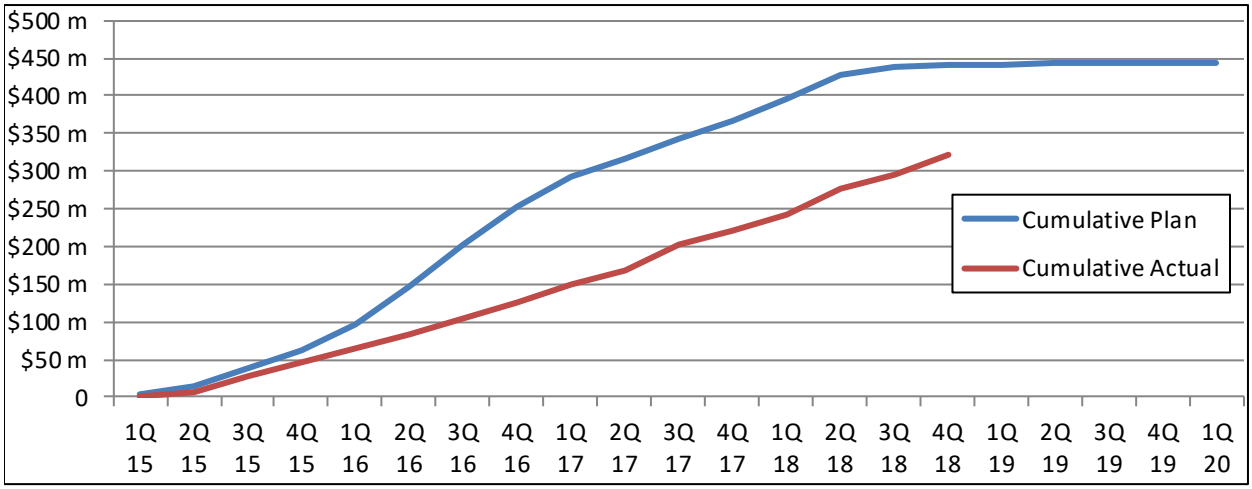


CM014B GCT Concourse & Facilities Fit Out Jan 2019

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
		(2-1)			(5-4)		(7-1)
$461.1	$484.7	$23.6	$404.6	$466.8	$62.2	$584.2	$123.1

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	
97.3%	68.9%	19.4%	1.6%	7.2%	1.2%	1.41% per month

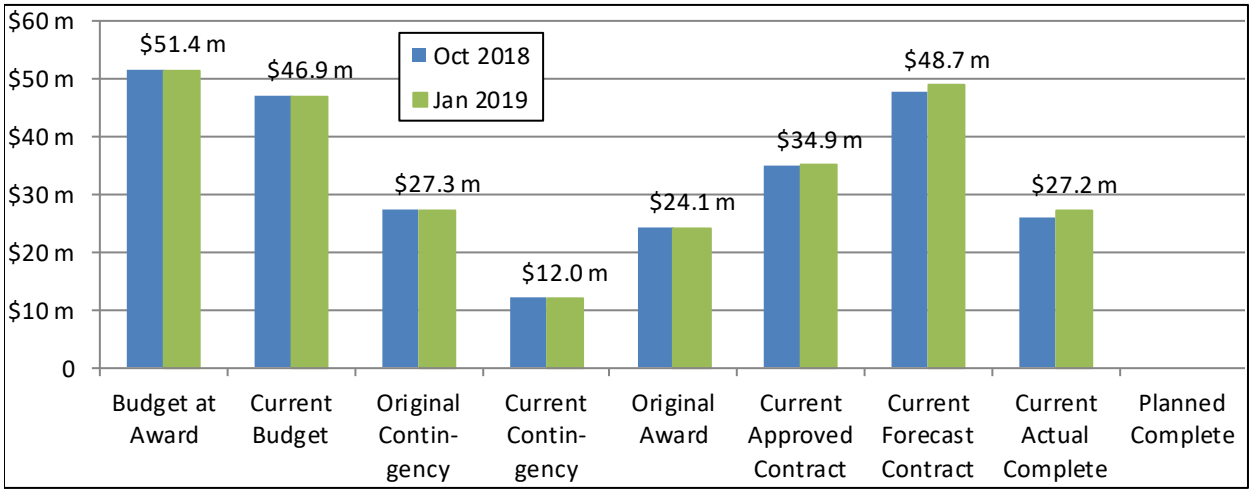




VM014 Vertical Circulation Elements (Escalators & Elevators) Jan 2019

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
		(2-1)			(5-4)		(7-1)
$51.4	$46.9	($4.5)	$24.1	$34.9	$10.8	$48.7	($2.7)

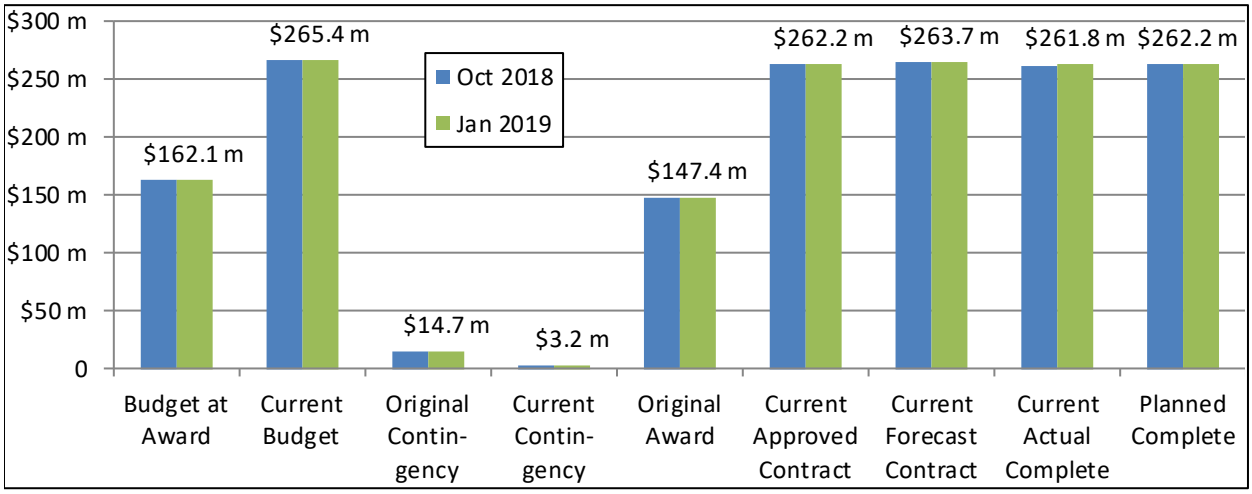
Percent Complete		Actual Prog Last 12 Mths		Actual Prog Last 6 Mths		Average Required Progress to reach forecast SC
Planned	Actual	Total	Avg/Mth	Total	Avg/Mth	
NA	78.0%	19.1%	1.6%	4.2%	0.7%	1.47% per month

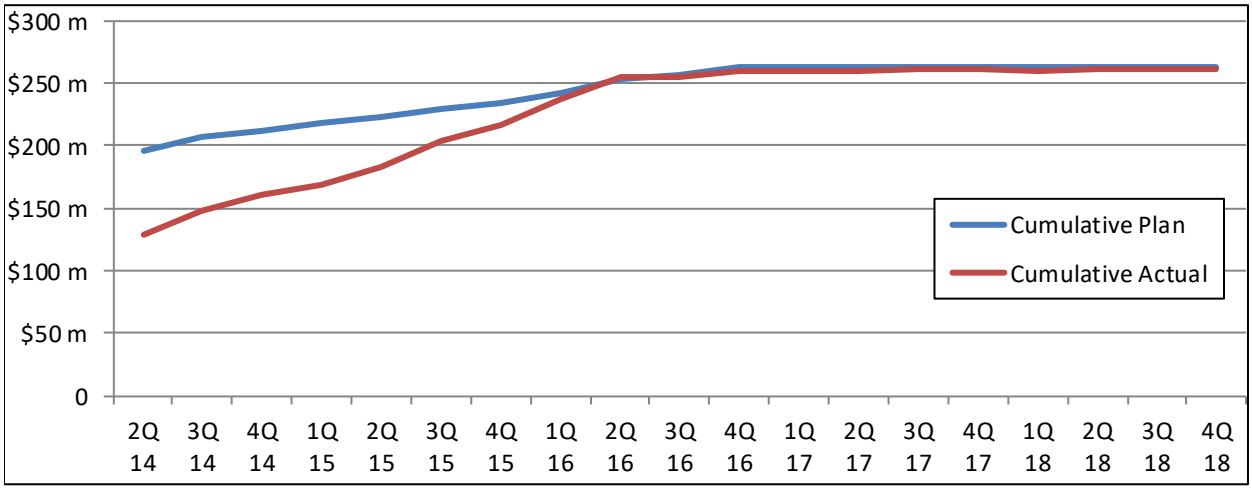


CQ032 Plaza Substation & Queens Structures Jan 2019

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
		(2-1)			(5-4)		(7-1)
$162.1	$265.4	$103.3	$147.4	$262.2	$114.8	$263.7	$101.6

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	
100.0%	99.8%	0.2%	0.0%	0.1%	0.0%	0.07% per month

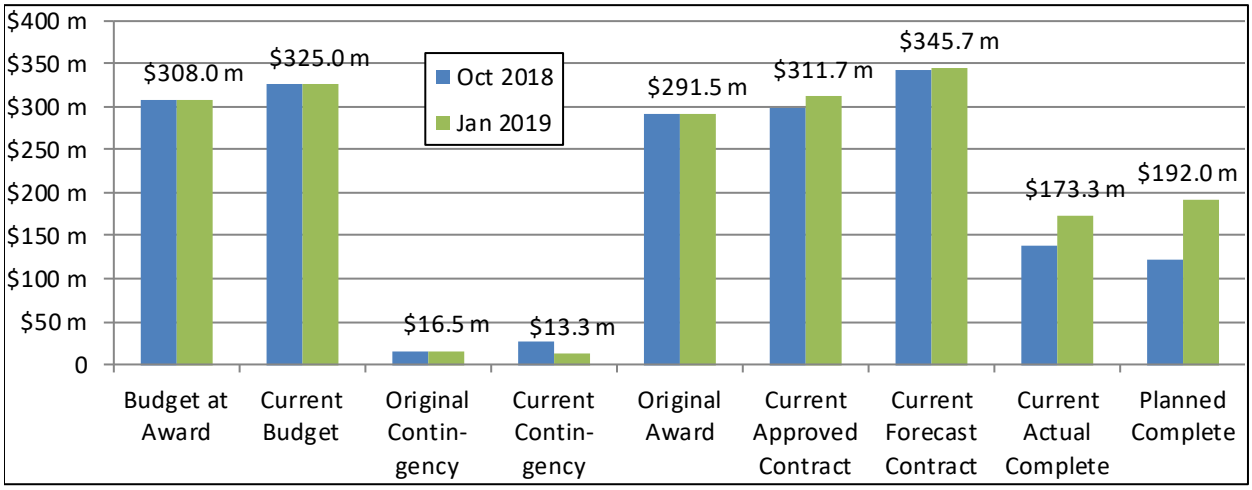


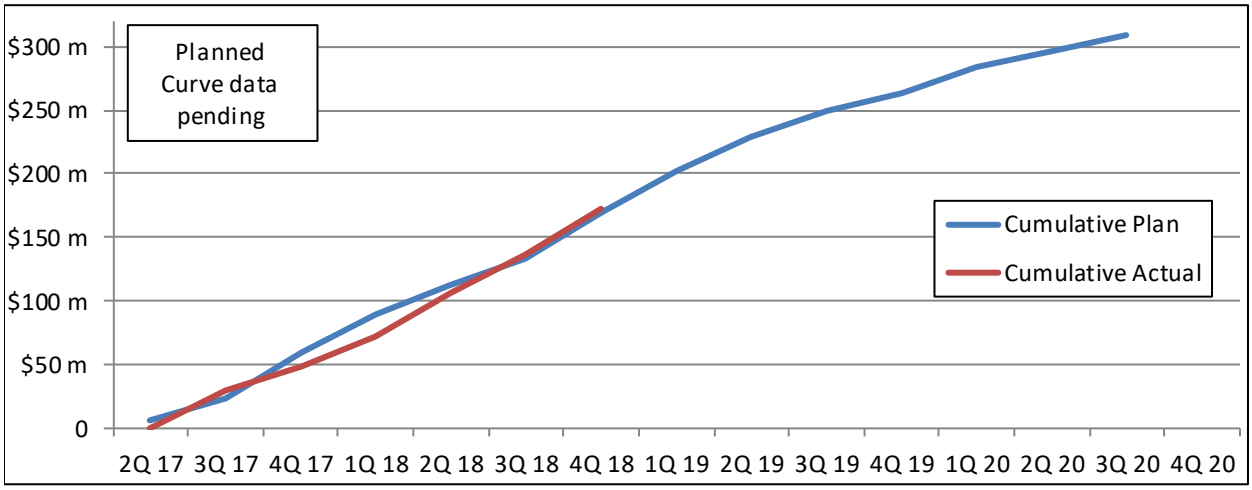


CQ033 Mid-Day Storage Facility Jan 2019

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
		(2-1)			(5-4)		(7-1)
$308.0	$325.0	$17.0	$291.5	$311.7	$20.2	$345.7	$37.7

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	
61.6%	55.6%	39.2%	3.3%	19.7%	3.3%	1.64% per month

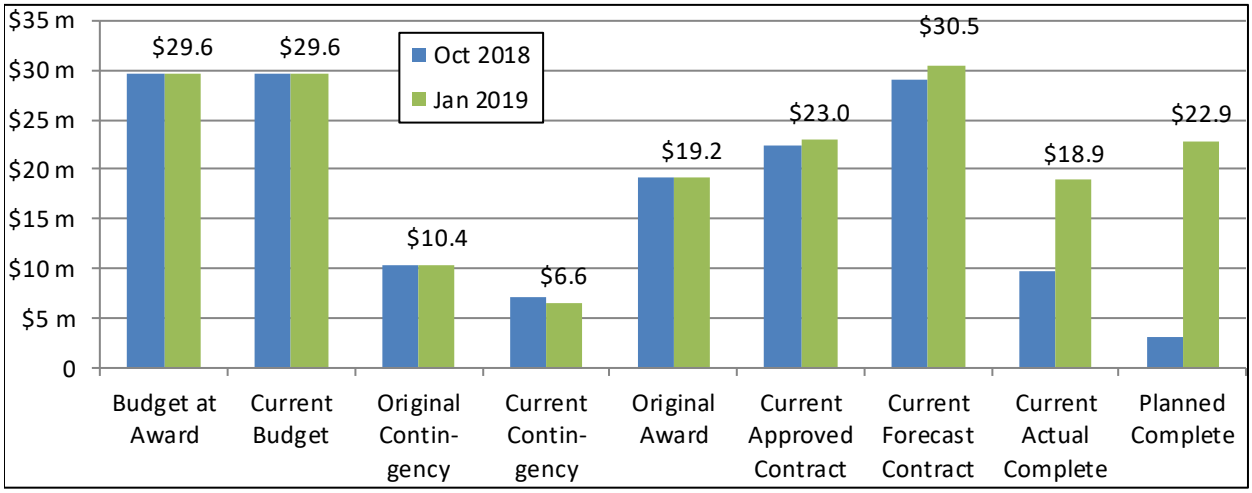


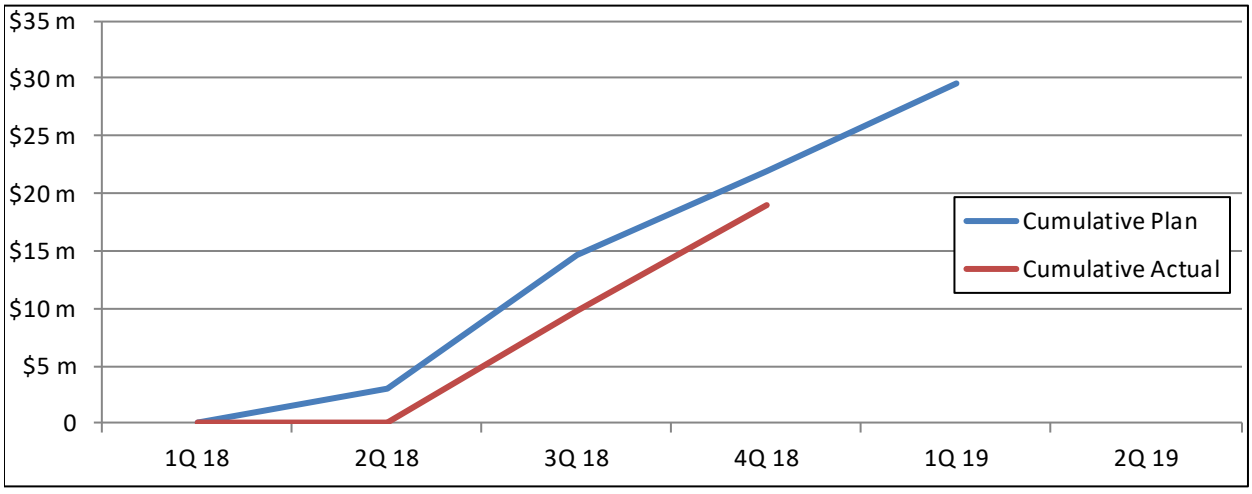


CH057D Track A Cut and Cover Structure Jan 2019

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
		(2-1)			(5-4)		(7-1)
$29.6	$29.6	$0.0	$19.2	$23.0	$3.8	$30.5	$0.9

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	
99.4%	82.4%	NA	NA	82.4%	13.7%	5.87% per month

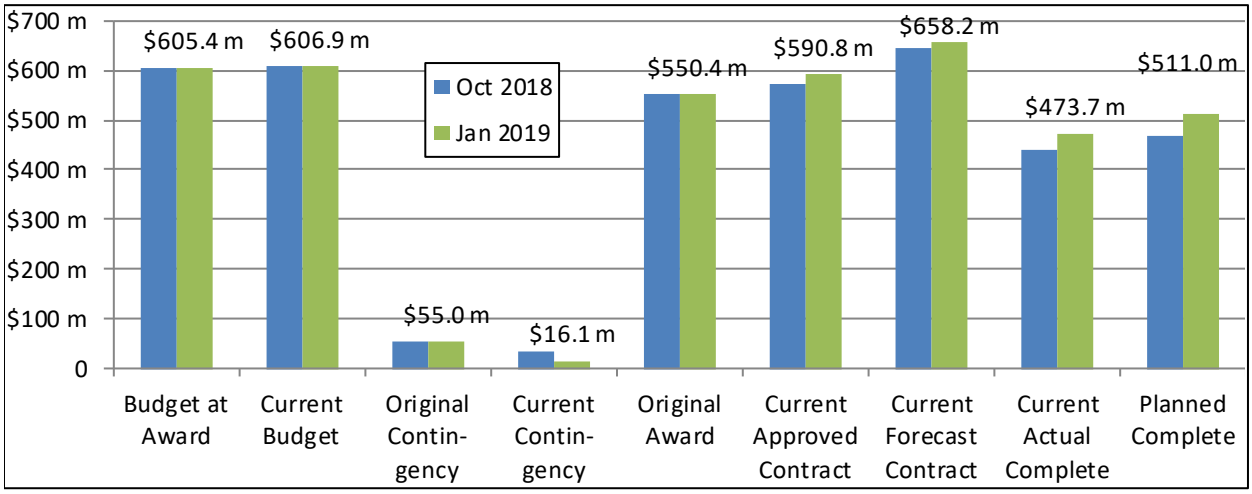


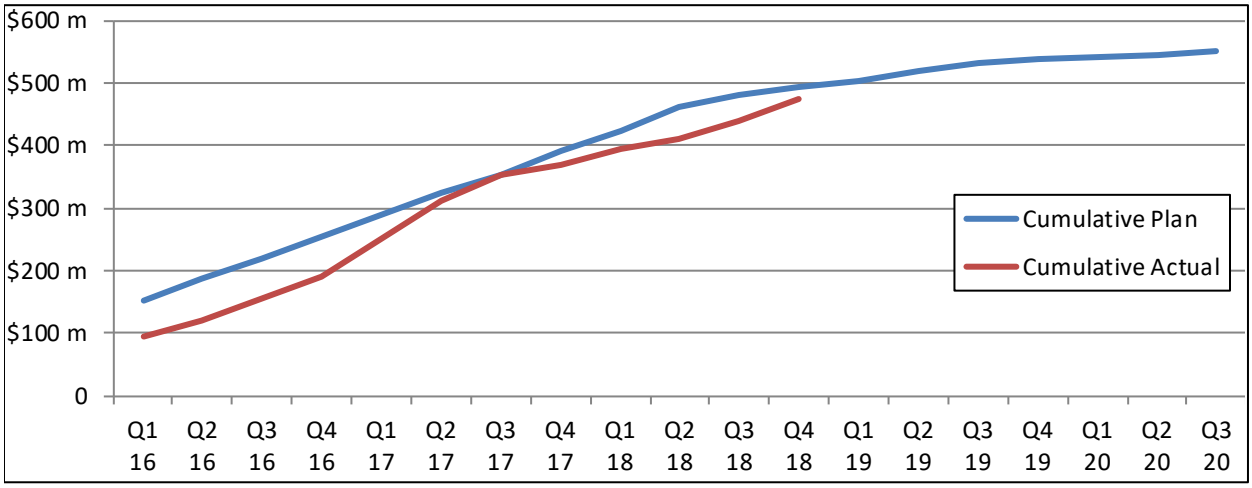


CS179 Systems Package 1 – Facilities Systems Jan 2019

Budget at Award	Current Budget	Change from Original to Current (2-1)	Contract at Award	Current Approved Contract	Change from Original to Current (5-4) (options+mods)	Current Forecast	Change from Current Forecast to Budget at Award (7-1)
$605.4	$606.9	$1.5	$333.6	$590.8	$257.2	$658.2	$52.8

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	
86.5%	80.2%	13.4%	1.1%	8.2%	1.4%	0.57% per month

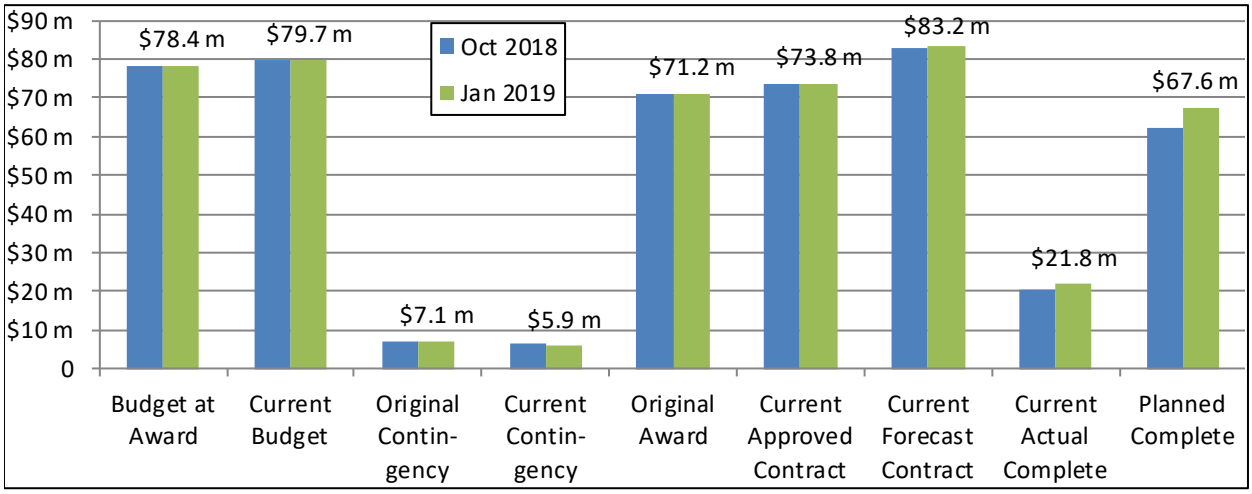


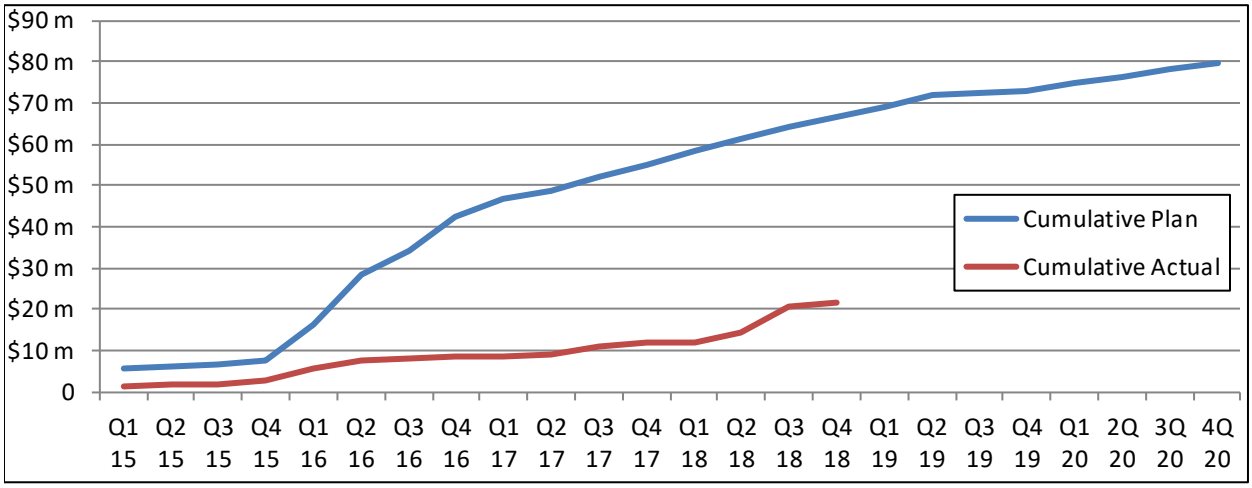


CS084 Tunnel Systems Package 4 – Traction Power Jan 2019

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
		(2-1)			(5-4)		(7-1)
$78.4	$79.7	$1.3	$71.2	$73.8	$2.6	$83.2	$4.8

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	
91.6%	29.5%	13.1%	1.1%	10.1%	1.7%	2.61% per month

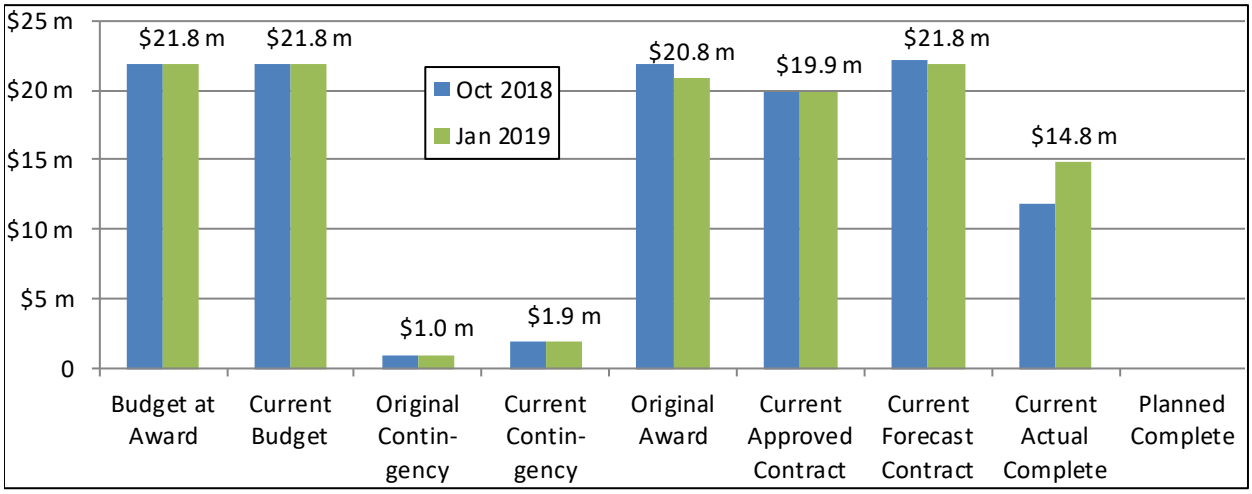


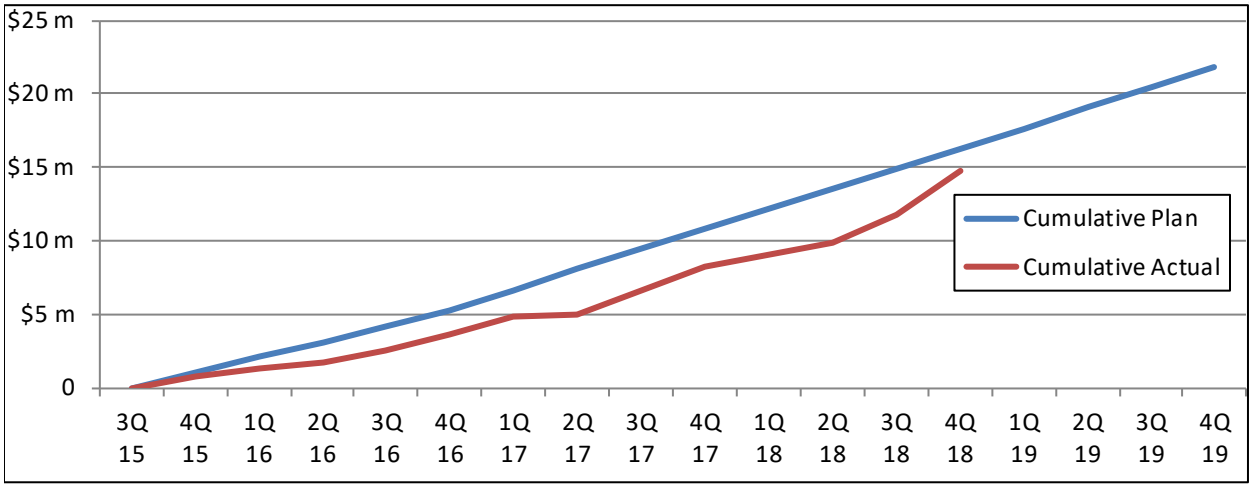


VS086 Systems Package 3 – Signal Equipment Procurement Jan 2019

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
		(2-1)			(5-4)		(7-1)
$21.8	$21.8	$0.0	$20.8	$19.9	($0.9)	$21.8	$0.0

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	74.2%	32.6%	2.7%	24.4%	4.1%	2.15% per month

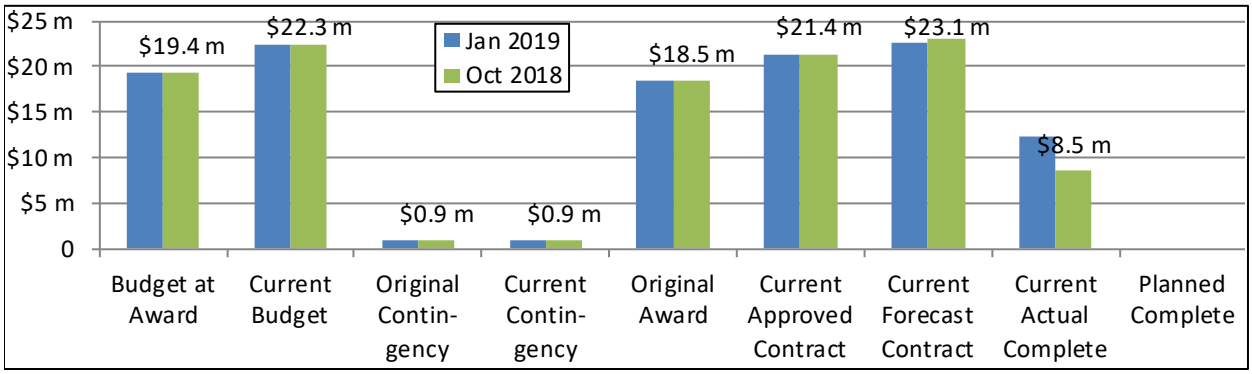




VQ033 Midday Storage Yard CILs Jan 2019

Budget at Award	Current Budget	Change from Original to Current (2-1)	Contract at Award	Current Approved Contract	Change from Original to Current (5-4)	Current Forecast	Change from Current Forecast to Budget at Award (7-1)
$19.4	$22.3	$2.9	$18.5	$21.4	$2.9	$22.7	$3.3

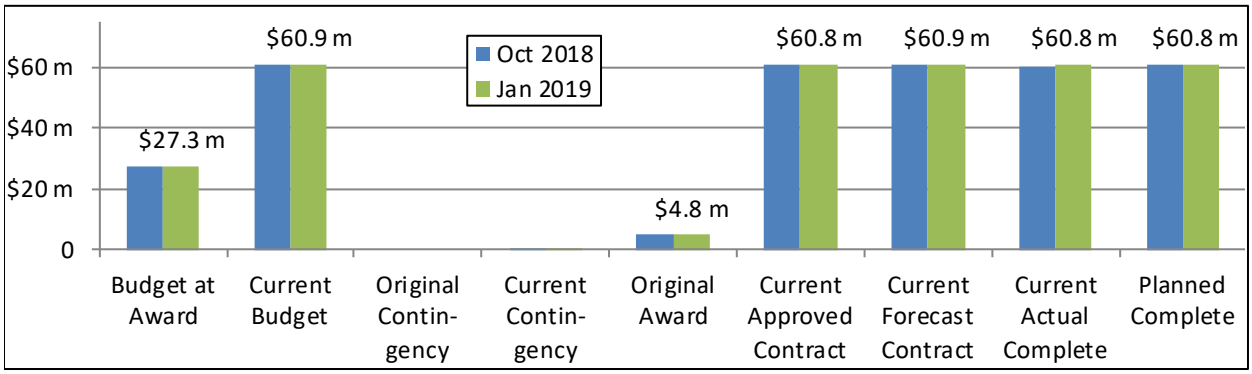
Percent Complete		Actual Prog Last 12 Mths		Actual Prog Last 6 Mths		Average Required Progress to reach forecast SC
Planned	Actual	Total	Avg/Mth	Total	Avg/Mth	
NA	57.8%	27.5%	2.3%	26.9%	4.5%	2.81% per month



FHA02 Harold Stage 2 – Amtrak F/A Jan 2019

Budget at Award	Current Budget	Change from Original to Current (2-1)	Contract at Award	Current Approved Contract	Change from Original to Current (5-4)	Current Forecast	Change from Current Forecast to Budget at Award (7-1)
$27.3	$60.9	$33.6	$4.8	$60.8	$56.0	$60.9	$33.6

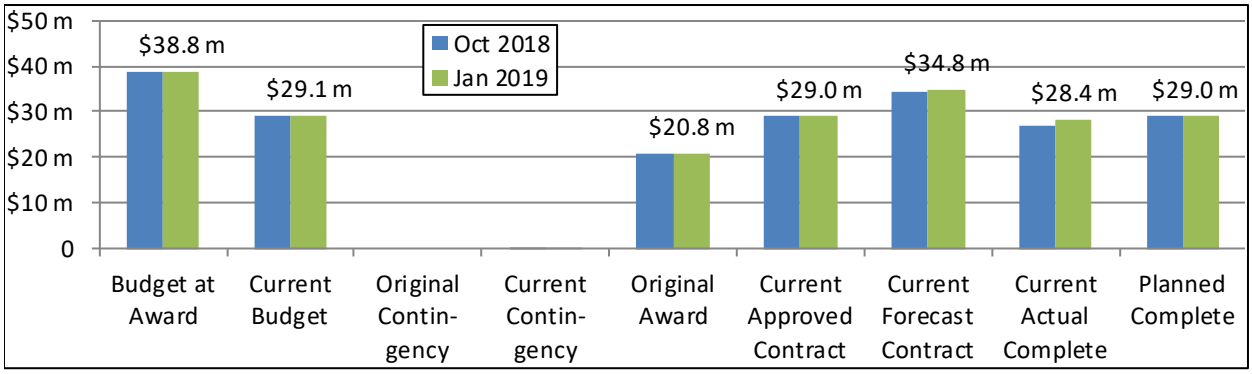
Percent Complete		Actual Prog Last 12 Mths		Actual Prog Last 6 Mths		Average Required Progress to reach forecast SC
Planned	Actual	Total	Avg/Mth	Total	Avg/Mth	
100.0%	99.9%	9.7%	0.8%	2.0%	0.3%	0.00% per month



FHL01 Harold Stage 1 – LIRR F/A Jan 2019

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
		(2-1)			(5-4)		(7-1)
$28.8	$29.1	$0.3	$20.8	$29.0	$8.2	$34.8	$6.0

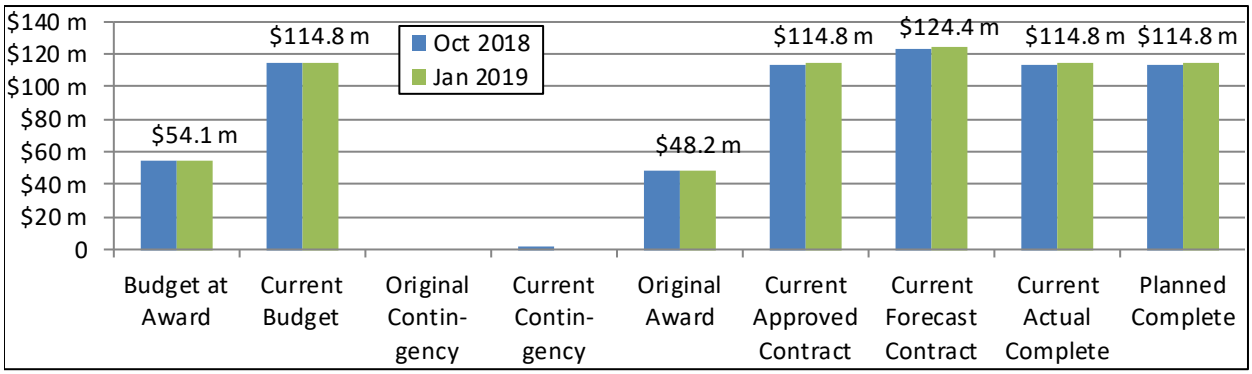
Percent Complete		Actual Prog Last 12 Mths		Actual Prog Last 6 Mths		Average Required Progress to reach forecast SC
Planned	Actual	Total	Avg/Mth	Total	Avg/Mth	
100.0%	97.5%	-8.2%	-0.7%	-0.9%	-0.2%	1.25% per month



FHL02 Harold Stage 2 – LIRR F/A Jan 2019

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
		(2-1)			(5-4)		(7-1)
$54.1	$114.8	$60.7	$48.2	$114.8	$66.6	$124.4	$70.3

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	
100.0%	100.0%	3.3%	0.3%	10.0%	1.7%	0.00% per month



APPENDIX K – 3rd PARTY CONTRACT MILESTONE METRICS

As of IPS data date February 1, 2019

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	Quarterly Change Notes
CM006: Manhattan Structures North							
NTP	Notice to Proceed	3/31/14A	N/A	N/A	3/31/14A	0	
SC	Substantial Completion	11/30/16	N/A	6/1/17	3/30/19	850	3 month forecasted delay.
FC	Final Completion	2/28/17	N/A	8/30/17	6/28/19	850	3 month forecasted delay.
CM007: GCT Caverns							Approved baseline in Feb. 1, 2017 IPS.
NTP	Notice to Proceed	4/19/16	4/11/16A	N/A	4/11/16A	-8	
4	Trackwork & 3rd Rail Work Complete (excludes STW @ GCT4, GCT6 & Plaza West)	N/A	10/3/19	8/7/19	12/26/19	84	2 week forecasted delay.
5	Substations US1 and US2 Complete	N/A	6/27/18	2/1/19	2/22/19	240	3 month forecasted delay. Contract date changed by Mod. 56.
5A	Caverns Ready for Integrated Systems Testing	4/11/19	8/7/19	8/7/19	10/30/19	84	3 week forecasted delay.
6	All Caverns and Tunnel Work Complete	N/A	12/16/19	12/16/19	5/7/20	143	2 month forecasted delay.
6A	Substantial Completion	7/19/19	1/28/20	1/28/20	5/7/20	100	2 month forecasted delay.
6B	Punchlist Completion	N/A	4/27/20	4/27/20	8/7/20	102	2 month forecasted delay.
7	Integrated System Testing Completion	N/A	6/1/20	6/1/20	7/20/20	49	1 month forecasted delay.
CM014B: GCT Concourse and Facilities Fit Out							Approved baseline in Nov. 1, 2016 IPS.
NTP	Notice to Proceed	11/2/14	2/2/15A	N/A	2/2/15A	92	
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	3/28/19	755	4.5 month forecasted delay.
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	2/3/20	830	4.5 month forecasted delay.
8	Substantial Completion	7/24/19	1/21/19	10/28/20	11/10/20	475	3.25 month forecasted delay. Contract date changed +3 months.
8A	Punchlist Complete	5/17/18	5/21/19	12/16/18	3/10/21	1028	3.5 month forecasted delay.

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	Quarterly Change Notes
9	Integrated Systems Testing Completed	7/24/19	3/23/20	10/25/19	12/6/21	866	6 month forecasted delay.
9A	Ready for Integrated Systems Testing	5/17/18	10/2/18	5/20/18	7/24/20	799	6 month forecasted delay.
10	Shaft 4	N/A	7/1/18	7/1/18	4/22/19	295	4.25 month forecasted savings.
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	3/31/19	1270	3 month forecasted delay.
7	Final Completion	1/7/16	N/A	12/5/16	6/30/19	1270	3 month forecasted delay.
CQ033: Mid-Day Storage Yard							Approved baseline in Nov. 1, 2017 IPS.
NTP	Notice to Proceed	7/4/15	N/A	N/A	4/11/17A	-	
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	11/3/20	237	5 month forecasted delay.
5	YS Track Completion	N/A	4/11/18	4/11/18	2/5/20	665	5 month forecasted delay.
6	Substantial Completion	10/25/18	8/10/20	8/10/20	4/4/21	892	5 month forecasted delay.
8	Completion of Plaza Work	N/A	7/12/18	7/12/18	3/11/19	242	5 month forecasted delay.
9	Complete Option 1 - Demo Amtrak Buildings	N/A	5/27/20	5/27/20	10/24/19	-216	3 month forecasted delay.
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 A	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	2/10/19	118	1.5 month forecasted savings.
7	SEQ, TM2 & 6199	N/A	10/26/18	10/26/18	2/16/19	113	1.25 month forecasted savings.
8	Substantial Completion	N/A	1/31/19	1/31/19	3/30/19	58	2 month forecasted savings.
9	Final Completion	N/A	4/30/19	4/30/19	6/27/19	58	2 month forecasted savings.
CH058A: Harold Structures B/C Approach							
1	Obtain Underpilling Design Approval	N/A	5/22/2019	5/22/2019	1/14/2019 A	-128	4 month actualized delay.
2	Complete 39th Street Bridge Load Transfer	N/A	9/4/2019	9/4/2019	9/4/2019	0	
3	Erect Catenary Structure 927-2/3H	N/A	2/29/2019	2/29/2019	2/28/2020	-1	
4	Complete Removal of TBM Cuterhead	N/A	12/27/19	12/27/19	12/27/19	0	
5	Complete 39th Street Bridge Re-transfer	N/A	8/8/20	8/8/20	8/7/20	-1	
6	Complete CO8 Ductbank	N/A	8/22/19	8/22/19	8/22/19	0	
7	Complete B/C Structure from Sta 1204+2.5 to 1206+05	N/A	9/23/20	9/23/20	9/23/20	0	

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	Quarterly Change Notes
8	Substantial Completion	N/A	3/17/21	3/17/21	3/17/21	0	
9	Final Completion	N/A	9/15/21	9/15/21	9/15/21	0	
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	
CS179: Systems Package 1 - Facilities Systems							Approved baseline in Oct. 1, 2016 IPS.
NTP	Facilities Systems Package 1 NTP	3/31/14A	3/31/14A	N/A	3/31/14A	-	
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	
3	Completion of Multiple Rooms (CIR, Sig. Reactor, Interlocking 1D, TPSS C06 and C07)*	10/13/16	12/31/16	5/22/17	2/1/19	841	3 month forecasted delay.
4A	C04 TPSS Room (Level P1) Ready for CS084 Work at 2nd Ave. Vent Facility	5/5/16	2/1/17	2/1/17	2/1/19	1002	3 month forecasted delay.
5	GCT 6 CIR Ready for CS086 (orig CS086) Installation	10/17/16	4/14/17	4/30/17	2/1/19	837	3 month forecasted delay.
6	B10 Permanent Power Energized (Precedes Energization of B05, B06,B08, B09, B11 & B13)	6/24/16	4/28/17	4/22/17	2/1/19	952	3 month forecasted delay.
7	GCT 5 CIR Ready for CS086 (orig CS086) Installation	2/17/17	5/27/17	4/30/17	2/1/19	714	3 month forecasted delay.
8	GCT 4 CIR Ready for CS086 (orig CS086) Installation	5/2/17	6/27/17	4/30/17	2/1/19	640	3 month forecasted delay.
9	C01 & C02 TPSS Room Ready for CS084 at Tail Tracks	8/7/17	6/8/17	6/8/17	2/1/19	543	3 month forecasted delay.
10	GCT 3 CIR Ready for CS086 (orig CS086) Installation	11/6/17	9/6/17	9/6/17	2/1/19	452	3 month forecasted delay.
11	C03 TPSS Room Ready for CS084 at 55th St. Vent Facility	2/20/18	2/27/18	3/25/18	5/23/19	457	3 month forecasted delay.
12A	Integrated System Testing Start (TOC & All Permanent Power Complete)	5/2/18	12/8/18	9/1/18	12/11/19	588	1 year forecasted savings.
12B-1	Complete IST of All Systems Equip Installed by CM007	10/22/19	7/1/20	3/23/20	2/22/21	489	2 month forecasted savings.
12B-2	Complete IST of All Systems Equip Installed by CM014A	7/24/19	7/1/20	3/23/20	2/22/21	579	2 month forecasted savings.
12B-3	Complete IST of All Systems Equip Installed by CM014B	7/24/19	7/1/20	3/23/20	2/22/21	579	2 month forecasted savings.
13	Substantial Completion Including Completion of IST	12/9/19	7/1/20	7/1/20	11/25/21	717	No change.
CS084: Tunnel Systems Package 4 - Traction Power Systems							Approved baseline in the Jan 1, 2016 IPS.

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	Quarterly Change Notes
NTP	CS084 NTP	9/5/14	10/29/14A	N/A	10/29/14A	54	
1	Energize Traction Power Substation C08	5/26/17	N/A	5/6/18	6/30/20	1131	2 week forecasted savings.
2	Energize Traction Power Substation C04 and C05	6/20/18	12/14/18	10/3/18	9/2/20	805	1.25 month forecasted delay.
3	Energize Traction Power Substation C06 and C07	10/2/18	3/2/19	3/2/19	1/7/21	828	2 week forecasted delay.
4	Energize Traction Power Substation C01 and C02	10/30/18	1/30/19	2/5/19	9/4/20	675	1 month forecasted delay.
5	Energize Traction Power Substation C03	12/28/18	5/16/19	5/16/19	10/1/20	643	1 week forecasted delay.
6	Complete Local testing of all substation	1/11/19	7/30/19	7/30/19	1/21/21	741	1 week forecasted savings.
7	Substantial completion & Final Completion	10/21/19	11/25/19	12/2/19	4/15/21	542	1 week forecasted savings.
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							Approved baseline in May 1, 2016 IPS.
NTP	Notice To Proceed (NTP) Actual 1/15/16 by JPS	N/A	1/15/16A	N/A	1/15/16A	-	
1	Mid-3 CIL (NTP+549d)*	N/A	7/21/17	5/2/19	5/16/19	664	2 week forecasted delay.
2	Mid-6 CIL (NTP+855d)*	N/A	5/23/18	8/13/19	8/13/19	447	
3	Mid-8 CIL (NTP+1158d)*	N/A	11/22/18	9/10/19	9/25/19	307	2 week forecasted delay.
SC	Substantial Completion (NTP+1216d)	N/A	5/19/19	3/6/20	3/24/20	310	2 week forecasted delay.
VS086: Systems Package 3 - Tunnel Signal Equipment							Approved baseline in Dec. 1, 2016 IPS.
NTP	VS086 NTP	7/7/14	9/30/14A	N/A	9/30/14A	85	
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	
3	Furnish Tunnel Signal Equip. & Hardware for Plaza CIR (NTP+582CD)	2/18/16	6/29/17	4/28/17	11/27/18A	1013	1 week actualized delay.
4	Furnish Tunnel Signal Equip. & Hardware for GCT5 & GCT6 CIRs (NTP+650CD)	4/26/16	1/9/18	1/17/19	2/7/19	1017	2 week forecasted delay. Contract date changed +14 months.
5	Furnish Tunnel Signal Equip. & Hardware for GCT3 & GCT4 CIRs (NTP+730CD)	7/17/16	6/5/18	4/8/19	4/15/19	1002	1 month forecasted savings. Contract date changed +13 months.

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	Quarterly Change Notes
SC	Substantial Completion (NTP+1840CD)	12/9/19	10/14/19	11/19/19	12/23/19	14	2 month forecasted delay. Contract date changed +1 month.

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 Report. (data date February 1, 2019).

4 Current ESA Forecast Date - Date shown in current IPS Monthly Update (data date February 1, 2019).

5 Delta - Difference between Current ESA Forecast Date and a baseline Date. The baseline will either be the IPS Baseline Date (June 2014), or Approved Contract Baseline Date. 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 38th St	2/16/16	7/2/18A	128	1/18/17	3/1/19	-92	9/13/16	6/3/19	-63	2/23/17	6/25/19	-56	2/9/18	7/16/19	-57
CO2 Tail Tracks 38th St	2/16/16	10/23/18A	44	5/24/16	3/1/19	-114	9/13/16	6/6/19	-28	2/20/17	6/25/19	-27	2/9/18	7/16/19	-28
CO3 55th Street	2/23/16	4/11/19	-87	6/1/16	5/13/19	-158	9/13/16	9/3/19	-13	3/13/17	9/25/19	-5	8/2/18	10/15/19	-5
CO4 2nd Avenue	2/18/16	2/28/19	-91	11/21/16	2/28/19	-570	9/13/16	2/28/19	-91	10/5/16	1/22/18A	0	3/13/17	2/12/18A	0
CO5 Vernon	2/18/16	2/7/19	-538	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	4/11/19	-87	5/26/16	2/27/19	-569	9/30/16	6/7/19	0	11/21/16	7/5/19	-2	6/13/17	7/25/19	0
CO7 QP Yard	2/18/16	4/23/19	-89	5/26/16	2/22/19	-107	9/13/16	8/14/19	-62	1/12/17	9/13/19	-60	8/17/17	10/3/19	-62
CO8 43rd St Pre-fab Bldg	1/21/16	10/23/18 A	0	5/12/16	8/16/17A	0	9/12/16	4/25/19	-49	10/25/16	5/9/19	20	12/6/16	5/30/19	20

*Notes

1 - Current Update = IPS with Data Date 2/1/19.

2 - Delta = Change over the quarter, from IPS with data date 11/1/18, 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 38th St	11/6/18	4/20/20	-56	12/27/18	6/10/20	-57	1/21/19	7/1/20	-57	2/4/19	9/4/20	-58	12/2/19	4/15/21	22
CO2 Tail Tracks 38th St	11/14/18	4/7/20	-7	12/24/18	5/20/20	-7	1/22/19	6/11/20	-8	2/5/19	8/17/20	-11	12/2/19	4/15/21	22
CO3 55th Street	3/1/19	5/26/20	-7	N/A	N/A	N/A	5/6/19	7/30/20	-8	5/16/19	10/1/20	-9	12/2/19	4/15/21	22
CO4 2nd Avenue	4/27/18	2/17/20	-7	7/6/18	4/27/20	-10	8/7/18	5/27/20	-9	8/21/18	7/31/20	-10	12/2/19	4/15/21	22
CO5 Vernon	6/8/18	8/15/19	-114	N/A	N/A	N/A	9/19/18	1/14/20	-115	10/3/18	6/16/20	-91	12/2/19	4/15/21	22
CO6 QP Main	9/10/18	8/28/20	-7	N/A	N/A	N/A	1/3/19	12/22/20	-11	1/17/19	1/7/21	-13	12/2/19	4/15/21	22
CO7 QP Yard	10/22/18	4/16/20	117	N/A	N/A	N/A	2/15/19	8/11/20	113	3/1/19	8/25/20	113	12/2/19	4/15/21	22
CO8 43rd St Pre-fab Bldg	9/12/17	4/17/20	19	12/8/17	2/17/20	102	2/1/18	5/27/20	-19	2/15/18	6/30/20	13	12/2/19	4/15/21	22

1. Current Update = IPS with Data Date 2/1/19.
2 - Delta = Change over the quarter, from IPS with Data Date 11/1/18, 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.
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	2Q2018	3Q2018	4Q2018	1Q2019
CM007	< 90 days Open	30	9	9	17
	> 90 days Open	31	36	37	33
	Total Open	61	45	46	50
	Total Closed	62	86	87	110
	Total NCRs	123	131	133	160
CM014B	< 90 days Open	12	16	5	11
	> 90 days Open	15	11	15	19
	Total Open	12	27	20	30
	Total Closed	40	42	55	57
	Total NCRs	52	69	75	87
CQ032	< 90 days Open	6	2	1	0
	> 90 days Open	1	9	9	10
	Total Open	12	11	10	10
	Total Closed	114	118	120	120
	Total NCRs	126	129	130	131
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
CM006	< 90 days Open	0	0	0	5
	> 90 days Open	0	0	0	12
	Total Open	0	0	0	17
	Total Closed	26	26	26	191
	Total NCRs	26	26	26	208
CH061A	< 90 days Open	5	4	0	0
	> 90 days Open	1	2	0	0
	Total Open	6	6	0	0
	Total Closed	10	12	18	18
	Total NCRs	16	18	18	18
CS179	< 90 days Open	4	7	6	1
	> 90 days Open	14	14	14	17
	Total Open	18	21	20	18
	Total Closed	39	43	47	49
	Total NCRs	57	64	66	67
CS084	< 90 days Open	1	0	1	1
	> 90 days Open	1	0	0	3
	Total Open	2	0	0	4
	Total Closed	4	6	6	7
	Total NCRs	6	6	7	11
CQ033	<90 days Open	0	3	0	2
	>90 days Open	0	0	0	1
	Total Open	0	3	0	3
	Total Closed	11	11	14	14
	Total NCRs	11	14	14	17

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 32 contract modifications having magnitudes in excess of $100,000 during the period from November 2018 through January 2019. These modifications represent a total net cost increase of $50.7 million. The PMOC reviewed staff summaries of select modifications to check compliance with the guidelines. Unless otherwise noted, the PMOC observed that the CM followed the ESA project procedures.

CH053 had 1 modification during the review period that resulted in an increase of $2.0 million. The PMOC reviewed modification 170, Track D Approach, dated December 10, 2018.

CH057D had 2 modifications during the review period that resulted in an aggregate increase of $577.6 thousand. The PMOC reviewed modification 3, Installation of Turnouts on MLI and MU Tracks, with a value of $444.8 thousand and dated November 13, 2018.

CM007 had 4 modifications during the review period that resulted in an aggregate increase of $834.5 thousand. The PMOC reviewed modification 55, Deletion of Metal Clad Cables for Public Emergency Telephones, with a credit value of $173.0 thousand and dated January 23, 2019.

CQ033 had 2 modifications during the review period that resulted in an aggregate increase of $1.7 million. The PMOC reviewed modification 29, Track Resequencing, with a value of $1.55 million and dated January 9, 2019.

CM014B had 16 modifications executed during the review period that resulted in an aggregate increase of $15.1 million. This modification is #185 (Add Stairway at the 47th Street Node-Package #2 CPR-097) with a value of $3,329,168 million and staff summary dated October 3, 2018. This work is part of a larger series of modifications to the 47th Street stairways in Modification #165.

b(4) [redacted]

CS084 had 1 modification during the review period that resulted in an aggregate increase of $245.1 thousand. The PMOC reviewed modification 13, VRN Duct Banks, dated December 3, 2018. The MTACC has referred this modification to the Cost Recovery panel for review.

CS179 had 19 modifications during the review period that resulted in an aggregate increase of $13.4 million. The PMOC reviewed modification 119, L1RR Fiber Optic Network (FON), with a value of $2.3 million and dated November 19, 2018. In the Modification, the MTA and the Contractor expressly reserve their respective rights and defenses under the Contract in that regard. The MTACC has referred this modification to the Cost Recovery panel for review.

Professional GEC Services had 1 modification during the review period that resulted in an aggregate increase of $28 million. The PMOC reviewed modification 151, Additional Funding for Construction Phase Services, dated December 4, 2018.

APPENDIX O – CM007- DIRECT FIXATION – QUALIFICATION TESTING AND TRACK 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	Re-testing resumed March 2019

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 March 14, 2019

CM007 - Direct Fixation Track 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	50.1%
Planned Progress	See Note #1 below	100.0%

*Progress Data from March 24, 2019 ESA Progress Summary: Track & Third Rail - DFF.

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	60.6%
Planned Progress	93.1%

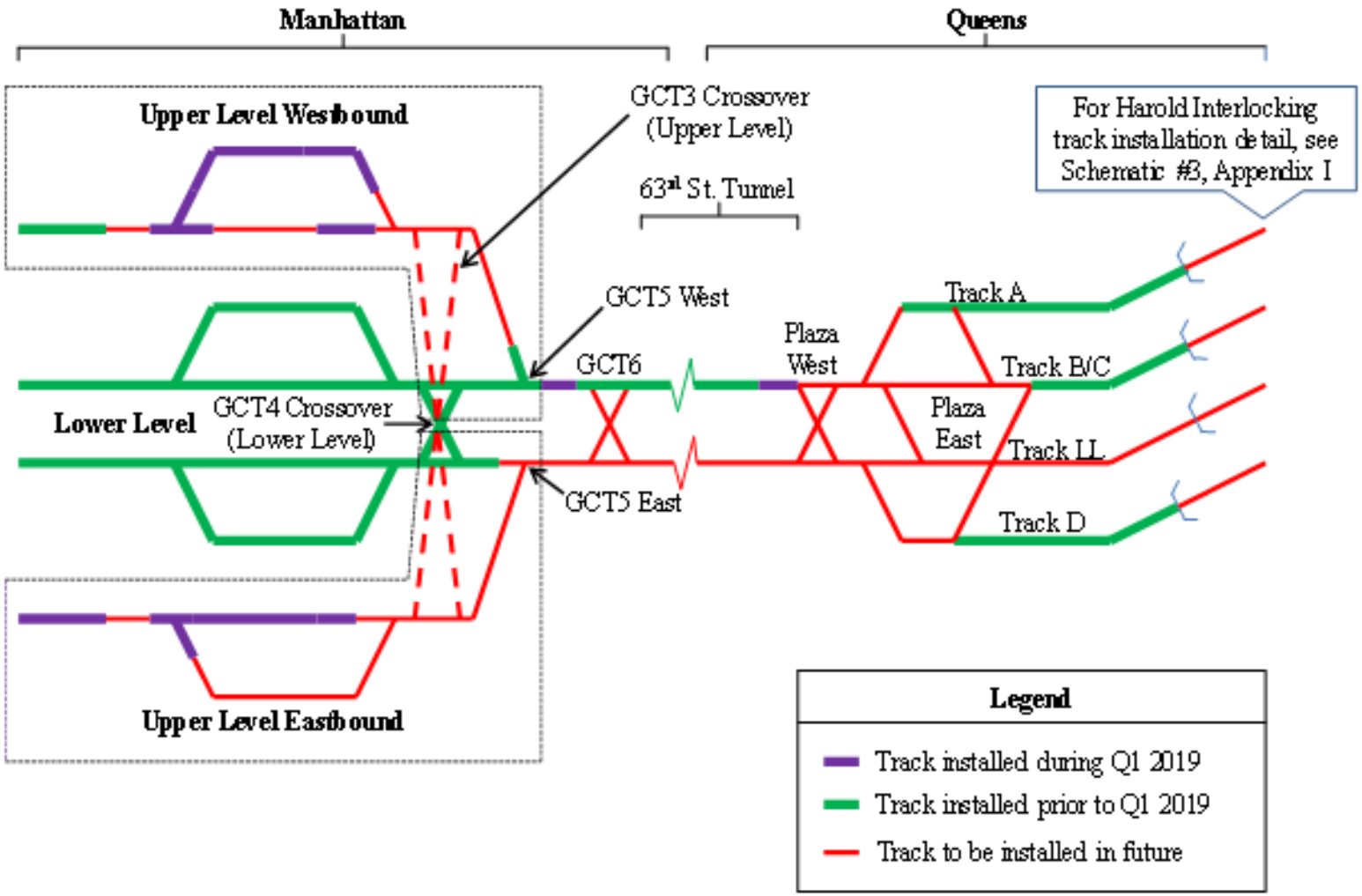
*Progress Data from March 24, 2019 ESA Progress Summary: Track& Third Rail – RTB.

Special Trackwork (turnouts)

S T Assemblies	Special Trackwork RTB (STRTB)	Special Trackwork DFF (STDFF)
Installation Status	Progressing	Not started
Actual Progress	19.6%	
Planned Progress	83.3%	

*Progress Data from March 24, 2019 ESA Progress Summary: Track & Third Rail - Special Trackwork

Appendix O: Track Construction
Manhattan and Queens
Status as of March 31, 2019



APPENDIX P – CONTRACT CS084 – TRACTION POWER SUBSTATIONS

Contractor's Issues by Substation

General Issues

1. Track access coordination with CM007
2. Monuments – awaiting listing of acceptable monuments

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. Conduit blockage from cable vault to street
5. Dielectric floor scarification not done

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)
4. Floor scarification modification needed

C04 (2nd Avenue)

1. Replacement of AC feeder duct bank by CS179 needed
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 FCR
3. Still have water infiltration issue
4. CPRs needed for various other coordination issues

C06/C07 (Plaza)

1. CS179 conduit at bench level blocking wall penetrations
2. Doorway needs to be enlarged for delivery/installation of reactors (mod to CS179 needed)
3. Coordination: interferences from CS179 (light fixtures and ductwork)
4. Transformer delivery contingent n CS179 lifting beam installation

C08 (43rd Street)

1. Conduit duct banks be0ween C08 vault and tracks (shown on contract drawings as existing) are missing and be installed under CH058A contract
2. Sewer and water supply work required

APPENDIX Q – OPERATIONAL READINESS

Rail Activation Plan & Task Working Groups (TWG) – Q42018 Status

NOTE: The Quarterly update for 4Q2018 was held on February 12, 2019, and the data presented in the items below reflects the status of Operational Readiness activities as of that date.

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, that goal was not achieved and revised forecast completion date is currently unavailable.

(**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 continues to be 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 are 726 tasks and activities currently identified that must be completed to successfully implement full ESA revenue service. Of those 726 RAP tasks and activities, 98 are already complete and 142 are currently in progress. The remaining 486 are not scheduled to start yet.
- Seventeen (17) of the tasks and activities that are currently in progress are considered overdue when compared to the current ESA Target date of February 2022. Three significant overdue tasks are: 1) the finalization 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 previously advised that the EAP and Volume #3 of the RAP would be completed by the end of 2018; however, that date was not met. The EAP remains in draft form and continues to be under review by ESA stakeholders. The completion of Volume #3 of the RAP is dependent on the completion of an OPR Group-developed Comprehensive System Test Plan (CSTP), which, in turn is dependent on the development and approval of the Incremental Integrated System Test (IIST) Plan– a plan currently being developed as part of the CS179 contract. Completion dates for these two RAP activities are unknown at this time. 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 under TWG Nos. 2 and 6.

TWG No.2 – Train Service and Operations:

- At the Q32018 OPR briefing, MTACC reported that a revised Service Plan that addresses a reduction in the planned level of revenue service would be complete in July 2019. Due to a lack of staff resulting from the MTA hiring freeze, the forecast for completion of the new Plan is delayed to the end of 2019.
- While the revised Plan is being developed, MTACC reported 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 continues to utilize the requirements set forth in its "original" F2 Service Plan. However, consideration is being given to a reduced level of revenue service.
- As a result, numerous activities – the most important ones being the acquisition and training of personnel and the procurement of railcars – are significantly behind schedule. 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.
- MTA continues to re-evaluate the strategy for the hiring of personnel to fulfill the locomotive engineer and conductor requirements – an activity whose commencement, based on existing training protocol, is significantly overdue. Alternative strategies to reduce the training time are being proposed and evaluated; but, no date for completion of this evaluation task, or the commencement of hiring, is available at this time.
- The vehicle procurement strategy is discussed later under TWG No. 11; and, MTA is assessing the possible use of existing Signal department personnel at the appropriate time to temporarily address the delayed commencement of hiring for that staffing requirement.

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

- MTACC reported that LIRR is reviewing possible alternatives for the cleaning and maintenance of the 12 new Ventilation plant facilities; and, is working with NYCT to identify what joint agreements are needed to provide these services at the 7 LIRR/NYCT shared facilities.
- A newly identified item concerning joint LIRR/NYCT discussions regarding cathodic protection and corrosion control in the ESA tunnels was noted. In response to an inquiry from the PMOC regarding this issue and whether this important electrical criteria was included in the original ESA designs, MTACC did not have an answer and indicated that it would investigate this matter further and advise the PMOC of its findings. Subsequent to the meeting, LIRR staff indicated that the designs used for construction of the facilities in the tunnels did not address cathodic protection or corrosion control of the type experienced by NYCT in its tunnels. Cathodic protection and corrosion control in NYCT tunnels is a serious issue that NYCT endeavors to keep under control for safety and other reasons. The extent of any work that may be required to address this issue is unknown at this time. However, the PMOC's experience with an issue of this type on a previous MTA project indicates that any remedial work that might be required could be extensive.

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. Currently, there are 249 assets under interim maintenance out of a projected total of 15,533 when the ESA Project is

finished. An additional 266 assets from the CQ032 contract are presently in the process of being incorporated into the active database in anticipation of commencement of interim maintenance when that contract reaches substantial completion at the end of Q12019.

- The PMOC noted that most of the ESA assets are also considered federal assets whose maintenance and state of good repair will be evaluated by the FTA during their Triennial Reviews of LIRR. The Director of Asset Management responded that the Maximo asset management system will support this review process.

TWG No. 5 – Grand Central Terminal:

- MTACC indicates that the approval to award a contract for Cellular & Wireless coverage in GCT was presented to the MTA Board in November 2018.
- In response to an inquiry from the PMOC regarding a clarification of the relationship between the Unified Trash Operating Plan and the RAP, MTACC indicated that the completion of the Plan and the MNR-managed construction contracts has an impact on ESA Operational Readiness and on GCT's ability to support ESA service. When asked if the MNR design and construction activities are incorporated into the overall ESA IPS, MTACC indicated that these activities were not currently in the IPS, but would be added.
- 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.
- MTACC indicated that this TWG needed to meet again very soon, as there has been some turnover of MNR personnel originally on this TWG and replacement personnel need to be brought up to speed on the status and strategies of the activities needed to achieve this "One MTA" goal.

TWG No.6 – Staffing and Training:

- The status of the Staffing and Training activities is basically unchanged from that reported in the Q32018 OPR briefing. As noted earlier, 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.
- LIRR's ability to provide the proper staffing for eventual ESA revenue service continues to be significantly impacted by the MTA-imposed hiring freeze; and, no date for lifting that freeze is known at this time. Hiring of locomotive engineers, train conductors, and signal personnel remains well behind schedule when compared to the original FS Service Plan.
- The current estimate for new hires is 1,043, not including third-party contractors.

TWG No.7 – Safety and Security:

- A 2nd draft of the Emergency Action Plan (EAP) developed by this TWG was distributed in January 2019 and remains under review by all ESA stakeholders for comments before being finalized. Although the LIRR's GCT EAP is patterned after the EAP being used at Penn Station, it is being specifically developed for LIRR operations at GCT. Comments on the draft Plan from stakeholders are expected by the end of February 2019.
- The OPR Director noted that the stakeholders include LIRR, MNR, MTA Police and the FDNY.

TWG No. 8 – Public Information and Marketing:

- In its Q32018 OPR briefing, MTACC reported that, 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. In the fourth quarter of 2018, discussions continued 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; however, that date was not met and a new date for completion is unknown at this time.
- In response to an inquiry from the PMOC about the possible inclusion of NYCT in the discussions and planning for the signage strategy, MTACC indicated that NYCT had not been involved to date. MTACC agreed with the PMOC that, since connections to NYCT service would be available to ESA customers, it might be a good idea to involve NYCT in any signage planning strategy; and, indicated that it would follow up on the possibility of NYCT's inclusion in the development of the strategy.
- As previously reported, this TWG developed and circulated a newsletter to all LIRR employees to let them know what ESA was all about and the current status. The PMOC had 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.

TWG No. 9 – Agreements:

- This TWG continues to prepare a comprehensive physical asset list to determine a strategy to operate and maintain ESA assets. This list will, among other considerations, be used to identify jurisdictional work efforts necessary to operate and maintain the assets and provide ESA revenue service.
- This TWG is also working on developing a list of labor Agreements that need to be developed or modified to provide and maintain ESA service. The PMOC noted that some type of activity regarding the execution of any new labor Agreements, or modifications to existing labor Agreement, should appear in the ESA OPR IPS.

TWG No. 10 – Finance and Administration:

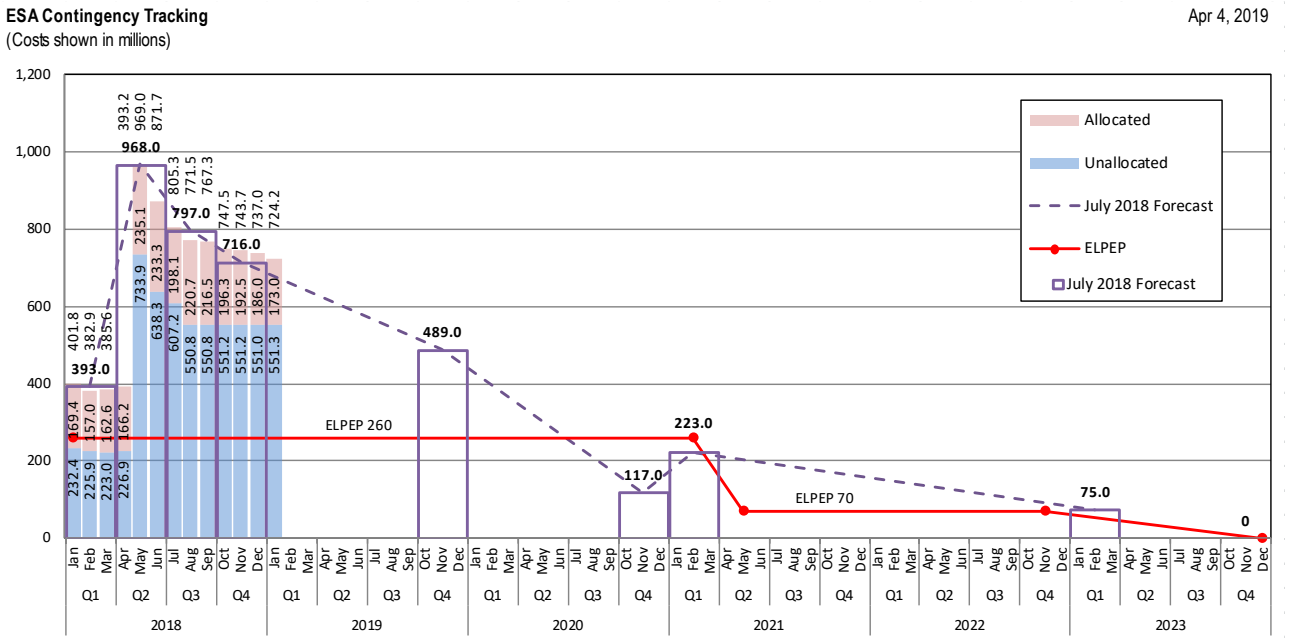
- LIRR continued to advise that it is planning to award a contract for the development and installation of the locomotive engineer Training Simulator by the end of 2019 to meet the training requirements dictated by the current ESA RSD.
- LIRR end users have been requested to identify materials and equipment needed to operate and maintain ESA service.

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.
- In Q42018, LIRR received responses to the re-advertised 1st Phase RFP for the M-9A railcars. LIRR issued the 2nd Phase RFP documents requesting technical and pricing information in January 2019 with an expected response date in March 2019 – which has now been delayed to April 2019. The current MTA plan is to evaluate whatever proposals are received and make a contract award by the end of June 2019.
- A number of different strategies regarding the availability of railcars to provide revenue service on the December 2022 projected RSD are under discussion. One scenario has LIRR

performing overhauls on some number of its M-3 cars so it can continue to utilize them in revenue service on other branches of the LIRR – they cannot be used in ESA service because of performance issues – and then using the newer M-9 cars for ESA service until the M-9A cars are delivered. The final determination of a comprehensive strategy depends on the finalization and approval of the revised Service Plan and what level of service – and how many railcars are needed for that service – will be required on the current RSD date.

APPENDIX R – ESA CONTINGENCY TRACKING



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)	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Schedule	Revenue Service Date (RSD)	Dec 31, 2013	Dec 31, 2023	Dec. 2022	April 30, 2018
Total Project % Complete	Based on Invoiced Amount		76.5% actual vs. 76.6% planned (ESA calc. †)		
Project Performance Rate since 2014 "Re-Plan"	Based on Earned Value		81.6% (PMOC calculation of construction spending at Q42018 planned vs. actual since re-baselining)		
Contracts	Total contracts awarded to date		$9,432.2 m	84.7% (PMOC calculation†)	
	Total construction contracts awarded to date		$7,255.2 m	90.5% (PMOC calculation†)	

Major Issue	Status	Comments
Project Funding and Budget	b(4) [redacted]	The MTACC needs an additional approximately $800 million in the 2020-2024 Capital Plan to complete the ESA program, which is less than the $956 million previously reported. The lower figure takes into account that the restoration of the $157 million borrowed from the Regional Investment program will be made directly in the Capital Plan. Unallocated contingencies will be used to fund contracts that are not currently fully budgeted.
Project Cost	The ESA PMT updated the ESA program budgets based on the approval of Budget Amendment 3 for the 2015-2019 Capital Plan. The April 2018 EAC is $11,133 million. The Amended FFGA Baseline Cost Estimate is $10,922 million.	If the 2020-2024 Capital Plan is not approved for the required ESA funds, then there may be significant impacts to the completion of current contracts, award of remaining contracts, and/or completion of railroad force account work. Concerns remain about the time elapsed in resolving the open Cost and Schedule issues and, ultimately, their cost impacts.
Project Schedule	The primary critical and near-critical paths to target RSD, including float, are: ▪ Manhattan/Systems – no float (critical path) ▪ Mid-day Storage Yard (Queens) – [redacted] b(4) The target RSD forecast remains on February 14, 2022. The public RSD remains December 13, 2022. The Amended FFGA Revenue Operations Date is December 2023.	There remain 36 months to the target RSD, which b(4) [redacted]
Manhattan/-Systems Schedule Path	IPS 114 shows that the ESA Program Critical Path runs through the Manhattan/Systems contracts. b(4) [redacted]	Concerns continue for the ESA program Manhattan/Systems critical path. The Manhattan/-Systems path completion date is November 25, 2021, in IPS 114. 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) medium level of risk mitigation, excluding financing.
† ESA April 2018 EAC forecast: Construction $8,014.1 million; Engineering $871.8 million; Soft Cost $1,980.4 million; b(4) [redacted] and, Total $11,133 million.