PMOC COMPREHENSIVE MONTHLY REPORT

East Side Access (MTACC-ESA) Project

Metropolitan Transportation Authority
New York, New York

Report Period June 1 to June 30, 2019

PMOC Contract No. DTFT60D1400017

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

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PMOC Lead: [redacted]
Length of time on project: Thirteen years on project for Urban Engineers

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Third Party Disclaimer

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EXECUTIVE SUMMARY

This summary highlights key events and important issues for the 2nd Quarter of 2019.

	Q1 2019	Q2 2019	Notes
Program Status[1]	76.5% actual 76.5% as-planned	78.6% actual 78.4% as-planned	Meeting April 2018 spending plan.
Construction Status	79.7% actual 80.3% as-planned	82.4% actual 82.3% as-planned	Meeting April 2018 spending plan.
Construction Progress Issues	CM014B, CS084, VS086, CS179.	CM014B, CS084, CS086, CS179.	Access restraints for CS086.
Funding	$10,335 m	$10,335 m	No change.
b(4)	[redacted]	[redacted]	[redacted]
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	No new risks added in Q2 2019.
Construction Safety	0.87 LTI 1.75 RI	0.39 LTI 0.78 RI	Safety ratios increased during Q2 2019.
b(4)	[redacted]	[redacted]	[redacted]
Buy America	Three issues	One issue	1 new potential issue Q1 2019

Contracts Awarded/Completed:	Contracts CM006 and CQ032 achieved Substantial Completion (retroactively) on March 31, 2019. No contract awarded/completed in Q2 2019.
Harold Interlocking:	Tunnel B/C construction continued and Tunnel D excavation resumed to complete construction of the remainder of the East Approach Structure to existing Harold Interlocking grade. .
Key Stakeholder Issues:	Late LIRR completion of Positive Train Control design, late LIRR approvals for CS179 final control and non-control systems designs, JPMC development of 270 Park Ave. all remained issues during Q2 2019.
Project Management Plan:	Drafts for Sub-plans SMP, CMP, and RMP submitted during Q4 2018. Revised CPP issued Q1 2019. Revised Draft TCC issued May 2019.
Organization:	The Senior Vice President Program Executive Harold Systems and Start-Up, left the program on June 30, 2019, to start retirement; no replacement identified.

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

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

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 2nd Quarter 2019

a. Engineering/Design Progress

In the ESA April 2019 MPR, the PMT reported the overall engineering effort at 86.0% complete compared to planned completion of 86.7%. 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 made available on January 14, 2019. In April 2019, ESA advised that award of the CH063 contract will be deferred until Q4 2019 due to continued improvement in Amtrak's electric traction construction for the ESA project, other scope revisions and re-advertising.

c. Construction Progress

In the ESA April 2019 MPR, MTACC reported that total construction progress reached 82.4% complete compared with planned progress of 82.3%. 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 Q2 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 yet confirmed. 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 are two potentially significant impacts of PTC implementation.

- There is the risk 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 18 months 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 38 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 remains first with Contract CM007 and later with Contract CS179. 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. Cost and schedule negotiations continued into Q2 2019 and the CS179 contract modification for the final Incremental IST plan and schedule was executed in June 2019. A similar contract modification for CM014B, executed in May 2019, includes alignment with the revised CS179 schedule. MTACC is now negotiating with CM007 to align the schedule with the revised CS179 schedule. MTACC will follow up with the associated contract modifications for the CS084, VS086, CS086 and CQ036 contracts.

e. New Cost and Schedule Issues

MTACC is managing the ESA program to the $10,335 million interim budget established in April 2018 EAC, which addresses program funding through December 2020. In the third quarter of 2019, the MTACC anticipates requesting additional local funds of approximately $800 million in the 2020–2024 Capital Plan.

MTACC continues to use the alternative methodology for the IPS schedule wherein its dates are informed by the MCS schedule. The forecast Target RSD in IPS 117 (May 1, 2019) remained February 14, 2022 and the Late RSD remained December 13, 2022, during Q2 2019. The Manhattan/Systems completion date improved by approximately 5 months based on the revised schedules for CS179 and CM014B. The Harold and Queens completion dates were held relatively constant. The PMOC also notes that the Issue Contingency was removed from the Manhattan/Systems path and the Harold path became more critical than the Queens path.

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 as well as completion of the necessary re-designs. 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. MTACC continues to be challenged to prevent the backlog from growing due to the ongoing need for new contract modifications. The PMOC believes that continued, long-term effort is required to reduce the backlog and prevent recurrence of this problem.

b. Real Estate Acquisition

In its ESA April 2019 MPR, MTACC reported that MTA Real Estate continued to work with JPMC to develop the construction agreement for JPMC's new world headquarters building at 270 Park Avenue and the impacts it will have on the new LIRR GCT concourse between 47th and 48th Streets. MTACC also reports that negotiations for construction of the 48th Street entrance, which is temporarily on hold, are moving forward with the property owner of the building at 415 Madison Avenue. The MTA/JPMC MOU was executed on March 31, 2019. The MTA/JPMC Construction Agreement negotiations continued through June 2019. MTACC is also pursuing another agreement with the owner of the building located at 415 Madison Avenue that will, along with the JPMC Construction Agreement, provide a coordinated plan for the 47th and 48th Street Entrances to the LIRR Terminal that is acceptable to all stakeholders.

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 have not supported 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. However, the rate that new modifications are being created is only marginally lower than the rate that existing modifications are executed or closed and this tends to reduce the rate of backlog reduction.

d. Procurement

The ESA April 2019 MPR shows that total procurement for the ESA Program is 85.5% complete, with total awards at $9,516 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. ESA is currently revising the work scope and plans to reissue the bid documents by late Q3 or early Q4 2019.

e. Railroad Force Account (Support and Construction)

During June 2019, LIRR Electric Traction (ET) personnel continued to make miscellaneous 3rd rail reconfigurations in Harold Interlocking. LIRR Signal personnel continued to make miscellaneous signal revisions in Harold Interlocking and supported the CH058A contractor's Tunnel B/C construction. Amtrak ET personnel continued to make catenary revisions on Subs 1, 2, 3, and 4 Tracks in "Q" Interlocking to support the CQ033 contractor's construction of the Mid-Day Storage Yard (MDSY). Amtrak C&S personnel continued to install signal trough and cables along Loop 2 Track between Loop and "T" Interlockings.

f. Third-Party Construction and Procurement

Manhattan

CM006 Manhattan North Structures: In Q2 2019, ESA reported the CM006 contractor achieved SC in Q1 2019. Accordingly, the PMOC will no longer report on Contract CM006.

CM007 GCT Station Caverns and Track: Construction continued for the north and south back of house facilities and the East and West Caverns. Track construction continued in the Caverns and Tunnel tracks. Qualification testing of special trackwork components continued in Q2 2019.

In its April 2019 MPR, MTACC reports that "the contractor has completed 70% of the work compared to an average planned percent complete of 80.3% planned". The monthly planned was 1.8%. The actual was 2.2%. Construction continued for the north and south back of house facilities on all levels of the East and West Caverns. Track work continued in the Caverns and Tunnel tracks. Architectural finish work (walls, floors, and ceilings) and MEP work is proceeding aggressively at various stages of completion.

CM014B GCT Concourse & Facilities Fit-Out: In its April 2019 MPR MTACC reports that April 2019 cumulative progress was 84.3% vs 74.6% planned. Architectural finish work is advancing aggressively in all of the concourse except the area between E 47th to E 48th. In this area preparations are underway for the JPMC third party contractor to mobilize at the site for the new 270 Park Building foundation and substructure work.

VM014 Vertical Circulation Elements: For CM007, all of the 16 Escalators and 6 Elevators have been delivered to the site. For CM014B, all 22 escalators have been fabricated and delivered. All elevator fabrication has been completed and delivered, with the exception of EL #10 (50th St. Vent Building). EL #22 (Biltmore Connection) has been fabricated, but delivery has been delayed due to as-built issues in the elevator shaft.

Queens

CQ032 Plaza Substation and Queens Structures: In Q2 2019, ESA reported the CQ032 contractor achieved SC in Q1 2019. The contractor continued NCR corrective action during June 2019.

CQ033 Mid-Day Storage Yard Facility: Construction continued on yard work, Track D excavation work to complete the remainder of the East Approach Structure to existing Harold Interlocking grade, utility work, yard lighting, catenary structure work, traction power work, personnel access bridge work, and various building and car appearance maintenance platform work. Track and turnout construction continued through Q2 2019. Signal CIL building installation continued.

Harold Interlocking

CH057D – Harold Track Work Part 3: Although Substantial Completion for CH057D was achieved on March 10, 2019, nonetheless the contractor continued to make limited flash butt rail end welds on the Westbound Bypass Track during June 2019.

CH058A – Harold Structures Part 3 – Tunnel B/C Approach Structure: During June 2019, the contractor continued to install soldier piles in the East Approach Structure, continued to install electric traction conduit between the C08 Substation and Harold Interlocking tracks, continued to make catenary modifications on the North Runner Track to facilitate future CQ033 MDSY track construction, and began installation of structural steel to underpin the 39th Street overhead bridge.

Systems

CS179 – Systems Facilities Package No. 1: During Q2 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 38 months ago, has not occurred yet and the completion of FD for all 19 non-control systems is also delayed. Additionally, during Q2 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. While MTACC has made an improvement in issuing Contractor Proposal Requests (CPRs) for the previously approved contractor's Notices of Change (NOC), prompt action on the review and comment of other contractor NOCs is still an area where MTACC needs improvement. This inability to address NOCs on a timely basis continues to be a significant issue that is impacting progress. A previously noted Buy/Ship America issue that could impact design and construction completion also remains unresolved. The potential Buy/Ship America issue related to motors on small ventilation fans that was identified in Q1 2019 remains under investigation.

CS084 Traction Power Systems Package 4: During Q2 2019, installation work in the Vernon (C05) substation effectively progressed and all the substation equipment has now been delivered. Additionally, the contractor has finished the installation of all the major equipment at the C04 substation and began the processes required to begin the installation of traction power feeder cables from the substation to the track. Previously reported issues at the other substations are in the process of being addressed, but water infiltration and access restraint issue continue to affect work progress

(see Appendix L). Contract modifications to the CS084 and other contracts that address the open issues will be needed to achieve a timely completion of this contract. Off-site fabrication of the C08 substation continued and the FAT was re-scheduled to occur the last week in June 2019. If the FAT results warrant it, the plan is to deliver the C08 substation in July 2019. In June 2019, there was a successful re-test of the C03 transformer that had failed two previous hi-pot tests and that completes all hi-pot testing of the substation transformers. Two other major quality issues – one related to the appearance of damage to MTA-supplied inductive reactors and the second involving compliance of track monuments to LIRR specifications – remain as significant open issues.

VS086, Systems Package 3 – Signal Equipment Procurement: The previously reported issue regarding the use of TRU-III track circuit equipment is resolved with the LIRR acknowledging that this equipment can be used on its property. While MTA has yet to incorporate Positive Train Control (PTC) in this contract, work efforts on this task are progressing with LIRR's PTC design and scope of work package submission to MTACC. The GEC is now preparing design and work scope packages to add PTC to the VS086, CS086, and CS179 contracts. 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 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 LIRR wanted. MTACC directed the VS086 contractor to provide this protection using the methodology acceptable to LIRR. The contractor continued to indicate that any changes to the completed design element will require extensive design changes and delays to the completion of the contract. One additional issue dealing with Application Logic for the signal control system was identified during 2Q 2019, the impact of which is under investigation.

CS086, Tunnel Systems Package 2 – Signal Installation: In Q2 2019, the contractor completed 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 were identified by the contractor as possible items delaying its commencement of work on the contract. Issues noted include water infiltration, equipment layout conflicts, and other obstructions and misalignments inconsistent with existing contract drawings. One significant issue that could have a negative impact on the timely progression of CS086 contract work was identified during the surveys. It is related to the mounting of signal impedance bonds in the track area. The contractor contends that there are numerous locations where the pre-installed holes in the track invert for the impedance bond mounting plates do not align with the standard impedance bond mounting plate. MTACC will need to investigate the extent of any impact the remediation of this condition will have on this and other ESA contracts. The contractor continues to advise that it is being impacted by the lack of access to locations and the lack of contractually obligated track time for work site access. MTACC is investigating this issue and evaluating contract language to identify the validity of the contractor's assertions.

g. Vehicles

The PMOC remains concerned about the schedule slippage of the LIRR federal vehicle procurement program for the M-9A vehicles because it has the potential to significantly impact delivery of the vehicles and, hence, MTACC's Revenue Service Date. Through June 2019, the LIRR continued to evaluate proposals for the vehicles during the second of its two-step RFP procurement process, the contract for which it originally expected to award in June 2019. During June 2019, the PMOC was informed that the award will continue to be delayed, possibly beyond July 2019, while LIRR continues its evaluations of the proposals.

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 June 14, 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). Refer to Appendix Q, Operational Readiness, for a more detailed discussion.

i. Project Schedule

The IPS 117 (data date May 1, 2019) update shows that the Target RSD forecast date of February 14, 2022, and the Public RSD forecast date of December 13, 2022, have not changed since IPS 114, and the primary critical path still runs through Manhattan/Systems work. During February, March, and April 2019, the Manhattan/Systems path held its completion date and float; the Harold path lost 7 weeks of float; and the Queens path gained 16 weeks 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 April 2019.

Table 2: Project Budget/Cost Table
(Cost shown in millions)

	FFGA			MTA Current Budget (Interim)			Expenditures April 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%	10,134.0	11,451.5	100.0%	9,149.7	79.9%
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%	9,516.4	10,335.1	90.3%	8,532.1	82.6%
		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%	2,436.7	100.0%
		2,436.7	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%	6,817.7	7,636.2	66.7%	5,833.3	76.4%
		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 final Incremental IST plan and schedule incorporated into Contracts CS179 and CM014B still needs to be added to Contracts CM007, CS084, VS/CS086 and CQ033; and, inadequate construction progress on CM014B and CS084. The PMOC remains concerned about the overall progress of the ESA program. The PMOC is also concerned about potential schedule risks resulting from the impacts that the redevelopment of 270 Park Avenue could have on the ESA program, especially with regard to the ongoing construction of the LIRR Concourse. Although ESA program float remained constant from February 2019 through April 2019, future changes are likely due to these concerns.

l. FTA Quarterly Review Meeting

The FTA Quarterly Review Meeting for East Side Access and Second Avenue Subway (Phase 1) was held on April 22, 2019. Highlights of the ESA discussion include:

1. The FTA expressed concern about the recent NYS initiative to "study" ESA to determine how completion can be accelerated.
    - Recent similar NYS efforts to accelerate repairs to a Superstorm Sandy damaged NYCT subway tunnel across the East River presented significant challenges to the FTA regarding the federal funding for that project.

- MTACC responded that it does not anticipate this situation and made reference to the last minute change to the NYS budget to include funding for the study of the ESA project.
- The FTA and MTACC agreed to continue discussions, as needed, about this situation.

2. MTACC stated that there would be no cost or schedule impacts to ESA resulting from construction of the new JP Morgan Chase (JPMC) office tower at 270 Park Avenue in Manhattan.
    - MTA/MTACC-JPMC Memorandum of Understanding of March 31, 2019 sets in motion specific actions including: finalizing 48th Street Entrance; finalizing MTA/MTACC-JPMC Construction Agreement; partial de-mobilization of CM014B contractor in footprint of 270 Park Avenue to allow construction of new foundations and substructures; and, agreement that JPMC work will not impact any ESA systems installation or testing work.
    - The FTA noted some significant challenges:
        - "Buy America" requirements may become an issue if there is any cost sharing for ESA facilities and there may be some federal restrictions. MTACC responded that the MTA/MTACC-JPMC construction agreement includes JPMC's responsibility to meet all federal requirements.
        - There can be no federal money in the MTACC/JPMC construction agreement. Federal regulation enforcement can be challenging. The MTACC responded that MTA is willing to work with the FTA to address and resolve any federal funding concerns.
3. MTACC discussed the major risks to complete ESA and achieve the forecast Revenue Operations Date.
    - For work in Harold Interlocking, ESA remains concerned about new Amtrak and LIRR projects that may increase demand for force account resources to the detriment of ESA. ESA is particularly concerned about pressure on LIRR resources. ESA noted that Amtrak's ability to provide sufficient track foremen and watchmen is expected to be good through the end of 2019 but will likely be challenged to continue to provide adequate support starting in 2020.
    - ESA stated that Incremental Integrated Systems Testing needs to adhere to the schedule agreed with CS179 and confirmed that the recent $60 million CS179 contract modification is consistent with the ESA April 2018 Estimate-at-Completion (contract baseline cost) and the forecast contingency.
4. FTA expressed concerns regarding the MTA/JPMC construction agreement meeting applicable federal requirements.
    - The FTA is concerned about mingling federal and non-federal work as anticipated to accommodate construction of the foundations/substructures for JPMC's new office building at 270 Park Avenue within the new LIRR Concourse at Grand Central Terminal.
    - MTACC said that MTA is willing to work with the FTA to address and resolve any federal funding concerns.

5. Actions to be completed by MTACC include:
    - Arrange for a more detailed presentation and discussion with the FTA and PMOC regarding the CS179 contract modification for the revised September 2021 substantial completion date. **[ESA-A49-Jun 19]**
    - Continue to work with the FTA on the MTACC Recovery Plan required by the Full Funding Grant Agreement. **[ESA-A49-Jun 19]**

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. MTACC planned to include all aforementioned updates in the draft TCC Plan submitted during May 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 $387 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. The PMP will be updated based on changes made to the revised Sub-Plans.

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 Q2 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 Q2 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

June 2019 was the final month for the Senior Vice President Program Executive Harold Systems and Start-Up as he plans to retire effective July 1, 2019. The Program Manager Systems left the project earlier in 2Q 2019. Replacements have not been named for either as of the end of June 2019.

The PMOC is concerned about the CM staffing for Contracts CS084, VS086 and CS086 that together are valued at $147 million. The Deputy CM for CS086 recently resigned and the single Construction Manager for all three contracts now has only 2 staff personnel remaining. The PMOC notes 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 consultants' 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 consultants to reduce their direct labor costs by 10%. It is possible that this issue, depending on the individual consultants' 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. No such particular incidents have been noted through June 2019, however.

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 Q3 2019 to reflect the recent changes in the ESA project organization, management, and operational processes as reflected in the recent PMP sub-plan updates.

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 117 has a February 14, 2022 Target RSD, which has remained unchanged since IPS 114. 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 has now been removed from the IPS as a result of the acceptance of the syndicated schedule by CM014B and CS179. In the PMOC's opinion, the risks associated with execution of IST and redevelopment of 270 Park Avenue could likely consume a significant amount of the program contingency during the 35 months remaining until 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 due to revisions and updates to the IPS with new activities, milestones, and logic, which contributes to a lack of stable critical path. The PMOC anticipates that the schedule will stabilize now that the PMT has executed contract mods for contracts CM014B and CM007.

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 85.5% bid ($9,516.4 million awarded) and 78.6% complete ($8,754.0 million invoiced). Total ESA program contingencies are $646.5 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 April 2018 EAC exceeds the amended FFGA BCE by $211 million (1.9%). Although the MTACC carries the $463 million Rolling Stock Reserve outside the ESA budget, the FTA included funds for

all rolling stock procurements in its $10,922 million amended BCE. The MTACC reassessment held both the December 2022 Public RSD date and the amended FFGA Revenue Operations Date of December 2013. MTA/MTACC has discussed the forecast with the FTA and had reportedly issued its draft Recovery Plan for the ESA program in June 2019. MTA/MTACC had earlier indicated that the plan will include impacts resulting from the acceleration plan and the MTA/JPMC integrated approach for construction of the foundations/substructures for the new building at 270 Park Avenue as well as the revised Incremental IST plan and schedule reflected in the recent major contract modification to CS179. As of June 30, 2019, the PMOC had not received the draft Recovery Plan.

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 Q1 2019 Operational Readiness Briefing was delayed and held on June 14, 2019. The status briefing for 2Q 2019 (April 2019 thru the end of June 2019) has yet to be scheduled. During Q1 2019, MTACC continued to effectively 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. (See Appendix T for a Summary Status of the Safety and Security Certifications).

b. Project Construction Safety Performance

Through May 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 0.94 versus 1.5 (2019 BLS average) lost time accidents per 200,000 work hours. The ESA recordable ratio for CY 2019 was 1.50 versus 2.5 (2019 BLS average). ESA safety ratios for May 2019 were 0.82 for lost time and 1.64 for recordable injuries.

c. Security

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

1.6 Project Quality

Quarterly Quality Oversights (QQOs): The Q2 2019 QQO audits completed by ESA include: CM014B (no rating provided).**Nonconformance Reports (NCRs):** Table M located in the Appendix provides a summary of NCR status on major active contracts for ESA, as per the June 2019 contractor logs. The table shows the 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:

Long Island Rail Road

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

During Q2 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 continued through June 2019
- LIRR review of GEC proposed corrective repairs to out-of-tolerance 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 June 30, 2019, completion and approval of all 10 Control System final designs is 38 months late compared to the original contract baseline schedule.
- 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. 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 18 months late. MTACC has already acknowledged that the contract modification for incorporation of PTC requirements will impact the substantial completion date for Contract VS086.

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 June 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. Going forward, the PMOC recommends that the PMT continue to actively engage executive management in MTACC and the MTA to assist with resolution of any new problems.

Other Stakeholders

Construction of the foundation and substructure systems required for the planned new JP Morgan/Chase (JPMC) building at 270 Park Avenue is likely to have a significant impact a portion of the new LIRR Concourse, currently under construction at GCT. Ongoing MTA, MTACC-ESA, and JPMC discussion continued through June 2019. Without access to the MTA/MTACC-JPMC Construction Agreement, currently being finalized, that will provide better definitions of the scopes of work and the construction schedule, schedule impacts cannot be accurately forecast at this time. See discussion in Section 6.0. **[ESA-133-Dec18]**

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 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 a revised draft of the RMP update.

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. Critical ESA program elements on the Manhattan/Systems path include the Integrated Systems Testing and the reconstruction of 270 Park Avenue. MTACC plans on completing a comprehensive risk review of the ESA project once agreement is reached with the CS179 contractor regarding the Incremental Integrated System Test plan, which will serve as the primary basis for the ESA Program schedule through revenue service. The PMOC notes that the CS179 contract modification that includes the revised Incremental IST plan and schedule was executed in June 2019.

2.0 PROJECT SCOPE

2.1 Engineering/Design and Construction Phase Services

In the ESA April 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. During April 2019, ESA announced that award of the CH063 contract will be deferred until Q4 2019 due to continued improvement in Amtrak's electric traction construction for the ESA project, other scope revisions, and re-advertising. ESA is currently revising the bid package.

Status of Construction Packages Not Advertised

CM015 (48th Street Entrance): MTA notified the owner of the building located at 415 Madison Avenue 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. Based on code compliance requirements, an emergency exit to street level will need to be provided in the interim. The GEC is developing the design for this feature and the PMT is coordinating design development with the owners of the existing buildings at 270 Park Avenue and 415 Madison Avenue. Once the concept for this exit is completed, it will be reviewed by ESA, MNR, and LIRR.

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 June 30, 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 Q2 2019, is 38 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 Q2 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:

The only reported design issues are those related to the correction of problems identified during field surveys (e.g., track monuments). All equipment designs are complete, with equipment in the fabrication and delivery stage.

VS086 Systems Package 3 – Signal Equipment Procurement:

Per MTACC, the incorporation of PTC into the signal design will impact the cost and completion date of the contract. The addition of PTC into the VS086 signal system design cannot be accomplished until the GEC completes its design of the PTC work scope and a contract modification is developed and issued to the VS086 contractor. 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 LIRR wanted. Although the contractor contended that its approach was in compliance with the contract requirements and that the proper protection is provided with its current design, MTACC directed the VS086 contractor to provide this protection using the methodology acceptable to LIRR. The contractor continued to indicate that any changes to this completed design element will require extensive design changes and delays to the completion of the contract. One additional issue dealing with Application Logic for the signal control system was identified during 2Q 2019, the impact of which is under investigation.

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 notes that the new project organization and operation has shown some process improvements that address these concerns, but improvements need to be expedited program-wide **[Ref: ESA-125-Sep16]**.

2.2 Procurement

The ESA April 2019 MPR shows that total procurement for the ESA Program is 85.5% complete, with total awards at $9,516 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, and on March 13, 2019, received

seven responses to its "Qualifications" portion of its solicitation. From those, four were "Prequalified." ESA is currently revising the scope of work to include the MDSY connections, previously included in Contract CH064, and to reduce the catenary work due to improved Amtrak force account performance. The second part of the procurement will be advertised in late July/early August 2019, and the NTP is scheduled to be issued in December 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 ESA April 2019 MPR that the total construction progress reached 82.4% complete compared with 82.3% 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%	6/1/17	3/1/19	1
	nc	nc	nc	nc	nc	nc	nc	nc	nc	
	361.6	350.2	11.4	346.0	356.0	100.0%	98.8%	6/1/17	3/1/19	
CM007	709.3	666.8	42.5	466.1	720.5	78.1%	69.9%	1/28/20	8/6/20	
	nc	nc	nc	+14.5	nc	nc	+2.2%	nc	+30cd	
	709.3	666.8	42.5	451.6	720.5	78.1%	67.7%	1/28/20	7/7/20	
CM014B	578.2	474.6	103.6	393.5	593.5	98.5%	82.9%	8/18/18	7/9/20	
	+93.5	+2.8	+90.7	+39.2	nc	nc	+7.8%	nc	+14cd	
	484.7	471.8	12.9	354.3	593.5	98.5%	75.1%	8/18/18	6/25/20	
VM014	46.9	34.9	12.0	30.4	48.7	NA	87.0%	10/25/19	3/23/20	
	nc	nc	nc	+1.7	nc	NA	+4.9%	nc	nc	
	46.9	34.9	12.0	28.7	48.7	NA	82.1%	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 declared.

CM006 – Manhattan North Structures

Schedule: The ESA Q1 2019 MPR reported Milestone MS#3, Substantial Completion (SC), was issued on March 1, 2019. All remaining open work items were transferred to contract CS179 and contract CM007. Accordingly, the PMOC will no longer report on Contract CM006.

CM007 - GCT Station Caverns and Track

Schedule: The ESA April 2019 MPR projects Milestone #4 (Track and 3rd Rail Work Complete) by February 13, 2020 (-190 CDs; the TIA/recovery schedule is still under review); Milestone #5A

(Caverns Ready for Integrated Systems Testing) is forecast for January 28, 2020 (-174 CDs); Milestone #6 (All Caverns and Tunnel Work Complete) is forecast for August 6, 2020 (-234 CDs); and, Milestone #6A (Substantial Completion) is forecast for August 6, 2020 (-191 CDs).

Construction Progress: North and South Back of House, East and West: Continue mezzanine and lower level electrical work, and continue MEP work upper and lower levels; continue CMU wall installation (SW); continue bathroom tile work (NW and SE).

Cross Passages: Continue glass tile work.

GCT 6: Access to lower level on hi-rail equipment via ramp from this location.

East Cavern: Continue light fixture installation lower and mezzanine levels; Continue mezzanine level sprinkler piping; continue miscellaneous. framing, duct, and painting; Continue installation of escalators 51, 52, 57, and 58 , and continue installation of elevators 5, 6, and 18.

West Cavern: Continue light fixture installation lower and mezzanine levels; Continue miscellaneous framing, duct, and painting; and continue installation of elevator 19, and continue installation of escalators 63, 64, and 66.

Track: Continued track construction in the upper level East and West Caverns and Tunnel Track; Continued third rail installation. Continued turnout construction. Continued qualification testing of Special Trackwork DFF assemblies. As of June 16, 2019, ESA reports overall Track Construction at 63.0% completion.

Monuments: MTACC has reported in its Weekly Summary report ending June 16, 2019, that "Monuments identified out of contract tolerance in the underground locations. CM presented updated results based on GEC's memo to LIRR on 3/4/19. Updated concurrences sent to LIRR on 4/17/19 and 5/2/19". Following a survey/review, the CM007 contract reports that: There are 450 total monuments under their survey, covering contracts CM005, CM006, CM007, and CQ032. Of these, 207 are noted as "Out of Tolerance".

Architectural Elements: Through June 24, 2019, Architectural Wall work was approximately 18.8% complete. Work included installation of west elevation C06 cove panel in East Cavern between gridlines 15-17; installation of ceramic tiles in Rooms 178,181 and 102; construction of knee wall at 45th, 48th and 46th St. Nodes and installation of glass header frames at Escalators#61 and #62. Architectural Ceiling progress was at approximately 18.2% and includes installation of the unistrut grid supports for C03 and C05 drop ceiling panels on Mezzanine Level East Cavern and Cross Passageways #5 and #6. Architectural Floor progress was approximately 20% complete and consisted of installation of 2"x2"wire mesh and placement of invert cements in Rooms #177 and #178.

MEP – Mechanical: Through June 24, 2019, HVAC duct progress was 78.7% complete. HVAC piping progress remained at 75.3% complete. Work included installation and alignment of linear diffusers LD-1, LD-2 at Cross Passageway, Mezzanine Level, Gridline 18 and East Cavern, Mezzanine Level, Gridline 5.

MEP – Fire Protection (FP) and Plumbing: Through June 24, 2019, FP progress was 69.5% complete. Plumbing progress remained 93.1% complete. Work has included installation of 6" Fire Sprinkler line in West Cavern Upper Level, Gridline 28; installation of 3" Hot Water Supply/Return (HWS/R) and Chilled Water Supply/Return (CHWS/R)in the East Cavern, Upper Level Gridline 1.

MEP – Electrical: Through June 24, 2019 Electric Conduit installation remained at approximately 62.4% complete. Electric Fixtures percentage increased significantly to approximately 73.6%

complete. Work has included installation of conduits for various systems including escalators, elevators and lighting. Installed racks for light fixtures in Mechanical Room #183.

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 to negotiate a revised CPM schedule, and the PMOC recommends this negotiation be completed as soon as possible.

CM014B – GCT Concourse & Facilities Fit-Out

Schedule: In its ESA April 2019 MPR, MTACC resumes the advisement that "CM014B is significantly behind schedule their earned value has been below their baseline late projections each month. Meeting the contractual Substantial Completion date is no longer achievable, re-baseline of the CM014B schedule is underway". The PMOC notes that a significant contract modification was executed in May 2019 that includes key changes: revised baseline schedule that aligns with the recently negotiated CS179 baseline schedule updated to implement the Incremental IST plan and schedule ; improved Substantial Completion date of June 2021.

In the report, MTACC reports that, through April 30, the contractor had completed 84.3% of the work vs. 74.6% planned. This change is the result of the aforementioned re-baselining.

Milestone #7 (50th St. Vent Building) January 27, 2018, now February 3, 2020, due to the required revisions to the Pump Room layout. In its April 2019 MPR, MTACC has removed this milestone from the report, with no reason given.

Milestone #8 (Substantial Completion) August 18, 2018; then July 27, 2020; then November 10, 2020, and now back to July 9, 2020.

Through June 24, 2019, the structural steel erection remained at 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 also remains at 28% complete. The HVAC Chilled Water Pipe work is approximately 45% complete.

Construction Progress: Electricians continued with installation of branch and device conduit, Ticket Area systems wiring, Wellway lights, 45th St. Node lights, rough-in and overhead racks.

Plumbers continue installation of domestic water piping, CCU testing, and installation of gutters/downspouts throughout the Concourse Mechanical work continues with the installation of air plenums, AHU units, ducts, and sprinkler piping and heads. Chilled water piping continues throughout the Concourse, including re-routing in the 47th St. to 48th St. zone. Installation of the marble stone wall finish is ongoing in public areas from south to north. Installation of the suspended ceiling system continues throughout the Concourse from south to north.

Biltmore Connection: MNR outage for tracks 39/40 is continues. Forming and placement of concrete encasement of new beams was completed at the MNR Tracks 39/40. Installation of the Q deck and new steel for the partial Biltmore slab was completed. Placement of this portion of the Biltmore slab was completed.

Wellways: In the Wellways, escalator maintenance is ongoing, one day every 2 months. In September 2019, all stairs in Wellways #1 and #2 will have to be removed for cleaning before going into In-Contract Maintenance. This is required because the previously agreed to re-sequencing of the work required the escalators to go in first, and the CM014B contractor to come back in and work over the escalators to complete architectural and MEP work in Wellways #1 and #2. This will take approximately 9 weeks (1 week per line of stair). In Wellway #1, installation of the glass tile curtainwall is complete. Preparations are underway to demobilize the overhead scaffolding. In

Wellway #2, installation for glass tile curtainwall is ongoing along with the glass tile along the incline. In Wellway #3, Machine Room installation and escalator build up continues and are scheduled to be completed August 2019. In Wellway #4, Machine Room installation and escalator build up continues and are scheduled to be completed July 2019.

47th Street Cross Passage: At Elevator #13, installation is complete. Preparations are underway for turnover of the elevator to MNR. 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 release approved oil/water separator for fabrication, hydrostatic test for condenser water and punchlist work.

270 Park Building: The CM014B contractor is digging the test pits and re-routing chilled water piping for the JPMC independent contractor.

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: The PMOC is concerned about the upcoming 270 Park Building erection and construction of the required shearwalls and foundation work in part of the ESA Concourse and the overall impact to the ESA RSD.

VM014 –Vertical Circulation Elements (Escalators & Elevators)

Schedule: In its April 2019 MPR, MTACC reports that, through April 30, 87% of the contract value was invoiced and 78.4% 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, all of the 16 Escalators and 6 Elevators have been delivered to the site. For CM014B, all 22 escalators have been fabricated and delivered. All elevator fabrication has been completed and delivered, with the exception of EL #10 (50th St. Vent Building). EL #22 (Biltmore Connection) has been fabricated, but delivery has been delayed due to issues in the elevator shaft.

Construction Progress: CM014B Installation – Installation of Elevators #1 and #2 was completed under an accelerated schedule. This allows for removal of the Alimak in Shaft 5. At Elevators #3 and #4 (Shaft 4), work deck installation is on-going. At Elevator #11 (3-Story Building), the running platform has been established and bracket/rail installation nears completion. Elevator #13 (47th Cross Passage), is complete. The current issue is completion of the turnover paperwork to MNR. In-Contract Maintenance – Elevators #9, #12, and #21, Escalators #30 and #31.

CM007 Installation – The Elevator #6 moving platform is complete. The CM007 contractor has taken over this car to complete their work. At Elevator #7, the hydraulic pump replacement is complete and the CM007 contractor has taken over the car for their use. The CM007 contractor also continues to use Elevator #8 for their contract use. Installation of the cab is on-going at Elevator #18. Elevator #19 cab is installed. Work to complete wiring/hall fixture installation continues. The VM014 contractor is demobilized at Escalators #52, #53, 54, #55, #56, #61, #62, #63, #64, and #65, but the trusses have been installed. Truss installation is on-going for Escalator #57. Bolt torque tests must be completed for all installed trusses.

Observations/Analysis: Throughout the course of this contract, there have been alignment issues with the various elevator accessways/shafts constructed by other contractors (CM014B). This has resulted

in the CM014B vertical circulation work falling considerably behind schedule compared to 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	263.6	1.8	261.5	264.6	100.0%	99.2%	9/6/16	3/1/19	1
	nc	nc	nc	nc	nc	nc	nc	nc	nc	
	265.4	263.6	1.8	261.5	264.6	100.0%	99.2%	9/6/16	3/1/19	
CQ033	326.1	313.0	13.1	200.5	349.3	69.3%	64.1%	8/10/20	10/31/20	
	nc	nc	nc	+10.2	nc	+3.3%	+3.3%	nc	nc	
	326.1	313.0	13.1	190.3	349.3	66.0%	60.8%	8/10/20	10/31/20	

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 declared.

CQ032 – Plaza Substation and Queens Structures

Schedule: The ESA Q1 2019 MPR reported Milestone MS#6, Substantial Completion (SC), accepted as March 1, 2019. ESA reported the CQ032 contract will complete corrective action work for open NCRs: tunnel bench repairs, concrete defects, and water remediation at the Plaza Structure. Remaining base contract work items were turned over to the CM007 and CS179 contracts. Ten NCRs remain open.

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 April 2019 MPR projects Milestone MS#6 Substantial Completion (SC) for October 31, 2020, -82 days.

Construction Progress: The contractor continued the following activities: CAM Platform work; Storage Building and Toilet Service Building foundation and CMU wall construction; Personnel Access Bridge roof installation; Water main, Storm Pipe, Fire Line, and Underdrain installation; Yard Lighting fixtures installation; Traction power installation. SOE and excavation work at the Tunnel D Approach Structure continued. Under deck light fixture installation: Queens Boulevard Bridge. Preparation work for CIL building installations continued. Track and turnout construction continued.

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

Concerns and Recommendations: 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	690.4	597.4	93.0	503.1	707.3	87.3%	83.4%	7/1/20	6/30/21	1
	+83.5	nc	+83.5	+11.8	nc	+0.1%	+1.2%	nc	(-148cd)	
	606.9	597.4	9.5	491.3	707.3	87.2%	82.2%	7/1/20	11/25/21	
CS084	79.7	73.8	6.0	30.5	83.3	92.4%	41.4%	12/2/19	4/2/21	1
	nc	nc	nc	+4.8	nc	nc	+6.6%	nc	(-27cd)	
	79.7	73.8	6.0	25.7	83.3	92.4%	34.8%	12/2/19	4/29/21	
CS086	60.9	53.0	7.9	0.5	61.1	TBD	nc	2/21/21	3/15/21	
	nc	nc	nc	nc	nc	NA	nc	nc	+22cd	
	60.9	53.0	7.9	0.5	61.1	TBD	nc	2/21/21	2/21/21	
VS086	21.8	20.2	1.7	16.2	21.6	NA	80.4%	10/14/19	2/24/20	1
	nc	nc	nc	+0.2	nc	NA	+0.9%	nc	+31cd	
	21.8	20.2	1.7	16.0	21.6	NA	79.5%	10/14/19	1/24/20	
VH051	30.2	29.7	0.5	29.6	30.2	NA	99.8%	4/30/15	5/31/21	
	nc	nc	nc	nc	nc	NA	nc	nc	nc	
	30.2	29.7	0.5	29.6	30.2	NA	99.8%	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 Q2 2019, the completion and approval of all 10 Control System final designs is 38 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 continue to have the potential to impact the timely completion of the contract. Additionally, the 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 continues to be under further investigation. (See Appendix G for details).

Construction Progress: In Q2 2019, 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 continues to be 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 (28 at last count) 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, other contractors installing systems-type equipment, and several other organizations – both internal and external to MTA. The PMOC notes that a significant contract modification was executed in May 2019 that includes these key changes: revised CS179 baseline schedule updated to implement the final negotiated Incremental IST plan and schedule; improved Substantial Completion date of June 2021. 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 Q2 2019, this has not occurred. In response to the PMOC request that MTACC provide the Incremental IST plan and schedule for review, MTACC gave the PMOC a briefing on the revised IST Plan on June 25, 2019, but did not supply any documentation regarding the plan or the testing schedule at that time. The PMOC requested a copy of the presentation documentation along with details about the testing that will be performed and the schedule associated with that testing. **[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. The lack of detail regarding the comprehensiveness of the testing plan and the schedule of the Incremental IST is a major concern for the PMOC. Further, the uncertainty that an agreement by all stakeholders (contractors, LIRR, MNR, Amtrak, NYCT, Con Edison, FDNY, etc.) on the implementation of any proposed Incremental IST Plan has been made raises concerns about MTACC's ability to achieve effective and successful completion of all testing in time to meet the current forecast ESA RSD. MTACC/ESA needs to continue working with all stakeholders to expedite finalization and approval of any 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. During the first six months of 2019, some of the access restraint issues were resolved and substantial physical work progress was achieved.

Installation work in the Vernon (C05) substation effectively progressed and all the C05 substation equipment has now been delivered. Additionally, the contractor has finished the installation of all the major equipment at the C04 substation and began the processes required to begin the installation of traction power feeder cables from the substation to the track.

Design Progress: The only reported design issues are those related to the correction of problems identified during field surveys (e.g., track monuments); all equipment designs are complete, with equipment in the fabrication and delivery stage.

Construction Progress: During Q2 2019, equipment installations on MTA property progressed, despite some SWOs and obstructions from other contractor's equipment installations. However, unresolved water issues in traction power equipment rooms continue to impact work progress. The contractor and MTACC are working together to address a list of concerns regarding unfinished work or obstructions in the substation areas; many of which were outstanding for several months. That list (See Appendix P) is updated each month and discussed at weekly coordination and monthly progress meetings. 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 contractor has developed a plan to address the delivery of the C01/C02 substation equipment deliveries through the use of a specialized on-track delivery vehicle. 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 are being addressed. 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. As of the end of June 2019, both of those transformers had successfully passed additional hi-pot testing; completing all testing of the required transformers. 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. Subsequent design investigation by LIRR and the GEC indicates that several of the original 26 reactors are not needed to provide broken-rail protection; however, further inspection of the extent of any damage to the remaining required reactors in the MTA warehouse remains as an unresolved issue. Significant schedule impacts could result if any of the remaining required 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 267 monuments that were inspected as of the end of Q2 2019, only 60 (22.5%) 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. In June 2019, MTACC directed the contractor to begin surveying these systems to determine their condition. 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 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 the addition of PTC to the contract work is established and a contract modification is negotiated and issued. 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: The Factory Acceptance Test (FAT) for the GCT4 Interlocking equipment was successfully performed in 2Q 2019 and the equipment will be delivered in July 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. Three design issues continue to need resolution or direction: 1) PTC design and incorporation; 2) Electromagnetic Interference (EMI) testing requirements; and, 3) 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 two 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 Q2 2019, MTACC approved the contractor's Baseline schedule. The latest monthly schedule update submitted already shows a six-month delay to the baseline schedule based on the contractor's contention that existing site conditions are preventing it from commencing work as it originally planned.

Work Activities: In Q2 2019, the contractor completed 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 were identified by the contractor as possible items delaying its commencement of work on the contract. Issues noted include water infiltration, equipment layout conflicts, and other obstructions and misalignments inconsistent with existing contract drawings. One significant issue that could have a negative impact on the timely progression of CS086 contract work was identified during the surveys. It is related to the mounting of signal impedance bonds in the track area. The contractor contends that there are numerous locations where the pre-installed holes in the track invert for the impedance bond mounting plates do not align with the standard impedance bond mounting plate. MTACC will need to investigate the extent of any impact the remediation of this condition will have on this and other ESA contracts. The contractor continues to advise that it is being impacted by the lack of access to locations and the

lack of contractually obligated track time needed for site access. MTACC is investigating this issue and evaluating contract language to identify the validity of the contractor's assertions. 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	23.1	6.6	21.3	29.4	100.0%	92.3%	1/31/19	3/10/19	1
	nc	nc	nc	nc	nc	nc	nc	nc	nc	
	29.6	23.1	6.6	21.3	29.4	100.0%	92.3%	1/31/19	3/10/19	
CH058A	66.9	63.9	3.0	11.2	73.0	12.6%	17.5%	3/17/21	3/17/21	
	(-1.8)	+1.1	(-2.9)	+3.7	nc	nc	+5.6%	nc	nc	
	68.7	62.8	5.9	7.5	73.0	12.6%	11.9%	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.

1. Substantial completion declared.

CH057D – Harold Trackwork Part 3

Construction Progress: Although Substantial Completion for CH057D was achieved on March 10, 2019, the contractor continued to make limited flash butt rail end welds on the Westbound Bypass Track during June 2019. No contract milestones were achieved during June 2019.

Observations/Analysis: ESA and the contractor continued to work very well together during 2Q 2019 although remaining work accomplished was very limited.

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 June 2019, the contractor continued to install soldier piles in the East Approach Structure, continued to install electric traction conduit between the C08 Substation and Harold Interlocking tracks, continued to make catenary modifications on the North Runner Track to facilitate future CQ033 MDSY track construction, and began to install structural steel to underpin the 39th Street overhead bridge. No contract milestones were achieved during June 2019.

Observations/Analysis: ESA and the contractor continue to work very well together, which has greatly aided the contractor to accomplish all construction goals to date either on or ahead of schedule. During June 2019, the ESA Construction Manager also announced that ESA and the contractor had successfully negotiated a contract modification to add installation of soldier piles for the Eastbound Re-Route Tunnel, which is adjacent to the Tunnel B/C work, to the CH058A contract.

Concerns/Recommendations: The PMOC has no concerns about this contract at this time and recommends that the parties continue their excellent working relationship in order to maintain good construction progress.

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 schedules in this section. Additionally, since adoption of the "ESA First" schedule, ESA discontinued references to the former "Stages" of Harold construction, although it has not done so for the cost components of Harold work.

	Current Budget	Appr'd Contract	Rem Budget	Invoice Cost	EAC	Planned Comp	Invoice Comp	Current BL SC	Forecast SC	Notes
FHA02	61.4	61.4	--	61.0	61.4	100.0%	99.4%	8/15/17	1/24/21	1
	+0.5	+0.6	(-0.1)	+0.2	nc	nc	(0.5%)	nc	nc	
	60.9	60.8	0.1	60.8	61.4	100.0%	99.9%	8/15/17	1/24/21	
FHA03	12.7	5.2	7.5	5.4	14.4	99.0%	42.8%	7/25/18	6/2/25	1
	nc	nc	nc	nc	nc	nc	nc	nc	nc	
	12.7	5.2	7.5	5.4	14.4	99.0%	42.8%	7/25/18	6/2/25	
FHL01	34.0	34.0	--	29.3	34.9	100.0%	86.2%	4/9/15	8/31/19	1
	+4.9	+5.0	(-0.2)	+0.5	nc	nc	(12.7%)	nc	nc	
	29.1	29.0	0.2	28.8	34.9	100.0%	98.9%	4/9/15	8/31/19	
FHL02	123.1	123.1	--	119.4	126.7	100.0%	97.0%	11/25/16	8/30/21	1
	+8.3	+8.3	nc	+4.6	nc	nc	(3.0%)	nc	nc	
	114.8	114.8	--	114.8	126.7	100.0%	100.0%	11/25/16	8/30/21	
FHL03	20.6	2.7	17.9	18.0	47.7	100.0%	50.1%	8/14/17	4/28/24	1
	nc	nc	nc	nc	nc	nc	nc	nc	nc	
	20.6	2.7	17.9	18.0	47.7	100.0%	50.1%	8/14/17	4/28/24	

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. Invoice percent complete is calculated using the current approved budget.

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

Construction Progress: During June 2019, Amtrak Electric Traction (ET) personnel continued to make catenary modifications on Sub 1, 2, 3, and 4 Tracks at "Q" Interlocking in order to facilitate future CQ033 MDSY track construction. Amtrak C&S personnel continued to install signal trough and cables along Loop 2 Track between Loop and "T" Interlockings.

Observations/Analysis: During Q2 2019, Amtrak was able to continue its improvement to supply direct force account and Access and Protection personnel to adequately cover all contract construction, although these issues will always be ESA concerns.

Concerns/Recommendations: The PMOC no longer has any particular concerns about the Amtrak ESA support issues, although it will continue to monitor them closely. The PMOC recommends that ESA and Amtrak continue to work closely together to keep the present momentum building.

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

Construction Progress: During June 2019, LIRR Electric Traction (ET) personnel continued to make miscellaneous 3rd rail and traction power modifications in Harold Interlocking. LIRR signal personnel continued to make miscellaneous signal revisions throughout Harold Interlocking and supported the CH058A contractor.

Observations/Analysis: Since the heavy 3rd rail, signal, and track construction during the past 18 months is now complete, LIRR ET and Signal personnel have begun to concentrate on miscellaneous work in Harold Interlocking that is important, but was not required when the heavy work was being done. Additionally, LIRR provided Access and Protection services for the CH058A and CQ033 contractors during June 2019.

Concerns/Recommendations: The PMOC has no particular concerns about LIRR Force Account support of Harold construction at this time, but 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 June 14, 2019, was the update for Q1 2019 and the data presented reflected the status of Task Working Group (TWG) activities up to that date. The next Quarterly update (Q2 2019) has yet to be scheduled. 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 Q1 2019 briefing.

Observations and Analysis: The primary responsibility of the Operational Readiness (OPR) Group is to develop the ESA Rail Activation Plan that will be used to progress the ESA project from construction efforts through commissioning and into revenue service. It is being developed through the use of 11 separate Task Working Groups (TWGs) that each focus on specific separate aspects of work activities needed to bring the ESA project to and into revenue service. The structure of the OPR Group has undergone several modifications during the past few quarters, with the latest, as previously reported, being the establishment of a LIRR Senior ESA Transition Team to identify activities needed to implement and maintain ESA service. In its previous report, the PMOC noted that only a few members of this team were originally in place. To address this staffing issue and to augment other OPR staff shortages, LIRR requested the approval to hire 40 individuals. As of the Q1 2019 briefing, twenty (20) of those positions are approved and are in various stages of the hiring process. MTACC previously advised that a revised ESA Revenue Service Plan (RSP) was needed because certain infrastructure might not be available by the RSD and because Amtrak work might interfere with ESA work. MTACC has indicated that a revised RSP will impact the new railcar procurement and LIRR staffing and training requirements. At the Q4 2018 briefing, MTACC noted that, while final development of the revised RSP remained projected for the end of August 2019, a general hiring freeze was impacting MTA's ability to put a fully-complemented Service Planning department in place, which could jeopardize the forecasted completion of the RSP. In Q1 2019, the MTA Vacancy Control Committee approved 5 new positions requested by LIRR's Service Planning department. LIRR anticipates that, once these 5 positions are filled, it will take between 9 and 12 months to complete the revised Service Plan. No firm date for this completion is available at this time. 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 and schedule, which was only recently developed and finalized under the CS179 contract. As of the Q1 2019 OPR briefing, the CSTP remained as an uncompleted item with no forecasted completion date available. A number of the other TWG activities are progressing satisfactorily; however, there are several (i.e., the railcar procurement and personnel hiring and training) that are significantly behind schedule. Information about the procurement of railcars is noted in Section 2.5 and details on the status of all the TWGs can be found in Appendix Q of this report.

2.5 Vehicles

Status: LIRR procurement of new 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 its first M-9A procurement effort in order to issue a new two-step RFP which added Locomotive Hauled Married Pair (LHMP) units and the decommissioning of the existing M-3 railfleet to the original M-9A procurement. This new RFP was issued in October 2018 and LIRR received responses to the "Qualifications" portion of the RFP in December 2018, after which it was determined that there was sufficient competition to proceed to the second step, "Cost/Schedule", which LIRR issued in January 2019. After one delay, vendors' responses were received in April 2019, and LIRR continued its evaluation of these through June 2019, although it had originally intended to award the contract by the end of June 2019. As of June 30, 2019, ESA has not yet been advised of the forecast date for award.

Observations/Analysis: Until a revised procurement schedule based on the successful vendor's response is developed, it will not be possible to adequately analyze the impacts that these continuing delays may have on RSD. The PMOC believes that it could be several more months before LIRR will issue the award. If that is the case, MTA may need to determine how to provide railcars from its existing fleet in order to meet its scheduled RSD date.

Concerns/Analysis: The PMOC remains concerned that the M-9A procurement continues to be delayed. The PMOC recommends that LIRR and the MTA do everything possible to award this contract as soon as possible.

2.6 Property Acquisition and Real Estate

Status: In its April 2019 MPR, ESA reported that MTA Real Estate continued to work with building owner JP Morgan Chase (JPMC) to develop plans for JPMC's re-construction of its new world headquarters at 270 Park Avenue in order to minimize impact on the new LIRR GCT concourse. In addition, ESA reported that plans for the new 48th Street entrance are also moving forward.

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 April 2019 MPR indicates that Community Relations continued to notify adjacent property owners in Queens of upcoming future construction activities and that it conducted 14 tours during the month for various interest groups and stakeholders.

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 Q3 2019 based on recent revisions to a number of PMP Sub-Plans.

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, the CPP in January 2019, and the TCC Plan in May 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.

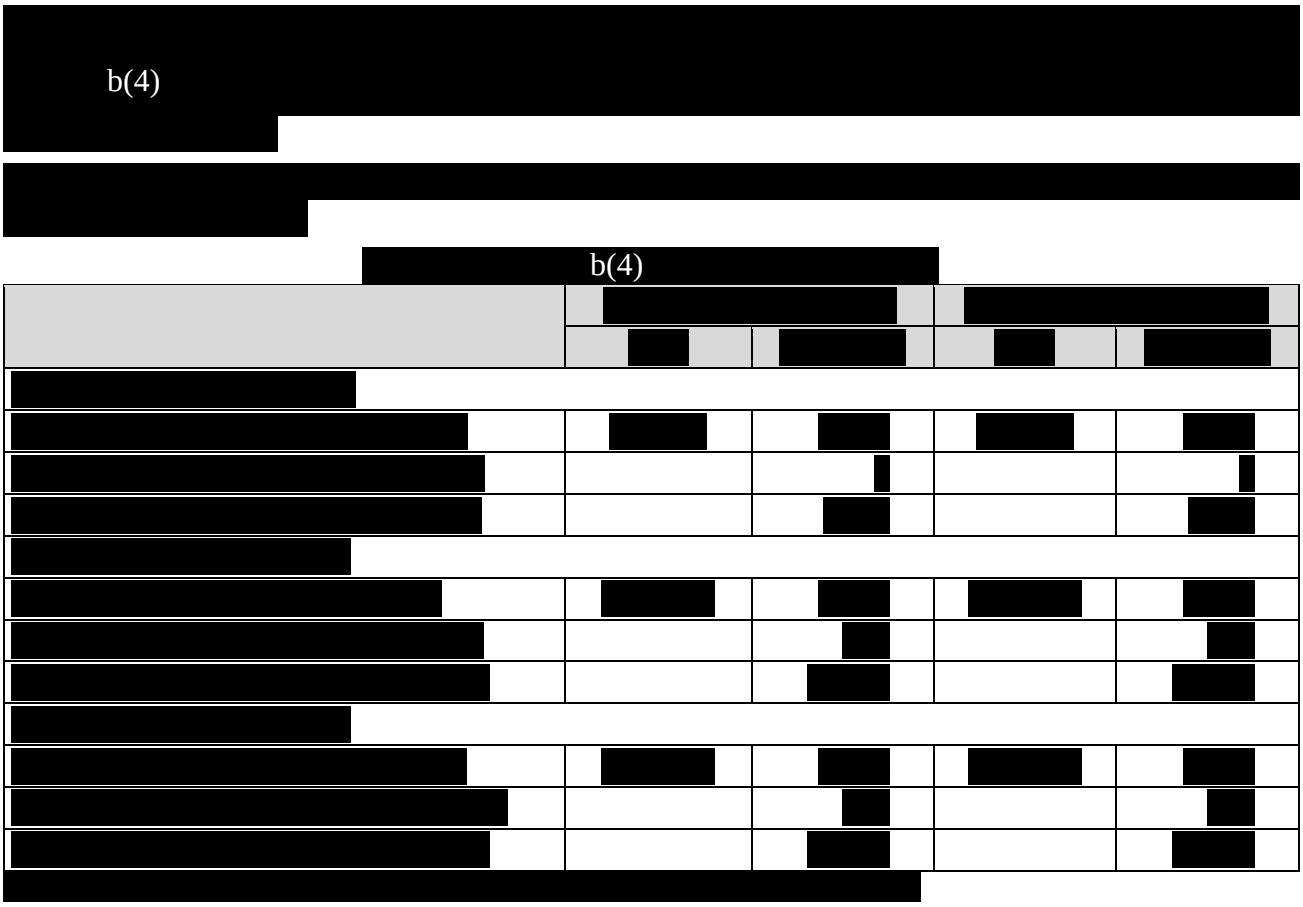
Observations: MTACC submitted the new ESA Procedure PIP 4.01 on February 22, 2019.

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 117 (data date May 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 Q2 2019 were prepared using the MTACC alternative IPS procedure.



4.2 Primary Critical Path

IPS 117 forecasts that the finish date for the Manhattan/Systems longest path is June 29, 2021 (no float), approximately 5 months earlier that it was forecast in IPS 114. The major change that shortened the path was that the Issue Contingency activity was eliminated due to the incorporation of the syndicated schedule for IST, which allowed an earlier start of FRA-LIRR testing and more time for LIRR final testing and previews.

The Manhattan/Systems path remained generally unchanged since IPS 114 and it 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 and IST for BMS/field network. The path continues with Phase 3 IST of BMS and integration with HVAC/FLSS systems, ending in June 2021 with the completion of all IST and CS179 substantial completion. From this point the path runs through LIRR FRA testing, LIRR final system testing, LIRR initial and final 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 117.

Table 4.2 – Primary Critical Path

Activity Name	Duration	Start	Finish
CM007 - GCT Station Caverns and Track			
West cavern upper platform conduit, devices and wire	537	11-Jun-18A	29-Nov-19
West cavern upper platform framing and ceilings	96	29-Nov-19	3-Mar-20
CS179 System Package 1 – Facilities Systems			
East Cavern upper platform systems conduit and Radiax	144	3-Mar-20	24-Jul-20
East Cavern upper platform BMS local testing and IST for BMS/field network	130	24-Jul-20	30-Nov-20
IST for BMS and integration with HVAC/FLSS systems	212	30-Nov-20	29-Jun-21
Program Activities			
LIRR FRA Signals and Power Testing †	115	29-Jun-21	21-Oct-21
LIRR Final Testing and Previews ‡	116	21-Oct-21	13-Feb-22
Target Revenue Service Date			**14-Feb-22**
b(4)	[redacted]	[redacted]	[redacted]
Public Revenue Service Date			**13-Dec-22**

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

Although Contract CS086 does not appear on the critical path it has activities that have no float, including work for GCT-6 - Wayside GCT-6 Interlocking (AR-19), Terminations for Wayside Devices at 39th St Vent (Tunnel LL; 4G36 Location), and Plaza Interlocking. Contract CM014B has work that is approximately 4 weeks off the Manhattan/Systems critical path and CS084 has work that is approximately 7 weeks off the critical path. Important dates for each CS084 substations (including submittals, equipment fabrication, and installation) are tabulated in Appendix L. The data shows that CO1, CO2, and CO3 each experienced a two-month delay to energization. Substations CO3, CO4, CO5, CO6, and CO7 still have equipment submittals to be approved and each experienced a two to three-month delay to those activities. Overall, these delays appear to have been absorbed and/or mitigated in the IPS, as the projected substantial completion date for CS084 was delayed two weeks over the quarter. It is noted that an activity for CO1 "Fabrication Window Lost" is scheduled to occur between May 16, 2019 and March 27, 2020, which may impact progress on CO1 fabrication work.

The MTACC has been developing coordination point milestone activities in the IPS schedule to track and monitor the progress of inter-contract coordination for the ESA program. These activities have experienced month-to-month changes – ranging from slippage to pre-dated completion – that have reduced their usefulness as a tool to monitor progress. At this point in time, MTACC has added milestones and updated their dates to match the syndicated Incremental IST schedule, which have been agreed to by the CS179 and CM10B contractors in executed contract modifications. MTACC has confirmed that these milestones form their plan for progressing the ESA program and can now be monitored going forward to measure progress. There remains the 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 further complicate and impede progress. (Refer to Appendix F, ESA Coordination Point Changes.)

Sub Program Longest Path – Harold Interlocking

IPS 117 shows that the Harold Interlocking work path is the second longest ESA program path. The Harold Interlocking work path concludes on July 20, 2021, in IPS 117, 7 calendar days later than the

date of July 13, 2021, in IPS 114. This, combined with the additional time added to the schedule for LIRR testing, caused the float to decrease to 92 calendar days (44 calendar days less than the 136 calendar days in IPS 114). The Harold Interlocking work path begins with CH058A underpinning of the 39th Street Bridge and excavation and for and construction of the Track B/C Approach Structure construction through July 2020, followed by force account switch, signal, catenary work and cutovers through the end of July 2021. At the completion of construction of the Harold work path, there are 3 months of float to the LIRR final testing activity, at which point the path joins the ESA program critical path.

Sub Program Longest Path – Queens

IPS 117 shows that the Queens (Mid-Day Storage Yard) work path is the longest program path. The finish date for the Queens path is October 31, 2020, in IPS 117, a recovery of 5 months from the date of April 4, 2021, in IPS 114, and the float on the path increased by approximately 3.8 months. Progress along the Queens path has benefited from the revised schedule for CQ033 that mitigated previous forecast delays. The Queens path currently runs through CQ033 construction of low voltage and traction power duct banks. This is followed by installation of the MID-8 CIL, signal troughs; cabling and connections to CIL-7 and CIL-8; terminations and testing of the RFID system; and, completion of IST and CQ033 substantial completion on October 31, 2020. From the end of the Queens path, there are approximately 8 months of float to the LIRR FRA testing activity on 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	9/15/19	12/1/19	27	3/5/22

PMOC Observations, Analysis, and Concerns

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

1. Concerns continue about the Manhattan/Systems work path. While MTACC has reduced the uncertainties concerning Incremental IST schedule with contract modifications to CM014B and CS 179, further agreements are needed with secondary contractors that includes CM007, CS084, VS086, CS086 and CQ033. Risks will remain for prosecution of the schedule due to the effect of construction activity stacking. Additionally, the redevelopment of 270 Park Avenue does not have an agreed upon schedule. Future schedules may show the shifts in the critical path, further delays, and reduction of the Issues Contingency. **[Ref: ESA-128-Sep17]**
2. The PMOC has ongoing concerns about the significant schedule changes that resulted in shifts in scope on the Manhattan/Systems schedule path, which drives the ESA Program Critical Path. While the MTACC has reached agreement with the CS0179 and CM014B contractors for the Incremental IST schedule, other Manhattan/Systems contracts remain near critical and may exert a significant influence on the critical path.
3. The ESA program schedule contingency is 302 CDs, which is only 27 CDs above the minimum required FTA ELPEP schedule contingency. The ability of the MTACC to maintain the FTA minimum until the next ELPEP hold point (95% constructed; Q4 2020) is at risk due to the

uncertainties about the Manhattan/Systems schedule, the greatest of which is execution of the approved plan and schedule for the Incremental IST.

4. Progress on CS084, Tunnel Systems Package 4 – Traction Power, is slow and is currently reported as 35.7% complete compared with as-planned progress of 90.2%. The PMOC observes that work on CS084 continues to be delayed each quarter. With five out of the eight substations still requiring equipment submittals approval, fabrication is being delayed, impacting installation and energization. While much of the delays appear to have been absorbed and/or mitigated in the schedule, float to the program is being lost to this important sub-critical work. It is noted that MTACC continues to work with the contractor to develop a realistic and updated schedule and the PMOC believes that a revised schedule will incorporate delays in the delivery of equipment that will push out milestone dates. The PMOC recommends that ESA continue to analyze options to recover the schedule with a focus on major electrical equipment submittals and layouts, identifying major issues, and, determining corrective measures.
5. The PMOC has been concerned about the lack of progress to advance Incremental IST as indicated by not achieving the scheduled coordination point completion dates. With the incorporation of the syndicated schedule for Incremental IST into the ESA IPS, the MTACC reestablished the coordination point activities. While additional coordination points will be added to the plan when contract modifications are in place for other contracts, they now form the backbone of a reliable execution plan. If not addressed, the lack of progress will result in the need to perform more concurrent work leading up to and during IST than had been planned, which will further complicate and impede progress.
6. The CM014B contractor's capability to complete the 25% of its remaining work in the 13 months prior to the forecast SC in July 2020. The PMOC believes that this is overly optimistic based on the contractor's historic construction performance.

5.0 PROJECT COST

5.1 Budget/Cost

In the ESA April 2019 MPR, MTACC reported that the ESA program is 78.6% complete compared to planned progress of 78.4% of the $11,133 million April 2018 EAC forecast. The report also shows that construction progress reached 82.4% complete compared with planned progress of 82.3%. 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.

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	Feb 2019 CBB	Mar 2019 CBB	Apr 2019 CBB	CBB / FFGA Var.	CBB / Amend FFGA Var.
10 Guideway & Track Elements	1,989	3,405	3,353	3,403	3,401	3,448	73.4%	2.8%
20 Stations, Stops, Terminals, Intermodal	1,169	2,238	2,327	2,287	2,287	2,378	103.5 %	2.2%
30 Support Facilities (Yards, Shops, Admin)	356.3	474.2	450.8	558.6	559.7	565.9	58.9%	25.6%
40 Site Work and Special Conditions	205.1	610.6	562.5	530.6	530.6	530.9	158.9 %	-5.6%
50 Systems	619.3	605.6	627.7	713.6	713.6	737.0	19.0%	17.4%
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	2,146	2,146	2,152	81.8%	19.0%
b(4)								
Subtotal	6,350	10,178	10,922	10,335	10,335	10,335	62.8%	-5.4%
100 Financing Cost	1,036	1,036	1,116	1,116	1,116	1,116	7.8%	0.0%
Total	7,386	11,214	12,038	11,452	11,452	11,452	55.0%	-4.9%

5.2 Project Cost Management and Control

In the ESA April 2019 MPR, MTACC reported that total construction progress reached 82.4% complete compared with planned progress of 82.3%. 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 generally tracking the straight line projection for the April 2018 EAC forecast, however, they have been consistently behind the curve by $20 million in each of the past 6 months. 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. Maintaining the projected average spending rates is contingent on finalizing open schedule issues (e.g. 270 Park Avenue) and executing the Incremental IST program as planned. 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

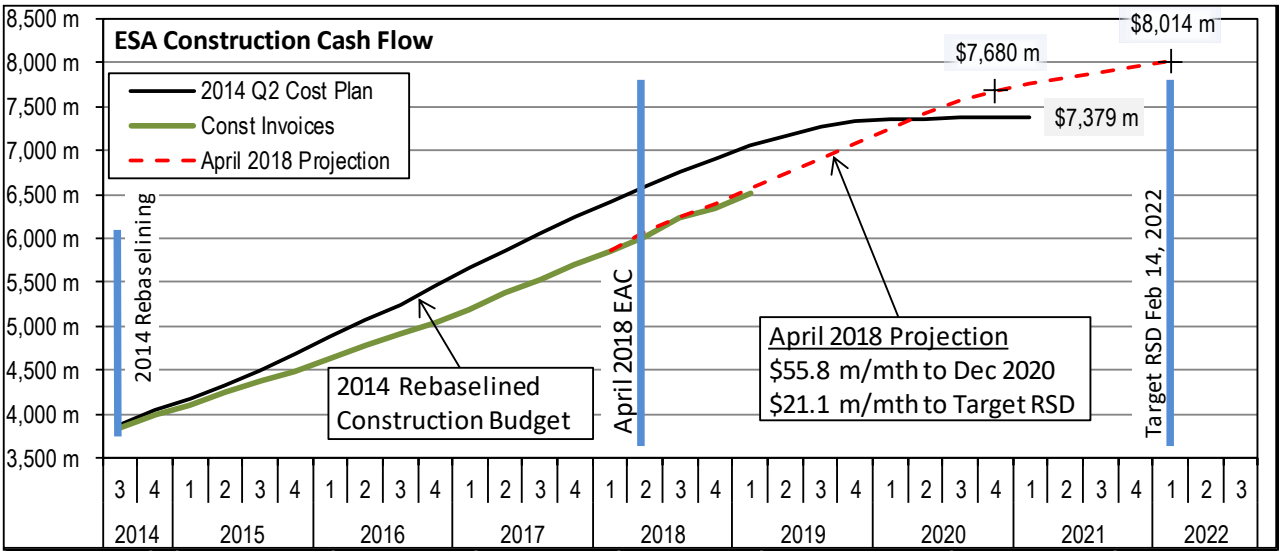


Table 5.3 shows the ESA budgets along with current awards and invoiced costs. Note that the percentages shown are invoiced percent of the current budget, not of the April 2018 EAC forecast.

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

Elements	Baseline Total Budget June 2014	April 2018 EAC Forecast	April 2019			
			Current Budget (interim)	Actual Awards	Invoiced Costs	Invoice Pct. of Budget
Construction Subtotal	7,379.3	8,014.1	**7,705.5**	**7,316.0**	**6,604.0**	**85.7%**
Soft Cost Subtotal	2,798.5	2,852.2	**2,629.6**	**2,200.4**	**2,149.9**	**81.8%**
Engineering	720.6	871.8	795.3	766.6	750.1	94.3%
OCIP	282.6	457.4	379.2	379.2	372.6	98.2%
Project Management	972.2	1,117.3	977.8	932.6	909.2	93.0%
Real Estate	182.1	203.7	124.9	119.2	117.9	94.4%
Rolling Stock	202.0	202.0	7.5	2.7	0.2	3.1%
Soft Cost Subtotal	439.0	267.0	344.9	--	--	--
Total (without financing)	10,177.8	11,133.3	**10,335.1**	**9,516.4**	**8,754.0**	**84.7%**

5.3 Change Orders

Table 5.4 lists the 43 contract modifications with magnitudes greater than $100,000 that were executed during the period from February 2019 through April 2019. The net increase of these modifications was $58.1 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
	February 2019	
CM007	Cavern Fire Alarm Change (mod. 68)	199,000
CM014B	RFI #1539 - Tile 3622 Gutter Support Steel (CPR-111) (mod. 207)	107,920
CM014B	Con-Edison - 10-inch Steam Service on 48th Street (CPR-123) (mod. 214)	192,617
CM014B	Transformer House 1 Drainage (CPR-039 R6) (mod. 173)	581,117
CM014B	B30 Substation Support Services (CPR-089) (mod. 187)	1,657,056
CM014B	Additional Gutter Downspouts and Leaders (CPR-128) (mod. 204)	567,507
CQ032	Water Infiltration Remediation Launch Block (mod. 91)	742,585
CQ032	Amtrak Bridge Grouting (mod. 92)	648,644
CQ033	Relocation and abandonment of existing wells (mod. 30)	170,000
CS179	Replacement of Mechanical Fire Dampers (mod. 174)	718,024
CS179	2nd Avenue Discharge, Drainage & Condenser pipes (mod. 176)	505,000
CS179	23rd Street Scope Transfer (mod. 173)	2,450,000
CS179	55th Street Security Door (mod. 122)	243,627
CS179	Alarming Security Related Cabinets (mod. 154)	612,337
CS179	CTC Code Charts (mod. 184)	678,728
PMC	Extension PM/CM Service to 6/30/19 (mod. 44)	33,165,470
	March 2019	
CH058A	B-931 Structures Demolition (mod. 1)	450,000
CM007	Overhead Drain Line Per RFI 323 (mod. 59)	346,550
CM007	63rd Street CMU Additions (mod. 70)	455,000
CM007	US-1 & US-2 Breakers Replacement Equipment Procurement (mod. 81)	645,870
CM014B	Public Area Cable Trays, Non-Public Area Cable Trays, and Seismic Restraints (CPR-103, CPR-126, CPR-169) (mod. 196)	1,320,058
CQ033	Miscellaneous Catenary (mod. 31)	1,130,000
CS179	CS084 Remote Control Disconnect Switches (mod. 179)	287,000
CS179	GCT Caverns Fire Alarm (mod. 185)	183,000
CS179	GCT Cavern Linear Heat Detection Deletion (mod. 192)	(103,711)
CS179	Cross Flue TVF Power (mod. 180)	526,905
CS179	Signal Power Connection (mod. 191)	144,149
CS179	Plaza Door Modifications (mod. 199)	124,500

Contract	Description / Mod No.	Amount
	April 2019	
CH058A	North Runner Wire No. 111 (mod. 2)	1,083,040
CH061A	Deletion of B-929.5W and B-929W Structures (mod. 22)	(150,000)
CM014B	Demark Room Expansion (CPR-104) (mod. 221)	717,260
CM014B	RFI #730 - 50th Street Pump Room (CPR-117) (mod. 222)	1,035,347
CM014B	RFI #1440 - Shaft 4 - Existing Alignment Issues (CPR-164) (mod. 233)	136,500
CM014B	RFI #1460 - Fire Hose Valves in Stairwells (CPR-137) (mod. 242)	130,657
CM014B	CW Workaround due to 47th Street Schedule Issues (CPR-132) (mod. 225)	281,056
CQ032	Removal of Scope of Work at the 23rd Street Facility & Additional Work in the Area of the Ventilation Shafts (mod. 90)	300,000
CS179	Field Network Clarifications and Changes (mod. 172)	1,910,000
CS179	Bench Level Track Dampers (mod. 178)	582,000
CS179	PTC Cable Procurement (mod. 186)	623,476
CS179	GCT Cavern Radio Antenna Coaxial Cable Installation (mod. 193)	1,568,000
CS179	GCT Escalator operations concourse nodes (mod. 198)	595,930
CS179	Tunnel D - Route for Radio Communication Cable (mod. 203)	250,000
CS179	Two Way Radio Cables - GCT Caverns (Seismic Restraints) (mod. 207)	255,750

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 approximately $800 million 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 April 1, 2019.

Local Funding: The budget for Local Funding is $7,636.4 million, of which $6,055.2 million was expended through May 1, 2019. Financing costs are funded separately from other local sources.

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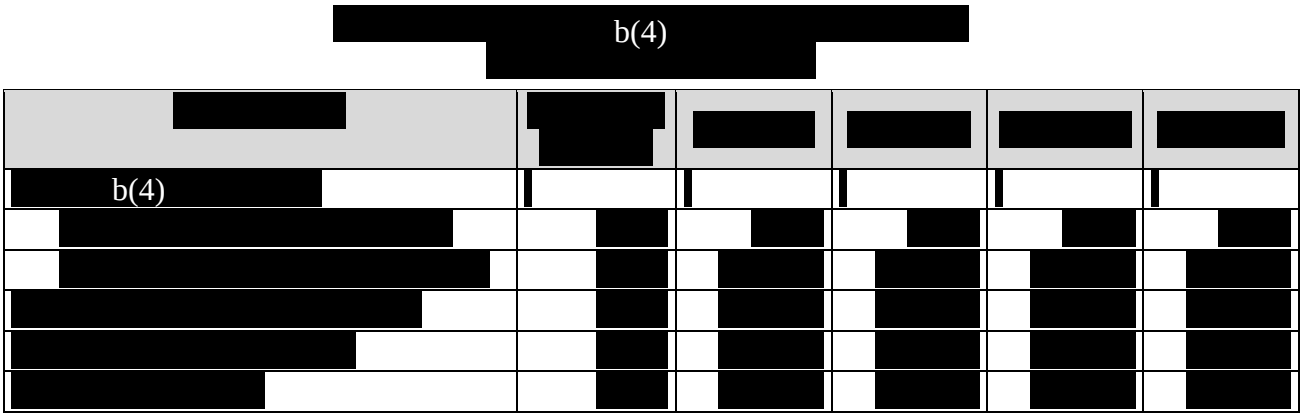

Concerns and Recommendations: The PMOC remains concerned about future demands on the program's contingencies until the MTA 2020-2024 Capital Plan is funded and the related budget adjustments are performed. The MTACC cost plan forecasts drawing contingencies down to approximately $117 million at the end of December 2020, at which time the ESA program budgets and contingencies would be replenished with funds from the 2020-2024 Capital Plan. The forecast $117 million contingency balance is below the ELPEP minimum, which would be addressed in the recovery plan that the MTACC is preparing. The PMOC remains concerned that the ESA program requires significant funding of approximately $800 million in the 2020-2024 Capital Plan.

The PMOC notes that the MTACC is following its strategy of holding significant funding as contingencies, which is being released to specific projects on an as-needed basis, commensurate with construction progress and other needs. While this strategy retains maximum flexibility for the MTACC, it differs from the generally accepted practice of committing to budgets for known program costs, tends to artificially inflate the program contingency, and reduces the accuracy of contract completion percentages.

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, however, noted improvements for Amtrak ET support during Q4 2018 and continuing through Q1 and Q2 2019.

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 two distinct elements:

a.) 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.

b.) 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 June 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 41.4% complete (actual) vs. 92.4% as- planned.
- Contract CM014B is reported at 82.9% complete (actual) vs. 98.5% 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.
- Adequate schedule progress for executing the finalized Incremental IST plan.
- A critical stakeholder issue with JPMC has developed involving its plans to construct a 70-story office tower replacing its existing office building at 270 Park Avenue. Impacts to the ongoing ESA construction of the new LIRR Concourse at GCT are 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 May 2019 as the Q1 2019 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 plan;
    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 June 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;
    12. Foundation/substructure systems required for the new JP Morgan/Chase (JPMC) building at 270 Park Avenue will impact the LIRR Concourse at GCT. Ongoing MTA, MTACC-ESA, and JPMC discussion continued through June 2019.
3. Specific remaining risks for the Harold Interlocking work, previously identified by MTACC, include the following:
    a) Funding: Funding constraints [risk realized in Q2 2017; long-term risk remains].
    b) Amtrak Support: Ongoing/future Regional Projects requiring extensive Amtrak support.
    c) 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.
- Foundation/substructure systems required for the planned new JPMC building at 270 Park Avenue may impact the ongoing ESA construction of the new LIRR Concourse at GCT. Ongoing MTA, MTACC-ESA and JPMC discussion continued through March 2019 in an effort to minimize changes to the ESA designs, to minimize the schedule impacts to the ongoing ESA construction of the LIRR Concourse at GCT, and to significantly reduce the cost risk to MTA/MTACC.

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 now involves six 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.

3. The PMOC is concerned about the potentially significant cost and schedule impacts resulting from construction of the required foundation and substructure systems for the planned new JP

Morgan/Chase (JPMC) building at 270 Park Avenue that will affect the ongoing ESA construction of the new LIRR Concourse at GCT. The PMOC recommends that MTA and MTACC-ESA expedite the engineering and design technical discussions, as well as the legal, contractual, schedule and cost considerations, to finalize the Construction Agreement with JPMC as soon as possible. **[Ref.: ESA-133-Dec18]**

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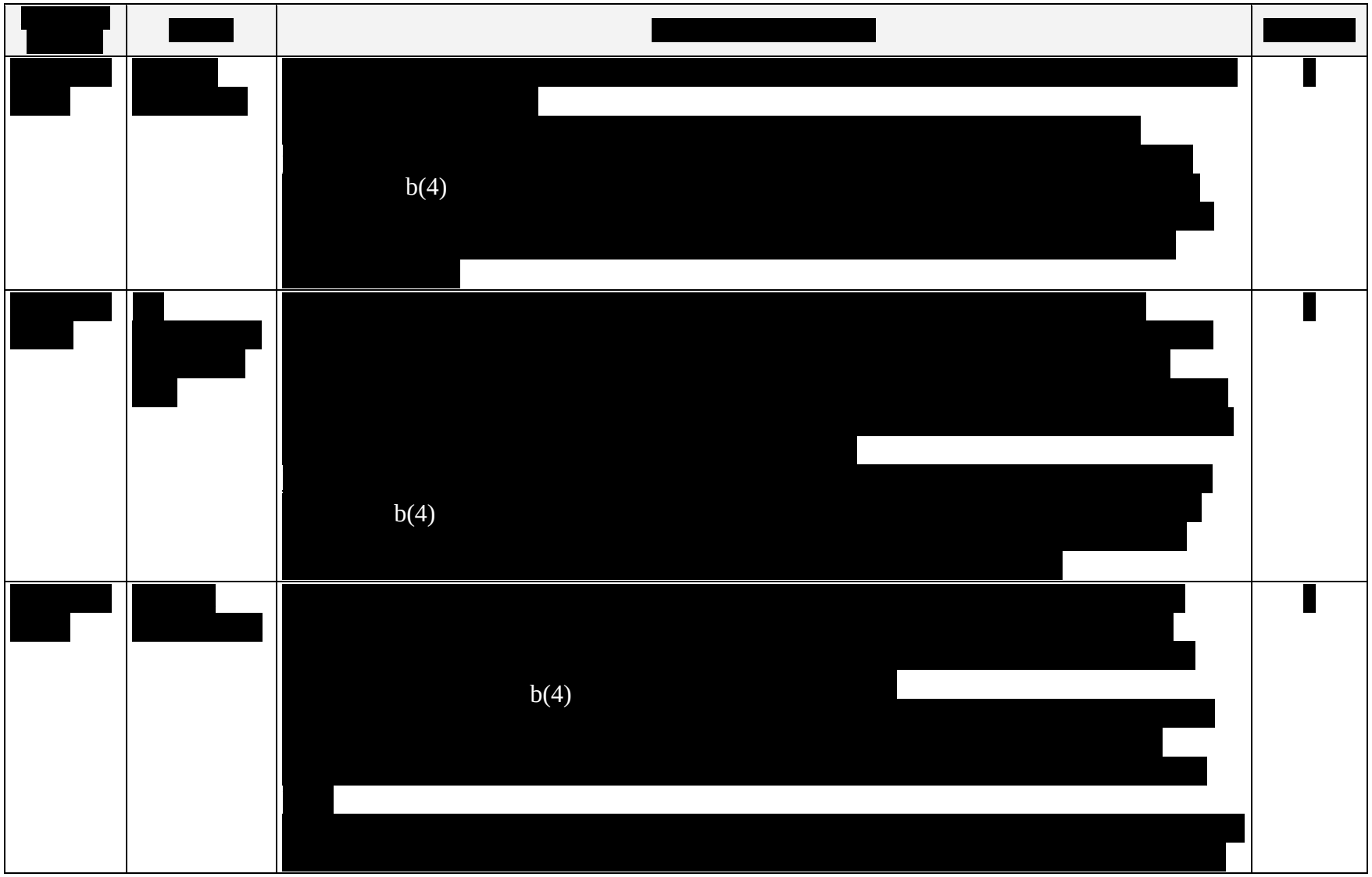

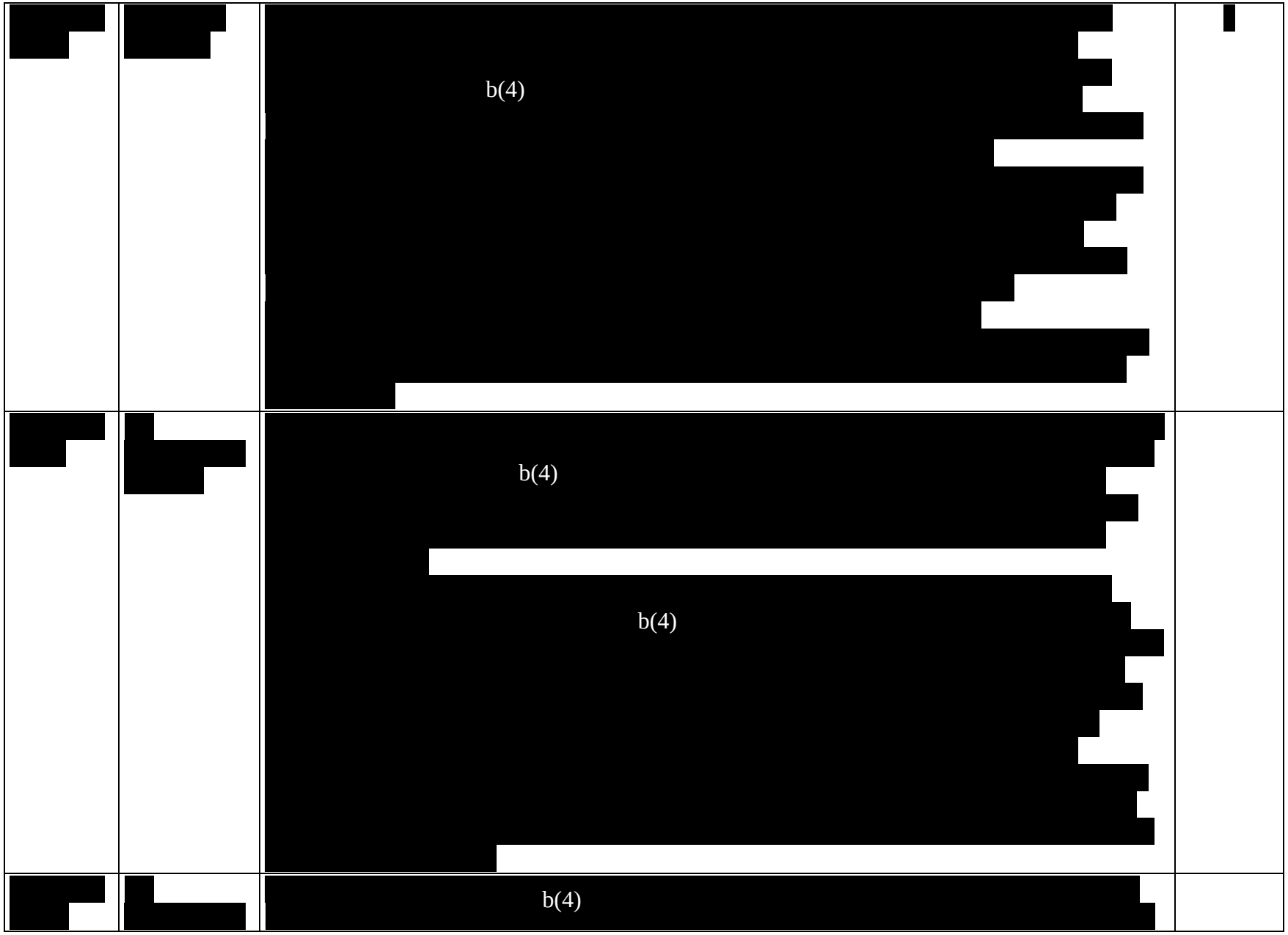
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APPENDIX A - LIST OF ACRONYMS

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
$8,754.0 million	Amount of Expenditures as of April 30, 2019, of the Interim Project Budget of $10,335.1 million
77.7%	Percent Complete, based on the ESA April 2018 EAC forecast of $11,133.3 million and invoices shown in the ESA April 2019 MPR.
$646.5 million	Total Project Contingency remaining (including $344.9 million identified by ESA as Unallocated Contingency, which includes ESA Reserves).
81.2%	Construction Percent Complete vs. 81.6% as planned based on the ESA April 2018 EAC construction forecast of $8,014.1 million shown in the ESA April 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.

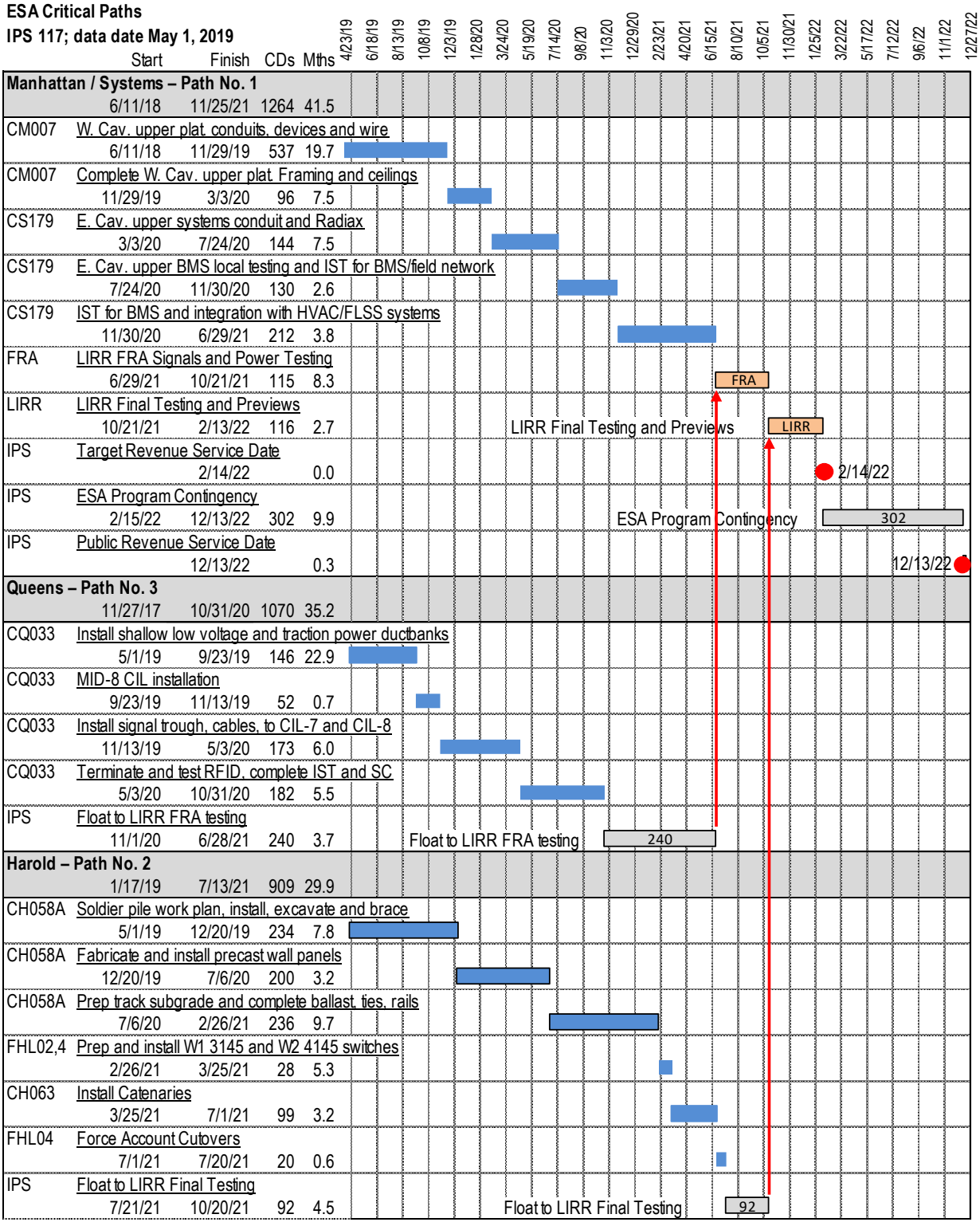
SSMP Monitoring	Y/N	Notes/Status
Does the Sponsor implement a process through which the Designated Function (DF) for Safety and DF for Security are integrated into the overall project management team? Please specify.	Y	The safety certification designee for MTACC, as well as the MTACC quality chief, meets 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



APPENDIX F - 90 DAY MILESTONE LOOK-AHEAD SCHEDULE – IPS 117

ACTIVITY ID	ACTIVITY DESCRIPTION	START	FINISH
CH057D: Harold Track Work Part 3			
CH057D-B2140	BC Prep: Demo 813 Switch		5-May-19
CH058A: Harold Structures - B/C Structure/ Catenary Structure**			
CH058A0035	AR#2 GO2 Substation Demolition		14-Jun-19
MS #2	Complete 39St Bridge Load Transfer		25-Jul-19
FHL01: Harold Stage 1 - LIRR F/A			
FHL01-2020	Decommissioning & Salvage of GO2 Substation		24-May-19
FHL01-1860	Install R5		1-May-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			
	No milestones forecasted for next 90 CDs		
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			
FHA03-CA4955	Q Tower ET Catenary Relocation Completion		13-Jul-19
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-Mar-19A
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			
	No milestones forecasted for next 90 CDs		
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		
CM007: GCT Caverns			
SUM-CM007-EM-20	CM007 – Install Rebar/Pour Concrete Slab/Complete Conduit Installation		22-May-19
MS#5	Substations US1 and US2 Complete		22-May-19
CM014B: GCT Concourse and Facilities Fit Out (BL)*			
MS#11A	Chiller Plant and HVAC Condition of Zones 1 and 5		13-Jun-19
MS #16	B20 Substation – Relay Settings Resubmission		10-Jul-19
MS #18A	GCT Zone 1 and 2 All Conduits (Except Demark Room)		30-May-19
MS #18B	GCT Zones 3 and 4 and Demark Room All Conduits		25-Jun-19
MS #20B	GCT Zone 2 Architectural Finishes		30-Jul-19
Numerous other activities; See MTACC IPS 117 Report, Section 5			
CQ033: Mid-Day Storage Yard Facility (Procurement Status TBD)			

ACTIVITY ID	ACTIVITY DESCRIPTION	START	FINISH
TP-SEC-1	Sec-1 Arch to Thomson – Traction Power Ductbanks Complete		1-May-19
A75400	Complete Detention Pipe		3-May-19
MV71836	Complete Medium Voltage Ductbank		17-May-19
A75190	Complete Pedestrian Bridge		13-Jun-19
MS #8	Completion of Plaza Work		7-May-19
VQ033: Mid-Day Storage Yard CIL Procurement			
MID-8-01340	PTMW – (Ships to ASTS-MID-8 CIl, Signal Cases and Battery Hut)		9-May-19
MID-6-01850	Hook Up CIL for Testing – MID-6		15-Jul-19
MID-8-01790	Assemble/Wire – MID-8 CIL, Signal Cases		1-Aug-19
MID-8-01530	FDR- MID-8 CIL, Signal Cases and Battery Hut		19-Jun-19
MS #1	MID-3 CIL, MID-4 CIL, MID-1 CIL, MID-2 CIL		17-May-19
CS084: Tunnel Systems Package 4 – Traction Power Systems			
CO4-1390	CO4 – Deliver Main PLC		24-May-19
CO6-1290	CO6 – Deliver DC Switchgear		15-Jul-19
CO1-1270	CO1 – Deliver EO DC Switches Control Cabinet		31-Jul-19
CO2-1330	CO2 – Deliver Main PLC		31-Jul-19
CO3-1080	CO3 – Approve Bus Duct, 12KA, Negative		5-Jun-19
CO4-8240	CO4 – Install 1200A Drawout Breaker		31-Jul-19
CO1-12100A	CO1 – CM007 Provides Hi-Rail/Rubber Road Access to Track 302		25-Jul-19
CO2-13000A	CO1 – CM007 Provides Hi-Rail/Rubber Road Access to Track 303		25-Jul-19
CS179: System Package 1 - Facilities Systems*			
M12A-01	Tunnel SCADA Network FAT		22-May-19
Numerous activities; See MTACC IPS 117 Report, Section 5			
CS086: Signal Installation			
GCT-SURV-1050, -1070, -1090	MTACC Rev/Apprv Surveys (GCT-6 CIR Conditions, Signal Case, and Signal Heads)		10-May-19
SUB-RCWY-460, -640, -660	MTACC Rev/Apprv Product Data (Raceways and Boxes)		30-May-19
GCT6-RCWY-1045	Prep & Submit GCT-6 CIR Layouts and/or Shop Dwgs		29-May-19
GCT5-WLK30	MTACC Address Deficiencies found on Surveys of GCT-5 CIR & Wayside Areas		14-May-19
GCT5/6WB1-100	Deliver Wayside Equipment to Site		2-Jul-19
GCT6-WLK70	Room Turnover for Construction – GCT-6		14-May-19
VS086: System Package 3 - Signal Equipment Procurement			
020960	As Bult Dwgs – Submit – GCT6 (Cases & CIR)		6-May-19
MS #5	Furnish Tunnel Signal Equipment & Hardware for GCT3 & GCT4 CIRs		21-May-19

*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	2/1/19 IPS Date	5/1/19 IPS Date	Delta CDs
CP-CM007-050	CIA 17A – CS179 Begin Civil/Electrical CR-M1, -M2, -L1, -L2	28-Feb-19	29-May-19	+90
CP-CM007-060	CIA 17B – CS179 Begin Civil/Electrical CR-M4, -L3, -L4	21-Feb-19	9-May-19	+77
CP-CM007-070	CIA 18A – CS179 Begin Civil/Electrical CR-C2, -M2	21-Mar-19	19-Jun-19	+90
CP-CM007-100	CIA 19B – CS179 Begin to Complete EC Mezz Conduits & Pull Cable	25-Feb-19	22-May-19	+86
CP-CM007-110	CIA 19C – CS179 Begin to Complete EC Under Platform Conduits & Pull Cable	11-Feb-19	9-May-19	+87
CP-CM007-130	CIA 20B – CS179 Begin to Complete WC Mezz Level Conduits & pull Cable	4-Mar-19	31-May-19	+88
CP-CM007-140	CIA 20C – CS179 Begin to Complete WC Upper Level Conduits & Pull Cable	12-Feb-19	10-May-19	+87
CP-CH057D-10-CM007	Tunnel B/C Approach Track and Third Rail Work	25-Mar-19	6-May-19	+42
CP-CH061A-20-CS179	Install Equipment in Tunnel A	27-Feb-19	1-May-19	+63
CP-CQ033-10-FHA03	Complete B-918 1/2N & Erect Pole/B-914W Guy Anchor	26-Apr-19	28-Feb-19A	-57
CP-VQ033-10-CQ033	FAT Testing and Delivery – MID1 CIL	28-Mar-19	6-May-19	+39
CP-VQ033-40-CQ033	FAT Testing and Delivery – MID4 CIL	18-Feb-19	16-Feb-19A	-2
CP-CM014B-90-CS179	AR 13B – 2nd Phase Access to 50th Street	17-Apr-19	12-Jun-19	+56
CP-CS179-170-IST	FAT – FLN	20-Feb-19	N/A*	N/A
CP-CS179-260-IST	FAT – Telephone	19-Feb-19	N/A*	N/A
CP-CS179-390-IST	38th Street Vent Facility – Mech – HVAC / DDC / TEC Testing	25-Feb-19	N/A*	N/A
CP-VM014-420-IST	Escalator & Elevator Deliveries for CM007	4-Apr-19	1-May-19	+27
CP-VM014-440-IST	Escalator & Elevator Deliveries Complete	4-Apr-19	16-May-19	+42
CP-CM007-180	Install GCT 5 Switches	13-Mar-19	28-May-19	+76
CP-CM007-250	Install GCT 4 Switches	1-Feb-19	1-May-19	+89
CP-VS086-20	Procure Signals – GCT 6	7-Feb-19	6-May-19	+88
CP-VS086-30	Procure Signals – GCT 5	7-Feb-19	14-May-19	+96
CP-VS086-40	Procure Signals – GCT 3	5-Apr-19	10-Jul-19	+96
CP-VS086-50	Procure Signals – GCT 4	15-Apr-19	21-May-19	+36

*N/A = Coordination Points for CS179 were revised in recently executed Mod. 197

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

Contract CS179

Equipment	Current Status
Small HVAC Units for Equipment Rooms	The contractor asserted 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.
Cook Motor Fans	Buy/Ship America conformance under investigation.

APPENDIX H –REMAINING ESA ELECTRIC TRACTION (CATENARY) CONSTRUCTION*
Start and Finish Dates from IPS 117 Data Date May 1, 2019

IPS Identifier	Scope	IPS Early Start	IPS Early Finish	Status
CH063 – 1.3 IOS Section 8 1.3	Install 7,100 LF CA WBY Track	10/12/20	2/4/21**	Only 8 of 35 catenary poles required for this task have been installed as of June 30, 2019. MTACC notes that this work is not required for LIRR revenue service into GCT.
CH063 1.1 Section 8 1.1	Catenary wire transfers Q and R	8/30/20	10/9/20	Catenary work at Q and R Interlockings continued through Q2 2019 and is expected to be complete at both locations by 8/31/19.
CH058BRI	Install 2,180 LF CA EBRR Track	10/14/20	2/28/23	CH058B to construct Eastbound Re-Route (EBRR) Track has not been advertised yet. CH058B to install 10 catenary poles prior to installation of CAs.
CH063-1470	Install CAs 1 Turnout location[1]FHL02		7/1/21	LIRR to install the #3234W turnout. Amtrak will install CAs after LIRR installs the turnout.
CH063-1470 and CH058B-1370	Install CAs 4 Tunnel B/C Turnout locations[2] (W and V Crossovers)	3/25/21	7/1/21	LIRR to install 4 Tunnel B/C turnouts prior to Amtrak installation of CAs.
FHA03-CA8106	Complete Loop 1A Electrification		3/31/21	Amtrak Loop 1A Track construction partially complete. Catenary assemblies will be installed after all track construction is complete.
FQA65-ET3400 and FQA-3060	Install CAs 14 Turnout locations[3]in Loop and T Interlockings		2/28/24	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.
FHA063-CA3698	PW2 Overrun	2/24/20	4/27/20	Will be scheduled as time permits. The PMOC notes that this work is not required for LIRR revenue service into GCT.

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.

** Catenary work noted will only be between the #1121E and #3121W turnouts in Harold Interlocking, but will not be for the entire planned Westbound Bypass Track.

1. #3234W CH063-1470
2. W crossover is between #3145 and #4145 turnouts (CH063-1470) and V crossover is between #2155 and #2254 turnouts (CH058B-1370).
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. There are three such items included in the PMOC's Quarterly Comprehensive Reports:

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

This diagram depicts the tracks, crossovers, and turnouts over which Amtrak Force Account and Third Party Electric Traction personnel will install catenary system components (overhead contact system) in order to operate Amtrak electric 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.

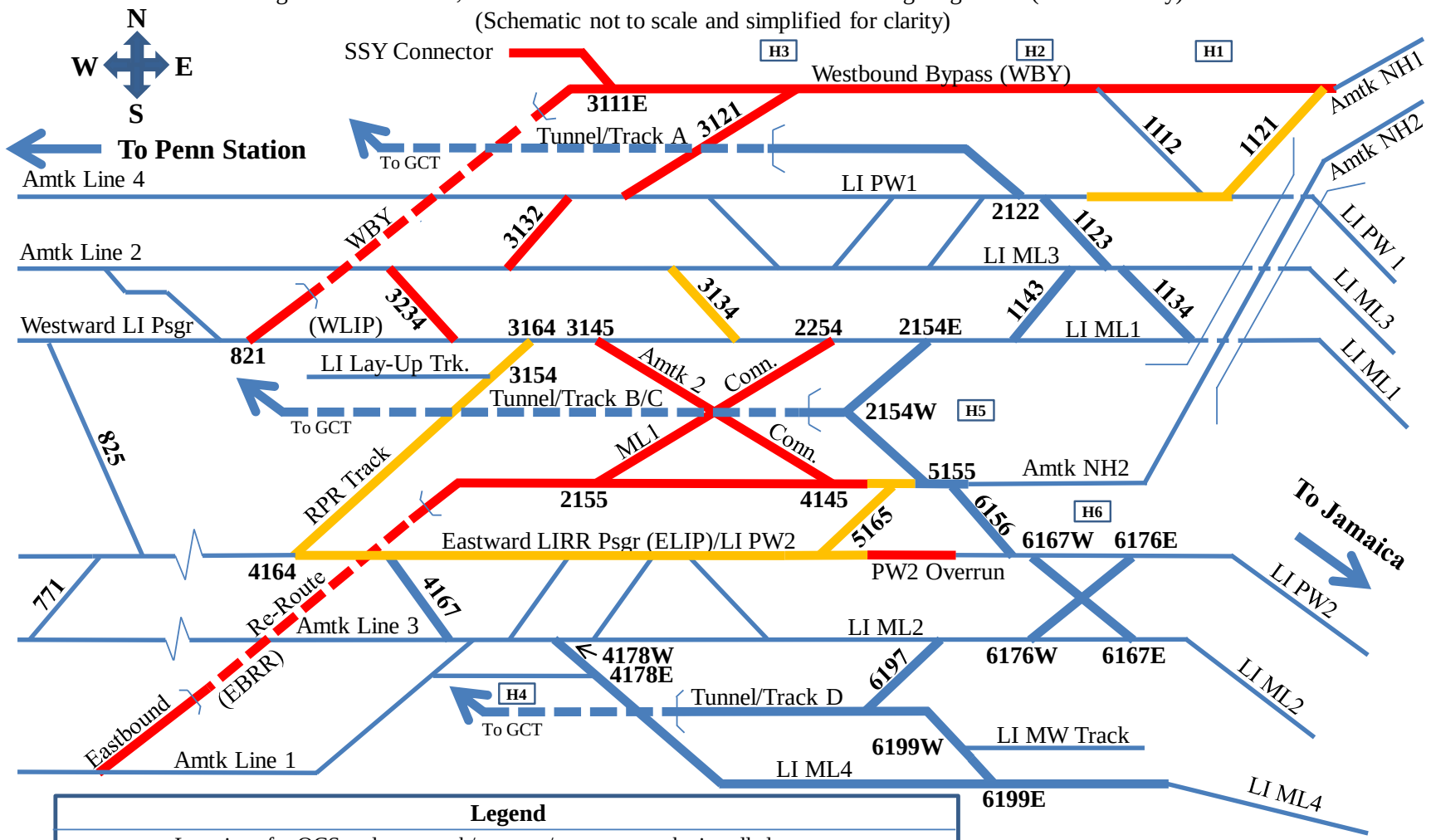
The information shown on these schematics will be updated with each PMOC Quarterly Comprehensive Report and will trace construction progress for that quarter.

Appendix I: Harold Interlocking Progress Monitoring Schematic

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

Progress as of June 30, 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 Q2 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

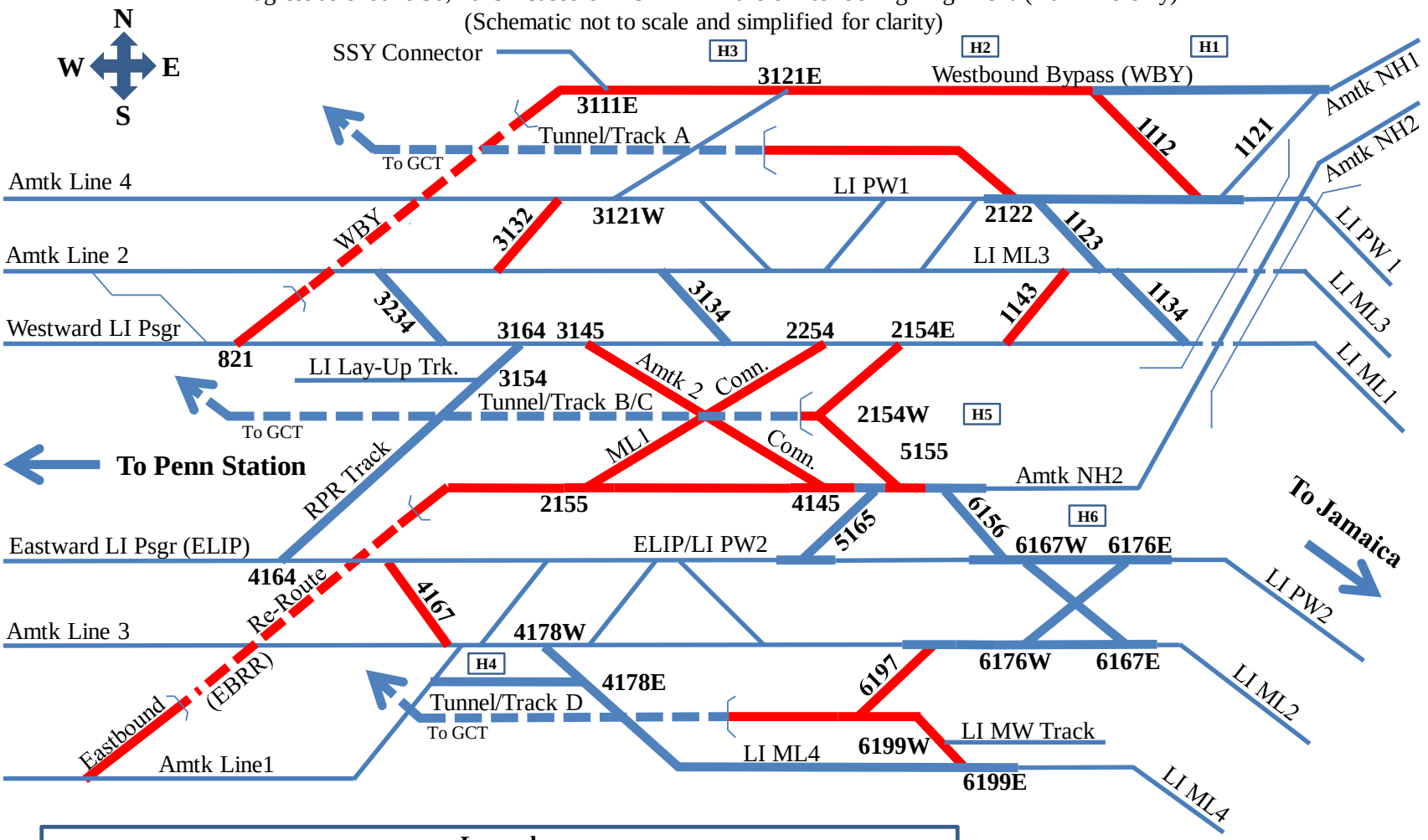
Note: There was no OCS scheduled for installation in Harold Interlocking during Q2 2019.

Appendix I: Harold Interlocking Progress Monitoring Schematic

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

Progress as of June 30, 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 Q2 2019
- Locations where 3rd Rail and/or new track was previously installed
- Existing track/turnouts/crossovers to remain as is

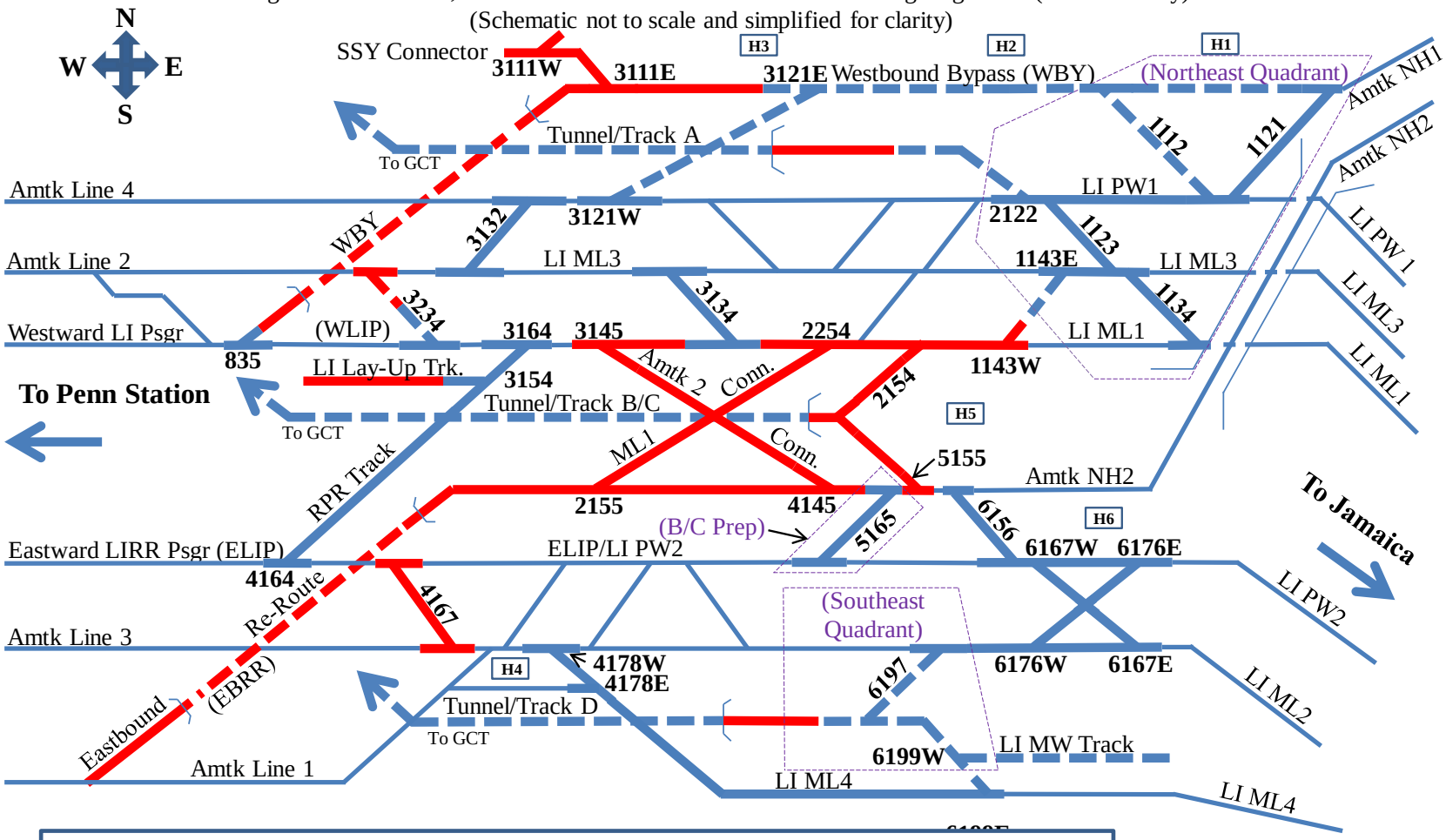
Note: There was no 3rd Rail scheduled for installation in Harold Interlocking during Q2 2019.

Appendix I: Harold Interlocking Progress Monitoring Schematic

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

Progress as of June 30, 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 Q2 2019
- New Turnouts/Track previously installed
- Dashed blue or green, installed, not in service
- Existing Turnouts/Track to remain as is

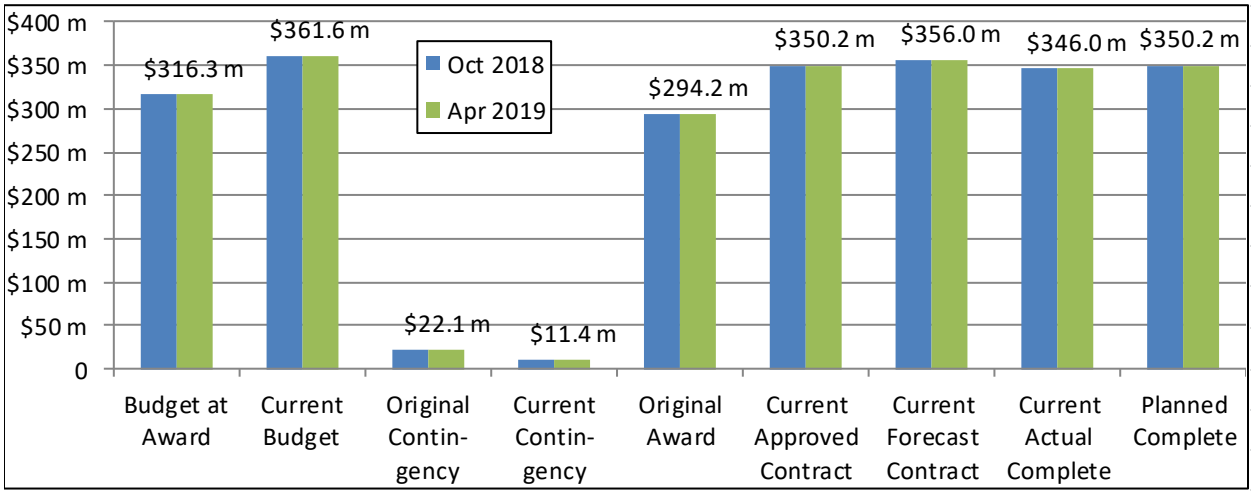
Note: There were no turnouts or crossovers scheduled for installation in Harold Interlocking during Q2 2019.

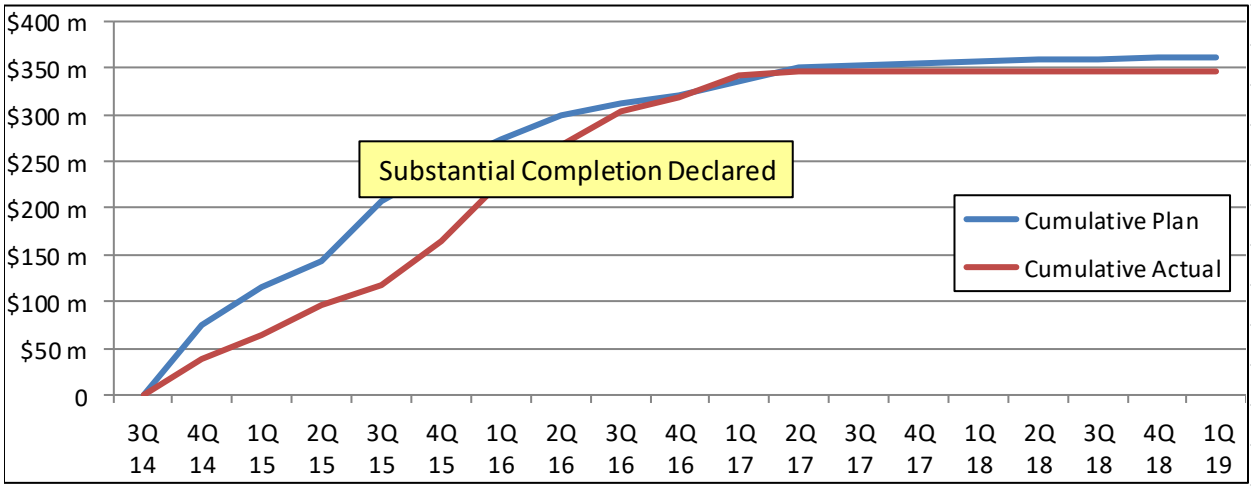
Appendix J – Cost Performance

CM006 Manhattan North Structures Apr 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%	0.0%	0.0%	0.0%	0.0%	per month

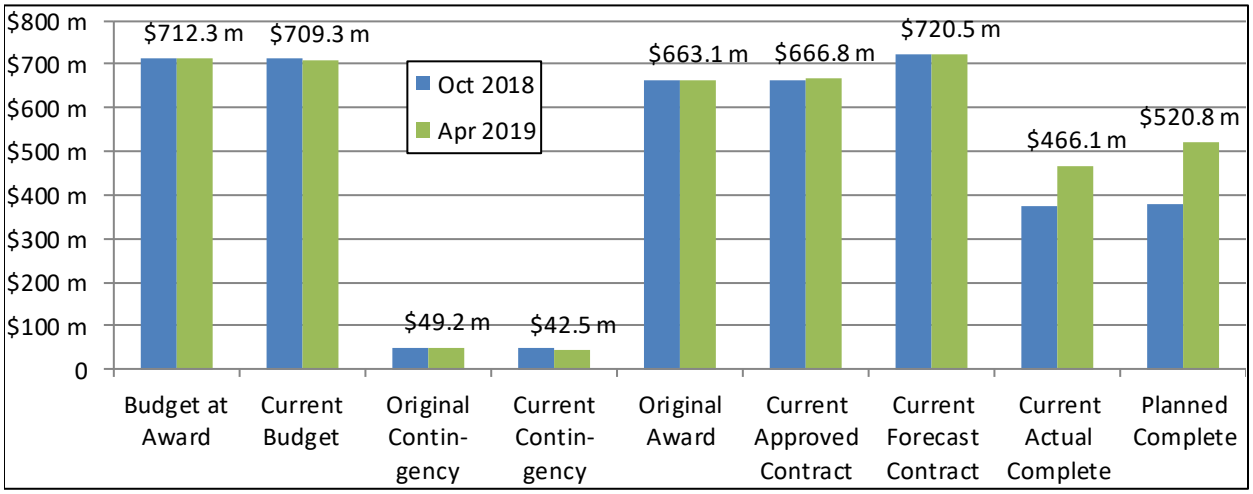


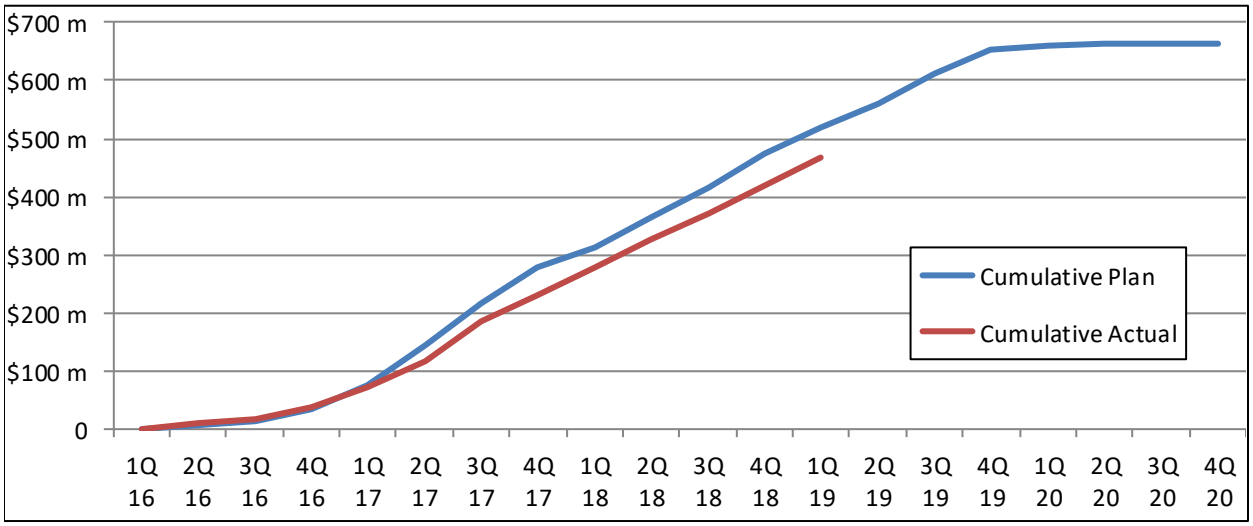


CM007 GCT Caverns Apr 2019

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)
$712.3	$709.3	($3.0)	$663.1	$666.8	$3.7	$720.5	$8.2

Percent Complete		Actual Prog Last 12 Mths		Actual Prog Last 6 Mths		Average Required Progress to reach forecast SC
Planned	Actual	Total	Avg/Mth	Total	Avg/Mth	
78.1%	69.9%	28.0%	2.3%	13.7%	2.3%	1.88% per month

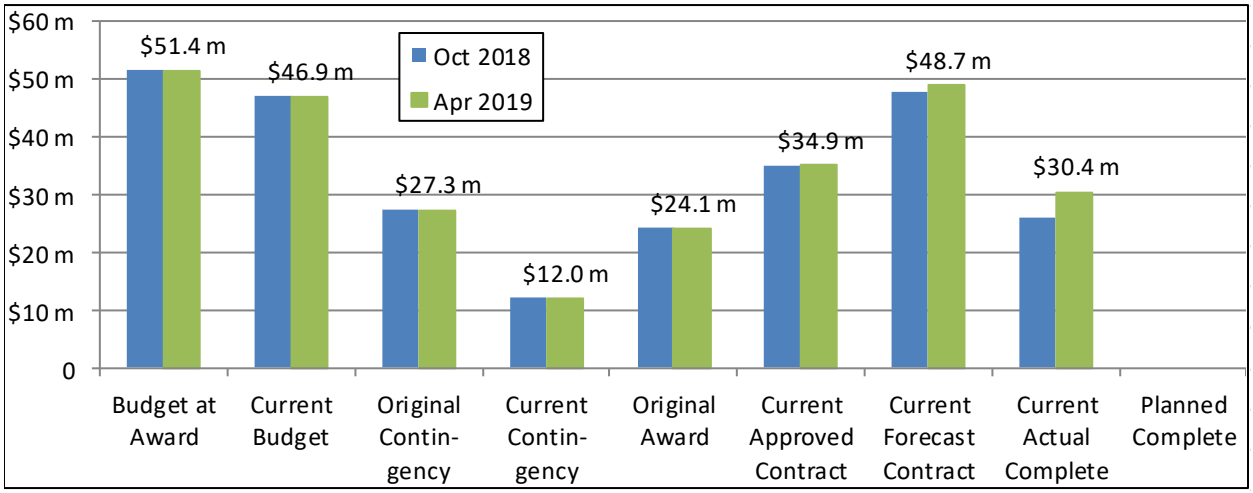




VM014 Vertical Circulation Elements (Escalators & Elevators) Apr 2019

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)

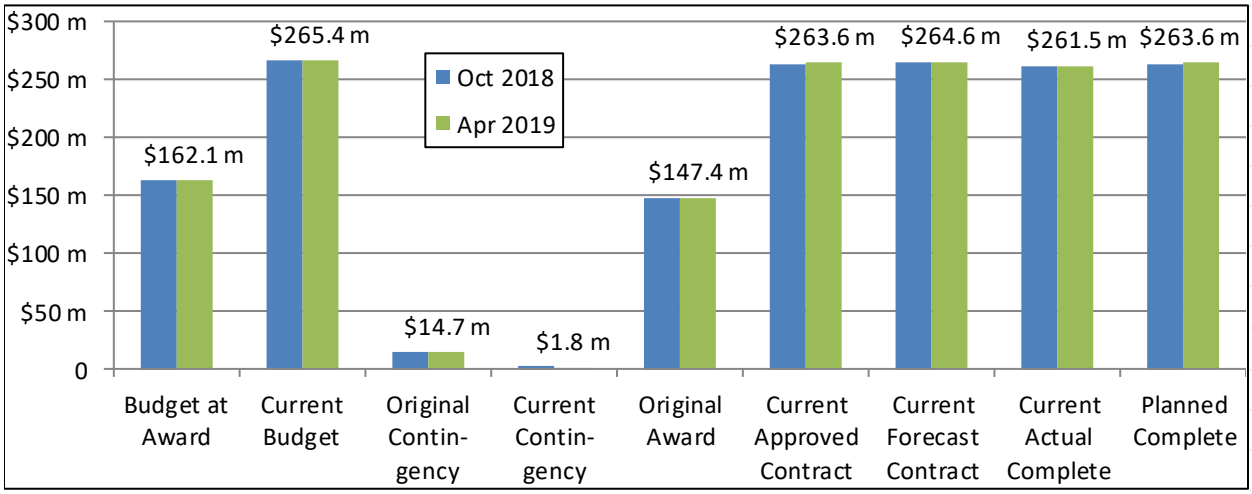
Percent Complete		Actual Prog Last 12 Mths		Actual Prog Last 6 Mths		Average Required Progress to reach forecast SC
Planned	Actual	Total	Avg/Mth	Total	Avg/Mth	
NA	87.0%	20.1%	1.7%	12.2%	2.0%	1.08% per month

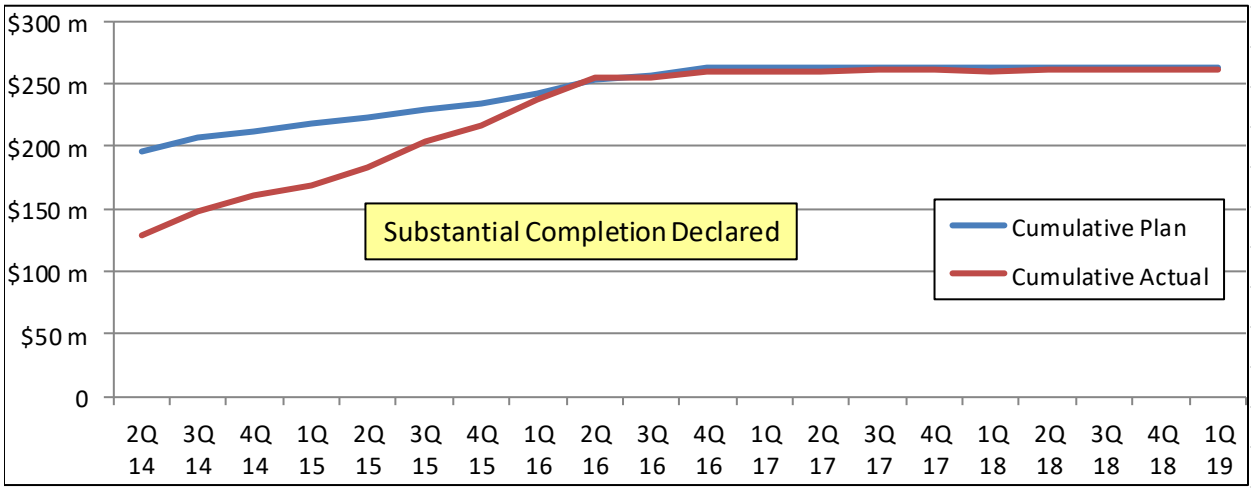


CQ032 Plaza Substation & Queens Structures Apr 2019

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	$263.6	$116.2	$264.6	$102.5

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%	99.2%	-0.4%	0.0%	-0.4%	-0.1%	per month

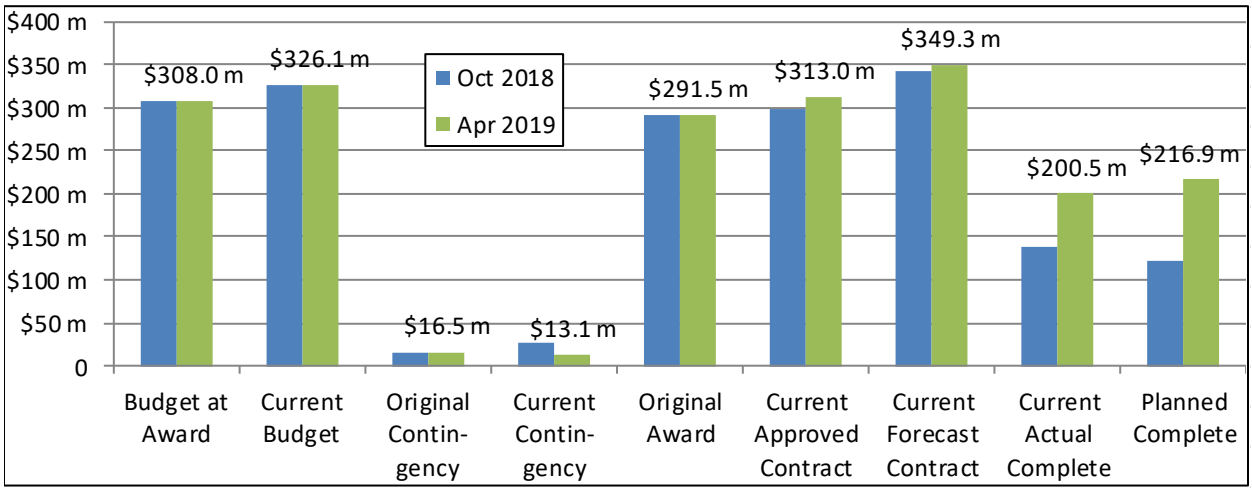


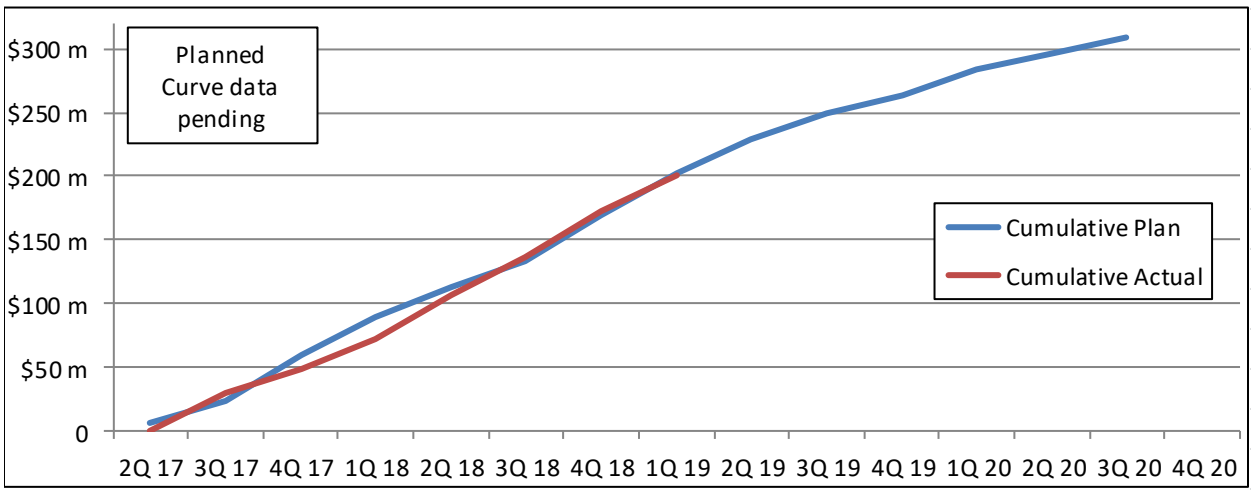


CQ033 Mid-Day Storage Facility Apr 2019

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)
$308.0	$326.1	$18.1	$291.5	$313.0	$21.5	$349.3	$41.3

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	
69.3%	64.1%	39.4%	3.3%	18.1%	3.0%	1.89% per month

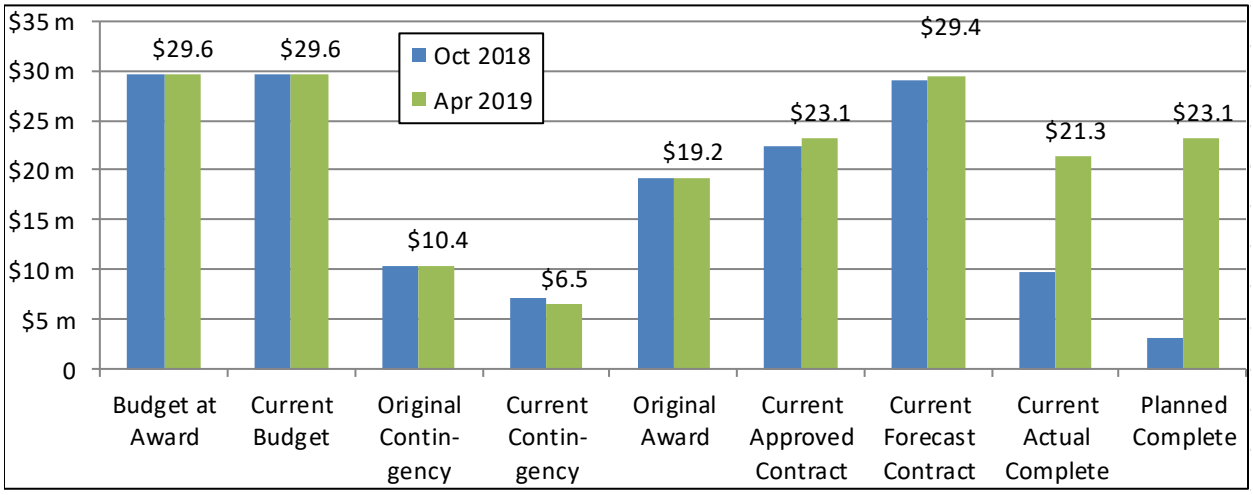


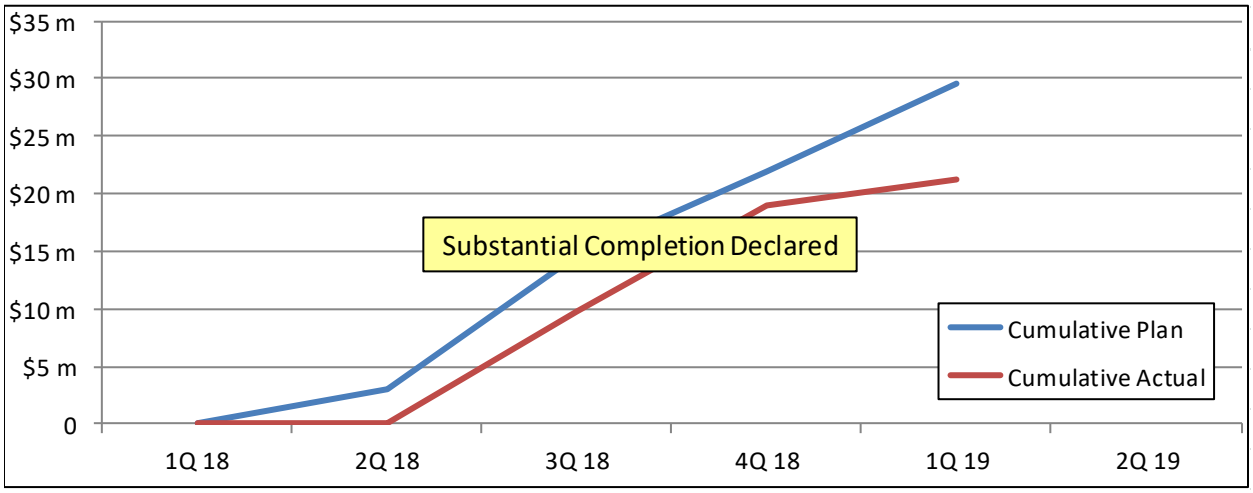


CH057D Track A Cut and Cover Structure Apr 2019

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)
$29.6	$29.6	$0.0	$19.2	$23.1	$3.9	$29.4	($0.2)

Percent Complete		Actual Prog Last 12 Mths		Actual Prog Last 6 Mths		Average Required Progress to reach forecast SC per month
Planned	Actual	Total	Avg/Mth	Total	Avg/Mth	
100.0%	92.3%	NA	NA	48.4%	8.1%	

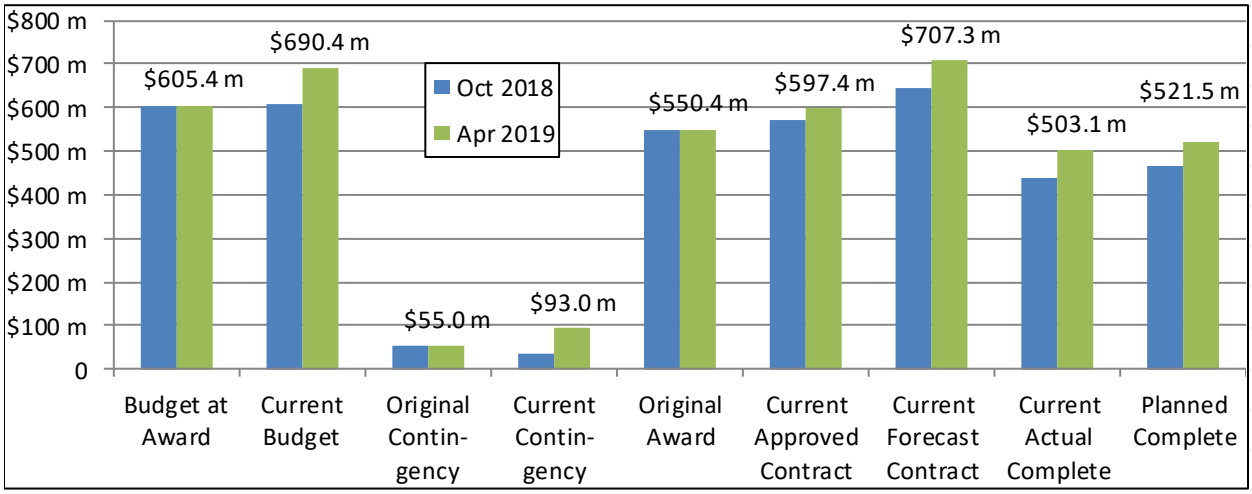


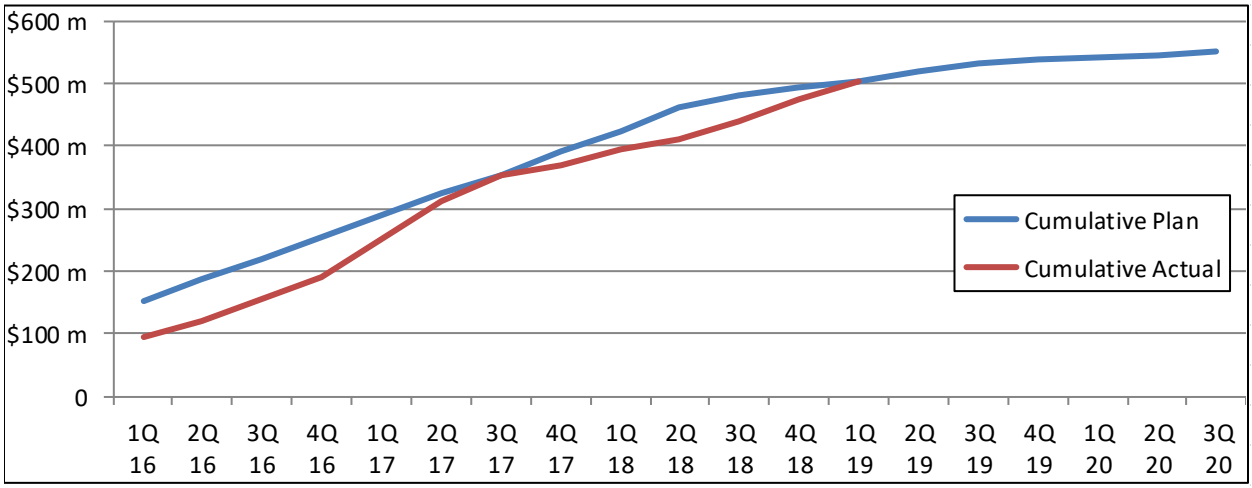


CS179 Systems Package 1 – Facilities Systems Apr 2019

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	$690.4	$85.0	$333.6	$597.4	$263.8	$707.3	$101.9

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	
87.3%	83.4%	13.8%	1.2%	7.4%	1.2%	0.61% per month

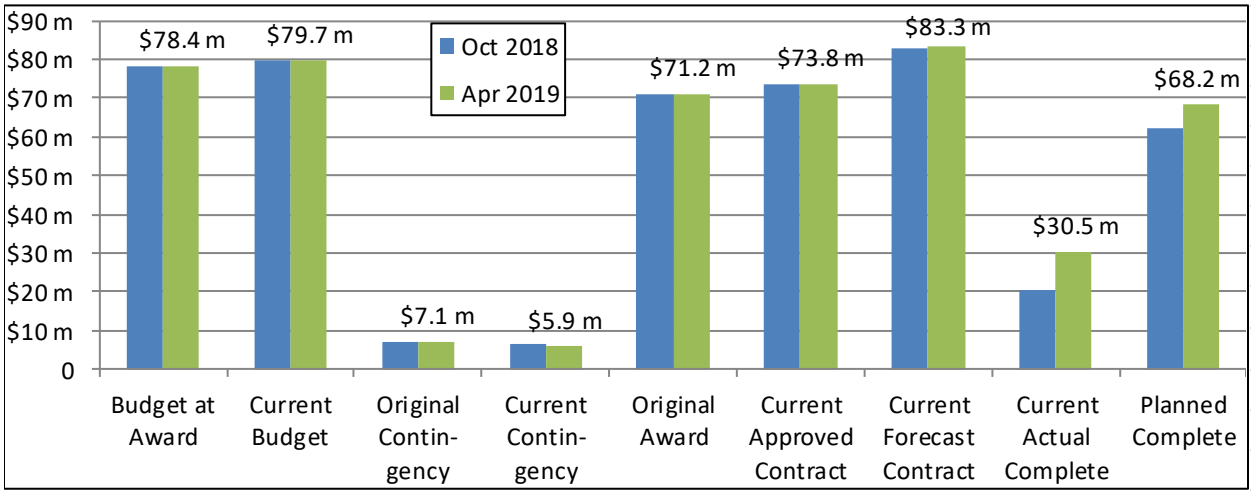


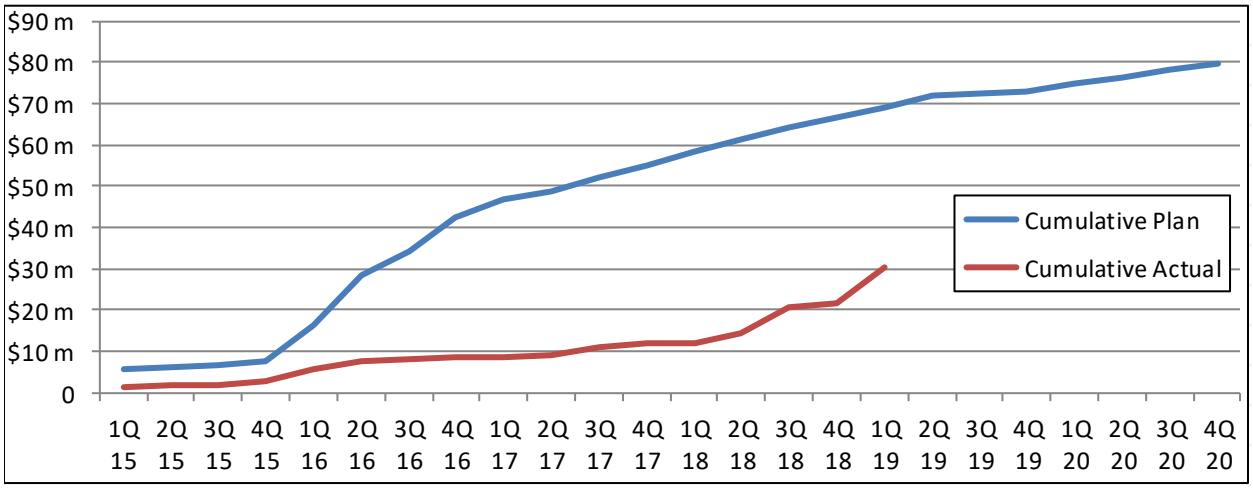


CS084 Tunnel Systems Package 4 – Traction Power Apr 2019

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	$83.3	$4.9

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	
92.4%	41.4%	25.2%	2.1%	13.4%	2.2%	2.44% per month

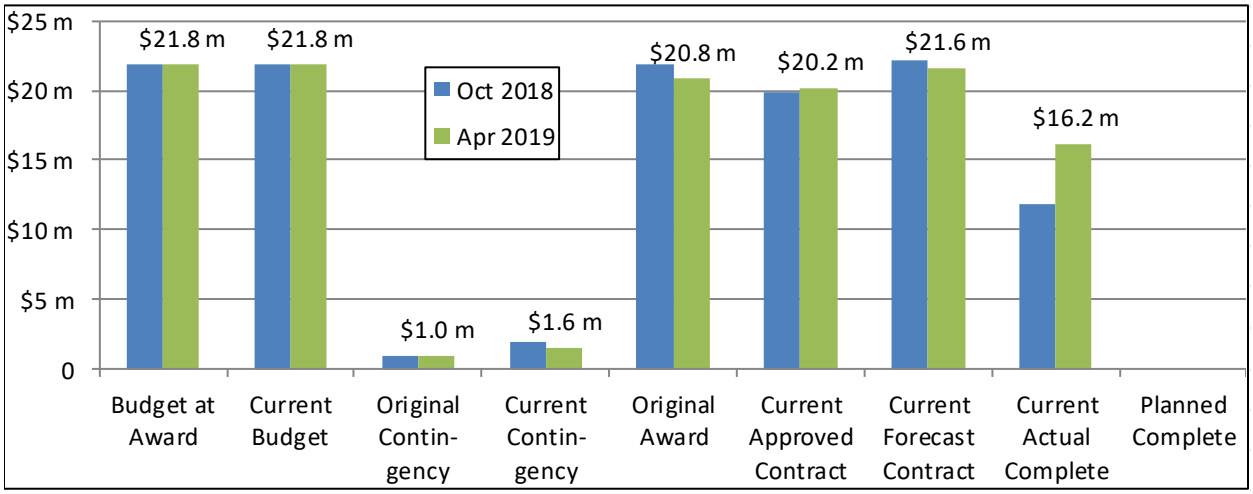


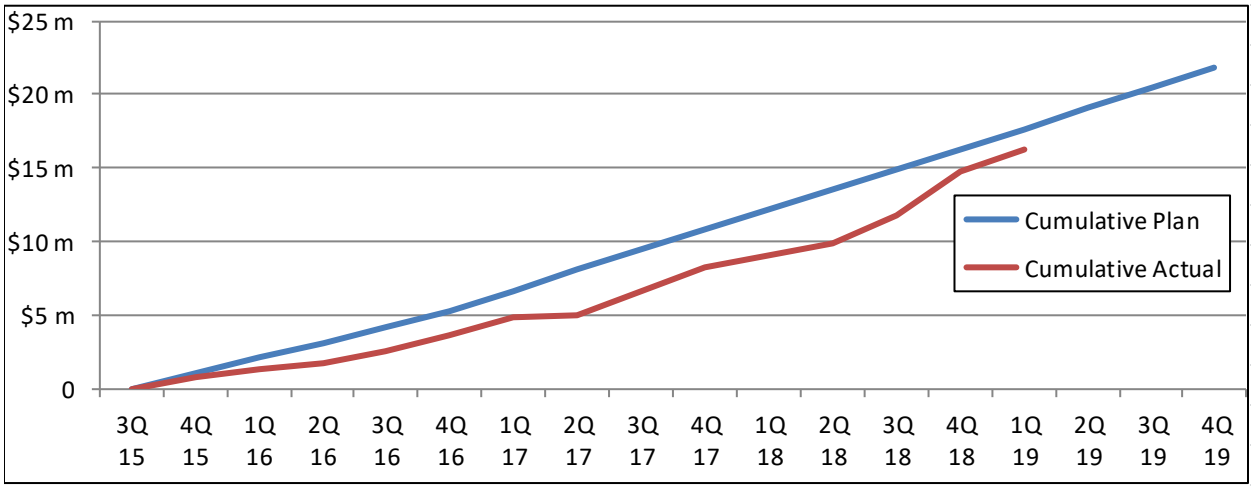


VS086 Systems Package 3 – Signal Equipment Procurement Apr 2019

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)
$21.8	$21.8	$0.0	$20.8	$20.2	($0.6)	$21.6	($0.2)

Percent Complete		Actual Prog Last 12 Mths		Actual Prog Last 6 Mths		Average Required Progress to reach forecast SC
Planned	Actual	Total	Avg/Mth	Total	Avg/Mth	
NA	80.4%	34.9%	2.9%	21.4%	3.6%	1.78% per month

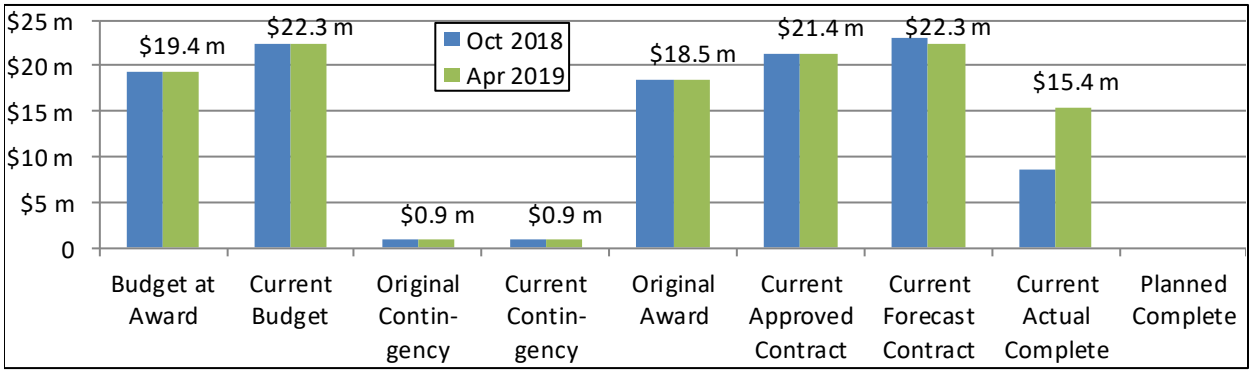




VQ033 Midday Storage Yard CILs Apr 2019

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)
$19.4	$22.3	$2.9	$18.5	$21.4	$2.9	$22.3	$2.9

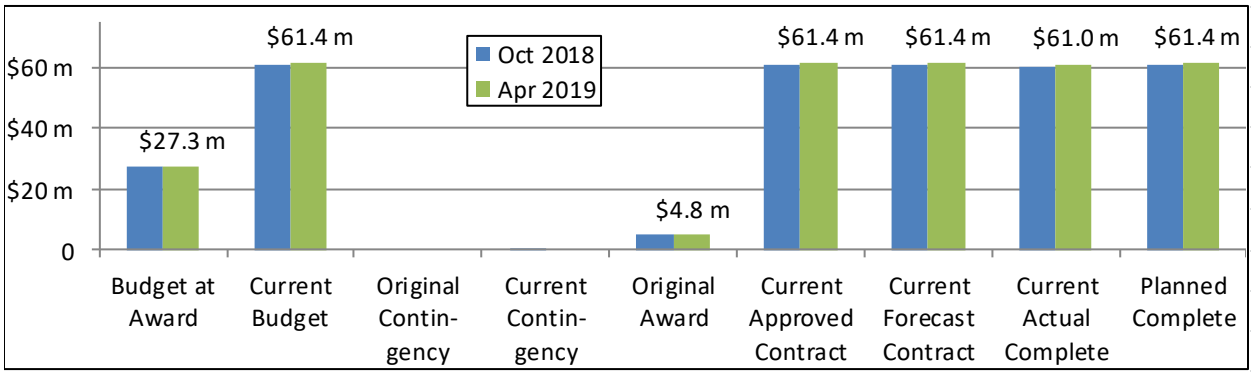
Percent Complete		Actual Prog Last 12 Mths		Actual Prog Last 6 Mths		Average Required Progress to reach forecast SC
Planned	Actual	Total	Avg/Mth	Total	Avg/Mth	
NA	71.8%	43.0%	3.6%	31.9%	5.3%	2.35% per month



FHA02 Harold Stage 2 – Amtrak F/A Apr 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)
$27.3	$61.4	$34.1	$4.8	$61.4	$56.6	$61.4	$34.1

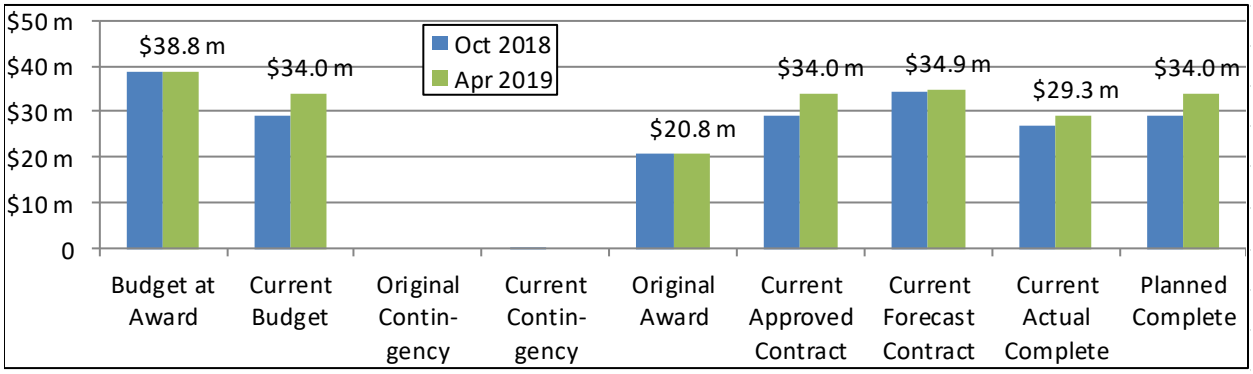
Percent Complete		Actual Prog Last 12 Mths		Actual Prog Last 6 Mths		Average Required Progress to reach forecast SC
Planned	Actual	Total	Avg/Mth	Total	Avg/Mth	
100.0%	99.4%	5.6%	0.5%	0.7%	0.1%	0.03% per month



FHL01 Harold Stage 1 – LIRR F/A Apr 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	$34.0	$5.2	$20.8	$34.0	$13.2	$34.9	$6.1

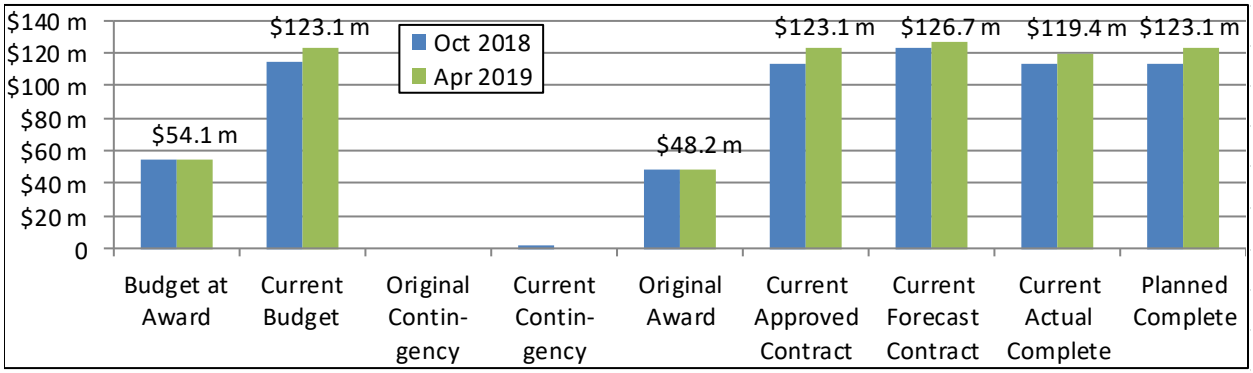
Percent Complete		Actual Prog Last 12 Mths		Actual Prog Last 6 Mths		Average Required Progress to reach forecast SC
Planned	Actual	Total	Avg/Mth	Total	Avg/Mth	
100.0%	86.2%	-11.1%	-0.9%	-6.1%	-1.0%	2.76% per month



FHL02 Harold Stage 2 – LIRR F/A Apr 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	$123.1	$69.0	$48.2	$123.1	$74.9	$126.7	$72.6

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%	97.0%	-2.9%	-0.2%	-1.6%	-0.3%	0.10% per month



APPENDIX K – 3rd PARTY CONTRACT MILESTONE METRICS
As of IPS data date May 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
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	2/13/20	133	Almost 3 month forecasted delay.
5	Substations US1 and US2 Complete	N/A	6/27/18	2/1/19	5/22/19	329	3 month forecasted delay.
5A	Caverns Ready for Integrated Systems Testing	4/11/19	8/7/19	8/7/19	1/28/20	84	3 month forecasted delay.
6	All Caverns and Tunnel Work Complete	N/A	12/16/19	12/16/19	8/6/20	234	3 month forecasted delay.
6A	Substantial Completion	7/19/19	1/28/20	1/28/20	8/6/20	191	3 month forecasted delay.
6B	Punchlist Completion	N/A	4/27/20	4/27/20	11/5/20	192	3 month forecasted delay.
7	Integrated System Testing Completion	N/A	6/1/20	6/1/20	9/25/20	116	2 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	-	-	Milestone removed.
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	-	-	Milestone removed.
8	Substantial Completion	7/24/19	1/21/19	10/28/20	7/9/20	351	4 month forecasted savings.
8A	Punchlist Complete	5/17/18	5/21/19	12/16/18	11/6/20	904	4 month forecasted savings.
9	Integrated Systems Testing Completed	7/24/19	3/23/20	10/25/19	9/26/21	795	2 month forecasted savings.
9A	Ready for Integrated Systems Testing	5/17/18	10/2/18	5/20/18	4/14/20	698	3 month forecasted savings.
10	Shaft 4	N/A	7/1/18	7/1/18	-	-	Milestone removed.
11A	Chiller Plant and HVAC Conditioning of Zones 1 and 2	N/A	5/15/19	5/15/19	6/13/19	29	New Milestone. Delta measured against Current Contract Date.
11B	HVAC Conditioning of Zones 3 and 4	N/A	10/1/19	10/1/19	9/29/19	-2	New Milestone. Delta measured against Current Contract Date.
12	Biltmore Room Connection	N/A	9/30/20	9/30/20	10/13/20	13	New Milestone. Delta measured against Current Contract Date.
13	Elevators EL-1 & EL-2 in Shaft 3 Operational	N/A	4/7/19	4/7/19	4/7/19A	0	New Milestone. Delta measured against Current Contract Date.

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
14	Elevator 13 (GCT Concourse to 47th Cross Passageway St.) Operational	N/A	3/1/19	3/1/19	3/1/19A	0	New Milestone. Delta measured against Current Contract Date.
15	Elevator 17 (TMC SMO) Operational	N/A	4/5/19	4/5/19	4/5/19A	0	New Milestone. Delta measured against Current Contract Date.
16	B20 Substation - Relay Settings Resubmission	N/A	4/14/19	4/14/19	7/10/19	87	New Milestone. Delta measured against Current Contract Date.
17	Overhead Primary Communication Conduits (Except Demark Room)	N/A	2/15/19	2/15/19	2/15/19A	0	New Milestone. Delta measured against Current Contract Date.
18A	GCT Zone 1 and 2 All Conduits (Except Demark Room)	N/A	6/1/19	6/1/19	5/30/19	-2	New Milestone. Delta measured against Current Contract Date.
18B	GCT Zones 3 and 4 and Demark Room All Conduits	N/A	6/1/19	6/1/19	6/25/19	24	New Milestone. Delta measured against Current Contract Date.
19	GCT Zones 1 and 4 MEP	N/A	2/22/20	2/22/20	2/20/20	-2	New Milestone. Delta measured against Current Contract Date.
20A	GCT Zone 1 Architectural	N/A	9/1/19	9/1/19	8/31/19	-1	New Milestone. Delta measured against Current Contract Date.
20B	GCT Zone 2 Architectural	N/A	8/1/19	8/1/19	7/30/19	-2	New Milestone. Delta measured against Current Contract Date.
20C	GCT Zone 3 Architectural	N/A	12/1/19	12/1/19	11/29/19	-2	New Milestone. Delta measured against Current Contract Date.
20D	GCT Zone 4 Architectural	N/A	3/1/20	3/1/20	2/28/20	-2	New Milestone. Delta measured against Current Contract Date.
CQ032: Plaza Substation and Queens Structures							
NTP	Notice to Proceed	8/10/11 A	8/10/11A	N/A	8/10/11A	-	
6	Substantial Completion	10/8/15	N/A	9/6/16	5/27/19	1327	2 month forecasted delay.
7	Final Completion	1/7/16	N/A	12/5/16	8/25/19	1326	2 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	6/1/20	82	5 month forecasted savings.
5	YS Track Completion	N/A	4/11/18	4/11/18	-	-	Milestone removed.
6	Substantial Completion	10/25/18	8/10/20	8/10/20	10/31/20	737	5 month forecasted savings.
8	Completion of Plaza Work	N/A	7/12/18	7/12/18	5/7/19	299	2 month forecasted delay.
9	Complete Option 1 - Demo Amtrak Buildings	N/A	5/27/20	5/27/20	12/23/19	-156	2 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	11/14/18A	73	

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
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	1/26/19A	103	
7	SEQ, TM2 & 6199	N/A	10/26/18	10/26/18	2/28/19A	125	
8	Substantial Completion	N/A	1/31/19	1/31/19	5/1/19	90	1 month forecasted delay.
9	Final Completion	N/A	4/30/19	4/30/19	6/2/19	33	1 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	
2	Complete 39th Street Bridge Load Transfer	N/A	9/4/2019	9/4/2019	7/25/2019	-41	5 week forecasted savings.
3	Erect Catenary Structure 927-2/3H	N/A	2/29/2019	2/29/2019	12/2/2019	-89	3 month forecasted savings.
4	Complete Removal of TBM Cuterhead	N/A	12/27/19	12/27/19	11/14/19	-43	5 week forecasted savings.
5	Complete 39th Street Bridge Re-transfer	N/A	8/8/20	8/8/20	8/5/20	-3	
6	Complete CO8 Ductbank	N/A	8/22/19	8/22/19	9/6/19	15	2 week forecasted delay.
7	Complete B/C Structure from Sta 1204+2.5 to 1206+05	N/A	9/23/20	9/23/20	9/14/20	-9	1 week forecasted savings.
8	Substantial Completion	N/A	3/17/21	3/17/21	3/17/21	0	
9	Final Completion	N/A	6/15/21	6/15/21	6/15/21	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	-	-	Milestone removed.
4A	C04 TPSS Room (Level P1) Ready for CS084 Work at 2nd Ave. Vent Facility	5/5/16	2/1/17	2/1/17	-	-	Milestone removed.
5	GCT 6 CIR Ready for CS086 (orig CS086) Installation	10/17/16	4/14/17	4/30/17	-	-	Milestone removed.
6	B10 Permanent Power Energized (Precedes Energization of B05, B06,B08, B09, B11 & B13)	6/24/16	4/28/17	4/22/17	-	-	Milestone removed.
7	GCT 5 CIR Ready for CS086 (orig CS086) Installation	2/17/17	5/27/17	4/30/17	-	-	Milestone removed.
8	GCT 4 CIR Ready for CS086 (orig CS086) Installation	5/2/17	6/27/17	4/30/17	-	-	Milestone removed.
9	C01 & C02 TPSS Room Ready for CS084 at Tail Tracks	8/7/17	6/8/17	6/8/17	-	-	Milestone removed.

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
10	GCT 3 CIR Ready for CS086 (orig CS086) Installation	11/6/17	9/6/17	9/6/17	-	-	Milestone removed.
11	C03 TPSS Room Ready for CS084 at 55th St. Vent Facility	2/20/18	2/27/18	3/25/18	-	-	Milestone removed.
12A-01	Tunnel SCADA Network FAT	N/A	5/30/19	5/30/19	5/22/19	-8	New Milestone.
12A-02	Local Testing Group 1	N/A	11/29/19	11/29/19	10/8/19	-52	New Milestone.
12A-03	Local Testing Group 2	N/A	3/9/20	3/9/20	2/5/20	-33	New Milestone.
12A-04	Local Testing Group 3	N/A	4/23/20	4/23/20	4/30/20	7	New Milestone.
12A-05	Local Testing Group 4	N/A	6/17/20	6/17/20	6/11/20	-6	New Milestone.
12A-06	Local Testing Group 5	N/A	5/5/20	5/5/520	5/2/20	-3	New Milestone.
12A-07	BCS FAT	N/A	1/15/20	1/15/20	12/25/19	-21	New Milestone.
12A-08	FA Network Installation	N/A	10/3/19	10/3/19	9/28/19	-5	New Milestone.
12A-09	Local Testing of Building Level Network	N/A	5/29/20	5/29/20	5/13/20	-16	New Milestone.
12A-10	Local Testing of Signal Power System	N/A	2/3/20	2/3/20	1/31/20	-3	New Milestone.
12B-01	Complete IST CM007	N/A	6/30/21	6/30/21	6/9/21	-21	New Milestone.
12B-02	Complete IST CS084	N/A	6/30/21	6/30/21	6/9/21	-21	New Milestone.
12B-03	Complete IST CM014A & CM014B	N/A	6/30/21	6/30/21	6/9/21	-21	New Milestone.
12B-04	BCS IST Complete	N/A	8/19/20	8/19/20	7/31/20	-19	New Milestone.
12B-05	Tunnel SCADA IST Complete	N/A	11/16/20	11/16/20	11/17/20	1	New Milestone.
12B-06	FA IST Complete	N/A	11/24/20	11/24/20	11/5/20	-19	New Milestone.
12B-07	Power SCADA IST Complete	N/A	11/4/20	11/4/20	10/22/20	-13	New Milestone.
12B-08	Phase 1 IST Complete	N/A	1/14/21	1/14/21	11/24/20	-51	New Milestone.
12B-10	Phase 3 – Part 1 IST Complete	N/A	1/31/21	1/31/21	1/19/21	-12	New Milestone.
12B-11	Phase 3 – Part 2 IST Complete	N/A	6/25/21	6/25/21	6/9/21	-16	New Milestone.
12B-12	Phase 4 IST Complete	N/A	12/4/20	12/4/20	10/23/20	-42	New Milestone.
12B-13	Phase 5 IST Complete	N/A	4/28/21	4/28/21	4/29/21	1	New Milestone.
12B-14	Track IST Complete	N/A	6/24/21	6/24/21	6/25/21	1	New Milestone.
13	Substantial Completion	N/A	6/30/21	6/30/21	6/30/21	0	New Milestone.
CS084: Tunnel Systems Package 4 - Traction Power Systems							Approved baseline in the Jan 1, 2016 IPS.
NTP	CS084 NTP	9/5/14	10/29/14 A	N/A	10/29/14A	54	
1	Energize Traction Power Substation C08	5/26/17	N/A	5/6/18	6/25/20	1126	
2	Energize Traction Power Substation C04 and C05	6/20/18	12/14/18	10/3/18	9/21/20	824	3 week forecasted delay.
3	Energize Traction Power Substation C06 and C07	10/2/18	3/2/19	3/2/19	12/23/21	813	3 week forecasted savings.
4	Energize Traction Power Substation C01 and C02	10/30/18	1/30/19	2/5/19	11/27/20	759	3 month forecasted delay.
5	Energize Traction Power Substation C03	12/28/18	5/16/19	5/16/19	10/20/20	662	3 week forecasted delay.
6	Complete Local testing of all substation	1/11/19	7/30/19	7/30/19	1/8/21	728	2 week forecasted savings.
7	Substantial completion & Final Completion	10/21/19	11/25/19	12/2/19	4/2/21	529	2 week forecasted savings.

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
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	2/18/20	99	3 month + forecasted delay.
3	Complete Tunnel A - Plaza thru A1198+19	12/29/19	12/29/19	12/29/19	4/1/20	94	3 month + forecasted delay.
4	Complete Tunnel B/C - Plaza thru B/C1203+54	7/9/20	7/9/20	7/9/20	7/30/20	21	3 week forecasted delay.
5	Complete Tunnel D - Plaza thru D1203+27	12/28/19	12/28/19	12/28/19	4/14/19	108	3 month + forecasted delay.
6	Complete All Work, except for Integrated Testing	11/28/20	11/28/20	11/28/20	12/19/20	21	3 week forecasted delay.
7	Substantial Completion	2/21/21	2/21/21	2/21/21	3/15/21	22	3 week forecasted delay.
8	Final Completion	5/22/21	5/22/21	5/22/21	3/15/21	22	3 week forecasted delay.
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	5/17/19	665	
2	Mid-6 CIL (NTP+855d)*	N/A	5/23/18	8/13/19	9/13/19	478	1 month forecasted delay.
3	Mid-8 CIL (NTP+1158d)*	N/A	11/22/18	9/10/19	10/8/19	320	2 week forecasted delay.
SC	Substantial Completion (NTP+1216d)	N/A	5/19/19	3/6/20	4/6/20	323	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	
4	Furnish Tunnel Signal Equip. & Hardware for GCT5 & GCT6 CIRs (NTP+650CD)	4/26/16	1/9/18	1/17/19	2/6/19	1016	
5	Furnish Tunnel Signal Equip. & Hardware for GCT3 & GCT4 CIRs (NTP+730CD)	7/17/16	6/5/18	4/8/19	5/21/19	1038	3 week forecasted delay.
SC	Substantial Completion (NTP+1840CD)	12/9/19	10/14/19	11/19/19	2/24/20	77	2 month forecasted delay.

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 May 1, 2019).

4 Current ESA Forecast Date - Date shown in current IPS Monthly Update (data date May 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	-	1/18/17	5/30/19	-90	9/13/16	8/19/19	-77	2/23/17	8/22/19	-58	2/9/18	9/19/19	-65
CO2 Tail Tracks 38th St	2/16/16	10/23/18A	-	5/24/16	5/30/19	-90	9/13/16	8/8/19	-63	2/20/17	8/26/19	-62	2/9/18	9/24/19	-70
CO3 55th Street	2/23/16	6/5/19	-55	6/1/16	8/12/19	-91	9/13/16	9/20/19	-17	3/13/17	10/14/19	-19	8/2/18	11/13/19	-29
CO4 2nd Avenue	2/18/16	5/29/19	-90	11/21/16	5/28/19	-90	9/13/16	5/29/19	-90	10/5/16	1/22/18A	-	3/13/17	2/12/18A	-
CO5 Vernon	2/18/16	5/21/19	-103	5/26/16	6/7/17A	-	9/13/16	5/1/18A	-	10/5/16	8/28/17A	-	11/8/16	5/5/18A	-
CO6 QP Main	2/18/16	7/11/19	-91	5/26/16	3/22/19A	-23	9/30/16	9/6/19	-91	11/21/16	8/13/19	-39	6/13/17	9/17/19	-54
CO7 QP Yard	2/18/16	7/23/19	-91	5/26/16	5/22/19	-89	9/13/16	11/12/19	-90	1/12/17	9/18/19	3	8/17/17	12/2/19	-60
CO8 43rd St Pre-fab Bldg	1/21/16	10/23/18 A	-	5/12/16	8/16/17A	-	9/12/16	5/19/19	-24	10/25/16	6/21/19	-43	12/6/16	7/15/19	-46

*Notes

1 - Current Update = IPS with Data Date 5/1/19.

2 - Delta = Change over the quarter, from IPS with data date 2/1/19, 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	6/17/20	-58	12/27/18	8/7/20	-58	1/21/19	8/28/20	-58	2/4/19	11/3/20	-60	12/2/19	4/29/21	-14
CO2 Tail Tracks 38th St	11/14/18	6/9/20	-63	12/24/18	7/23/20	-64	1/22/19	8/13/20	-63	2/5/19	10/19/20	-63	12/2/19	4/29/21	-14
CO3 55th Street	3/1/19	6/12/20	-17	N/A	N/A	N/A	5/6/19	8/18/20	-19	5/16/19	10/20/20	-19	12/2/19	4/29/21	-14
CO4 2nd Avenue	4/27/18	4/14/20	-57	7/6/18	6/23/20	-57	8/7/18	7/23/20	-57	8/21/18	9/28/20	-59	12/2/19	4/29/21	-14
CO5 Vernon	6/8/18	11/27/19	-104	N/A	N/A	N/A	9/19/18	3/10/20	-106	10/3/18	5/14/20	33	12/2/19	4/29/21	-14
CO6 QP Main	9/10/18	8/25/20	3	N/A	N/A	N/A	1/3/19	12/17/20	5	1/17/19	1/4/21	3	12/2/19	4/29/21	-14
CO7 QP Yard	10/22/18	5/8/20	-22	N/A	N/A	N/A	2/15/19	9/2/20	-22	3/1/19	9/17/20	-23	12/2/19	4/29/21	-14
CO8 43rd St Pre-fab Bldg	9/12/17	5/18/20	-31	12/8/17	5/20/20	-93	2/1/18	6/29/20	-33	2/15/18	7/6/20	-14	12/2/19	4/29/21	-14

1. Current Update = IPS with Data Date 5/1/19.
2 - Delta = Change over the quarter, from IPS with Data Date 2/1/19, 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	3Q2018	4Q2018	1Q2019	2Q2019
CM007	< 90 days Open	9	9	17	11
	> 90 days Open	36	37	33	43
	Total Open	45	46	50	54
	Total Closed	86	87	110	113
	Total NCRs	131	133	160	167
CM014B	< 90 days Open	16	5	11	22
	> 90 days Open	11	15	19	24
	Total Open	27	20	30	46
	Total Closed	42	55	57	66
	Total NCRs	69	75	87	112
CQ032	< 90 days Open	2	1	0	0
	> 90 days Open	9	9	10	12
	Total Open	11	10	10	12
	Total Closed	118	120	120	122
	Total NCRs	129	130	131	134
CH058A	< 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	0
	Total NCRs	91	91	91	0
CM006	< 90 days Open	0	0	5	2
	> 90 days Open	0	0	12	9
	Total Open	0	0	17	11
	Total Closed	26	26	191	197
	Total NCRs	26	26	208	208
CH061A	< 90 days Open	4	0	0	0
	> 90 days Open	2	0	0	0
	Total Open	6	0	0	0
	Total Closed	12	18	18	18
	Total NCRs	18	18	18	18
CS179	< 90 days Open	7	6	1	1
	> 90 days Open	14	14	17	17
	Total Open	21	20	18	18
	Total Closed	43	47	49	50
	Total NCRs	64	66	67	68
CS084	< 90 days Open	0	1	1	1
	> 90 days Open	0	0	3	4
	Total Open	0	0	4	5
	Total Closed	6	6	7	7
	Total NCRs	6	7	11	12
CQ033	<90 days Open	3	0	2	0
	>90 days Open	0	0	1	2
	Total Open	3	0	3	2
	Total Closed	11	14	14	15
	Total NCRs	14	14	17	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 42 contract modifications having magnitudes in excess of $100,000 during the period from February 2019 through April 2019. These modifications represent a total net cost increase of $58.1 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.

CH058A had 2 modifications during the review period that resulted in an aggregate increase of $1.5 million. The PMOC reviewed modification 1, B-931 Structures Demolition, costing $450.0 thousand and dated March 8, 2019; and, modification 2, North Runner Wire No. 111, costing $1.1 million and dated April 18, 2019.

CM007 had 4 modifications during the review period that resulted in an aggregate increase of $1.6 million. The PMOC reviewed modification 81, US-1 and US-2 Breaker Replacement Equipment Procurement, costing $645.9 thousand and dated March 28, 2019.

CM014B had 11 modifications during the review period that resulted in an aggregate increase of $6.7 million. The PMOC reviewed modification 225, CW Workaround due to 47th Street Schedule Issues (CPR-132), costing $281.1 thousand and dated April 24, 2019; and, modification 233, RFI 1440 - Shaft 4 - Existing Alignment Issues (CPR-164), costing $136.5 thousand and dated April 23, 2019.

CQ032 had 3 modifications during the review period that resulted in an aggregate increase of $1.7 million. The PMOC reviewed modification 90, Removal of Scope of Work at the 23rd Street Facility and Additional Work in the Area of the Ventilation Shafts, costing $300.0 thousand and dated April 4, 2019; modification 91, Water Infiltration Remediation Launch Block, costing $742.6 thousand and dated February 8, 2019; and, modification 92, Amtrak Bridge Grouting, costing $648.6 thousand and dated February 12, 2019.

CQ033 had 2 modifications during the review period that resulted in an aggregate increase of $1.3 million. The PMOC reviewed modification 31, Miscellaneous Catenary, costing $1.1 million and dated March 4, 2019.

CS179 had 19 modifications during the review period that resulted in an aggregate increase of $12.2 million. The PMOC reviewed modification 173, 23rd Street Scope Transfer, costing $2.5 million and dated February 19, 2019; and, modification 193, GCT Cavern Radio Antenna Coaxial Cable Installation, costing $1.6 million and dated April 24, 2019.

Professional Services had 1 modification during the review period that resulted in an increase of $33.2 million. The PMOC reviewed modification 44, Extension PM/CM Service to June 30, 2019, costing $33.2 million and dated February 26, 2019.

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	Testing ongoing

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 June 13, 2019

CM007 - Direct Fixation Track Construction*

Direct Fixation Track Construction

Direct Fixation	
Installation Status	Progressing
Actual Progress	69.9%
Planned Progress	96.8%

*Progress Data from June 16, 2019 ESA Progress Summary: Track & Third Rail - DFF.

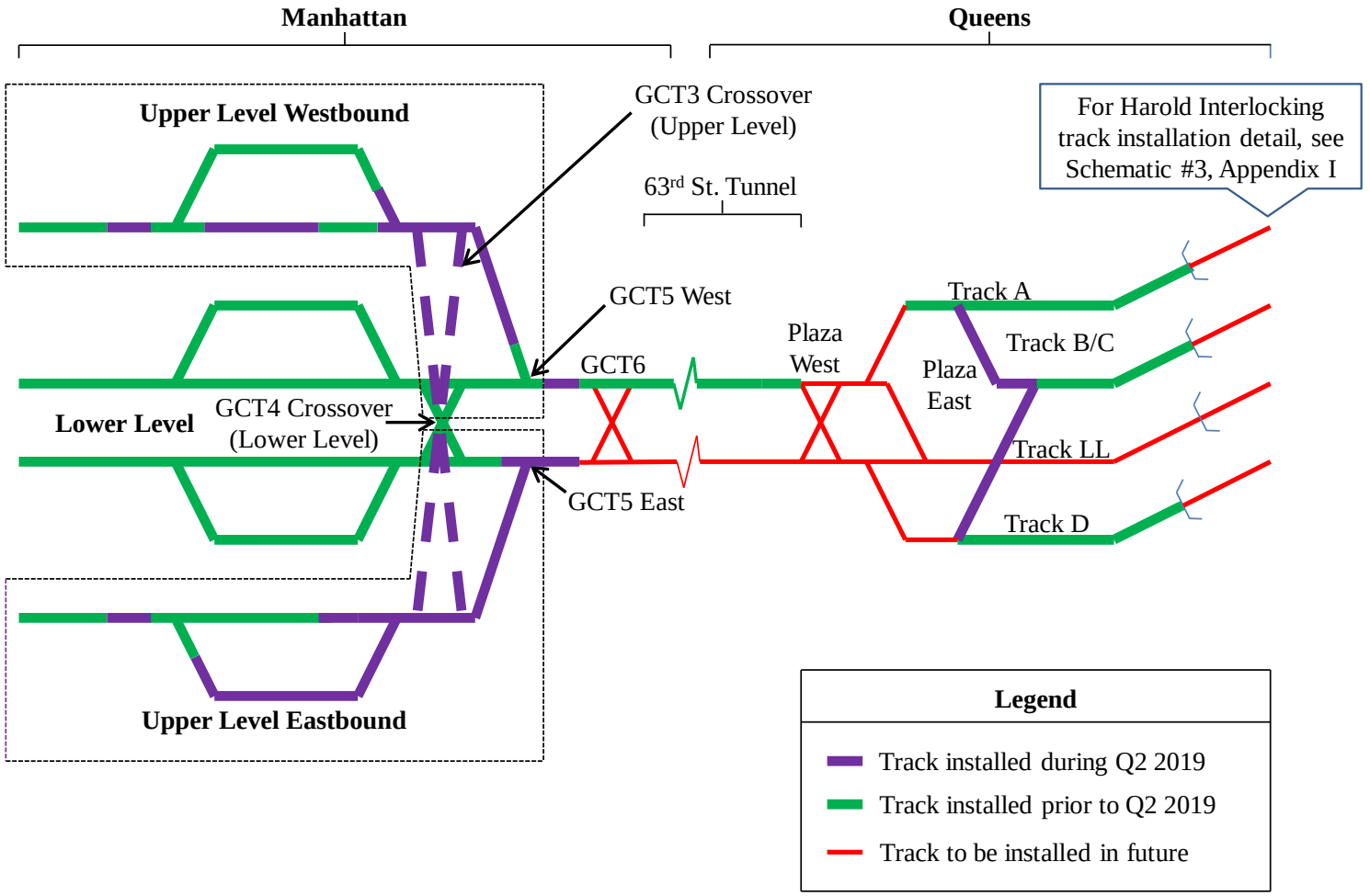
Note #1: Contractor has elected to use HADFF in locations where Standard DFF was specified.

Special Trackwork (turnouts)

S T Assemblies	Special Trackwork RTB (STRTB)	Special Trackwork DFF (STDFF)
Installation Status	Progressing	Not started
Actual Progress	52.4%	
Planned Progress	97.7%	

* Progress Data from June 16, 2019 ESA Progress Summary: Track & Third Rail - Special Trackwork

Appendix O: Track Construction
Manhattan and Queens
Status as of June 30, 2019



APPENDIX P – CONTRACT CS084 – TRACTION POWER SUBSTATIONS

Status of CS084 Traction Power Substations

General Issues

1. Track access coordination with CM007
2. Monuments – non-compliance to dimensional standards – surveys need to be completed and remediation strategies needed
3. Plan for integrated dynamic testing of all substations needs to be developed – needs railcars

C01/C02 (Tail Tracks)

1. Transformer delivery by high rail vehicle proposed – needs coordination for track access
2. Equipment delivery to substation rooms – coordination with MNR needed
3. Conduit viability from cable vault to street under investigation – will use camera in conduit
4. Dielectric floor scarification not done

C03 (55th Street)

1. Not ready for handover from CS179 – access date unknown
2. Water condition (drain) needs resolution by CS179 (CS179 contract modification needed)
3. Floor leveling and scarification needed – requires contract modification

C04 (2nd Avenue)

1. Replacement of AC feeder duct bank by CS179 still needed
2. All equipment installed
3. Preparing conduit runs for cable pulling

C05 (Vernon)

1. Removal of PVC duct in concrete conduits – requires MTACC approval of contract modification
2. Still has water infiltration issue
3. Conduit from Property Line box to substation installed
4. All equipment delivered

C06/C07 (Plaza)

1. Grounding and conduit work progressing
2. Doorway needs to be enlarged for delivery/installation of reactors (mod to CS179 needed)
3. Transformer delivery – contractor installed temporary lifting rig
4. Contract modification issued to level and scarify floors in both areas

C08 (43rd Street)

1. Conduit duct banks between C08 vault and tracks (shown on contract drawings as existing) are missing and will be installed under CH058A contract – scheduling coordination needed
2. Sewer and water supply work required
3. Substation delivery plan approved by MTACC – needs permits from MYC DOT to use crane for delivery and requires track protection by LIRR force account

APPENDIX Q – OPERATIONAL READINESS

Rail Activation Plan & Task Working Groups (TWG) – Q1 2019 Status

NOTE: The Quarterly update for Q1 2019 was held on June 14, 2019, and the data presented in the items below reflects the status of Operational Readiness activities as reported on 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. Additionally, LIRR has instituted a series of on-going workshops with its department heads to review critical Operational Readiness (OPR) work activities related to their respective disciplines. This additional engagement at a senior management level is expected to produce a more results-oriented process than previously experienced. Once again, MTACC indicated that completion of the Comprehensive System Test Plan (CSTP) is dependent on the adoption and implementation of an acceptable Integrated System Test Plan (ISTP) developed as part of the ESA CS179 contract. The development and completion of this CSTP is an on-going effort; and, although MTACC previously stated that it would like to complete it by the end of 2018, that goal was not achieved and a 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 that need 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.)

To address staffing issues, LIRR requested the approval to hire 40 individuals to augment its Senior ESA Transition Team and OPR Staff. Twenty (20) of those positions are approved this far and are in various stages of the hiring process. The PMOC requested a copy of the draft organization chart showing this staff augmentation.

TWG No.1 – Operational Readiness:

- This TWG has the responsibility to monitor and verify the Rail Activation Plan (RAP) activities. There are 697 tasks and activities currently identified that must be completed to successfully implement full ESA revenue service. Of those 697 RAP tasks and activities, 105 are already complete and 134 are currently in progress. The remaining 458 are not scheduled to start yet.
- Only two (2) of the tasks and activities that are currently in progress are considered overdue when compared to the current ESA Target date of February 2022; and, seven (7) more are due for completion by the end of October 2019. The two (2) overdue tasks are: 1) the finalization of an Emergency Action Plan (EAP) for ESA service; and 2) the completion of Volume #3 of the RAP. Significant progress on the previously reported overdue tasks related to the completion of LIRR's plan for hiring and training locomotive engineers, train conductors, and signalmen was achieved as a result of senior management discussions and the partial lifting of LIRR's hiring freeze. 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 adoption and implementation of

the Incremental ISTP– a plan being developed as part of the CS179 contract. Completion dates for these two RAP activities are unknown at this time.

TWG No.2 – Train Service and Operations:

- At the Q3 2018 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 was delayed to the end of 2019.
- During Q1 2019, the MTA Vacancy Control Committee approved 5 new positions requested by LIRR's Service Planning department to augment the staff developing the revised ESA Service Plan. LIRR anticipates that, once these 5 positions are filled, it will take between 9 and 12 months to complete the revised Service Plan. No firm date for this completion is available at this time.
- 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 well as the possibility of having to address a potential 6-month acceleration of the RSD.
- While the staffing issue saw some advancement during Q1 2019 as a result of the partial lifting of the MTA's hiring freeze, the other noted activities are significantly behind schedule. These delayed elements are time-sensitive; as staff resources need to be 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.
- During Q1 2019, LIRR developed a strategy for hiring and training locomotive engineers and increased class sizes to reduce the overall training time duration needed to train all the engineers required for ESA's RSD.
- The vehicle procurement strategy is discussed later under TWG No. 11; and, MTA continues to assess the possible use of existing Signal department personnel at the appropriate time to temporarily address the delayed commencement of hiring for that staffing requirement.
- The LIRR Transportation, Training, and Safety departments are participating in workshops to discuss requirements and training for emergency tunnel procedures. In response to a PMOC inquiry regarding the involvement of other MTA organizational units, (e.g., NYCT and MNR) in those workshops to address procedures at joint use facilities (e.g., ventilation plants and Grand Central Terminal), MTACC noted that it had not been done yet; but, would now be added.

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

- MTACC reported that LIRR continues to review 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.
- In its Q4 2018 report, the PMOC reported on a potential issue related to cathodic protection in the tunnels and indicated that MTACC would investigate this concern and provide an

update in a subsequent quarterly briefing. MTACC currently advises that this issue is being investigated as part of the CS084 contract; and, discussions with NYCT are being pursued.

- MTACC reported that MTA is reviewing overall labor requirements (in house and 3rd party) that may be required to efficiently operate and maintain the assets being added as part of the ESA project. Once decisions of whether to use in-house forces or 3rd party contractors to perform various tasks are made, negotiations with existing MTA unions and 3rd party contractors will be undertaken as may be required. No dates for the rendering of decisions are available at this time.

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 currently under interim maintenance out of a projected total of 15,533 when the ESA Project is finished. Included in the overall count of 15,533 assets are 266 assets from the CQ032 contract that were incorporated into the active database in anticipation of commencement of interim maintenance when that contract reaches substantial.
- The PMOC notes 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:

- One 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 potential requirement to negotiate changes to various labor contracts for MTA personnel working in GCT; and, to develop plans and procedures for operations in a facility (GCT) that currently has limited or no access during early morning hours. LIRR and MNR Terminal Operations and Customer Services managers are meeting to efficiencies in the operation and maintenance of GCT in light of the addition of ESA service. Both agencies will provide a report to Executive Staff to decide on a path forward for various operation and maintenance activities.

TWG No.6 – Staffing and Training:

- 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. Special attention is being given to staffing requirements that might be needed if any potential accelerated schedule is implemented.
- MTA has already approved the hiring of: 1) LIRR Engineering personnel to support the Operational Readiness, Testing & Commissioning, and ESA "Take Over" activities; 2) 12 personnel in LIRR's Signal department; 3) LIRR locomotive engineers; 4) LIRR Service Planning personnel; and 5) maintenance of Equipment personnel.

TWG No.7 – Safety and Security:

- A 3rd draft of the Emergency Action Plan (EAP) is currently being developed by a re-configured TWG No. 7 group. This TWG was re-configured in January 2019 specifically to develop a comprehensive ESA Emergency Action Plan. The parties working on this 3rd draft of the EAP include key, senior LIRR, MNR, and MTA emergency response stakeholders. A date for the completion of this draft EAP is unknown at this time.

- During Q1 2019, MTACC continued to effectively 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. (See Appendix T for a Summary Status of Safety & Security Certifications).

TWG No. 8 – Public Information and Marketing:

- In its Q3 2018 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. MTACC advises that discussions with MNR continued in Q1 2019; and that some funding was allocated for additional "dynamic" signage. MNR is currently reviewing cost proposals from its signage vendor.
- 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. No update on this item was available at the Q1 2019 briefing.
- MTACC advised that additional "static" signage will require additional funding; and, that the funding will be required to engage a consultant to provide services related to SHPO submissions.

TWG No. 9 – Agreements:

- This TWG finalized a comprehensive LIRR ESA asset list that will help 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 continued to note that some type of activity regarding the execution of any new labor Agreements, or modifications to existing labor Agreement, should eventually appear in the ESA OPR IPS.

TWG No. 10 – Finance and Administration:

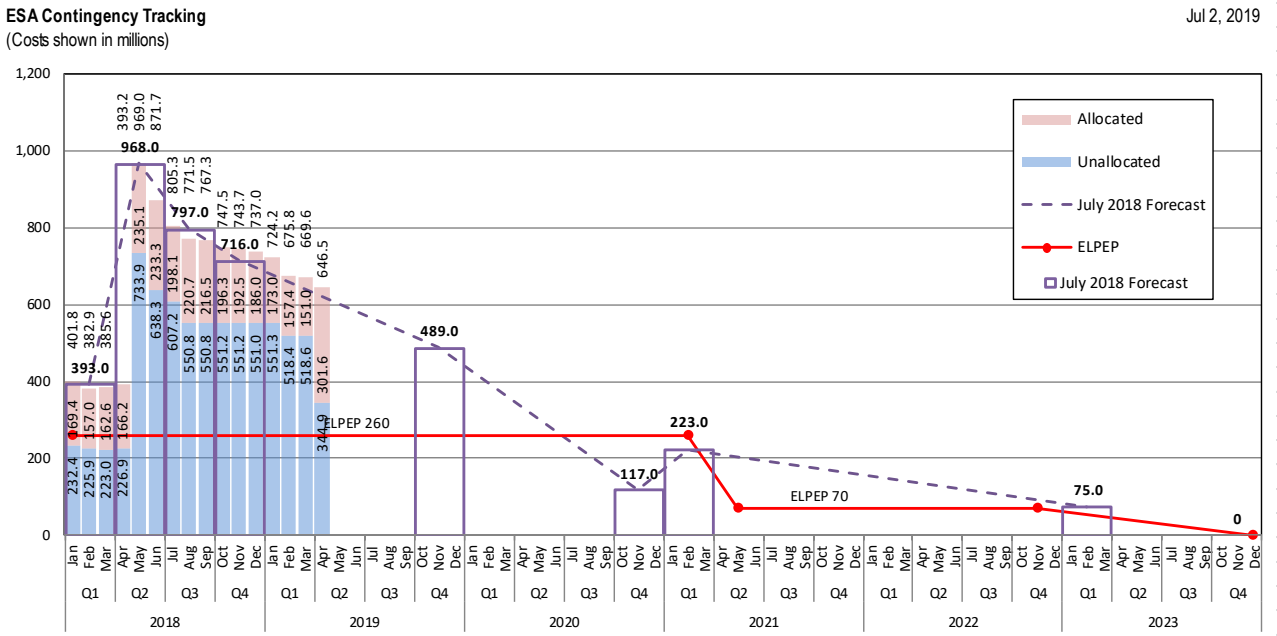
- LIRR continued to advise that it is planning to award a contract for the development and installation of the locomotive engineer Training Simulator by the end of 2019 to meet the training requirements dictated by the current ESA RSD. Procurement concurrence documentation is being circulated within LIRR.
- LIRR end users have been requested to identify materials, equipment, and work efforts 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 Q4 2018, 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 was subsequently delayed to April 2019. LIRR met with the responsive car builders in early May to discuss their respective proposals. LIRR requested that each car builder submit Best and Final Offers (BAFOs) by the end of May 2019. No update on the BAFO responses was available at the June 14th Q1 2019 OPR briefing; and, at that time, MTA still was projecting a June 2019 award for the M-9A cars. (**PMOC Note:** as of the end of June 2019, that award has not occurred; and, MTA has been unable to provide the PMOC with a new award date).

A number of different strategies regarding the availability of railcars to provide revenue service on the December 2022 projected RSD continue to be 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 – SAFETY AND SECURITY CERTIFICATION SUMMARY

Status as of June 14, 2019

Safety & Security Certification - Summary Status - June 14, 2019

ESA Work Area	Number of Contracts	Safety Certifications						Security Certifications						Comments
		Design			Construction			Design			Construction			
		100%	WIP	N/A	100%	WIP	N/A	100%	WIP	N/A	100%	WIP	N/A	
Manhattan / Bronx	17	16	0	0	9	7	0	12	0	4	2	10	4	1 contract deferred
Queens	4	4	0	0	2	2	0	2	0	2	0	2	2	
Harold	12	10	1	0	7	4	0	9	1	1	5	5	1	1 contract On-Hold
Systemwide Systems	3	2	1	0	0	3	0	2	1	0	2	1	0	
Force Account	19	11	6	2	2	15	2	11	0	8	11	0	8	
Vendors	8	3	3	2	0	6	2	5	0	3	3	2	3	

Legend: 100% = Complete
WIP = Work in progress
N/A = Not Applicable

APPENDIX T - 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	77.7% actual vs. 77.8% planned (ESA calc. †)			
Project Performance Rate since 2014 "Re-Plan"	Based on Earned Value	83.0% (PMOC calculation of construction spending at 1Q 2019 planned vs. actual since re-baselining)			
Contracts	Total contracts awarded to date	$9,516.4 m	85.5% (PMOC calculation†)		
	Total construction contracts awarded to date	$7,316.0 m	91.3% (PMOC calculation†)		

Major Issue	Status	Comments
Project Funding and Budget	b(4) [redacted]	b(4) [redacted]
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, not including Rolling Stock Reserve. The Amended FFGA Baseline Cost Estimate is $10,922 million and includes full cost of Rolling Stock.	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	[redacted] b(4) [redacted]	b(4) [redacted]
Manhattan/-Systems Schedule Path	IPS 117 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 117. Acceptable work progress along this schedule path relies heavily on the effectiveness of MTACC/ESA coordination efforts across the seven area contracts.

[redacted] b(4) [redacted]