PMOC COMPREHENSIVE MONTHLY REPORT

East Side Access Project

Metropolitan Transportation Authority
New York, New York

Report Period March 1 to March 31, 2020

PMOC Contract No. DTFT60D1400017

Task Order No. 0002, Project No. DC-27-5287, Work Order No. 10

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

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EXECUTIVE SUMMARY

This summary highlights key events and important issues for the 1st Quarter 2020.

	Q4 2019	Q1 2020	Notes
Program Status[1]	81.0% actual 82.0% as-planned	82.6% actual 83.8% as-planned	1.2% behind the April 2018 spending plan.
Construction Status[1]	85.3% actual 86.4% as-planned	87.1% actual 88.5% as-planned	1.4% behind the April 2018 spending plan.
Construction Progress Issues	CM014B, CS084, CS086, VSO86, CS179	CM014B, CS084, CS086, CS179	Access restraints for CS086.
Funding	$10,335 m	$11,133 m	$800 m added per 2020-2024 Capital Plan.
Cost/ Budget Contingency	b(4)	b(4)	
IPS Schedule	Target RSD April 2022 Man/Sys = Crit. Path	Target RSD Feb 2022; Man/Sys = Crit. Path	Gained 2 months float for target RSD.
Risk Management	13 major risks	14 major risks	New: Potential delays due to 2020 COVID-19 Pandemic
Construction Safety	1.34 LTI 2.15 RI	2.36 LTI 3.54 RI	Both LTI and RI ratios increased during Q1 2020
ELPEP Compliance	35 CDs < ELPEP min. $208 m > ELPEP min.	27 CDs > ELPEP min. $945 m > ELPEP min.	Contingencies greater than ELPEP mins.
Buy American	One issue	One issue	Potential issue from Q1 2019 resolved.
Contracts Awarded-/Completed:	No contracts awarded/completed in Q1 2020.		
Harold Interlocking:	Construction of Tunnel B/C Approach Structure continued.		
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 Q1 2020.		
Project Management Plan:	Drafts for SMP, CMP, and RMP submitted Q4 2018. Revised CPP issued Q1 2019. Revised Draft TCC issued May 2019. PMOC submitted review comments for SMP, CMP, RMP and TCC to FTA during December 2019.		
Organization:	No current issues.		

All Project Sponsor cost and schedule data included in this report is based on the MTA C&D East Side Access Monthly Progress Report for January 2020, referenced in this report as the ESA January 2020 MPR, which has a cost and schedule data date of February 1, 2020. Unless otherwise noted, all progress percentages in this report are based on invoiced costs and not actual construction.

REPORT FORMAT AND FOCUS

This report is submitted in compliance with the terms of the Federal Transit Administration (FTA) Contract No. DTFT60D1400017, Task Order No. 0002. Its purpose is to provide information and data to assist the FTA as it continually monitors the Sponsor's technical capability and capacity to execute a project efficiently and effectively, and hence, whether the Sponsor continues to be ready to receive

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

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 (MTA C&D) 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 Street Tunnel under the East River and new tunnels in Manhattan and Queens, including new power and ventilation facilities. The project includes a new eight track terminal constructed below the existing GCT and a new surface rail yard in Queens for daytime train storage. Future ridership forecast is 162,000 daily riders (27,300 new riders). The project will provide increased capacity for the commuter rail lines of the LIRR and direct access between suburban Long Island and Queens and a new passenger terminal in GCT in east Midtown Manhattan.

2. CHANGES DURING 1st Quarter 2020

a. Engineering/Design Progress

In the ESA January 2020 MPR, the PMT reported the overall engineering effort at 88.3% complete compared to planned completion of 89.1%. Since the ESA July 2018 MPR, the PMT calculates summary Engineering progress as a percentage of the $871.8 million April 2018 engineering baseline forecast.

b. New Contract Procurements

CH063 Electric Traction Catenary Work, 3rd Party, will be a negotiated RFP procurement. The RFQ for this contract was advertised earlier in 2019 and MTA C&D received seven proposals, of which four were deemed "Pre-Qualified". Proposals from those four were solicited during Q4 2019 and bids were received on January 30, 2020. However, negotiation and award of the contract will be delayed because MTA C&D has placed a 60-day procurement hold due to the 2020 COVID-19 Pandemic.

c. Construction Progress

In the ESA January 2020 MPR, MTA C&D reported that total construction progress reached 87.1% complete compared with planned progress of 88.5%. Since the ESA July 2018 MPR, the PMT calculates summary Construction progress as a percentage of the $8,014 million April 2018 construction baseline 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 continued to be very good through Q1 2020. 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, MTA C&D indicated that Amtrak may advance ERT Line 2 reconstruction to 2023, although

this has not yet been formally confirmed. The PMOC notes, however, that LIRR's current future plans include the start of Amtrak's work on ERT Line 2 in early 2023, immediately after the MTA RSD of December 2022. The risk remains that tunnel reliability or safety issues might require Amtrak to make emergency repairs at any time until the ESA 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 the 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 24 months late. MTA C&D now acknowledges that the contract modification for incorporation of PTC requirements will impact the substantial completion dates for Contracts VS086, CS086 and CS179.

Late Design Approval and RFI Closure on Contracts CS179, CS084, and VS086: The PMOC has continually reported delays in the process of GEC/LIRR review and approval of the contractor's final designs and RFI closures. Periodic improvements have been noted on the CS084 and VS086 contracts; but, increased attention to this issue on the CS179 contract continues to be needed. Based on the original baseline schedule, full CS179 design completion of the 10 control systems is now delayed 47 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 this portion of the ESA program includes several contracts that are all near critical, as well as two significant challenges regarding Integrated Systems Testing and the reconstruction at 270 Park Avenue. The risk to the program schedule increases each month as there are fewer schedule mitigation options available due to the decreasing time until the planned start of revenue service.

Advancement of the MTA C&D Plan for Incremental Integrated Systems Testing: Due to increasing schedule pressure, MTA C&D 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 is now reportedly delayed to Q3 2020. During 2019, ESA made important changes to the testing plan to reduce the risk of regression testing, which required additional changes to the testing schedule. Cost and schedule negotiations with the CS179 contractor and a modification for the final Incremental IST plan and schedule was executed in June 2019. A similar contract modification for the CM014B contract included alignment with the revised CS179 schedule. Negotiations for any modifications related to Incremental IST on other associated contracts (CM007, CS084, VS086, CS086, and CQ033) must still be advanced and completed.

e. New Cost and Schedule Issues

The ESA budget of $11,133 million was included in the MTA 2020-2024 Capital Program and was approved by New York State Capital Program Review Board in December 2019. In January

2020, the MTA updated ESA program budgets to include the approximately $800 million that was requested for ESA.

MTA C&D continues to use the alternative methodology for the IPS wherein schedule dates are informed by the Master Coordination Schedule (MCS). The forecast Target RSD in IPS 126 (February 1, 2020) gained 2 months to February 14, 2022 and the Public RSD remained December 13, 2022, during the period including November and December 2019 and January 2020. The Manhattan/Systems longest path completion date gained approximately 2 months over Q1 2020 and the critical path shifted to include only CS179; however, contracts CM007, CM014B, CS086 and CS084 remain near critical. The Queens path completion date lost approximately 5 weeks and the Harold path completion date remained the same over Q1 2020.

3. PROJECT STATUS SUMMARY AND PMOC ASSESSMENT

a. Sponsor Management Capacity and Capability

The PMOC remains concerned as to the ability of MTA C&D 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 MTA C&D 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 MTA C&D 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. MTA C&D continues to be challenged to prevent the backlog from growing due to the ongoing need for new contract modifications. It has been observed that the backlog is again increasing on Contracts CS179, CS086 and VS086. 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 January 2020 MPR, MTA C&D did not report any specific MTA Real Estate accomplishments during the month, but did report that MTA Real Estate support of third party construction at the 270 Park Avenue and 415 Madison Avenue buildings continued.

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 was late completing design reviews on CS179 Facilities Systems, VS086 Signal Equipment Procurement, and CS084 Traction Power Systems contracts. Project-wide, late MTA C&D responses to RFIs and Change Requests and MTA C&D's long processing time for contract modifications continue to impact the construction schedules. The PMOC notes that MTA C&D recognizes that extended time executing modifications has affected progress. MTA C&D instituted a Change Management Group, which prioritizes change orders based on schedule needs to achieve the forecast RSD. The backlog of outstanding contract changes had decreased for some period of time. 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. The PMOC remains concerned that the backlog of outstanding submittal approvals and contract changes for Contracts CS179, CS086 and VS086 is now increasing and continues to impact the timely progression of the work.

d. Procurement

The ESA January 2020 MPR shows that total procurement for the ESA Program is 88.0% complete, with total awards at $9,792 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 baseline forecast.

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 MTA C&D extended the deadline to March 13, 2019, due to many vendor questions. MTA C&D received seven proposals, of which four were deemed "Pre-Qualified". Proposals from those four contractors had been expected on January 30, 2020, with award planned for later in Q1 2020, but this was delayed due to proposer questions. Bid opening, negotiation and award of the contract will be further delayed because MTA C&D has placed a 60-day procurement hold due to the 2020 COVID-19 Pandemic.

e. Railroad Force Account (Support and Construction)

During March 2020, LIRR Force Account personnel installed the #5155 and #1143W turnouts in Harold Interlocking and continued support of the CH058A contractor in construction of the Tunnel B/C and Eastbound Re-Route East Approach Structures. Amtrak Electric Traction (ET) personnel completed construction of the overhead contact catenary system over LIRR's Port Washington #2 Track, known as the "PW2 Overrun", and began construction of the H44 and Q44 full tension air breaks. Amtrak C&S personnel continued to install and terminate signal cables into the Loop Interlocking Central Instrument House (CIH).

f. Third-Party Construction and Procurement

Manhattan

CM007 GCT Station Caverns and Track: The ESA October 2019 MPR reports that this contract was 80.4% complete vs. 94.3% planned. On December 18, 2019, the contract began a 6 week Vehicle Access Restriction for the other ESA contractors working in the tunnels. The CM007 contractor completed all main line ESA track work by March 31, 2020.

CM014B GCT Concourse and Facilities Fit-Out: Through March 31, 2020, the contractor continued to install architectural finishes throughout all areas of the new LIRR GCT concourse except for the area between 47th and 48th Streets, which is now occupied by the JPMC contractor that is constructing foundations and substructures for the new 270 Park Avenue building.

VM014 Vertical Circulation Elements: 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.

Queens

CQ032 Plaza Substation and Queens Structures: In Q2 2019, ESA retroactively reported that the CQ032 contractor achieved SC during Q1 2019. The contractor periodically continued NCR corrective action during Q1 2020.

CQ033 Mid-Day Storage Yard Facility: During March 2020, the contractor progressed Mid-Day Storage Yard grade preparation and track construction as well as Storage and Toilet Service

Building construction east of the Honeywell Street bridge and continued to install electric traction and signal power cable throughout the yard west of Honeywell Street bridge.

Harold Interlocking

CH058A – Harold Structures Part 3 – Tunnel B/C Approach Structure: During March 2020, the contractor continued to place invert and sidewall concrete in the Tunnel B/C Approach Structure and began to install formwork for concrete placement at the former TBM cutter head site. Additionally, the contractor completed excavation of the Eastbound Re-Route East Approach Structure and began to install formwork to begin concrete placement, which is being performed under a modification to the CH058A contract.

Systems

CS179 – Systems Facilities Package No. 1: During Q1 2020, the contractor reduced its daily workforce from 260 personnel to 120 personnel to follow "social distancing" protocols as a result the 2020 COVID-19 Pandemic's impact. Work continued on installing conduit, cable, and various equipment in the tunnels and at various facilities where there were no Stop Work Orders (SWOs) and access was available. Testing of installed equipment and cable splicing continues to be performed, but it is also being impacted by the institution of "social distancing" protocols. The current focus is on fire alarm system testing to meet an upcoming contract milestone. Water infiltration and access restraint issues continue and must still be remedied. The completion of Final Design (FD) for all 10 control systems, originally scheduled for completion 47 months ago, has not occurred yet; and, the contractor continues to indicate that the completion of FD for all 19 non-control systems is delayed due to outstanding unanswered questions. Additionally, during Q1 2020, the contractor continued to contend that a number of Notice of Change (NOC) submissions with the potential for cost and design impacts remain open and are impacting progress on the execution and completion of contract work. During Q4 2019, MTA C&D made some improvement in issuing Contractor Proposal Requests (CPRs) for the previously approved contractor's Notices of Change (NOC); but, prompt action on the review and comment of other contractor NOCs is still an area that MTA C&D should address. A previously noted Buy/Ship America issue that could impact construction acceptance also remains as an open item.

CS084 Traction Power Systems Package 4: During Q1 2020, the contractor submitted a "recovery" schedule and work plan. As of the end of March 2020, that "recovery" plan remained under evaluation by MTA C&D, as it did not agree with a plan developed by MTA C&D. In March 2020, the contractor advised MTA C&D that the submitted "recovery" plan and schedule would have to be substantially revised and re-submitted because several of the assumptions used to prepare the plan and schedule – assumptions provided by MTA C&D – were no longer valid. Internal wiring in the C08 substation continued; and, the CS179 contractor continued with the installation of the fire suppression and alarm system in that location. The delivery and installation of equipment to most of the substation locations continues and testing procedures for the various substations continue to be submitted for review. The installation of traction power feeder cables from some of the substations to the track continued at several locations, but is impacted by the lack of access to the track areas and track monuments that do not meet LIRR standards. Contract modifications to the CS084 and other contracts that address the open issues will be needed to achieve a timely completion of this contract. Two 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 open issues. The issue regarding access to the C03 substation location due to unresolved water infiltration issues had delayed all CS084 work at that substation. During March 2020, MTA C&D reported progress resolving the water

issue using injection grouting and is forecasting that the CS084 contractor will commence work in the C03 TPSS space in May 2020.

VS086, Systems Package 3 – Signal Equipment Procurement: At present, there continues to be no approved contract schedule by which MTA C&D or the PMOC can accurately gauge progress on this contract; and, the milestones for this contract must be modified to incorporate all the outstanding and added contract work. In March 2020, MTA C&D indicated that a contract modification would be issued shortly to extend the VS086 contract schedule SC date to February 2021. This postponement of the VS086 SC date would align the VS086 schedule with the current CS086 contract SC date, as the VS086 contractor needs to provide Construction Phase Services (CPS) to the CS086 contractor. The VS086 schedule will then require another modification to its SC date once the CS086 contract schedule SC date is modified to address the CS086 work delays. The VS086 contractor submitted a proposal – based on its own assumptions – for the PTC design work. MTA C&D has sent that proposal to LIRR for review and agreement. There are seven (7) outstanding design issues that could have a significant impact on the completion of the signal design under this contract. They are delineated later in Section 2.3 of this report under the discussion on the VS086 contract.

CS086, Tunnel Systems Package 2 – Signal Installation: Some measurable construction work finally commenced on this contract in Q4 2019 and continued into Q1 2020. In early March 2020, the contractor implemented an accelerated work plan with personnel working more than one shift at various locations. However, in March 2020, work in one location, the CIR at GCT-6, was halted indefinitely when a worker revealed that he had undergone testing for symptoms of the COVID-19 virus. As of the end of March 2020, the test results were not available and the location remained quarantined for any work. The contractor continues to cite room and track access issues that are, per the contractor, causing further day-to-day delays in the progression of the work. As previously reported, major issues noted include water infiltration, equipment layout conflicts, and other obstructions and misalignments inconsistent with existing CS086 contract drawings.

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, MTA C&D's Revenue Service Date. LIRR received two BAFOs on January 29, 2020, and continued to review the proposers' requested waivers and deviations during the remainder of Q1 2020. LIRR had planned to make the award late Q2 2020, but the delays due to the impacts of the 2020 COVID-19 Pandemic has made that target date questionable.

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 April 23, 2020, and subsequent meetings with LIRR personnel. Commissioning of the work and startup of ESA service is governed by the 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 126 (February 1, 2020) update shows that the forecast Target RSD for the ESA program improved approximately 2 months to February 14, 2022 from the IPS 123 forecast and that the Public RSD forecast remained December 13, 2022. The primary critical path still runs through

Manhattan/Systems work; however, while the path has shifted to include only CS179, contracts CM007, CM014B, CS086 and CS084 remain near critical. Also in IPS 126, the completion dates for the Manhattan/Systems path improved by approximately 2 months; the Harold date remained the unchanged; and, the Queens date slipped 5 weeks.

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

The MTA increased the ESA program current budget to $11,133 million in accordance with the approval of the MTA 2020-2024 Capital Program by the New York State Capital Program Review Board in December 2019. Table 2 provides a summary of FFGA budgets and ESA program current budgets and expenditures through January 2020.

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

	FFGA			Current Baseline Budget			Expenditures January 2020	
	Original FFGA	Amended FFGA	Pct. of FFGA	Obli-gated	CBB	Pct. of CBB	Expen-ditures	Pct. of CBB
Grand Total	7,386.0	12,038.5	100.0%	10,409.7	12,249.8	100.0%	9,642.4	78.7%
Financing Cost	1,036.0		14.0%	617.6	1,116.5	9.1%	617.6	55.3%
		1,116.5	9.3%					
Total Project Cost	6,350.0		86.0%	9,792.1	11,133.3	90.9%	9,024.8	81.1%
		10,922.0	90.7%					
Total Federal Share	2,683.0		36.3%	2,698.8	2,698.8	22.0%	2,698.8	100%
		2,698.8	22.4%					
5309 New Starts share	2,632.0		35.6%	2,436.7	2,436.7	19.9%	2,436.7	100%
		2,436.7	21.9%					
Non New Starts share	51.0		0.7%	66.6	66.6	0.5%	66.6	100%
		66.6	0.6%					
ARRA	0.0	195.4	1.6%	195.4	195.4	1.6%	195.4	100%
Local Share	3,667.0		49.6%	7,093.4	8,434.6	68.9%	6,326.0	75.0%
		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 need to be added to Contracts CM007, CS084, VS/CS086 and CQ033; and, inadequate construction progress on CM014B and CS084. 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. This work, now approximately 2 months behind schedule, involves construction of the new foundations and substructures for the new office tower at 270 Park Avenue located over the northern end of the LIRR Concourse in Zone H4. Following completion of the new foundations/substructures, the 270 Park Avenue owner's construction contractor will then complete the balance of the ESA work scope in that part of the LIRR Concourse. A new major risk developed during March 2020 involving schedule and cost impacts due to the 2020 COVID-19 Pandemic. MTA C&D has in place a **"**Reduced Activity Work Plan for 3rd-Party Work" that identifies essential work by contract such as facility power energization, communications, tunnel ventilation, CM014B chillers and others. While the schedule and cost impacts cannot be determine at this time, the PMOC expects the impacts to be significant. The ESA program float increased 63 calendar days, from 240 to 303 calendar days, over the period of November 2019 through January 2020.

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:** MTA C&D 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. MTA C&D updated the TCC Plan in Q3 2017. In April 2018, FTA advised MTA C&D to incorporate its current updates and commence with a subsequent revision that addresses management changes resulting from the MTA C&D Six-Point Plan for ESA. MTA C&D 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 also notes that MTA and MTA C&D have been proactive and diligent in managing the situation with a key stakeholder, JP Morgan Chase, and the impacts that this stakeholder's plans for a new office tower at 270 Park Avenue will have on completing construction of the new LIRR Concourse at Grand Central Terminal.
- **Project Management Plan:** MTA C&D is using the current version of the PMP, Rev. 10, which the PMOC reviewed and the FTA accepted in 2017.
- **Cost/Schedule Contingency:** MTA C&D, FTA, and the PMOC agree on the planned ELPEP minimum cost and schedule contingency hold points, levels, and drawdowns. MTA C&D continues to report the cost and schedule contingency levels against the ELPEP minimums in its quarterly reports to the FTA. The PMOC notes that the schedule contingency is 303 calendar days, 27 days more than the 275 day ELPEP minimum. The total cost contingency is $945 million above the $260 million ELPEP minimum.

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

- **Schedule Management Plan:** The ESA project should continue to make additional improvements to the Schedule Management Plan (SMP) in the following areas: Alternative Integrated Project Schedule (IPS) Updating, Forecasting, and Schedule Contingency Management against a current baseline schedule. MTA C&D 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 MTA C&D Cost Contingency Management and Secondary Mitigation. MTA C&D 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 MTA C&D to incorporate its current updates and then commence with a subsequent revision that addresses any changes resulting from the MTA C&D 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 MTA C&D to incorporate its current updates and then commence with a subsequent revision that addresses any changes resulting from the MTA C&D 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 MTA C&D Six-Point Plan for ESA to reduce future programmatic risks. MTA C&D issued updated drafts for the CMP, SMP, and RMP in December 2018 as well as the CPP in January 2019. During December 2019, the PMOC returned review comments to the FTA on the revised SMP, CMP, RMP and TCC Plan. The PMP will be updated based on changes made to the revised Sub-Plans.

Revisions to the ELPEP Document: MTA C&D submitted an updated ELPEP with suggested revisions in Q3 2017. In April 2018, FTA advised MTA C&D 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 MTA C&D 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 and the associated cost and schedule impacts.
- 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.
- PMT, CM and GEC's responsiveness to RFIs, Notices of Change and Field Change Requests on contracts has often been slow and has impacted construction progress and increased costs. This is becoming an increasing problem on Contracts CS179, CS086 and VS086.
- Processing and approval of construction contract modifications is taking too long and this creates cost and schedule impacts. The PMOC acknowledges recent improvements in this area, but continued effort is required to continue to reduce approval times.

Although management focus on all of these issues has resulted in some improvements, the PMOC notes that these issues have continued to significantly challenge the ESA Program through Q1 2020. The MTA C&D President, together with the ESA Executive VP/Sr. Program Executive and the ESA-PMT/CM, have made significant changes to the ESA project organization, management, and operational processes to better focus efforts on improving the effectiveness of management decision making, execution of critical required actions, and coordination with LIRR, the primary project stakeholder. The performance of the new ESA project organization and operation through Q1 2020 has demonstrated where further changes and adjustments are needed. ESA continues to evaluate and adjust processes to improve its effectiveness in achieving identified program goals.

b. Staffing

The PMOC is concerned about the CM staffing for Contracts CS084, VS086, and CS086 that have a total remaining construction forecast value of approximately $67 million. The single Construction Manager (CM) for all three contracts was recently given two more managerial personnel, augmenting the existing staff of two people, to assist in the management of these three Systems-related contracts. Two of the contracts (CS084 and CS086) are beginning to implement accelerated recovery schedules and will be working multiple work shifts at disparate locations. While the addition of management staff is helpful and very needed, accelerated installations at numerous disparate sites for the CS084 and CS086 contracts will necessitate expanded field inspection services; services that have been insufficient thus far on all the ESA Systems-related contracts. The PMOC notes that limitations caused by insufficient staffing might be one factor contributing to the issues in Section 1.1.a, Organization, and may become more significant as coordination needs increase among these three contracts and Contracts CM007, CM014B and CS179. The PMOC notes that additional staffing may be needed for activities related to the processing of contract modifications and to address issues related to timely GEC and LIRR submittal reviews for the CS179 and CS086 contracts.

1.2 Project Management Plan

a. History of Performance

The MTA C&D 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, MTA C&D 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 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. The MTA C&D's proposed ESA budget of $11,133 million was approved by the MTA Board in September 2019 and approved by the NYS governor on January 1, 2020.

b. PMP

MTA C&D 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. MTA C&D is planning to update the PMP 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

MTA C&D 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 126 has a February 14, 2022, forecast target RSD, which has improved approximately 2 months since IPS 123. The program level schedule contingency is 303 calendar days, which is 28 days more than the 275 day ELPEP minimum and 691 days less that the 994 days established in the July 1, 2014 IPS re-baseline. The alternative IPS methodology, which is informed by the MCS, is MTA C&D's effort to capture schedule issues and unknowns. In the PMOC's opinion, the risks associated with execution of Incremental IST, redevelopment of 270 Park Avenue, and delays to CS084 traction power substation energization, could likely consume a significant amount of the program contingency in the 25 months remaining until the target RSD.

The controlling work on the critical path for the ESA program, as reported in the IPS, continues to shift month-to-month due to revisions and updates to the IPS with new activities, milestones, and logic, which contribute to a lack of schedule stability along the program critical path. Additionally, the schedule is being driven by Operational Readiness efforts in establishing the time needed for LIRR operational testing.

b. Cost

In June 2014, MTA C&D re-baselined the ESA program with a budget of $10,177 million (excluding financing costs and Rolling Stock Reserve). MTA C&D reassessed the program in April 2018 and forecasted the budget at $11,133 million, which totals to the MTA ETPC $11,596.3 million with the inclusion of the $463 million MTA ESA Rolling Stock Reserve. MTA C&D 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 88.0% awarded ($9,792.1 million) and 82.6% complete ($9,189.4 million invoiced). Total ESA program contingencies are $1,204.5 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 baseline forecast.

1.4 Federal Requirements

a. FFGA

The Amended FFGA budget is $10,922 million for construction and revenue vehicles ($12,038 million including financing costs of $1,116 million). The MTA C&D reassessment of April 2018 established the baseline budget for the ESA program at $11,133 million for the portion of the program that the MTA C&D is managing for the MTA, and which is the subject of their reporting (as agreed in December 2009). The April 2018 baseline budget includes the cost of 50 of the 160 FFGA revenue vehicles. The cost for the balance of 110 revenue vehicles, which are being procured for MTA by LIRR, is funded separately through a dedicated MTA ESA rolling stock reserve of $463 million. The full cost of the ESA program for construction and revenue vehicles – the MTA Estimated Total Project Cost (MTA ETPC) – is $11,596 million ($12,713 million including finance costs; refer to table 5.1).

The $11,596 million MTA ETPC exceeds the amended FFGA $10,922 million Baseline Cost Estimate (BCE) by approximately $674 million (6.2%; net of financing). MTA/MTA C&D discussed the cost forecast with the FTA and issued a draft Recovery Plan for the ESA program in June 2019. MTA/MTA C&D had earlier indicated that the plan would include impacts resulting from acceleration plans and the MTA/JPMC integrated approach for construction of the foundations/substructures at 270 Park Avenue, as well as for the Incremental IST plan for the ESA program. The MTA C&D reassessment of April 2018 held both the December 2022 Public RSD date and the amended FFGA Revenue Operations Date of December 2023.

b. Federal Regulations

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

1.5 Safety and Security

a. Safety and Security Certification Process

The Q1 2020 briefing was held on April 23, 2020. The general Operational Readiness information in this report is a summary of information received at the April 23rd meeting. MTA C&D continues to work on the processing of Safety and Security Certifications; however, the summary data available to the PMOC on the status of this activity is only as current as the data provided to the PMOC in the Q2 2019 in October 2019 briefing. That summary data is listed in Appendix S of this report. The PMOC continues to request updated information from MTA C&D on the Safety and Security Certification process, but has yet to receive any current updates. As noted in its previous reports, the PMOC observed continuing improvement in the evaluation of safety and security elements of the various contracts and the execution of the required certifications.

b. Project Construction Safety Performance

For the calendar year 2020 through February, ESA project safety statistics for lost time accident and recordable injuries on active construction contracts began to trend above the Bureau of Labor Statistics (BLS) national average with a CY2020 project wide ratio of 2.36 versus 1.5 (2020 BLS average) lost time accidents per 200,000 work hours. The ESA recordable ratio for CY2020 was 3.54 versus 2.6 (2020 BLS average). ESA safety ratios for February 2020 were 3.31 for lost time and 4.13 for recordable injuries.

c. Security

ESA did not report any significant security issues in its ESA January 2020 MPR.

1.6 Project Quality

Quarterly Quality Oversights (QQOs):

There were three QQO Audits conducted during Q1 2020 on Contracts CS179, CM014B and CM007 for their Q4 2019 quality performances.

Nonconformance Reports (NCRs): Table M located in the Appendix provides a summary of the NCR status on the major active contracts for ESA, as per the February 2020 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 4 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]**
4. ESA will reportedly need to replace some portion of the rail installed to date by the CM007 contractor due to observed deterioration involving pitting and corrosion. See Section 7.0 for details. **[ESA-134-Sep19]**

1.7 Stakeholder Management

a. Railroads

MTA C&D'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 MTA C&D 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 MTA C&D in support of the ESA project needs and to provide timely decisions in response to design, construction, or operational issues.

During Q1 2020, several key ESA issues involving LIRR continued to challenge the project:

- 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 two of the 10 control systems (Contract CS179) continues to be delayed. MTA C&D management continues to

indicate that only 8 of the 10 control system final designs are approved. As of March 31, 2020, completion and approval of the final two Control System final designs is 47 months late compared to the original contract baseline schedule. Further, during Q1 2020, several of the already approved systems (both Control and Non-Control) were undergoing design changes to reflect changes requested by LIRR or identified during equipment/system testing.

- LIRR's plan for Positive Train Control (PTC) design, installation, testing, and commissioning has presented a number of challenges to ESA for 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 over 24 months late. MTA C&D now forecasts that the contract modification for incorporation of PTC requirements will impact the substantial completion dates for Contract VS086, CS086 and CS179.
- LIRR review of MTA C&D's evaluation, recommendations and plan for replacement of some portion of the MTA C&D provided rail material by the CM007 contractor due to concerns about the condition of the rail based on observed deterioration involving pitting and corrosion.

Amtrak

As the agency that jointly, with LIRR, operates and maintains Harold Interlocking in Long Island City, Queens, Amtrak is a key project stakeholder. Based on Amtrak's historical inability to provide sufficient force account support, especially Electric Traction (ET) personnel, ESA has significantly revised the Harold construction schedule twice since 2014. As a result, the ESA PMT produced the "ESA First" construction schedule which re-prioritized work elements in Harold to operate new LIRR service into GCT and delayed some of the FRA-funded work, categorized as Regional Investment, not specifically required for LIRR operation into GCT. Through March 2020, the earlier noted improvements in Amtrak's support for the ESA work have been sustained, especially in providing access and protection to the third party contractors.

In 2016, Amtrak announced plans to reconstruct, starting in 2019, its East River Tunnels (ERT) Line 1 and Line 2 that were damaged by Superstorm Sandy in 2012, but later postponed it until 2025. During March 2019, MTA C&D indicated that Amtrak may advance ERT Line 2 reconstruction to 2023, although this has not yet been formally confirmed. 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 MTA C&D'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 MTA C&D'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. MTA C&D was able to successfully execute the ambitious 2018 ESA track work program for Harold Interlocking through innovative development of third-party construction contracts to address historical force account resource shortcomings. Going

forward, the PMOC recommends that the PMT continue to actively engage executive management in MTA C&D 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 will significantly impact a portion of the new LIRR Concourse currently under construction at GCT. The foundation/substructure for the new office tower at 270 Park Avenue will be located at the northern end of the LIRR Concourse in Zone H4. This required the demobilization of the ESA Contract CM014B in Zone H4 followed by mobilization of the 270 Park Avenue owner's construction contractor to build the new foundation/substructure and then complete the balance of the ESA work scope in that part of the LIRR Concourse. JPMC's construction contractor did not meet the milestone to start construction of the caissons on November 22, 2019, and this work did not start until March 21, 2020. JPMC is preparing a recovery schedule. See discussion in Section 6.0 of this report. [ESA-133-Dec18]

1.8 Local Funding

a. MTA/New York State (Capital Plan)

The ESA budget of $11,133 million was included in the MTA 2020-2024 Capital Program, which was approved by New York State Capital Program Review Board in December 2019. In January 2020, the MTA updated ESA program budgets to include the approximately $800 million that was requested for ESA. The PMOC recognizes that the MTA has sufficient budgets for the ESA program.

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 MTA C&D 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 MTA C&D to incorporate its current updates and commence with a subsequent revision that addresses any changes resulting from implementation of the MTA C&D Six-Point Plan for ESA. In December 2018, MTA C&D resubmitted a revised draft of the RMP update. The PMOC returned review comments to the FTA during December 2019.

b. Monitoring

The ESA Risk Manager continues to update, track, and issue program level risk updates to the Risk Register on a regular basis. MTA C&D 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. MTA C&D had earlier planned to complete a comprehensive risk review of the ESA project once agreement is reached with the CS179 contractor regarding the Incremental Integrated System Test

plan, which was to serve as the primary basis for the ESA Program schedule through completion of construction, systems testing, commissioning and start-up to revenue service. The PMOC notes that the CS179 contract modification that includes the revised Incremental IST plan and schedule and the CM014B contract modification that includes alignment of the schedule with the revised Incremental IST plan and schedule were executed during Q2 2019. As of March 31, 2020, MTA C&D has not performed the planned comprehensive risk review

2.0 PROJECT SCOPE

2.1 Engineering/Design and Construction Phase Services

In the ESA January 2020 MPR, the PMT reported the overall Engineering effort as 88.3% complete compared to planned completion of 89.1%. Since the ESA July 2018 MPR, the PMT calculates summary engineering progress as a percentage of the $871.8 million April 2018 engineering baseline forecast.

Status of Construction Packages Advertised

CH063 Electric Traction Catenary Work, 3rd Party, will be a negotiated RFP procurement. The RFQ for this contract was advertised earlier in 2019 and MTA C&D received seven proposals, of which four were deemed "Pre-Qualified". Proposals from those four contractors had been expected on January 30, 2020, with award planned for later in Q1 2020, but this was delayed due to proposer questions. Bid opening, negotiation and award of the contract will be further delayed because MTA C&D has placed a 60-day procurement hold due to the 2020 COVID-19 Pandemic.

Status of Construction Packages Not Advertised

CM015 (48th Street Entrance): MTA/MTA C&D-ESA has completed negotiations with the owners of the buildings at 415 Madison Avenue and 270 Park Avenue regarding the ESA 47th Street and the 48th Street Entrances to the LIRR Concourse at GCT. As a result of these negotiations and anticipated agreements and with the FTA's August 2019 concurrence, the owner of 415 Madison Avenue will construct the 48th Street Entrance core and shell and will complete facility fit-out. Accordingly, MTA C&D will not procure the CM015 work scope as a third-party construction contract.

FQA33B, Mid-Day Storage Yard Facility – Amtrak F/A, includes provision for what was originally a second west end yard access to the Amtrak mainline through a connection from Sub 3 to Line 4. During March 2019, however, MTA C&D received CCC approval to pursue this option for the single west end MDSY exit. During the development of the CH063 contract since 2019, ESA included the installation of the Sub 3 to Line 4 turnout in the CH063 scope of work. As a result, FQA33B will now be an Amtrak access and protection work package only.

Positive Train Control Design by LIRR

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

- LIRR had been expected to complete the PTC design by March 31, 2018, but this was not achieved. MTA C&D earlier reported that LIRR had been expected to complete the PTC design in January 2019, but this was delayed due to resolving GEC/LIRR comments on the GCT3 and GCT4 application logic submittals and reaching scope concurrence with Contracts VS086, CS086, and CS179. As of August 31, 2019, LIRR had reportedly provided most of the design information to the GEC. However, there remained outstanding items at that time required for completion of the additional scope

of work for the three contracts noted above, including: Book of Plans and details of the Wayside Interface Units for Plaza Interlocking; PTC L2 Switch and FDP drawing for each ESA interlocking; Bill of Material for equipment provided by LIRR PTC; and LIRR PTC test plans and procedures, including FRA testing. As of March 31, 2020, some, but not all, of these items have been provided to the GEC.

- The GEC has prepared preliminary 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. MTA C&D is currently working through the CPR and contract modification process with both the CS179 and CS086 contractors for incorporation of the PTC work scope. The PMOC notes, however, that these changes cannot be finalized until LIRR completes the PTC design. MTA C&D has already acknowledged that the contract modification for incorporation of PTC requirements will impact the substantial completion dates for Contracts VS086, CS086 and CS179. Because the PTC design is unfinished, MTA C&D, working with the VS086 contractor, has developed a list of PTC "assumptions" that was included in a CPR issued to the VS086 contractor to prepare a cost proposal for the specific PTC related design/equipment fabrication work that will be required. Due to continuing delays to completion of the PTC design by LIRR, MTA C&D is now planning to install PTC after completion of the base signal system under VS086 and CS086, and this will delay substantial completion of both ESA contracts.

Status of MTA C&D and LIRR Review and Approval of Systems Contractors' Final Designs

CS179 System Package 1 - Facilities Systems: The CS179 contractor continues to work on the completion of the final designs of the various contract required systems; a process that, as of the end of Q1 2020, is 47 months late. Additionally, the PMOC is aware of LIRR's formal approval of only eight of the ten Control System Final Designs (FDs) as of the end of Q1 2020. Further, the contractor continues to contend that the resolution of a number of NOCs submitted, but still unresolved, could further impact equipment designs and possible re-configuration of fabricated equipment racks.

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), the potential modification of the design for the "blue-light" issue noted in previous reports, the progression of a study by the GEC on the potential need for cathodic protection, and a minor issue related to the design of an interior door in the C08 substation. Except for these four design issues, all the other known design issues have been addressed and equipment is in various stages of fabrication or delivery.

VS086 Systems Package 3 – Signal Equipment Procurement: There are seven (7) outstanding design issues that could have a significant impact on the completion of the signal design under this contract. They are: 1) PTC design and incorporation; 2) PTC Application Logic changes; 3) Electromagnetic Interference (EMI) requirements; 4) issues regarding the "light-out" protection design; 5) inclusion of the design and provisioning of train departure test equipment, 6) preparation of Track and Signal Routing (TSR) designs and charts; and 7) the possibility of a software-based design change to the operational methodology for the "Diamond" track switch.

CS086, Tunnel Systems Package 2 – Signal Installation: : The PMOC previously reported that the only design issues noted by MTA C&D on this contract revolved around issues related to

installation of equipment in the field. Specific problems included: 1) missing "ground" plates; 2) additional equipment racks; 3) equipment interference layouts in rooms; 4) installation of 91.6 Hz ATS equipment; 5) the mounting of impedance bonds to the track bed, where mounting plate attachment points appear to be out of tolerance; and 6) the ability to properly install signal cases and signal heads in the designated locations.

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 some 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

MTA C&D needs to focus on updating and achieving intermediate milestones in a timely fashion and to work closely with all parties to achieve this. MTA C&D management needs to more effectively engage outside stakeholders such as building owners, Amtrak, and 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/or 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 continues to be needed. The PMOC continues to note 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 January 2020 MPR shows that total procurement for the ESA Program is 88.0% complete, with total awards at $9,792 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 baseline forecast.

Status: The current active procurements during Q1 2020 include:

- CH063 Electric Traction Catenary Work, 3rd Party, will be a negotiated RFP procurement. The scope of work will include ET catenary relocation work for the Mid-Day Storage Yard, catenary construction work for the new W crossover in Harold Interlocking, and other miscellaneous catenary work. The contract was advertised online in January 2019 and responses were received in March 2019. Of the 7 responses received, 4 were deemed "Pre-Qualified" and ESA solicited "Cost/Schedule" proposals from those four during Q4 2019. The solicitation included additional work scope. Proposals from those four contractors had been expected on January 30, 2020, with award planned for later in Q1 2020, but this was delayed due to proposer questions. Bid opening, negotiation and award of the contract will

be further delayed because MTA C&D has placed a 60-day procurement hold due to the 2020 COVID-19 Pandemic.

Concerns and Recommendations: Delays to award of Contract CH063 may impact the remaining work in the Harold Interlocking, including the completion of the west end LIRR Mid-Day Storage Yard exit to Amtrak Line 4.

2.3 Construction

The ESA January 2020 MPR shows that total construction progress reached 87.1% complete compared with 88.5% 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 baseline 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 are equal to the allocations 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
CM007	708.3	669.1	39.2	577.4	719.9	86.9%	86.3%	7/1/20	7/14/20	
	nc	+0.8	(-0.8)	+15.9	(-4.1)	+2.8%	+2.2%	nc	+20 cd	
	708.3	668.3	40.0	561.5	724.0	84.1%	84.1%	7/1/20	6/24/20	
CM014B	571.7	539.1	32.6	473.3	544.4	91.9%	87.8%	6/26/20	1/2/21	
	nc	+0.3	(-0.3)	+20.5	nc	+1.6%	+3.8%	nc	+5 cd	
	571.7	538.8	32.9	452.8	544.4	90.3%	84.0%	6/26/20	12/28/20	
VM014	46.9	34.9	12.0	32.4	50.4	NA	92.8%	10/25/19	3/23/20	
	nc	nc	nc	nc	nc	NA	nc	nc	nc	
	46.9	34.9	12.0	32.4	50.4	NA	92.8%	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.

CM007 - GCT Station Caverns and Track

Schedule: Milestone #5 (Substations US1 and US2 Complete) was forecast for November 22, 2019, from the previous October 22, 2019. Milestone #5 was completed in November 2019 and included successful local testing.

Construction Progress: Through December 31, 2019, work proceeded in the East and West, north and south Back of House Zones with the pulling of control wire for the HVAC, erection of small amounts of CMU wall and installation of Stair 20 glass rail framing.

Cross Passages: At Cross Passages #3-6, installation of C07 stone mounted curved surfaces and Unistrut supports for stone soffits continued.

Shaft #5: The contractor completed shotcrete applications including the smoothing layer and completed installation of waterproofing.

West Cavern: Installation continued of rail post supports for Stairs #7, #15, and #16. Installment of Stair #5 treads nears completion. Installation of W06 Aquasole floor tiles continues throughout. Installation of ceiling ribs is ongoing at the Mezzanine and Upper Levels. At the Mezzanine Level, installation of wall framing and W03 wall panels continues throughout. Buildout continues at

Elevator #8 and Escalators #61-64, and #66. At the Plenum, dampers and control conduit continues.

East Cavern: Installation continued of rail post supports for Stairs #9 and #11. Installation of W06 Aquasole floor tiles continues throughout. Installation of light fixture supports, MC cables and Emergency Power Feeders continues throughout. Buildout continues for Escalators #57 and #58. At the Plenum, dampers and control conduit continues.

Track: On December 18, 2019, the contract began a 6 week Vehicle Access Restriction for the other ESA contractors working in the tunnels. The purpose of this restriction is to provide the CM007 contractor access to complete Milestone #4 (Track and Third Rail Work Complete, January 28, 2020) early on an accelerated schedule. In the tunnels, installation continued of duct bank handrails from GCT6 to GCT7. Trackwork continued at Track EB2 103+00 to 167+37 (DFF), Plaza West, Plaza West to SW 14 (140' DFF), Switch 14, Plaza West to SW 24W (140' DFF), Switch 24W, Switch 24E, and Yard Lead Approach Track STA 1175+60 – 1230+96 (RTB).

Traction Power Track Monument Repairs: Surveying/review of the monuments continues. Work on Out of Tolerance monuments continues in Areas #3 – 10. Work in Areas #1 and #2 is complete. The contractor is coordinating with contract CS084 to establish the dates that they need the repaired monuments for cable pulling. CM007 will need to support the CS084 Milestone 4C: availability of track monuments for cable pulling - 80% complete by Apr. 1, 2020; 100% complete by May 1, 2020.

Architectural: Through March 31, 2020, architectural wall finish work installation continued throughout the mezzanine.

MEP – Mechanical: Through March 31, 2020, HVAC duct and piping installation continued throughout the Train Halls.

MEP – Electrical: Through March 31, 2020, electrical conduit wiring, and fixtures continued throughout the Train Halls.

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

Concerns and Recommendations: The PMOC is concerned about the length of time monument repairs and track replacement will have on the IST and contract completion.

CM014B – GCT Concourse and Facilities Fit-Out

Schedule: No contract milestones were scheduled to be or were completed during March 2020. In its January 2020 MPR, ESA reports that the Substantial Completion date for CM14B has been extended until January 2, 2021, -190 days, and that the Biltmore Connection completion is once again projected for October 9, 2020, -9 days.

Construction Progress: Electrical, mechanical, plumbing, fire protection, terrazzo floor installation, and finish work continued throughout all areas of the new LIRR concourse and escalator ways during March 2020.

Observations/Analysis: The PMOC observes that construction to finish the concourse and escalator ways is continuing, albeit well behind the original schedule.

Concerns/Recommendations: Although it is still too early to determine the ultimate impact that JPMC construction of 270 Park Avenue may have on LIRR concourse completion and ESA RSD, nonetheless the PMOC continues to be concerned about its full impact. The PMOC therefore recommends that MTACD continue to fully engage JPMC to complete its construction as soon as possible.

VM014 –Vertical Circulation Elements (Escalators and Elevators)

Schedule: This contract provides all the elevator and escalator material and installation for the CM007 and CM014B contracts. Through March 31, 2020, all 6 elevators and 16 escalators have been delivered and installed for the CM007 contract construction of the new LIRR train halls. Through March 31, 2020, 20 of 22 elevators have been delivered and are being installed for CM014B in its construction of the LIRR concourse.

Construction Progress: Through March 31, 2020, elevator and escalator mechanical work continued throughout the LIRR train halls and concourse. Elevators #10 and #22 still have to be delivered and installed.

Observations/Analysis: This contract has progressed relatively smoothly and the contractor has supported the CM007 and CM014B contractors entirely adequately.

Concerns/Recommendations: The PMOC recommends that ESA overcome the issues (which are not insurmountable) that have delayed the installations of elevators #10 and #22 and install them as soon as possible.

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
CQ033	335.1	324.9	10.3	272.2	348.6	88.8%	83.8%	8/10/20	1/25/21	
	nc	nc	nc	+6.3	(-0.1)	+2.0%	+2.0%	nc	(-9 cd)	
	335.1	324.9	10.3	265.9	348.7	86.8%	81.8%	8/10/20	2/3/21	

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.

CQ032 – Plaza Substation and Queens Structures

Schedule: The last ESA MPR that reported on this contract was the October 2019 MPR, which reported that the close-out status of this contract remained open. Open issues include: tunnel duct bench remediation and grouting/PAC remediation in the Plaza structures. Eleven NCRs remain open.

CQ033 – Mid-Day Storage Yard Facility

Schedule: No contract milestones were scheduled to be or were completed during March 2020. The ESA January 2020 MPR projects Milestone MS #6, Substantial Completion as January 25, 2021.

Construction Progress: During March 2020, the contractor continued to install signal and traction power cables west of the Honeywell Avenue overhead bridge and began utility conduit excavation and installation, as well as track and Storage and Toilet Service Building construction east of Honeywell Avenue Bridge. CQ033 construction contractor stated during last progress meeting that it has reduced field force size by 40% due to the 2020 COVID-19 Pandemic situation; contractor management staff reduced by 50%.

Observation/Analysis: ESA and the contractor continue to work well together.

Concerns and Recommendations: The PMOC presently has neither concerns about, nor recommendations for, the CQ033 contract other than to maintain progress as it has in the past.

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	721.1	686.8	34.3	581.5	786.5	87.4%	84.7%	6/30/21	10/8/21	1
	+30.0	+0.6	+29.5	+8.8	+2.9	+0.9%	+1.2%	nc	+10 cd	
	691.1	686.2	4.8	572.7	783.6	86.5%	83.5%	6/30/21	9/28/21	
CS084	79.7	74.1	5.6	53.8	83.0	100.0%	72.6%	12/2/19	4/27/21	1
	nc	+0.2	(-0.2)	+1.1	+0.2	nc	+1.4%	nc	(-58 cd)	
	79.7	73.9	5.8	52.7	82.8	100.0%	71.2%	12/2/19	6/24/21	
CS086	60.9	53.0	7.9	8.5	67.3	51.8%	16.0%	2/21/21	2/25/21	
	nc	nc	nc	nc	(-0.2)	+1.7%	nc	nc	(-35 cd)	
	60.9	53.0	7.9	8.5	67.5	50.1%	16.0%	2/21/21	4/1/21	
VS086	21.8	20.4	1.5	18.2	23.0	NA	89.2%	10/14/19	12/1/20	1
	nc	nc	nc	+0.2	(-0.9)	NA	+1.1%	nc	nc	
	21.8	20.4	1.5	18.0	23.9	NA	88.1%	10/14/19	12/1/20	
VH051	30.2	29.8	0.4	29.7	30.2	NA	99.6%	4/30/15	7/13/21	
	nc	nc	nc	nc	nc	NA	nc	nc	nc	
	30.2	29.8	0.4	29.7	30.2	NA	99.6%	4/30/15	7/13/21	

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 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. MTA C&D management acknowledges that only 8 of the 10 Control system final designs (FDs) are approved. As of the end of Q1 2020, the completion and approval of all 10 Control System final designs is 47 months late. Progress on Non-Control Systems designs also continues to be 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 complete equipment rack production. Additionally, a previously noted Buy/Ship America issue that could impact design and construction completion also remains as an open issue (See Appendix G for details).

Construction Progress: During Q1 2020, the contractor continued installing conduit, cable, and equipment in the tunnels and at the various facilities where there were no SWOs and where access was available. However, in March 2020, the contractor reduced its daily workforce from 260 personnel to 120 personnel to follow "social distancing" protocols as a result of impacts due to the 2020 COVID-19 Pandemic. Testing of installed equipment and cable splicing continues to be performed, but it is also being impacted by the institution of "social distancing" protocols. The current focus is on fire alarm system testing to meet an upcoming contract milestone. The contractor continues to advise MTA C&D that the open SWOs (7 as of the end of March 2020), access restraints (due to water infiltration, as-built site conditions, etc.), and now, the impact of 2020 COVID-19 Pandemic safety protocols and directives are impacting the progression of work. Water infiltration and access restraint issues continue and must still be remedied. 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. While some improvement in resolving the coordination issues has been observed as a result of weekly coordination meetings between the CS179 contractor and several other contractors, much more focus and direction needs

to be applied on adjacent contractor coordination by MTA C&D. The completion of FD for all 10 control systems, originally scheduled for completion 47 months ago, has not occurred yet; and, the contractor continues to indicate that the completion of FD for all 19 non-control systems is delayed due to outstanding unanswered questions. Additionally, during Q1 2020, the contractor continued to contend that a number of Notice of Change (NOC) submissions with the potential for cost and design impacts remain open and are impacting progress on the execution and completion of contract work. During Q4 2019, MTA C&D made some improvement in issuing Contractor Proposal Requests (CPRs) for the previously approved contractor's Notices of Change (NOC); but, prompt action on the review and comment of other contractor NOCs is still an area that MTA C&D should address. A previously noted Buy/Ship America issue that could impact construction acceptance also remains as an open item. The contractor advised that equipment rack production and delivery continues; but, production of 58 out of the 356 proposed racks has not started yet because of outstanding design issues or SWOs. As of the end of March 2020, 298 racks have been delivered to ESA locations.

Incremental Integrated Systems Testing Plan: The PMOC previously reported that MTA C&D, in discussions with the CS179 contractor, developed an Incremental Integrated Systems Testing (IST) Plan to meet the schedule requirements for RSD. This approach was significantly different than originally planned under Contract CS179. The new Incremental IST Plan required 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 noted that a significant modification to the CS179 contract was executed in May 2019 that included these key contract schedule changes culminating in a revised Substantial Completion date of June 2021. This new testing approach also required associated contract modifications for the CS084, VS086, CS086, and CQ033 contracts. However, based on discussions at contract progress meetings for the CS084, CS086, and VS086 contracts, it still does not appear that MTA C&D has engaged these contractors in the development or agreement of this new testing plan. In June 2019, in response to the PMOC request that MTA C&D provide the Incremental IST plan and schedule for review, MTA C&D gave the PMOC a briefing on the revised IST Plan. No detailed documentation regarding the plan or the testing schedule was provided at that time; and, 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. As of the end of March 2020, that documentation has yet to be provided by MTA C&D. **[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, delays due to SWOs, design changes, and the incremental IST testing plan. The PMOC also has significant concerns about the unresolved Buy/Ship America issue, as delays in acquiring a suitable alternative should a waiver not be granted, could have an adverse impact on the completion of the contract work. Additionally, the PMOC remains very 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 continues to track 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 MTA C&D's ability to achieve effective and successful completion of all testing in time to meet the current forecast ESA RSD. MTA C&D/ESA needs to continue working with all stakeholders to expedite finalization and approval of the Incremental IST Plan and schedule.

CS084 Tunnel Systems Package 4 – Traction Power

For many months, the PMOC has noted that this contract was significantly behind schedule; and, that has resulted in a failure to meet the contractual SC in December 2019. 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. Most of the equipment designs were approved by the end of Q3 2019; and, the contractor was able to fabricate most of the required equipment and deliver it to the various work sites. As a result, the contractor was able to invoice for equipment fabrication and delivery which brought the "Planned vs. Actual" numbers in the Table above closer together – seemingly indicating that the contract work is close to being on schedule.

In Q4 2019, MTA C&D requested that the contractor provide a "recovery" schedule and plan so contractor milestones could be re-established. At that time, the contractor indicated that it would attempt to provide the requested "recovery" schedule despite its belief that some of the MTA C&D-provided assumptions (e.g., availability of all track monuments by the end of November 2019 and complete access to the C03 facility in January 2020) were unrealistic. The PMOC also rendered an opinion in its past three reports that the validity of the MTA C&D-generated assumptions was highly questionable. The revised forecasted SC date in Q2 2021 shown in the above Table is based on a preliminary unapproved "recovery" plan submitted by the contractor in February 2020. As of the end of March 2020, that "recovery" plan remained under evaluation by MTA C&D, as it did not agree with a plan developed by MTA C&D. Further, in March 2020, the contractor advised MTA C&D that the submitted "recovery" plan and schedule would have to be substantially revised and re-submitted because several of the milestone assumptions provided by MTA C&D and used to prepare the plan and schedule (e.g., the C03 substation availability date and the date for completion and hand over of all track monuments assumptions) had not been met by MTA C&D. The PMOC does note progress on the cited assumption. The issue regarding access to the C03 substation location due to unresolved water infiltration issues had delayed all CS084 work at that substation. During March 2020, MTA C&D reported progress resolving the water issue using injection grouting and is forecasting that the CS084 contractor will commence work in the C03 TPSS space in May 2020.

Design Progress: The only significant reported design issues are those related to the correction of problems identified during field surveys (e.g., water remediation, track monuments, and equipment installations), the potential modification of the design for the "blue-light" issue noted in previous reports, the progression of a study by the GEC on the potential need for cathodic protection, and a minor issue related to the design of an interior door in the C08 substation. Except for these four design issues, all the other known design issues have been addressed and equipment is in various stages of fabrication or delivery. In Q2 2019, MTA C&D identified a design issue related to the "blue light" system being utilized to de-energize the 3rd rail. LIRR indicated that the system being deployed did not utilize the methodology that it wanted. The contractor's rebuttal was that LIRR already approved the design – and implementation methodology – of this system when it approved the final design drawings; and, any change to the design would impact the already completed PLC design. As previously reported, MTA C&D advised the contractor that it believed the issue concerning the "blue light" system was resolved, but the contractor disagreed. It remains unclear at this time what additional steps will be taken by the contractor or MTA C&D to close out this issue. Designs for water remediation methodologies in spaces designated for CS084 equipment

and other identified field construction issues continue to remain unresolved. Remediation efforts for out-of-specification track monuments are still underway in many locations. As a result of discussions with NYCT related to cathodic protection, MTA determined that any "maintenance" actions related to cathodic protection in the ESA tunnels would fall under the purview of NYCT's existing "cathodic protection" group. MTA C&D must still issue a contract modification to the GEC to perform a study of this concern. At the end of March 2020, the GEC indicated that no progress on this study had been made to date because personnel need to be track safety certified to perform the survey; and, because of "social distancing" protocols put in place to deal with the COVID-19 virus, the earliest track safety course available is in May 2020. MTA C&D and the contractor continue discussions on the blue light system modifications and any required changes to the PLC software.

One other previously identified design related issue continues to remain as an open item – that of agreement between the SCADA software designer and MTA. MTA needs to reach agreement regarding the submission of the source code, a commercial issue, before LIRR will grant final acceptance of the system.

Construction Progress: During Q1 2020, substantial work on this contract occurred. The installation of internal wiring to connect the multiple sections of the C08 pre-fabricated substation progressed; and, the contractor completed several installations of cabling from the substations to track locations in areas where the access was granted and where remediated track monuments met LIRR standards installation. During Q4 2019, several water leaks between the pre-fabricated sections of the C08 substation were noted and, as of the end of March 2020, several of the leaks still persist. The CS179 contractor continues to install the fire alarm system in the C08 substation; but, efficient progression of the work is being hampered by the need to provide "social distancing" in the substation for the employees of the two contractors. MTA C&D is considering a contractor's suggestion to work separate shifts to move forward with all the work in the C08 substation. A connection from the C08 substation to the site sewer system is still needed.

Transformers have been installed at all the substations except the C03 substation, which has an access restraint issue because of water infiltration. All CS084 work at the C03 substation had been on hold due to the unresolved water infiltration issue; however, the delivery and installation of equipment to other substation locations continues and testing procedures for the various substations are being submitted for review. During March 2020, MTA C&D reported progress resolving the water issue using injection grouting and is forecasting that the CS084 contractor will commence work in the C03 TPSS space in May 2020. Previously reported issues at some of the substations are in the process of being addressed, but water infiltration and access restraint issues 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.

Two 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 open issues. The contractor continues to cite coordination issues, water infiltration issues, access restraints, stop work orders (SWOs), and differing site conditions as its reasons why work at the various locations cannot progress. Despite the continued diligence of the contractor and MTA C&D to work together to address these issues, progress on the issues continues to be slow, as a significant number of the cited issues involve coordination with other contracts and require the development and issuance of contract modifications to various contracts. A list of those issues (See Appendix P) continues to be updated each month and discussed at weekly coordination and monthly progress meetings.

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. Two different fabrication procedure modifications were necessary to correct the issues that caused the testing failure of these transformers. Both the PMOC and LIRR raised concerns regarding the "acceptability" and long-term viability of the transformers that were fabricated and tested before the second fabrication procedure modification was implemented. Discussions between MTA C&D and LIRR regarding these concerns were held, but no information regarding the disposition of this concern is available to the PMOC at this time; and, the PMOC remains concerned regarding this issue.

During Q3 2018, a quality-related issue; that of potential damage to the 26 MTA-supplied inductive reactors, was identified. In Q4 2018, the contractor took possession of 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, but has since occurred. In 2019, a design investigation by LIRR and the GEC indicated that only 10 of the original 26 reactors must be installed by the CS084 contractor to provide broken-rail protection; 6 of which are already installed at the C05 and C06 substations. Four (4) reactors must still be installed at the C03 substation by the CS084 contractor, while reactor installations at the C08 and C07 substations will be done by LIRR forces and the CQ033 contractor, respectively. 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 MTA C&D verified, specification non-conformance issues with several track monuments (conduit turn ups at track level for routing of traction power cables). Corrective action to address non-conformance issues with track monuments continues to be a major significant issue impacting the progression of work on this contract. MTA C&D indicated there are approximately 450 track monuments; and, that upon initial inspection of 275 of them, there were 232 (or 84.4%) that the contractor found to be out of tolerance compared to LIRR standards. In early 2019, joint teams of MTA C&D, GEC, and the contractor performed limited field visits to try out some sample cable mock-ups at several locations. It became apparent during those initial inspections that there was no overall acceptable solution identified that would fully address this major issue. MTA C&D eventually engaged the CM007 contractor to identify and replace non-conformance track monuments. That work continued into Q1 2020, at which time the CM007 contractor began the turnover of remediated monuments to the CS084 contractor.

Some of the monument remediation efforts performed by the CM007 contractor were deemed acceptable and cable installations started in those areas. However, the CS084 contractor continues to advise MTA C&D that not all of the remediated monuments that were turned over meet the LIRR standard; and, cable cannot be installed at those locations. The contractor indicated that there are almost 2,100 traction power feeder leads required throughout the ESA territory; and, that an order, with a 20-week lead time for fabrication and delivery for any specific lengths of leads, could not be placed until all the monument remediation efforts are completed. Since monument remediation efforts are still underway, and in an effort to minimize any further delay related to the installation of these feeder cables, MTA C&D has decided to let the CS084 contractor, with LIRR approval, fabricate the required feeder leads in the field.

The issue regarding access to the C03 substation location due to unresolved water infiltration issues had delayed all CS084 work at that substation. MTA C&D advised, at the March ESA Cost and Schedule Review Meeting, that the CS084 contractor will commence work in the C03 TPSS space in May 2020. The water infiltration has been resolved, using grout injections, on the north

side and the south side and is expected to be completed by late March/early April 2020. During April 2020, the CS179 contractor will complete their work and MTA C&D is expecting to turn over the space to the CS084 contractor by early May 2020.

Concerns and Recommendations: The PMOC has continually raised a concern at CS084 contract meetings about verification of the viability of manhole and conduit systems at CS084 substation locations. In June 2019, MTA C&D directed the contractor to begin surveying these systems to determine their condition – that surveying continues as locations become available and track monuments are turned over to the CS084 contractor. Some issues with clogged or missing conduits have been identified and MTA C&D needs to provide direction on a resolution. 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 MTA C&D continue discussions related to those concerns.

VS086 Systems Package 3 – Tunnel Signal Procurement

The contractual SC date was February 7, 2020, which was not met. At present, there continues to be no approved contract schedule by which MTA C&D or the PMOC can accurately gauge progress on this contract; and, the milestones for this contract must be modified to incorporate all the outstanding and added contract work. In March 2020, MTA C&D indicated that since the VS086 contractor needs to provide Construction Phase Services (CPS) to the CS086 contractor, a contract modification would be issued shortly to extend the VS086 contract schedule SC date to February 2021, a date that coincides with the current CS086 contract SC date. The VS086 schedule will then require another modification to its SC date once the CS086 contract schedule SC date is modified to address the CS086 work delays.

Design Progress: Discussions regarding the methodology and scheduling of the Factory Integrated Acceptance Test (FIAT), which is performed after the FAT to test the interlocking designs and equipment as a composite systems package, were started in August 2019 and continue between MTA and the VS086, CS086, and CS179 contractors (the CS179 contractor is providing design data for the testing). The PMOC has asked to see how this testing is incorporated into the Incremental IST Plan, but has yet to receive any input from MTA C&D on this.

- There are seven (7) outstanding design issues that could have a significant impact on the completion of the signal design under this contract. They are: The addition of PTC into the VS086 signal system design cannot be accomplished until MTA C&D issues a contract modification to the VS086 contractor. The development and issuance of any modification that addresses PTC is dependent on the development of a PTC work scope, which has not been forthcoming from LIRR as the PTC design remains unfinished. To address this issue, the VS086 contractor submitted a proposal – based on its own assumptions – for the PTC design work. MTA C&D has sent that proposal to LIRR for review and agreement.
- While the commercial issue dealing with Application Logic for the signal control system, identified during 2Q 2019, remains under discussion, the contractor is moving forward with the technical aspects of the work.
- The contractor provided a justification for an EMI testing waiver for its ATT-20 track circuit equipment; and, in January 2020, MTA C&D indicated that LIRR would reject the contractor's request for a waiver to not perform any testing of the ATT-20 equipment. Further discussions on this item will be undertaken.

- In early 2019, LIRR rejected the contractor's design approach for the "light-out" protection portion of the overall signal design, indicating that the proposed methodology used to provide this protection was not what LIRR wanted. The contractor contended that its approach was in compliance with the contract requirements and that the proper protection was provided with its design, In Q4 2019, after a number of months of unsuccessful mediation discussions between parties on this design element, the contractor submitted a cost proposal for the work. Although that proposal is still under review, the contractor is now moving forward with the technical design modifications, and waiting for a contract modification from MTA C&D to settle the commercial issues.
- Although identified as an open issue in late 2019, there has been no progress by the GEC on the development of a work scope for the inclusion of the train departure signaling design and equipment by the VS086 contractor. MTA C&D and GEC personnel need to meet with LIRR Operations personnel to determine what will be needed to address this issue. Inclusion of this design and equipment for the ESA project will require contract modifications to the VS086, CS086, and GEC contracts.
- The TSR design and documentation is required for comprehensive testing of the signal system and must be added to the contract work scope. In March 2020, the GEC began working on the development of the TSR design and charts even though MTA C&D has still not given it a NTP with the design work. The GEC indicates that, presuming all contractual review times for submissions and approvals are met, the final TSR will be available in September 2020. This TSR testing must still be incorporated into whatever Incremental IST Plan will be used by MTA C&D for the project.
- The January 2020 LIRR request to modify the method of operation for the "Diamond" track switches is now under evaluation by MTA C&D senior management to ascertain the merits and impacts of modifying this existing design approach. Any change to the existing design will require software changes and re-testing of the signal design.

Equipment Fabrication and Delivery Progress: The contractor provided a plan to retrofit and/or replace any equipment that was damaged in transit to the ESA staging areas. The goal was to repair and re-deliver that equipment in August 2019; however, due to various reasons, the contractor did not pick up the specified equipment from ESA property until December 2019. In March 2020, the contractor indicated that all the equipment is ready for re-delivery to work sites and the CS086 contractor. Delivery coordination discussions between the VS086 and CS086 contractors will take place in April 2020.

Concerns and Recommendations: The PMOC remains concerned about the number of unresolved items with potential cost and schedule impacts.

CS086 Tunnel Systems Package 2 – Signal Installation

Notice to Proceed (NTP) on this contract was given on September 29, 2018; and, as of the end of October 2019, there had been no substantial "construction" activity on this contract. The contractor cited track access, worksite access, and water infiltration issues as the primary cause of its delay starting construction. In November 2019, the contractor finally began mobilization to several work sites. In late Q4 2019, the contractor, based on certain MTA C&D provided assumptions related to mitigation of the known issues, began development of the MTA C&D requested "recovery" schedule, and submitted it in late January 2020. As of the end of March 2020, MTA C&D had not formally approved the submitted recovery schedule; but, the contractor and MTA C&D agreed that the contractor could begin acceleration efforts to recover some of the lost time.

The contractor started utilizing two shifts of work on a daily basis in the tunnel locations to recover some of the lost time; and, discussions between the contractor and MTA C&D continue regarding the possible implementation of a third shift of work at the Plaza location when that site becomes available. While MTA C&D is currently forecasting SC of this contract in February 2021, MTA C&D acknowledges that that date will need to be extended once all the known issues are addressed and remediated.

Work Activities: In March 2020, work in one location, the CIR at GCT-6, was halted indefinitely when a worker revealed that he had undergone testing for symptoms of the COVID-19 virus. As of the end of March 2020, the test results were not available and the location remained quarantined for any work. The contractor continues to cite room and track access issues that are, per the contractor, causing further day-to-day delays in the progression of the work. Major issues being reported include water infiltration, equipment layout conflicts, and other obstructions and misalignments inconsistent with existing CS086 contract drawings. In March 2020, the contractor again noted that access to the Plaza signal rooms is not possible due to water infiltration issues, and that water continues to build up in the GCT-4 and GCT-5 cable vaults.

There are a number of other issues effectively limiting the progression of work. The most serious are: 1) the mounting of signal impedance bonds in the track area where the pre-installed holes in the track invert for the impedance bond mounting plates apparently do not align with the standard impedance bond mounting plate; 2) obstructions precluding the installation of signal equipment at the various locations surveyed; 3) the absence of electrical grounding plates for signal case and signal head grounding; and, 4) several areas where the proposed signal equipment was to be located that appear to be too small for the proposed signal equipment. MTA C&D agrees that many of these findings are legitimate and is working with GEC to identify remediation efforts as may be necessary.

In late 2019, MTA C&D requested that the contractor develop mock ups of the impedance bond template, signal cases, and signal heads so that the mock ups could be used to determine the most critical areas that need to be addressed. The contractor indicated that the mock ups would be available for deployment in January 2020, but that date was not met. In March 2020, the contractor deployed its mock up signal case and signal head mockup at the Roosevelt Island location for LIRR inspection and approval, which was granted. The contractor must still develop a mockup for any signal head that needs to be installed in a tunnel area that has a "curved" wall.

Site surveys of Impedance bond areas – approximately 70 locations – with a mock up installation template that were supposed to begin in January 2020, are now planned to start in April 2020. Once the survey is complete, the contractor will notify MTA C&D of the extent of any mounting problems and request rectification. Surveys by the CS179 contractor to determine the availability and adequacy of grounding plates continued in March 2020. Once those surveys are complete, MTA C&D will determine a course of action to provide the needed grounding.

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
CH058A	86.5	82.3	4.2	49.7	90.7	57.9%	60.4%	3/17/21	3/17/21	
	nc	+0.1	(-0.1)	+3.3	(-0.2)	+3.8%	+3.9%	nc	nc	
	86.5	82.2	4.3	46.4	90.9	54.1%	56.5%	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.

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

Schedule: No contract milestones were scheduled to be or were completed during March 2020. Contract Milestone MS#8, Substantial Completion, is presently scheduled for March 17, 2021.

Construction Progress: During March 2020, the contractor continued to place invert and sidewall concrete in the East Approach Structure of Tunnel B/C east of 39th Street overhead bridge and began to install formwork at the TBM portal west of 39th Street Bridge. Additionally, the contractor completed installation of all piles and continued excavation of the East Approach Structure of the Eastbound Re-Route Tunnel.

Observations/Analysis: ESA and the contractor continued to work very well together during March 2020 and the primary work at both work locations appears to be ahead of contract schedule.

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

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	61.8	61.8	--	61.1	61.8	100.0%	98.9%	8/15/17	1/24/21	1
	nc	nc	nc	nc	nc	nc	nc	nc	nc	
	61.8	61.8	--	61.1	61.8	100.0%	98.9%	8/15/17	1/24/21	
FHA03	13.9	5.2	8.7	10.9	15.8	100.0%	78.7%	7/25/18	6/2/25	1
	nc	nc	nc	+0.2	nc	nc	+1.6%	nc	nc	
	13.9	5.2	8.7	10.7	15.8	100.0%	77.1%	7/25/18	6/2/25	
FHL02	127.3	127.3	--	124.5	132.8	100.0%	97.7%	11/25/16	8/30/21	1
	nc	nc	nc	+0.2	nc	nc	+0.1%	nc	nc	
	127.3	127.3	--	124.3	132.8	100.0%	97.6%	11/25/16	8/30/21	
FHL03	20.6	2.7	17.9	25.0	37.2	100.0%	83.4%	8/14/17	4/28/24	1
	nc	nc	nc	nc	nc	nc	+0.2%	nc	nc	
	20.6	2.7	17.9	25.0	37.2	100.0%	83.2%	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 March 2020, Amtrak Electric Traction (ET) personnel completed installation of new overhead catenary over the LIRR Port Washington #2 Track, known as "PW2 Overrun" and began construction of the H44 and Q44 full tension air breaks (FTABs) in Harold Interlocking in preparation for CH063 future electric traction construction. Amtrak C&S personnel continued to install and terminate signal cables in the new Loop Interlocking Central Instrument House (CIH).

Observations/Analysis: Amtrak adequately supported ESA construction during March 2020.

Concerns/Recommendations: The PMOC has no significant concerns about Amtrak ESA support, although it will continue to monitor it closely. The PMOC recommends that ESA and Amtrak continue to work closely together.

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

Construction Progress: During March 2020, LIRR Track, Signal, and Electric Traction (ET) personnel installed the #5155 and #1143W turnouts in Harold Interlocking and Signal and ET personnel continued to relocate signal and electric traction cables in support of CH058A construction of Tunnel B/C.

Observations/Analysis: LIRR performed its direct ESA construction and supported the CH058A contractor in an entirely adequate fashion during March 2020.

Concerns/Recommendations: The PMOC has no significant concerns about the LIRR Force Account support of ESA construction at this time, but it will continue to monitor future work closely. The PMOC recommends that ESA and LIRR continue to work closely together.

2.4 Operational Readiness

Status: The most recent quarterly Operational Readiness (OPR) briefing, held on April 23, 2020, was the update for Q1 2020; and, the data presented in this report reflects the status of Task Working Group (TWG) activities up to that date. The details of the progress of the Rail Activation Plan (RAP) and specific TWGs that are contained in Appendix Q are, unless specifically noted, based on information provided at the April 2020 briefing.

Observations and Analysis: The primary responsibility of the Operational Readiness (OPR) Group is to develop the ESA Rail Activation Plan (RAP) 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 underwent several modifications during 2019 with the main focus on the enhancement of its Operational Readiness (OPR) staffing and the further development of what it is now calling its "Rail Activation Plan Transition Team" (RAPTT) – a Team composed of LIRR's ESA Transition Team and OPR personnel. The other major staffing development was the creation and filling of an Executive Director of Operational Readiness position who reports directly to the LIRR's Chief Engineer LIRR Strategic Planning/ESA and oversees all the Operational Readiness activities.

As noted in previous PMOC reports, MTA C&D 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. MTA C&D also indicated that a revised RSP would impact the new railcar procurement and LIRR staffing and training requirements. In 2018, the development of the revised RSP was delayed due to limitations on knowledgeable staff and a general hiring freeze that impacted MTA's ability to put a fully-complemented Service Planning department in place. While a number of LIRR personnel, or in some cases consultant resources, were brought on-board to progress the OPR efforts, additional Service Planning, Engineering, and Safety personnel are still required and in the process of being acquired.

LIRR continues to refine its personnel needs based on assumptions regarding ESA service levels relative to established or projected revenue service dates. The projected additional headcount needed to effectively operate ESA service on the established RSD remains "confidential". However, it is significantly less than original projections due to assumptions being made regarding the available levels of service, and the time periods identified, for the start of ESA revenue service.

Hiring of the personnel commenced in late 2019, but is now being impacted by issues related to the COVID-19 virus protocols. Training classes for locomotive engineers are in various stages of development and implementation.

One required RAP deliverable is a Comprehensive Systems Test Plan (CSTP). A draft partial plan was prepared several years ago and was updated in August 2018. Further updates and finalization of the CSTP depend on an acceptable ESA Integrated System Test (IST) Plan and schedule, which was reportedly developed under the CS179 contract. As of the January 2020 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, the railcar procurement is significantly behind schedule. Information about the procurement of railcars is noted in Section 2.5.

2.5 Vehicles

Status: LIRR procurement of new vehicles is a concurrent effort with its sister MTA agency, Metro- North Railroad (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 160 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 the following additional scope to the original M-9A procurement: Locomotive Hauled Married Pair (LHMP) units; and the decommissioning of the existing M-3 rail-fleet. The 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. The vendor's responses were received in April 2019. LIRR issued a "Best and Final" (BAFO) solicitation to the two remaining vendors during Q4 2019 and the proposals in response to that solicitation were received on January 29, 2020. Through March 31, 2020, however, LIRR continued to analyze the two proposals it received on January 29, 2020, and has not been able to progress the procurement beyond that point, which is now potentially exacerbated by the 2020 COVID-19 Pandemic impacts. Nonetheless, LIRR's target date to award the M-9A contract remains June 2020.

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 will have on ESA's RSD. In July 2019, however, ESA informed the PMOC that, based on conditions at that time, delivery of the first M-9A vehicle would not be until April 2023. That would be after MTA C&D's Target (February 14, 2022) and Public (December 13, 2022) RSD dates, but before the FFGA RSD date of December 31, 2023. If that occurs, MTA will need to determine how to supply vehicles from its existing fleet in order to begin LIRR service into GCT by either of its stated RSD dates. The revised service plan, which the December 2019 IPS indicates is now delayed until December 2020, will detail how this delay will be accommodated.

Concerns/Recommendations: 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 January 2020 MPR, MTA did not report any significant Real Estate accomplishments, but did note that Real Estate continued to work with the building owners at 270 Park Avenue and 415 Madison Avenue to progress their construction.

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

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

2.7 Community Relations

Status: The January 2020 MPR indicates that Community Relations continued to support ESA construction through numerous outreach and social media avenues throughout the month.

Observations/Analysis: The PMOC believes that MTA C&D Community Relations staff continued to perform its outreach campaign in an entirely effective manner.

Concerns/Recommendations: The PMOC has no concerns about or recommendations for MTA C&D Community Relations at this time.

3.0 PROJECT MANAGEMENT PLAN AND SUB PLANS

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

Observations: MTA C&D plans to update several PMP sections for the next revision, including: Management, Procurement, Operational Readiness, and Systems Testing and Startup. MTA C&D is planning to prepare the draft of the next revision to the PMP based on recent revisions to a number of PMP Sub-Plans.

3.1 PMP Sub-Plans

MTA C&D is updating several of the PMP Sub-Plans to document changes called for by the implementation of the MTA C&D 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 MTA C&D that they are acceptable.

MTA C&D had previously 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 MTA C&D to incorporate its current updates and commence with a subsequent revision that addresses changes resulting from the MTA C&D Six-Point Plan for ESA. MTA C&D issued updated drafts for the CMP, SMP, and RMP in December 2018, the CPP in January 2019, and the TCC Plan in May 2019. During December 2019, the PMOC returned review comments to the FTA on the revised SMP, CMP, RMP and TCC Plan.

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

Concerns and Recommendations: MTA C&D 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. MTA C&D plans to create a new procedure for the management processes being used by the newly formed PMO Analytics Group.

Observations: MTA C&D submitted the new ESA Procedure PIP 4.01 during Q1 2019.

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

4.0 PROJECT SCHEDULE

4.1 Integrated Project Schedule

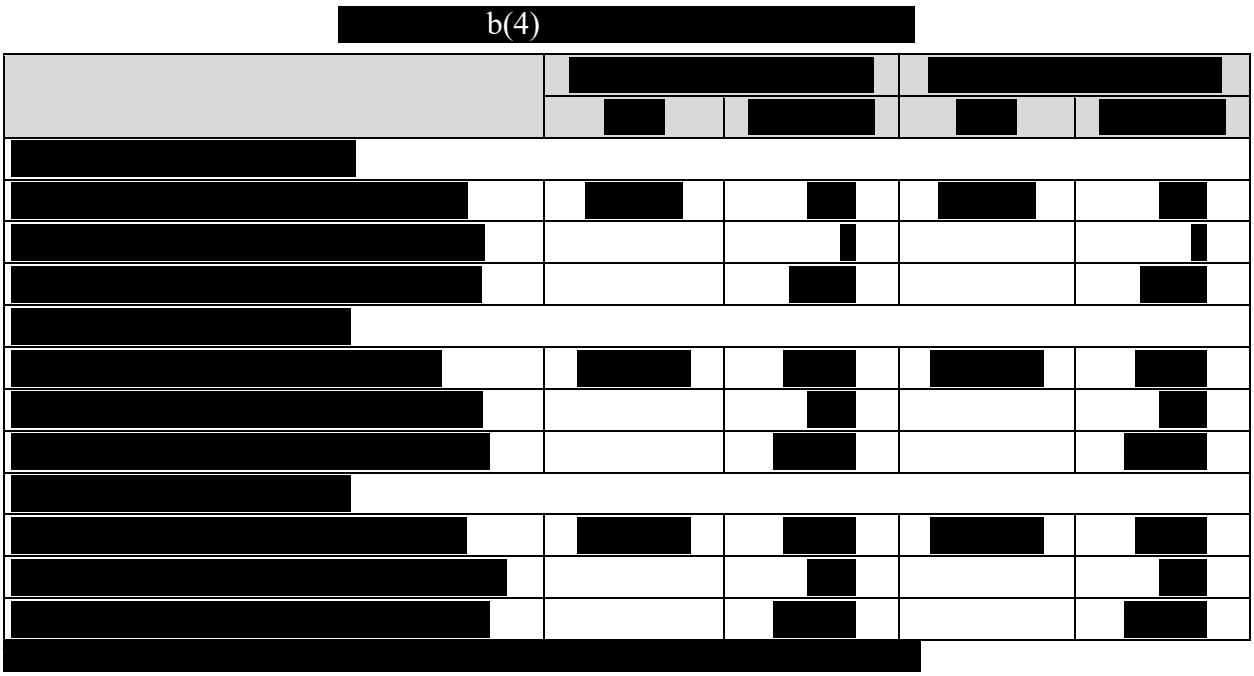
The schedule information in this report is based on IPS 126 (February 1, 2020) and the IPS Progress Report. The forecast for the Target Revenue Service Date (RSD) improved by approximately 2 months to February 14, 2022, and the Public RSD remains December 13, 2022. MTA C&D continues to use the alternative IPS procedure for preparing IPS schedules.

In IPS 126, the Manhattan/Systems work path has no float and it remains the most critical path of the ESA program. As shown in Appendix F, ESA Critical Path Chart, the critical paths through the three main ESA program work areas are: 1) Manhattan/Systems (no float); 2) Harold Interlocking (106 calendar days float); and, 3) Queens (154 calendar days float). The PMOC notes that float on the Manhattan/Systems and Queens (Mid-Day Storage Yard) paths is measured to the start of LIRR testing and commissioning, and that float on the Harold Interlocking path is measured to the final phases of LIRR testing and commissioning.

The Target RSD improved to February 14, 2022 from the previous forecast of April 18, 2022. The Public RSD remained as previously forecast on December 13, 2022. The program schedule contingency increased to 303 calendar days to the Public RSD, which is 691 days less that the 994 days established in the July 1, 2014 IPS re-baseline.

Table 4.1 shows dates, remaining durations and contingencies for the Target, Public, and FFGA Revenue Service Dates.

b(4)



4.2 Primary Critical Path

IPS 126 forecasts the finish date for the Manhattan/Systems longest path to be June 29, 2021 (no float), approximately 2 months sooner than as forecast in IPS 123. The IPS 126 critical path has changed entirely since IPS 123. The critical path now includes only contract CS179. The path is now driven by completion of rail systems and handoff to LIRR for operational testing and commissioning. The completion of the concourse and related public systems are no longer on the critical path but they remain near critical.

The Manhattan/Systems path in IPS 126 has shifted back to the track and rail road systems work that comprised the path in IPS 120, rather than the buildout and systems testing in the GCT concourse. This is due to MTA C&D prioritizing work leading to the turnover of rail systems (track, signals, traction power, etc.) to LIRR for their testing and training. The change resulted in the rail system activities supplanting the GCT concourse buildout and testing on the critical path.

The critical path starts with CS179 development of the Centralized Traffic Control (CTC) Train Information Monitoring and Control System (TIMACS) including system scoping, design, test procedures, and plans; and then followed by deployment and installation. The path then moves to CS179 two-way radio integration testing with LIRR, FDNY, NYPD, and MTAPD; and then uplink/downlink coverage tests. The Manhattan/Systems path ends with completion of all track IST on June 29, 2021. From this point the program longest path runs through two phases of LIRR testing and commissioning and concludes with the Target RSD on February 14, 2022, which is approximately two months earlier than in IPS 123 and increasing program float to approximately 10 months to the public date for the start of ESA revenue service.

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 126.

Table 4.2 – Primary Critical Path

Activity Name	Duration	Start	Finish
CS179 - System Package 1 – Facilities Systems			
CTC TIMACS Scoping, Design, FDR approval	376	13-Jun-19	22-Jun-20
CTC TIMACS test procedures, plan and approval	122	22-Jun-20	21-Oct-20
CTC TIMACS sys. tests, deployment and installation	105	21-Oct-20	2-Feb-21
Radio Integration tests: LIRR, FDNY, NYPD, MTAPD	29	2-Feb-21	2-Mar-21
Radio uplink/downlink tests; complete track IST	120	2-Mar-21	29-Jun-21
Program Activities			
LIRR -Test and Commission (track transition) †	107	29-Jun-21	13-Oct-21
LIRR -Test and Commission ‡	125	13-Oct-21	14-Feb-22
Target Revenue Service Date			14-Feb-22
b(4) [redacted]	[redacted]	[redacted]	[redacted]
Public Revenue Service Date			**13-Dec-22**

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

Contracts CM007, CM014B, CS086, CS084 and CS179 have other near critical work, in addition to the critical work described above. It is anticipated that the critical path will continue to shift among the various scope elements of these contracts in coordination with their progress.

The MTA C&D inserted coordination point milestone activities in the ESA IPS to track and monitor the progress of inter-contract coordination. While MTA C&D added milestones to match

the syndicated Incremental IST schedule agreed to for CS179 and CM014B, milestones for other contracts have yet to be been added. For IPS 126, MTA C&D reported that 36 of the 53 coordination points scheduled for completion in January 2020 were not achieved but slipped an average of one month, and the float on each of these milestones is in excess of 6 months. Of the 17 milestones that were reported complete, only one was completed in January 2020 and, the remaining 16 that were reported complete had actually been achieved anytime from a few months to a year before this reporting period.

The effectiveness of using coordination points to monitor progress is greatly reduced with their forecast completion dates slipping month-to-month. The lack of progress through coordination points indicates that more concurrent work than planned will be needed during the period leading to and through Incremental IST, which may complicate and impede progress. (Refer to Appendix F, ESA Coordination Point Changes.)

Sub Program Longest Path – Harold Interlocking

IPS 126 shows that the Harold Interlocking work path remains the second longest ESA program path. The Harold Interlocking work path concludes on June 28, 2021, in IPS 126, the same as in IPS 123. The float on the Harold path has been reduced to 106 calendar days (3 months less than IPS 123). The Harold Interlocking work path is the same as IPS 123 and begins with CH058A construction of the B/C structure slab and walls and work at the 39th Street bridge; track subgrade preparation, ballast, track and turnouts through March 2021. This is followed by LIRR force installation of switches, switch machines, signals and jumpers; CH063 catenary work; and finally LIRR force account cutovers in June 2021, as shown in IPS 126. At the completion of the Harold work path, there are approximately 3.5 months of float to LIRR testing and commissioning activities, at which point the path joins the ESA program critical path.

Sub Program Longest Path – Queens

IPS 126 shows that the Queens (Mid-Day Storage Yard) path is the least critical program path. The finish date for the Queens path is January 25, 2021 in IPS 126, one month later than it was IPS 123. The scope that comprises the Queens path starts with the CQ033 signal cable pulling and termination; and, commissioning for MID-6 CIL and battery hut. This is followed by 5 months for IST leading to CQ033 substantial completion on January 2021, approximately one month later than in IPS 123. From the end of the Queens path there are approximately 5.1 months of float to the LIRR testing and commissioning activities 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 2Q 2020, 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	9/11/19A	3/6/20A	5/1/20	26 mos.	6/30/22

PMOC Observations, Analysis, and Concerns

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

1. 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 MTA C&D has agreed on the Incremental IST schedule with the CS179 and CM014B contractors, other Manhattan/Systems contract schedules have not yet been aligned with the CS179 and CM014B schedules, remain near critical, and may exert a significant influence on the critical path in the future. **[Ref: ESA-128-Sep17]**

2. The PMOC notes that MTA C&D has reported that the Schedule Contingency gained 2 months in IPS 126 and is now 303 calendar days, which is 27 days more than the 275 day minimum required FTA ELPEP schedule contingency. The ability of the MTA C&D to recover and hold 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.
3. Progress on CS084, Tunnel Systems Package 4 – Traction Power, is slow and is currently reported as 72.6% complete compared with as-planned progress of 100%. The PMOC observes that work on CS084 continues to be delayed each quarter. For substations still requiring equipment submittal approvals, fabrication is being delayed, impacting installation and energization. While many of the delays are being absorbed and/or mitigated in the schedule, float is being lost due to this important near-critical work. It is noted that MTA C&D continues working with the contractor to develop a realistic schedule. The PMOC believes that a revised schedule will incorporate equipment delivery delays that will push out milestone dates. The PMOC recommends that ESA continue analyzing options to recover the schedule with a focus on equipment submittals, layouts, major issues, and corrective measures.
4. The PMOC is concerned about the lack of progress in preparing for IST, as indicated by slippages to the coordination point milestone completion dates. While MTA C&D added milestones to match the syndicated Incremental IST schedule for CS179 and CM014B, milestones for other contracts have not yet been added. The slippages and high levels of float point to a reduction in the usefulness of the current coordination points to monitor progress. The lack of progress achieving coordination points indicates the need for more concurrent work than planned during the period leading to and through Incremental IST, which may complicate and impede progress.
5. The CM014B contractor's capability to complete the remaining 15% of work in the 10 months prior to the forecast SC in January 2021 is questionable. The PMOC believes that this is optimistic based on the contractor's historic construction performance.
6. The 2020 COVID-19 Pandemic is already impacting construction progress. Contract CS179's workforce, which currently controls the Program critical path, has experienced a reduction of more than half. Additionally, CS086 has temporarily not worked at GCT6 CIR due to this impact. CS086 is close to critical, and is expected to become critical in the near future as related to getting prepared for LIRR track systems testing and commissioning work.

5.0 PROJECT COST

5.1 Budget/Cost

In the ESA January 2020 MPR, MTA C&D reported that the ESA program is 82.6% complete compared to planned progress of 83.8% of the $11,133 million April 2018 baseline forecast. The report also shows that construction progress reached 87.1% complete compared with planned progress of 88.5%. Since the ESA July 2018 MPR, the PMT calculates summary construction progress as a percentage of the $8,014 million April 2018 construction baseline forecast. Individual

contract and force account package completions are calculated as a percentage of their current awarded value.

The MTA C&D established the revised budget of $10,178 million (excluding the rolling stock reserve and financing) for the ESA project in June 2014. In April 2018, MTA C&D forecasted the ESA program EAC at $11,133 million. In January 2020, the MTA increased the ESA program budgets by approximately $800 million to a total of $11,133 million, based on the December 2019 approval of the 2020-2024 Capital Program by the NY State Capital Program Review Board. 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, MTA ETPC, CBB
(Cost shown in millions)

Standard Cost Category	FFGA Dec 2006	June 2014 Project Budget	Amended FFGA	April 2018 MTA ETPC	Aug 2019 CBB	Sep 2019 CBB	Oct 2019 CBB	CBB / FFGA Var.	CBB / Amend FFGA Var.
10 Guideway and Track Elements	1,989	3,405	3,353	3,479.7	3,403	3,409	3,434	72.7%	2.4%
20 Stations, Stops, Terminals, Intermodal	1,169	2,238	2,327	2,473.6	2,378	2,378	2,382	103.9 %	2.4%
30 Support Facilities (Yards, Shops, Admin)	356.3	474.2	450.8	612.7	575	578	578	62.3%	28.3%
40 Site Work and Special Conditions	205.1	610.6	562.5	591.9	518	519	519	153.0 %	-7.8%
50 Systems	619.3	605.6	627.7	810.9	720	730	734	18.5%	17.0%
60 ROW, Land, Existing Improvements	165.3	219.4	192.2	241.0	162	162	162	-1.8%	-15.6%
70 Vehicles	494.0	672.9	879.5	209.9	15	15	15	-96.9%	-98.2%
80 Professional Services	1,184	1,975	1,809	2,446.5	2,233	2,256	2,256	90.5%	24.7%
[redacted] b(4)	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Subtotal	6,350	10,641	10,922	11,596	10,335	10,335	11,133	75.3%	1.9%
100 Financing Cost	1,036	1,036	1,116	1,116	1,116	1,116	1,116	7.8%	0.0%
Total	7,386	11,677	12,038	12,713	11,452	11,452	12,250	65.9%	1.8%

5.2 Project Cost Management and Control

In the ESA January 2020 MPR, MTA C&D reported that total construction progress reached 87.1% complete compared with planned progress of 88.5%. Since the ESA July 2018 MPR, the PMT calculates summary Construction progress as a percentage of the $8,014 million April 2018 construction baseline 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 includes the April 2018 baseline forecast. The chart reveals that cumulative construction costs are generally trending below the straight line projection for the April 2018 baseline forecast. The project's progress continued to run behind the cost curve during the past 6 months and it is currently approximately $90 million below plan. To remain on plan for the April 2018 baseline forecast

expenditures, the ESA program needs to close the current gap and then maintain a monthly average of approximately $55.8 million to 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. CM007, CS084, and CS086), executing the Incremental IST program, and ensuring that the reconstruction of 270 Park Avenue proceeds as planned. The PMOC is concerned about the MTA C&D's ability to sustain the planned rate of construction spending, which could impact the timely achievement of revenue service.

Table 5. 2: Plan vs. Actual Construction Cash Flow

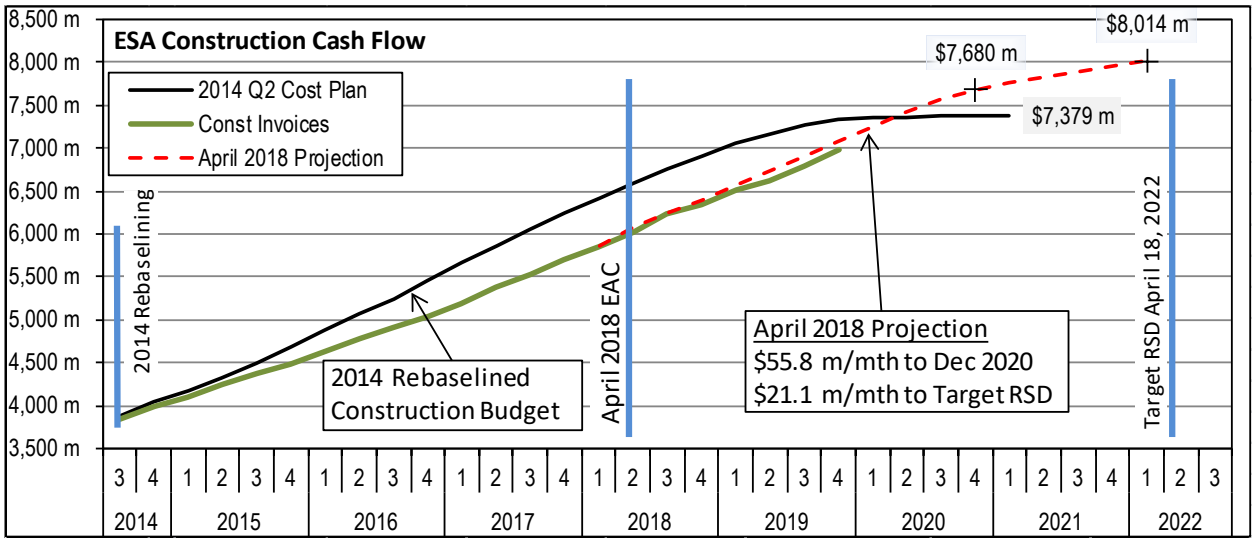


Table 5.3: Project Budget and Invoices

(Cost shown in millions)

Elements	Baseline Total Budget June 2014	April 2018 MTA ETPC	January 2020				Invoice Pct. of MTA ETPC
			Current Budget (interim)	Actual Awards	Invoiced Costs	Invoice Pct. of Budget	
Construction	**7,379.3**	**8,014.1**	**7,693.1**	**7,457.6**	**6,983.5**	**90.8%**	**87.1%**
Soft Cost Subtotal	**2,157.5**	**2,650.2**	**2,380.6**	**2,331.7**	**2,214.6**	**93.0%**	**83.6%**
Engineering	720.6	871.8	817.7	789.7	769.5	94.1%	88.3%
OCIP	282.6	457.4	384.2	384.2	383.5	99.8%	83.8%
Project Management	972.2	1,117.3	1,053.8	1,037.8	943.0	89.5%	84.4%
Real Estate	182.1	203.7	124.9	120.0	118.6	94.9%	58.2%
Rolling Stock†	665.0	665.0	7.5	2.8	0.3	3.9%	0.0%
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Subtotal	**10,640.8**	**11,596.3**	**11,133.3**	**9,792.1**	**9,198.4**	**82.6%**	**79.3%**
Financing	1,036.0	1,116.5					
Total	**11,676.8**	**12,712.8**					

Note: † MTA ESA Rolling Stock Reserve of $463 million added to June 2014 Budget and April 2018 MTA ETPC and Current Budget to account for the cost of 160 revenue vehicles.

5.3 Change Orders

Table 5.4 lists the 17 contract modifications with magnitudes greater than $100,000 that were executed during the period from November 2019 through January 2020. The net increase of these

modifications was $30.5 million. The PMOC reviewed several of these change orders and found that MTA C&D change order procedures were followed. Refer to Appendix N for further information.

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

Contract	Description / Mod No.	Amount
	November 2019	
CH058A	Installation of N1 3rd Rail Conduits (mod. 8)	135,000
CM014B	CM014B ATC Panels - RFI 1796 (mod. 279)	300,764
CM014B	MNR - 46th Street Connector Modification for Ladder N (mod. 197)	1,000,000
CM014B	Replace B20 & B30 65kVA Breakers with 85kVA Breakers (mod. 267)	2,778,177
CM014B	Use of 50th Street Freight Elevator (mod. 288)	137,624
CQ033	Dutchkills Catch Basin (mod. 53)	350,000
CS179	55th Street Level Floor in ConEdison Rooms (mod. 285)	100,000
CS179	Additional Blue Light Stations (mod. 277)	366,174
CS179	Fire Alarm Vent Plant Modifications (mod. 271)	300,316
CS179	Transfer of Painting, CM005, CM006, CQ032 (mod. 276)	669,000
	December 2019	
40-01R	Additional Funding for CPS (2019) (mod. 166)	22,700,000
CS179	Yard Service Building Demark Room (mod. 292)	233,520
	January 2020	
CM007	CM005 (Lower Level) Traction Power Monument Remediation (mod. 102)	233,485
CM007	Lower Level - Upper Platform Sump Pump Access (mod. 95)	324,746
CM007	SWP Head Panel Redesign (mod. 94)	461,728
CS179	12th Street Service Stairwell – Door Hardware (mod. 305)	249,800
CS179	Final Settlement of Dispute Notice #8 - B09 Overall Coordination Study - Calculation Failure (mod. 283)	125,000

5.4 Project Funding

The ESA budget of $11,133 million was included in the MTA 2020-2024 Capital Program and was approved by New York State Capital Program Review Board in December 2019. In January 2020, the MTA updated program budgets to include the approximately $800 million that was requested for the ESA program. The MTA has an additional $463 million available in an ESA Rolling Stock Reserve.

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.

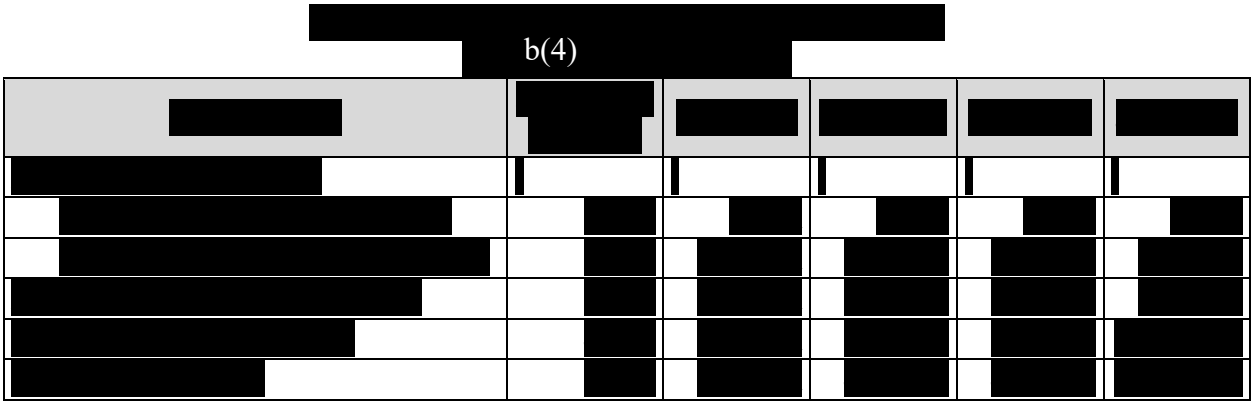
Local Funding: The budget for Local Funding is $8,434.6 million, of which $6,499.7 million was expended through February 1, 2020. Financing costs are funded separately from other local sources.

5.5 Project Cost Contingency

The ESA January 2020 MPR reports that the total budgeted contingencies are $1,204.5 million, which includes $1,052.1 million as unallocated contingency and $152.5 million as allocated contingency. Refer to Table 5.5. The PMOC tracks the ESA contingency levels in comparison with the MTA C&D April 2018 contingency forecast and ELPEP commitments as shown in Appendix R. The PMOC notes that the plot of the MTA C&D contingency forecast shows a dip

below the ELPEP minimum before Hold Point 2 in the fourth quarter of 2020. The PMOC is not concerned about this because the forecast was based on MTA C&D's conservative assumption that additional funding would be available at the end of 2020. As can be seen in the chart, the additional funding provided to the ESA program in the 2020-2024 Capital Program has increased the contingency to a level substantially above the fourth quarter 2020 projection. The PMOC will continue to monitor ESA program contingencies and commitments. The chart tracking contingency levels is shown in Appendix R.

In the period from November 1, 2019 to February 1, 2020, unallocated contingencies were increased by $795.7 million and allocated contingencies were increased by $32.3 million. The total contingency amount is now significantly higher than the baseline forecast that was presented to the MTA board in April 2018 due to the additional funds provided by the 2020-2024 Capital Program. The high contingency value reflects MTA C&D's strategy of holding significant amounts as contingencies and then releasing them to specific projects on an as-needed basis, commensurate with construction progress.



Concerns and Recommendations:

1. The ESA budget of $11,133 million was included in the MTA 2020-2024 Capital Program and was approved by New York State Capital Program Review Board in December 2019. In January 2020, the MTA updated ESA program budgets to include the approximately $800 million that was requested for ESA. The MTA C&D cost plan forecasted drawing contingencies down to approximately $117 million at the end of December 2020, which would have been the scenario if the Capital Pan had not been approved until late in 2020. The PMOC is not concerned about the forecasted contingency dip because the ESA program received additional funding in the 2020-2024 Capital program and construction and contingency budgets have now been restored.
2. MTA C&D is working with CS084 and CM007 to incorporate the schedule changes to resolve the major open cost and schedule issues and to incorporate Incremental IST. The implications of the incremental IST schedule on contracts VS/CS086 and CQ033 are yet to be determined and the PMOC believes that the cost increases could be significant. The MTA C&D reported that they and the CM007 contractor have agreed on the cost for the contract modification.
3. Ongoing and possible future delays may result in increasing costs for the following contracts:
   - CS084 – the late completion of designs has delayed the fabrication of some traction power equipment; transformer test failures; and, resolution of potential damage to some of the 26 inductive reactors provided by MTA C&D.

- VS086 and CS086 – incorporation of Positive Train Control into the ESA signal system and technology issues.

4. The MTA C&D's strategy of holding funding as contingencies rather than funding contract budgets to their projected value results is an overstatement of both the contract completion percentages and the total value of unallocated contingencies. While this strategy retains maximum flexibility for MTA C&D, 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.

5. The 2020 COVID-19 Pandemic is likely to have significant impacts to the MTA rail transit agencies and may adversely impact the ESA program. Due to unprecedented reductions to ridership that MTA is experiencing on its transit systems (NYCT Subways, MNR, and LIRR) and uncertainties in the characteristics of a recovery, the PMOC believes the ensuing unforeseen financial needs are likely to impact many aspects of the ESA program and the MTA Capital Plan. The impacts to the ESA program may range from increased contractor costs to delays in receiving the additional funding as the MTA, NYC, and New York State make necessary fiscal decisions to stabilize the areas for which they are responsible.

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 MTA C&D. The PMOC has, however, noted improvements for Amtrak ET support during Q4 2018 and continuing through Q1 2020.

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, MTA C&D 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 systems testing, start-up, and commissioning for Tracks A, B/C, and D could be delayed and potentially impact the MTA C&D RSD. There is less likelihood, however, that this could impact the FFGA ROD of December 2023 that is 12 months later than the MTA C&D 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 in Harold Interlocking to provide support for LIRR's system-wide, i.e., non-ESA, PTC work

currently underway and required to meet the FRA mandated December 31, 2020 deadline for installation and activation.

b) MTA C&D 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 subsequently 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 September 2019 based on some incomplete design as well as outstanding LIRR items required for completion of the additional scope of work for the three contracts noted below. 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 notes that this continued delay increases the schedule risk to the three cited ESA contracts and may also require modifications to the final CS179 Integrated System Testing plan and schedule. MTA C&D has already acknowledged that the contract modification for incorporation of PTC requirements will impact the substantial completion dates for Contracts VS086, CS086 and CS179. Due to continuing delays to completion of the PTC design by LIRR, MTA C&D is now planning to complete installation of PTC after completion of the base signal system under VS086 and CS086, and this will delay substantial completion of both ESA contracts.

Capital Funding Risk

The ESA budget of $11,133 million was included in the MTA 2020-2024 Capital Program, which was approved by New York State Capital Program Review Board in December 2019. In January 2020, the MTA updated ESA program budgets to include the additional funding that was requested for ESA. The PMOC recognizes that the MTA has sufficient budgets for the ESA program and no longer foresees a funding risk. Therefore, the PMOC Concern in Section 7.0 will be removed. **[Ref: ESA-127-Jun17]**

ESA Vehicle Risk

During the July 2019 Cost/Schedule meeting, ESA informed the PMOC that it was apparent that no new M-9A vehicles could be procured on time to support ESA's Target RSD. Since that time, although there has been significant LIRR effort to progress the procurement, no tangible progress has been made. As a result, although viable proposers provided their Best and Final Offers in January 2020, no selection or contract award was made through March 31, 2020. Therefore, the PMOC believes that the ESA Vehicle Risk has been realized and that MTA will have to provide vehicles for ESA opening day from its existing fleet of vehicles.

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 72.6% complete (actual) vs. 100% as- planned; correction of as built out-of-tolerance track monuments increases delay risk.
- Contract CM014B is reported at 87.8% complete (actual) vs. 91.9% as-planned.
- Due to late completion of the LIRR's final design for PTC, there will be additional schedule delays to the ESA systems contracts related to signals.
- Adequate schedule progress for executing the finalized Incremental IST plan.
- The 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. This

work is now reported two months late. Potential 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 MTA C&D-retained risk.

Due to contractor work site time and access constraints, there is very limited opportunity for the contractors to make up the time lost to interface delays. Should delays continue to accumulate, a meaningful recovery would likely not be possible.

JP Morgan Chase Redevelopment at 270 Park Avenue

The foundation and substructure systems required for the planned new JP Morgan Chase (JPMC) building at 270 Park Avenue may significantly impact the ongoing construction of the new LIRR Concourse at GCT. The foundations/substructures for the new office tower at 270 Park Avenue will be located at the northern end of the LIRR Concourse. This has required demobilization of the ESA Contract CM014B in Zone H4 in October 2019 followed by mobilization of the 270 Park Avenue owner's construction contractor to build the new foundations/substructures and then complete the balance of the ESA work scope in that part of the LIRR Concourse.

During Q1 2020, significant delays to the new foundation/substructure work progress became evident:

- JPMC has struggled to complete designs and respond to MTA C&D review comments in support of the approved construction schedule.
- Scheduled MNR track outages for JPMC construction work were missed due to late JPMC design submittals.
- JPMC's construction contractor did not meet the milestone to start construction of the caissons on November 22, 2019 and this work did not start until March 21, 2020**.**

MTA C&D/ESA has developed a Contingency Plan, as part of the Construction Agreement, which would be triggered by a significant JPMC delay in advancing the work that could delay the ESA Revenue Service Date. A significant element of the Contingency Plan is the requirement for JPMC to provide temporary pedestrian corridors through the JPMC construction sites to allow full planned use of the LIRR Concourse for revenue service. This would complicate later completion of the remaining ESA work for the LIRR Concourse in the affected area(s). This contingency plan has not yet been invoked and JPMC is preparing a recovery plan for MTA/MT C&D approval. **[Ref.: ESA-135-Mar20]**

The PMOC does note that MTA C&D had earlier advised that the current CS179 Substantial Completion date of June 30, 2021 will be delayed as a result of construction of the new foundations and substructures and the associated extended systems testing by CS179.

2020 COVID-19 Pandemic

During Q1 2020, the global COVID-19 pandemic became the top medical, social and economic challenge in the United States. This situation is expected to have significant cost and schedule impacts to the completion of the ESA Program. As of March 31, 2020, the following key impacts have been noted:

- Local testing of MTA C&D has enacted a Reduced Activity Work Plan for 3rd Party Work. The Plan identifies essential work, based on ESA program schedule critical needs, such as facility power energization, communications, tunnel ventilation, CM014B chillers and others. The work plan is currently updated weekly and will be in effect indefinitely until MTA, NYS

and CDC restrictions are eased. Any associated cost entitlements are undetermined at this time.

- The CS179 contractor has reduced its overall manpower from 260 people per day to 120 people per day to provide for "social distancing". The PMOC notes that Contract CS179 is on the Manhattan/Systems schedule critical path for the ESA Program. Some equipment systems are being delayed to allow for "social distancing".
- Fire alarm installation work in C08 substation location is being delayed to allow for "social distancing" with CS084 contractor who is also working in the substation.
- Local testing of some equipment systems is being delayed to allow for "social distancing".
- CQ033 construction contractor stated during its last progress meeting that it has reduced field force size by 40% due to the situation; contractor management staff reduced by 50%.

The approved 2020-24 Capital Plan includes $800 million of additional funding needed to complete the ESA Program by December 2022. Due to unprecedented reductions to ridership on the MTA transit systems (NYCT Subways, MNR and LIRR) and uncertainties in the characteristics of a recovery, the PMOC believes that this will introduce significant unforeseen financial needs that are likely to impact many aspects of the 2020-24 Capital Plan and may impact the expected additional funding for the ESA Program. **[Ref.: ESA-136-Mar20]**

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 2 years, 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. The PMOC returned review comments to the FTA during December 2019.

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 January 2020 as the Q4 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; ESA budget approved by MTA, September 2019; NYS governor approved the Capital Plan, January 2020 and ESA budgets adjusted; new risk in Q1 2020 based on 2020 COVID-19 Pandemic);
    2. Recovery of lost time due to significant schedule delays on CM014B and CS084;
    3. Successful execution of multiple hand-off interfaces across 6 major 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 March 2020);
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 MTA C&D 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 MTA C&D 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.
13. Correction of out-of-tolerance and unacceptable as-built conditions: traction power track monuments built under 3 earlier contracts; rail installed in tunnels by CM007.
14. 2020 COVID-19 Pandemic cost and schedule impacts.

6.3 Risk Mitigations

Current Risk Mitigation Efforts:

The PMOC notes that the PMT has implemented mitigation strategies for a number of the recent and 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; MTA C&D 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 MTA C&D president's ESA Six-Point Plan to reduce future risk.
- Foundation/substructure systems required for the planned new JPMC building at 270 Park Avenue will impact the ongoing ESA construction of the new LIRR Concourse at GCT. MTA, MTA C&D-ESA and JPMC efforts over the last 18 months has resulted in the Memorandum of Understanding and the Construction Agreement that

minimizes changes to ESA designs, minimizes the schedule impacts to the ongoing ESA construction of the LIRR Concourse at GCT, and significantly reduces the cost risk to MTA/MTA C&D.

Concerns and Recommendations

1. The PMOC recognizes that MTA C&D 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 MTA C&D and MTA to assist with resolution of outstanding issues with Amtrak and LIRR. Amtrak support for Harold third-party contracts has continuously improved since 2018 to the point that the PMOC no longer considers it to be a significant issue. As a result, the PMOC will close this issue. **[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 MTA C&D 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 MTA C&D-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. MTA C&D 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. This needs to be an ongoing process.

3. The PMOC remains 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. This concern has now increased due to the schedule delays experienced by JPMC and their construction contractor. **[Ref.: ESA-135-Mar20]**

4. During the September 2019 reporting period, a potentially significant problem was identified by MTA C&D. ESA will need to replace some portion of the rail installed to date by the CM007 contractor due to observed deterioration involving pitting and corrosion. The PMOC notes that this rail was provided by MTA C&D and installed by the CM007 contractor as part of the base scope of work. MTCC acknowledges that this is a significant problem and that MTA C&D will be completing a comprehensive review and analysis of the issue and will make recommendations for a solution. **[Ref.: ESA-134-Sep19]**

5. The cost and schedule impacts due to the 2020 COVID-19 Pandemic have the potential to become significant. The concern is that MTA and MTA C&D have very little control over the outcomes or timing of a construction recovery because of the nature of a public health crisis. **[Ref.: ESA-136-Mar20]**

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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
CIH	Central Instrument House (Amtrak designation)
CIL	Central Instrument Location (LIRR designation)
CM	ESA Construction Manager assigned to each contract
CMP	Cost Management Plan
CPOC	Capital Program Oversight Committee
CPRB	Capital Program Review Board
CPR	Contractor Proposal Request
CPP	Contract Packaging Plan
CR	Candidate Revision
CSTP	Comprehensive System Test Plan
CTC	Centralized Traffic Control
DCB	Detailed Cost Breakdown
DFF	Direct Fixation Fasteners
EDOR	Executive Director Operational Readiness
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
MCS	Master Coordination Schedule
MEP	Mechanical/Electrical/Plumbing
MNR	Metro-North Railroad
MTA	Metropolitan Transportation Authority
MTA C&D	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
RAPTT	Rail Activation Plan and Transition Team
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
TIMACS	Train Information Monitoring and Control System
WMATA	Washington Metro Area Transit Auth.
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 Finance Charges and Regional Investment Program
$12,038.5 million	Total Project Cost ($YOE) at Amended FFGA signed
$12,712.8 million	Total Project Cost ($YOE), as of April 2018 MTA ETPC, including costs for financing and revenue vehicles
$11,133.3 million	Total Project Current Budget ($YOE) excluding Finance Charges and Regional Investment Program.
$9,198.4 million	Total Expenditures (as invoiced) as shown in the ESA January 2020 MPR.
82.6%	Percent Complete, based on the ESA April 2018 baseline forecast of $11,133.3 million and invoices shown in the ESA January 2020 MPR.
$1,205.5 million	Total Project Contingency remaining (including $1,052.1 million identified by ESA as Unallocated Contingency, which includes ESA Reserves).

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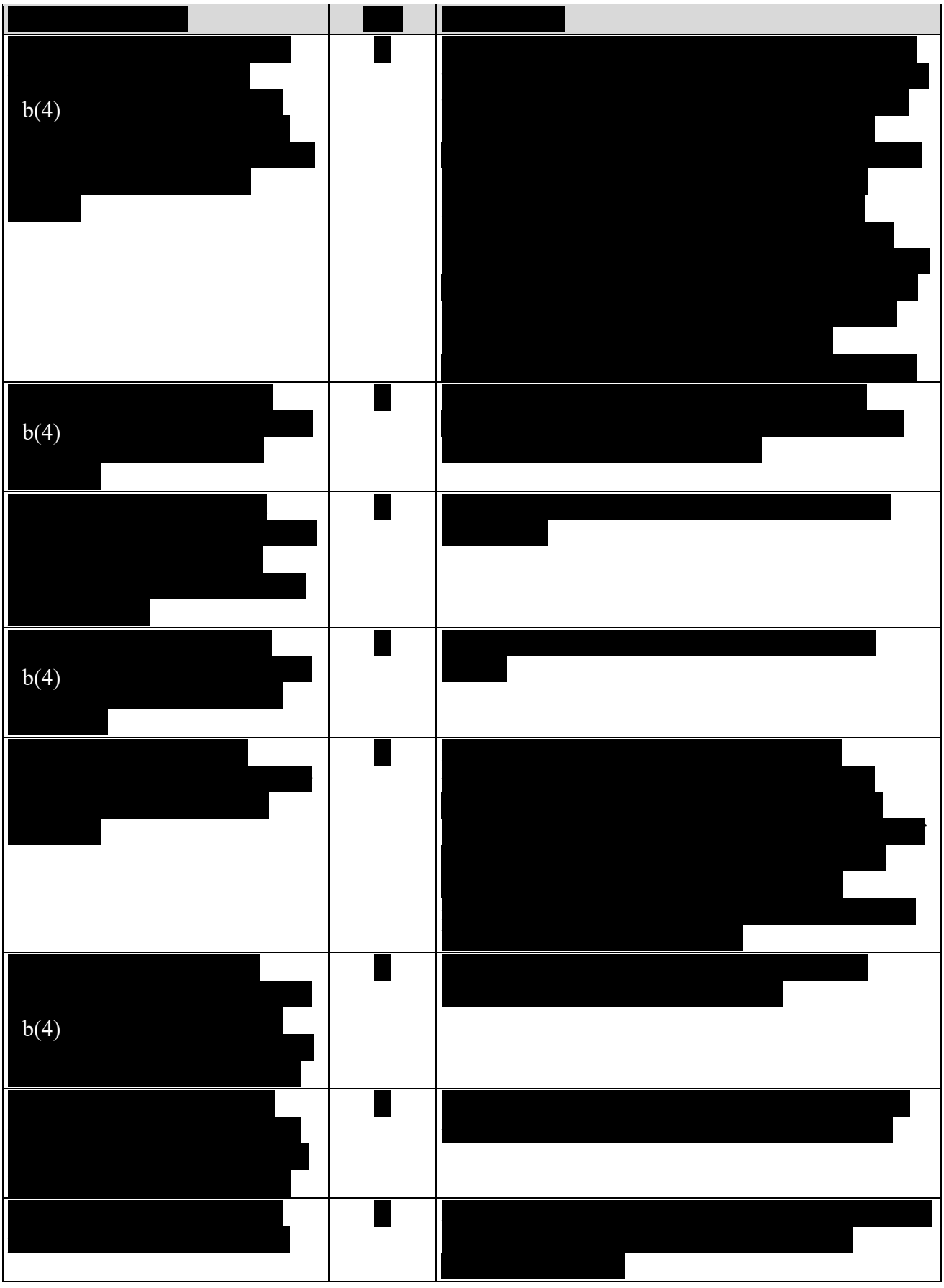
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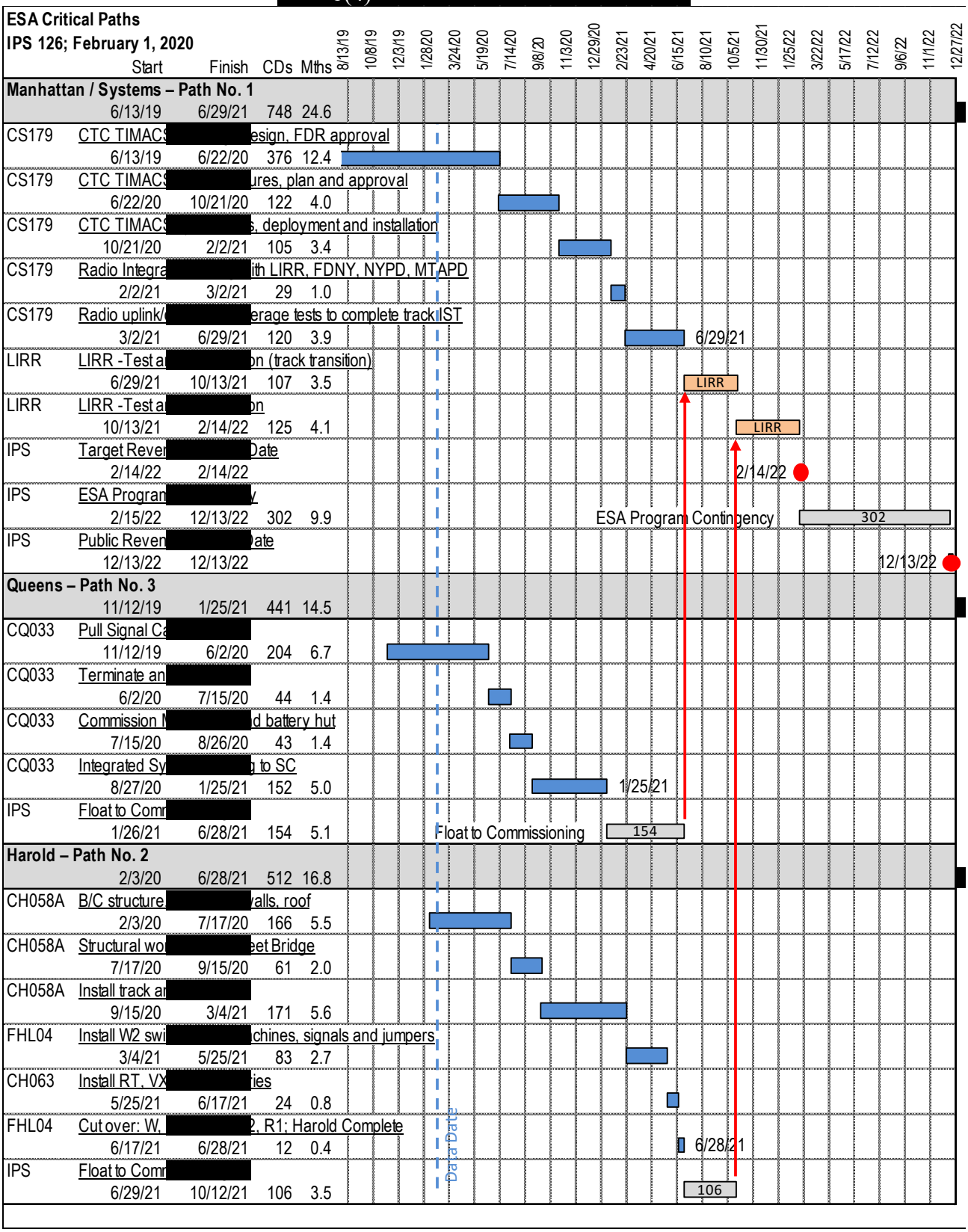
ESA Critical Paths
IPS 126; February 1, 2020
Start Finish CDs Mths
8/13/19 10/8/19 12/3/19 1/28/20 3/24/20 5/19/20 7/14/20 9/8/20 11/3/20 12/29/20 2/23/21 4/20/21 6/15/21 8/10/21 10/5/21 11/30/21 1/25/22 3/22/22 5/17/22 7/12/22 9/6/22 11/1/22 12/27/22
Manhattan / Systems – Path No. 1
6/13/19 6/29/21 748 24.6
CS179 CTC TIMACS esign, FDR approval
6/13/19 6/22/20 376 12.4
CS179 CTC TIMACS ures, plan and approval
6/22/20 10/21/20 122 4.0
CS179 CTC TIMACS s, deployment and installation
10/21/20 2/2/21 105 3.4
CS179 Radio Integra ith LIRR, FDNY, NYPD, MTAPD
2/2/21 3/2/21 29 1.0
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LIRR LIRR -Test a n (track transition)
6/29/21 10/13/21 107 3.5
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10/13/21 2/14/22 125 4.1
LIRR
IPS Target Rever Date
2/14/22 2/14/22
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IPS ESA Progran y
2/15/22 12/13/22 302 9.9
ESA Program Contingency
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IPS Public Reven ate
12/13/22 12/13/22
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Queens – Path No. 3
11/12/19 1/25/21 441 14.5
CQ033 Pull Signal Ca
11/12/19 6/2/20 204 6.7
CQ033 Terminate an
6/2/20 7/15/20 44 1.4
CQ033 Commission M d battery hut
7/15/20 8/26/20 43 1.4
CQ033 Integrated Sy g to SC
8/27/20 1/25/21 152 5.0
1/25/21
IPS Float to Comm
1/26/21 6/28/21 154 5.1
Float to Commissioning
154
Harold – Path No. 2
2/3/20 6/28/21 512 16.8
CH058A B/C structure alls, roof
2/3/20 7/17/20 166 5.5
CH058A Structural wo eet Bridge
7/17/20 9/15/20 61 2.0
CH058A Install track ar
9/15/20 3/4/21 171 5.6
FHL04 Install W2 swi chines, signals and jumpers
3/4/21 5/25/21 83 2.7
CH063 Install RT, VX ies
5/25/21 6/17/21 24 0.8
FHL04 Cut over: W, 2, R1; Harold Complete
6/17/21 6/28/21 12 0.4
6/28/21
IPS Float to Comm
6/29/21 10/12/21 106 3.5
Data Date
106

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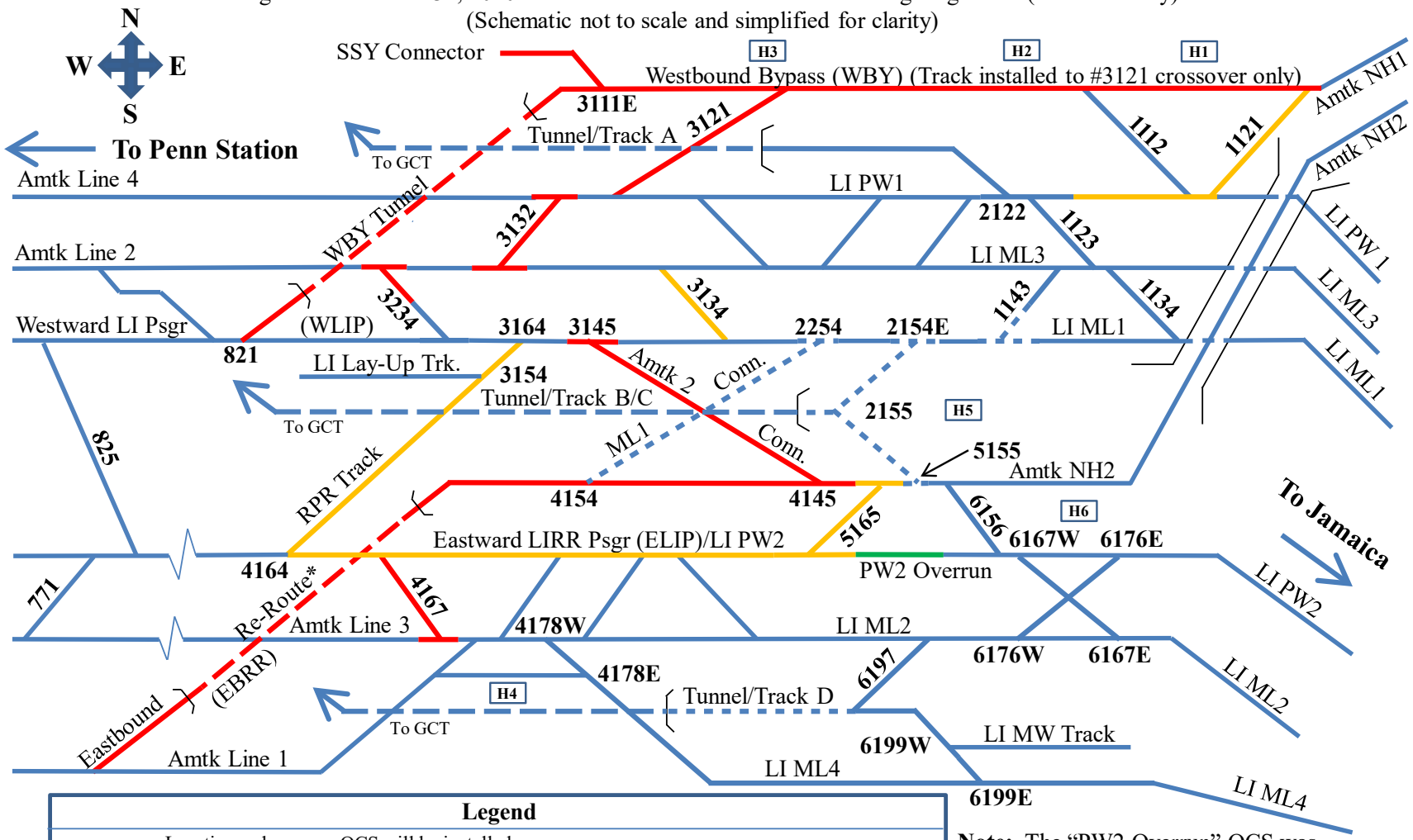
Appendix I: Harold Interlocking Progress Monitoring Schematic

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

Progress as of March 31, 2020 - based on ESA 14-4 Harold Interlocking Alignment (main line only)
(Schematic not to scale and simplified for clarity)



Legend

- Locations where new OCS will be installed
- Locations where new OCS was installed during Q1 2020
- Locations where OCS was previously installed by ESA
- Locations where new track/turnouts/crossovers will be built without OCS
- Locations where existing track/turnouts/crossovers were previously installed by ESA
- Locations where existing track/turnouts/crossovers will remain as is

Note: The "PW2 Overrun" OCS was installed as of March 31, 2020.

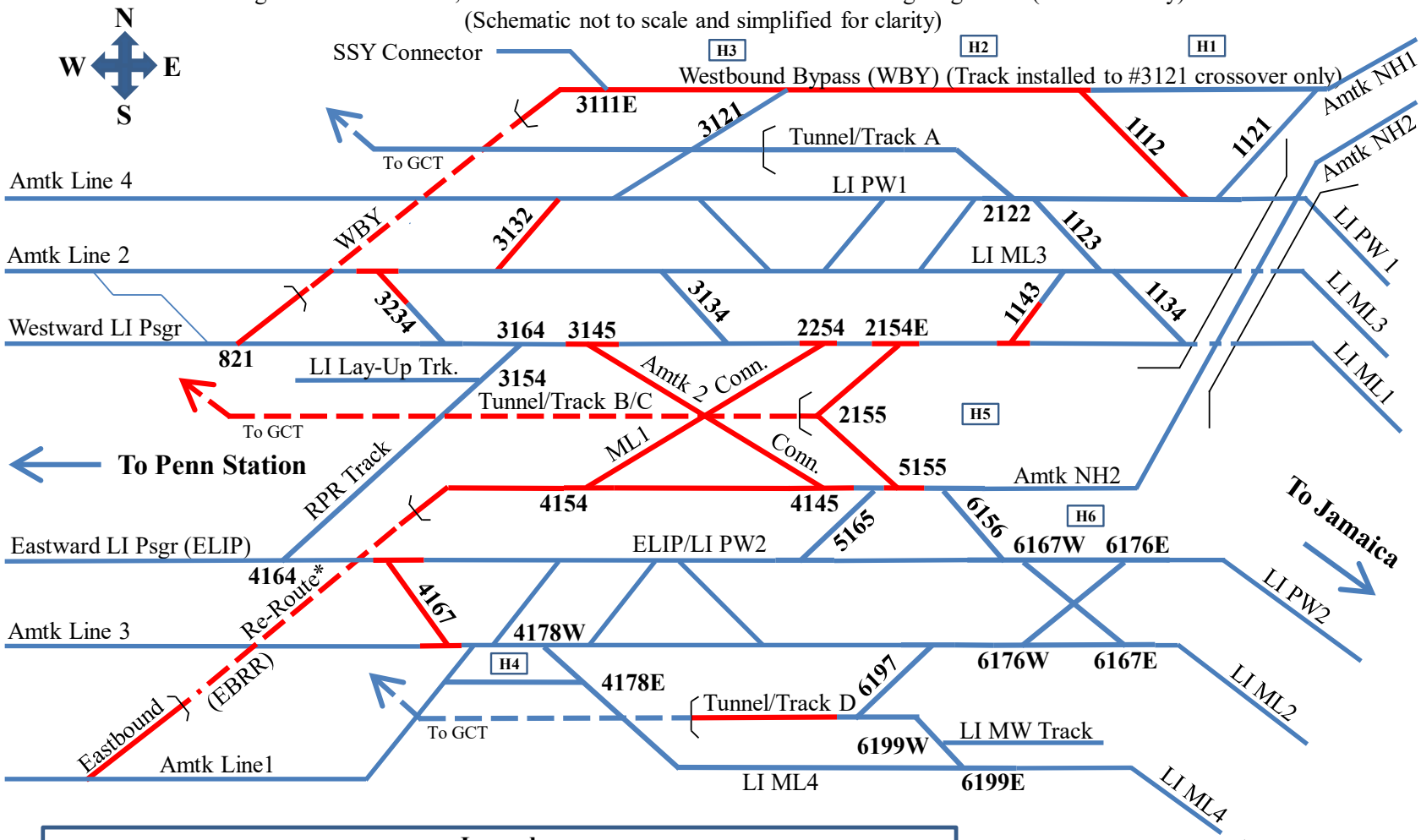
* Construction on EBRR began in October 2019.

Appendix I: Harold Interlocking Progress Monitoring Schematic

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

Progress as of March 31, 2020 - based on ESA 14-4 Harold Interlocking Alignment (main line only)

(Schematic not to scale and simplified for clarity)



Legend

- Locations for 3rd Rail and/or new track/turnouts/crossovers to be installed
- Locations where 3rd Rail with new track was installed during Q1 2020
- Locations where 3rd Rail and/or new track was previously installed
- Existing track/turnouts/crossovers to remain as is

Note: There was no new 3rd Rail installed or scheduled for installation in Harold Interlocking during Q1 2020.

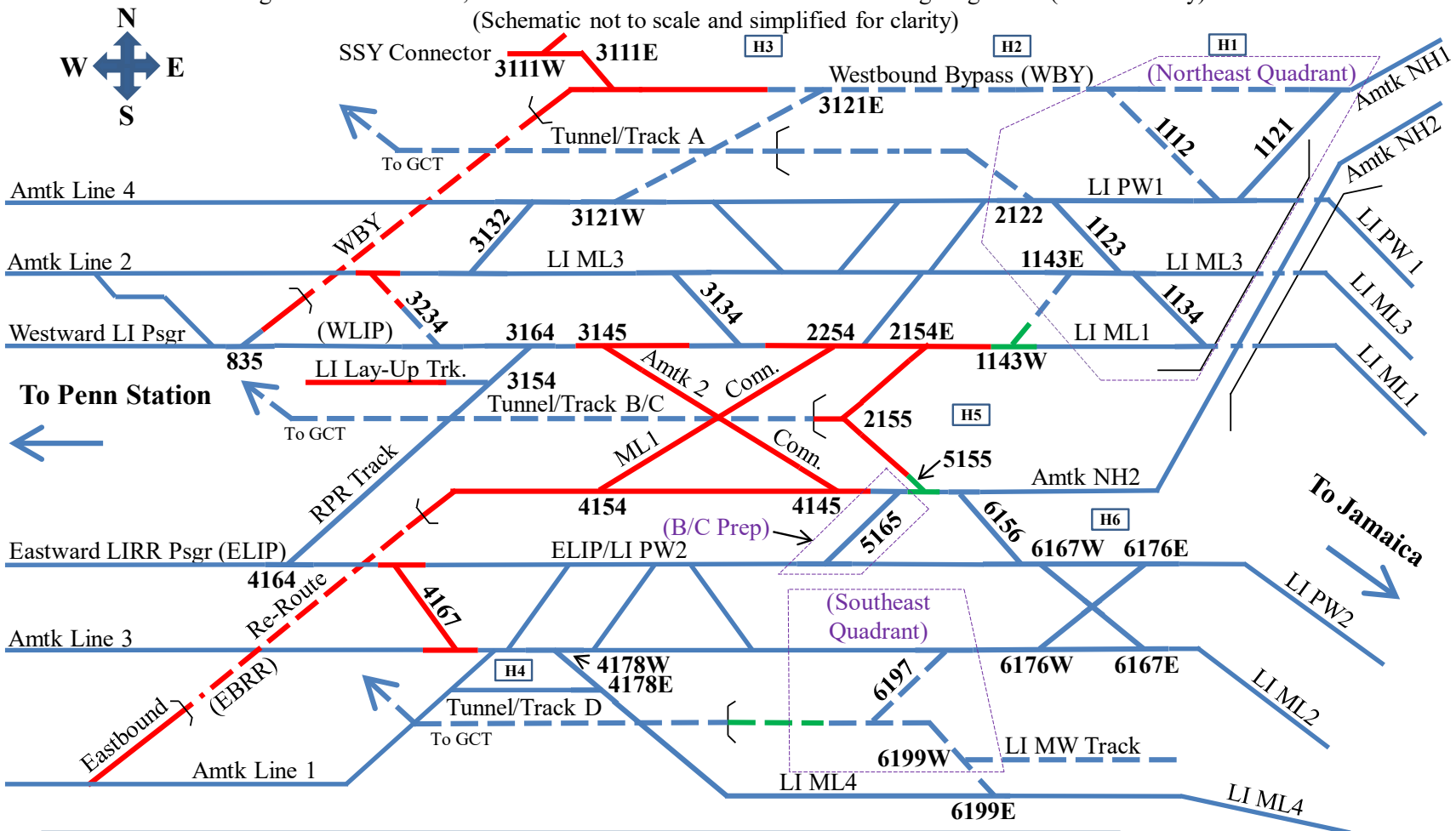
* Construction of EBRR began in October 2019.

Appendix I: Harold Interlocking Progress Monitoring Schematic

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

Progress as of March 31, 2020 - based on ESA 14-4 Harold Interlocking Alignment (main line only)

(Schematic not to scale and simplified for clarity)



Legend

- ESA turnouts/track to be installed
- ESA turnouts/crossovers/track installed during Q1 2020
- New Turnouts/Track previously installed
- Dashed blue or green, installed, not in service
- Existing Turnouts/Track to remain as is

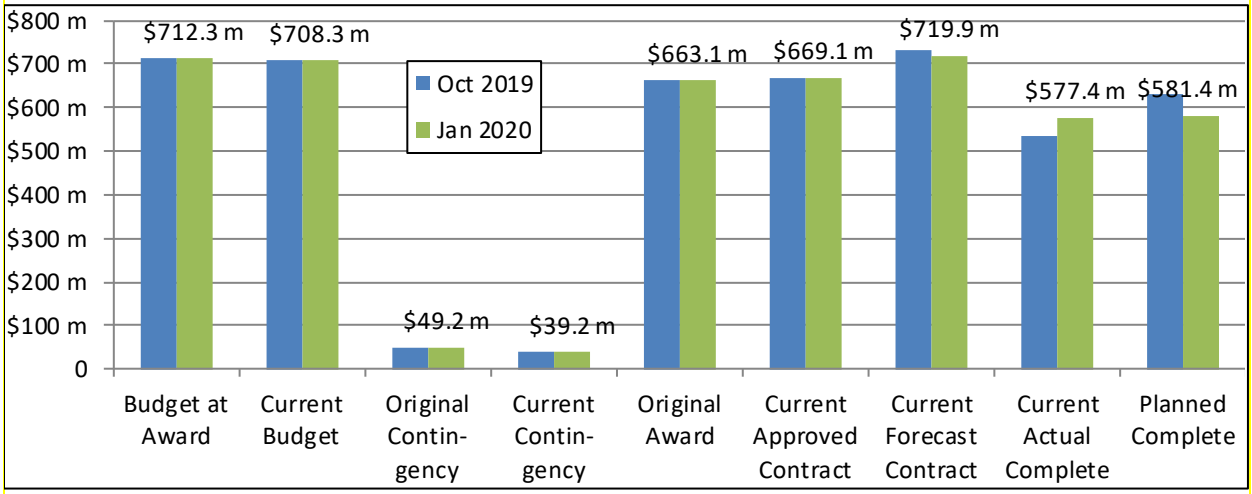
Note: The #5155 and #1143W Turnouts and remainder of Track D installed/constructed during Q1 2020.

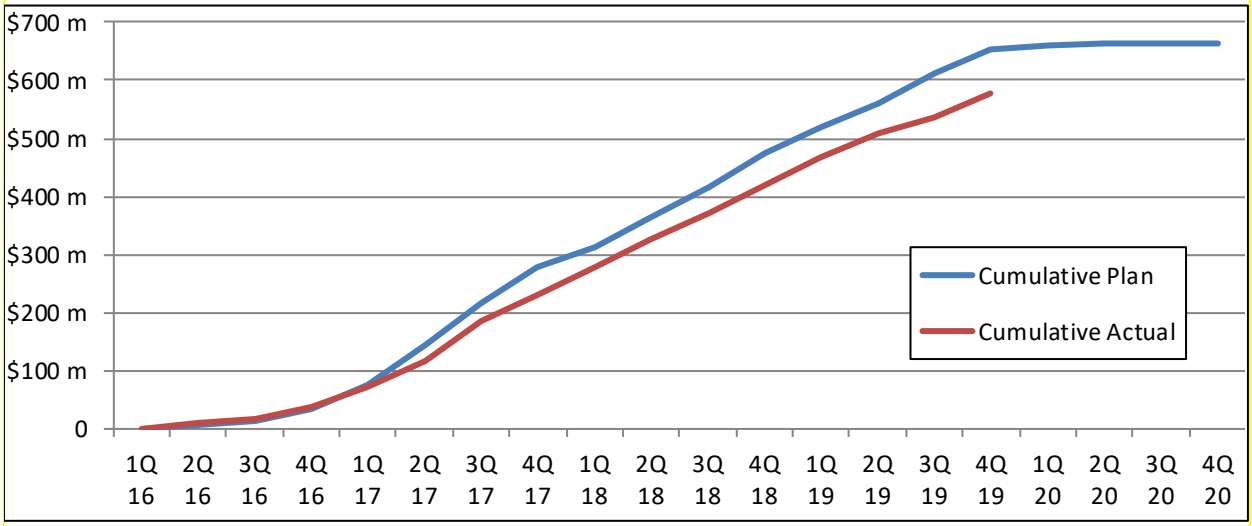
Appendix J – Cost Performance

CM007 GCT Caverns Jan 2020

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)
$712.3	$708.3	($4.0)	$663.1	$669.1	$6.0	$719.9	$7.6

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	
86.9%	86.3%	23.0%	1.9%	9.8%	1.6%	2.28% per month

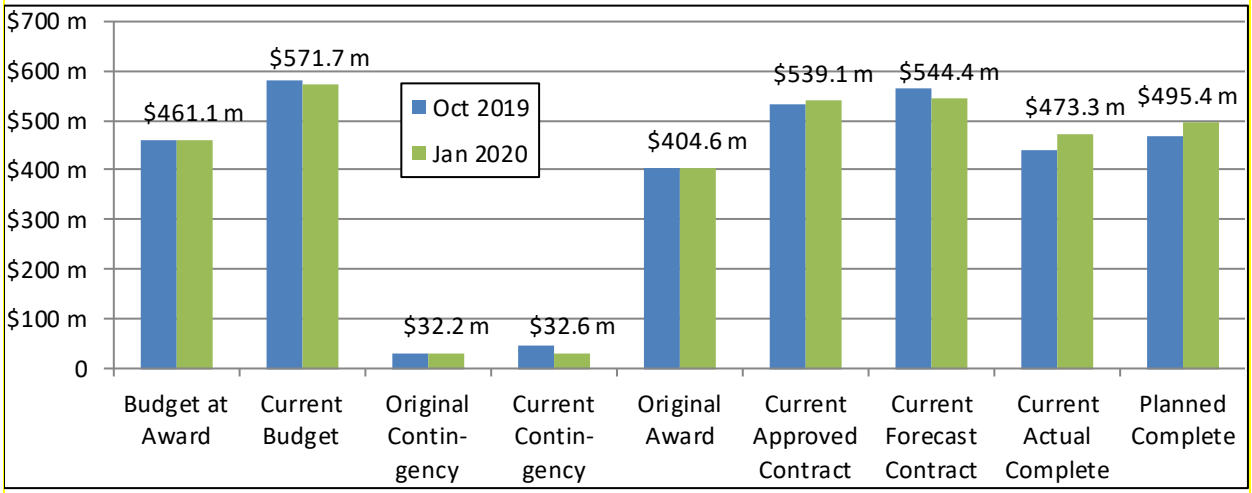


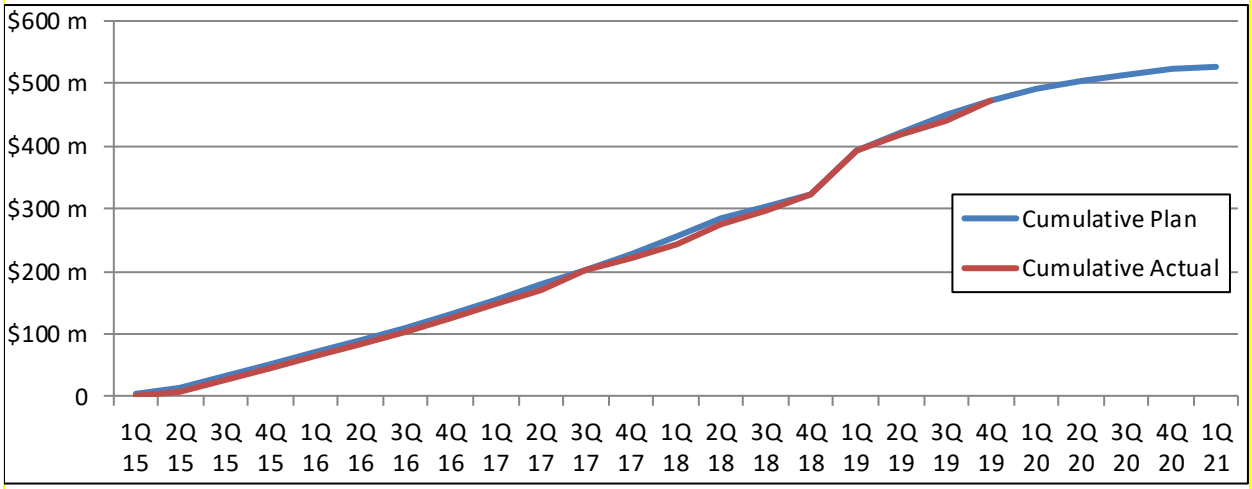


CM014B GCT Concourse & Facilities Fit Out Jan 2020

Budget at Award	Current Budget	Change from Original to Current	Contract at Award	Current Approved Contract	Change from Original to Current	Current Forecast	Change from Current Forecast to Budget at Award
		(2-1)			(5-4)		(7-1)
$461.1	$571.7	$110.6	$404.6	$539.1	$134.5	$544.4	$83.3

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	
91.9%	87.8%	18.9%	1.6%	8.9%	1.5%	1.02% per month

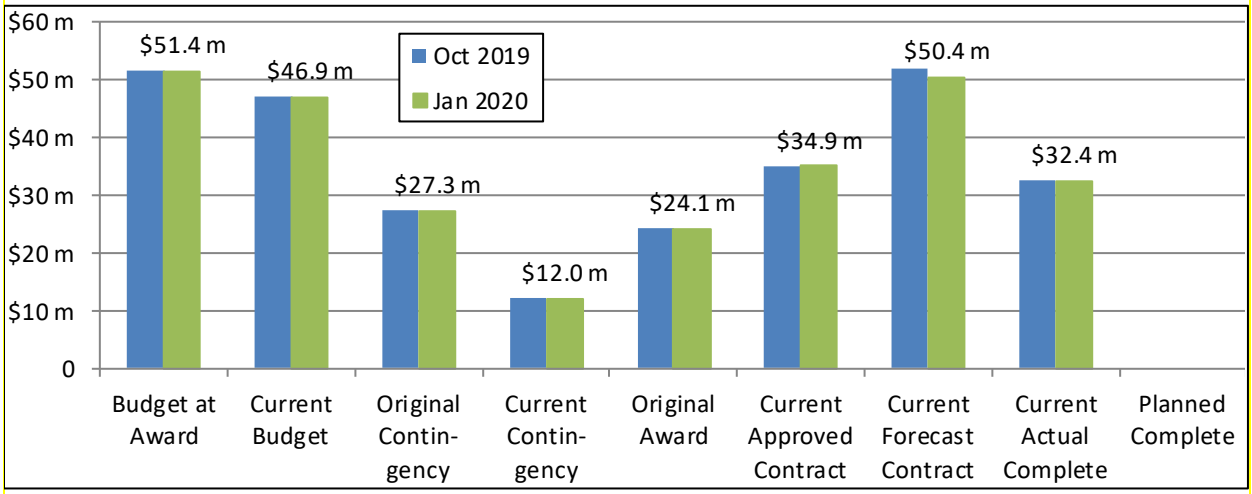




VM014 Vertical Circulation Elements (Escalators & Elevators) Jan 2020

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	$50.4	($1.0)

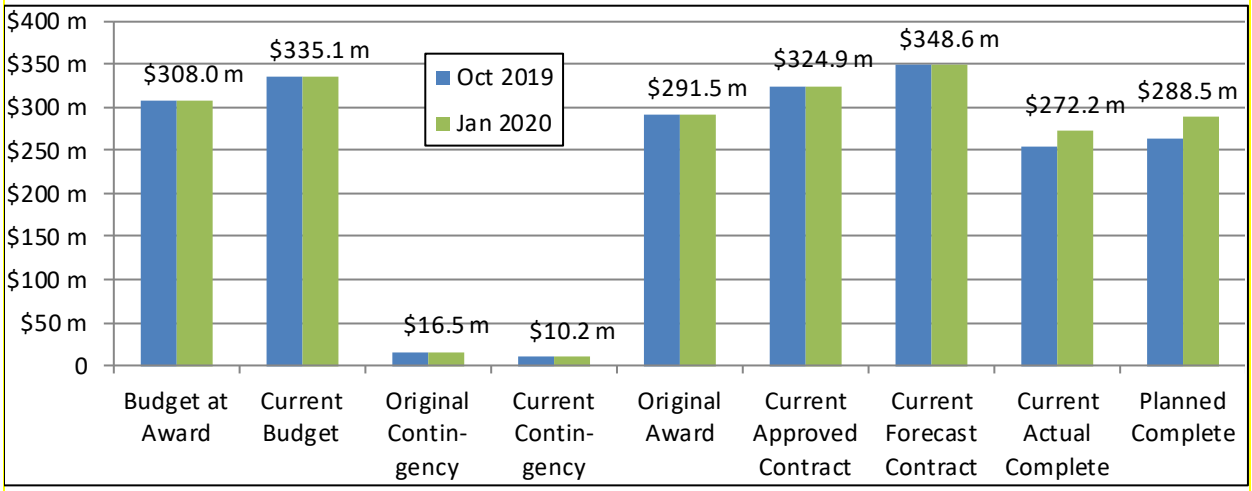
Percent Complete		Actual Prog Last 12 Mths		Actual Prog Last 6 Mths		Average Required Progress to reach forecast SC
Planned	Actual	Total	Avg/Mth	Total	Avg/Mth	
NA	92.8%	14.8%	1.2%	0.0%	0.0%	2.40% per month

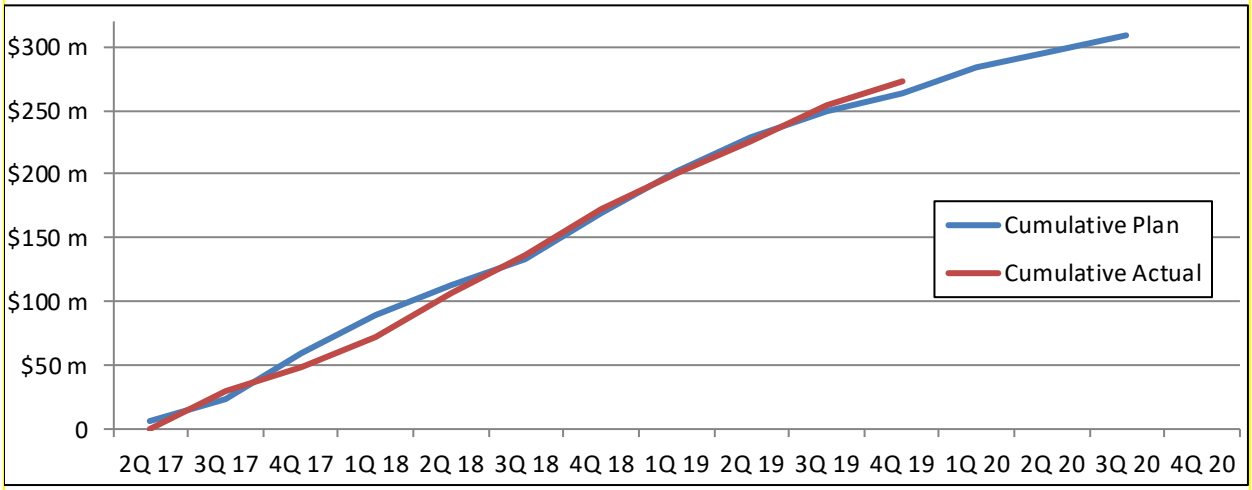


CQ033 Mid-Day Storage Facility Jan 2020

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	$335.1	$27.1	$291.5	$324.9	$33.4	$348.6	$40.6

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	
88.8%	83.8%	28.2%	2.4%	12.6%	2.1%	1.25% per month

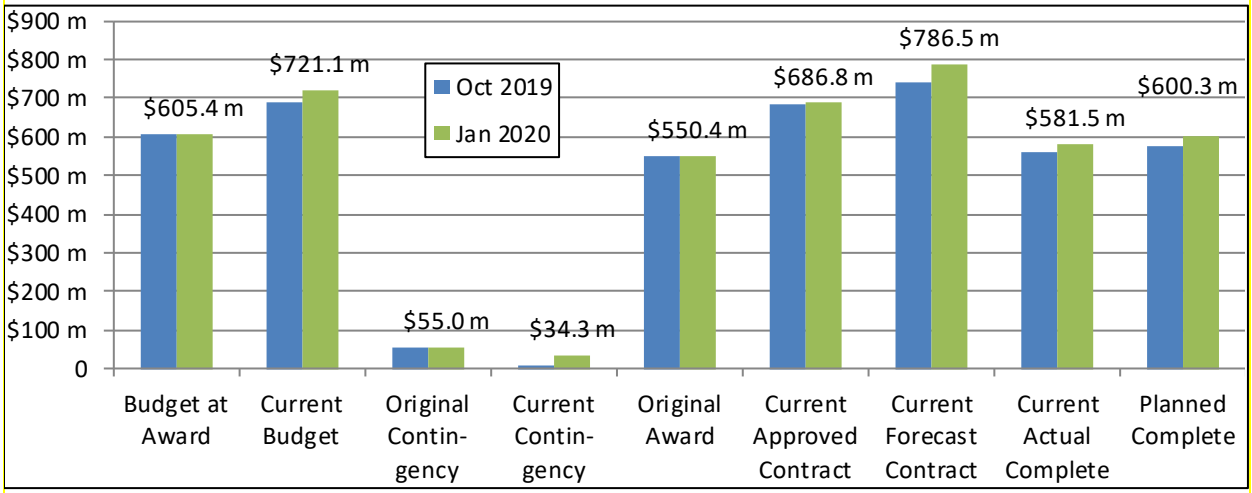


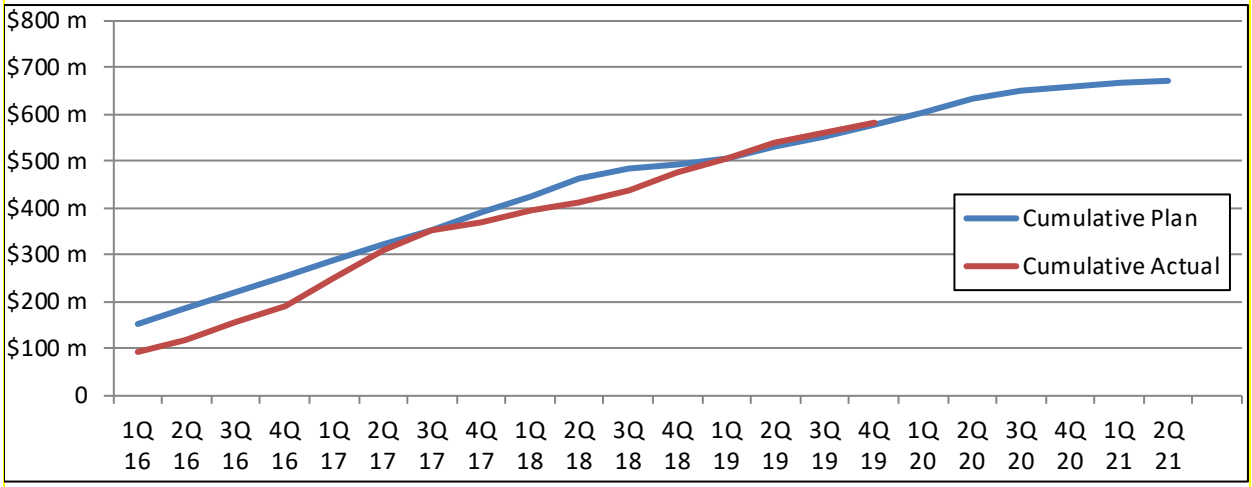


CS179 Systems Package 1 – Facilities Systems Jan 2020

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)
$605.4	$721.1	$115.7	$333.6	$686.8	$353.2 (options+mods)	$786.5	$181.1

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	
87.4%	84.7%	4.5%	0.4%	5.3%	0.9%	0.73% per month

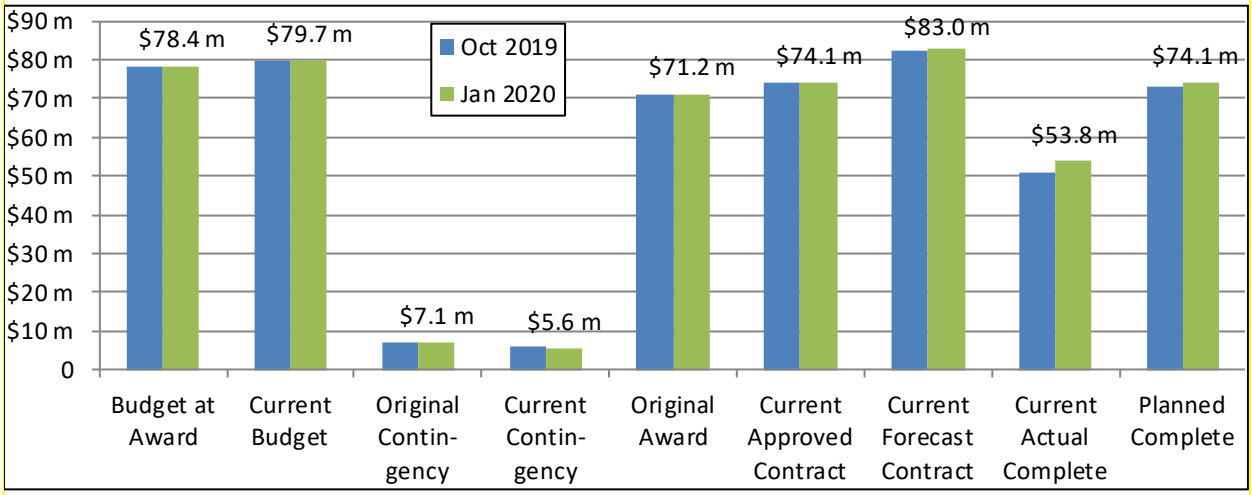


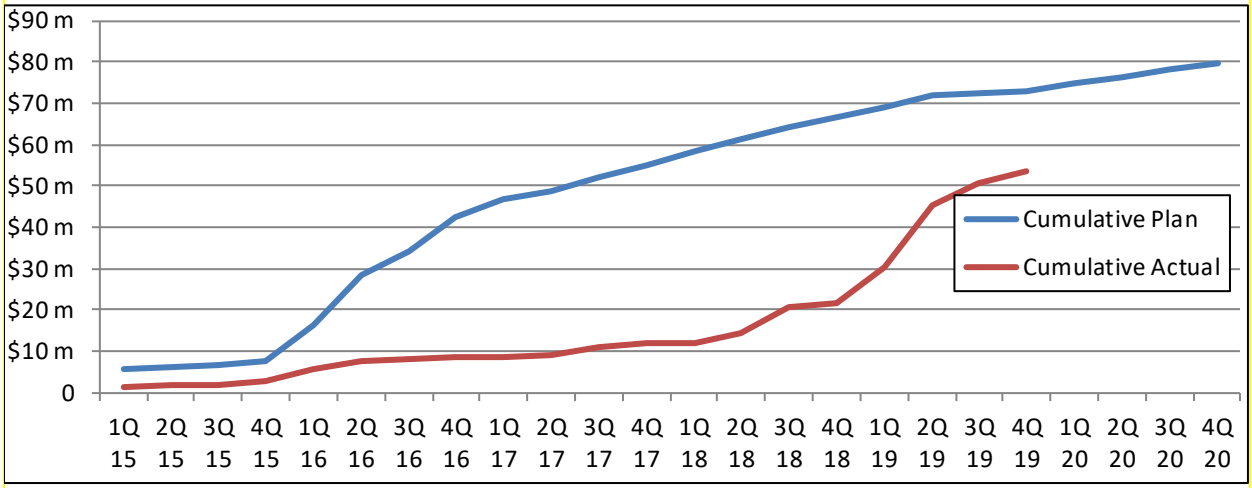


CS084 Tunnel Systems Package 4 – Traction Power Jan 2020

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	$74.1	$2.9	$83.0	$4.6

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%	72.6%	43.1%	3.6%	11.4%	1.9%	1.71% per month

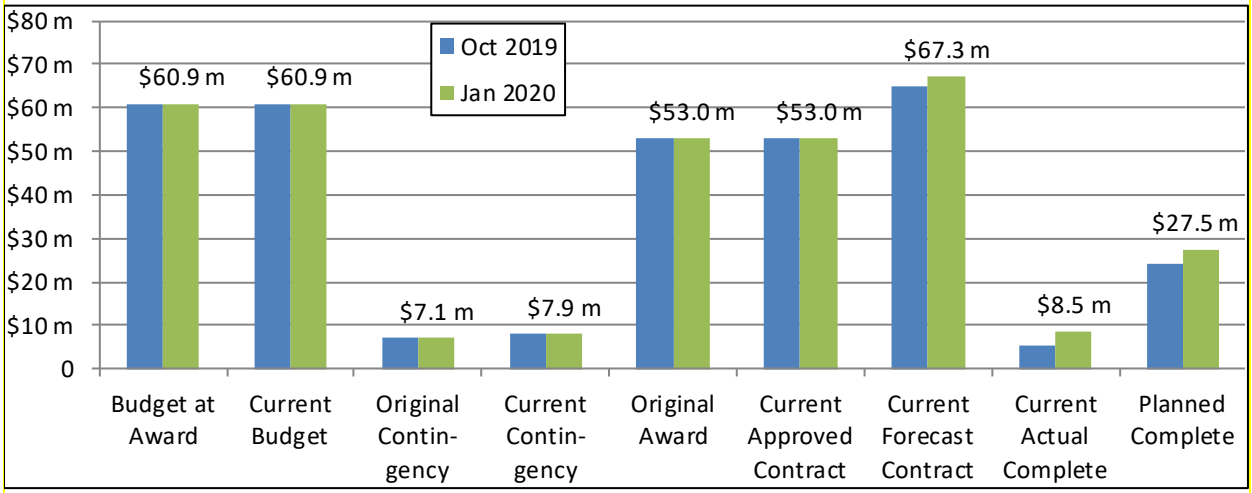


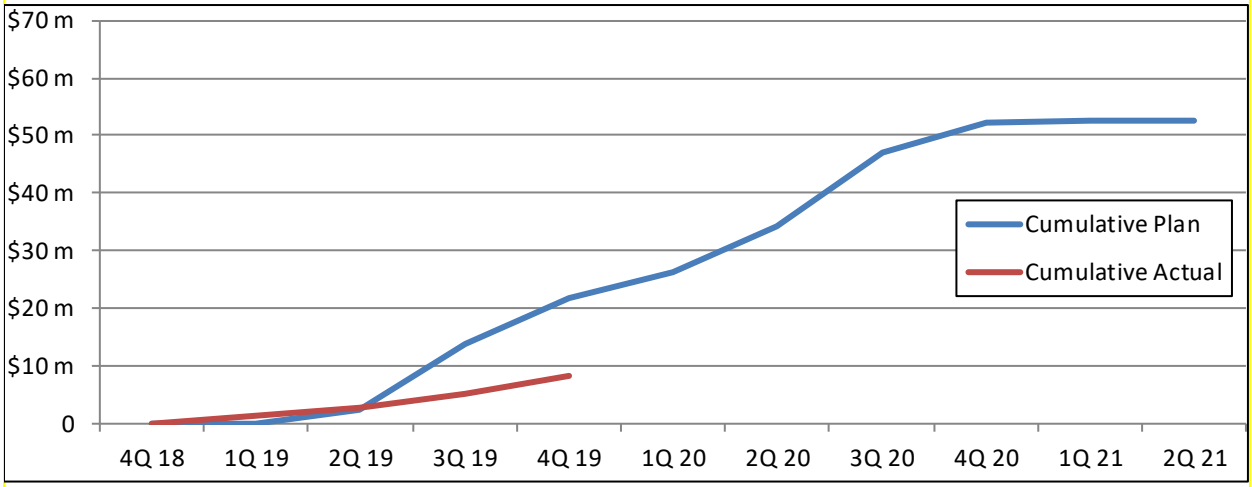


CS086 Tunnel Systems Package 2 Jan 2020

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)
$60.9	$60.9	$0.0	$53.0	$53.0	$0.0	$67.3	$6.4

Percent Complete		Actual Prog Last 12 Mths		Actual Prog Last 6 Mths		Average Required Progress to reach forecast SC
Planned	Actual	Total	Avg/Mth	Total	Avg/Mth	
51.8%	16.0%	NA	NA	10.9%	1.8%	6.00% per month

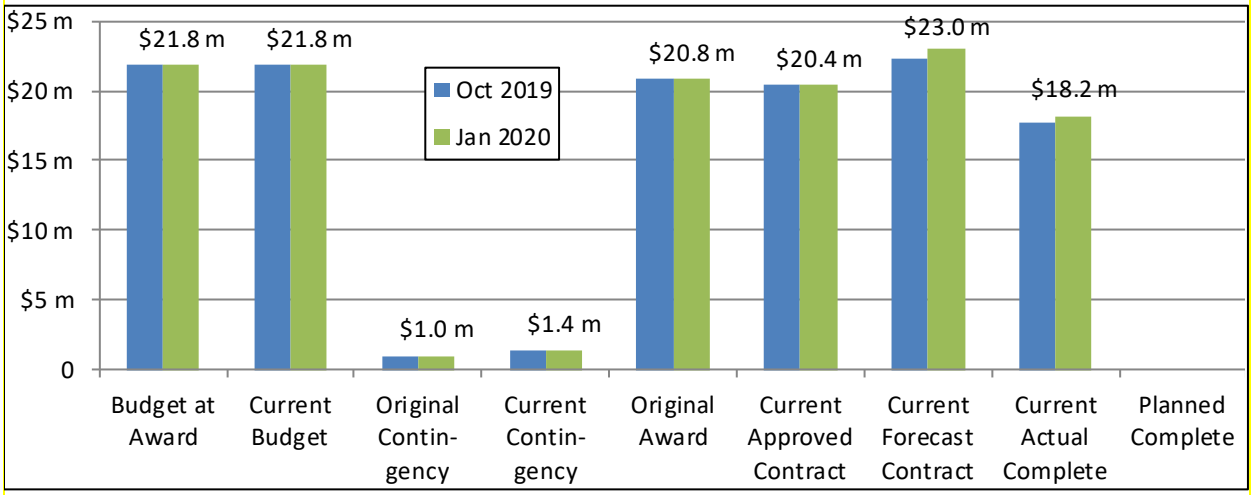


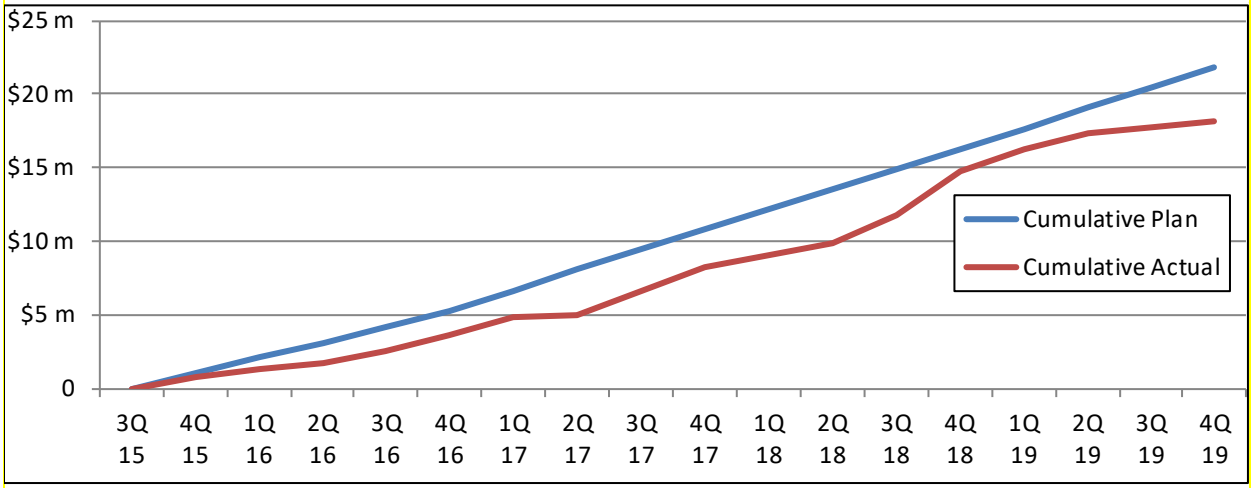


VS086 Systems Package 3 – Signal Equipment Procurement Jan 2020

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	$20.4	($0.4)	$23.0	$1.2

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	89.2%	15.0%	1.3%	3.9%	0.7%	0.98% per month

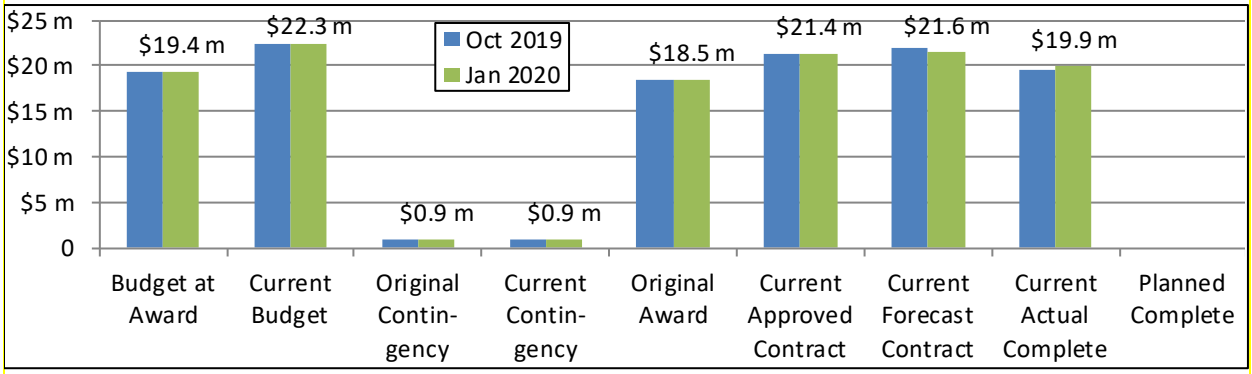




VQ033 Midday Storage Yard CILs Jan 2020

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	$21.6	$2.2

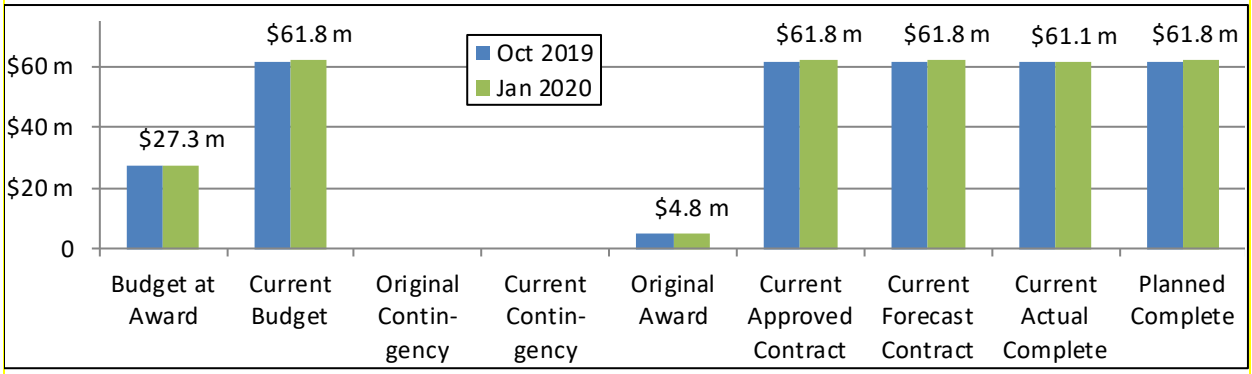
Percent Complete		Actual Prog Last 12 Mths		Actual Prog Last 6 Mths		Average Required Progress to reach forecast SC
Planned	Actual	Total	Avg/Mth	Total	Avg/Mth	
NA	92.7%	34.9%	2.9%	10.8%	1.8%	1.22% per month



FHA02 Harold Stage 2 – Amtrak F/A Jan 2020

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	$61.8	$34.5	$4.8	$61.8	$57.0	$61.8	$34.5

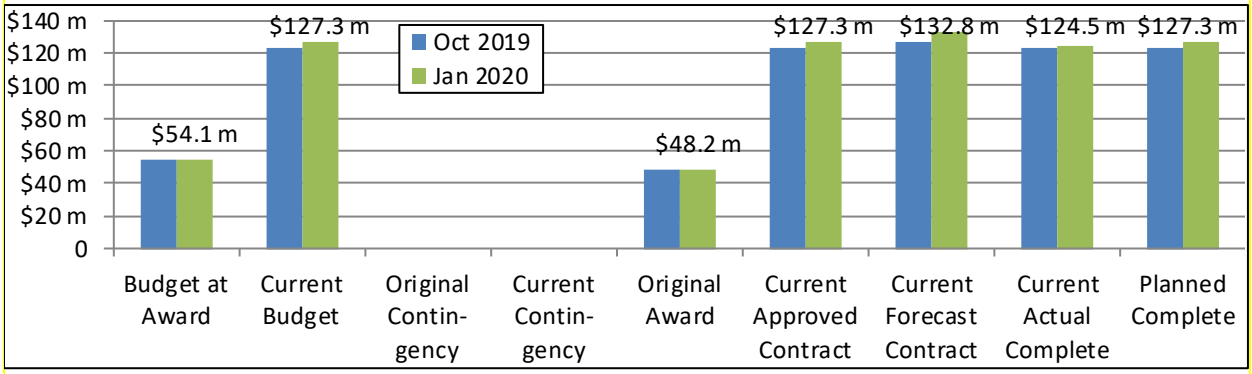
Percent Complete		Actual Prog Last 12 Mths		Actual Prog Last 6 Mths		Average Required Progress to reach forecast SC
Planned	Actual	Total	Avg/Mth	Total	Avg/Mth	
100.0%	98.9%	-1.0%	-0.1%	-0.6%	-0.1%	0.08% per month

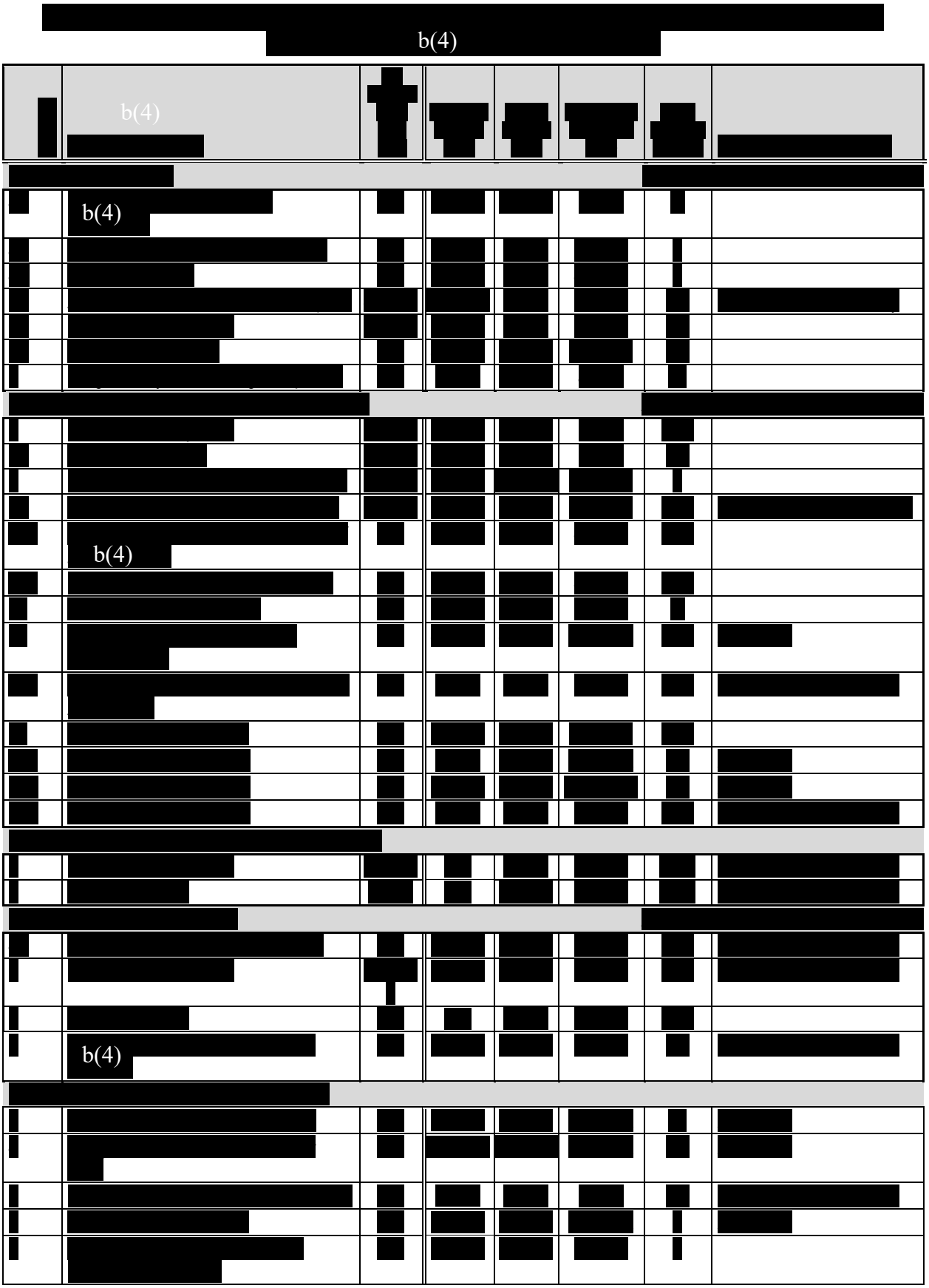


FHL02 Harold Stage 2 – LIRR F/A Jan 2020

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)
$54.1	$127.3	$73.2	$48.2	$127.3	$79.1	$132.8	$78.7

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%	97.7%	-2.3%	-0.2%	0.0%	0.0%	0.12% per month

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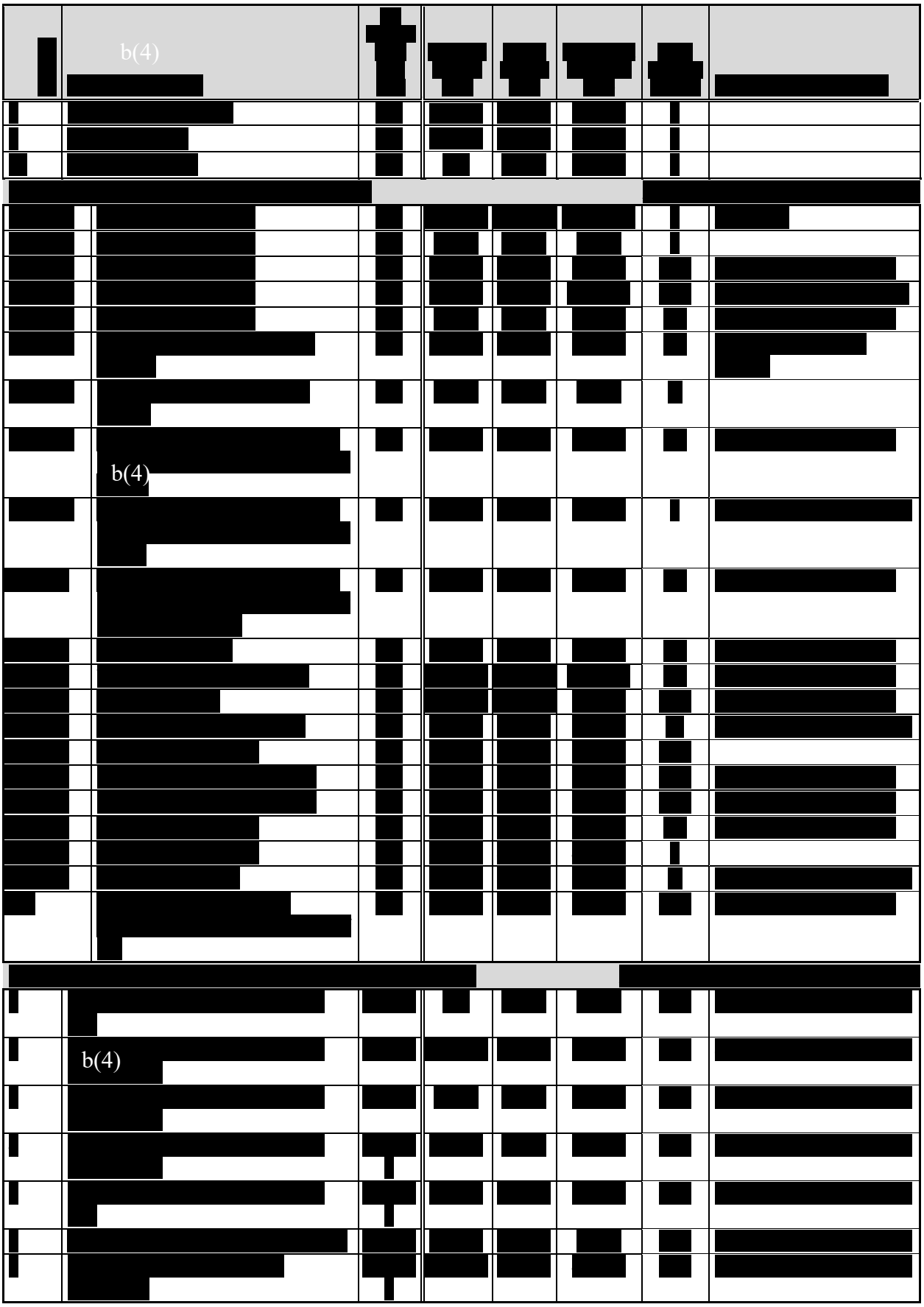
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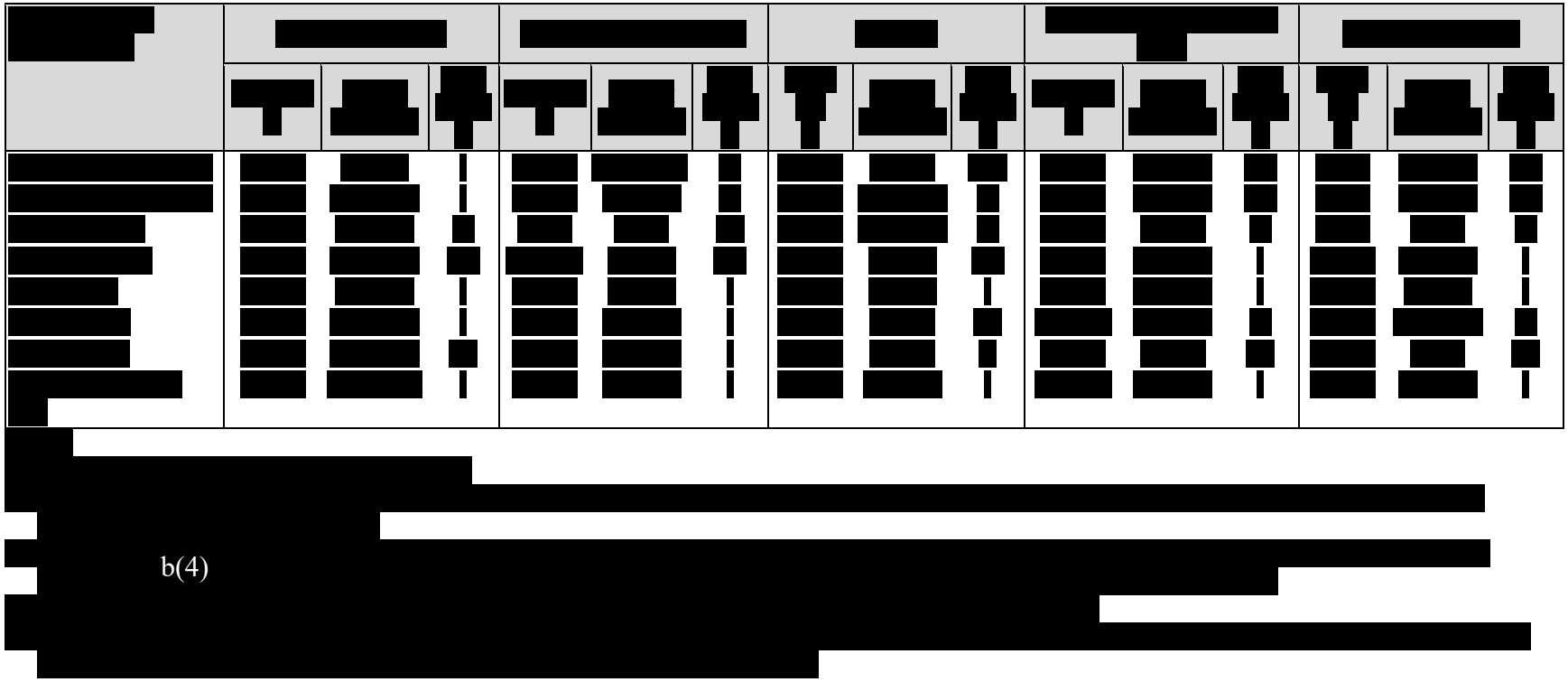

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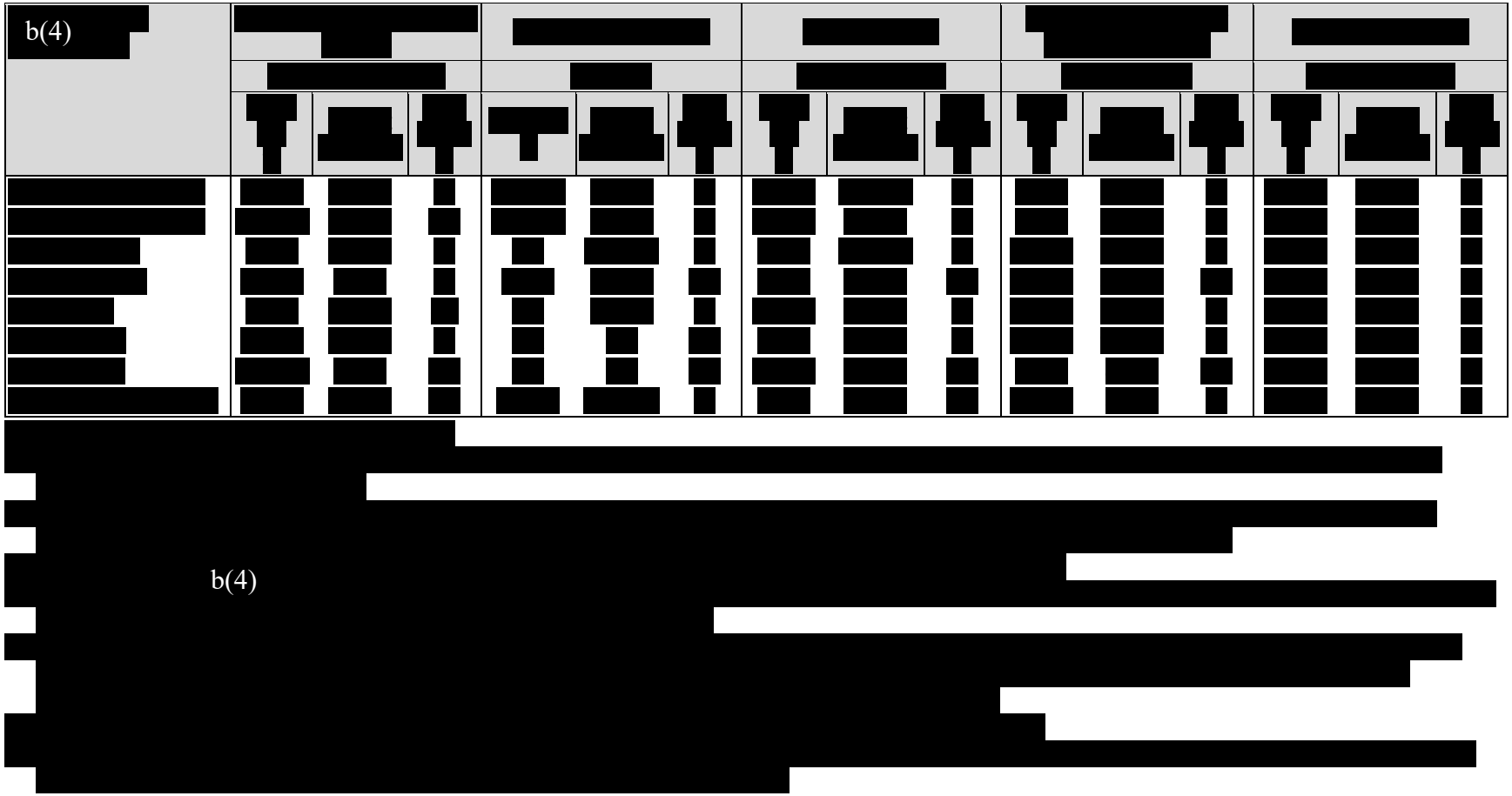
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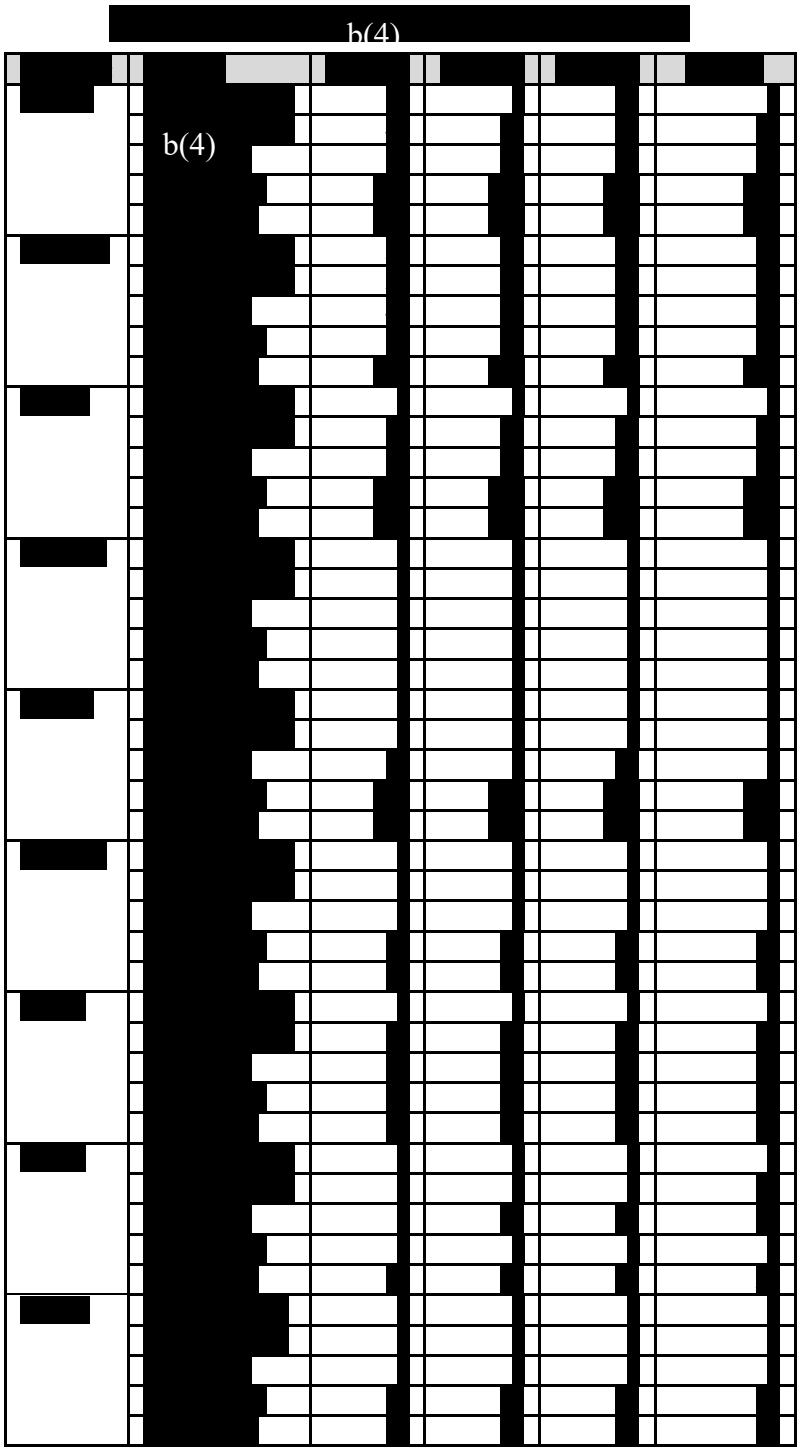
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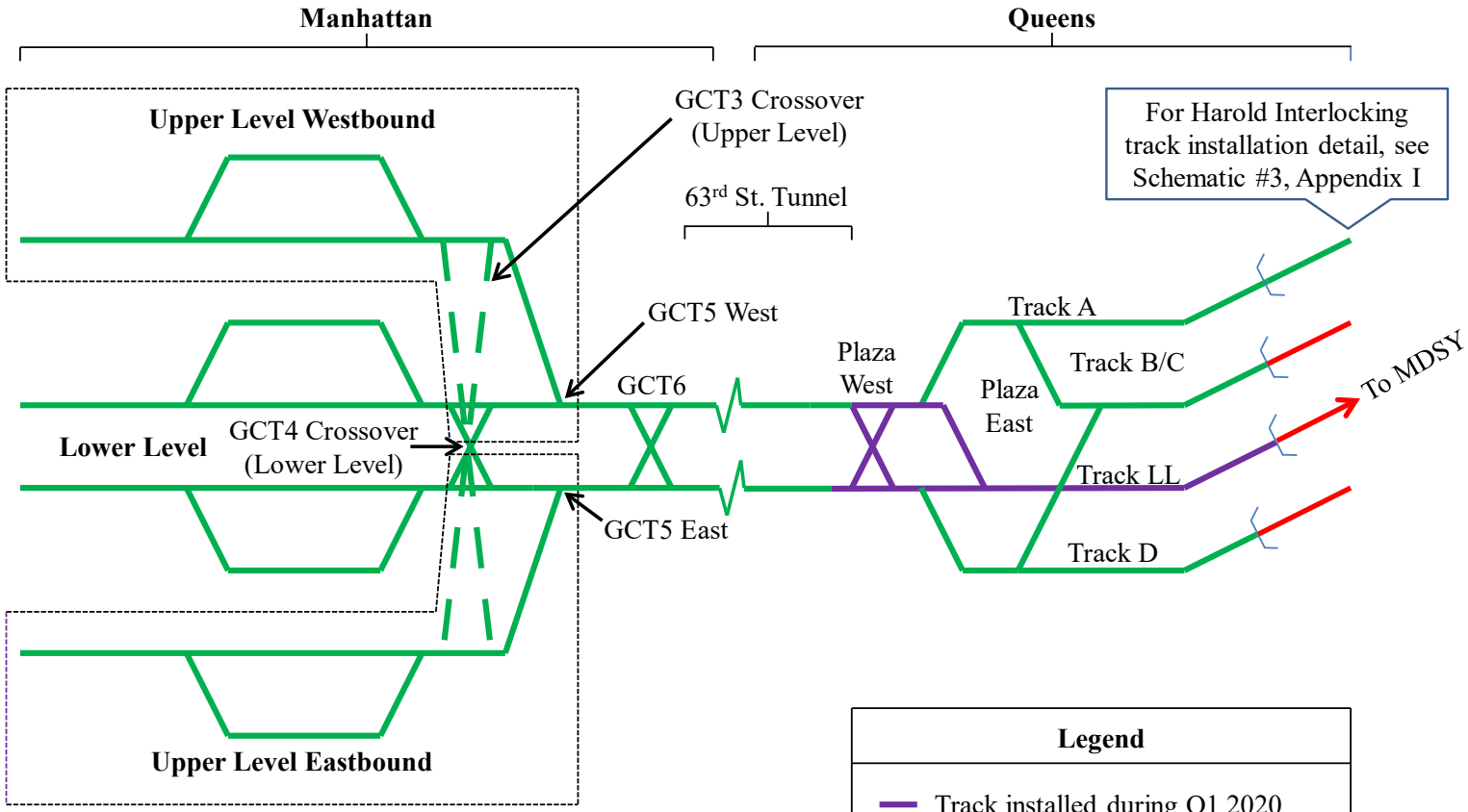
Appendix O: Track Construction
Manhattan and Queens
Status as of March 31, 2020



Note: All CM007 track in ESA Tunnels has been installed as of March 31, 2020.

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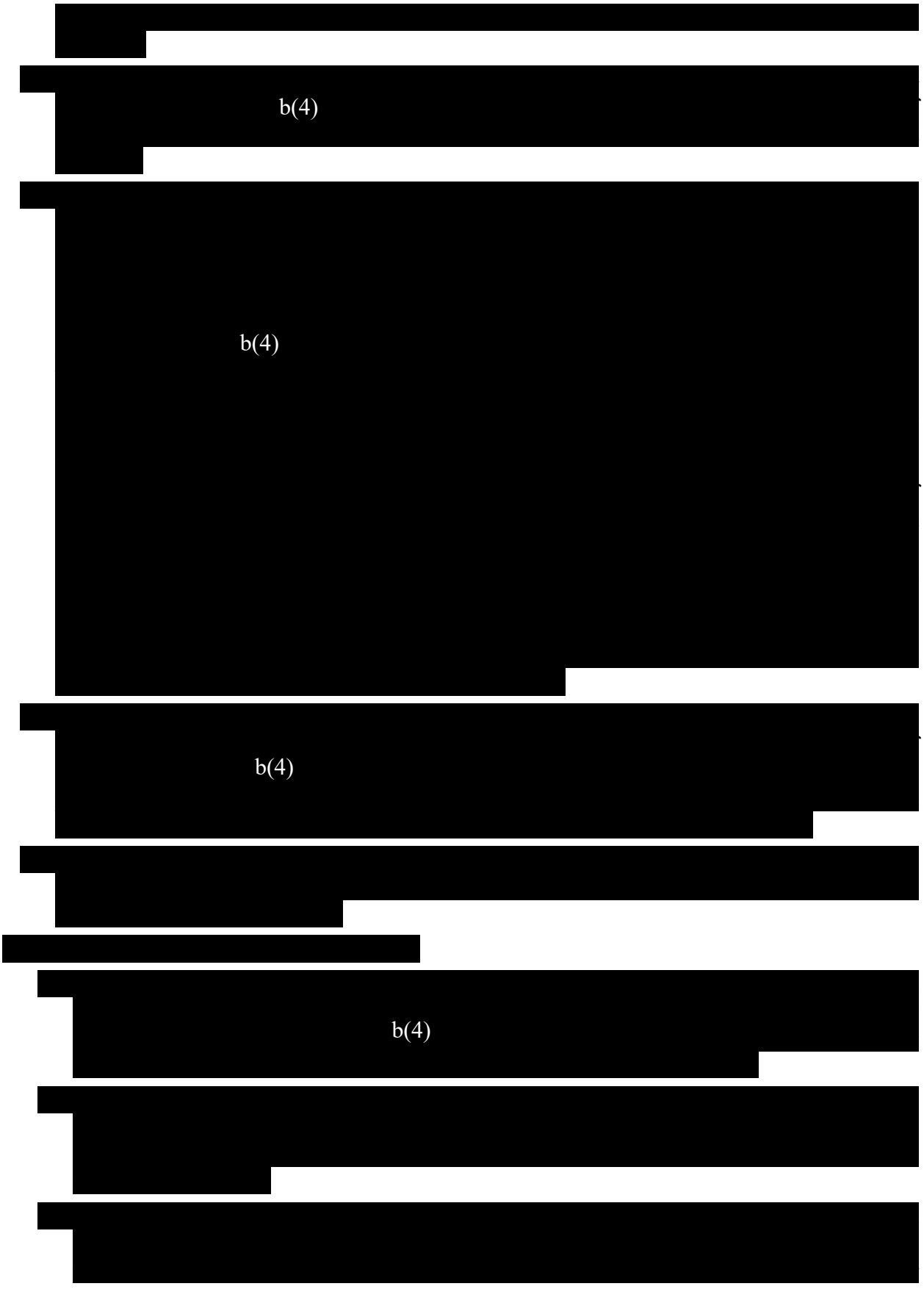
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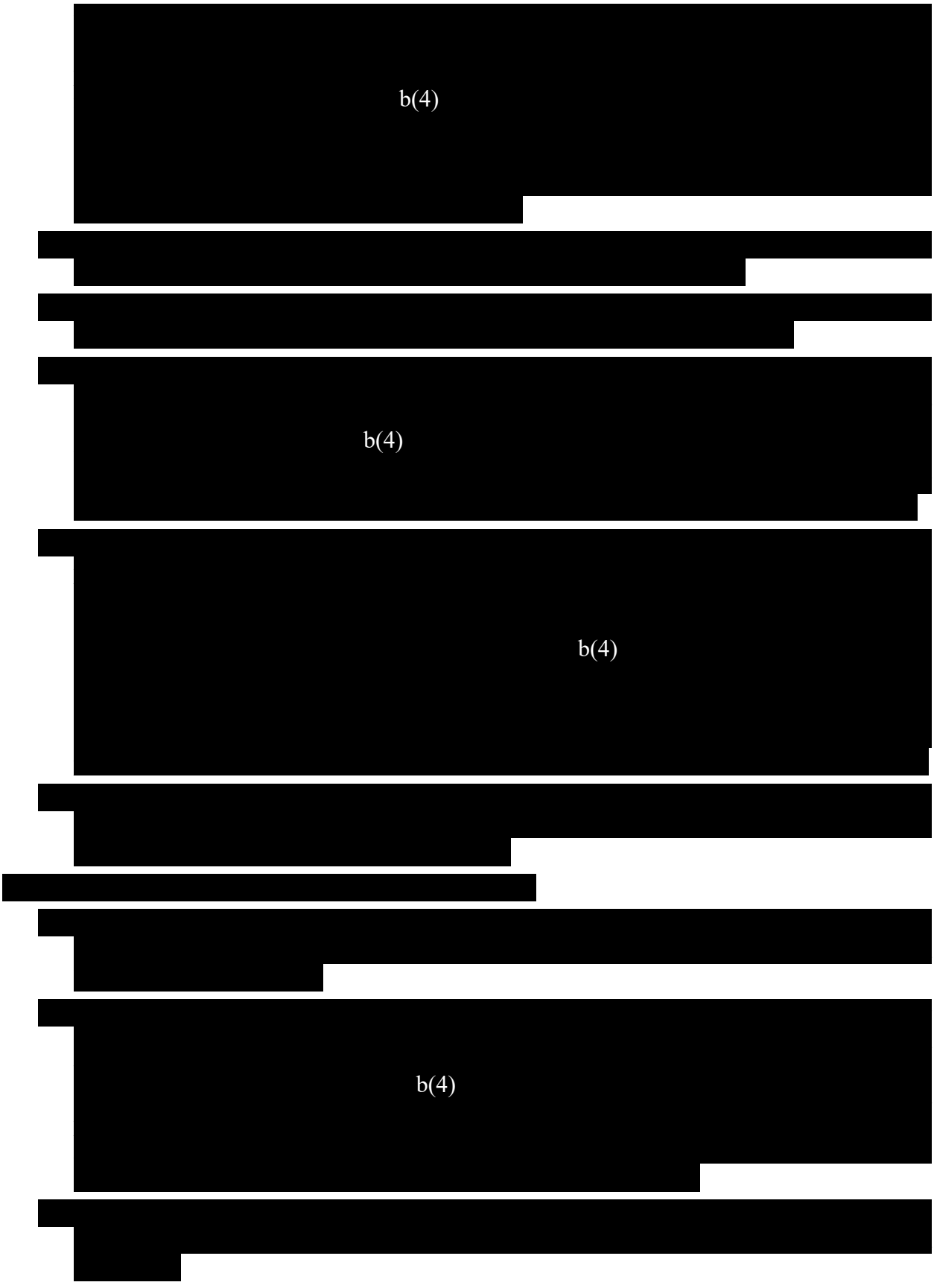
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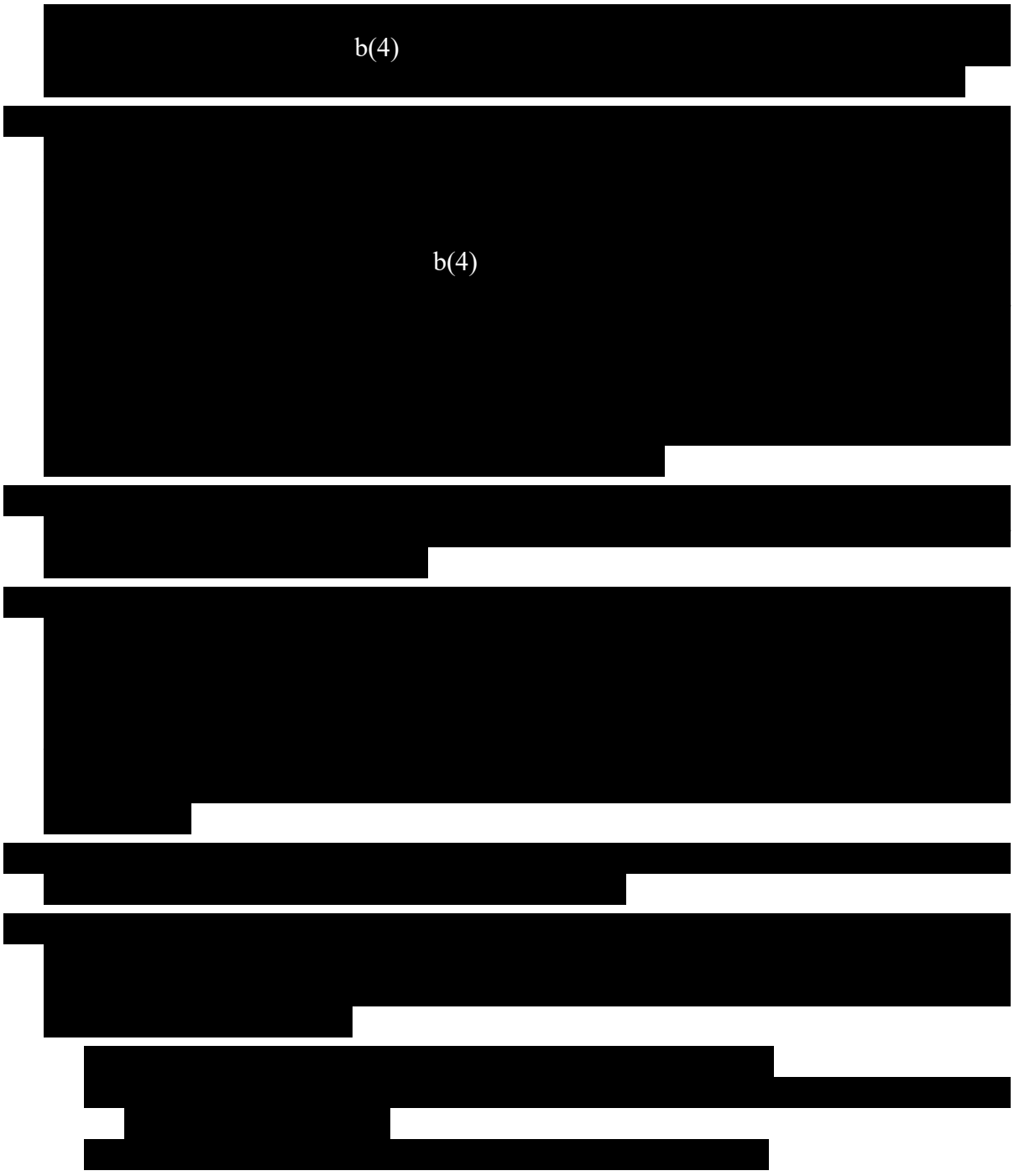
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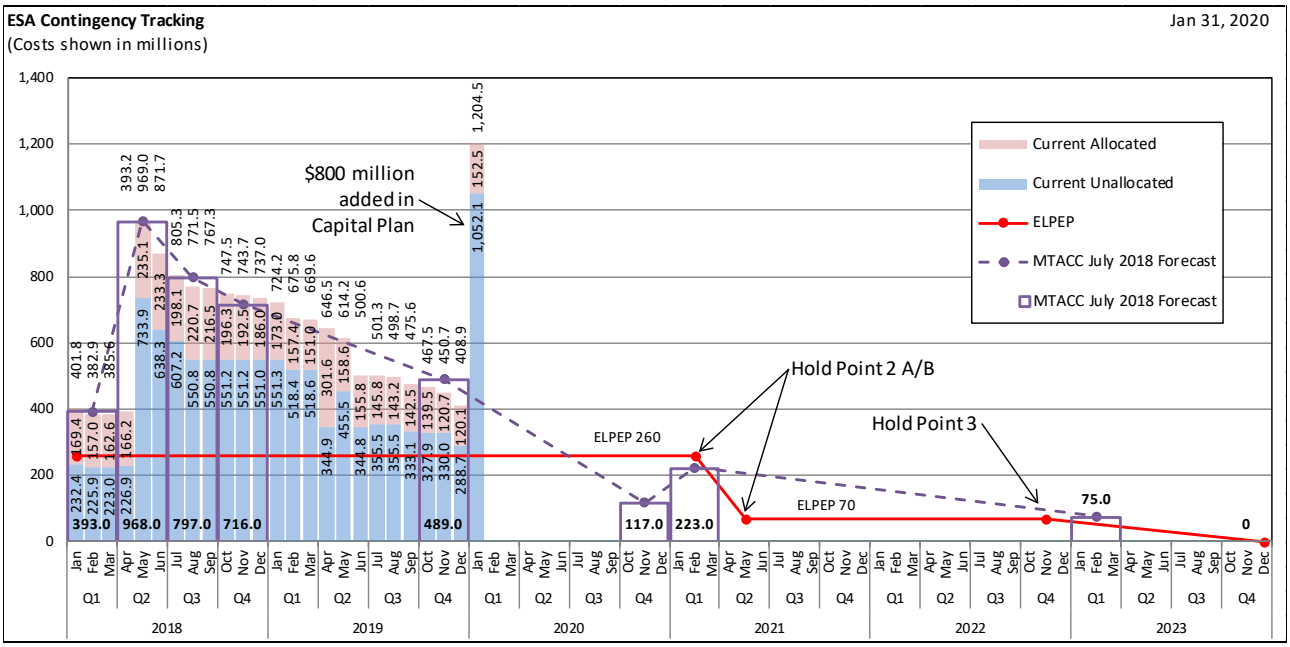

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APPENDIX T - ESA CORE ACCOUNTABILITY ITEMS

Project Status:		Original at FFGA	Amended FFGA	Current	ELPEP **
Cost	Cost Estimate (including finance and rolling stock costs)	$7,386.0 m	$12,038.5 m	$12,712.8 m*	$9,155.1 m
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	b(4)	[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		82.6% actual vs. 83.8% planned (ESA calc. †)		
Project Performance Rate Since 2014 ESA Re-Plan	Based on Earned Value		83.9% (PMOC calculation of construction spending at Q4 2019 planned vs. actual since re-baselining)		
Contracts	Total contracts awarded to date		$9,792.1 m	88.0% (PMOC calculation†)	
	Total construction contracts awarded to date		$7,457.6 m	93.1% (PMOC calculation†)	

Major Issue	Status	Comments
Project Funding and Budget	The ESA program current budget has been increased to $11,133.3 million, including b(4) The budget was increased by $800 million with the incorporation of the 2020-2024 Capital Program.	The MTA C&D has resolved the needs for the ESA program [redacted] b(4)
Project Cost	The MTA ETPC is $12,712.8 million, including costs for financing and 160 revenue vehicles, $674.3 million above the Amended FFGA Baseline Cost Estimate of $12,038.5 million.	Concerns remain about the time elapsed in resolving the open Cost and Schedule issues and, ultimately, their cost impacts. 2020 COVID-19 Pandemic has the potential for significant schedule impacts and associated cost increases.
Project Schedule	The primary critical and near-critical paths to target RSD, including float, are: ▪ Manhattan/Systems – no float (critical path) b(4) [redacted]. The public RSD remains December 13, 2022. The FFGA Revenue Operations Date is December 2023.	[redacted] b(4) [redacted]. The PMOC is concerned that until uncertainties related to Incremental IST performance and redevelopment of 270 Park Avenue are known, future schedules may show the shifts in the critical path, further delays, and potentially may impact the program schedule contingency.
Manhattan/-Systems Schedule Path	IPS 123 shows that the ESA Program Critical Path runs through the Manhattan/Systems contracts. This work path has several major open/unresolved issues performance concerns regarding incremental IST and the major redevelopment of 270 Park Avenue, as well as the 2020 COVID-19 Pandemic, that may have potentially significant schedule impacts.	Concerns continue for the ESA program Manhattan/Systems critical path. The Manhattan/-Systems path completion date is August 20, 2021 in IPS 123. Acceptable work progress along this schedule path relies heavily on the effectiveness of MTA C&D/ESA coordination efforts and contractor performance across the major contracts. 2020 COVID-19 Pandemic has the potential for significant schedule impacts.

Notes: * The cost current budget was established in the April 2018 and includes costs for financing and 160 revenue vehicles.

** 2010 Enterprise Level Project Execution Plan (ELPEP) reflecting medium level of risk mitigation and includes costs for financing and 160 revenue vehicles.

† ESA April 2018 baseline forecast: Construction $8,014.1 million; Engineering $871.8 million; Soft Costs (OCIP; Project Management; Real Estate) $1,778.4 million; Rolling Stock $202.0 million; and b(4) [redacted]