

PMOC MONTHLY REPORT
East Side Access (MTA C&D-ESA) Project
Metropolitan Transportation Authority
New York, New York

Report Period February 1 – February 29, 2020

PMOC Contract No. DTFT60D1400017

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

Urban Engineers of New York, D.P.C., 1 Penn Plaza, Suite 4125, New York, NY 10119

PMOC Lead: E. Williamson, 212-736-9100; ejwilliamson@urbanengineers.com

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

TABLE OF CONTENTS

Executive Summary	1
Monitoring Report	2
1.0 Project Status	2
a. Engineering Design and Construction Phase Services	2
b. Procurement	4
c. Construction	4
d. Quality Assurance and Quality Control	13
2.0 Schedule Data	14
3.0 Cost Data	18
4.0 Risk Management	20
5.0 ELPEP Compliance Summary	22
6.0 Safety and Security	23
7.0 Issues and Recommendations	23

APPENDICES

Appendix A – Acronyms

Appendix B – Charts and Tables

Chart 1 – ESA Critical Paths

Table 1 – Summary of Critical Dates

Table 2 – Project Budget/Cost Table

Table 3 – Project Budget and Invoices

Table 4 – Comparison of Standard Cost Categories: FFGA, MTA ETPC, CBB

Table 5 – Summary by FTA Standard Cost Categories

Table 6 – Program Critical Dates 90 Day Look-Ahead

Table 7 – ESA Core Accountability Items

Third Party Disclaimer

This report and all subsidiary reports are prepared solely for the Federal Transit Administration (FTA). This report should not be relied upon by any party, except the FTA or the project sponsor, in accordance with the purposes as described below.

For projects funded through the FTA Full Funding Grant Agreements (FFGA) program, FTA and its Project Management Oversight Contractor (PMOC) use a risk-based assessment process to review and validate a project sponsor's budget and schedule. This risk-based assessment process is a tool for analyzing project development and management. Moreover, the assessment process is iterative in nature; any results of an FTA or PMOC risk-based assessment represent a "snapshot in time" for a particular project under the conditions known at that same point in time. The status of any assessment may be altered at any time by new information, changes in circumstances, or further developments in the project, including any specific measures a sponsor may take to mitigate the risks to project costs, budget, and schedule, or the strategy a sponsor may develop for project execution. Therefore, the information in the monthly reports will change from month to month, based on relevant factors for the month and/or previous months.

EXECUTIVE SUMMARY

This summary highlights key events and important issues for the current month.

Overall Program Status¹: Overall program status is 82.1% actual versus 83.2% as-planned.

Construction Status¹: Construction status is 86.5% actual versus 87.81% as-planned.

Contracts

Awarded/Completed: (None)

Construction Progress Issues: CM014B, CS084, CS179, CS086.

Program Funding: Total program funding is \$10,335 million, which is sufficient for the MTA C&D forecasts through December 2020.

Program Cost and Budget: Total remaining contingencies decreased to \$408.9 million (\$288.7 million unallocated; and \$120.1 million allocated).

Integrated Project Schedule: The target RSD forecast improved to April 11, 2022. The program critical path is controlled by Manhattan/Systems work.

Risk Management: 13 major risks remain.

Harold Interlocking: No Issues.

Key Stakeholder Issues: LIRR – Late resolution of CS179, CS084, CS086, and VS086 issues; late completion of Positive Train Control Design. MTA C&D - Change Order processing issues, GEC CPS support for Contractor Submittals, Redesigns, RFIs, Field Conditions.

Construction Safety: 1.50 – Lost Time (LT) and 3.01 Recordable (RI) BLS Injury ratios during January 2020; both higher than December 2019.

ELPEP Compliance: MTA C&D reported Schedule Contingency is 25 CDs less than the ELPEP minimum; Cost is \$150 million above ELPEP minimum.

Project Management Plan: MTA C&D is updating PMP/Sub-plans to reflect major management, organizational, and process changes (in progress).

Buy America: One CS179 Issue – Small Split HVAC units (waiver requested).

All Project Sponsor cost and schedule data included in this report is based on the MTA C&D East Side Access Q4 2019 Quarterly Progress Report, referenced in this report as the ESA Q4 2019 Report, which has a Cost and Schedule data date of January 1, 2020. Unless otherwise noted, all progress percentages in this report are based on invoiced costs, 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.2. Its purpose is to provide information and data to assist the FTA as it continually monitors the Project Sponsor's technical capability and capacity to execute a project efficiently and effectively, and hence, whether the Project Sponsor continues to be ready to receive federal funds for further project development. This report covers the project and quality management activities on the East Side Access (ESA) Mega-Project managed by MTA Construction and Development (MTA C&D) with MTA as the Sponsor and financed by the FTA FFGA.

¹ Based on invoice cost and April 2018 EAC forecast.

MONITORING REPORT

1.0 PROJECT STATUS

a. Engineering Design and Construction Phase Services

In the ESA December 2019 Report, the PMT reported the overall engineering effort at 87.6% complete compared to planned completion of 88.9%. Since the ESA July 2018 MPR, the PMT has been calculating summary Engineering progress as a percentage of the \$871.8 million April 2018 engineering EAC forecast.

Status of Construction Packages Advertised

CH063 Electric Traction Catenary Work, 3rd Party: The RFQ for this contract was advertised during 1Q2019 and MTA C&D received seven proposals, of which four were deemed pre-qualified. ESA issued a Best and Final Offer solicitation to those four proposers on September 11, 2019, with responses originally due back to ESA in December 2019. Due to many proposers' questions, however, ESA did not award the contract in December 2019, as planned, but continued to delay award of this contract through February 2020. ESA now anticipates award in early April 2020.

Status of Construction Packages Not Awarded

CM015 – 48th Street Entrance: MTA/MTA C&D-ESA has reached agreements 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, 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 the facility fit-out work.

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 that was added to CH063 scope of work. As a result, FQA33B will now be an Amtrak access and protection work package only.

Status of Positive Train Control Design

Positive Train Control: 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-ESA 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. Although LIRR had reportedly provided most of the design information to the GEC, there remained outstanding items at that time required for completion of the additional scope of work for the three contracts noted above, including: Final Design, Book of Plans, Bill of Material and details of the Wayside Interface Units for Plaza Interlocking; PTC L2 Switch and FDP drawing for each ESA interlocking; and Final LIRR PTC test plans and procedures, including FRA test plans. As of February 29, 2020, some, but not all, of these items have been provided to the GEC.

- The GEC had earlier prepared initial scope design modifications to Contracts CS179, VS086, and CS086, to provide for the LIRR designed PTC overlay onto the ESA systems and insure coordination with the LIRR PTC requirements. However, contract modifications cannot be finalized absent the final PTC design. Accordingly, MTA C&D made the decision during Q4 2019 to work through the CPR and contract modification process with the CS179, VS086 and CS086 contractors for incorporation of as much of the PTC work scope that can be reliably included based on PTC assumptions developed by MTA C&D that will be included in the CPRs for the three referenced contracts. 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.

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

CS179, Systems Facilities Package No.1: 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. MTACC management acknowledges that only 8 of the 10 Control system final designs (FDs) are approved. As of the end of February 2020, the completion and approval of all 10 Control System final designs is 46 months late – a condition that could impact the start of the Incremental Integrated Systems Testing (IST). Additionally, one previously approved Control System final design – that for the Voice Communications System (VCS) – continues to undergo design changes that will require additional Factory Acceptance Tests (FAT). Completion of some of the Non-Control Systems designs also continues to be delayed and the contractor continues to assert that open issues and unanswered NOCs are delaying design completion and equipment rack fabrication.

As of the end of February 2020, the number of contractor submittals, RFIs, and FCR) awaiting MTACC responses was 547, 24, and 1, respectively. MTA responses on over 38% of the submittals, RFIs, and FCRs exceed the 30-Day turnaround time stipulated in the contract. The delay in providing responses to the contractor is still, per the contractor, impacting work progress. The completion of Final Design (FD) for all 10 Control Systems, which was scheduled for completion 46 months ago, has not occurred yet, with the last two (2) Control Systems (Fire Life Safety and Security Management) still under design development. Continued delays to completion of final designs on Control and Non-Control Systems have the potential to impact the start and completion of the Incremental IST.

CS084, Traction Power Systems Package 4: Some design issues related to water remediation methodologies in spaces designated for CS084 equipment and other identified field construction issues continue to remain open – most notably, the solution to the water issue at the C03 substation that has all CS084 work at that location on hold. A disagreement between MTA C&D and the contractor on what action will be taken on any possible modification of the implementation methodology designed for the blue light system was revealed in November 2019; and, further discussion on this item is underway. The contractor continues to indicate that any change in design of the blue light system will require further changes to the PLC software.

VS086, Systems Package 3 – Signal Equipment Procurement: There continues to be seven (7) significant design issues needing resolution or direction that have the potential to negatively impact the schedule. A detailed discussion is included under VS086 in Section 1.0(c) Construction later in this report.

CS086, Tunnel Systems Package 2 – Signal Installation: It was previously reported that the only design issues noted by MTACC on this contract revolved around issues related to installation of

equipment in the field. Specific problems included the ability to properly install signal cases and signal heads in the designated locations – there are some noted obstructions – and the mounting of impedance bonds to the track bed, where mounting plate attachment points appear to be out of tolerance. Additional design/installation issues have been identified: missing “ground” plates; additional equipment racks; equipment interference layouts in rooms; and installation of 91.6 Hz ATS equipment. A contract modification to address the changes incorporated into the conformed contract documents is still required.

b. Procurement

The ESA December 2019 Report shows that total procurement for the ESA Program is 87.9% complete, with total awards at \$9,989.9 million. Since the ESA July 2018 MPR, the PMT has been calculating summary procurement progress as a percentage of the \$11,133 million ESA program April 2018 EAC forecast. Active procurements include:

CH063 Electric Traction Catenary Work, 3rd Party: This will be a negotiated procurement using the RFP process. 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 proposals from those 4 respondents were solicited in a Best and Final (BAFO) solicitation issued on September 11, 2019. BAFO responses were originally due back on December 9, 2019, but ESA delayed award of the contract through February 2020 due to many proposers’ questions. ESA now anticipates award of the contract in early April 2020.

c. Construction

The ESA December 2019 Report states that the total construction progress reached 86.5% complete compared with 87.8% as-planned. Since the ESA July 2018 MPR, the PMT has been calculating construction progress as a percentage of the \$8,014 million April 2018 construction EAC forecast. The percentage of work complete, as shown throughout this report, is calculated using invoiced costs to represent construction progress. The current contract and force account budgets equal the amounts that are allocated in the MTA Impact accounting system and are used for percentage calculations for individual contracts.

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 nc 708.3	668.3 +0.5 667.8	40.0 (-0.5) 40.5	561.5 +11.4 550.1	724.0 (-1.0) 725.0	84.1% (12.4%) 96.5%	84.1% +1.7% 82.4%	7/1/20 +155 cd 1/28/20	6/24/20 (-106 cd) 10/8/20	
CM014B	571.7 nc 571.7	538.8 +0.1 538.7	32.9 (-0.1) 33.0	452.8 +9.4 443.4	544.4 (-1.7) 546.1	90.3% +1.3% 89.0%	84.0% +1.7% 82.3%	6/26/20 nc 6/26/20	12/28/20 +117 cd 9/2/20	
VM014	46.9 nc 46.9	34.9 nc 34.9	12.0 nc 12.0	32.4 nc 32.4	50.4 (-0.3) 50.7	NA NA NA	92.8% nc 92.8%	10/25/19 nc 10/25/19	3/23/20 nc 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: The ESA November 2019 MPR reports that this contract was 82.4% complete vs. 96.5% planned. 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 January 31, 2020, work proceeded in both the East and West Caverns with the pulling of control wire for the HVAC and installation of rail post supports for Stairs #9 & #11. Buildout continued for Elevators #7 & #8 and Escalators #62 - #66. HVAC Duct Progress remained approximately 78.7% complete, Piping was 79.7%. MEP Fire Protection remained approximately 69.5% complete and Plumbing was 93.8%. Electrical conduit was approximately 72.5% complete and Fixtures remained 91.1%. Architectural Wall progress was approximately 37.4% complete; Ceilings 28.5% and Flooring was approximately 23.7% complete. In the tunnels, installation continued of ductbank handrails from GCT6 to GCT7.

Trackwork: 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. Continued at Track EB2 103+00 to 167+37 (DFF), Plaza West & 140' DFF Track on WB1/EB2, Switch 14, Switch 24W, Switch 24E and Yard Lead Approach Track STA 1175+60 – 1230+96 (RTB).

Traction Power Track Monument Repairs: Work on Out of Tolerance monuments in Areas #1 & 2 is complete. The contractor is coordinating with contract CS84 to coordinate the dates that they need the repaired monuments for cable pulling.

Rail Replacement: As previously reported by the PMOC, MTA C&D has identified, with the assistance of an independent engineering consultant, the need to replace some portion of the rail installed to date by the CM007 contractor due to observed significant deterioration involving pitting and corrosion. In January 2020, MTA C&D advised the PMOC that they are completing an order to purchase replacement rail. Additionally, MTA C&D advised that detailed field inspection and evaluation of the rail that will need to be replaced has been deferred until all rail installation, alignment and cleaning is completed, now expected by May 1, 2020.

CM014B – Concourse and Facilities Fit-Out:

Schedule: No contract milestones were scheduled to be or were completed during February 2020. Substantial Completion is projected to be December 28, 2020, and Milestone #12, Completion of Biltmore Connection, is projected to be November 2, 2020.

Construction Progress: The following construction continued during February 2020: Terrazzo floor placement, electrical punchlist work, preparations for the electrical cutover of the Biltmore Connection, and air plenum, plumbing fixture, chiller plant, wellway, communications wire, and miscellaneous concourse finish installations.

VM014 – Vertical Circulation Elements (Escalators and Elevators):

Schedule: This contract provides for the fabrication and delivery of all materials required for the 20 elevators and 38 escalators that will be installed by the contractors constructing the new LIRR GCT Concourse (CM014B) and Train Terminal (CM007). The schedules for installations are determined by each contractor.

Construction Progress: Through February 2020, materials for all escalators and all but two elevators (EL#10 and EL#22) have been delivered to the jobsite.

Queens 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	265.9	348.7	86.8%	81.8%	8/10/20	2/3/21	
	+0.8	+0.1	+0.8	+5.4	+0.2	+2.3%	+1.6%	nc	+31 cd	
	334.3	324.8	9.5	260.5	348.5	84.5%	80.2%	8/10/20	1/3/21	

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.

CQ033 – Mid-Day Storage Yard Facility:

Schedule: No contract milestones were scheduled to be or were completed in February 2020.

Construction Progress: The contractor completed installation of all turnouts west of Honeywell Avenue Bridge and demolition of the Building #7 chimney during February 2020. Additionally, the following construction continued throughout the MDSY during February 2020: CAM platform fit-out; Retaining Wall B installation; cart storage and storage building construction; signal cable and third rail installation; track construction east of Honeywell Avenue bridge; and environmental remediation of Building #7.

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	691.1	686.2	4.8	572.7	783.6	86.5%	83.5%	6/30/21	9/28/21	1
	+0.7	+0.3	+0.3	+4.4	+37.4	+1.2%	+0.7%	nc	+28 cd	
	690.4	685.9	4.5	568.3	746.2	85.3%	82.8%	6/30/21	8/31/21	
CS084	79.7	73.9	5.8	52.7	82.8	100.0%	71.2%	12/2/19	6/24/21	1
	nc	nc	nc	+0.8	(-0.1)	+0.2%	+1.0%	nc	(-1 cd)	
	79.7	73.9	5.8	51.9	82.9	99.8%	70.2%	12/2/19	6/25/21	
CS086	60.9	53.0	7.9	8.5	67.5	50.1%	16.0%	2/21/21	4/1/21	1
	nc	nc	nc	+2.5	+3.3	+1.5%	+4.6%	nc	(-87 cd)	
	60.9	53.0	7.9	6.0	64.2	48.6%	11.4%	2/21/21	6/27/21	
VS086	21.8	20.4	1.5	18.0	23.9	NA	88.1%	10/14/19	12/1/20	1
	nc	nc	nc	nc	+1.5	NA	nc	(-262 cd)	+12 cd	
	21.8	20.4	1.5	18.0	22.4	NA	88.1%	7/2/20	11/19/20	

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

Please refer to the contract narratives for additional information.

1. Forecast SC is based on the approved schedule that does not account for open unresolved issues.

CS179 – Systems Package 1 – Facilities Systems:

Schedule: MTA C&D initially developed an Integrated System Test Plan (ISTP) to meet the testing requirements of the Project; and, subsequently in 2019, amended the ISTP to further address the schedule and testing requirements for the contract. This amended ISTP was characterized as an Incremental ISTP and ESA presented an outline of this plan to the PMOC at the end of June 2019. The presentation was only an outline of what would be accomplished; and it failed to provide any details regarding the system tests, the testing methodologies, or testing schedule. The PMOC needs to understand the impacts of incomplete/changed designs for certain systems, current open NOCs, field work constraints and SWOs that are still in effect.

On several occasions since the June 2019 briefing, the PMOC has requested that MTA C&D provide a much more detailed briefing on this Incremental ISTP. To date, MTA C&D has not

been able to provide the requested briefing. MTA C&D indicates that the Incremental ISTP is scheduled to begin in August 2020; however, the completion of this testing has slipped from July 2021 to August 2021, one month beyond the previously reported July 9, 2021, SC date.

Design Progress: The completion of Final Design (FD) for all 10 Control Systems, which was due 46 months ago, has not occurred yet; with two (2) of the Control Systems (Building Management/Fire Life Safety and Security Management) still under design development. Additionally, one previously approved Control System final design – that for the Voice Communications System (VCS) – continues to undergo design changes that will require additional Factory Acceptance Tests (FATs). The contractor also has the responsibility to design, install, and test 19 Non-Control systems; several of which, according to the contractor, continue to have FD progress falling behind schedule. The contractor continues to contend that the lack of resolution on open items (e.g., the open NOCs and Stop Work Orders) is the primary cause for its delays; and that any continued progress on system designs and equipment testing is being hampered by lack of information from MTA C&D/LIRR, unanswered RFIs, and unissued CPRs that have the potential to alter existing designs. Despite the delays in receiving FD approvals, the contractor continues to develop and submit test plans.

Construction Progress: In February 2020, the CS179 contractor continued to actively progress installation work efforts in the tunnels, in numerous communications rooms, in substation facilities, and in various other areas where access was available and conditions warranted. The contractor has placed an increased focus on local testing of installed equipment and systems so as to move closer to its plan to begin Integrated System Tests (IST). Local testing of the power SCADA system will commence without the inclusion of the emergency power system, as the energization of the B-20 substation is required and this substation energization continues to be delayed. Discussions will be needed to determine what, if any, regression testing will be required once the B-20 substation is energized. Coordination issues with other contractors, unexpected field conditions, unresolved design issues, water infiltration remediation efforts, open NOCs/CPRs, and Stop Work Orders continue to impact further and efficient progress. The CS179 contractor is working with MTA C&D and the CS086 contractor to alleviate tunnel interferences that are keeping the CS086 contractor from advancing its work. The contractor reports that it is making progress on the replacement of the damaged duct banks at the 55th Street facility. The Southside ductbank installation was completed in February and the forecast is to complete the Northside ductbank by the end of March 2020. However, the GEC must complete the design to direct any accumulated water to the track area; and, MTA C&D will need to issue the associated contract modification.

Despite the fact that the BMS/FLSS and Security Control Systems have not achieved FD completion yet, factory testing for these two Control Systems is still scheduled for completion by the end of April 2020 and June 2020, respectively. The IST for the Tunnel Ventilation System is scheduled to begin in June 2020; however, the ESA CM indicates that this date will, most likely, be delayed because it requires the full operation of equipment at the 55th Street facility and that equipment is not forecast for availability until 4Q 2020. The FAT of the Backbone Communications System (BCS) – a Non-Control system – was completed in January 2020. The contractor indicates that there were no major exceptions taken during the BCS FAT, and, a report of the test findings must still be submitted. The contractor indicates that the BCS IST is being negatively impacted by recent CPRs issued by MTA C&D; and, further discussions on these CPRs between all parties regarding any impacts need to occur. Testing of 4 of the 19 Non-Control Systems continues to remain incomplete due to either the lack of a completed design or the lack

of approved test procedures for those systems. The contractor contends that development of test procedures for the 2 Control systems and the 4 Non-Control systems cannot be completed until contract interface coordination issues are adequately addressed, Stop Work Orders are lifted, and RFIs and NOCs are resolved.

MTA C&D needs to provide detailed information about the impacts of the construction of the 270 Park Avenue foundations so that work schedules and overall installation and testing impacts can be determined. In January 2020, the contractor advised MTA C&D that the cable vault at the Roosevelt Island facility was, once again, filling up with water. MTA C&D reports that since the cause of the water infiltration cannot be determined, their strategy will be to “manage” it over time rather than “prevent” it for all time. Installation of sump pumps at this location is, per MTA C&D, not an option at this time. The contractor has also identified various areas that require remediation of “ground” plates for the ESA signal system (installed by other contractors) and is making needed repairs to enable signal equipment installations by the CS086 contractor.

The PMOC continues to observe a lack of progress in the timely resolution of adjacent contractor interface issues despite regular meetings with the contractors involved. Further, the ESA PMT does not appear to be able to effectively manage the resolution of these adjacent contractor interface issues. The PMOC recommends that MTACC management take a larger role and assert more control in managing the resolution of these issues.

CS084 – Tunnel Systems Package 4 – Traction Power Systems:

Schedule: The contractual CS084 SC date was December 2, 2019 and the current forecast is June 25, 2021. The CS084 contract schedule is out of date and contract milestones – including the SC date – need to be adjusted based on the approved track installation phasing plan for CM007 and room access and other construction issues (including water infiltration remediation) are resolved with the CS179 contract. The contractor continues to indicate that all of the delays are as a result of late approval of substation designs, unresolved issues, and obstructions in CS084 work areas from other ESA contractors, SWOs, and site access restraints. In October 2019, MTA C&D provided the CS084 contractor with a list of assumptions to use to develop a recovery schedule. At that time, and again in January 2020, 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 were. The proposed schedule modification was submitted in February 2020; and, at the end of February it remained under evaluation by MTA C&D. The proposed schedule includes acceleration of work efforts; and, MTA C&D indicates that negotiations are needed, as the contractor’s revised work plan does not agree with a plan developed by MTA C&D.

The contractor noted in its submission that the schedule would require further refinement, as MTA C&D’s assumption that all track monuments would be available for cable installation by the end of November 2019 was not met and remains incomplete. Further, there does not appear to be any identified resolution to the water infiltration issue at the C03 substation facility; which has all CS084 work at that location on hold.

Design Progress: Designs for water remediation methodologies in spaces designated for CS084 equipment and other identified field construction issues continue to remain open. Remediation efforts for out-of-specification track monuments are still underway in many locations. However, the ordering or field fabrication of the cabling from the monuments to the 3rd rail is still an issue, as the finite number of cables of the specific sizes needed for the monument sites cannot be determined until all the monument remediation efforts are completed. In January 2020, an issue regarding the attachment of the cable from the impedance bond bus to the negative return rail was identified by LIRR and under consideration by the contractor. Discussions with NYCT related to

cathodic protection are continuing and MTA C&D is preparing to issue a contract modification to the GEC to perform a study of this concern. MTA C&D and the contractor continue to discuss blue light system modifications and 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 C&D need to reach agreement regarding the submission of the source code, a commercial issue, before LIRR will grant final acceptance of the system.

Construction Progress: Equipment installations are complete in the C04 substation but the CS084 contractor cannot complete the cable installation work because the CS179 contractor is still working in the area and there is no room for additional personnel. The contractor indicates that all equipment and material for the substations, with the exception of the C03 substation equipment/material, has been delivered to the respective substation locations. The C03 substation equipment is currently in storage awaiting access availability at the C03 substation. 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 some of the locations cannot progress.

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. After changes in the fabrication methodology were made to correct the defects, both of those transformers were re-fabricated and successfully passed additional hi-pot testing; completing all testing of the required transformers. Both the PMOC and LIRR raised concerns regarding the acceptability and long-term viability of the 10 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 the outcome remains unknown.

MTA C&D took the action to have the CM007 ESA contractor ensure that, where possible, any replacement or repaired track monuments that are turned over to the CS084 contractor meet LIRR specifications; and, the CM007 contractor is making fixes as may be necessary. Some of the monuments in the Yard Track area have been turned over to the CS084 contractor and cable installation work at those locations is progressing.

The replacement of the PVC liner from the C05 conduit system was completed in February 2020; and, the energization of the substation by ConEd is forecast for March 2020. Work on conduit repair/re-installations at several other substations needs to be performed. Other obstruction issues, caused by other ESA contractors remain at several locations and must be resolved to facilitate CS084 cable installations.

Reassembly of the C08 substation pre-fabricated sections was completed; but, several water leaks between the pre-fabricated sections were noted. Work on the elimination of the water leaks progressed in January 2020, but several leaks still persist. The CS179, contractor continues to install the fire alarm system; and, a connection to the site sewer system is still needed. The plan is still to be able to energize this substation by the end of March 2020.

The condition and utilization of the MTA-supplied inductive reactors continues to be an area of concern. The original contract requirement was to have the CS084 contractor install 26 of the reactors to provide broken-rail protection at the various substation locations. In Q3 2018, the PMOC reported on a quality-related issue regarding potential damage to the 26 MTA-supplied inductive reactors. In Q4 2018, after much discussion regarding the acceptability of these reactors,

the contractor accepted two of the reactors and installed one in the Vernon (C05) substation. Subsequent 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 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. Significant schedule impacts could result if any of the remaining required inductive reactors are determined to be unacceptable for use or do not perform as required.

VS086 – Systems Package 3, Signal Equipment Procurement:

Schedule: The original contractual Substantial Completion (SC) date for this contract was October 2019. 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. The contractor and MTA C&D are discussing modifications to the contract that will adjust the schedule to reflect additional design and fabrication work identified over the last several months: incorporation of a Positive Train Control (PTC) system and Construction Phase Services (CPS) support of the CS086 contractor in testing VS086 supplied signal equipment once it is installed. Presently, MTA C&D plans to issue two contract modifications related to a schedule time extension for the VS086 contract: 1) an extension to align the contract SC date with the current February 2021 CS086 SC date and to address all the current issues; and 2) once the PTC work scope is finalized, any required extension to address whatever design, fabrication, and CPS work is associated with the installation and testing of PTC. Currently, MTA C&D is showing a forecasted SC date of December 2020 date, one (1) month later than that reflected in MTA C&D's previous monthly report. It is not clear how the December 2020 date was determined given the understanding that the VS086 contractor will have to support the CS086 contractor's installation and testing of signal equipment, and that the current S/C date for the CS086 contract is shown as April 2021.

Design Progress: MTA and the VS086, CS086, and CS179 contractors continue to discuss the methodology and scheduling of the Factory Integrated Acceptance Test (FIAT) that is performed after the FAT to test the interlocking designs and equipment as a composite systems package. The VS086 contractor indicates that the FIAT is intended to certify that the interlocking control system equipment supplied by the VS086 contractor is compatible with the various Control and Non-Control systems being designed and installed by the CS179 contractor. No date for this FIAT, which will be done in the field rather than in a factory environment, has been established at this time; nor, have any details been provided showing how this testing is incorporated into the Incremental IST Plan.

The PMOC previously reported that there were seven (7) significant design issues needing resolution or direction that had the potential to negatively impact the schedule – all seven remain as open items needing resolution. 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.

In the absence of any comprehensive input from LIRR, the VS086 contractor made its own assumptions regarding the needs of LIRR on the PTC-related issues (Nos. 1 and 2) and submitted a proposal to perform the work. MTA C&D is planning on negotiating a contract modification to address the PTC work, based on the contractor's assumptions in March 2020. In January 2020,

LIRR notified MTA C&D that it was rejecting VS086 contractor's request for a waiver on the need for EMI testing of the ATT-20 track circuit equipment. The contractor continues to take issue with this rejection, indicating that the addition of the ATT-20 equipment was done under a change order and there was no mention of EMI testing requirement in the Change Order. The VS086 contractor has, despite not having a contract modification in hand, begun working on the software redesign for the "light-out" protection and the PTC Application Logic issues. The GEC must still prepare a design scope of work for the inclusion of the train departure signaling design and equipment. Further, the GEC continues to wait for a written Notice to Proceed (NTP) to begin work on the development of the TSR documents. Once the NTP is received, the GEC and the VS086 contractor estimate that the TSR documents will be available for use in 6 months, based on contractual response times and no further LIRR changes. The January 2020 LIRR request to modify the method of operation for the "Diamond" track switch 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's earlier plan to retrofit ATT-20 track equipment and/or replace any equipment that was damaged in transit to the ESA staging areas, with re-delivery by the end of August 2019, slipped repeatedly and is now forecast for March 2020. The re-delivery of this equipment is further complicated by the CS086 contractor relocating its ESA equipment storage facility, which won't be ready for equipment deliveries until April 2020. The delivery of equipment to the Plaza facility remains as an outstanding issue, as the areas where the equipment needs to be placed are impacted by water infiltration. The VS086 contractor and the CS086 contractor note that MTA C&D has yet to certify the use of the proposed (by MTA C&D) grouting contractor. Without this certification, the grouting contractor cannot perform the work and the equipment will remain in storage until the water infiltration in the Plaza areas is mitigated.

CS086 – Tunnel Systems Package 2 – Signal Installation

Schedule: 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; and, currently, work efforts are progressing. In late Q4 2019, the contractor began development of the MTA C&D requested "recovery" schedule that would be based on certain MTA C&D provided assumptions related to mitigation of the known issues and submitted it in late January 2020. As of the end of February 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 has begun to utilize two shifts of work on a daily basis in the tunnel locations to recover some of the lost time; and, discussions are underway to implement a third shift of work at the Plaza location when that site becomes available. MTA C&D's December 2019 ESA Progress Report indicates that the current SC date for this contract is now April 1, 2021 – almost two months earlier than that previously reported. Without the recovery plan and schedule, the PMOC is unable to evaluate the earlier forecast SC date.

Design/Construction Progress: The contractor continues to indicate that there were still areas in GCT-4 and GCT-5 with water infiltration issues that need to be addressed. Site access to the Plaza signal rooms is also not available due to water infiltration.

While the contractor must still provide a comprehensive list of issues identified at the sites it surveyed, numerous issues regarding site accessibility, water infiltration, and equipment layouts have been identified. MTACC has already taking action to resolve a few of issues and is engaged in discussions on how to mitigate some of the other issues. As the contractor accesses more worksite locations, new issues continue to be identified.

In June 2019, the PMOC reported on a significant issue regarding the mounting of signal impedance bonds in the track area. The contractor obtained a mockup mounting plate and planned to start inspecting impedance bond locations in February 2020 to determine the extent of any installation issues. This inspection work, however, had not started as of February 29, 2020.

Other noted issues include: 1) missing “grounding” plates for signal cases and signal apparatus; 2) obstructions precluding the installation of signal equipment at the various locations surveyed; and, 3) several areas where the proposed signal equipment was to be located that appear to be too small for the proposed signal equipment. The contractor has developed, and planned to deploy in February 2020, a signal case and signal head mockup at the Roosevelt Island location for LIRR inspection and approval. 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. The CS179 contractor is handling the issue regarding the “ground” plates, replacing or installing the plates where needed.

As previously reported, MTA C&D indicates that it will be necessary to re-negotiate contract Modification 001 to include updated design drawings and address cable length changes. MTA C&D, the GEC, and the contractor continue to conduct meetings to identify all the required changes before developing the revised work scope. Two new requirements requiring contract changes were identified in January 2020 – that of an increase in the quantity of equipment racks and the installation of 91.6 Hz ATS equipment that was not included in the contract documents.

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	82.2	4.3	46.4	90.9	54.1%	56.5%	3/17/21	3/17/21	
	nc	nc	nc	+3.7	(-0.6)	+5.0%	+4.6%	nc	nc	
	86.5	82.2	4.3	42.7	91.5	49.1%	51.9%	3/17/21	3/17/21	

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

Please refer to the contract narratives for additional information.

CH058A – Harold Structures – B/C Approach

Schedule: No contract milestones were scheduled to be or were completed during February 2020.

Construction Progress: During February 2020, the contractor continued to excavate the East Approach Structure of Tunnel B/C and continued to place re-bar and concrete for the approach structure invert and sidewalls. Additionally, the contractor continued to install piles and began to excavate for the Eastbound Re-Route Tunnel.

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 +0.4 61.4	61.8 +0.4 61.4	-- nc --	61.1 nc 61.1	61.8 +0.4 61.4	100.0% nc 100.0%	98.9% (0.7%) 99.6%	8/15/17 nc 8/15/17	1/24/21 nc 1/24/21	1
FHA03	13.9 +1.5 12.4	5.2 nc 5.2	8.7 +1.5 7.2	10.7 +0.3 10.4	15.8 +1.6 14.2	100.0% nc 100.0%	77.1% (6.8%) 83.9%	7/25/18 nc 7/25/18	6/2/25 nc 6/2/25	1
FHL02	127.3 +4.2 123.1	127.3 +4.2 123.1	-- nc --	124.3 +0.1 124.2	132.8 +7.2 125.6	100.0% nc 100.0%	97.6% (3.3%) 100.9%	11/25/16 nc 11/25/16	8/30/21 nc 8/30/21	1
FHL03	20.6 nc 20.6	2.7 nc 2.7	17.9 nc 17.9	25.0 +0.1 24.9	37.2 (-0.2) 37.4	100.0% nc 100.0%	83.2% (10.6%) 93.8%	8/14/17 nc 8/14/17	4/28/24 nc 4/28/24	1

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

Please refer to the contract narratives for additional information

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

FHA02 and FHA03 – Harold Stage 2 and Stage 3 Amtrak:

Construction Progress: During February 2020, Amtrak Electric Traction (ET) personnel continued construction of the catenary extension over Port Washington #2 Track east of 39th Street in Harold Interlocking (the PW2 Overrun). Amtrak C&S personnel continued to reconfigure the signal system along the Loop Tracks for the future track realignment.

FHL02 and FHL03 – Harold Stages 2 and 3 LIRR:

Construction Progress: During February 2020, LIRR ET personnel continued to install cross-track traction power cables from C08 Substation to the Harold Interlocking tracks and supported the CH058A contractor's construction of the Tunnel B/C Approach Structure. LIRR Signal personnel continued to make signal revisions for the 2020 turnout installations (scheduled to begin in March 2020), and continued to support the CH058A contractor.

d. Quality Assurance and Quality Control

The PMOC reports Quality Assurance/Control issues in its quarterly comprehensive reports. MTA C&D did not report any significant issues regarding Quality Assurance or Quality Control in its ESA Q4 2019 Report. The PMOC continues to monitor developments regarding the following concerns:

1. The Contract CS084 transformer test failures that occurred in 2017 and 2018 as well as the concerns about the condition of the 26 inductive reactors provided by MTA C&D to the CS084 Contractor. No known final resolutions were achieved during January 2020.
2. Potential out of tolerance as-built bench wall clearance for railcars in ESA tunnels. See Section 7.0 (CQ032) for details of survey and remediation.
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 1.0c (CM007; CS084) for details of survey and remediation.
4. During the September 2019 reporting period, MTA C&D identified the need to replace some portion of the rail installed to date by the CM007 contractor due to observed significant deterioration involving pitting and corrosion. The PMOC notes that the CM007 has been directed by MTA C&D to accelerate the completion of installation of the remaining track and third-rail. See Section 1.0c (CM007) for details.

[REDACTED]

b(4)

[illegible]

The ESA program primary critical path in IPS 125 remains through Manhattan/Systems work and ends on August 25, 2021, 5 days earlier than it as reported in IPS 124. Table 2.2 shows the contracts and work that comprise the Manhattan/Systems path as reported in this update.

Table 2.2: ESA IPS Primary Critical Path IPS 125 – January 1, 2020

Activity Name	Duration	Start	Finish
CS084 – Tunnel Systems Package 4 – Traction Power			
Substation C03 layout/installation drawings and approval	925	2-Oct-17	13-Apr-20
C03 install equipment, switch gear, rectifiers, etc.	130	13-Apr-20	20-Aug-20
C03 pull power and ground cable and terminate	82	20-Aug-20	9-Nov-20
C03 test substation, ConEd reviews and energizes	143	9-Nov-20	31-Mar-21
CS179 System Package 1 – Facilities Systems			
IST for track, traction power, and radio	148	31-Mar-21	25-Aug-21
Program Activities			
LIRR FRA Signals and Power Testing †	147	25-Aug-21	18-Jan-22
LIRR Final Testing and Previews ‡	84	18-Jan-22	11-Apr-22
Target Revenue Service Date			11-Apr-22
b(4)			
Public Revenue Service Date			13-Dec-22

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

‡ Successor Harold Interlocking path.

The IPS schedule incorporates MTA C&D's Incremental IST plan, which has been incorporated for CS179 and CM014B. Additional schedule adjustments are expected when contract modifications for IST are issued for contracts CM007, VS/CS084, and CS086. Contracts CM007, CM014B, CS086, and CS179 have near critical work. It is anticipated that the critical path will continue to shift among the various scope elements of these contracts in coordination with their progress.

MTA C&D continues to add and update coordination point milestone activities to the IPS schedule to track and monitor the progress of inter-contract coordination for the ESA program. The coordination points have experienced month-to-month slippages, which reduces their usefulness in monitoring progress. The milestones are coordinated with the syndicated IST schedule, to which the CS179 and CM014B contractors have agreed. MTA C&D has confirmed that these milestones form its plan for progressing the ESA program and can now be monitored going forward to measure progress. For IPS 125, MTA C&D reported 4 of 54 coordination point milestones were achieved as scheduled in December 2019 for contracts CM007, CM014B, CH058A, CQ033, CS179, and the Rail Activation Plan. The PMOC notes that although the coordination points in IPS 125 have generally more than 6 months of total float, there remains the concern that the lack of progress achieving the schedule dates indicates an increasing need for concurrent work in the period leading up to and during IST, which may complicate and impede future progress.

Discussion of Progress along the Critical Path

The Manhattan/Systems critical path completion date in IPS 125 is August 25, 2021, 5 days earlier than the date shown in IPS 124.

The Manhattan/Systems path in IPS 125 has changed completely from the path shown in IPS 124, with CM014B dropping off the path and the CS179 scope changing. The MTA C&D revised the schedule to prioritize the 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 buildout and systems testing in the GCT concourse on the critical path. The critical path is now controlled by the CS084 C03 substation. It begins with CS084-CS179 coordination of BIM layouts, and submission and approval of the layouts; then CS084 installation electrical

equipment including switchgear, breakers, control cabinets, rectifiers, and transformers. This is followed by installation of conduits, cable trays, cable racks, and bus ducts; and then pulling and terminating high voltage cables, DC distribution cables, control cables, and grounding cables. The path continues with testing of cables, insulation and grounding; and then functional and field acceptance tests of electrical equipment. At this point ConEd reviews the system, conduction tests and energizes the substation. The path continues with IST for track and traction power, is controlled by the IST for radio systems. The Manhattan/Systems path ends with completion of IST August 25, 2021. From this point, the path runs through LIRR FRA testing, LIRR final system testing, LIRR initial and final previews. The IPS 125 shows the duration of LIRR-FRA testing as 4.8 months; and, the duration of LIRR final testing and previews as 2.8 months. The program longest path concludes with the Target RSD on April 11, 2022, (b)(4)

90-Day Look-Ahead of Program Critical Activities/Milestones

Appendix B, Table 6, shows the ESA Program activities on the primary critical Manhattan/-Systems path that are planned for the next 90 days as forecast in IPS 125.

Sub Program Longest Path – Harold Interlocking

IPS 125 shows that the Harold Interlocking path remains as the second longest ESA program path. The Harold Interlocking path concludes on July 12, 2021, in IPS 125, 2 weeks later than it was in IPS 124. The float on this path relative to the ESA program critical path (Manhattan/Systems work) is 189 calendar days, approximately 3 weeks less than in IPS 124.

The Harold Interlocking has not changed since IPS 124. The path includes CH058A construction of the B/C structure slab and walls; preparation of the track subgrade, placement of ballast, track and turnouts through substantial completion in March 2021. This followed by LIRR force installation of the W2 switch panel, switch machines, signals and jumpers; CH063 catenary work; and finally LIRR force account cutovers in July 2021, approximately 2 weeks later than in IPS 124. At the completion of the Harold path, (b)(4)

(b)(4), at which point the path joins the ESA program critical path.

Sub Program Longest Path – Queens

IPS 125 shows that the Queens (Mid-Day Storage Yard) path is the least critical program path. The finish date for the Queens path is February 3, 2021 in IPS 125, one month later than it was in IPS 124. The scope that comprises the Queens path starts with the CQ033 cable procurement and delivery; cable pulling from MID-2, MID-4 and MID-5 to cases and termination; and commissioning and IST for MID5 CIL in September 2020. This is followed by 5 months for IST leading to CQ033 substantial completion on February 3, 2021, approximately 2 weeks later than in IPS 124. (b)(4)

Upcoming Contract Procurements

Table 2.4 shows the status of current and upcoming contract procurements as reported in IPS 125 (January 1, 2020).

Table 2.4: Procurement Schedule

Contract Description	Advertise Date	Bid Date	NTP	Project Length	Substantial Completion
CH063 ET Catenary Work – 3 rd Party	9/11/19	2/13/20	5/1/20	24 mos.	5/1/22

CH063 Electric Traction Catenary Work, 3rd Party: As detailed in Section 1.0b, Procurement, above, the RFQ for this contract was advertised earlier in 2019 and MTA C&D received seven proposals, of which four were deemed pre-qualified. ESA issued a Best and Final Offer solicitation to those four respondents on September 11, 2019, with responses originally due back on December 9, 2019. Due to several questions from the proposers, however, the BAFO responses were delayed through February 2020 and are now due back in late Q1 2020 with award projected for early Q2 2020.

PMOC 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 executed modifications with the CS179 and CM014B contractors for the Incremental IST schedule, other Manhattan/Systems contracts remain near critical and may exert a significant influence on the critical path.
2. The PMOC notes that MTA C&D has reported that the Schedule Contingency is 246 calendar days in IPS 125, which is 29 days less than the b(4). 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 for 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 71.2% complete compared with as-planned progress of 100%. The PMOC observes that work on CS084 is program critical and continues to be delayed each month. While many of the delays appear to have been absorbed and/or mitigated in the schedule, float has been lost for this critical work. The PMOC believes that a revised schedule will push out milestone dates. The PMOC recommends that ESA continue to analyze options to recover lost time with a focus on identifying major issues and corrective measures.
4. The PMOC is concerned about the lack of progress to advance IST as indicated by slippages to the coordination point completion dates. For IPS 125, MTA C&D reported that 4 of 54 coordination point milestones were achieved in December 2019 for contracts CM007, CM014B, CH058A, CQ033, CS179, and the Rail Activation Plan. The PMOC notes that although the coordination points in IPS 125 b(4), there remains the concern that the lack of progress achieving coordination point dates indicates an increasing need for concurrent work in the period leading up to and during IST, which may complicate and impede future progress. The slippages and float levels point to a reduction in the usefulness of coordination points for monitoring progress.
5. The CM014B contractor's capability to complete the approximately 10% of its remaining work in the 11 months remaining to the forecast SC in December 2020 is questionable. The PMOC believes that this is optimistic based on prior construction performance.
6. Delays to the program from JPMC work at 270 Park Avenue remain a concern. This work is not yet modeled in the IPS and therefore its impact is not yet fully known. It had already

Table 3.2: Executed Change Order Log (magnitude > \$100,000)

Contract	Description / Mod No.	Amount
CS179	Yard Service Building Demark Room (mod. 292)	233,520
GEC	Additional Funding for CPS (2019) (mod. 166)	22,700,00

Funding

The ESA program has funding of \$10,335 million through December 2020. The MTA C&D's proposed ESA budget of \$11,133 million is included in the 2020-2014 Capital Plan, which was approved by the Governor of the State of New York in January 2020. The MTA C&D anticipates updating the ESA budgets in the first quarter of 2020.

The Amended FFGA budget is \$12,038 million, which includes \$10,922 million for construction and revenue vehicles, and \$1,116 million for financing costs. The MTA C&D reassessment of April 2018 forecast the ESA program Net ETPC \$11,133 million for the portion of the program that the MTA C&D is managing for the MTA, and it is the subject of their reporting (as agreed in December 2009). The April 2018 forecast includes costs for 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 (refer to Appendix B, table 4).

Federal Funding: The total Federal funding commitment to the ESA project is \$2,698.8 million, of which all of the funds have been effectively drawn down as of January 1, 2020.

Local Funding: The budget for Local Funding is \$7,636.4 million, of which \$6,438.3 million has been expended through January 1, 2020. Financing costs are funded separately from other local sources.

PMOC Concerns and Recommendations

1. The PMOC is concerned that 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.
2. The PMOC is monitoring a reduced risk that ESA budgets are not replenished in time to match program needs. The MTA C&D anticipates updating the ESA budgets in the first quarter of 2020.
3. MTA C&D is working with 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 CS084, 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.
4. Ongoing and possible future delays may result in increasing costs for the following contracts:
 - CS084 – the late completion of final design has delayed the completion of 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 and collateral cost impacts to CS179.

4.0 RISK MANAGEMENT

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

Harold Interlocking – ESA Risk

Harold Re-Sequencing Plan (ESA First) Risk: Through February 2020, MTA C&D continued to adjust the ESA First Harold Re-Sequencing plan, as required, to accommodate any identified railroad force account constraints. The PMOC notes that the noticeable improvements for LIRR direct Force Account work and Amtrak ET support that had been reported starting in Q1 2019 appeared to have been sustained through February 2020.

Amtrak Preparation for Extended East River Tunnel Outages Risk: The PMOC has continuing concerns regarding the impact to the ESA Harold work due to the Amtrak program to harden East River Tunnel (ERT) Lines 1 and 4 in preparation for extended outages for ERT Lines 1 and 2 to complete Hurricane Sandy damage-related reconstruction work, originally planned for 2019 and now deferred until 2025, starting with Line 2. During March 2019, MTA C&D indicated that Amtrak may advance ERT Line 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 December 2022 RSD. Should this occur, 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 of December 2022. There is less likelihood, however, that this situation would impact the FFGA RSD of December 2023.

LIRR Positive Train Control (PTC) Risk

This risk has two distinct elements, as discussed here.

- a.) LIRR may divert some force account resources away from support for the ESA work to provide support for LIRR's system-wide, i.e., non-ESA, PTC work currently underway. The PMOC notes that the LIRR PTC Group is reportedly resource constrained and is not able to provide the needed level of technical and coordination support for the ESA PTC work due to increasing schedule pressure to complete PTC system-wide for the existing LIRR rail network by the current FRA deadline of December 2020
- b.) MTA C&D-ESA 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 reaching scope concurrence with Contracts VS086, CS086, and CS179. LIRR had earlier reportedly provided most of the PTC design information to the GEC, however, there are remaining outstanding items required for finalization of the additional scope of work for the three contracts noted above and the associated contract modifications cannot be completed absent the final PTC design. See Section 1.0 for details. Accordingly, MTA C&D made the decision during Q4 2019 to work through the CPR and contract modification process with the CS179, VS086 and CS086 contractors for incorporation of as much of the PTC work scope that can be reliably included based on PTC "assumptions" developed by MTA C&D that will be included in the CPRs for the three referenced contracts. 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 MTA C&D 2020–2024 Capital Plan included approximately \$800 million to complete the ESA program and it was approved by the MTA in September 2019. The plan was sent to the NYS

Capital Plan Review Board and was deemed approved by the Governor of the State of New York in January 2020. The MTA C&D anticipates updating the ESA budgets in the first quarter of 2020. The PMOC is monitoring a reduced risk that ESA budgets are not replenished in time to match program needs.

ESA Vehicle Risk

The PMOC remains concerned about the schedule slippage of the LIRR federal vehicle procurement program for the M-9A vehicles because it has now adversely impacted delivery of the vehicles in time for the MTA C&D's RSD. LIRR is procuring the vehicles in a two-step RFP process, the first step of which, Qualifications, was completed in December 2018. The second, Cost/Schedule part of the procurement, however, has been delayed for various reasons since December 2018. During December 2019, LIRR completed and solicited the second step of the procurement, a Best and Final Offer (BAFO) for the vehicles. The proposers' responses were received by LIRR on January 29, 2020, after which LIRR began evaluation. LIRR intends to issue the award and NTP for this procurement in early April 2020.

Manhattan/Systems Performance Risk

The Manhattan/Systems path remains at risk for future open/unresolved issues. Contract modifications for impacts related to JPMC work at 270 Park have not yet been incorporated into the IPS. Additionally, inter-contract coordination points for work leading up to the start of IST have not been achieved month-to-month. Modifications for contracts CS084, CS086, and CM007 have yet to be issued and may have additional negative impacts on the schedule. The impact of delayed installation and testing of PTC may also have a schedule impact to the ESA Program.

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 will impact the ongoing construction of the new LIRR Concourse at Grand Central Terminal. All MTA costs-to-date have been reimbursable by JPMC and all related MTA C&D-ESA work is being performed by a dedicated team so not to impact the management and technical services being provided for the ESA program. With execution of the MTA/MTA C&D – JPMC Memorandum of Understanding and the MTA/MTA C&D-JPMC Construction Agreement, MTA C&D believes that it has mitigated the risks of schedule delays and additional costs. The PMOC does note, however, that MTA C&D has 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. JPMC's construction contractor started demolition work during November 2019. The PMOC is primarily concerned about potential schedule risks resulting from adverse impacts on completion of the construction of the new LIRR Concourse. Information received during February 2020 has significantly increased the PMOC's concern: The PMOC notes that the JPMC contractor was scheduled, in accordance with the MTA C&D/JPMC Construction Agreement of July 31, 2019, to start foundation (caisson/caps) work for Section MA on November 22, 2019 but as of February 29, 2020, this work had not yet commenced. MTA C&D acknowledged at the February 24, 2020 Cost and Schedule Review Meeting that the caisson redesign is anticipated to recover only four weeks of the three months lost to JPMC's late start of work. The Acting Director also clarified that JPMC's construction would still be at least 2 months late after the redesign is incorporated into the schedule. MTA C&D shares the PMOC's concern that approximately 2 months of lost time need to be recovered.

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).

5.0 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. MTACC planned to include all aforementioned updates in the draft TCC Plan revision submitted during May 2019.
- **Continuing ELPEP Compliance:** The ESA project should continue to make additional improvements in the following areas: Management of GEC Construction Phase Services; Change Control Committee (CCC) Process and Results; Stakeholder Management; and Risk-Informed Decision Making. The PMOC 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, the FTA, and the PMOC are in agreement on the 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 MTA C&D is reporting that the Schedule Contingency 4 weeks less than the ELPEP minimum of 275 calendar days. The total Cost Contingency is \$150 million above the ELPEP minimum contingency of \$260 million.

The PMOC notes that, with completion and approval of the Schedule Management Plan and Cost Management Plan updates currently in use, as well as the FFGA amendment, 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, 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.

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, the CPP in January 2019, as well as the TCC in May 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.

6.0 SAFETY AND SECURITY

Based on safety information supplied by MTA, the PMOC-calculated ESA Injury Ratios for January 2020 were 1.50 for Lost Time Injuries (LTI) and 3.01 for Recordable Injuries (RI). The LTI ratio was slightly above and RI ratio was above the Bureau of Labor Statistics (BLS) 2020 Safety Guideline of 1.5 for LTI and 2.6 for RI. Additionally, ESA did not report any significant security issues in its Q4 2019 Quarterly Performance Report.

7.0 ISSUES AND RECOMMENDATIONS

Design: The PMT design management team needs to focus on the timely achievement of time-critical intermediate milestones and work closely with the GEC to provide the required design related Construction Phase Services for schedule critical construction/procurement efforts as determined by the PMO Analytics Group. Also, the PMOC has observed the following:

- Approvals from the railroads, both LIRR and Amtrak, and other outside stakeholders, are requiring considerably more time than planned; and,
- LIRR is making changes that alter the design basis and result in time-consuming and costly re-design work by the GEC as well as cost and schedule impacts to construction activities.

The ESA PMT needs to continue to monitor and improve coordinating the interface of design reviews and equipment approvals between the GEC and LIRR for the CS084, CS179, and VS086 contracts. These shortcomings indicate possible technical capacity and capability issues in the particular design support areas.

Water Infiltration Concerns on Contracts CS179, CS084, CS086 and CQ032:

The PMOC remains concerned about the numerous ongoing water infiltration issues in the electrical and electronic equipment rooms either constructed by, or provided for, these contracts. The PMOC notes that, while a number of the water remediation efforts employed have been successful, others have not; and this has caused delays to construction work. The CS179, CS086, and CS084 contractors continue to advise MTA C&D of additional water infiltration issues in

areas where work access is available. In addition, water and PAC remediation issues remain in several areas under Contract CQ032.

Tunnel Clearance Concerns: There remain seven NCRs related to potential out of tolerance railcar clearances in ESA tunnel bench walls that require remediation. Three field changes were executed in July 2019 for remediation in the Bellmouth, GCT7, and Tunnel D, although no progress at those locations has been made through February 2020. ESA continues to forecast that duct bench remediation will be complete by March 31, 2020, although, based on progress to date, the PMOC believes that projection to be overly optimistic.

Contract CS179: The PMOC recommends that the ESA PMT make improvements regarding the PMOC's following concerns for CS179:

- Timely delivery and discussion about the contractor's monthly schedule submissions;
- Identification and mitigation of coordination issues;
- ESA PMT responses to contractor NOCs and issuance of CPRs; and,
- Timely design review and approvals *for* the contractor's design submittals and RFIs.

Contract CS084: The PMOC remains concerned about the following issues:

1. Transformer hi-pot testing failures and long-term viability of the transformers;
2. Verification of existing conduit and manholes in several substations;
3. Coordination with other contractors;
4. Possible damage to the MTA-provided inductive reactors due to improper storage and handling by MTA;
5. Extent of non-conformance of track monuments;
6. Water infiltration issues in the facilities; and continuing design changes or re-evaluations to equipment or implementation methodology.

Contract VS086: The PMOC remains concerned that there is no accurate and comprehensive schedule in place that addresses all issues and would allow MTACC to effectively manage this contract. Completion of a new schedule is essential. Issues regarding the light-out protection design, PTC Application Logic design incorporation, train departure testing design and equipment fabrication, decisions regarding the software changes for the specialty "Diamond" switch, and Track and Signal Routing design charts need to be expeditiously addressed.

Contract CS086: The PMOC remains concerned that there is no accurate and comprehensive schedule in place that would allow MTACC to effectively manage this contract. MTACC needs to address the key critical issues discussed in earlier sections of this report and reach agreement with the contractor on a new schedule.

Project Funding: The MTA 2020–2024 Capital Plan includes approximately \$800 million to complete the ESA program. It was approved by the MTA board and the governor's office. The PMOC is monitoring a reduced risk that ESA budgets are not replenished in time to match program needs. The MTA C&D anticipates the ESA budget update in Q1 2020.

Project Budget: The PMOC is concerned about MTA C&D's unconventional strategy of holding significant contingencies that would only be released to specific projects on an as-needed basis commensurate with construction progress and future contract modifications. While MTA C&D's strategy retains maximum flexibility, it differs from the generally accepted practice of committing funds to budgets for known program costs. The PMOC is concerned that the strategy results in an overstatement of both the contract completion percentages and the total value of unallocated contingencies at any point in time.

Project Schedule: The PMOC remains concerned about the remaining program schedule contingency, which is 4 weeks less than the ELPEP minimum of 275 calendar days. IPS 125 shows that CS084 work for substation C03 now controls the Manhattan/Systems area and the Program

critical path. Planned critical work then moves through the start of CS179 IST for radio systems. Manhattan/Systems contracts that are not on the critical path, but which are quite near to it, include CM007 and CM014B, each of which has its own schedule challenges which may impact the program schedule.

Risk Management: The segmentation of construction packages has created multiple inter-contract interfaces and milestones. In the PMOC's opinion, managing inter-contract handoffs and interfaces has been, and will continue to be, very challenging and represents a significant MTA C&D-retained risk. The PMOC believes that achieving any meaningful schedule recovery, especially for Contracts CM014B, CS179, CS086, and CS084, will be difficult at best. The PMOC considers the major remaining risks for the East Side Access Program to be:

1. Program Funding – update of program budgets and inclusion in MTA Capital Plan (long term risk realized Q2 2018; ESA budget approved by MTA and CPRB/governor);
2. Recovery of lost time due to significant schedule delays on CS084;
3. Successful execution of multiple hand-off interfaces across several contracts;
4. Contractor access and work area coordination in Manhattan;
5. Duration of integrated systems testing and effectiveness of Incremental IST;
6. Continued availability of adequate Amtrak and LIRR force account resources;
7. Continued availability of required track outages in Harold Interlocking;
8. Maintaining adequate schedule performance of the remaining work in Harold Interlocking (Improved performance noted through January 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; and,
12. Foundation systems required for the new JP Morgan/Chase (JPMC) building at 270 Park Avenue will impact construction of the new LIRR Concourse at GCT. (Risk significantly increased based on issues revealed during January 2020)
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.

APPENDIX A – ACRONYMS

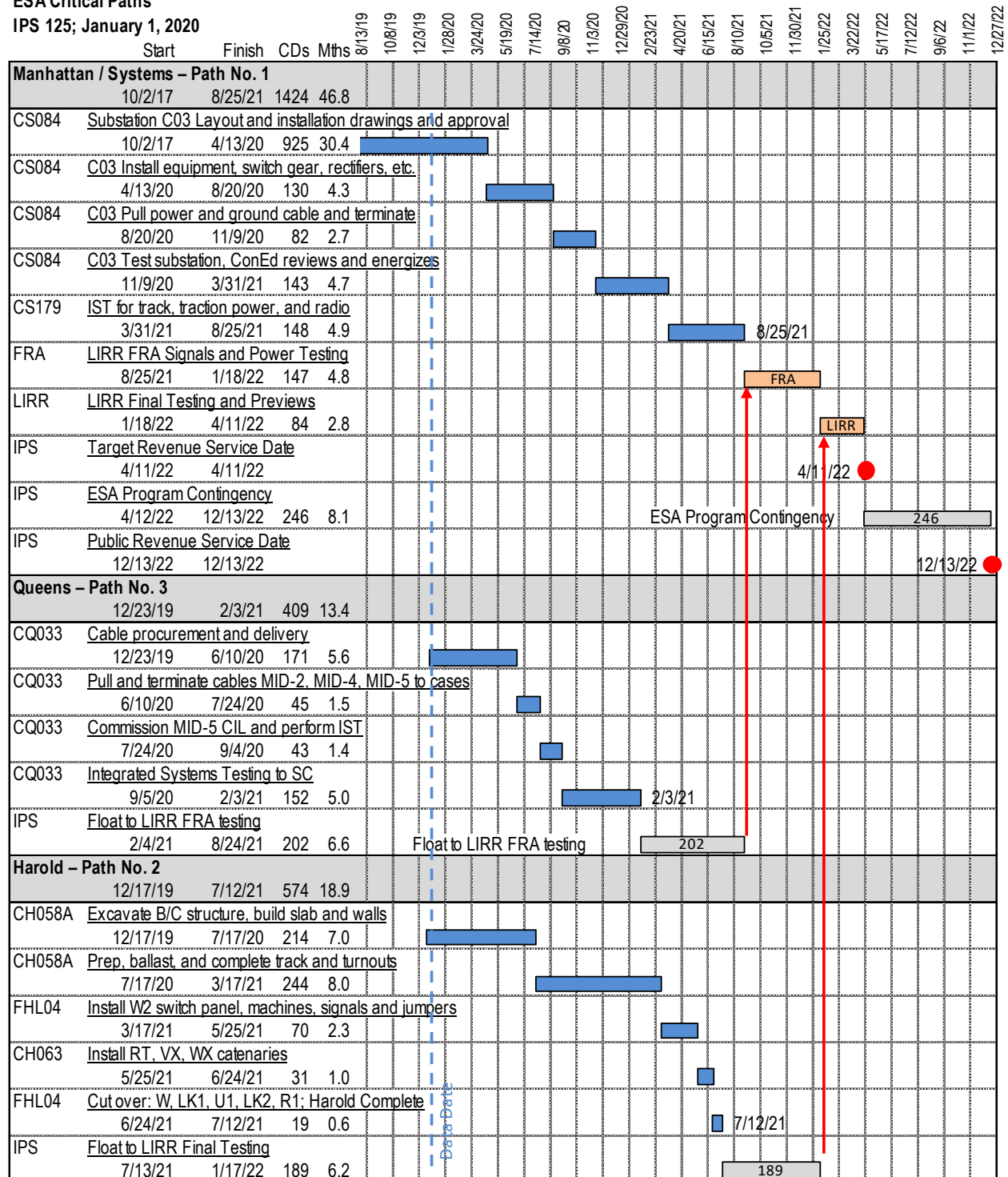
AFI	Allowance for Indeterminates	IPS	Integrated Project Schedule
ARRA	American Recovery and Reinvestment Act	IST	Integrated System Test
AWO	Additional Work Order	JPMC	J. P. Morgan Chase
BIM	Building Information Model	LIRR	Long Island Rail Road
BLS	Bureau of Labor Statistics	LSZH	Low Smoke Zero Halogen
BSA	Buy/Ship America	MNR	Metro-North Railroad
C&S	Communication and Signals	MOD	Contract Modification
CBB	Current Baseline Budget	MPR	Monthly Progress Report
CCC	Change Control Committee	MTA	Metropolitan Transportation Authority
CCM	Consultant Construction Manager	MTA C&D	MTA Construction and Development
CCTV	Closed Circuit Television	NCR	Nonconformance Report
CD	Calendar Day	NOC	Notice of Change
CIL	Central Instrument Location	NTP	Notice to Proceed
CIR	Central Instrument Room	NYCT	New York City Transit
CM	ESA Construction Manager assigned to each contract	OCIP	Owner Controlled Insurance Program
CMP	Cost Management Plan	PAC	Pneumatically Applied Concrete
CMU	Concrete Masonry Unit	PCO	Proposed Change Order
ConEd	Consolidate Edison Company	PLC	Program Logic Control
CPOC	Capital Program Oversight Committee	PMOC	Project Management Oversight Contractor (Urban Engineers)
CPP	Contract Packaging Plan	PMP	Project Management Plan
CPR	Contractor Proposal Request	PMT	ESA Project Management Team
DC	Direct Current	QA	Quality Assurance
DCB	Detail Cost Breakdown	QPR	Quarterly Progress Report
DFF	Direct Fixation Fastener	RFI	Request for Information
EAC	Estimate at Completion	RFP	Request for Proposal
ELPEP	Enterprise Level Project Execution Plan	RMP	Risk Management Plan
ERT	East River Tunnel	ROD	Revenue Operations Date
ESA	East Side Access	ROW	Right of Way
ET	Electric Traction	RPR	Relocated Primary Route
F/A	Force Account	RSD	Revenue Service Date
FAT	Factory Acceptance Testing	RTB	Resilient Tie Block
FD	Final Design	SC	Substantial Completion
FFGA	Full Funding Grant Agreement	SCADA	Supervisory Control and Data Acquisition
FIAT	Factory Integrated Acceptance Testing	SDR	Second Design Review
FRA	Federal Railroad Administration	SLCS	Signal Local Control System
FTA	Federal Transit Administration	SMP	Schedule Management Plan
GCT	Grand Central Terminal	SMS	Security Management System
GEC	General Engineering Consultant	SWO	Stop Work Order
HVAC	Heat, Ventilation and Air Conditioning	TCC	Technical Capacity and Capability
		TPSS	Traction Power Substation
		TSR	Track and Signal Route
		WBY	Westbound Bypass Tunnel

APPENDIX B – CHARTS AND TABLES

Chart 1: ESA Critical Paths – IPS 125 – January 1, 2020

ESA Critical Paths

IPS 125; January 1, 2020



APPENDIX B – TABLES

Table 1: Summary of Critical Dates

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

Notes: * Project Sponsor forecast Revenue Operations Date per presentation the MTA CPOC in June 2014.
 ** Source –Based on PMOC 2014 schedule trending analysis representing a medium degree of mitigation.
 *** Source – Amended FFGA, August 2016

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

	FFGA			MTA Current Baseline Budget (CBB)			Expenditures January 1, 2020	
	Original FFGA	Amended FFGA	Pct. of FFGA	Obligated	CBB	Pct. of Total CBB	Expenditures	Pct. of CBB
Grand Total	7,386.0	12,038.5	100.0%	10,407.4	11,451.5	100.0%	9,588.1	83.7%
Financing Cost	1,036.0		14.0%	617.6	1,116.5	9.7%	617.6	55.3%
		1,116.5	9.3%					
Total Project Cost	6,350.0		86.0%	9,789.8	10,335.1	90.3%	8,970.5	86.8%
		10,922.0	90.7%					
Federal Share	2,683.0		36.3%	2,698.8	2,698.8	23.6%	2,698.8	100%
		2,698.8	22.4%					
5309 New Starts share	2,632.0		35.6%	2,436.7	2,436.7	21.3%	2,436.7	100%
		2,436.7	20.2%					
Non New Starts share	51.0		0.7%	66.6	66.6	0.6%	66.6	100%
		66.6	0.6%					
ARRA	0.0	195.4	1.6%	195.4	195.4	1.7%	195.4	100%
Local Share	3,667.0		49.6%	7,091.0	7,636.2	66.7%	6,271.7	82.1%
		8,223.2	68.3%					

Table 3: Project Budget and Invoices
(Cost shown in millions)

Elements	Baseline Total Budget June 2014	April 2018 MTA ETPC	January 1, 2020				Invoice Pct. of MTA ETPC
			Current Budget (interim)	Actual Awards	Invoiced Costs	Invoice Pct. of Budget	
Construction	7,379.3	8,014.1	7,658.4	7,455.2	6,936.0	90.6%	86.5%
Soft Cost Subtotal	2,157.5	2,650.2	2,380.5	2,331.7	2,200.7	92.5%	83.0%
Engineering	720.6	871.8	817.7	789.7	763.9	93.4%	87.6%
OCIP	282.6	457.4	384.2	384.2	383.4	99.8%	83.8%
Project Management	972.2	1,117.3	1,053.6	1,037.8	934.9	88.7%	83.7%
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	3.8%	0.0%
b(4)							
Subtotal	10,640.8	11,596.3	10,335.1	9,789.8	9,137.0	88.4%	78.8%
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 Forecast to account for the cost of 160 revenue vehicles.

Table 4: Comparison of Standard Cost Categories: FFGA, MTA ETPC, CBB
(Cost shown in millions)

Standard Cost Category	FFGA Dec 2006	June 2014 Project Budget	Amend ed FFGA	April 2018 MTA ETPC	Oct 2019 CBB	Nov 2019 CBB	Dec 2019 CBB	CBB / FFGA Var.	CBB / Amend FFGA Var.
10 Guideway & Track Elements	1,989	3,405	3,353	3,479.7	3,402	3,403	3,409	71.4%	1.6%
20 Stations, Stops, Terminals, Intermodal	1,169	2,238	2,327	2,473.6	2,378	2,378	2,378	103.5%	2.2%
30 Support Facilities (Yards, Shops, Admin)	356.3	474.2	450.8	612.7	575	575	578	62.3%	28.3%
40 Site Work and Special Conditions	205.1	610.6	562.5	591.9	520	518	519	153.0%	-7.8%
50 Systems	619.3	605.6	627.7	810.9	721	720	730	17.8%	16.3%
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	2,233	2,256	90.5%	24.7%
b(4)									
Subtotal	6,350	10,641	10,922	11,596	10,335	10,335	10,335	62.8%	-5.4%
100 Financing Cost	1,036	1,036	1,116	1,116	1,116	1,116	1,116	7.8%	0.0%
Total	7,386	11,677	12,038	12,713	11,452	11,452	11,452	55.0%	-4.9%

Table 5: Summary by FTA Standard Cost Categories
(Costs shown in millions)

Standard Cost Category	FFGA	June 2014		January 1, 2020		
		Project Budget	Amended FFGA	Current Budget	Awarded Value	Paid to Date
10 - Guideway & Track Elements	1,988.7	3,405.5	3,353.4	3,408.7	3,356.6	3,143.2
20 - Stations, Stops, Terminals, Intermodal	1,168.7	2,238.2	2,326.8	2,377.7	2,309.8	2,071.5
30 - Support Facilities (Yards, Shops, Admin)	356.3	474.2	450.8	578.1	567.7	488.6
40 - Site Work and Special Conditions	205.1	610.6	562.5	518.9	494.5	502.7
50 – Systems	619.3	605.6	627.7	729.8	681.5	526.5
60 - ROW, Land, Existing Improvements	165.3	219.4	192.2	162.3	157.3	155.9
70 - Vehicles	494.0	209.9	879.5	15.4	10.7	5.8
80 - Professional Services	1,184.0	1,975.4	1,809.0	2,255.5	2,211.7	2,076.2
b(4)						
Subtotal	6,349.9	10,177.8	10,922.0	10,335.1	9,789.8	8,970.5
100 - Finance Cost	1,036.1	1,036.1	1,116.5	1,116.5		
Total	7,386.0	11,213.9	12,038.5	11,451.6		

Table 6: Program Critical Dates 90 Day Look-Ahead – IPS 125 – January 1, 2020

Act. Id.	Name	Start	Finish	Float
CS084	Tunnel Systems Package 4 – Traction Power Systems			
C03-1460	Coordination of BIM Layout with CS179 – CO3	2-Oct-17A	14-Feb-20	1 cd
C03-1470	Submit Field Installation Layout Drawings – CO3	14-Feb-20	13-Mar-20	1 cd
CO3-1480	Approve Field Installation Layout Drawings – CO3	13-Mar-20	23-Apr-20	1 cd

Table 7: ESA Core Accountability Items

Project Status		Original at FFGA	Amended FFGA	Current	ELPEP **
Cost	Cost Estimate (including finance and rolling stock)	\$7,386.0 m	\$12,038.5 m	\$12,712.8 m*	\$9,155.1 m
	b(4)				
Schedule	Start of Revenue Service	Dec. 31, 2013	Dec. 31, 2023	Dec. 2022	April 30, 2018
Project Percent Complete		Based on Invoiced Amount		82.1% actual vs. 83.2% 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		\$9,789.8 m	87.9% (PMOC calculation†)	
	Total construction contracts awarded to date		\$7,455.2 m	93.0% (PMOC calculation†)	
Major Issue	Status		Comments		
Project Funding and Budget	The total program budget is \$10,335.1 million, b(4). The MTA included an additional approximately \$800 million for the ESA program in the 2020-2024 Capital Plan. The Capital Plan was deemed approved by the Governor of the State of New York in January 2020.		The MTA C&D needs an additional approximately \$800 million in the 2020-2024 Capital Plan to complete the ESA program b(4). The MTA C&D anticipates updating the ESA budgets in the first quarter of 2020 using additional funding from the approved 2020-2024 Capital Plan.		
Project Cost	The MTA ETPC is \$12,712.8 million, including costs for financing and 160 vehicles, \$674.3 million above the Amended FFGA Baseline Cost Estimate of \$12,038.5 million.		With the approval of the 2020-2024 Capital Plan, potential impacts to the completion of current contracts, award of remaining contracts, and/or completion of railroad force account work have been reduced. Concerns remain about the time elapsed in resolving the open cost and schedule issues and, ultimately, their cost impacts.		
Project Schedule	The primary critical and near-critical paths to target RSD, including float, are: ▪ Manhattan/Systems - no float (critical path) b(4) ▪ Mid-day Storage Yard (Queens) - 202 CDs The target RSD forecast is April 11, 2022; and the public RSD remains December 13, 2022. The Amended FFGA Revenue Operations Date is December 2023.		There remain 27 months to the target RSD, which is followed by b(4). 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 125 shows that the ESA Program Critical Path runs through the Manhattan/Systems contracts. There are near critical major open/-unresolved performance issues regarding execution of incremental IST and the redevelopment of 270 Park Avenue that might have potentially significant schedule impacts.		Concerns continue for the ESA program Manhattan/Systems critical path. The Manhattan/-Systems path completion date is August 25, 2021 in IPS 125. Progress along this schedule path relies heavily on the effectiveness of MTA C&D/ESA coordination efforts and contractor performance across the seven construction contracts.		

Notes: * The cost forecast total 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 EAC 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)