

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

Report Period October 1 – October 31, 2019

PMOC Contract No. DTFT60D1400017

Project No. DC-27-5287, Task Order No. 0002, Work Order No. 09

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

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Third Party Disclaimer

This report and all subsidiary reports are prepared solely for the Federal Transit Administration (FTA). This report should not be relied upon by any party, except 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: The Overall Program is 80.0% actual versus 80.8% as-planned (based on invoice cost and April 2018 EAC forecast).

Construction Status¹: The Construction Status is 84.1% actual versus 85.1% as-planned (based on invoice cost and April 2018 EAC forecast).

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 MTACC forecasts through December 2020.

Program Cost and Budget: b(4)

Integrated Project Schedule: The target RSD forecast slipped to March 14, 2022. The ESA 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. MTACC- Change Order processing issues, GEC CPS support for Contractor Submittals, Redesigns, RFIs, Field Conditions.

Construction Safety: 1.71 – Lost Time (LT) and 2.56 Recordable (RI) BLS Injury ratios during September 2019; LT higher and RI lower than August 2019.

ELPEP Compliance: b(4)

Project Management Plan: MTACC 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 MTACC East Side Access Monthly Progress Report for August 2019, referenced in this report as the ESA August 2019 MPR, which has a Cost and Schedule data date of September 1, 2019. 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. 0002. 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 Capital Construction (MTACC) 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 August 2019 MPR, the PMT reported the overall engineering effort at 87.3% complete compared to planned completion of 87.8%. Since the ESA July 2018 MPR, the PMT calculates summary Engineering progress as a percentage of the \$871.8 million April 2018 engineering EAC forecast.

Status of Construction Packages Advertised

CH063 Electric Traction Catenary Work, 3rd Party: The RFQ for this contract was advertised earlier in 2019 and MTACC received seven proposals, of which four were deemed “pre-qualified”. ESA issued a “Best and Final Offer” solicitation for this contract on September 11, 2019, with responses due back on December 9, 2019. ESA is scheduled to issue the award and NTP in January 2020.

Status of Construction Packages Not Awarded

CM015 – 48th Street Entrance: MTA/MTACC-ESA has achieved significant progress in negotiations with the owners of the buildings at 415 Madison Avenue and 270 Park Avenue regarding the ESA 47th Street and the 48th Street Entrances to the LIRR Concourse at GCT. As a result of these negotiations and anticipated agreements, and with the FTA's August 2019 concurrence, the owner of 415 Madison Avenue will construct the 48th Street Entrance core and shell and will complete facility fit-out.

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, MTACC received CCC approval to pursue this option for the single west end MDSY exit. Correspondingly, the funding for the FQA33A Sub 4 to Line 2 connection option, which was under previous consideration, will be transferred to the FQA33B Sub 3 to Line 4 option.

Status of Positive Train Control Design

Positive Train Control: The MOU between MTACC and LIRR for the implementation of Positive Train Control (PTC) on ESA was executed and the Technical Concurrence Document has been agreed upon by MTACC and LIRR. MTACC-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. MTACC earlier reported that LIRR had been expected to complete the PTC design in January 2019, but this was delayed due to resolving GEC/LIRR comments on the GCT3 and GCT4 application logic submittals and reaching scope concurrence with Contracts VS086, CS086, and CS179. As of August 31, 2019, LIRR had reportedly provided most of the design information to the GEC. However, there remain outstanding items as of October 31, 2019, required for completion of the additional scope of work for the three contracts noted above, including: Book of Plans and details of the Wayside Interface Units for Plaza Interlocking; PTC L2 Switch and FDP drawing for each ESA interlocking; Bill of Material for equipment provided by LIRR PTC; LIRR PTC test plans and procedures, including FRA test plans.
- The GEC had earlier prepared initial scope design modifications to Contracts CS179, VS086, and CS086, which will provide for the LIRR designed PTC overlay onto the

ESA systems. The GEC has provided LIRR with the proposed changes for PTC on these contracts to insure coordination with the LIRR PTC requirements, but contract modifications cannot be completed absent the final PTC design. Accordingly, MTACC is currently working through the CPR and contract modification process with both the CS179 and CS086 contractors for incorporation of as much of the PTC work scope that can be reliably be included. Due to continuing delays to completion of the PTC design by LIRR, MTACC 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 MTACC and LIRR Review and Approval of Systems Contractors' Final Designs

CS179, Systems Facilities Package No.1: The backlog of overdue submittals and RFI reviews noted in earlier reports continues to be a significant unresolved issue for the CS179 project team. As of October 28, 2019, the number of contractor submittals stood at 299 awaiting MTACC response with 172 of those (57%) exceeding the required 30 day turnaround time. While this is an improvement in the reduction in the number of open responses (from 704 to 299), the delay in providing responses to the contractor is still, per the contractor, impacting work progress. In October 2019, MTACC continued its effort to address the contractor's Notices of Change (NOC) and the issuance of Contractor Proposal Requests (CPRs) for those NOCs deemed to be warranted. MTACC reports that there has been improvement in the resolution of these NOCs; however, no statistical data is available at this time. The completion of Final Design (FD) for all 10 Control Systems, which was scheduled for completion 41 months ago, has not occurred yet, with two (2) of the Control Systems (Fire Life Safety and Security Management) still under design development. As of the end of October 2019, the Voice Communications System, which had already received approval by LIRR, continued to undergo some minor design modifications. Further, the completion of FD for all 19 Non-Control Systems continues to be delayed. The full impact of the Control and Non-Control System FD delays on contract progress remains undetermined at this time.

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. While a comprehensive plan for remediation of specification non-conformance issues related to the track monuments is still being developed, remediation efforts in many locations has begun. Discussions with NYCT related to cathodic protection are continuing and MTACC is planning on issuing a contract modification to the GEC to perform a "study" of this concern. Previously identified internal MTA discussions regarding what action will be taken on any possible modification of the implementation methodology designed for the "blue light" system continue with no forecasted completion date. The contractor continues to indicate that any change in design at this time will require further changes to the PLC software.

VS086, Systems Package 3 – Signal Equipment Procurement: Work on the design to incorporate Positive Train Control (PTC) requires a contract modification that must still be developed and negotiated. In July 2019, MTACC transmitted some PTC design documents to the contractor; and, based on the review of the documents, both the contractor and the GEC indicate that MTA's PTC design is incomplete. MTACC indicates that LIRR needs to finalize the design and meetings between LIRR, MTACC, the GEC, and the VS086 contractor are needed to identify the information required to progress any follow up design under the VS086 contract. Several other previously identified design issues (light-out protection, train departure testing, and changes to Application Logic software) continue to remain under discussion, with no forecasted completion date available at this time.

CS086, Tunnel Systems Package 2 – Signal Installation: As of the end of October 2019, the only design issues noted by MTACC on this contract revolve around issues related to installation of equipment in the field. Specific problems include 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. A contract modification to address the changes incorporated into the conformed contract documents is still required.

b. Procurement

The ESA August 2019 MPR shows that total procurement for the ESA Program is 86.7% complete, with total awards at \$9,654 million. Since the ESA July 2018 MPR, the PMT calculates summary procurement progress as a percentage of the \$11,133 million ESA program April 2018 EAC forecast. 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 will be solicited for the “Cost/Schedule” portion of the procurement. ESA revised the scope of work to include the alternate MDSY track connection, previously included in Contract CH064, and reduced the catenary work due to continued improvement in Amtrak’s electric traction construction for the ESA project. ESA issued a “Best and Final Offer” solicitation to the 4 pre-qualified contractors on September 11, 2019, with their responses due back on December 9, 2019. ESA is scheduled to issue the contract award and NTP in January 2020.

c. Construction

The ESA August 2019 MPR states that the total construction progress reached 84.1% complete compared with 85.1% as-planned. Since the ESA July 2018 MPR, the PMT calculates summary construction progress as a percentage of the \$8,014 million April 2018 construction EAC forecast. The percentage of work complete, as shown throughout this report, is calculated using invoiced costs to represent construction progress. The current contract and force account budgets equal the amounts 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	709.3	667.8	41.5	519.9	749.0	89.8%	77.9%	1/28/20	9/21/20	
	nc	+0.2	(-0.2)	+9.4	+3.2	+2.6%	+1.4%	nc	+26cd	
	709.3	667.6	41.7	510.5	745.8	87.2%	76.5%	1/28/20	8/26/20	
CM014B	578.2	531.5	46.7	431.5	590.5	84.1%	81.2%	6/26/20	11/18/20	
	nc	+0.2	(-0.2)	+12.2	+14.6	+2.0%	+2.3%	nc	+40cd	
	578.2	531.3	46.9	419.3	575.9	82.1%	78.9%	6/26/20	10/9/20	
VM014	46.9	34.9	12.0	32.4	48.6	NA	92.8%	10/25/19	3/23/20	
	nc	nc	nc	nc	+1.1	NA	nc	nc	nc	
	46.9	34.9	12.0	32.4	47.5	NA	92.8%	10/25/19	3/23/20	

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

CM007 – GCT Station Caverns and Track:

Schedule: The ESA August 2019 MPR indicates that Milestone #5 (Substations US1 and US2 Complete) was forecast for October 18, 2019, but not achieved as of October 31, 2019.

Construction Progress: The following construction continued in various locations in the Westbound Train Hall during October 2019: Electrical MEP cable and conduit installation; mechanical HVAC installation; fire protection and plumbing installation; as well as architectural finish work. Additionally, track installation continued in Tunnel EB2 east of GCT6.

Traction Power Track Monument Repairs: The CM007 contract reports, in their Weekly Summary ending October 31, 2019, there are 446 total track monuments under their survey, covering contracts CM005, CM006, CM007 and CQ032. Of the total 446, 166 were ready for turnover with 0 turned over. Remediation is underway in CM005 and CM006 contract zones.

Rail Replacement: During the September 2019 reporting period, MTACC 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 this rail was provided by MTACC and installed by the CM007 contractor as part of the base scope of work. MTACC continues working with CM007, LIRR, and the PMT to complete the evaluation and assessment of the installed rail and to develop a plan to address the rail condition issue.

CM014B – Concourse and Facilities Fit-Out:

Schedule: The contract date for Substantial Completion is November 20, 2020, excluding completion of LIRR concourse within the footprint of foundation work for 270 Park Avenue. The Substantial Completion for the Biltmore Connection is October 9, 2020.

Construction Progress: Through October 31, 2019, MTACC reports that the structural steel erection remained at 75% complete vs. 100% planned (2773 of 3682 pieces), has been proceeding very slowly, and has impacted the schedule and the CS179 contract. HVAC Piping (Chilling System) remained at 45% complete and HVAC ductwork progress remained at 78% complete.

Electricians continued with installation of branch and device conduit, pulling of wire, Lighting, Security Conduits and Ticket Area conduits and wiring. Plumbers continue installation of fixtures, gutters and downspouts. Mechanical work continues with CCU Inspections and Chiller Water Plant chilled water testing. Installation of the marble stone wall finish is ongoing in public areas from south to north. Installation of the suspended ceiling system continues throughout the Concourse from south to north.

270 Park Building: MTA issued the required authorization to JPMC for them to mobilize at the site October 1, 2019. MTA is preparing The De-Scoping documents to remove Zone #4 Scope from the CM014B contract to facilitate the 270 Park work.

VM014 – Vertical Circulation Elements (Escalators and Elevators):

Schedule: In its August 2019 MPR Although this contract includes milestones covering fabrication and delivery of escalators and elevators, the actual schedule for those areas is driven by the respective schedules and access dates provided by the CM014B and CM007 contractors.

Construction Progress: For CM007, In-Contract Maintenance (ICM) is underway at Escalators #59 and #60. ICM Readiness Reviews have been held for Escalator #51 and Elevators #18 and #19. For CM014B, ICM is underway for Elevators #1, #2, #9, #12, #17, and #21 and Escalators #30 and #31.

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	326.1	318.3	7.8	237.3	348.6	76.8%	74.6%	8/10/20	11/9/20	
	nc	+0.5	(-0.5)	+11.1	(-0.7)	+2.7%	+3.4%	nc	+26cd	
	326.1	317.8	8.3	226.2	349.3	74.1%	71.2%	8/10/20	10/14/20	

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.

CQ033 – Mid-Day Storage Yard Facility:

Schedule: The ESA Q2 2019 MPR projects Milestone MS#6, Substantial Completion (SC) for October 6, 2020, -57 days.

Construction Progress: The contractor continued construction/installation of the following yard facilities: CAM Platform, Storage Building, Cart Storage Building, Toilet Service Building;; Personnel Access Bridge fire standpipe, Water main and Sanitary Sewers, Yard Lighting fixtures, and Traction power conduit, cables, and track monuments. Preparation work for B15 substation; Concrete slab and wall construction work at Tunnel D Approach continued. Under deck light fixture installation: Honeywell Bridge. New track and turnout construction and third rail installation west of Queens Boulevard continued.

Systems Contracts

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

	Current Budget	Appr'd Contract	Rem Budget	Invoice Cost	EAC	Planned Comp	Invoice Comp	Current BL SC	Forecast SC	Notes
CS179	690.4	680.4	10.1	544.2	734.3	82.4%	80.1%	6/30/21	7/26/21	1
	nc	+1.6	(-1.5)	+5.7	+0.4	+0.9%	+0.7%	+365cd	+24cd	
	690.4	678.8	11.6	538.5	733.9	81.5%	79.4%	6/30/20	7/2/21	
CS084	79.7	73.9	5.8	45.9	82.2	96.8%	62.1%	12/2/19	4/30/21	1
	nc	nc	nc	+0.7	(-1.1)	+0.9%	+0.9%	nc	nc	
	79.7	73.9	5.8	45.2	83.3	95.9%	61.2%	12/2/19	4/30/21	
CS086	60.9	53.0	7.9	3.0	65.2	30.0%	5.6%	2/21/21	5/8/21	
	nc	nc	nc	+0.3	+2.3	+5.2%	+0.5%	nc	+10cd	
	60.9	53.0	7.9	2.7	62.9	24.8%	5.1%	2/21/21	4/28/21	
VS086	21.8	20.4	1.5	17.4	22.3	NA	85.3%	7/2/20	12/18/20	1
	nc	nc	nc	nc	(-0.1)	NA	nc	+262cd	+169cd	
	21.8	20.4	1.5	17.4	22.4	NA	85.3%	10/14/19	7/2/20	
VH051	30.2	29.7	0.5	29.6	30.1	NA	99.8%	4/30/15	7/13/21	
	nc	nc	nc	nc	nc	NA	nc	nc	nc	
	30.2	29.7	0.5	29.6	30.1	NA	99.8%	4/30/15	7/13/21	

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

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

CS179 – Systems Package 1 – Facilities Systems:

Schedule: As previously reported, MTACC developed an Integrated System Test Plan (ISTP) to meet the testing requirements of the Project. ESA presented an outline of its Incremental ISTP to the PMOC at the end of June 2019. The PMOC was hoping that the presentation would enable it

to assess if the new ISTP addresses the contractual testing requirements and if the schedule addresses the concerns previously noted with the CS179 contract schedule. Those concerns were if the schedule:

1. Was based on the premise that all submitted designs are final;
2. Implied that all field work is ready-to-go as currently understood;
3. Took into consideration any impact from the open NOCs; and
4. Addressed any impacts to the contract work from SWOs that remained in effect past the data date of the schedules.

The Incremental ISTP presented was, in the PMOC's opinion, an outline of what would be accomplished and did not include details regarding the system tests, the testing methodologies, or testing schedule for all the systems provided under this contract. Detailed information from MTACC regarding the June 2019 Incremental ISTP presentation was requested in June, but is still pending. MTACC is currently reporting a July 9, 2021, SC date, a one week slippage from the previous month's report.

Design Progress: The completion of Final Design (FD) for all 10 Control Systems, which was due 41 months ago, has not occurred yet, with two (2) of the Control Systems (Fire Life Safety and Security Management) still under design development. As of the end of October 2019, the Voice Communications System, which is one (1) of the 10 Control Systems that had already received approval by LIRR, continued to undergo some minor design modifications. The contractor is also responsible 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 these delays; and that any continued progress on system designs and equipment testing is being severely hampered by unanswered RFIs and unissued CPRs that have the potential to alter existing designs. Despite the delays in receiving FD approvals, the contractor continues to move forward with the development and submission of test plans.

Construction Progress: In October 2019, the CS179 contractor continued to actively progress installation work efforts in the tunnels and at the ventilation and various substation facilities where access was available and conditions warranted. Local testing of installed equipment, systems, and cabling also continued. Coordination issues with other contractors, unexpected field conditions, unresolved design issues, water infiltration remediation efforts, open NOCs/CPRs, and numerous Stop Work Orders continue to impact further and efficient progress. Environmental conditions regarding water and moisture in the various equipment rooms remain as an unresolved item of discussion between MTACC, LIRR, and the contractor. At the end of October 2019, the contractor began the witness Factory Acceptance Testing (FAT) for the Signal Network (one of the 10 Control Systems). Incorporation of the testing for the Centralized Train Control (CTC) system into the Signal Network FAT will occur in early November 2019. Factory testing for the last 3 of the 10 Control Systems and 6 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 the test procedures for these 9 systems are either "on-hold" or still in development pending the resolution of contract interface coordination issues, Stop Work Orders, and resolution of RFIs and NOCs.

CS084 – Tunnel Systems Package 4 – Traction Power Systems:

Schedule: The original SC date was May 2019; and, MTACC's current forecast is for SC to occur at the end of April 2021. However, as previously reported, the CS084 contract schedule is out of date and contract milestones – including the SC date – need to be adjusted after an approved track installation phasing plan is developed for CM007 and room access and other construction issues

are resolved with the CS179 contract. The contractor continued 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. As previously reported, the contractor advised MTACC that the development of any accurate “recovery” schedule could not be accomplished until MTACC provided reliable information related to the correction of construction issues and access restraints. In October 2019, MTACC provided the CS84 contractor with a list of assumptions to use to develop the requested “recovery” schedule. The contractor indicates that it will provide the requested “recovery” schedule despite its belief that some of the MTACC-provided assumptions (e.g., availability of all track monuments by the end of November 2019 and complete access to the C03 facility in January 2020) are unrealistic. Based on the status of the monument remediation efforts (see below under Construction Progress) and the current information provided to the PMOC regarding water infiltration remediation efforts in the C03 substation facility, the PMOC also questions the accuracy of the MTACC-provided assumptions.

Design Progress: The design focus continues to be on developing solutions to issues identified during site surveys and construction activities. Some design issues related to water remediation methodologies in spaces designated for CS084 equipment and other identified field construction issues continue to remain open. While a comprehensive plan for remediation of specification non-conformance issues related to the track monuments is still being developed, remediation efforts in many locations have begun. Discussions with NYCT related to cathodic protection are continuing and MTACC is planning on issuing a contract modification to the GEC to perform a “study” of this concern. Previously identified internal MTA discussions regarding what action will be taken on any possible modification of the implementation methodology designed for the “blue light” system continue, with no forecasted completion date. The contractor continues to indicate that any change in the “blue-light” design at this time will require further changes to the PLC software.

One other previously identified design related issue remains as an open item – that of agreement between the SCADA software designer and MTA regarding the submission of the “source code”, which is a commercial issue. Although this is not truly a “design” issue holding up any fabrication or construction, an agreement between the parties will be needed before LIRR will grant final acceptance of the system.

Construction Progress: Equipment installations are complete in the C04 substation and a considerable amount of equipment for the remaining substations has been fabricated and delivered to storage, where it will remain until the respective TPSS rooms for those substations are ready. 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. Progress on addressing these issues continues to be slow, as a significant number of the cited issues involve coordination with other contracts and require the development and issuance of contract modifications to various contracts.

The second inductive reactor will be installed in the C05 substation facility by early November 2019, completing the installation of major equipment in this location. Traction power cables are being installed at various locations. As previously reported, the condition and utilization of the MTA-supplied inductive reactors continues to be an area of concern, as no further inspection of the condition of the reactors remaining in MTACC’s storage facility has been made as of the end of October 2019.

The PMOC previously reported significant Quality issues related to 2 of the 18 required substation transformers (those for the C03 and C05 substations) in which there were 3 failures related to foreign debris in the windings while undergoing hi-pot testing. As of the end of June 2019, both

of those transformers had successfully passed additional hi-pot testing; completing all testing of the required transformers. Two different fabrication procedure modifications were necessary to correct the issues that caused the testing failure of these transformers. Both the PMOC and LIRR raised concerns regarding the “acceptability” and long-term viability of the transformers that were fabricated and tested before the second fabrication procedure modification was implemented. Discussions between MTACC and LIRR regarding these concerns were held, but no information regarding the disposition of this concern is available to the PMOC at this time. The PMOC remains concerned regarding this issue.

Corrective action to address non-conformance issues with track monuments (conduit turn ups at track level for routing of traction power cables) continues to be a major significant issue impacting the timely progression of work on this contract. MTACC continues to indicate that there are approximately 450 track monuments that required traction power feeder cable connections. As of the latest data provided to the PMOC (data dated 10/6/19), 275 monument locations installed under the CM005, CM006, and CQ032 contracts were inspected to determine if they conformed to LIRR measurement standards, and 232 (84%) were found to be out of tolerance. In September 2019, MTACC advised the CS084 contractor that 47 remediated monuments were ready for turn over to the CS084 contractor. As previously reported by the PMOC, the CS084 contractor performed inspections of these locations and attempted to “ball and brush” the conduits to see if cables could be readily installed. The contractor reported that 66% of the inspected monuments and conduits were deemed unacceptable due various reasons – most of which involved the inability to pull cable through the conduits. In October 2019, an additional 40 monument locations – those installed under the CM007 contract – were turned over to the CS084 contractor; and, once again, upon inspection of some of the 40 locations, the CS084 contractor reported that a significant number of the monuments remained out of tolerance or unusable. Further development of a solution to this problem, including the management and coordination of the various contractors by MTACC, is urgently needed.

Despite MTACC’s continued reporting that the C03 substation rooms are still impacted by significant water infiltration and no solution is apparent at this time, it informed the CS084 contractor that the C03 facility will be ready for the start of CS084 construction work in January 2020. Both the CS084 contractor and the PMOC are skeptical that this access availability date will be achievable, as all work by the CS179 and CS084 contractors at this location remains on hold pending the resolution of the water issue. Other water issues continue at the C01/C02, C05, and C06/C07 substations and are being evaluated to determine the causes and to develop remediation plans.

The PVC liner must still be removed from the C05 conduit system so that feeder cables can be installed; and, work on conduit repair/re-installation from 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 installations.

Delivery of the C08 substation pre-fabricated sections is complete and the substation manufacturer is on-site to assist in the required interconnect cable wiring work in the various substation sections. CS084 installation of traction power cables from the C08 substation to the main line tracks in Harold Interlocking continued. The plan is to be able to energize this substation by the end of December 2019.

As previously reported, in July 2019, the CS084 contractor attempted to install the C06/C07 transformers only to find that the shaftway between the upper and lower levels at this location was out of plumb by approximately one (1) foot, causing the transformer casing to hit one of the side

walls of the shaftway. MTACC, the contractor, and the transformer manufacturer agreed that the only way to lower the transformer is to remove the outer casing of the transformer during the lowering process and then re-install the outer casing once the transformer is in place. As of the end of October 2019, the two transformers at the C06/C07 substations were installed and transformers at several other substation locations will require this outer casing removal/reinstallation effort as work progresses. The LIRR has raised a concern about this solution and discussions between MTACC and LIRR continue.

The PMOC remains concerned about many issues, including:

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

VS086 – Systems Package 3, Signal Equipment Procurement:

Schedule: At present, there continues to be no approved contract schedule by which MTACC or the PMOC can accurately gauge progress on this contract. Further, the milestones for this contract must still be modified to incorporate all the outstanding and added contract work. MTACC continues to indicate that a contract modification for incorporation of PTC requirements and incorporation of construction phase services to assist the CS086 contractor during installation and testing of the signal equipment will extend the original October 2019 contract substantial (SC) completion. The current forecast by MTACC shows a December 2020 SC date, a 5-month slippage from previous reports. Knowing 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 May 2021, it is unclear to the PMOC how this December 2020 S/C date was determined.

Design Progress: Discussions regarding the methodology and scheduling of the Factory Integrated Acceptance Test (FIAT), which is performed after the FAT to test the interlocking designs and equipment as a composite systems package, started in August 2019 between MTA and the VS086, CS086, and CS179 contractors (the CS179 contractor is providing design data for the testing) continue. MTACC indicates that the FIAT cannot be completed until all the signal equipment is installed in the field.

Four previously reported design issues that have the potential to negatively impact the schedule continue to need resolution or direction: 1) PTC design and incorporation; 2) direction from MTACC on requested PTC Application Logic changes; 3) Electromagnetic Interference (EMI) testing requirements; and 4) direction from MTACC on commercial issues regarding the "light-out" protection design. These four issues have been open for several months with no apparent progress on resolution. After MTACC provided the contractor with what is now acknowledged as an incomplete PTC design, MTA subsequently identified a LIRR request to alter the PTC Application Logic to address a train operation issue. MTA must decide if this requested change, which will impact an already completed design, is warranted and then direct the contractor

appropriately. The contractor must still provide a justification for an EMI testing waiver for its ATT-20 track circuit equipment, and discussions between the contractor and MTACC continue on the “light-out” protection issue.

One additional design item was recently identified – that of Track and Signal Routing (TSR). This deals with the development of signal drawings showing the progression of trains on the various tracks under various signaling conditions. The contractor contends that this requirement was not in the contract and MTACC is investigating what needs to be done to address this item.

Equipment Fabrication and Delivery Progress: The contractor provided a plan to retrofit and/or replace any equipment that was damaged in transit to the ESA staging areas. The original goal was to have the damaged equipment returned to the VS086 facility for repairs, with re-delivery by the end of August 2019. Additionally, three (3) racks of equipment from Plaza Interlocking were to be returned to the factory at the same time for the installation of the ATT-20 track equipment. For several reasons, the August goal was missed; and, the current plan is for the equipment to be repaired/reconfigured and delivered back to MTACC by the end of December 2019.

CS086 – Tunnel Systems Package 2 – Signal Installation

Schedule: While MTACC is currently forecasting an April 2021 SC date, the contractor continues to indicate a May 2021 date in its updates. Further, the contractor contends that any schedule it submits is inaccurate due to room and track access issues that are, per the contractor, causing day-to-day delays in the progression of the work. Notice to Proceed (NTP) on this contract was given on September 29, 2018; and, as of the end of October 2019, there has been no substantial “construction” activity on this contract. At the October 2019 Monthly Progress meeting, the contractor indicated that it would begin mobilization to several work sites during November 2019. In order to produce some kind of schedule that can be used to determine the progress of the work, MTACC, in October 2019, requested that the contractor provide a “recovery” schedule based on certain MTACC-provided assumptions related to room and track access. Upon review of the MTACC-provided assumptions, the contractor indicated that although it did not believe that some of the assumptions were valid, it would prepare and submit a draft “recovery” schedule.

Design/Construction Progress: The contractor continued to advise that the Plaza Interlocking equipment room and a number of cable vaults have major water infiltration issues that need to be addressed. MTACC must still determine the extent of the reported problems and develop a remediation plan as may be necessary.

The backlog of submittal responses by MTACC continues to be an issue.

After follow up inspections of the GCT-3, GCT-4, and GCT-5 rooms, the contractor accepted for turn over the GCT-3 and GCT-4 rooms without provisions. The contractor also “provisionally” accepted the GCT-5 rooms, on the condition that MTACC can make the HVAC system operational. The contractor intends to work in the GCT-3, GCT-4, and GCT-5 Central Instrument Rooms (CIRs) simultaneously to expedite installation progress. Work in the Plaza rooms and in GCT-6 is on hold pending the resolution of water issues at the Plaza location and equipment obstructions in the GCT-6 site.

The contractor continued to indicate that there are numerous obstructions precluding the installation of tunnel signal equipment at the various locations surveyed. The contractor provided a “preliminary” listing of the issue areas and MTACC has begun mitigation efforts in some of them. However, the contractor must still provide a detailed listing of the obstructions to MTACC so that all the issues can be addressed in a timely manner. Once that list is submitted, MTACC will need to develop a mitigation plan for the equipment installations.

In its June 2019 report, the PMOC reported one significant issue that was identified during the surveys that could have a negative impact on the timely progression of CS086 contract work. That issue is the mounting of signal impedance bonds in the track area and the contractor's contention that there are numerous locations where the pre-installed holes in the track invert for the impedance bond mounting plates do not align with the standard impedance bond mounting plate. The contractor recently indicated that it would fabricate a mockup mounting plate template and use it to survey all the impedance bond locations to determine which locations were out of tolerance. MTACC requested the contractor expeditiously conduct that survey and, as soon as possible, provide the results of that survey to MTACC.

In August 2019, the contractor advised MTACC that the CIRs have only "temporary" power systems in use and those systems are under the control of the CS179 contractor, who continually turns the power on and off, without any prior notice, in the various CIRs to perform its work. The CS086 contractor continues to maintain its position that these power shut-offs will impact the environmental conditions in the room and this would cause the risk of damage to the new signal equipment. The automatic power transfer/backup systems for the CIRs will only be operational when "permanent" power is installed in the rooms. Permanent power installations in all the rooms are not scheduled to be completed until the spring of 2020, which will, per the CS086 contractor, delay the progression of work. MTACC continues to investigate what to do regarding this development.

Other: In the October 2019 Monthly Progress meeting, MTACC advised that, because of several design changes, including those associated with cable length changes, it would be necessary to re-negotiate contract Modification 001. No further information on that development was made available to the PMOC.

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	68.7	63.9	4.8	28.4	82.4	48.4%	44.5%	3/17/21	3/17/21	
	nc	nc	nc	+3.1	(-7.9)	+8.2%	+4.9%	nc	nc	
	68.7	63.9	4.8	25.3	90.3	40.2%	39.6%	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 Tunnel B/C contract milestones were scheduled or completed during October 2019. On October 29, 2019, however, ESA and the contractor executed a contract modification for the contractor to construct the East Approach Structure of the Eastbound Re-Route (EBRR) Tunnel, which will be immediately adjacent to the Tunnel B/C portal west of 39th Street.

Construction Progress: During October 2019, the contractor completed demolition of 39th Street overhead bridge Piers #6 and #7, continued to excavate the Tunnel B/C East Approach Structure east of 39th Street, and continued to demolish the TBM cutterhead and the existing G02 Substation basement structures. Additionally, the contractor began to "pre-trench" and install piles for the East Approach Structure of the EBRR.

Railroad Force Account Contracts

Costs and substantial completion dates are tabulated below for active Force Account packages. Railroad Force Account agreements do not contain schedule requirements, so the PMOC will not report on schedules in this section. Additionally, since adoption of the "ESA First" schedule, ESA

discontinued references to the former “Stages” of Harold construction, although it has not done so for the cost components of Harold work.

	Current Budget	Appr'd Contract	Rem Budget	Invoice Cost	EAC	Planned Comp	Invoice Comp	Current BL SC	Forecast SC	Notes
FHA02	61.4	61.4	--	61.0	61.4	100.0%	99.5%	8/15/17	1/24/21	1
	nc	nc	nc	nc	nc	nc	nc	nc	nc	
	61.4	61.4	--	61.0	61.4	100.0%	99.5%	8/15/17	1/24/21	
FHA03	8.9	5.2	3.7	7.1	12.9	100.0%	79.7%	7/25/18	6/2/25	1
	nc	nc	nc	(-0.9)	+2.7	nc	(9.7%)	nc	nc	
	8.9	5.2	3.7	8.0	10.2	100.0%	89.4%	7/25/18	6/2/25	
FHL02	123.1	123.1	--	120.4	126.3	100.0%	97.8%	11/25/16	8/30/21	1
	nc	nc	nc	+0.2	nc	nc	+0.1%	nc	nc	
	123.1	123.1	--	120.2	126.3	100.0%	97.7%	11/25/16	8/30/21	
FHL03	20.6	2.7	17.9	23.9	37.5	100.0%	91.7%	8/14/17	4/28/24	1
	nc	nc	nc	+0.3	(-0.1)	nc	+1.2%	nc	nc	
	20.6	2.7	17.9	23.6	37.6	100.0%	90.5%	8/14/17	4/28/24	

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

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

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

Construction Progress: During October 2019, Amtrak Electric Traction (ET) personnel completed all catenary modifications on Subs 3 and 4 Tracks in “Q” Interlocking and continued to make miscellaneous catenary modifications in Harold Interlocking in support of the CH058A contract. Completion of the “Q” Interlocking work will allow the CQ033 contractor to install Mid-Day Storage Yard tracks in that area. Amtrak Communications & Signal (C&S) personnel completed installation of signal trough adjacent to the Loop Tracks between Loop and “T” Interlockings and continued to install signal cable in the trough.

FHL02 and FHL03 – Harold Stages 2 and 3 LIRR:

Construction Progress: During October 2019, LIRR Electric Traction (ET) personnel continued to support the CS084 contractor to install traction power cables between the C08 Substation and the main line tracks in Harold Interlocking. LIRR Signal personnel completed the “4B/4C” signal pre-test (a preliminary test to simulate the future turnouts that will lead to/from the B/C Tunnel when the entire Harold Rev. 14-4M track reconfiguration is complete) and continued to support the CH058A contractor by relocating signal cables in the footprint of Tunnel B/C work.

d. Quality Assurance and Quality Control

The PMOC reports Quality Assurance/Control issues in its quarterly comprehensive reports. MTACC did not report any significant issues regarding Quality Assurance or Quality Control in its August 2019 MPR. 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 MTACC to the CS084 Contractor. No final resolutions were achieved during October 2019.
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, MTACC identified the need to replace some portion of the rail installed to date by the CM007 contractor due to observed deterioration involving pitting and corrosion. See Section 1.0c (CM007) for details.

2.0 SCHEDULE DATA

Status and Schedule Contingency

The schedule information in this report is based on IPS 121 (data date September 1, 2019) and IPS Progress Report. The forecast for the Target Revenue Service Date (RSD) slipped approximately one month to March 14, 2022, and the Public RSD remained December 13, 2022. The IPS schedule was prepared using the MTACC alternative IPS procedure.

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Program Primary Critical Path – Manhattan/Systems

The ESA program primary critical path in IPS 121 remains through Manhattan/Systems work and ends on July 26, 2021, approximately 2 and one-half weeks later than as reported in IPS 120. 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 121 September 1, 2019

Activity Name	Duration	Start	Finish
CM007 – GCT Station Caverns and Track			
Mobilize/install track work and third rail at Plaza East	282	1-Aug-19	8-May-20
Complete Track Monuments at EB2	127	8-May-20	11-Sep-20
CS086– Tunnel Systems Package 2 Signal Installation			
GCT6 Plaza deliver and install equip; wire and terminate	92	11-Sep-20	11-Dec-20
Signal breakdown / connectivity testing and diagnostics	81	11-Dec-20	1-Mar-21
CS179 System Package 1 – Facilities Systems			
Track IST 2-way radio testing to substantial completion	148	1-Mar-21	26-Jul-21
Program Activities			
LIRR FRA Signals and Power Testing †	146	26-Jul-21	18-Dec-21
LIRR Final Testing and Previews ‡	87	18-Dec-21	14-Mar-22
Target Revenue Service Date		14-Mar-22	14-Mar-22
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Public Revenue Service Date			13-Dec-22

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

‡ Successor Harold Interlocking path.

The IPS schedule incorporates MTACC’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.

Although not currently on the ESA program critical path through the Manhattan/Systems scope of work, contracts CS084 and CM014B are near critical and could therefore appear on the critical path.

MTACC continues to add 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. MTACC 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 121, MTACC reported that the coordination milestones for CS179, CM014B, and CM007 lost an average of one month during August 2019. There were four coordination points that were reportedly completed for the period of July 2019 prior to the IPS 121 update. There remains the risk that the lack of progress through coordination points indicates an increasing need for more concurrent work in the period leading up to and during IST than had been planned, which may further complicate and impede progress.

Discussion of Progress along the Critical Path

The Manhattan/Systems critical path completion date in IPS 121 is July 26, 2021, approximately three and one-half weeks later than as was shown in IPS 120. The slippage is due to CM007 track work and will be mitigated with an accelerated track phasing plan, which is currently being negotiated.

The scope that comprises the Manhattan/Systems path in IPS 121 runs through CM007 track and third rail layout and installation for tunnel EB2 to Plaza East leading to track work milestone 4; followed by the completion of track monuments in EB2 from GCT6 to Plaza East. This is followed by CS086 delivery and installation of wayside signal equipment at GCT6 and Plaza; cable pulling and termination; and finally signal and connectivity testing. The path then shifts to CS179 track phase integrated system testing, ending in July 2021 with the completion of all IST and CS179 substantial completion, approximately one month later than as shown in IPS 120. As noted above, the slippage is due to CM007 and will be mitigated with an accelerated track phasing plan. From this point, the path runs through LIRR FRA testing, LIRR final system testing, and LIRR initial and final previews. The durations of these test periods changed in IPS 121, with the FRA testing gaining one month and the LIRR testing reduced by one month; however, the aggregate duration remained constant at approximately 7.5 months. The path concludes with the Target RSD on March 14, 2022, one month later than as shown in IPS 120.

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

Appendix B, Table 6, shows the ESA Program activities on the primary critical Manhattan/-Systems work path that are planned for the next 90 days as forecast in IPS 121.

Sub Program Longest Path – Harold Interlocking

IPS 121 shows that the Harold Interlocking work path remains as the second longest ESA program path. The Harold Interlocking work path concludes on June 28, 2021, in IPS 121, unchanged from IPS 120. The float on this path is 172 calendar days, which is an increase of 2 months due to the changes on the Manhattan path in IPS 121. The Harold Interlocking work path begins with CH058A construction the B/C approach structure excavation and concrete work; then completion of civil and track work east of the interface between cut and cover and open cut structures. The path continues with LIRR force account work for the W crossover switch; CH063 catenary work for the RT track and the W crossover above the backfilled B/C structure; LIRR force account for the cutovers for the W crossover and switch 5165W; and, cutovers for the B/C approach switches (LK1, U1 and LK2) and the R crossover through the end of June 2021. At the completion of the Harold work path, there are approximately 5.5 months of float to the LIRR final testing activity, at which point the path joins the ESA program critical path.

Sub Program Longest Path – Queens

IPS 121 shows that the Queens (Mid-Day Storage Yard) work path remains as the longest program path. The finish date for the Queens path is November 9, 2020, in IPS 121 and is approximately one month later than as was shown in as in IPS 120 and the scope that comprises the path has changed. The Queens path currently runs through pulling signal power cables, which has been delayed due to Amtrak wire transfers and existing site conditions. The path then shifts to tagging and terminating cables at CIL-8; commissioning CIL-8; and completion of IST and CQ033 substantial completion in November 2020. From the end of the Queens path, there are approximately 8.5 months of float to the LIRR FRA testing activity on the ESA program critical path (Manhattan/Systems work).

Upcoming Contract Procurements

Table 2.4 shows the status of current and upcoming contract procurements as reported in IPS 121 (September 1, 2019).

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	12/9/19	1/31/20	28 mos.	5/15/22

CH063 Electric Traction Catenary Work, 3rd Party: MTA issued an RFP on January 4, 2019, for the design-build contract. Seven “Qualification” submittals were received in March 2019, after which 4 vendors were selected to be “Pre-Qualified”. Solicitations for the “Cost/Schedule” portion of the procurement were scheduled to be issued in early August 2019, but were delayed while MTACC continued to finalize the scope of work. ESA issued a “Best and Final Offer” solicitation to the 4 pre-qualified contractors on September 11, 2019, with their responses due back on December 9, 2019. ESA is scheduled to issue the contract award and NTP in January 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 MTACC has reached agreement 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 MTACC has reported that the Schedule Contingency lost approximately one month in IPA 121 and is now at the ELPEP minimum of 275 calendar days, although the MTACC anticipates recovering this time during negotiations with the CM007 contractor. The ability of the MTACC to maintain the FTA minimum until the next ELPEP hold point (95% constructed; Q4 2020) is at risk due to the uncertainties about the Manhattan/Systems schedule, the greatest of which is execution of the approved Incremental IST plan.
3. Progress on CS084, Tunnel Systems Package 4 – Traction Power, is slow and is currently reported as 62.1% complete compared with as-planned progress of 96.8%. The PMOC observes that work on CS084 continues to be delayed each quarter. For substations still requiring equipment submittal approvals, fabrication is being delayed, impacting installation and energization. While many of the delays appear to have been absorbed and/or mitigated in the schedule, float to the program is being lost to this important sub-critical work. It is noted that MTACC continues to work with the contractor to develop a realistic and updated schedule and the PMOC believes that a revised schedule will incorporate delays in the delivery of equipment that will push out milestone dates. The PMOC recommends that ESA continue to analyze options to recover the schedule with a focus on major electrical equipment submittals and layouts, identifying major issues, and, determining corrective measures.
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 121, MTACC reported that the coordination milestones for CS179, CM014B, and CM007 lost an average of one month during August 2019. The slippages point to a reduction in the usefulness of coordination points for monitoring progress. There remains the risk that the lack of progress through coordination points indicates an increasing need for more concurrent work in the period leading up to and during IST than had been planned, which may further complicate and impede progress. With the incorporation of the syndicated schedule for IST into the ESA IPS, MTACC reestablished the coordination point activities, which were intended to form a reliable execution plan.

MTACC continues to add coordination point milestone activities to the IPS schedule to track and monitor the progress of inter-contract coordination. The milestones are coordinated with the syndicated IST schedule, to which the CS179 and CM014B contractors have agreed.

5. The CM014B contractor’s capability to complete the approximately 20% of its remaining work in the 11 months remaining to the forecast SC in September 2020. The PMOC believes that this is overly optimistic based on the contractor’s historic construction performance.

3.0 COST DATA

Budget/Cost

In the ESA August 2019 MPR, MTACC reported that the ESA program is 80.0% complete compared to planned progress of 80.5% of the \$11,133 million April 2018 EAC forecast. The report also shows that construction progress reached 84.1% complete compared with planned progress of 85.1%. Since the ESA July 2018 MPR, the PMT calculates summary construction progress as a percentage of the \$8,014 million April 2018 construction EAC forecast.

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Change Orders/Budget Adjustments

The ESA August 2019 MPR lists 11 change orders with magnitudes greater than \$100,000 that were executed in August 2019. The aggregate value of these change orders was \$74.1 million.

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

Contract	Description / Mod No.	Amount
CS179	55 th Street Conduit Drain Boxes (mod. 240)	343,048
CS179	23 rd Street Additional Water Remediation (mod. 248)	127,475
CS179	GCTCC Service Corridor Fire Alarm Modifications (mod. 254)	110,763
CS179	PLZ Courtyard Security Changes (mod. 255)	228,880
CS179	29 th Street Additional Water Remediation (mod. 256)	163,700
CS179	GCTCC Cellular Wi-Fi Demark Concourse Modifications (mod. 252)	203,713
CS179	23rd Street Rusted Equipment Hatch Frames (mod. 230)	370,000
CM014B	Retail Space at 48 th Street Entrance - Harden Ceiling (mod. 264)	220,002
CQ033	NOCs-Lack of Work-Site Access Claims through 2018 (mod. 39)	440,000
PMC	Extension – PMC Service to 12/31/2019 (mod. 47)	71,838,284
VH051A	Excusable Time Extension (Jan 1, 2019 – Dec 31, 2019; mod. 19)	105,000

Funding

Budget Amendment 3 to the 2015–2019 Capital Plan has been incorporated into the ESA program budget established funding of \$10,335 million for the ESA program through December 2020. The MTACC’s proposed ESA budget of \$11,133 million was approved by the MTA Board in September 2019 for the 2020-2014 Capital Plan, which will provide an additional approximately \$800 million to fund the ESA program through completion.

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 MTACC reassessment of April 2018 forecast the ESA program at \$11,133 million for the portion of the program that the MTACC 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 August 1, 2019.

Local Funding: The budget for Local Funding is \$7,636.4 million, of which \$6,211.1 million has been expended through September 1, 2019. Financing costs are funded separately from other local sources.

PMOC Concerns and Recommendations

1. The PMOC is concerned that MTACC’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 MTACC, it differs from the generally accepted practice of committing to budgets for known program costs, tends to artificially inflate the program contingency, and reduces the accuracy of contract completion percentages. The current total contingency of \$499 million is approximately \$50 million less than was projected and presented to the MTA board in April 2018. The PMOC anticipates that the budgets will be updated after additional major contract modifications are executed and after the 2020–2024 Capital Plan is adopted.

2. The MTACC funding request for the 2020–2024 Capital Plan included approximately \$800 million to complete the ESA program and was approved by the MTA board in at the September 2019 meeting. The plan was proposed to the NYC Capital Plan Review Board on October 1, 2019. The MTACC cost plan forecasts drawing contingencies down to approximately \$117 million at the end of December 2020, which, should it occur, would be less than the ELPEP minimum contingency of \$260 million.
3. MTACC 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.
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 MTACC.
 - VS086 and CS086 – incorporation of Positive Train Control into the ESA signal system and technology issues.

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 October 2019, MTACC 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 October 2019.

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, MTACC indicated that Amtrak may advance ERT 2 reconstruction to 2023, although this has not yet been formalized. The risk remains that tunnel systems reliability or safety issues might require Amtrak to make emergency repairs on either Line 1, 2, or 4 at any time between now and the 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 MTACC 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 may also be unable to provide the needed technical and coordination support for the ESA work due to increasing schedule pressure to complete PTC system-wide for the existing LIRR rail network.
- b.) MTACC-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 more recently 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 completion 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, MTACC is currently working through the CPR and contract modification process with both the CS179 and CS086 contractors for incorporation of as much of the PTC work scope that can be reliably be included. Due to continuing delays to completion of the PTC design by LIRR, MTACC 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 MTACC funding request for the 2020–2024 Capital Plan included approximately \$800 million to complete the ESA program and was approved by the MTA board at the September 2019 meeting. The plan was proposed to the NYC Capital Plan Review Board on October 1, 2019. The PMOC remains concerned that, until the 2020-2024 Capital Plan is approved this potential funding constraint may significantly impact the program budget and schedule as well as the start of revenue operations.

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 the potential to significantly impact delivery of the vehicles in time for MTACC’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. Nonetheless, through October 2019, LIRR continued to develop a “Best and Final Offer” (BAFO) solicitation as the second step of its procurement, but had not issued the solicitation as of October 31, 2019. Additionally, in July 2019, ESA informed the PMOC that, based on conditions at that time, delivery of the first M-9A vehicle would not be until April 2023. This would be after MTACC’s Target (February 14, 2022) and Public (December 13, 2022) RSD dates, but before the FFGA RSD date of December 31, 2023. If that occurs, MTA will need to determine how to supply vehicles from its existing fleet in order to begin LIRR service into GCT. The revised Service Plan, expected in December 2019, will detail how this delay will be accommodated.

Manhattan/Systems Performance Risk

The Manhattan/Systems path remains at risk for future open/unresolved issues. Contract modifications for CS179 and CM014B have been issued to address Incremental IST, however, 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 are not achieved month to month. Modifications for contracts CS084, CS086, and CM007 have yet to be issued and may have additional negative impacts to the schedule. The impact of delayed installation and testing of PTC may 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 MTACC-ESA work is being performed by a dedicated team so not to impact the management and technical services being provided for the ESA program. MTACC has taken the position that there

will be no schedule delays to the forecast RSD and no additional costs to MTA as a result of this work. The MTA/MTACC – JPMC Memorandum of Understanding was executed by both parties on March 31, 2019. The follow-on MTA/MTACC-JPMC Construction Agreement was approved at the July 2019 MTA Board meeting and executed by both parties on July 31, 2019. With this action, MTACC believes that it has mitigated the risks of schedule delays and additional costs. The PMOC does note, however, that MTACC 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 commenced mobilization during October 2019.

The PMOC is primarily concerned about potential schedule risks resulting from adverse impacts on completion of the construction of the new LIRR Concourse. MTACC/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:** MTACC indicated that it will review the Technical Capacity and Capability (TCC) Plan and propose revisions, if required, to reflect the current status of the program. MTACC updated the TCC Plan in Q3 2017. In April 2018, FTA advised MTACC to incorporate its current updates and commence with a subsequent revision that addresses management changes resulting from the MTACC Six-Point Plan for ESA. MTACC planned to include all aforementioned updates in the draft TCC Plan submitted during May 2019.
- **Continuing ELPEP Compliance:** The ESA project should continue to make additional improvements in the following areas: Management Decision; Design Development; Change Control Committee (CCC) Process and Results; Stakeholder Management; Procurement; and Risk-Informed Decision Making. The PMOC continues to note progress in two previously identified areas – Issues Management and Timely Decision Making, particularly when responding to new issues arising from the railroads’ Force Account resource availability, track outages, and other issues regarding the remaining work in Harold Interlocking. The PMOC also notes that MTA and MTACC 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:** MTACC is using the current version of the PMP, Rev. 10, that the PMOC reviewed and the FTA accepted in 2017.
- **Cost/Schedule Contingency:** MTACC, the FTA, and the PMOC are in agreement on the ELPEP minimum cost and schedule contingency hold points, levels, and drawdowns. MTACC continues to report the cost and schedule contingency levels against the ELPEP minimums in its quarterly reports to the FTA. The PMOC notes that MTACC has reported that the Schedule Contingency lost 27 calendar days this month and is now equal to the ELPEP minimum of 275 calendar days. The total Cost Contingency is \$238.7 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. MTACC is using Rev. 2 of the SMP, dated September 2016. An updated draft was issued in December 2018.
- **Cost Management Plan:** The ESA project should continue to make additional improvements to the Cost Management Plan (CMP) in the following areas: Project Level EAC Forecasting, Project Level EAC Forecast Validation, and MTACC Cost Contingency Management and Secondary Mitigation. MTACC is using Rev. 2 of the CMP, dated October 2016. An updated draft was issued in December 2018.
- **Risk Management Plan:** ESA submitted the updated Risk Management Plan in Q4 2017. In April 2018, the FTA advised MTACC to incorporate its current updates and then commence with a subsequent revision that addresses any changes resulting from the MTACC Six-Point Plan for ESA. An updated draft was issued in December 2018.
- **Project Quality Manual:** ESA submitted the updated Project Quality Manual in February 2018. In April 2018, the FTA advised MTACC to incorporate its current updates and then commence with a subsequent revision that addresses any changes resulting from the MTACC Six-Point Plan for ESA.

The updates of the Project, Cost, Schedule, Risk Management, Contract Packaging, and Technical Capacity and Capability Plans will document the changes called for by the incorporation of the MTACC Six-Point Plan for ESA to reduce future programmatic risks. MTACC issued updated drafts for the CMP, SMP, and RMP in December 2018, the CPP in January 2019, as well as the TCC in May 2019. The PMP will be updated based on changes made to the revised Sub-Plans.

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

6.0 SAFETY AND SECURITY

Based on safety information supplied by MTA, the PMOC-calculated ESA Injury Ratios for September 2019 were 1.71 for Lost Time Injuries (LTI) and 2.56 for Recordable Injuries (RI). Both the LTI and the RI injury ratios were above the Bureau of Labor Statistics (BLS) 2019 Safety Guideline of 1.5 for LTI and 2.5 for RI. Additionally, MTACC did not report any significant security issues in its August 2019 MPR.

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 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 MTACC 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 as-built railcar clearances in newly constructed ESA tunnel bench walls that require remediation. Current status: Three field changes were executed in July 2019 for the remediation of duct bench at the Bellmouth, GCT 7, and Tunnel D to maintain adequate train envelope clearances, with forecast completion December 2019.

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;
- Resolution and implementation of coordination issues;
- ESA PMT responses to contractor NOCs and issuance of CPRs; and,
- Timely design review and approvals to the contractor’s design submittals and Requests for Information.

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

1. Transformer installations at locations requiring outer casing removal/reinstallation;
2. Transformer hi-pot testing failures and long-term viability of the transformers;
3. Verification of existing conduit and manholes in several substations;
4. Coordination with other contractors;
5. Possible damage to the MTA-provided inductive reactors due to improper storage and handling by MTA;
6. Extent of non-conformance of track monuments;
7. Water infiltration issues in the facilities; and
8. 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 would allow MTACC to effectively manage this contract. The PMOC recommends that MTACC expedite completion of discussions regarding the development of such a schedule that addresses all the issues currently identified on this contract. Issues regarding the light-out protection design and PTC Application Logic design incorporation 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 noted water infiltration issues and expeditiously correct any deficiencies noted during inspections of the work sites to enable the timely progression of the contract work. The completion of an accelerated track installation phasing and usage plan for remaining trackwork with the CM007 contract needs to be expedited to avoid any further access restraint delays. The extent of the contractor-noted issue regarding the impedance bond mounting plates must be quantified by MTACC and a resolution must be expeditiously identified and implemented.

Project Funding: The MTACC funding request for the 2020–2024 Capital Plan included approximately \$800 million to complete the ESA program and was approved by the MTA board in at the September 2019 meeting. The plan was proposed to the NYC Capital Plan Review Board on October 1, 2019. The PMOC remains concerned that, until the 2020-2024 Capital Plan is approved, this potential funding constraint may significantly impact the program budget and schedule as well as the start of revenue operations.

Project Budget: The PMOC is concerned about MTACC’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 based on future contract modifications. While MTACC’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 lost 27 calendar days this month and is now equal to the ELPEP minimum of 275 calendar days. IPS 121 shows that CM007 track and switch work in EB2, Plaza East, and Plaza West is now controlling the Manhattan/Systems area and the Program critical path. Planned critical work then moves through CS086 work leading to the start of CS179 Track Phase IST. Manhattan/Systems contracts that are not on the critical path, but are quite near to it, include CM014B and CS084, 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 MTACC-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 the program budgets and inclusion in the MTA Capital Plan (long term risk realized in Q2 2018);
2. Recovery of lost time due to significant schedule delays on 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 August 2019);
9. Remaining schedule path float will be used in the near future and Manhattan/Systems path will become critical (risk realized in April 2018);
10. Coordination risk retained by MTACC in Manhattan and the ESA tunnels with regard to construction and testing interface management for the systems work;

11. CS084 equipment issues involving transformers, 3 hi-pot test failures, and final resolution of concerns about MTACC provided inductive reactor equipment; 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.
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.

Specific remaining risks for the Harold Interlocking work, previously identified by MTACC, include the following:

1. Funding: Funding constraints (risk realized in Q2 2018; short-term risk resolved through December 2020; long-term risk remains).
2. Amtrak Support: Ongoing/future Regional Projects requiring extensive Amtrak support.
3. Reconstruction of Existing Amtrak ERT Lines 1 and 2: Earlier deferred until 2025 after the ESA program; now possibly rescheduled to 2023, just after ESA RSD of December 2022 (public date). The risk now is from the impact of unplanned emergency tunnel repairs.

APPENDIX A – ACRONYMS

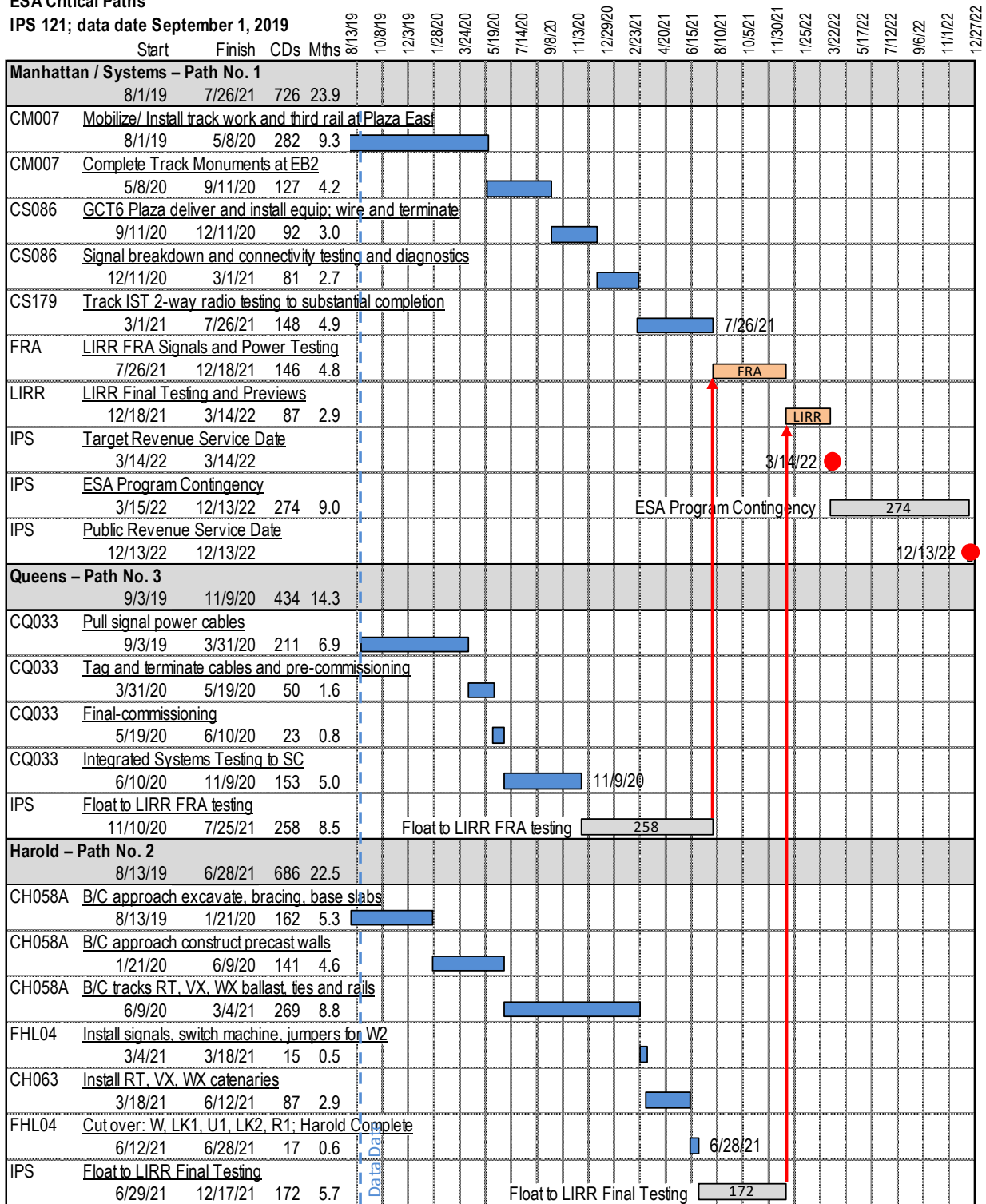
AFI	Allowance for Indeterminates	IPS	Integrated Project Schedule
ARRA	American Recovery and Reinvestment Act	IST	Integrated System Test
AWO	Additional Work Order	JPMC	J. P. Morgan Chase
BIM	Building Information Model	LIRR	Long Island Rail Road
BLS	Bureau of Labor Statistics	LSZH	Low Smoke Zero Halogen
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	MTACC	Metropolitan Transportation Authority Capital Construction
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 121 – September 1, 2019

ESA Critical Paths

IPS 121; data date September 1, 2019



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 September 1, 2019	
	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%	10,271.6	11,451.5	100.0%	9,350.7	81.7%
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%	9,654.0	10,335.1	90.3%	8,733.1	84.5%
		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%	6,955.3	7,636.2	66.7%	6,034.3	79.0%
		8,223.2	68.3%					

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

Elements	Baseline Budget June 2014	April 2018 EAC Forecast	September 1, 2019			
			Current Budget (interim)	Actual Awards	Invoiced Costs	Inv. Pct. of Budget
Construction Subtotal	7,379.3	8,014.1	7,619.0	7,404.6	6,738.8	88.4%
Soft Costs Subtotal	2,359.5	2,852.2	2,716.1	2,249.4	2,171.0	79.9%
Engineering	720.6	871.8	795.3	766.6	761.2	95.7%
OCIP	282.6	457.4	379.2	379.2	372.6	98.3%
Project Mgmt.	972.2	1,117.3	1,053.6	981.6	918.8	87.2%
Real Estate	182.1	203.7	124.9	119.2	118.0	94.5%
Rolling Stock	202.0	202.0	7.5	2.7	0.3	3.5%
Contingency Subtotal	439.0	267.0	355.5	--	--	--
Total w/o Financing	10,177.8	11,133.3	10,335.1	9,654.0	8,909.9	86.2%

Note: ESA carries the Rolling Stock Reserve as an off-line cost, outside the program budget.

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	Jun 2019 CBB	Jul 2019 CBB	Aug 2019 CBB	CBB / FFGA Var.	CBB / Amend FFGA Var.
10 Guideway & Track Elements	1,989	3,405	3,353	3,479.7	3,409	3,400	3,400	71.0%	1.4%
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	565.9	565.5	565.5	58.7%	25.5%
40 Site Work and Special Conditions	205.1	610.6	562.5	591.9	518.7	517.6	517.6	152.4%	-8.0%
50 Systems	619.3	605.6	627.7	810.9	712.7	712.3	712.3	15.0%	13.5%
60 ROW, Land, Existing Improvements	165.3	219.4	192.2	241.0	162.3	162.3	162.3	-1.8%	-15.6%
70 Vehicles	494.0	672.9	879.5	209.9	15.4	15.4	15.4	-96.9%	-98.2%
80 Professional Services	1,184	1,975	1,809	2,446.5	2,228	2,228	2,228	88.2%	23.2%
90 Unallocated Contingency	168.5	439.0	720.2	730.0	344.8	355.5	355.5	110.9%	-50.6%
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		September 1, 2019		
		Project Budget	Amended FFGA	Current Budget	Awarded Value	Paid to Date
10 - Guideway & Track Elements	1,988.7	3,405.5	3,353.4	3,400.0	3,343.3	3,095.0
20 - Stations, Stops, Terminals, Intermodal	1,168.7	2,238.2	2,326.8	2,378.5	2,299.6	1,995.6
30 - Support Facilities (Yards, Shops, Admin)	356.3	474.2	450.8	565.5	557.6	449.7
40 - Site Work and Special Conditions	205.1	610.6	562.5	517.6	490.6	494.4
50 – Systems	619.3	605.6	627.7	712.3	668.3	499.0
60 - ROW, Land, Existing Improvements	165.3	219.4	192.2	162.3	156.6	155.4
70 - Vehicles	494.0	209.9	879.5	15.4	10.6	5.8
80 - Professional Services	1,184.0	1,975.4	1,809.0	2,228.2	2,127.4	2,038.3
90 - Unallocated Contingency	168.5	439.0	720.2	355.5	--	--
Subtotal	6,349.9	10,177.8	10,922.0	10,335.1	9,654.0	8,733.1
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 121 – September 1, 2019

Act. Id.	Name	Start	Finish	Float
CM007	GCT Caverns			
P4-9930	Install and weld insulated joints – EB2 between GCT4 & GCT5 approach	1-Aug-19 A	3-Sep-19	3 cd
P4-14160	Mobilize track materials to site	11-Sep-19	12-Sep-19	3 cd
P4-14210	Setting track inlets (switch #24W) – Plaza east	24-Sep-19	15-Oct-19	3 cd
P4-16390	Weld rail (switch #24W) – Plaza east	18-Nov-19	22-Nov-19	3 cd

Table 7: ESA Core Accountability Items

Project Status		Original at FFGA	Amended FFGA	Current	ELPEP **
Cost	Cost Estimate (including finance and rolling stock costs)	\$7,386.0 m	\$12,038.5 m	\$12,712.8 m*	\$9,155.1 m
	b(4)				
Schedule	RSD	Dec. 31, 2013	Dec. 31, 2023	Dec. 2022	April 30, 2018
Total Project Percent Complete	Based on Invoiced Amount		80.0% actual vs. 8.8% planned (ESA calc. †)		
Project Performance Rate Since 2014 ESA Re-Plan	Based on Earned Value		83.0% (PMOC calculation of construction spending at Q3 2019 planned vs. actual since re-baselining)		
Contracts	Total contracts awarded to date		\$9,654.0 m	86.7% (PMOC calculation†)	
	Total construction contracts awarded to date		\$7,404.6 m	92.4% (PMOC calculation†)	
Major Issue	Status	Comments			
Project Funding and Budget	The total program budget is \$10,335.1 million, including \$355.5 million in unallocated contingencies. The MTA board approved approximately \$800 million in additional funds at for the ESA program at their September 2019 meeting. The capital plan is under review by the NYS Capital Plan Review Board.	The MTACC needs an additional approximately \$800 million in the 2020-2024 Capital Plan to complete the ESA program. Unallocated contingencies, \$355.5 million, will be used to fund contracts that are not currently fully budgeted.			
Project Cost	The MTA ETPC is \$12,712.8 million, including costs for financing and 160 revenue vehicles, \$674.3 million above the Amended FFGA Baseline Cost Estimate of \$12,038.5 million.	If the 2020-2024 Capital Plan is not approved for the required ESA funds, then there may be significant impacts to the completion of current contracts, award of remaining contracts, and/or completion of railroad force account work. Concerns remain about the time elapsed in resolving the open cost and schedule issues and, ultimately, their cost impacts.			
Project Schedule	The primary critical and near-critical paths to target RSD, including float, are: <ul style="list-style-type: none"> Manhattan/Systems - no float (critical path) Harold Interlocking - b(4) The target RSD forecast has been delayed one month to March 14, 2022. The public RSD remains December 13, 2022. The Amended FFGA Revenue Operations Date is December 2023.	The MTACC anticipates recovering the target RSD one month slip. There remain 30 months to the target RSD, which is followed by ██████████ ██████████ to the public RSD. The PMOC is concerned that until uncertainties related to Incremental IST performance and redevelopment of 270 Park Avenue are addressed, future schedules may show the shifts in the critical path, further delays, and may impact the program schedule contingency.			
Manhattan/Systems Schedule Path	IPS 121 shows that the ESA Program Critical Path runs through the Manhattan/Systems contracts. This work path has major open/unresolved performance issues regarding incremental IST and the redevelopment of 270 Park Avenue that have potentially significant schedule impacts.	Concerns continue for the ESA program Manhattan/Systems critical path. The Manhattan/-Systems path completion date is July 26, 2021, in IPS 121. Progress along this schedule path relies heavily on the effectiveness of MTACC/ESA coordination efforts and contactor performance across the seven area 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)