

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

Report Period April 1 – April 30, 2019

PMOC Contract No. DTFT60D1400017

Project No. DC-27-5287, Task Order No. 0002, Work Order No. 08

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

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Third Party Disclaimer

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EXECUTIVE SUMMARY

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

Overall Program Status: The Overall Program is 77.0% actual versus 77.1% as-planned (based on invoice cost and April 2018 EAC forecast).

Construction Status: The Construction Status is 80.2% actual versus 80.9% as-planned (based on invoice cost and April 2018 EAC forecast).

Contracts CM006 achieved SC Mar. 1, 2019 (declared Apr. 15, 2019).

Awarded/Completed: CQ032 achieved SC on April 15, 2019.

Construction Progress Issues: CM014B, CS084, VS086, 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: Total remaining contingencies decreased to (b)(4) million (b)(4).

Integrated Project Schedule: The target RSD forecast is February 14, 2022. The ESA program critical path is controlled by Manhattan/Systems work.

Risk Management: 12 major risks remain.

Harold Interlocking: CH058A contractor began Tunnel B/C field construction.

Key Stakeholder Issues: LIRR – Late resolution of CS179, CS084, CS086, and VS086 issues; late completion of Positive Train Control Design.

Amtrak – Continuing Force Account availability issues; Electric Traction improved availability.

MTACC - Change Order processing issues, GEC CPS support for Contractor Submittals, Redesigns, RFIs, Field Conditions.

Construction Safety: 0.89 – Lost Time and 1.79 Recordable BLS Injury ratios during March 2019; both increases from February 2019.

ELPEP Compliance: MTACC reported Schedule Contingency is only 27 CDs above ELPEP minimum; Cost is \$464 million above ELPEP min.

Project Management Plan: MTACC 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 February 2019 and referenced in this report as the ESA February 2019 MPR, which has a Cost and Schedule data date of March 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.

MONITORING REPORT

1.0 PROJECT STATUS

a. Engineering Design and Construction Phase Services

In the ESA February 2019 MPR, the PMT reported the overall engineering effort at 80.8% complete compared to planned completion of 81.4%. Since the ESA July 2018 MPR, the PMT calculates summary Engineering progress as a percentage of the \$871.8 million April 2018 EAC forecast of engineering costs.

Status of Construction Packages Advertised

CH063 Electric Traction Catenary Work: RFQ advertised online on January 4, 2019; documents were made available on January 14, 2019. During the April 2019 Harold Oversight meeting, ESA informed the PMOC that award of the CH063 contract will be deferred until Q4 2019 due to continued improvement in Amtrak's electric traction construction for the ESA project.

Status of Construction Packages Not Awarded

CM015 – 48th Street Entrance: Design work remained suspended through April 2019. MTA has notified the building owner of 415 Madison Avenue that construction of the 48th St. Entrance has been deferred. Based on code compliance requirements, an emergency exit to street level will need to be provided in the interim. The GEC is developing the design for this feature and the PMT is coordinating design development with the owners of the existing buildings at 270 Park Avenue and 415 Madison Avenue. The concept for this exit is due on May 1, 2019, after which it will be reviewed by ESA, MNR, and LIRR.

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

FQA33B, Mid-Day Storage Yard Facility – Amtrak F/ A, includes provision for 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 west end MDSY exit. Correspondingly, the funding for the FQA33A Line 2 connection option will be transferred to the Sub 3 to Line 4 option.

CH063 Electric Traction Catenary Work, 3rd Party, will be a negotiated RFP procurement. The contract includes design-build ET catenary relocation work for the Mid-Day Storage Yard and completion of all the remaining catenary work required for operational readiness in Harold Interlocking. RFQ advertised online on January 4, 2019 and proposals were submitted on March 13, 2019. During the April 2019 Harold Oversight meeting, ESA informed the PMOC that award of the CH063 contract will be deferred until Q4 2019 due to continued improvement in Amtrak's electric traction construction for the ESA project.

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 will be installing, testing, and commissioning PTC for all track and signal systems built under the ESA Program. The PTC design was not completed as of April 30, 2019.

- 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 has been delayed due to resolving GEC/LIRR comments on the GCT3 and GCT4 application logic submittals. The PTC design was not completed as of April 30, 2019.
- The GEC has prepared initial scope design modifications to Contracts CS179, VS086, and CS086, which will provide for the LIRR designed PTC overlay onto the ESA systems. The GEC has provided LIRR with the proposed changes for PTC on these contracts to insure coordination with the LIRR PTC requirements. The PMOC notes that these changes cannot be finalized until LIRR completes the PTC design. MTACC has already acknowledged that the contract modification for incorporation of PTC requirements will impact the substantial completion date for Contract VS086.

Status of MTACC and LIRR Review and Approval of Systems Contractors' Final Designs

CS179, Systems Facilities Package No.1: The backlog of overdue submittals and RFI reviews noted in earlier reports continues to be a significant, ever increasing, unresolved issue for the CS179 project team. The contractor continues to assert that overdue responses on design submittals and RFI, unresolved NOC, and numerous SWOs are impacting the completion of design work and delaying the contract schedule. The contractor continues to note that there are still 24 NOCs contributing to its inability to finalize designs; 18 of which MTACC was to issue CPRs and 7 more that exceed the 30-day turnaround time duration provision in the contract. The completion of FD for all 10 Control Systems, which was scheduled for completion 36 months ago, has not occurred yet and the completion of FD for all 19 Non-Control Systems is also delayed. The full impact of the Control and Non-Control System FD delays on contract progress remains undetermined at this time. One Buy/Ship America issue (previously noted) that could impact design and construction also remains unresolved.

CS084, Traction Power Systems Package 4: Although the contractor continues to contend that unresolved design issues, differing site conditions, and coordination issues are causing delays to this contract, progress continues to be made on the fabrication and delivery of equipment. Issues related to construction and schedule coordination with other contractors continue to impact progress on the contract. Some design issues related to water remediation methodologies in spaces designated for CS084 equipment and other identified field construction issues also remain open. A plan for remediation of specification non-conformance issues related to the track monuments has yet to be advanced. Design work for the SCADA/PLC equipment remains as an on-going item with no forecasted completion date identified.

VS086, Systems Package 3 – Signal Equipment Procurement: The contractor continues to assert that the lack of timely responses on design submittals and inquiries caused delays in the progression of the work. Work on the design to incorporate Positive Train Control (PTC) requires a contract modification that must still be developed and negotiated. MTA gave the contractor a directive to proceed with LIRR's interpretation of the contract regarding a design issue related to the methodology to be used to provide signal "light-out" protection. The contractor advised that this change to its design methodology will impact the completion of designs for several interlockings; and, although the contractor will proceed with the directive, it intends to file a dispute claim.

CS086, Tunnel Systems Package 2 – Signal Installation: The contractor reported that all surveys of the various work sites to determine the condition of sites and if access for work was possible

are complete; and, a report of the findings was under development. The contractor indicates that there are numerous issues (e.g., water infiltration, obstructions, and incomplete prior work) that need to be resolved before it can begin work at the various sites. MTACC indicates that a significant amount of revised or additional contract drawings need to be forwarded to the contractor to address additional requirements to the CS086 contract; however, those documents have yet to be provided. The contractor indicates that it cannot procure some materials (e.g., signal cables) until it has a full understanding of the total amount of work required for this contract; therefore, material procurements are being held until the additional documents and contract requirements are made available.

b. Procurement

The ESA February 2019 MPR shows that total procurement for the ESA Program is 85.1% complete, with total awards at \$9,475.0 million. Since the ESA July 2018 MPR, the PMT calculates summary procurement progress as a percentage of the \$11,133 million April 2018 EAC forecast of all ESA program costs. Active procurements include:

- CH063 Electric Traction Catenary Work, 3rd Party: This will be a negotiated procurement using the RFP process. The contract includes design-build ET catenary relocation work for Mid-Day Storage Yard and completion of all the remaining catenary work required for operational readiness in Harold Interlocking. RFQ advertised online on January 4, 2019; qualification submittals were originally due on February 27, 2019, but MTACC extended the deadline to March 13, 2019, due to many vendor questions. MTACC received several proposals which it continued to review during the remainder of March 2019. Subsequently, in late April 2019, ESA informed the PMOC that it would defer award of the CH063 contract until Q4 2019 due to Amtrak's continued improvement in its electric traction construction for ESA.

Contract CM015, 48th Street Entrance, is on hold pending an agreement between MTA and the owner of 415 Madison Avenue.

c. Construction

In the ESA February 2019 MPR, MTACC reported that total construction progress reached 80.2% complete compared with planned progress of 80.9%. Since the ESA July 2018 MPR, the PMT calculates summary construction progress as a percentage of the \$8,014 million April 2018 EAC forecast of construction costs. 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
CM006	361.6	350.2	11.4	346.0	356.0	100.0%	98.8%	6/1/17	4/30/19	1
	nc	nc	nc	nc	nc	nc	nc	(-2cd)	+31cd	
	361.6	350.2	11.4	346.0	356.0	100.0%	98.8%	6/3/17	3/30/19	
CM007	709.3	665.2	44.1	434.6	718.1	76.5%	65.3%	1/28/20	6/5/20	
	(-3.0)	+0.4	(-3.4)	+13.6	(-4.4)	+2.5%	+2.0%	nc	+29cd	
	712.3	664.8	47.5	421.0	722.5	74.0%	63.3%	1/28/20	5/7/20	
CM014B	484.7	470.4	14.3	332.3	594.9	97.9%	70.6%	8/18/18	12/7/20	
	nc	+3.6	(-3.6)	+10.6	+10.7	+0.6%	+1.7%	(-100cd)	+27cd	
	484.7	466.8	17.9	321.7	584.2	97.3%	68.9%	11/26/18	11/10/20	
VM014	46.9	34.9	12.0	28.7	48.7	NA	82.1%	10/25/19	3/23/20	
	nc	nc	nc	+1.5	nc	NA	+4.1%	nc	nc	
	46.9	34.9	12.0	27.2	48.7	NA	78.0%	10/25/19	3/23/20	

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

Please refer to the contract narratives for additional information.

1. Substantial completion not declared.

CM006 – Manhattan North Structures:

Schedule: The ESA February 2019 MPR projects Milestone MS#3, Substantial Completion (SC), by March 30, 2019, and MS#4, Final Completion, by June 28, 2019. ESA reported, on April 15, 2019, that it agreed to a Substantial Completion date of March 1, 2019 with the contractor. Also, a transfer agreement was also executed April 11, 2019, transferring all of the remaining work to either contract CS179 or contract CM007.

CM007 – GCT Station Caverns and Track:

Schedule: The ESA February 2019 MPR projects Milestone #4 (Track & 3rd Rail Work Complete) by January 17, 2020 (-163 CDs; the TIA/recovery schedule is still under review); Milestone #5 (Substations US1 and US2 Complete) is forecast to March 22, 2019 (-49 CDs; not achieved and likely to push again); Milestone #5A (Caverns Ready for Integrated Systems Testing) is forecast to November 27, 2019 (-112 CDs); Milestone #6 (All Caverns and Tunnel Work Complete) is forecast to June 5, 2020 (-171 CDs); and, Milestone #6A (Substantial Completion) is forecast to June 5, 2020 (-128 CDs).

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

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

East Cavern: Continued light fixture installation lower level; Continued mezzanine level sprinkler piping; Continued steel framing for escalators; Continued installation of escalator 54 and 56, and continued installation of elevator 18.

West Cavern: Continued light fixture installation lower level; Continued steel framing for, elevators and escalators, and painting, ceiling installation; Continued installation of elevators 7 and 19, and continued installation of escalators 63 and 64.

Track: Continued track construction in the upper level Caverns and lower level Tunnel Track; Continued third rail installation. Continued turnout construction. Continued qualification testing of Special Trackwork DFF assemblies. As of April 14, 2019, ESA reports overall Track Construction at 56.4% completion.

Architectural: Through April 28, 2019, Architectural Wall work was approximately 15.7% complete. Architectural Ceiling progress was at approximately 15.7%. Architectural Floor progress was approximately 20% complete.

CM014B – Concourse and Facilities Fit-Out:

Schedule: The ESA February 2019 MPR reports that this contract was 70.5% complete vs. 97.9% planned. MTACC and the contractor recently reached a settlement on the Time Impact Analysis (TIA). The settlement has been approved by the MTA Board. The schedule impact is that the contractor is now on a 7-Day Acceleration Schedule. The new contract date for Substantial Completion is June 2020. The Biltmore Room Substantial Completion date is October 2020.

Through April 16, 2019, the structural steel erection was 75% complete by piece and 69% by weight. As previously reported, this work is proceeding very slowly and is impacting the schedule and the CS179 contract. Cumulative metal ceiling deck progress was 28% complete. HVAC Piping (Chilling System) was 44% complete.

Construction Progress: Electricians continued with installation of Wellway lights, 45th St. Node lights, rough-in and overhead racks. Plumbers continue installation of domestic water piping, CCU testing, and installation of gutter drains throughout the Concourse. Installation of seismic angles continues in Zones 1-4. Mechanical work continues with the installation of AHU/FCUs in available areas, ducts, and sprinkler piping & heads. Installation of the marble stone wall finish is ongoing in public areas from south to north. Installation of the suspended ceiling system continues throughout the Concourse from south to north.

Biltmore Connection: This work continues on the tertiary critical path for the contract.

Wellways: In the Wellways, escalator maintenance is ongoing, one day every 2 months. In Wellway #1, installation of the glass tile curtainwall is continuing. Installation of the Stainless Steel curved wall panels continues. In Wellway #2, installation for glass tile curtainwall is ongoing. Escalator maintenance is underway, 1 week every 2 months. This work is scheduled for completion in April 2019. In Wellway #3, Machine Room installation and escalator build up continues and are scheduled to be completed June 2019. In Wellway #4, Machine Room installation and escalator build up continues and are scheduled to be completed May 2019.

47th Street Cross Passage: The expanded 47th St. Entrance temporarily replaces the delayed 48th St. Entrance (CM015) and becomes the only entrance at the northern end of the Concourse. At Elevator #13, installation nears completion. This unit is to be turned over to MNR and the paperwork and processes for that turnover is being negotiated. The work at Tracks 36/35 at the MNR Express Track for the construction of the modifications/additions to the Passageway “U Tub”, needed to install Escalator #32, has begun. The trackwork will be reinstalled.

50th St. Vent Facility: The Vent Building continues in full fit-out mode. Punch list work is ongoing throughout.

270 Park Avenue Building: The independent contractor continues with layout and core drilling in the area between E. 47th and E. 48th St.

VM014 – Vertical Circulation Elements (Escalators and Elevators):

Schedule: In its February 2019 MPR, MTACC reports that 82.1% of the contract value was invoiced and 78.4% paid.

Construction Progress: For CM007, as of April 16, 2019, 14 of the 16 Escalators have been delivered to the site. All 6 Elevators have been delivered to the site. All elevators and escalators are in various stages of installation. For CM014B, all 22 escalators have been fabricated and delivered. All elevator fabrication has been completed, with the exception of EI #10 (50th St. Vent Building). EL #22 (Biltmore Connection) delivery is scheduled for May 2019. Further, the contractor is preparing, on request by MTACC, a forecast schedule timeline for engineering, fabrication and delivery of the 9 escalators for future contract CM015.

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
CQ032	265.4	263.6	1.8	261.5	264.4	100.0%	99.2%	9/6/16	6/28/19	1
	nc	+1.4	(-1.4)	(-0.3)	+0.7	nc	(0.6%)	nc	+89cd	
	265.4	262.2	3.2	261.8	263.7	100.0%	99.8%	9/6/16	3/31/19	
CQ033	325.0	311.8	13.1	179.6	348.1	66.0%	57.6%	8/18/18	4/13/21	
	nc	+0.1	(-0.2)	+6.3	+2.4	+4.4%	+2.0%	(-723cd)	+9cd	
	325.0	311.7	13.3	173.3	345.7	61.6%	55.6%	8/10/20	4/4/21	

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

Please refer to the contract narratives for additional information.

1. Substantial completion not declared.

CQ032 – Plaza Substation and Queens Structures:

Schedule: The ESA February 2019 MPR projects Milestone MS#6, Substantial Completion (SC), by June 28, 2019, and forecasts Milestone MS#7, Final Completion, by September 26, 2019. ESA reported the CQ032 contract reached SC on April 15, 2019, when ESA elected to take Beneficial Occupancy of the Work with the exception of open items pertaining to bench repairs, concrete defects, and NCRs, submittals, and deliverables. The Yard Services Building will be turned over to the CS179 contract. Remaining punch list items under CQ032 were transferred to the CS179 contract.

Construction Progress: The CQ032 contractor continued the following activities in April 2019: work regarding closure of NCRs, work to eliminate water infiltration conditions, documentation, and other commercial items. Twelve NCRs remain open. Nine NCRs are related to tunnel duct bench remediation of as-built track clearance deviations.

CQ033 – Mid-Day Storage Yard Facility:

Schedule: MTACC reports that Milestones MS#1, MS#2, MS#3, and MS#4 have been achieved. Milestones MS#4A (Start Integrated Testing), MS#5 (YS Track Completion), and MS#6 (Substantial Completion) are impacted by the delay of Access Restraints AR#1 and AR#2. AR#1 requires Amtrak to remove rail located at the west end of the Mid-Day Storage Yard (MDSY). AR#2 requires the installation of new catenary poles and Amtrak wire transfers, and pole locations are obstructed by an Amtrak signal trough. The contractor requires both AR#1 and #2 to install underground duct banks to complete the YS Track, followed by Integrated Testing. The ESA February MPR projects Milestone MS#6 Substantial Completion (SC) for April 13, 2021, -246

days, however, a contract modification for resequencing contract work is being developed that will recover the substantial completion date.

Construction Progress: The contractor continued the following activities in April 2019: CAM Platform work continued; Storage Building and Toilet Service Building foundation construction continued, to be followed by CMU wall construction to start early May 2019; Personnel Access Bridge roof installation continued; Water main, Storm Pipe, Fire Line, and Underdrain installation continued; Yard Lighting pole construction continued; Duct bank construction continued; Traction power installation continued. Work at Tunnel D Approach continued: piles, lagging, and excavation. Preparation work for CIL building installations continued. New Arch Street track and turnout construction continued, will continue during the 60 day outage, and expected to be completed early May 2019.

Systems Contracts

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

	Current Budget	Appr'd Contract	Rem Budget	Invoice Cost	EAC	Planned Comp	Invoice Comp	Current BL SC	Forecast SC	Notes
CS179	606.9	586.0	20.9	479.3	708.4	87.2%	80.4%	7/1/20	11/25/21	1
	nc	(-4.8)	+4.7	+5.6	+50.2	+0.7%	+0.2%	nc	nc	
	606.9	590.8	16.2	473.7	658.2	86.5%	80.2%	7/1/20	11/25/21	
CS084	79.7	73.8	6.0	23.0	83.2	92.7%	31.2%	12/2/19	4/29/21	1
	nc	nc	nc	+1.2	nc	+1.1%	+1.7%	nc	+14cd	
	79.7	73.8	6.0	21.8	83.2	91.6%	29.5%	12/2/19	4/15/21	
CS086	60.9	53.0	7.9	--	60.9	TBD	nc	2/21/21	2/21/21	2
	nc	nc	nc	(-0.5)	nc	NA	(0.8%)	nc	nc	
	60.9	53.0	7.9	0.5	60.9	TBD	0.8%	2/21/21	2/21/21	
VS086	21.8	19.9	1.9	14.8	21.7	NA	73.5%	10/14/19	1/24/20	1
	nc	nc	nc	nc	(-0.1)	NA	(0.7%)	nc	+32cd	
	21.8	19.9	1.9	14.8	21.8	NA	74.2%	10/14/19	12/23/19	
VH051	30.2	29.7	0.5	29.6	30.2	NA	99.7%	4/30/15	5/31/21	
	nc	nc	nc	nc	nc	NA	nc	nc	(-43cd)	
	30.2	29.7	0.5	29.6	30.2	NA	99.7%	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.
- 2.Baseline Scheduled not yet submitted.

CS179 – Systems Package 1 – Facilities Systems:

Schedule: At the April 2019 MTA board meeting, MTACC provided MTA Board members with its Plan to complete the ESA Project. As part of that Plan, MTACC included an Integrated System Test Plan (ISTP) to meet the testing requirements of the Project. That ISTP was not shared with the PMOC; so, an assessment of the Plan, and the testing methodology, was not possible. The PMOC requested that MTACC provide it with a presentation of the ISTP so that the PMOC has an opportunity to evaluate the adequacy and completeness of the testing. Besides assessing if the new ISTP addresses the contractual testing requirements, the PMOC will be looking to see if the schedule addresses the concerns previously noted with the CS179 contract schedule. Those concerns are if the schedule:

1. Is based on the premise that all submitted designs are final (which is not the case);

2. Considers that all field work is ready-to-go as currently understood (which is not the case);
3. Takes into consideration any impact from the open NOCs; and
4. Addresses any impacts to the contract work from SWOs that remain in effect past the data date of the schedules.

Design Progress: The final approval of all 10 control system Final Designs (FDs), a critical activity, is now 36 months late. MTACC Senior Management indicates that the LIRR has formally approved 8 out of the 10 Control System FDs. One of the Control Systems, the centralized signal control system, must now undergo design modifications to conform to signal circuit design information recently provided by the VS086 Signal design contractor. 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) 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 not having the information it says it needs, the contractor continues to move forward with the development of test plans and equipment fabrication. Factory testing of equipment for 4 of the 10 Control Systems and 3 of the 19 Non-Control Systems is on hold pending the resolution of contract interface coordination issues, Stop Work Orders, and resolution of RFIs and NOCs.

Construction Progress: In April 2019, the CS179 contractor continued to actively progress installation of conduit, cable, fire stopping, fire standpipe, lighting, vent fans, etc. in the tunnels and at the various substation facilities where access was available and conditions warranted. 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. Furthermore, the previously noted concern related to environmental conditions regarding water and moisture in the various equipment rooms and the “open” type equipment racks remains as an unresolved item of discussion between MTACC, LIRR, and the contractor.

CS084 – Tunnel Systems Package 4 – Traction Power Systems:

Schedule: The information for CS084 is supplemented by discussions at an early-April 2019 Progress Meeting that reviewed contract progress up to April 10, 2019. The contractor continued to indicate that all of the contract milestones are delayed as a result of delays associated with the approval of substation designs, unresolved issues, and obstructions in CS084 work areas from other ESA contractors, SWOs, and site access restraints. The timely development and issuance of necessary contract modifications on this contract and other contracts for which work is required to progress the CS084 work continues to be an issue requiring attention.

Design Progress: The design focus continues to be on developing solutions to issues identified during site surveys and construction activities. As these issues are identified, the GEC is being tasked to develop design solutions. There remains, however, one original design effort, LIRR’s approval of SCADA software, that needs to be accomplished to progress the work.

Construction Progress: A considerable amount of equipment for the substations has been fabricated and delivered to storage, where it will remain until the TPSS rooms for those substations are ready for their installation of the substation equipment. The contractor continues to cite coordination issues, design approval delays, access restraints, stop work orders, and differing site conditions as its reasons why work at the various locations cannot progress. Progress on

addressing the issues continues to be exceedingly 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.

MTA has the contractual obligation to provide 26 Inductive Reactors to the contractor for installation at various locations. The contractor initially refused to accept these reactors based on concerns about apparent damage to some units and notified MTACC of this problem. Considerable discussions regarding the condition and utilization of the reactors ensued and continue; and, as of early-April 2019, only one of the reactors had been installed.

The PMOC previously reported significant quality issues related to the failure of transformers while undergoing hi-pot testing. The last of the transformer testing, including the second re-test of one of the repaired transformers, is now scheduled to take place in May 2019. Previously reported discussions and decisions regarding the long-term viability of transformers manufactured and tested prior to the modification of the fabrication process remain as items yet to be finalized between the LIRR and MTACC.

Corrective action to address the previously identified issue regarding specification non-conformance issues with track monuments (conduit turn ups at track level for routing of traction power cables) is now a significant issue that is being discussed at meetings of ESA's senior level management. Based on the findings of initial inspections of the existing monuments, MTACC directed the GEC to prepare 10 different "typical" designs to remediate monument installation deficiencies detected during those inspections. Once the draft designs are complete, MTACC will ask LIRR to review the remediation possibilities, with the goal of having the LIRR render a decision as to if the contract specification requirements – LIRR standards – can be waived in certain locations where the deficiencies were noted. The contractor advised that it cannot order the pre-assembled traction power feeder lead cables that go from the monuments to the 3rd rail – long lead-time items – until the decisions are made regarding the acceptability of any of the non-conforming monuments. Any decision that accepts non-conforming monuments that require feeder leads of a different length than those required by LIRR standards could present a problem for long-term maintenance to the LIRR. There are approximately 453 track monument locations and almost 2,100 feeder leads required throughout the ESA territory.

Other significant issues, previously discussed but not resolved yet, involve the installation of traction power cables. One is the necessity for LIRR to waive specification requirements to allow for splicing of these cables in pull boxes, to address incorrect installations by other ESA contractors. The other concerns the number of bends in some of the installed traction power conduit systems that exceed LIRR specifications and impact the installation of the traction power cables.

The PMOC remains concerned about many issues, including:

1. TPSS equipment delivery methodology (means and methods);
2. Installation of the C08 traction power cables due to missing conduit and manholes;
3. Transformer hi-pot testing failures and long-term viability of the transformers;
4. Verification of existing conduit and manholes in several substations;
5. Coordination with other contractors;
6. Possible damage to the MTA-provided inductive reactors due to improper storage and handling by MTA;
7. Extent of non-conformance of track monuments; and
8. Water infiltration issues in the facilities.

VS086 – Systems Package 3, Signal Equipment Procurement:

Schedule: As noted previously, the milestones for this contract must be modified to accurately evaluate progress. It remains unclear when this schedule update will take place. MTACC has already indicated that the contract modification for incorporation of PTC requirements and incorporation of construction phase services to assist the CS086 contractor will impact the contract substantial completion date.

Design Progress: The contractor continued to assert that the lack of timely responses on design submittals and inquiries caused previous delays in the progression of the work. There are two contract modifications required for incorporation of PTC into the signal design – one for the GEC and the other for the VS086 contractor to incorporate the circuitry into the VS086 signal design. Neither has been developed yet because LIRR’s PTC design is still not complete.

The previously noted issue of Electro-Magnetic Interference (EMI) with ESA signal and communications equipment remains as an unresolved open issue and the contractor continues to prepare a waiver request to delete this contract requirement.

To address LIRR’s concern that the signal “light-out” protection methodology being proposed by the contractor was not what it wanted, MTACC gave the contractor a directive to proceed with LIRR’s interpretation of the contract regarding this design issue. The contractor advised that this change to its design methodology will impact the completion of designs for several interlockings; and, although the contractor will proceed with the directive, it intends to file a dispute claim.

Equipment Fabrication and Delivery Progress: The repair or replacement of the damaged Plaza Interlocking equipment is complete and the equipment is now in the CS086 storage facility awaiting installation. The remainder of the interlocking equipment is forecast for delivery in early-May 2019.

The Factory Integrated Acceptance Testing (FIAT), which must be performed to test the interlocking designs and equipment as a composite systems package must still be accomplished. Design data from the CS179 contractor is required to perform the FIAT, and MTACC continues to indicate that this design data is still under development by the CS179 contractor. Therefore, the forecasted date for the FIAT, which will be conducted at the ESA site, is undetermined at this time.

CS086 – Tunnel Systems Package 2 – Signal Installation

Schedule: The contractor’s baseline schedule was “conditionally” approved in April 2019, with just cost and labor information correlated with the schedule activities yet to be submitted. The last monthly update of the contractor’s schedule indicates an approximate five-month delay in contract work due to site access issues.

Design/Construction Progress:

- The contractor continued to advise that the Plaza Interlocking equipment room has a major water infiltration issue that needs to be addressed.
- In April 2019, the contractor finished performing surveys of equipment locations to identify any issues (e.g., water infiltration, obstructions, etc.) at those sites. The contractor must still submit its lists of issues to MTACC so that discussions can take place regarding any corrective action that may need to be taken.
- The contractor continues to advise that Room 4G36 is too small to fit all the proposed equipment – this needs to be verified by MTACC. If it is ultimately determined that the equipment will not fit in the existing room, a re-design of equipment layouts and cable routing and lengths could be required.

- MTACC continues to indicate that it will send a significant amount of revised/additional contract drawings and specifications to the contractor for pricing and inclusion in the contract. As of the end of April 2019, this action remained as an open item. The contractor indicates that identification of any additional contract requirements must be expedited, as no cable for the contract will be ordered until all cable lengths required for the contract are finalized.

Harold Interlocking Contracts

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

	Current Budget	Appr'd Contract	Rem Budget	Invoice Cost	EAC	Planned Comp	Invoice Comp	Current BL SC	Forecast SC	Notes
CH057D	29.6	22.8	6.8	19.9	30.3	100.0%	87.2%	1/31/19	3/10/19	
	nc	(-0.2)	+0.2	+1.0	(-0.2)	+0.6%	+4.8%	nc	(-20cd)	
	29.6	23.0	6.6	18.9	30.5	99.4%	82.4%	1/31/19	3/30/19	
CH058A	68.7	62.4	6.4	3.2	73.9	8.6%	5.2%	3/17/21	3/17/21	
	nc	nc	nc	+0.5	(-1.1)	NA	+0.9%	nc	nc	
	68.7	62.4	6.4	2.7	75.0	TBD	4.3%	3/17/21	3/17/21	

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

CH057D – Harold Trackwork Part 3:

Schedule: The CH057D contractor did not complete any specific schedule milestones during April 2019.

Construction Progress: During April 2019, the contractor continued to surface the Westbound Bypass Track and flash butt weld rail ends at various locations in the Northeast and Southeast Quadrant and Westbound Bypass work areas.

CH058A – Harold Structures – B/C Approach

Schedule: On April 9, 2019, CH058A Access Restraint #1 was lifted, which allowed the contractor unlimited access to the Tunnel B/C work site. Additionally, the contractor’s Baseline Schedule was “Approved as Noted” by ESA during April 2019.

Construction Progress: During April 2019, the contractor continued site mobilization and began installation of worksite fencing, C08 ductbank excavation at 43rd Street, and pre-trenching for pile installation under 39th Street Bridge.

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	60.9	60.8	0.1	60.8	61.4	100.0%	99.9%	8/15/17	2/21/21	1
	nc	nc	nc	nc	+0.5	nc	nc	nc	+42cd	
	60.9	60.8	0.1	60.8	60.9	100.0%	99.9%	8/15/17	1/10/21	
FHA03	12.7	5.2	7.5	5.0	14.8	99.0%	39.5%	7/25/18	6/2/25	1
	nc	nc	nc	+1.7	(-0.1)	nc	+13.2%	nc	nc	
	12.7	5.2	7.5	3.3	14.9	99.0%	26.3%	7/25/18	6/2/25	
FHL01	29.1	29.0	0.2	28.6	34.7	100.0%	98.0%	4/9/15	3/13/19	1
	nc	nc	nc	+0.2	(-0.1)	nc	+0.5%	nc	nc	
	29.1	29.0	0.2	28.4	34.8	100.0%	97.5%	4/9/15	3/13/19	
FHL02	114.8	114.8	--	114.8	123.8	100.0%	100.0%	11/25/16	8/30/21	1
	nc	nc	nc	nc	(-0.6)	nc	nc	nc	nc	
	114.8	114.8	--	114.8	124.4	100.0%	100.0%	11/25/16	8/30/21	
FHL03	20.6	2.7	17.9	18.0	47.7	100.0%	50.1%	8/14/17	4/28/24	1
	nc	nc	nc	nc	(-0.6)	nc	nc	nc	nc	
	20.6	2.7	17.9	18.0	48.3	100.0%	50.1%	8/14/17	4/28/24	

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

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

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

During April 2019, Amtrak ET personnel completed installation of the HML2 Full Tension Air Break and began to make catenary relocations on the Loop Tracks and Sub 3 and Sub 4 Tracks necessary to allow the CQ033 contractor to construct track for the Mid-Day Storage Yard. Amtrak C&S personnel continued to install signal trough around Loop 2 Track between Loop and “T” Interlockings.

FHL01, FHL02, and FHL03 – Harold Stage 1, 2, and Stage 3 LIRR:

During April 2019, LIRR ET personnel continued to salvage reusable electric traction equipment from the old G02 Substation and make miscellaneous 3rd rail reconfigurations in Harold Interlocking. LIRR Signal personnel continued miscellaneous signal work in the NEQ, SEQ, and Westbound Bypass work areas and began to wire switch machines for future turnout installations for the #5155 and #3234 crossovers.

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 ESA February 2019 MPR. The PMOC continues to monitor developments regarding the following concerns, but notes there were no final resolutions during April 2019:

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.
2. Potential out of tolerance as-built bench wall clearance for railcars in ESA tunnels.
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.

2.0 SCHEDULE DATA

Status and Schedule Contingency

The schedule information in this report is based on IPS 115 (data date March 1, 2019) and IPS Progress Report. The forecast for the Target Revenue Service Date (RSD) remained February 14, 2022, and the Public RSD remained December 13, 2022. The IPS schedule was prepared using the MTACC alternative IPS procedure.

The remaining program schedule contingency identified in IPS 115 is 302 calendar days to the Public RSD, unchanged from that which was reported in IPS 114. The ESA Program contingency is only 27 CDs above the minimum required FTA ELPEP schedule contingency, and 692 CDs less than the 994 CD duration that was established in the July 1, 2014 IPS re-baseline.

In IPS 115, the Manhattan/Systems work path has no float and it remains the most critical path of the ESA program. As shown in Appendix B, ESA Critical Path Chart, the float on the paths through the three main ESA program work areas are: 1) Manhattan/Systems (no float); 2) Queens (117 CDs float); and, 3) Harold Interlocking (136 CDs float). The PMOC notes that float on the Manhattan/Systems and Harold Interlocking paths is measured to the start of LIRR Final Systems Testing and that the float on the Queens (Mid-Day Storage Yard) path is measured to the start of LIRR FRA Testing (signals and power).

Table 2.1 shows dates, remaining durations, and contingencies for the Target, Public, and FFGA Revenue Service Dates.

Table 2.1: Schedule Contingency – ESA IPS 115 – March 1, 2019

	IPS 114 – Feb 1, 2019		IPS 115 – Mar. 1, 2019	
	Date	Cal. Days	Date	Cal. Days
Target RSD Contingency				
Duration Remaining to Target RSD	2/14/22	1,109	2/14/22	1,081
Remaining Target RSD Contingency		0		0
Remaining IPS Contingency Percent		0.0%		0.0%
Public RSD Contingency				
Duration Remaining to Late RSD	12/13/22	1,411	12/13/22	1,383
Remaining Public RSD Contingency		302		302
Contingency Percent of IPS Duration		21.4%		21.8%
FFGA RSD Contingency				
Duration Remaining to FFGA RSD	12/31/23	1,794	12/31/23	1,766
Remaining FFGA RSD Contingency †		685		685
Contingency Percent of IPS Duration		38.2%		38.8%

Notes: †This duration is the difference between the Target RSD and the FFGA RSD.

Program Primary Critical Path – Manhattan/Systems

The ESA program primary critical path in IPS 115 remains through Manhattan/Systems work and ends on November 24, 2021. Table 2.2 shows the contracts and work that comprise the Manhattan/Systems path as reported in this update. There were no significant changes to the scope that comprises the Manhattan/Systems path in IPS 115, and its end date is unchanged from IPS 114.

The IPS schedule is based on MTACC’s plan for Incremental IST, which will be incorporated into the IPS now that contract modifications were issued to CS179 and CM014B in April 2019. The MTACC is anticipating that the target RSD may improve by 1 month with these changes. Additional modifications may be necessary for contracts CM007, CM014B, CS179, and VS/CS084. The ESA program schedule contingency could be impacted if the Incremental IST scheduled Phase 3 testing is not started in the forecasted timeframe, currently August 2020.

Table 2.2: Primary Critical Path – IPS 115, March 1, 2019

Activity Name	Duration	Start	Finish
CM007 - GCT Station Caverns and Track			
West cavern upper conduit, circuits for communications, FA, smoke, and ceilings	571	11-Jun-18A	2-Jan-20
CS179 System Package 1 – Facilities Systems			
East Cavern Upper conduit, wire, and Phase 3 Zone 1 local testing for communications systems to completion	226	2-Jan-20	14-Aug-20
GCT Phase 3 Zone 1 IST complete BCS interface testing	76	14-Aug-20	28-Oct-20
GCT Phase 3 IST for Fire Alarm complete	113	28-Oct-20	17-Feb-21
Issue Contingency	282	17-Feb-21	25-Nov-21
Program Activities			
LIRR Final Testing and Previews †	81	25-Nov-21	13-Feb-22
Target Revenue Service Date			14-Feb-22
ESA Program-Level Contingency	302	15-Feb-22	13-Dec-22
Public Revenue Service Date			13-Dec-22

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

Discussion of Progress along the Critical Path

The Manhattan/Systems critical path completion date in IPS 115 is November 25, 2021, unchanged from IPS 114.

The Manhattan/Systems path runs through CM007 construction of west cavern upper level conduit and fixtures for communications, fire alarm, smoke exhaust, facility power, and ceiling finishes; then through CS179 construction of east cavern upper level conduit, wire, and local testing for communications systems, and completion of local testing for Phase 3 Zone 1. The path continues with Phase 3 Zone 1 IST of the BCS and interfacing systems to achieve the BCS IST milestone; followed by Phase 3 IST of the fire alarm system and interfaces to complete Phase 3 IST. The CS179 Issue Contingency comprises the final ten months of the path, ending in November 2021 as it did in IPS 114. From this point the path runs through LIRR final testing and previews and concludes with the Target RSD on February 14, 2022. All activities on the Manhattan/Systems path, up to the Issue Contingency, finish 4 weeks later than they did in IPS 114. The finish date on the path did not slip due to the duration of the Issue Contingency being reduced by 4 weeks.

There were no Manhattan/Systems path coordination point milestones in IPS 115 that were scheduled for completion in February 2019. No coordination points were achieved ahead of scheduled during this period and many slipped their forecast dates by one month. There is a risk that the lack of progress through coordination points will result in the need for more concurrent work in the period leading up to and during IST than had been planned, which may complicate and impede progress.

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 115.

Sub Program Longest Path – Queens

The Queens (Mid-Day Storage Yard) work path is second longest of the three ESA program areas in IPS 115. The Queens path slipped 9 days during the update period, and now ends on April 13, 2021. The total float on the Queens longest path is 117 CDs, which is split with 58 CDs before the FRA testing activity and an additional 59 CDs after. The delay to CQ033 substantial completion had not impacted the program due to float along the path, and the connection to CS179 IST work scheduled to occur approximately six months prior to substantial completion.

The work that comprises the Queens path changed completely in IPS 115 due to the implementation of a mitigation plan that reduced the criticality of the work leading to the release of Access Restraint 2. The mitigation plan to resequence track work to provide an alternate Arch Street Route through TRT3, T2, NL2, and M2 Tracks is underway. The YS track under AR 2 will now be built at a later stage and will not affect the critical path. The Queens path now begins with track work and turnouts for tracks TRT3, T2, M2, M17 and SL. The path then continues to signal cable pulling and the installation and testing of the RFID system, followed by MDSY integration testing and the path ends in November 2020. This is followed by 58 CDs of float to the FRA testing activity, and then 59 CDs of float to the LIRR final testing activity on the ESA program critical path (Manhattan/Systems work).

Sub Program Longest Path – Harold Interlocking

Harold Interlocking work path is the longest of the three ESA program areas in IPS 115. The Harold path concludes on July 13, 2021, the same date as in IPS 114.

The work that comprises the Harold Interlocking path remains unchanged since IPS 114. The path begins with relocation of catenary and communications systems facilities in order to start underpinning the 39th Street bridge; then approach structure construction and backfilling; and, followed by the completion of civil and track work for the open portion of the B/C approach. The path continues through CH063 and Access Restraint 2 to perform critical catenary work at the Amtrak 2 to Westward LIRR Passenger track connection (W crossover) above the B/C approach structure. The Harold path then shifts to FHL04 LIRR Force Account to cut over the W crossover and B/C approach track, third rail and signals. From the end of the Harold construction, there are 136 CDs of float to the LIRR final 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 115 (March 1, 2019).

Table 2.4: Procurement Schedule

Contract Description	Advertise Date	Bid Date	NTP	Project Length	Substantial Completion
CH063: ET Catenary Work 3rd Party	1/4/19 A	5/15/19	9/4/19	22 mos.	6/21/21

CH063 Electric Traction Catenary Work, 3rd Party: MTA issued an Expression of Interest (EOI) notice on November 9, 2018, for the design-build contract. The receipt of bids and Notice to Proceed were originally forecasted as April 30, 2019, and July 31, 2019, respectively. ESA

received bids for CH063, but, in late April 2019, ESA informed the PMOC that award was being deferred until Q4 2019 due to Amtrak's continued improvement in electric traction construction for ESA.

PMOC Concerns

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

1. Concerns continue about the Manhattan/Systems work path. While MTACC has reduced the uncertainties concerning Incremental IST schedule, the risks remain for execution of the schedule due to the effect of construction activity stacking. Additionally, the redevelopment of 270 Park Avenue does not have an agreed upon schedule. Future schedules may show the shifts in the critical path, further delays, and reduction of the Issues Contingency.
2. The PMOC has ongoing concerns about the significant schedule changes that resulted in shifts in scope on the Manhattan/Systems schedule path, which drives the ESA Program Critical Path. While the MTACC has reached agreement with the CS0179 and CM014B contractors for the Incremental IST schedule, other Manhattan/Systems contracts remain near critical and may exert a significant influence on the critical path.
3. The ESA program schedule contingency is 302 CDs, which is only 27 CDs above the minimum required FTA ELPEP schedule contingency. The ability of the MTACC to maintain the FTA minimum until the next ELPEP hold point (95% constructed; 4Q 2020) is at risk due to the uncertainties about the Manhattan/Systems schedule, the greatest of which is execution of the plan for the Incremental IST.
4. Progress on CS084, Tunnel Systems Package 4 – Traction Power, is slow and is currently reported as 31.2% complete compared with as-planned progress of 92.7%. The PMOC observes that much of the work has had day-for-day delays in each IPS update. The PMT is working with the contractor to develop a realistic schedule; however, the PMOC believes that a revised schedule will incorporate delays in the delivery of equipment that will push out milestone dates. The PMOC recommends that ESA continue to analyze options to recover the schedule with a focus on major electrical equipment submittals and layouts, identifying major issues, and, determining corrective measures.
5. The PMOC is concerned about the lack of progress indicated by coordination point activities not achieving scheduled completion dates to advance IST. This indicates the evolving nature of the IPS schedule, which needs to be finalized so that it can be a reliable management tool. The MTACC has recognized the need to add a significant number of coordination points to the schedule to manage the work. If not addressed, the lack of progress will result in the need to perform more work concurrently leading up to and during IST than had been planned, which will further complicate and impede progress.
6. The CM014B contractor's capability to complete the 30% of its remaining work in the 15 months prior to forecast SC of June 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 February 2019 MPR, the PMT reported that the total project progress is 77.0% complete compared to as-planned progress of 77.1% of the \$11,133 million April 2018 EAC forecast. The report also shows that construction progress reached 80.2% compared with planned

progress of 81.4% of the \$8,014 million April 2018 EAC forecast, based on invoiced construction costs. Contract percentage calculations use the amount that has been allocated to each contract in the MTA Impact accounting system for the budget.

Contingency

The ESA February 2019 MPR shows that contingencies in the current budget total (b)(4) million, which includes unallocated contingencies of (b)(4) million and allocated contingencies of (b)(4) million. Refer to Table 3.1. The total contingency is (b)(4) million above the ELPEP contingency amount of \$260 million.

Unallocated contingencies decreased by (b)(4) million and allocated contingencies decreased by (b)(4) million (post-award contingencies) for a total decrease of all contingencies of (b)(4) million. These revisions are in line with the EAC forecast that was presented to the MTA board in April 2018. The high value of the Project-Wide Reserve reflects MTACC’s strategy of holding significant funds as contingencies and then releasing them to specific projects on an as-needed basis, commensurate with construction progress. This approach tends to artificially inflate the program contingency and reduces the accuracy of contract completion percentages. The MTACC cost plan anticipates drawing contingencies down to (b)(4) million by the end of December 2020 and then replenishing the contingencies and the balance of the ESA program budgets with funds from the 2020-2024 Capital Plan.

The PMOC remains concerned about future demands on the program’s contingencies until the MTA 2020–2024 Capital Plan is funded and the related budget adjustments are performed.

Table 3.1: ESA Cost Contingency (Costs shown in millions)

Contingency	June 2014 Baseline	Nov 2018	Dec 2018	Jan 2019	Feb 2019
Allocated Contingency					
Pre-Award Contingency (AFI)	112.7 m	(b)(4)			
Post-Award Contingency (AWO)	266.3 m				
Allocated Contingency Subtotal	379.0 m				
Unallocated Contingency					
Project-Wide Reserve	439.0 m				
Total Contingencies	818.0 m				

Change Orders/Budget Adjustments

The ESA November 2018 MPR lists 19 change orders with magnitudes greater than \$100,000 that were executed in February 2019. The net value of these change orders was \$43.8 million.

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

Contract	Description / Mod No.	Amount
CM007	Cavern Fire Alarm Change (mod. 68)	199,000
CM007	No Access UL Under Platform (mod. 64)	109,291
CM014B	Additional Gutter Downspouts and Leaders (CPR-128) (mod. 204)	567,507
CM014B	B30 Substation Support Services (CPR-089) (mod. 187)	1,657,056
CM014B	Con-Edison - 10-inch Steam Service on 48th Street (CPR-123) (mod. 214)	192,617
CM014B	RFI #1539 - Tile 3622 Gutter Support Steel (CPR-111) (mod. 207)	107,920
CM014B	RFI#729 - North Transfer Station Existing Drain Line and Tie in Points (mod. 167)	230,000
CM014B	Transformer House 1 Drainage (CPR-039 R6) (mod. 173)	581,117
CQ032	Amtrak Bridge Grouting (mod. 92)	648,644
CQ032	Water Infiltration Remediation Launch Block (mod. 91)	742,585
CQ033	Relocation and abandonment of existing wells (mod. 30)	170,000
CS179	23rd St. Scope Transfer (mod. 173)	2,450,000
CS179	2nd Ave Discharge, Drainage & Condenser pipes (mod. 176)	505,000
CS179	55th Street Security Door (mod. 122)	243,627
CS179	Alarming Security Related Cabinets (mod. 154)	612,337
CS179	CTC Code Charts (mod. 184)	678,728
CS179	Replacement of Mechanical Fire Dampers (mod. 174)	718,024
VS086	GCT Track Renumbering / Control of Plaza from TOC (mod. 1)	174,000
PM	Extension PM Service to 6/30/19 (mod. 44)	33,165,470

Funding

Budget Amendment 3 to the 2015–2019 Capital Plan has been incorporated into the ESA program budget. This action added \$157 million (local funds) and increased the overall ESA program budget from \$10,178 million to a new value of \$10,335 million.

Federal Funding: The total Federal funding commitment to the ESA project is \$2,698.8 million, of which all of the funds have been effectively drawn down as of February 1, 2019.

Local Funding: The budget for Local Funding is \$7,636.4 million, of which \$5,868.9 million has been expended through March 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 in an overstatement of both the contract completion percentages and the total value of unallocated contingencies. While this strategy retains maximum flexibility for the MTACC, it differs from the generally accepted practice of committing to budgets for known program costs and tends to artificially inflate the program contingency and reduces the accuracy of contract completion percentages. The PMOC anticipates that the budgets will be updated after major contract modifications are executed and when the 2020–2024 Capital Plan is adopted.
2. The MTACC needs to prepare its 2020–2024 Capital Plan, which is anticipated to include approximately \$800 million to complete the ESA program. The MTACC cost plan forecasts

drawing contingencies down to approximately (b)(4) million at the end of December 2020, at which time the ESA program budgets and contingencies would be replenished with funds from the 2020-2024 Capital Plan. The forecast (b)(4) million contingency balance is below the ELPEP minimum, which would be addressed in the MTACC recovery plan that is now anticipated in the second quarter of 2019. This future potential funding constraint could be a major risk.

3. The PMOC acknowledges that the MTACC issued modifications for contracts CS179 and CM014B to resolve the major open cost and schedule issues and to incorporate Incremental IST. The implications of these changes on contracts CS084, VS/CS086, CM007, and CQ033 are yet to be determined. Additionally, 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 April 2019, MTACC continued to adjust the “ESA First” Harold Re-Sequencing plan to accommodate railroad force account constraints. As a result, the impacts caused by insufficient Amtrak support were reduced during this period, but not totally eliminated. This situation continues to be a challenge for MTACC, although the noticeable improvements that have been recently reported appeared to have been sustained through April 2019 for LIRR direct Force Account work and Amtrak ET support.

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 RSD of December 2022. Should this occur, the remaining ESA construction work in Harold Interlocking, as well as the systems testing, start-up, and commissioning for Tracks A, B/C, and D, could be delayed and potentially impact the MTACC RSD of December 2022. There is less likelihood, however, that such an event 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.
- b.) 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. This delay continued through April 2019. The GEC acknowledges that the required associated design changes for ESA Contracts VS086, CS086, and CS179 cannot be completed until the PTC is finalized. The PMOC continues to monitor this situation to determine what schedule risk this situation presents to the three cited ESA contracts and also with regard to finalization of the CS179 Integrated System Testing Plan and Schedule. MTACC has already acknowledged that the contract modification for incorporation of PTC requirements will impact the substantial completion date for Contract VS086.

Capital Funding Risk

MTACC has forecasted a need for approximately \$800 million in the 2020–2024 Capital Plan. The PMOC remains concerned that – until the 2020-2024 Capital Plan is approved – this potential future funding constraint may significantly impact the program budget and schedule as well as the start of Revenue Service.

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 and, hence, MTACC’s Revenue Service Date. On January 24, 2019, LIRR issued the second step Phase II, “Cost/Technical,” portion of the two-step RFP to vendors that submitted successful proposals for the Phase I, “Qualifications”, initial step of the RFP. During April 2019, LIRR received proposals for Phase II, after which the LIRR began its evaluations. Due to the confidential nature of the procurement process, however, LIRR is not permitted to share any details of the proposals it received. Nonetheless, LIRR continues to state that it will award the contract in June 2019. The PMOC believes that this is overly optimistic based on previous LIRR vehicle procurements and the manner in which such procurements generally progress.

Manhattan/Systems Performance Risk

The Manhattan/Systems path is at risk for future open/unresolved issues. Contract modifications for CS179 and CM014B have been issued to address Incremental IST, which needs to be incorporated in the IPS and in contract modifications for interfacing contracts, as necessary. Additionally, MTACC is working through the implications that the reconstruction of 270 Park Avenue could have on the ESA program. Without better definitions of the scopes of work, and the MTACC/JPMC integrated construction schedule, schedule impacts cannot be accurately forecast. Finally, Contract CS084 TPSS C06 is close to the critical path with only 70 CDs of float.

JP Morgan Chase Redevelopment at 270 Park Avenue

Foundation and substructure systems required for the planned new JP Morgan Chase (JPMC) building at 270 Park Avenue will impact the LIRR Concourse at GCT as well as the MNR train shed. Schedule impacts to the ESA design and construction work are potentially significant. More detailed information from ESA-PMT was provided during 1Q 2019. Ongoing MTA, MTACC-ESA, and JPMC discussion continued through April 2019. 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 approved at the March 2019 MTA Board meeting and executed by both parties on March 31, 2019. A Construction Agreement is expected to be completed in the April/May 2019 timeframe.

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 3Q 2017. In April 2018, FTA advised MTACC to incorporate its current updates and commence with a subsequent revision that addresses management changes resulting from the MTACC Six-Point Plan for ESA. All aforementioned updates will be consolidated in a draft that was anticipated, but not met, in December 2018. The draft TCC Plan update is now expected during May 2019.
- **Continuing ELPEP Compliance:** The ESA project should continue to make additional improvements in the following areas: Management Decision; Design Development; Change Control Committee (CCC) Process and Results; Stakeholder Management; Procurement; and Risk-Informed Decision Making. The PMOC continues to note progress in two previously identified areas – Issues Management and Timely Decision Making, particularly when responding to new issues arising from the railroads’ Force Account resource availability, track outages, and other issues regarding the remaining work in Harold Interlocking.
- **Project Management Plan:** MTACC is using the current version of the PMP, Rev. 10, that the PMOC reviewed and the FTA accepted in 2017.
- **Cost/Schedule Contingency:** MTACC, 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 remains only 27 CDs above ELPEP minimum. The total Cost Contingency is (b)(4) million above the ELPEP minimum contingency of \$260 million.

The PMOC notes that, with completion and approval of the most recent Schedule Management Plan and Cost Management Plan updates, 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 4Q 2017. In April 2018, the FTA advised MTACC to incorporate its current updates and then commence with a subsequent revision that addresses any changes resulting from the MTACC Six-Point Plan for ESA. An updated draft was issued in December 2018.

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

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

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 March 2019 were 0.89 for Lost Time Injuries (LTI) and 1.79 for Recordable Injuries (RI). Both were below Bureau of Labor Statistics (BLS) 2019 Safety Guidelines of 1.5 for LTI and 2.5 for RI. Additionally, MTACC did not report any significant security issues in the ESA February 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 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.

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.

Procurement: The PMOC had previously recommended that the ESA PMT update the current version of the CPP, Rev. 12.0, and minimize shifting scope for the remainder of the project. This update needs to account for the remaining third-party contracts and railroad force account packages, along with all additional scope/scope transfers and a procurement timeline. In January 2019, ESA issued the draft Rev.13.0 to the CPP.

Water Infiltration Concerns Regarding 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. Further, the CS179 and CS084 contractors continue to advise MTACC of more water infiltration issues in areas where work access is now available and the CS086 contractor recently re-stated its concern over identified a water issues in the Plaza Interlocking facility rooms. Discussions continue regarding equipment rack configurations and a potential water infiltration/moisture issue. Water conditions remain in three main areas under CQ032: the former Launch Block area of the Plaza, the Amtrak Bridge area, and the former Early Access Chamber area. Current CQ032 status: Further grouting at the Launch Block area will be performed under another contract; Grouting was performed in April 2019 at the Amtrak Bridge, and GEC is reviewing options as the area is still not dry; Contractor is performing concrete repairs to the defective concrete at the EAC where cores were taken; ESA has hired an outside consultant to investigate PAC installation in the Plaza.

Contract CQ032: There are potential out of tolerance as-built railcar clearance with the newly constructed bench wall in the ESA tunnels. There are now nine NCRs related to tunnel duct bench clearance as-built deviations and remediation for train clearance requirements. Current status: Required submission of as-builts, and/or approval of survey control submissions to move forward with remediation. MTACC should remain diligent to complete the remediation plan so that the corrective work can start as soon as possible. ESA issued requests for proposal to contractor for repair work at GCT7 (Plaza West) and Tunnel D.

Contract CS179: The PMOC recommends that the ESA PMT continue making 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: There are 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. This is a major finding that may result in significant impact. There are approximately 453 monuments, many of which were not constructed in accordance with LIRR standards. LIRR, MTACC-PMT, CM, GEC and the CM007 contractor are inspecting and reviewing. MTACC should remain diligent to complete the remediation plan so that the corrective work can start as soon as possible.

MTACC should prioritize the execution of contract modifications to the CS084 and other associated contracts in an effort to preclude any further impact to substation installations. Additionally, the PMOC remains concerned about the following issues:

1. Equipment delivery methodology (means and methods);
2. Installation of the C08 traction power cables due to missing conduit and manholes;
3. Transformer hi-pot testing failures and long-term viability of the transformers;
4. Verification of existing conduit and manholes in several substations;
5. Coordination with other contractors;
6. Possible damage to the MTA-provided inductive reactors due to improper storage and handling by MTA;
7. Extent of non-conformance of track monuments; and,
8. Water infiltration issues in the facilities.

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 and encourages MTACC to quickly complete discussions regarding the development of such a schedule that addresses all the issues currently identified on this contract. The PMOC is concerned that design decisions are not being made in a timely manner. Issues regarding the acceptability of “open-type” racks and PTC design incorporation need to be expeditiously resolved.

Contract CS086: MTACC and the contractor need 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.

Project Funding: The project is at risk due to the anticipated need for approximately \$800 million to address additional costs that were forecast by the PMT in the April 2018 program reassessment. Interim funding needs through December 2020 have been addressed. The PMOC is concerned about future potential impacts on the program budget and schedule if there are delays in funding the ESA program in the 2020–2024 Capital Plan.

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 of 302 calendar days that is only 27 calendar days above the ELPEP minimum. IPS 115 shows that Manhattan/Systems work is the primary critical path for the ESA program, which has unresolved issues for the redevelopment at 270 Park Avenue. Additionally, Manhattan/Systems contracts that are not on the critical path include CS084, CM007, and CS086, each of which has its own schedule challenges that may not be readily apparent due to the linear nature of critical path reporting.

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 any meaningful schedule recovery, especially for Contracts CM014B, CS179, 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 2Q 2018);
2. Recovery of lost time due to significant schedule delays on CM014B and CS084;
3. Successful execution of multiple hand-off interfaces across several contracts;
4. Contractor access and work area coordination in Manhattan;
5. Duration of integrated systems testing and effectiveness of Incremental IST;
6. Continued availability of adequate Amtrak and LIRR force account resources;
7. Continued availability of required track outages in Harold Interlocking;
8. Maintaining adequate schedule performance of the remaining work in Harold Interlocking (Improved performance noted through 1Q 2019);
9. Remaining schedule path float will be used in the near future and Manhattan/Systems path will become critical (risk realized in April 2018);

10. Coordination risk retained by MTACC in Manhattan and the ESA tunnels with regard to construction and testing interface management for the systems work;
11. CS084 equipment issues involving transformers, 3 hi-pot test failures, and final resolution of concerns about MTACC provided inductive reactor equipment;
12. Foundation systems required for the new JP Morgan/Chase (JPMC) building at 270 Park Avenue may impact the LIRR Concourse at GCT as well as the MNR train shed. Ongoing MTA, MTACC-ESA, and JPMC discussion continued through April 2019.

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

1. Funding: Funding constraints (risk realized in 2Q 2017; 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 completion; now possibly rescheduled to 2023, just after ESA RSD. The risk now is from the impact of unplanned emergency tunnel repairs.

Note: Five of the eight original risks were resolved at various times through the period to March 31, 2019, and have been removed from the list above.

APPENDIX A – ACRONYMS

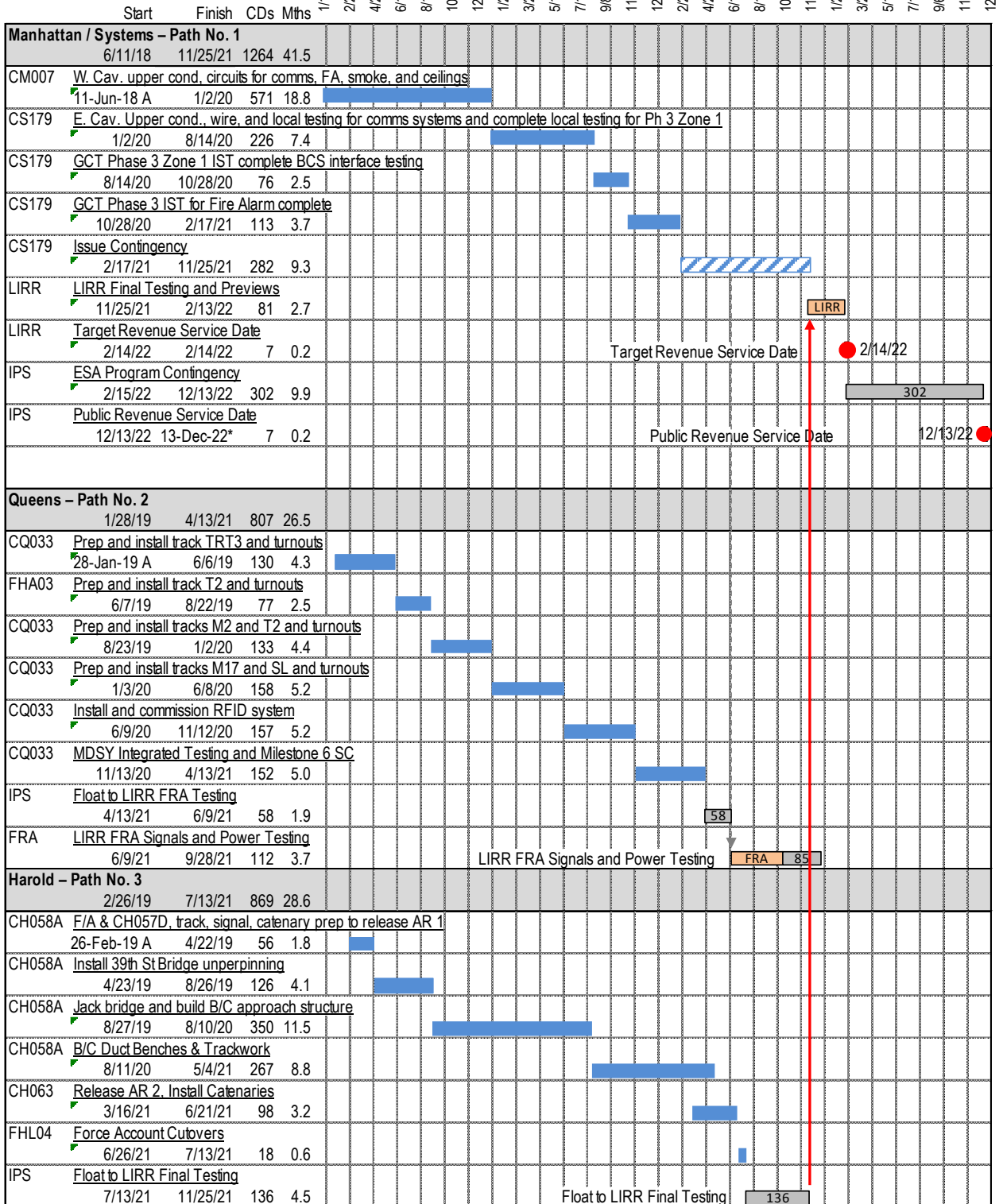
AFI	Allowance for Indeterminates	IPS	Integrated Project Schedule
ARRA	American Recovery and Reinvestment Act	IST	Integrated System Test
AWO	Additional Work Order	JPMC	J. P. Morgan Chase
BIM	Building Information Model	LIRR	Long Island Rail Road
BLS	Bureau of Labor Statistics	LSZH	Low Smoke Zero Halogen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

ESA Critical Paths

IPS 115; data date March 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 March 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%	10,092.6	11,451.5	100.0%	9,004.8	78.6%
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%	9,475.0	10,335.1	90.3%	8,387.2	81.2%
		10,922.0	90.7%					
Federal Share	2,683.0		36.3%	2,698.8	2,698.8	23.6%	2,698.8	99.9%
		2,698.8	22.4%					
5309 New Starts share	2,632.0		35.6%	2,436.7	2,436.7	21.3%	2,436.8	99.9%
		2,436.7	20.2%					
Non New Starts share	51.0		0.7%	66.6	66.6	0.6%	66.6	99.9%
		66.6	0.6%					
ARRA	0.0	195.4	1.6%	195.4	195.4	1.7%	195.4	99.9%
Local Share	3,667.0		49.6%	6,776.3	7,636.2	66.7%	5,688.4	74.5%
		8,223.2	68.3%					

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

Elements	Baseline Budget June 2014	April 2018 EAC Forecast	March 1, 2019			
			Current Budget (interim)	Actual Awards	Invoiced Costs	Inv. Pct. of Budget
Construction Subtotal	7,379.3	8,014.1	7,538.1	7,275.6	6,428.3	85.3%
Soft Costs Subtotal	2,359.5	2,852.2	2,797.1	2,199.4	2,139.4	76.5%
Engineering	720.6	871.8	795.0	766.3	748.7	94.2%
OCIP	282.6	457.4	379.2	379.2	372.5	98.2%
Project Mgmt.	972.2	1,117.3	972.0	931.9	900.1	92.6%
Real Estate	182.1	203.7	124.9	119.2	117.9	94.3%
Rolling Stock	202.0	202.0	7.5	2.7	0.2	3.0%
Contingency Subtotal	439.0	267.0	(b)(4)	--	--	--
Total w/o Financing	10,177.8	11,133.3	(b)(4)	9,475.0	8,567.7	82.9%

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

Table 4: Comparison of Standard Cost Categories: FFGA vs. CBB
(Cost shown in millions)

Standard Cost Category	FFGA	June 2014 Project Budget	Amended FFGA	Dec 2018 CBB	Jan 2019 CBB	Feb 2019 CBB	CBB / FFGA Var.	CBB / Amend FFGA Var.
10 - Guideway & Track Elements	1,988.7	3,405.5	3,353.4	3,403	3,403	3,403	71.1%	1.5%
20 - Stations, Stops, Terminals, Intermodal	1,168.7	2,238.2	2,326.8	2,290	2,290	2,287	95.7%	-1.7%
30 - Support Facilities (Yards, Shops, Admin)	356.3	474.2	450.8	558.6	558.6	558.6	56.8%	23.9%
40 - Site Work and Special Conditions	205.1	610.6	562.5	525.6	525.4	530.6	158.7%	-5.7%
50 - Systems	619.3	605.6	627.7	713.6	713.6	713.6	15.2%	13.7%
60 - ROW, Land, Existing Improvements	165.3	219.4	192.2	162.3	162.3	162.3	-1.8%	-15.6%
70 - Vehicles	494.0	209.9	879.5	15.4	15.4	15.4	-96.9%	-98.2%
80 - Professional Services	1,184.0	1,975.4	1,809.0	2,115	2,115	2,146	81.3%	18.6%
90 - Unallocated Contingency	168.5	439.0	720.2	(b)(4)				
Subtotal	6,349.9	10,177.8	10,922.0	(b)(4)				
100 - Finance Cost	1,036.1	1,036.1	1,116.5	(b)(4)				
Total	7,386.0	11,213.9	12,038.5	(b)(4)				

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

Standard Cost Category	FFGA	June 2014		January 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	3,402.6	3,304.8	3,018.8
20 - Stations, Stops, Terminals, Intermodal	1,168.7	2,238.2	2,326.8	2,287.4	2,217.9	1,834.8
30 - Support Facilities (Yards, Shops, Admin)	356.3	474.2	450.8	558.6	544.7	388.2
40 - Site Work and Special Conditions	205.1	610.6	562.5	530.6	501.2	511.1
50 - Systems	619.3	605.6	627.7	713.6	661.8	465.6
60 - ROW, Land, Existing Improvements	165.3	219.4	192.2	162.3	156.6	155.2
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	2,146.2	2,077.4	2,007.8
90 - Unallocated Contingency	168.5	439.0	720.2	(b)(4)	--	--
Subtotal	6,349.9	10,177.8	10,922.0	(b)(4)	9,475.0	8,387.2
100 - Finance Cost	1,036.1	1,036.1	1,116.5	(b)(4)		
Total	7,386.0	11,213.9	12,038.5	(b)(4)		

Table 6: Program Critical Dates 90 Day Look-Ahead – IPS 115 – March 1, 2019

Act. Id.	Name	Start	Finish	Float
CM007	GCT Station Caverns and Track			
WC.FOH.UPP ER.755	Universal Support System	11-Jun-18A	14-Mar-19	2
WC.FOH.UPP ER.760	Supports For Signage	14-Mar-19	21-Mar-19	2
P2-17880	WC- Elect- Install Upper Platform Branch Circuit Conduits (GL 3-12)	05-Sep-18A	12-Apr-19	2
P2-17890	WC-Elect-Install Upper Platform Comm Conduits (GL 3-12)	12-Apr-19	19-Apr-19	2
P2-17910	WC-Elect-Install Upper Platform Fire Alarm Conduits (GL 3-12)	19-Nov-18A	2-May-19	2
P2-17920	WC-Elect-Install Upper Platform Smoke Exhaust Control Conduits (GL 3-12)	19-Nov-18A	15-May-19	2
P2-17930	WC-Elect-Install Upper Platform Power, Receptacle and Lighting Panels (GL 3-12)	15-May-19	30-May-19	2
P2-17940	WC- Elect- Install Upper Platform Transformer (Dry Type) (GL 3-12)	30-May-19	6-Jun-19	2
P2-17950	WC- Elect- Install Upper Platform Branch Circuit Conductors (GL 3-12)	6-Jun-19	27-Jun-19	2

Table 7: ESA Core Accountability Items

Project Status		Original at FFGA	Amended FFGA	Current	ELPEP **
Cost	Cost Estimate	\$7,386 M	\$10,922 M	\$10,335 M*	\$8,119 M
Contingency	Unallocated /Risk Contingency	\$169.0 M	\$720.2 M	(b)(4)	
	Total Contingency (Allocated plus Unallocated)	\$738.7 M	\$1,068.2 M	(b)(4)	
Schedule	RSD	Dec. 31, 2013	Dec. 31, 2023	Dec. 2022	April 30, 2018
Total Project Percent Complete		Based on Invoiced Amount	77.0% actual vs. 77.1% planned (ESA calc.†)		
Project Performance Rate Since 2014 ESA Re-Plan		Based on Earned Value	81.6% (PMOC calculation of construction spending at Q42018 planned vs. actual since re-baselining)		
Contracts	Total contracts awarded to date		\$9,475 M	85.1% (PMOC calculation†)	
	Total construction contracts awarded to date		\$7,276 M	90.8% (PMOC calculation†)	
Major Issue	Status		Comments		
Project Funding and Budget	The total program budget is (b)(4) million, including (b)(4) million in unallocated contingencies.		The MTACC needs an additional approximately \$800 million in the 2020-2024 Capital Plan to complete the ESA program. Unallocated contingencies, (b)(4) million, will be used to fund contracts that are not currently fully budgeted.		
Project Cost	The ESA PMT updated the ESA program budgets based on the approval of Budget Amendment 3 for the 2015-2019 Capital Plan. The April 2018 EAC is \$11,133 million. The Amended FFGA Baseline Cost Estimate is \$10,922 million.		If the 2020-2024 Capital Plan is not approved for the required ESA funds, then there may be significant impacts to the completion of current contracts, award of remaining contracts, and/or completion of railroad force account work. Concerns remain about the time elapsed in resolving the open Cost and Schedule issues and, ultimately, their cost impacts.		
Project Schedule	The primary critical and near-critical paths to target RSD, including float, are: <ul style="list-style-type: none"> ▪ Manhattan/Systems – no float (critical path) ▪ Mid-day Storage Yard (Queens) – 117 CDs ▪ Harold Interlocking – 136 CDs The target RSD forecast remains on February 14, 2022. The public RSD remains December 13, 2022. The Amended FFGA Revenue Operations Date is December 2023.		There remain 35 months to the target RSD, which is followed by 9.9 months program float to the public RSD. The PMOC is concerned that until uncertainties related to Incremental IST 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 115 shows that the ESA Program Critical Path runs through the Manhattan/Systems contracts. This work path has several major open/unresolved issues having potentially significant schedule impacts: incremental IST (diminished); and, the major redevelopment of 270 Park Avenue.		Concerns continue for the ESA program Manhattan/Systems critical path. The Manhattan/-Systems path completion date is November 25, 2021, in IPS 115. This schedule has significant unresolved issues. Acceptable work progress along this schedule path relies heavily on the effectiveness of MTACC/ESA coordination efforts across the seven area contracts.		

Notes: * The cost estimate total budget was established in the May 2018 current baseline budget.

** 2010 Enterprise Level Project Execution Plan (ELPEP) reflecting medium level of risk mitigation, excluding financing cost of \$1,116 million.

† ESA April 2018 EAC forecast: Construction \$8,014.1 million; Engineering \$871.8 million; Soft Cost \$1,980.4 million; Contingency (b)(4) million; and, Total (b)(4) million