



Metropolitan Transportation Authority

Capital Program Oversight Committee Meeting

February 2018

Committee Members

J. Lhota, Chair

F. Ferrer

A. Albert

N. Brown

I. Greenberg

S. Metzger

J. Molloy

M. Pally

L. Schwartz

P. Trottenberg

J. Vitiello

P. Ward

C. Weisbrod

C. Wortendyke

N. Zuckerman

Capital Program Oversight Committee Meeting

**2 Broadway, 20th Floor Board Room
New York, NY 10004**

**Tuesday, 2/20/2018
1:30 - 3:00 PM ET**

1. PUBLIC COMMENTS PERIOD

2. APPROVAL OF MINUTES JANUARY 22, 2018

- Minutes from January '18 - Page 3

3. COMMITTEE WORK PLAN

- 2018 - 2019 CPOC Committee Work Plan - Page 6

4. LIRR and MNR POSITIVE TRAIN CONTROL UPDATE

- Progress Report on PTC - Page 8

- IEC Project Review on PTC - Page 25

5. B&T CAPITAL PROGRAM UPDATE

- Progress Report on B&T Capital Program - Page 32

- IEC Review on Hugh L. Carey Tunnel Restoration & Queens Midtown Tunnel Restoration - Page 57

- IEC Review on Verrazano-Narrows Bridge & Robert F. Kennedy Bridge - Page 62

6. UPDATE ON MINORITY, WOMEN AND DISADVANTAGED BUSINESS PARTICIPATION

- MWDBE and SDVOB Participation on MTA Capital Projects with Goals - Page 66

7. CAPITAL PROGRAM STATUS

- Commitments, Completions, and Funding Report - Page 68

Date of next meeting: Monday, March 19, 2018 at 2:00 PM

MINUTES OF MEETING
MTA CAPITAL PROGRAM OVERSIGHT COMMITTEE
January 22, 2018
New York, New York
2:00 P.M.

MTA CPOC members present:

Hon. Joseph Lhota
Hon. Fernando Ferrer
Hon. Andrew Albert
Hon. Ira Greenberg
Hon. Susan Metzger
Hon. John Molloy
Hon. Mitchell Pally
Hon. Carl Weisbrod

MTA CPOC members not present:

Hon. Norman Brown
Hon. Lawrence Schwartz
Hon. Polly Trottenberg
Hon. James Vitiello
Hon. Peter Ward
Hon. Carl Wortendyke
Hon. Neal Zuckerman

MTA staff present:

Veronique Hakim
Donald Spero
Michael Wetherell

NYCT staff present:

John Higgins
Branko Kleva
John O'Grady
John Santamaria

Independent Engineering Consultant staff present:

Mark Cosmedy
Joe DeVito
Diane Rinaldi
Cesar Silva
Richard Trabucco

* * *

Chairman Lhota called the January 22, 2018 meeting of the Capital Program Oversight Committee to order at 4:40 P.M.

Public Comments Period

There were three public speaker in the public comments portion of the meeting: Murray Bodin; Kevin Zeng; and Omar Vera.

Meeting Minutes

Upon motion duly made and seconded, the CPOC members approved the minutes to the previous meeting held on December 11, 2017.

Committee Work Plan

Mr. Spero announced that there were no changes to the Work Plan. The proposed 2018 CPOC Work Plan was then formally approved by the Committee.

NYCT Bus Procurement Update

Mr. Higgins updated the Committee on NYCT's Bus Procurement Program, including the overall Vision of the Program, including Safety, Environmental Sustainability, Customer Amenities, and Improved Service. He then provided an overview of Fleet Dynamics and Current Bus Deliveries. In its Schedule Review, the IEC cited the completion dates for the contracts awarded in 2016, and stated that for new and pending contracts since January 2017, all contracts are on schedule. With respect to deliveries completed in 2017 as well as current procurements, the IEC noted that the projects are on budget with no significant issues. Among its Observations, the IEC remarked that the Bus Procurement Program appears to be well managed, and the IEC commended NYCT for initiatives that will improve passenger safety, reduce emissions, and introduce new generation buses and technologies. Further details of the presentations, and Committee Members' comments and questions with respect thereto are included in the video recording of the meeting maintained in MTA's records.

NYCT Subway Car Program Update

Mr. Santamaria updated the Committee on the NYCT Subway Car Fleet, including an overview and delivery schedule of the \$741 million R179 Project, and the R211 Project (with a \$2 billion base order in the 2015-19 Capital Program). In its Project Review of the R179's, the IEC concurred with NYCT's forecasted schedule delay and production car delivery completion date, as well as the project budget and contingency status as presented by NYCT. The IEC then noted that the carbuilder will need to reach a production rate of 1 car per day in February 2018, and must then sustain this rate to meet the January 2019 delivery completion date. With respect to the R211's, the IEC offered the following Observations: the schedule for the R211 3-phase procurement program is aggressive by industry standards, but achievable; and additional NYCT engineering, inspection and testing resources may be required for the multi-phase procurement, given that design reviews, testing and production will overlap. Further details of the presentations, and Committee Members' comments and questions with respect thereto, are included in the video recording of the meeting maintained in MTA's records.

NYCT Sandy Recovery & Resiliency Division

Mr. Kleva updated the committee on the NYCT Sandy Recovery and Resiliency Program, including an overview of the performance of the \$5.52 billion Program (over \$3 billion of which has been awarded to date), as well as status updates on the Canarsie Tunnel Rehabilitation, the Myrtle Line Viaduct and Bridge, Clark Street Tube and the Clifton Shop Design-Build Project. In its Project Review on the Canarsie Tunnel Rehabilitation, the IEC concurred with NYCT that the project is currently on budget and schedule; the IEC then noted that two new substations at Maspeth and Harrison Place, which will address additional power requirements, have been awarded and are currently tracking on schedule. In its Project Review on the Myrtle Avenue Line Viaduct and Bridge, the IEC stated that the overall project is within budget and on schedule and then noted that at the current stage of the project, many of the risks identified as potential issues have not been realized or their probability of occurring has been greatly reduced. In its Project Review on the Clifton Repair Shop, the IEC stated that -- as reported by NYCT -- there are no major issues with the budget at this time. With respect to schedule, the IEC noted that while the design-build team has submitted their baseline schedule, the schedule has not been updated to reflect actual progress to date. The IEC further noted that acceptance of the design packages has not met the schedule milestones, but that the impact of design delays to the construction schedule has not been determined at this time. Finally, the IEC stated that delay in removing the existing Diesel and Paint Shops may impact the construction of the new shop. Further details of the presentations, and Committee Members' comments and questions with respect thereto are included in the video recording of the meeting maintained in MTA's records.

MTA Capital Program Commitments & Completions and Funding

Ms. Hakim presented commitment and completion performance highlights through December and stated that in 2017, agencies achieved \$7.3 billion in commitments, which is 100% of the goal. Regarding Completions in 2017, agencies achieved \$3.9 billion of the \$5 billion completions goal, or 79% of the goal. She then added that all variances are highlighted in the committee report. Ms. Hakim concluded by stating that the MTA also tracks delayed 2014, 2015 and 2016 major commitments and completions in a separate quarterly report, also included in the committee report.

Adjournment

Upon motion duly made and seconded, Chairman Lhota adjourned the January 22, 2018 meeting of the MTA Capital Program Oversight Committee at 5:25 PM.

Respectfully submitted,
Michael Jew-Gerals
Office of Construction Oversight



2018-2019 CPOC Committee Work Plan

I. Recurring Agenda Items

Approval of the Minutes
Committee Work Plan
Commitments/Completions and Funding Report

II. Specific Agenda Items

March

Quarterly MTACC Capital Program Update
Quarterly Change Order Report
Quarterly Traffic Light Reports

April

NYCT Capital Program Update

- Enhanced Stations Initiative
- Signals and Train Control Division
- Systems and Security Division

Update on Capital Program Security Projects (in Executive Session)

May

LIRR Capital Program Update

- Jamaica Capacity Improvements
- Main Line Double Track
- Mid Suffolk Electric Yard
- Morris Park Locomotive Shop and Employee Facility

MNR Capital Program Update

- Harmon Shop Replacement
- Hudson Line Sandy Restoration
- Customer Information System

NYCT, LIRR, MNR Update on New Fare Payment System

June

Quarterly MTACC Capital Program Update
LIRR and MNR Update on Positive Train Control (PTC)
Quarterly Change Order Report
Quarterly Traffic Light Reports

July

NYCT Capital Program Update

September

Quarterly MTACC Capital Program Update

Update on Minority, Women and Disadvantaged Business Participation

Update on Small Business Development Program

Quarterly Change Order Report

Quarterly Traffic Light Reports

October

LIRR and MNR Capital Programs Update

LIRR and MNR Joint Update on Rolling Stock

LIRR and MNR Update on Positive Train Control (PTC)

Update on Capital Program Security Projects (in Executive Session)

November

NYCT Capital Program Update

NYCT, LIRR, MNR Update on New Fare Payment System

CPOC Committee Charter Review

December

Quarterly MTACC Capital Program Update

Quarterly Change Order Report

Quarterly Traffic Light Reports

January

NYCT Capital Program Update

February 2018 CPOC PTC Project Update

February 20, 2018



PTC Overall Project Status

Item	Comments
Schedule	PTC operating on all lines by December 31, 2018
% Complete	LIRR - 63% MNR – 61%
Budget	\$968M <ul style="list-style-type: none">LIRR estimates an additional need of \$40 M to complete their project



Safety Layers of LIRR/MNR's PTC System

PTC Is Designed to Prevent:	Current Technology at LIRR	Current Technology at MNR	PTC Mandate
Train to train collisions	 Red signal violation automatically prevented over 15 mph	 Red signal violation automatically prevented over 15 mph	 Will stop train at red signals, regardless of speed
Overspeed derailments at curves and elsewhere	 Cab signal system automatically limits train speeds for permanent speed limits.	 CSE will automatically enforce permanent speed limits system wide as of 1 st Qtr. 2018.	 Limits train speeds for permanent and temporary speed limits
Incursion into work zones	 Track blocking prevents clearing routes into work zones.	 Enhanced Employee Protection System (EEPS) fulfills requirement	 MNR: EEPS. LIRR: Enforced Track Blocking and Roadway Worker Protection System
Movement of train through misaligned switch	 Protected by Cab Signal System / Automatic Train Control over 15 mph	 Protected by Centralized Train Control / Cab Signal System / Automatic Train Control over 15 mph	 Will stop train at interlocking red signal. Will limit speed to 15 mph outside interlockings.
Stop a train prior to a malfunctioning grade crossing	 Protection at malfunctioning grade crossing by operating rules and manual procedures	 Protection at malfunctioning grade crossing by operating rules and manual procedures	 PTC will permit applying a special TSR that will stop trains before the affected grade crossing.



 Yellow check = existing partial compliance with PTC mandate

 Green check = full compliance with PTC mandate

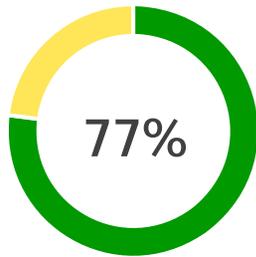
LIRR/MNR Project Progress Dashboard

Long Island Rail Road

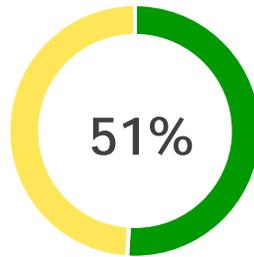
Radio Spectrum



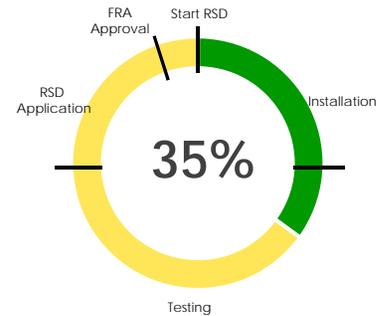
Installation of Hardware



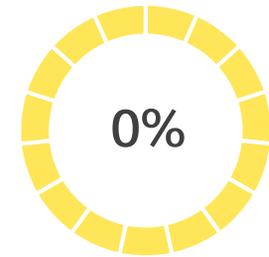
Employees Trained



PTC Operations (RSD) Pilot Lines



PTC Operations (RSD) 15 Non-Pilot Segments

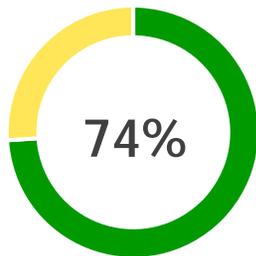


Metro North Railroad

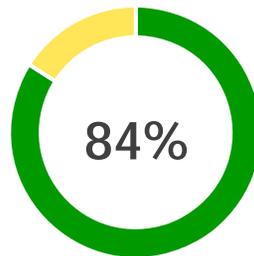
Radio Spectrum



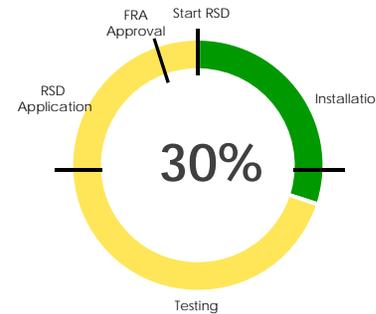
Installation of Hardware



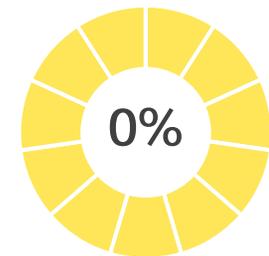
Employees Trained



PTC Operations (RSD) Pilot Lines



PTC Operations (RSD) 11 Non-Pilot Segments



LIRR PTC – 2018 Hardware Installation Projections

PTC Subsystem	System requirements	FRA Goals	Installs through Jan 2018	% Complete FRA Goal	Remaining to meet FRA Goals	Feb-18	Mar-18	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18
Transponders	3188	3188	2396	75%	792	5	88	162	162	162	163	0	50	0	0	0
WIUs	151	145	115	79%	30	2	0	0	0	2	7	10	10	0	0	5*
Communication Cases	111	108	99	92%	9	4	4	1	0	0	0	1	0	0	3*	0
M7	418	240	386	100%	0	16	16	0	0	0	0	0	0	0	0	0
DE/DM	45	30	5	16%	25	4	12	12	12	0	0	0	0	0	0	0
C3	23	17	2	12%	15	0	7	7	7	0	0	0	0	0	0	0
E15	16	5	0	0%	5	0	2	4	5	5	0	0	0	0	0	0
TC-82	1	1	0	0%	1	0	0	1	0	0	0	0	0	0	0	0



Month when FRA goal is met

* For future PTC in ESA tunnels



M7 installations complete to meet FRA goals and minimum operational needs

MNR East of Hudson PTC – 2018 Hardware Installation Projections

PTC Subsystem	System Requirements	FRA Goals	Installs through Jan 2018	% Complete FRA Goals	Remaining to meet FRA Goals	Feb-18	Mar-18	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18
Transponders	2931	2931	2502	85%	429	0	0	0	75	75	75	75	75	54		
WIU's	84	84	80	95%	4	1	1	1	0	0	1					
Radio Cases	104	104	41	39%	63	7	8	8	8	8	8	8	7	1		
M7	167	167	167	100%	0											
M3	69	32	4	12%	28	3	3	3	3	12	12	12	12	5		
P32	31	23	3 Complete 31 Partial (OBC)	13%/100%	20	3	4	4	4	4	4	4	1			
Cab Cars	52	35	2 Complete 33 Partial (OBC)	6%/94%	33	3	4	5	5	5	6	6	6	5	5	
M8	190	106	190 Partial (OBC)	0.0%/100%	106	0	0	24	24	24	24	24	24	24	22	
BL20	12	9	12 Partial	0.0%	9	0	1	1	1	2	1	1	1	2	2	
GP35	7	4	7 Partial	0.0%	4	0	0	0	0	1	1	1	1	1	2	



Month when FRA goal is met

All M7 installations complete

MNR Port Jervis Line Hardware Installation Projections

PTC Subsystem	System Requirements	FRA Goals	Installs through Jan 2018	% Complete FRA Goals	Remaining to meet FRA Goals	Feb-18	Mar-18	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18
Transponders	250	250	0	0%	250	0	0	0	0	0	80	80	90			
WIU's	10	10	0	0%	10	0	0	0	0	0	3	3	3	1		
Radio Cases	11	11	0	0%	11	0	0	0	0	0	3	3	3	2		

Note : Port Jervis Line Wayside Hardware Installation Schedule is dependent on NJ Transit PTC Contractor design and deliveries.

 Month when FRA goal is met



LIRR/MNR Project Update (October 2017 to January 2018)

- Final Design Review targeted for March 2018 (previously Dec 2017)
 - No major system design or hardware changes anticipated
 - Focus is on priority items that have potential impact to software development
 - Selected testing, training and maintenance related documents to be deferred.
- Started Office FAT in January
 - Testing focus is on core PTC functionality.
 - Extended FAT for a week to also run non-core test cases to identify all test variances.
- Performed Subsystem Factory Acceptance Tests (FATs) for pilot lines.
 - Joint decision between Railroads and Contractor to proceed with Integrated System pre-FAT with open variances.
 - Additional subsystem FAT testing is still planned in order to test non-functional and performance requirements, and address gaps found during requirements review.



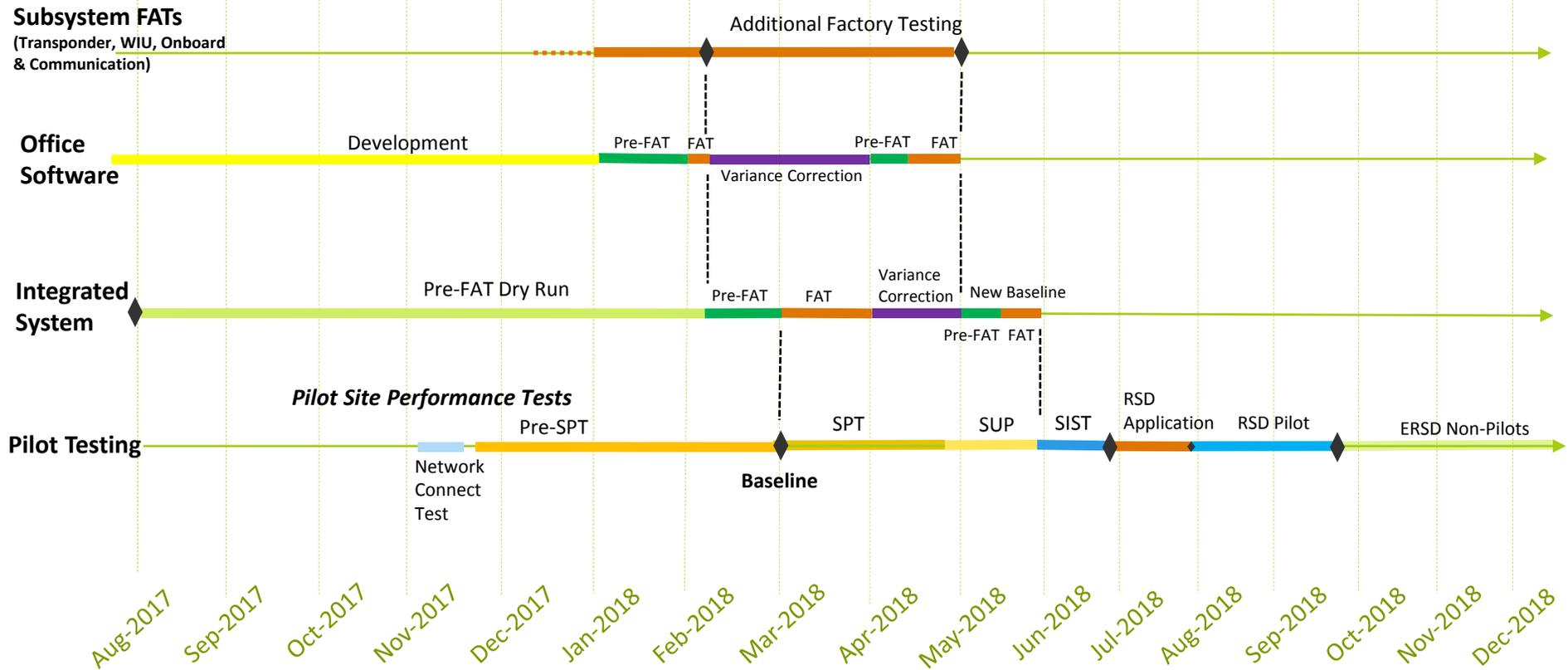
LIRR/MNR Project Update (October 2017 to January 2018)

- Performed the verification & validation of the PTC vital database for the pilot lines
 - Database V&V process validated and additional resources added to this activity
 - Other lines to be completed in May in advance of field testing
- Continued deliveries and installations of on board and wayside equipment
- Continued the development of training material and training of Railroad forces
- Continued preliminary field testing on pilot lines/test track demonstrates certain PTC functionality and provides some confidence in elements of the system design.
- Temporary Speed Restrictions (TSR) Enforcement, Positive Train Stop, Accurate Stop and Turn-back functionality.



LIRR/MNR Common Schedule Software/System Development & Test

- Pilot Lines in Revenue Service Demonstration by August 2018
- Proceeding with Current Design Assumptions on Interoperability and Security
- System Pre-Baseline for Early Field Testing on Test Tracks & Pilot Lines



SPT = Site Performance Tests
SIST = Site Integrated System Test

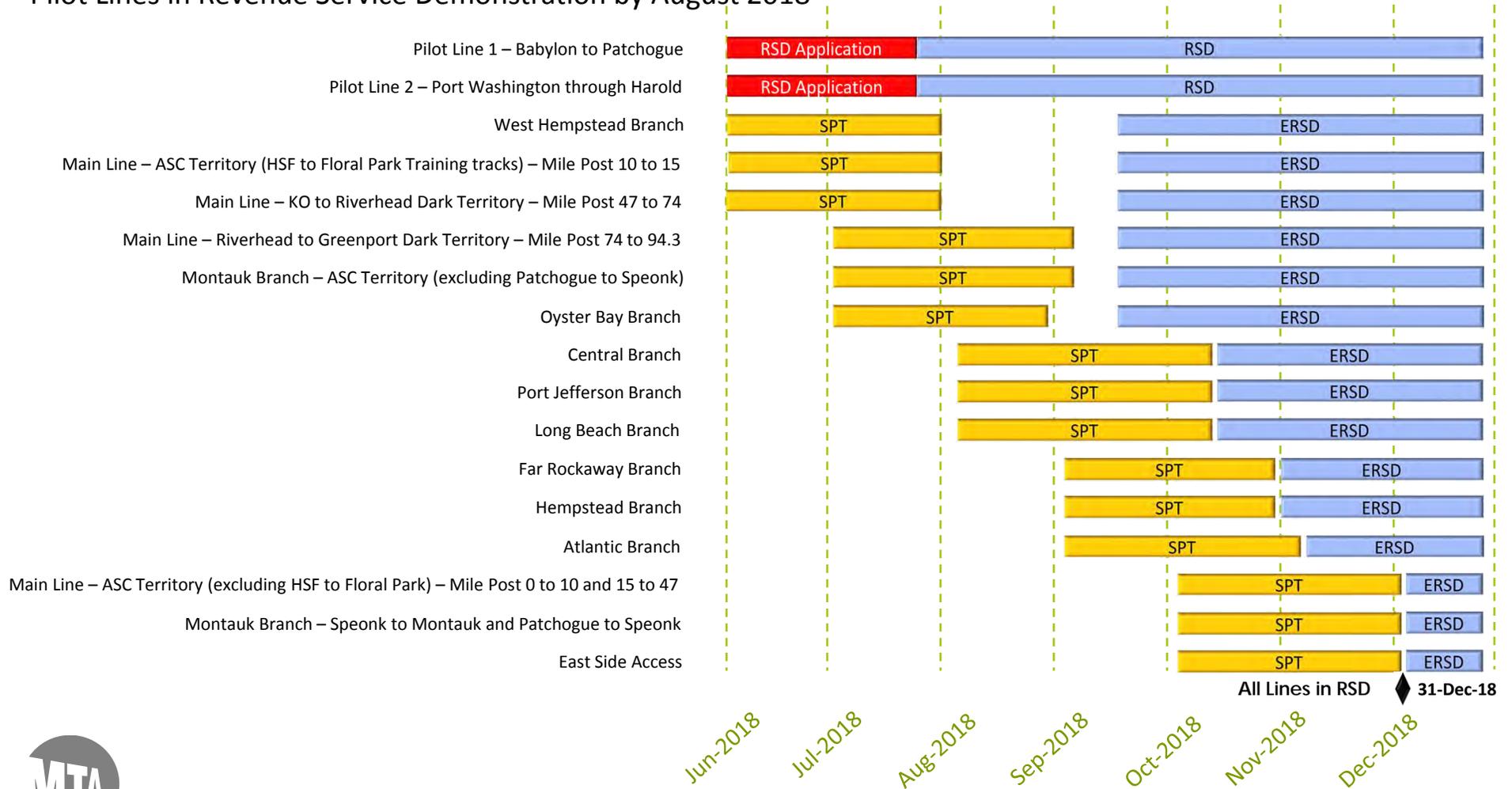
SUP = Site Update Period
RSD = Revenue Service Demonstration

ERSD = Extended Revenue Service Demonstration

LIRR Schedule – Line Segment Revenue Service

All Lines in Revenue Service by Dec-2018

Pilot Lines in Revenue Service Demonstration by August 2018



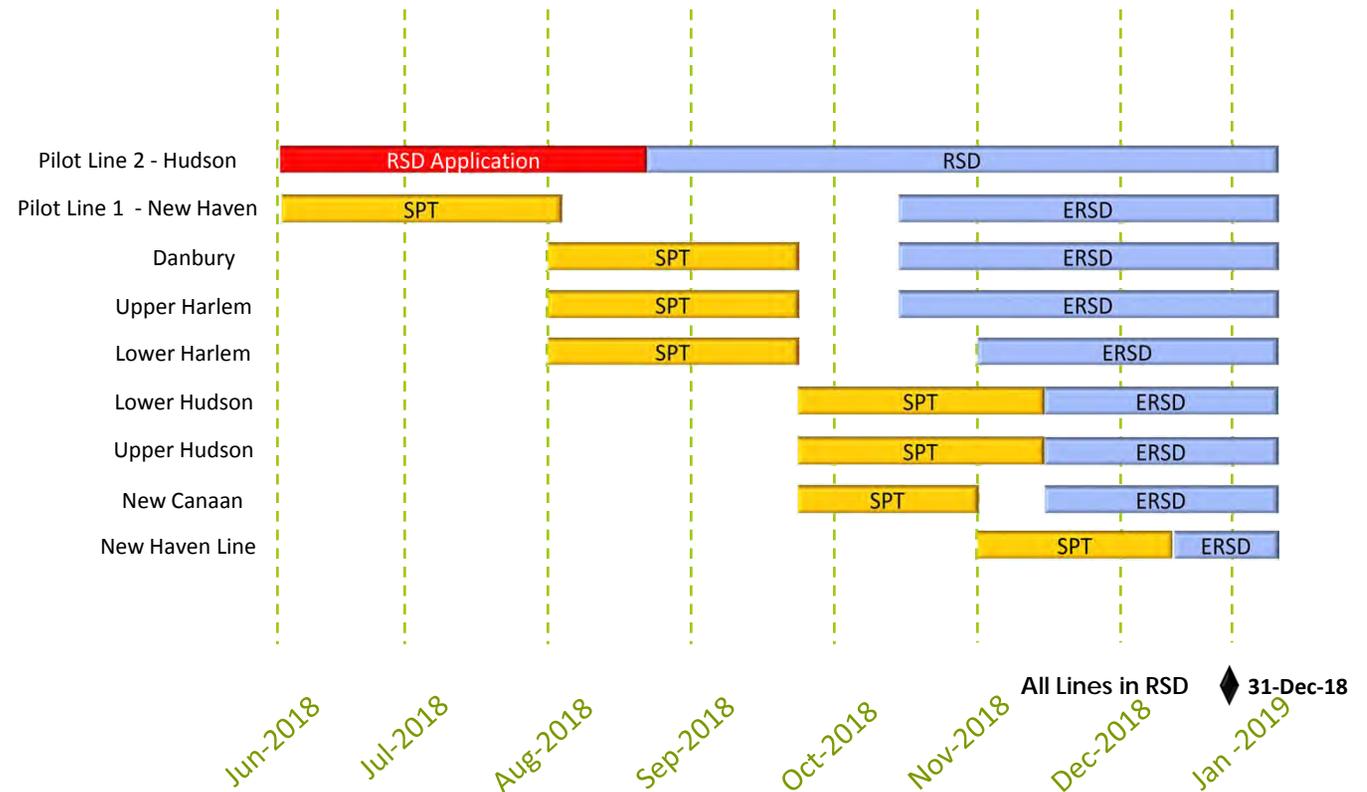
All Lines in RSD 31-Dec-18

SPT = Site Performance Tests RSD = Revenue Service Demonstration ERSD = Extended Revenue Service Demonstration



MNR Schedule – Line Segment Revenue Service

All Lines in Revenue Service by Dec-2018 (Except Waterbury)
 Hudson Line Pilot in Revenue Service Demonstration by August 2018



SPT = Site Performance Tests RSD = Revenue Service Demonstration ERSD = Extended Revenue Service Demonstration



LIRR/MNR Project Risks and Railroad Mitigations

- Proceeding with Integrated System FAT and pilot testing with open test variances from Subsystem FATs
 - Identify and focus on the required testing to meet the FRA PTC goals
 - Try to maximize the factory test environment to expedite test corrections and continue to conduct Integrated System tests.
 - Remotely witness test cases in order to expedite variance closure.
 - Expediting the delivery of the contractually required test lab to be utilized in New York to support testing.
 - The Contractor is providing a cloud based solution to allow the joint Railroad/Contractor team to access the Requirements Traceability Matrix (RTM) tool to support real-time Verification & Validation activities.
 - Implement shadow mode testing to provide input to and accelerate the completion of the SIST testing period and provide an initial view of system performance.
 - Witnessed preliminary testing of the core RWPS function (sending a TSR request to/from a phone to the PTC Safety server via a wifi connection) (LIRR only)



LIRR/MNR Project Risks and Railroad Mitigations

- Systems Integration challenges as a result of the application of ACSES to meet LIRR/MNR's high density operations which may only be discovered once we start final operational testing.
 - The Railroads are in the process to procure additional radio spectrum to minimize potential interference issues.
 - The Contractor assembled and tested portable test equipment that mimics train communications with the wayside in a compact package (trunk train) to speed up discovery of wayside communications issues without utilizing a real train.
- System Integrator's (SI) difficulty in the acquisition and retainage of PTC knowledgeable resources to support the project to meet PTC deadline.
 - The Contractor has added staff and are acquiring additional outside support for their design, testing and requirements work.
 - Railroads are utilizing their own consultants and attempting to hire retirees familiar with the Railroad's operations to support field testing and provide technical expertise where gaps in the contractor's team exists.



LIRR/MNR Project Risks and Railroad Mitigations

- Finalization of agreement with Amtrak for interoperability design and implementation.
 - Submitted a Letter of Understanding (LOU) to Amtrak to agree on steps forward.
 - Discussions with Amtrak's PTC vendor to review the Railroads' interface documents to confirm the agreed upon interoperability designs.
- Timely approvals by FRA of RSD applications to meet PTC deadline.
 - Received informal guidance from the FRA which better defines and will expedite the RSD application process
- Port Jervis Line PTC installation dependent upon receipt of PTC wayside equipment from New Jersey Transit (NJT).
 - MNR met with NJT Executive Management and requested a proposal to support the implementation of Civil Speed Enforcement (CSE) and a procurement strategy to expedite the delivery of PTC hardware.



LIRR/MNR PTC Timeline and Look-ahead

Feb 2018

LIRR/MNR to complete Office FAT (previously January)

MNR to complete wayside CSE implementation East of Hudson

Mar 2018

LIRR/MNR to achieve Final Design Review (FDR) (previously December 2017)

LIRR/MNR to complete Integrated System Pre-FAT

LIRR/MNR to start Site Performance Testing on Pilot lines (previously February)

MNR to start operating diesel & M7 trains with ACSES CSE

Apr 2018

LIRR/MNR to complete Integrated System FAT (previously March)

MNR to start operating M3 trains with ACSES CSE

Jun 2018

LIRR/MNR to submit RSD application for pilot lines

LIRR to complete all on-board installations

LIRR to start Site Performance Testing on non-pilot lines

July 2018

System Integrator (SI) to complete delivery of Train-the-trainer courses to RRs.



LIRR/MNR PTC Timeline and Look-ahead

Aug 2018

LIRR/MNR to obtain FRA approval to start RSD on pilot lines. (project schedule estimates a 2-month turnaround from FRA)

Sep 2018

LIRR/MNR to complete all required training to employees

LIRR/MNR to request expansion of RSD approval to non-pilot track segments

LIRR to complete all wayside installations (with the exception of ESA tunnels)

Oct 2018

MNR to complete all wayside installations

Nov 2018

MNR to complete all onboard installations

Dec 2018

LIRR/MNR to submit PTC Safety Plan to FRA for approval

LIRR/MNR to place all lines in PTC Operations (RSD)



February 2018 CPOC IEC Project Review

Positive Train Control



Budget Review

- The current project budget is \$968M.
 - This remains as last reported in October 2017.
 - As reported, the LIRR identified the need for \$40M to support:
 - Additional force account resources
 - Third party services



Schedule Review

- The Railroads are forecasting all lines in Revenue Service Demonstration (RSD) by December 2018.
- System Integrator has slipped FDR completion to March 2018
 - Railroads mitigation is to focus first on priority items that have potential impact on software development
- System Integrator (SI) has progressed FAT activities for office software
 - A number of test variances remain, and need to be addressed.
- Achieving the December 2018 date remains challenging
 - Time allocated to remaining activities has been further compressed.
- The current schedule is highly dependent on the ability of the SI to successfully complete the system integrated testing while resolving the identified test variances.



IEC Observations

- Recent FAT results continue to point to the need for improvements in requirements traceability, test readiness review (TRR) and test case coverage.
- The SI completed field data base verification for the pilot lines.
 - More work is needed to verify field data for remaining segments, and resolve technical issues.
- The start of Formal Pilot testing was delayed by one month to March 2018.
 - Project team continues to perform preliminary field testing on pilot lines.



IEC Observations

- Multiple Revenue Service Demonstrations (RSDs) are required within short periods of time.
- Challenging to achieve due to the magnitude of work to be done and potential constraints on resources and track access.



Project Risks

- The critical path on the common schedule is through system integration Pre-FAT & FAT, and site performance testing on Pilot Lines. Schedule risks include:
 - Limited time available to finalize FAT activities for subsystems that have unresolved open items,
 - Limited time available to address test variances associated with non-core requirements.

- Progressing multiple system development activities and testing in parallel to support both Railroads continue to stretch resources at both the Railroads and SI.
 - Shortage of experienced technical resources is adding more risk to the schedule.



Project Risks

- Additional test coverage is necessary in areas related to human factors, RAM, stress performance, and failover management.
- Limitation of integrated system factory testing environment will force dependence on field testing
 - Could delay detection and mitigation of potential variances.
- Severe schedule constraints for the development of Roadway Worker Protection System (RWPS) for LIRR.



MTA Bridges & Tunnels Engineering & Construction

Annual CPOC Capital Program Update

February 20, 2018



Table of Contents

- ▣ Overall Program Status
- ▣ Tunnel Program Update
- ▣ Verrazano-Narrows Bridge Program Update
- ▣ Robert F. Kennedy Bridge Program Update
- ▣ Henry Hudson Bridge Program
- ▣ Open Road Tolling Update



Status of Capital/Sandy Programs

PROGRAM	TOTAL PROGRAM EXCLUDING UN-ENCUMBERED CONTINGENCIES & RESERVES	COMMITTED TO DATE \$ (%)*	REMAINING PROJECT COMMITMENTS	OTHER (Contingencies/Reserves)	TOTAL PROGRAM
Sandy	\$676M	\$673M (99%)	\$3M	\$90M	\$766M
2010-2014 Capital	\$1.95B	\$1.94B (99%)	\$11M	\$63M	\$2.01B
2015-2019 Capital	\$2.55B	\$945M (37%)	\$1.61B	\$384M	\$2.94B

*Percentage of Total Program excluding un-encumbered contingencies & reserves



Status of Capital/Sandy Program Commitments

▣ 2017 Commitments

- ▣ Planned: \$528M (113 Commitments)
- ▣ Actual: \$676M (192 Commitments)
(128% of Planned)

▣ 2018 Commitments

- ▣ Planned: \$809M (100 Commitments)

▣ 2019 Commitments

- ▣ Planned: \$920M



Status of Capital/Sandy Program Completions

2010-2014 Program Completions	2017 Completions	2018 Planned Completions
<ul style="list-style-type: none"> ■ Current – 59% (\$1.18B) ■ Projected by end of 2018 – 88% (additional \$603M) 	<ul style="list-style-type: none"> ■ Capital Program <ul style="list-style-type: none"> ■ Planned: \$519M (10 Completions) ■ Actual: \$821M (20 Completions – 158% of the plan) ■ Sandy Program <ul style="list-style-type: none"> ■ Planned: \$13M (2 Completions) ■ Actual: \$12M (2 Completions) 	<ul style="list-style-type: none"> ■ Capital Program <ul style="list-style-type: none"> ■ Planned: \$728M (15 Completions) ■ Sandy Program <ul style="list-style-type: none"> ■ Planned: \$695M (15 Completions) ■ Total <ul style="list-style-type: none"> ■ \$1.42B (30 Completions)



Status of Design-Build Projects

Completed	Ongoing	Planned
5 Design-Build projects completed since 2010 totaling \$126M	6 Design-Build projects totaling \$272M	<ul style="list-style-type: none">2018 – 7 Design-Build projects currently estimated at \$205M2019 – 3 Design-Build projects estimated at \$130M

Design-Build projects comprise approximately 24% of the 2015-2019 Capital Program



Status of Small Business Mentoring Program (SBMP) & Discretionary Architecture and Engineering Program

- Goal for Tier 1 to date: \$16.9M
 - Actual to date: \$20.2M (120% of goal)
- Goal for Tier 2 to date: \$12.4M
 - Actual to date: \$19.1M (154% of goal)

- Discretionary A&E: 11 tasks awarded to date (\$1.125M)

Operations Command Center
Technology Installation – Constructed
by SBMP Program Graduate



Tunnel Program Update



Restoration of the Hugh L. Carey Tunnel

- Scope of Work:
 - Complete reconstruction of tunnel interior finishes
 - Upgrade of electrical, mechanical and life safety systems
 - Reconstruction of the Brooklyn Plaza

- Project Schedule & Budget:
 - Awarded: December 2014
 - Construction Budget and Schedule: \$328M with a duration of 39 months
 - Project is 92% complete
 - West tube completed on schedule in March 2017
 - Reconstruction of the Brooklyn Plaza completed in November 2017
 - Project on schedule for overall completion by March 2018



Replacement of Morris Street Pedestrian Bridge at Hugh L. Carey Tunnel Manhattan Plaza

Scope of Work:

- Replace the Morris Street Pedestrian Bridge
 - Add ADA accessibility
 - Eliminate intermediate support columns

Project Schedule & Budget

- Work began in August 2017
- Construction Budget and Schedule: \$12M with a duration of 6 months
- Project is 95% complete
 - Bridge re-opened to pedestrians on schedule on December 31, 2017



Rendering of new Morris St Bridge (looking South)

Original Morris St Pedestrian Bridge



Restoration of the Queens Midtown Tunnel

- Scope of Work:
 - Complete reconstruction of tunnel interior finishes
 - Replacement/upgrade of electrical, mechanical and life safety systems
 - Reconstruction of the Manhattan Exit Plaza roadway
- Project Schedule & Budget:
 - Awarded: April 2015
 - Construction Budget and Schedule: \$281M with a duration of 39 months
 - Project is 78% complete
 - North tube was completed on schedule in July 2017
 - Reconstruction of the Manhattan Exit Plaza was completed in July 2017
 - Project on schedule for overall completion by July 2018



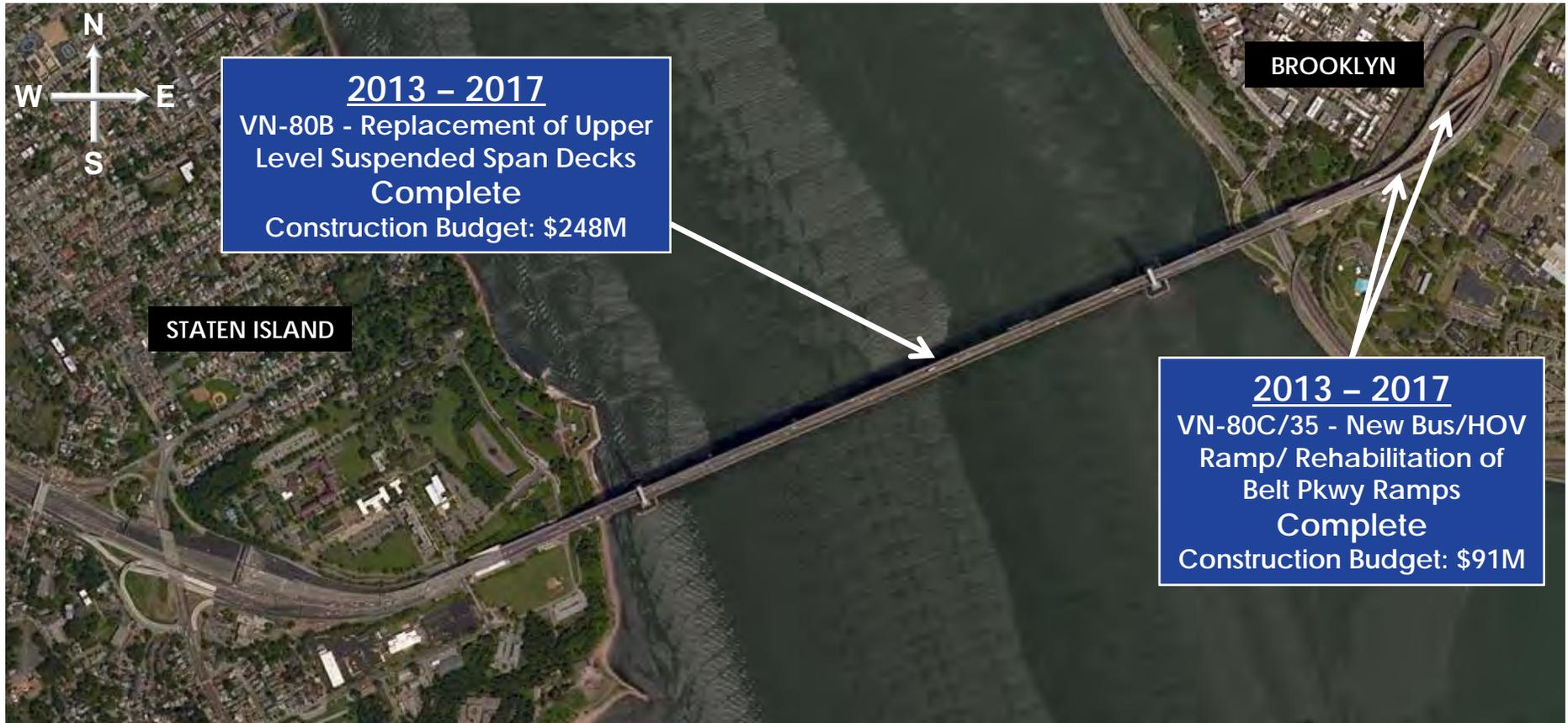
Flood Mitigation at the Hugh L. Carey & Queens Midtown Tunnels

- Scope of Work (Design-Build Project):
 - Meet FEMA 500 year flood level requirement
 - Elevation and protection against floods 4 feet higher than Sandy
 - Flood Doors
 - Plaza perimeter protection
 - Seawall extension at Governor's Island Ventilation Building

- Project Schedule & Budget:
 - Awarded: December 2016
 - \$64M budget with a duration of 24 months
 - Project is 60% complete and on budget and schedule
 - Installation of 8 flood doors – complete
 - Additional plaza perimeter protection – Design is complete with construction scheduled to begin first quarter of 2018



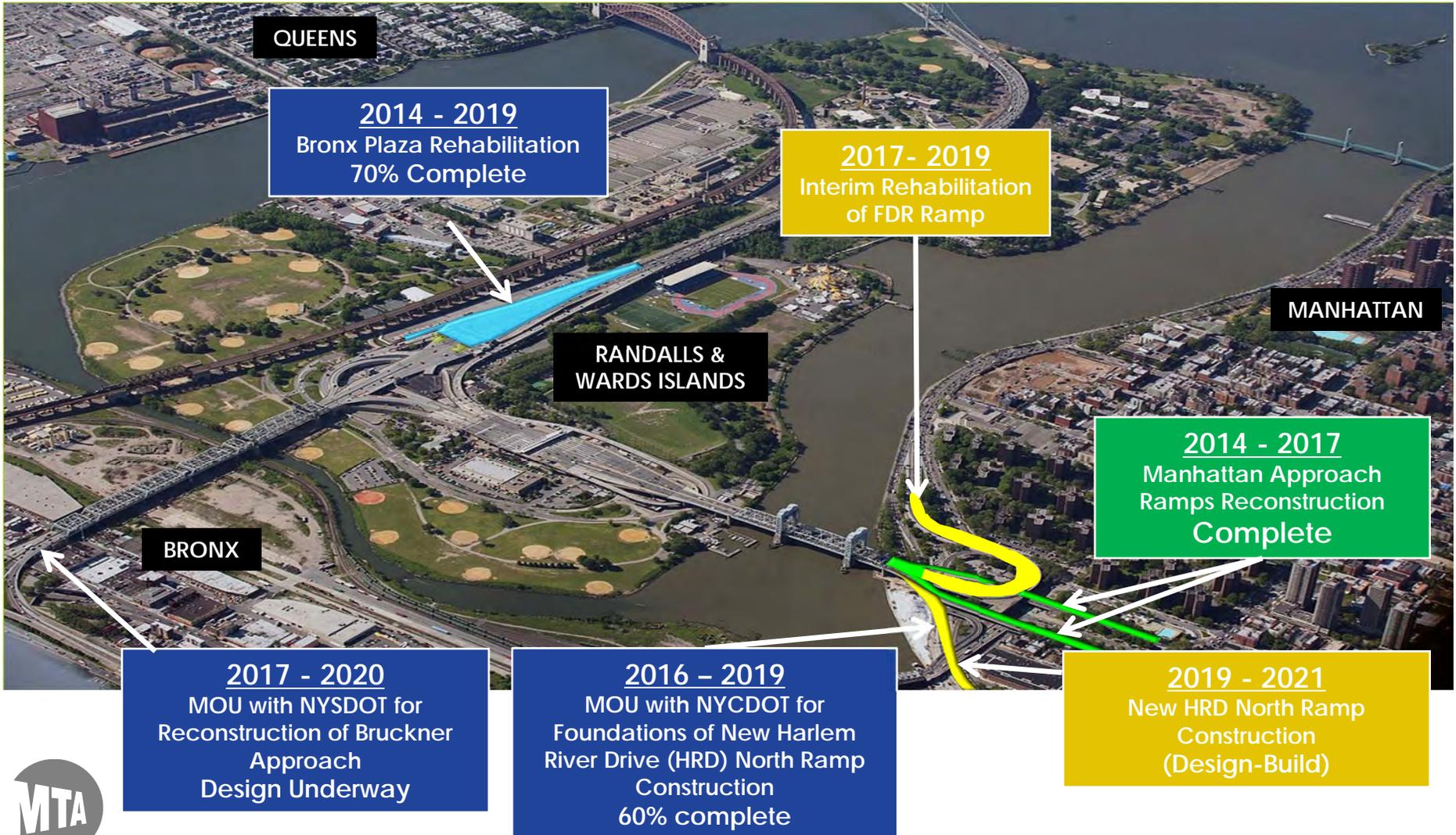
Verrazano-Narrows Bridge (VNB) Program Update



Robert F. Kennedy Bridge (RFK) Program Update



Robert F. Kennedy Facility Program Update



Major Completion: Rehabilitation of the Manhattan Approach Ramps at the Robert F. Kennedy Bridge

Scope of work:

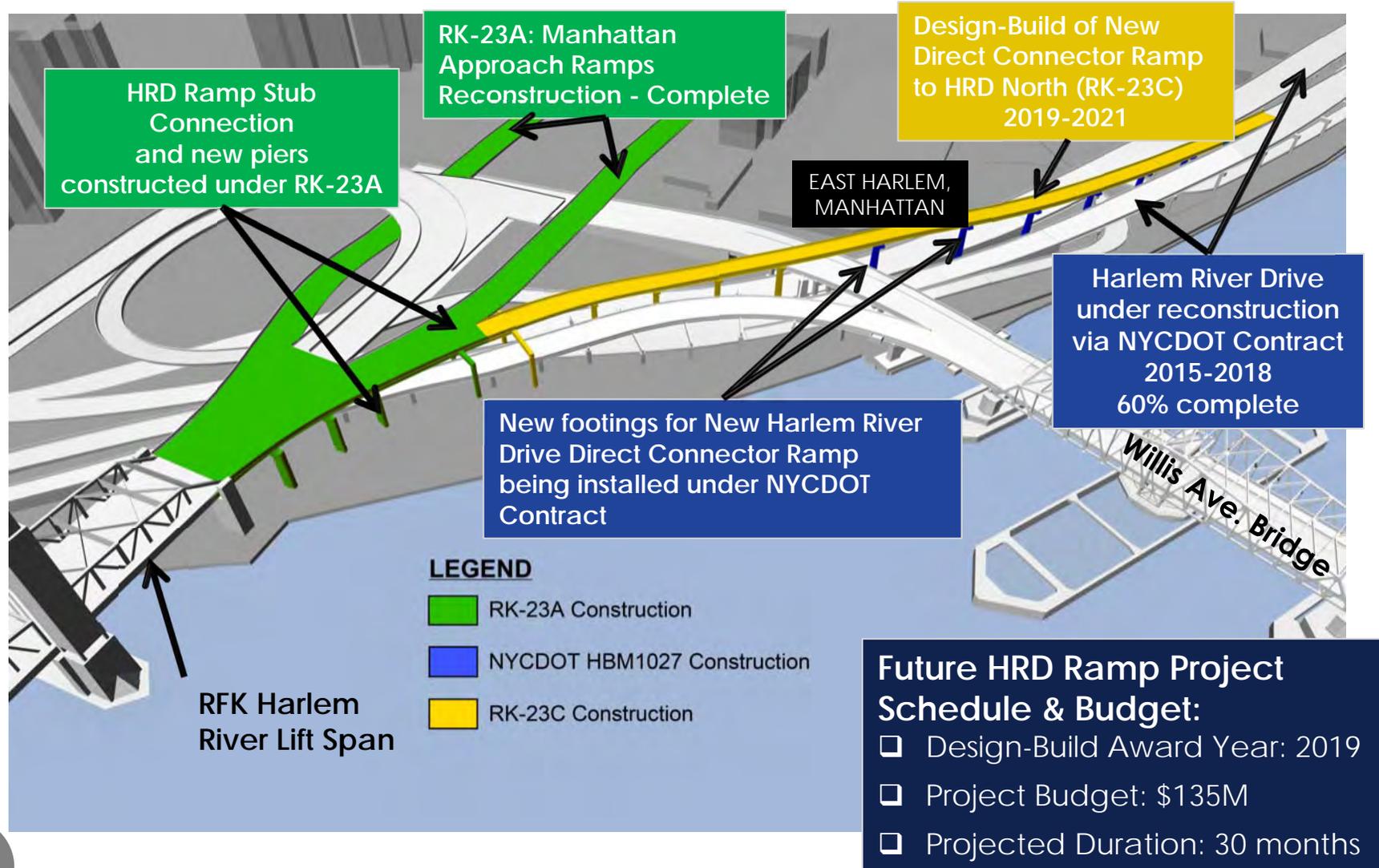
- Structural replacement and rehabilitation
- Construct connection stub for future Harlem River Drive Direct Connector Ramp
- Utility upgrades (new LED roadway lighting and fire standpipe)

Project Schedule & Budget:

- Awarded: December 2014
- Construction Budget and Schedule: \$68M (Capital) with a duration of 31 months
- Project was completed 2 months ahead of schedule and under budget



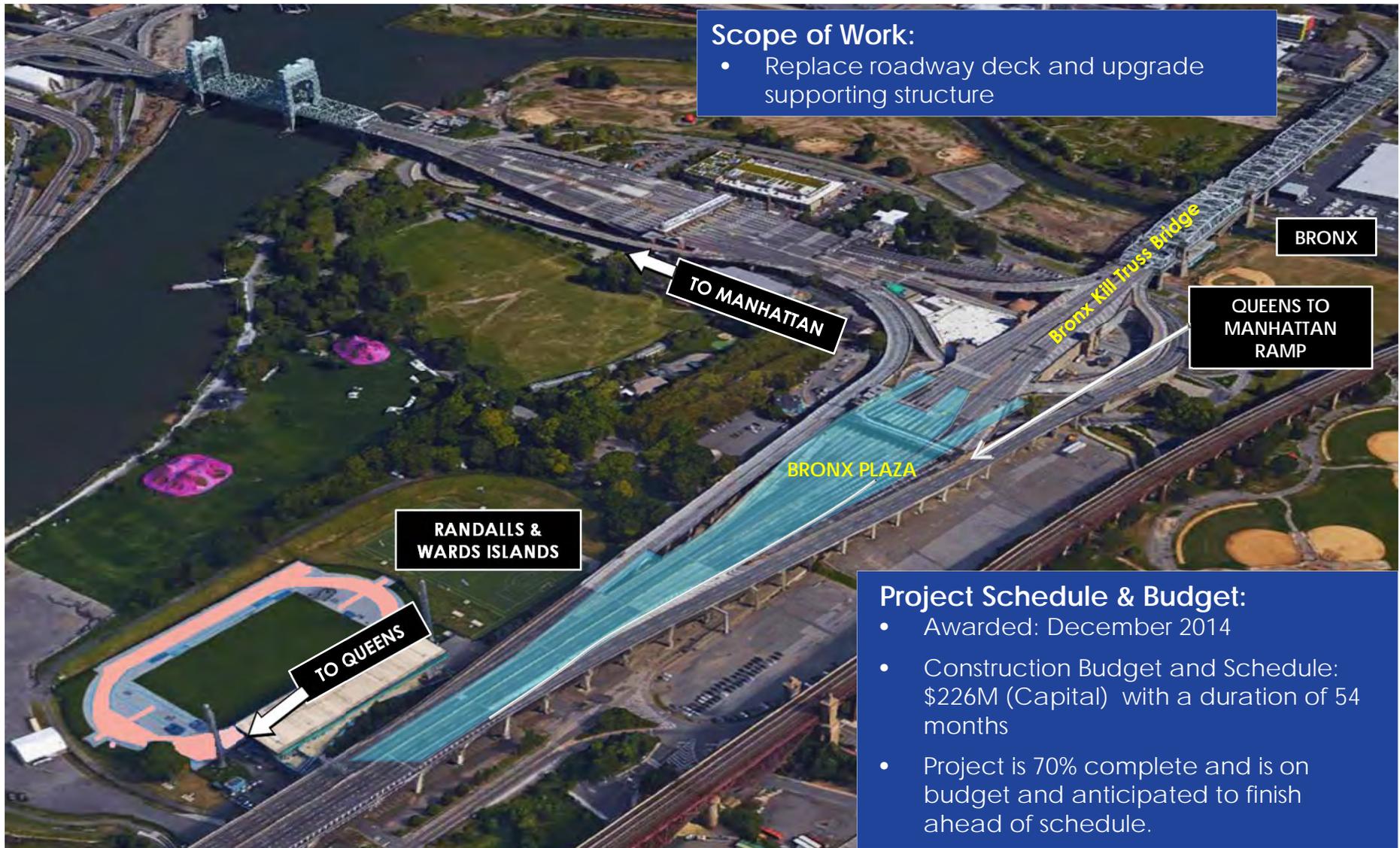
Status of Projects to construct a new Harlem River Drive (HRD) Direct Connector Ramp at the Robert F. Kennedy Bridge



Ongoing Project at the Robert F. Kennedy Bridge: Bronx Plaza Reconstruction

Scope of Work:

- Replace roadway deck and upgrade supporting structure



Project Schedule & Budget:

- Awarded: December 2014
- Construction Budget and Schedule: \$226M (Capital) with a duration of 54 months
- Project is 70% complete and is on budget and anticipated to finish ahead of schedule.

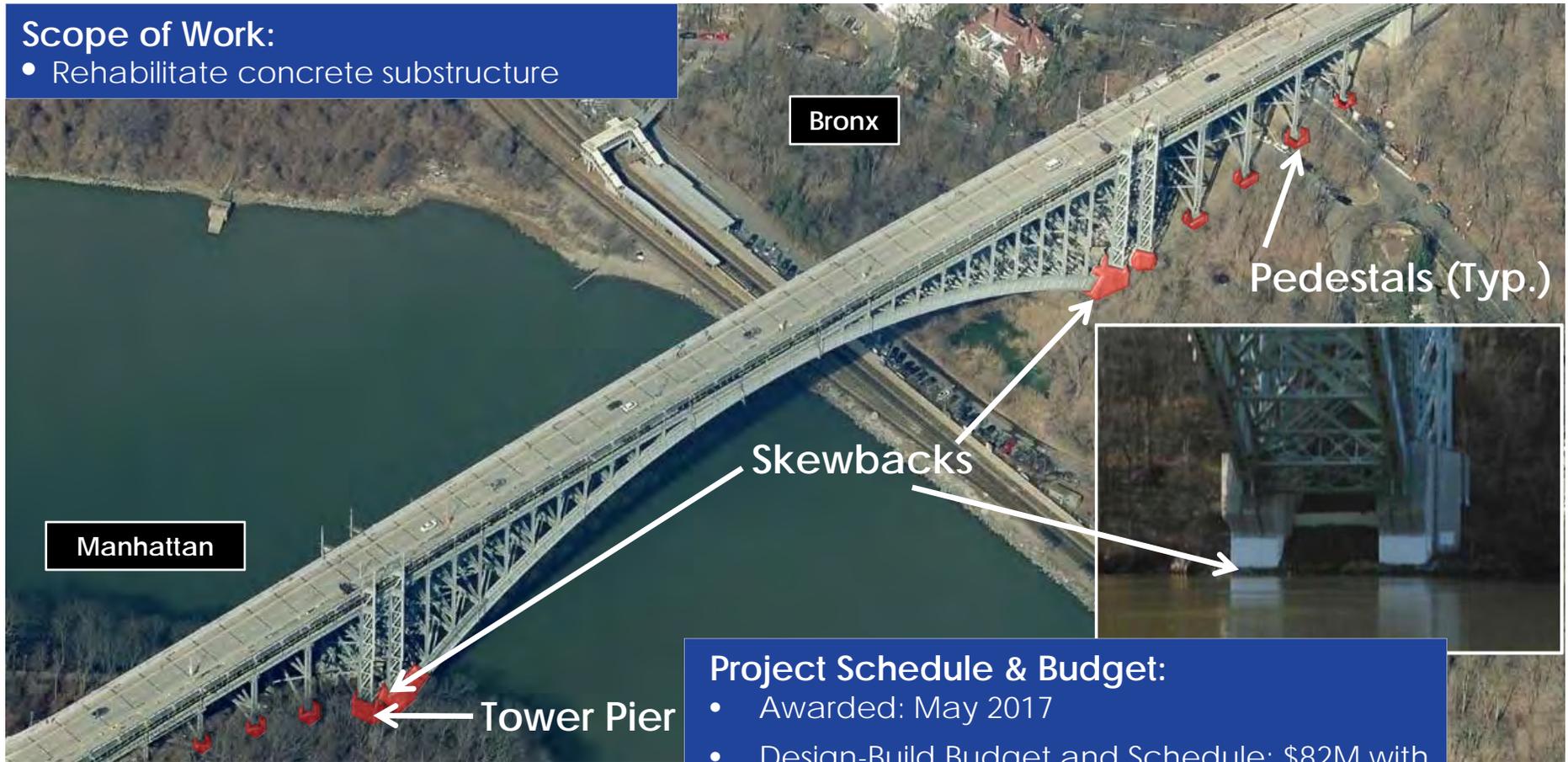
Henry Hudson Bridge (HHB) Program



Ongoing Projects at the Henry Hudson Bridge (HHB): Design-Build of Skewback, Tower Pier, & Pedestal Rehabilitation

Scope of Work:

- Rehabilitate concrete substructure



Ongoing Projects at the Henry Hudson Bridge (HHB): Plazas and South Approach Reconstruction and Replacement of Facility Lighting

Scope of Work:

- Staged reconstruction of the Upper and Lower Toll Plazas and the southbound approach
 - Removal of intermediate columns supporting upper level deck
- Lighting replacement on the northbound and southbound HH parkways



Project Schedule & Budget:

- Awarded: April 2017
- Construction Budget and Schedule: \$86M with incentives to minimize lane closures to 19 months
- Project is in the early stages of Construction



Open Road Tolling Update



Open Road/Cashless Tolling – Scope of Work

Scope

- Completely replaced tollbooth based tolling system with a gantry based tolling system at all B&T facilities
- Installed new concrete pavement within ORT tolling zone, modified vertical and horizontal alignment, and channelized traffic for ORT environment
- Consolidated conduits and infrastructure

PRE-ORT RFK MANHATTAN PLAZA



POST-ORT RFK MANHATTAN PLAZA



ORT Schedule & Budget Status

▣ Schedule

- ▣ Used an integrated program delivery method that leveraged existing competitively procured contracts
- ▣ Transformation to Open Road Tolling at all B&T facilities was completed 3 months ahead of schedule

▣ Budget

- ▣ \$501 million
- ▣ Funded from efficiencies in previous and current capital programs with no impact on critical state of good repair work
- ▣ Overall implementation on target for completion within the approved capital program
 - ▣ Negotiated prices are 14% below the contractor's proposal and within 4% of the engineers estimate



ORT Program Benefits

▣ Improved Regional Mobility and Customer Experience

- ▣ Customer travel time reduced by up to 32%
- ▣ Customers have saved 3.4 million hours of travel time

▣ Improved the Environment

- ▣ Fuel consumption reduced by 1.6 million gallons
- ▣ Carbon emissions reduced by 15,400 tons

▣ Enhanced Safety

- ▣ Collisions in the previous toll area are down by 41%
- ▣ Compared to pre-ORT period, collision rate has decreased 13%

▣ Capital Cost Avoidance

- ▣ Elimination of future planned toll plaza rehabilitation projects totaling \$650 million avoided over the next 20 years



February 2018 CPOC IEC Project Review

Hugh L. Carey Tunnel Restoration
&
Queens Midtown Tunnel Restoration



Schedule and Budget Review

Hugh L. Carey Tunnel Restoration

BB-28/BB-28S, BB-54

■ Schedule

- The contractor schedule depicts substantial completion to be March 2018, as planned.
- The IEC believes the schedule is aggressive but is achievable
- The contractor must maintain a high level of effort to meet the contract scheduled substantial completion date.

■ Budget

- The IEC concurs that the construction budget for the project is sufficient.



IEC Observations

Hugh L. Carey Tunnel

- Commissioning activities have been progressing slower than originally anticipated.
- The timing of the substantial completion date and current weather conditions may present challenges to completing weather sensitive mitigation efforts.
- Increased effort by the contractor in the delivery of training and O&M material is needed.
- The partnering between the Agency's senior level management and the contractor's senior level management has been instrumental in achieving project milestones.



Schedule and Budget Review Queens Midtown Tunnel Restoration QM40, QM40S, QM-18

■ Schedule

- The contractor's schedule depicts substantial completion to be July 2018, as planned.
- The IEC believes this date is achievable if current manpower efforts are sustained.

■ Budget

- The IEC concurs with the Agency that the construction budget for the project is sufficient.



IEC Observations

Queens Midtown Tunnel

- QM18/QM40
 - Weather conditions affecting weather sensitive construction activates.
- The Agency's senior level involvement has been instrumental in achieving project milestones.



February 2018 CPOC IEC Project Review

B&T Bridge Program
Verrazano-Narrows Bridge
&
Robert F. Kennedy Bridge



Verrazano-Narrows Bridge VN-80B, Replacement of the Upper Level Deck

■ Schedule

- The project was declared substantially complete on May 30, 2017.
- Open Road Tolling was implemented at the facility on July 8, 2017.
- The permanent lane closure work was completed approximately 13 months early.

■ Budget

- The project was completed within budget.



Robert F. Kennedy Bridge RK-65A Bronx Plaza Rehabilitation

□ Schedule

- The IEC agrees with the agency that the project is currently ahead of the baseline schedule. The project team was able to mitigate the following potential impacts to the schedule:
 - Implementation of Open Road Tolling (ORT)
 - Contract acceleration
 - Emergency work at Penn Station

□ Budget

- The project is currently within budget



Robert F. Kennedy Bridge RK-65A Bronx Plaza Rehabilitation

■ Risk Management

■ The following are the top remaining risks:

- **Delay in Approval of Design Submittals:** Critical due to changes in scope and staging for the acceleration. No issues at this time.
- **Unknown Steel Condition:** During deck demolition within staged construction. Only Stage 4 remains so the risk is greatly reduced.
- **Weather Delays:** Acceleration resulted in no more winter concrete deck pours. There is only a small likelihood of other severe weather delays.



Metropolitan Transportation Authority Department of Diversity and Civil Rights

M/WBE, DBE, and SDVOB Participation on
Capital Projects Update to CPOC

February 20, 2018



MWDBE and SDVOB Participation on MTA Capital Projects with Goals

January -- December 2017

- Federal Participation Goal: 17%* Actual DBE Participation: 16%
 - Total Awards: \$1.013 B**
 - Total DBE Awards \$162M

- NYS MBE Participation Goal: 15% Actual MBE Participation: 13%
 - Total Awards: \$712M**
 - Total MBE Awards \$92M

- NYS WBE Participation Goal: 15% Actual WBE Participation: 10%
 - Total Awards: \$712M**
 - Total WBE Awards \$70M

- NYS SDVOB Participation Goal: 6% Actual SDVOB Participation: 0%

* As of October 1, 2017 MTA's overall DBE goal increased to 18%.

**Based on original contract amount provided by MTA Agencies for third-party design and construction (excluding rolling stock and signals).



MTA Capital Program

2018 Commitment & Completion Goals



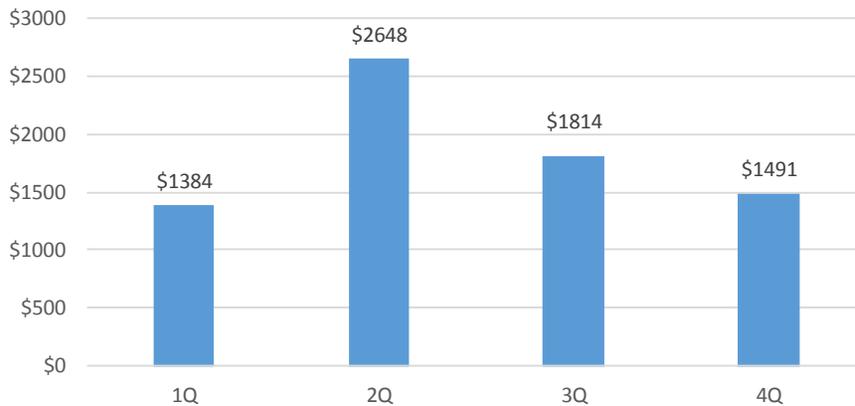
February 2018

2018 Commitment Goals

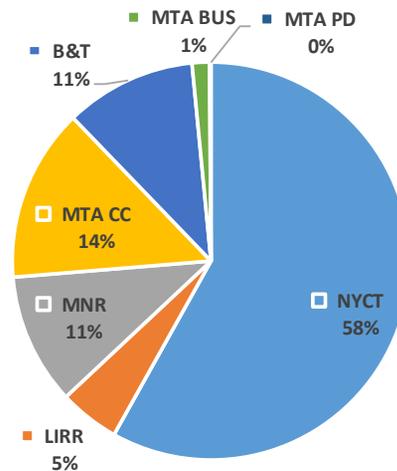
\$7.3 billion in planned commitments, including 43 major commitments falling into the following investment areas:

- Rolling Stock - \$516 million
- Stations - \$646 million
- Track - \$400 million
- Communications and Signals - \$1,077 million
- Network Expansion - \$666 million
- Sandy Restoration and Resiliency - \$1,226 million
- B&T - \$783 million

2018 MTA Commitment Goals by QTR
(\$millions)



2018 Commitments by Agency

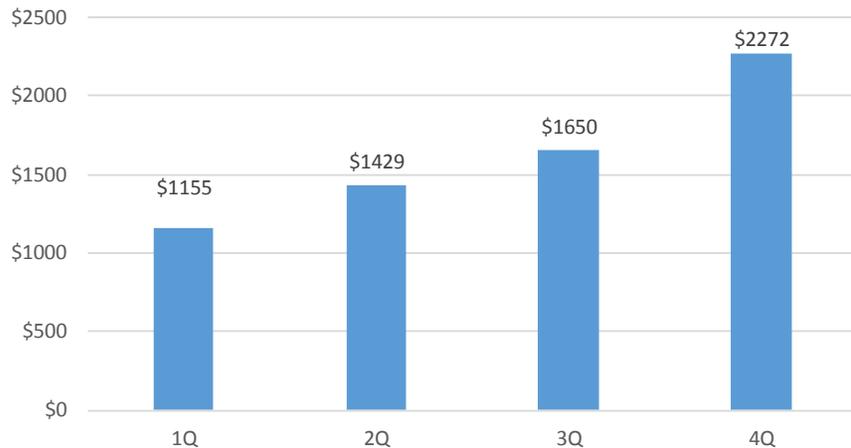


2018 Completion Goals

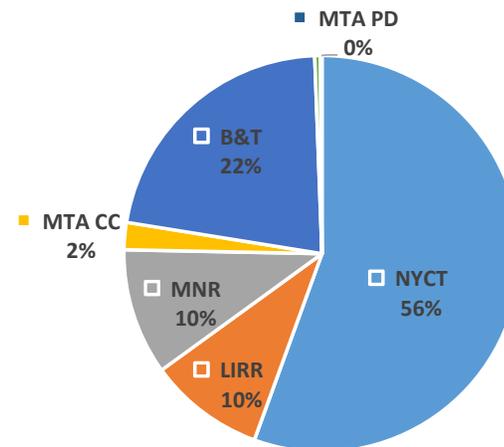
\$6.5 billion in planned completions, including 40 major completions falling into the following investment areas:

- Rolling Stock - \$1,133 million
- Stations - \$1,019 million
- Track - \$1,122 million
- Communications and Signals - \$1,415 million
- Network Expansion - \$144 million
- Sandy Restoration and Resiliency - \$844 million
- B&T - \$727 million

2018 MTA Completions Goals by QTR (\$millions)



2018 Completions by Agency



MTA Capital Program Commitments & Completions

through January 31, 2018

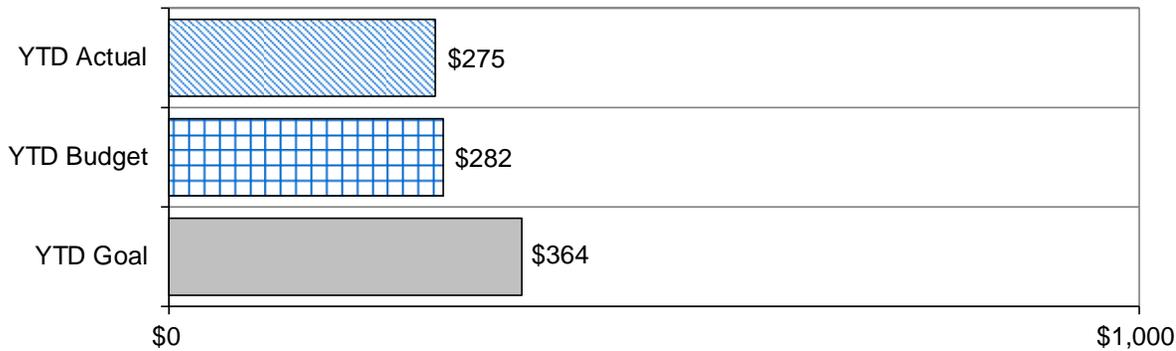
Capital Projects – Major Commitments – January 2018

In 2018, agencies plan for a goal of \$7.3 billion in overall commitments. 43 major commitments are planned. The 43 commitments include 18 for NYCT, five for LIRR, four for MNR, nine for B&T, three for MTACC, three for MTA Bus and one for MTA Police Department. The \$7.3 billion largely reflects commitment goals at three agencies: NYCT (\$4.3 billion), MTACC (\$1.0 billion) and B&T (\$0.8 billion).

Through January, agencies have committed \$275 million versus a \$364 million YTD goal. There were no planned major commitments in January. By year-end, the MTA forecasts meeting or exceeding its overall \$7.3 billion goal.

Budget Analysis

2018 Annual Goal	\$7,337	(\$ in millions)
2018 Forecast	103%	of Annual Goal
Forecast left to Commit	96%	(\$7,261)



Capital Projects – Major Completions – January 2018

In 2018, agencies plan for a goal of \$6.5 billion in overall completions. 40 major completions are planned. The 40 completions include 13 for NYCT, 10 for LIRR, three for MNR, 10 for B&T, two for MTACC, one for MTA Bus and one for MTA Police Department. The \$6.5 billion largely reflects completion goals at three agencies: NYCT (\$3.6 billion), B&T (\$1.4 billion) and MNR (\$0.7 billion).

Through January, agencies have completed \$105 million versus a \$124 million YTD goal. There were no planned major completions in January. By year-end, the MTA forecasts achieving or exceeding its overall \$6.5 billion goal.

Budget Analysis

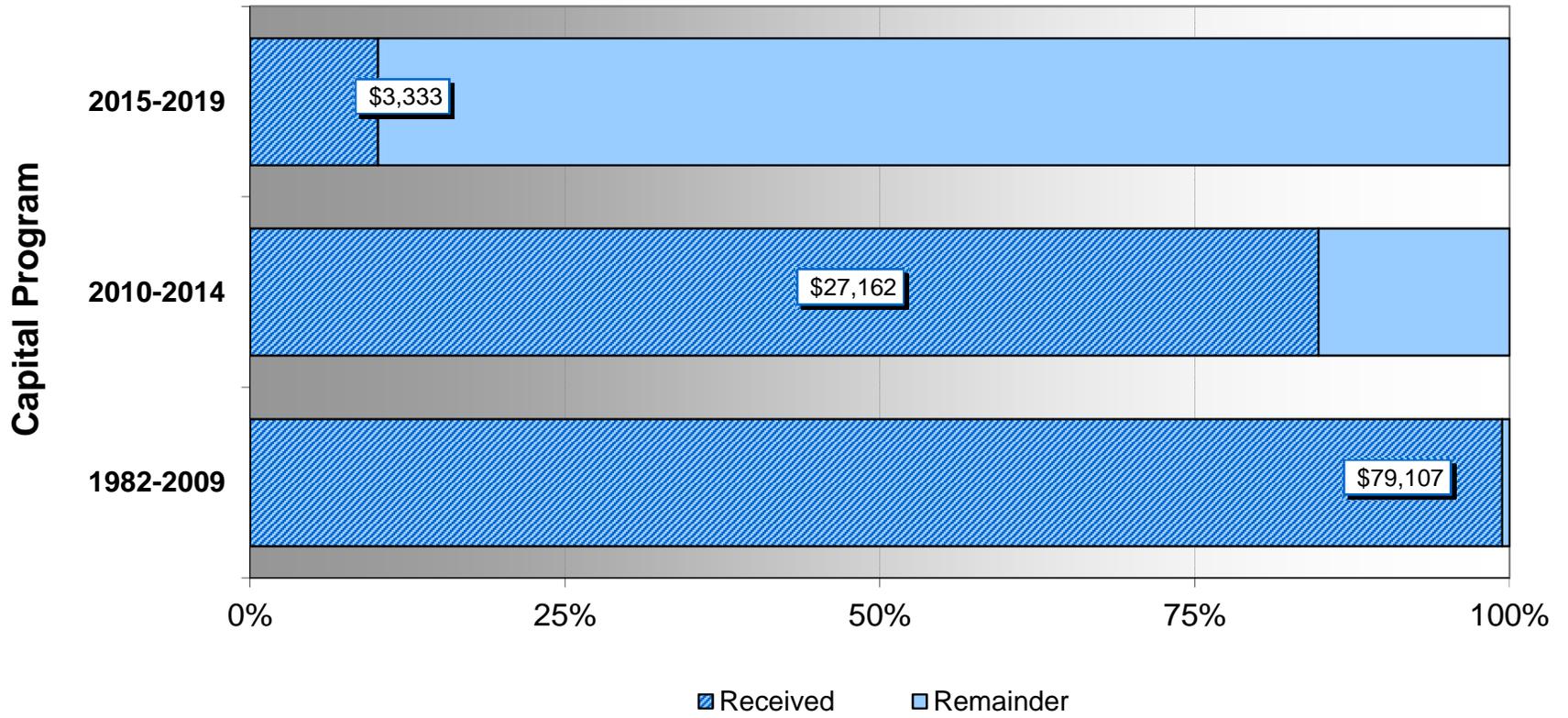
2018 Annual Goal	\$6,505	(\$ in millions)
2018 Forecast	101%	of Annual Goal
Forecast left to Complete	98%	(\$6,434)



Status of MTA Capital Program Funding

Capital Funding (January 2018)

\$ in millions



Capital Funding Detail (January 31, 2018)

\$ in millions

	Funding Plan		Receipts	
	Current	Thru December	This month	Received to date
1992-1999 Program	18,099	18,099	-	18,099
2000-2004 Program	21,691	21,691	-	21,691
2005-2009 Program	24,390	23,920	7	23,926

	Funding Plan		Receipts	
	Current	Thru December	This month	Received to date
2010-2014 Program				
Federal Formula, Flexible, Misc	\$5,544	\$5,544	\$ -	\$5,544
Federal High Speed Rail	295	295	-	295
Federal Security	1,257			
Federal New Start	189	100	-	100
Federal RIFF Loan	-	-	-	-
City Capital Funds	729	607	1	608
State Assistance	770	400	-	400
MTA Bus Federal and City Match	132	108	-	108
MTA Bonds (Payroll Mobility Tax)	11,772	11,675	-	11,675
Other (Including Operating to Capital)	1,743	1,479	-	1,479
B&T Bonds	2,018	2,018	-	2,018
Hurricane Sandy Recovery				
<i>Insurance Proceeds/Federal Reimbursement</i>	6,343	4,727	-	4,727
PAYGO	235	81	-	81
<i>Sandy Recovery MTA Bonds</i>	758	2	-	2
<i>Sandy Recovery B&T Bonds</i>	230	124	-	124
Total	32,015	27,161	1	27,162

	Funding Plan		Receipts	
	Current	Thru December	This month	Received to date
2015-2019 Program				
Federal Formula, Flexible, Misc	\$6,956	\$1,030	\$ -	\$1,030
Federal Core Capacity	100	-	-	-
Federal New Start	500	-	-	-
State Assistance	8,466	65	-	65
City Capital Funds	2,492	271	-	271
MTA Bonds	7,907	12	-	12
Asset Sales/Leases	600	-	-	-
Pay-as-you-go (PAYGO)	2,270	1,094	561	1,655
Other	575	36	-	36
B&T Bonds & PAYGO	2,940	264	-	264
Total	32,806	2,772	561	3,333