MTA Capital Program 2015-2019

Renew. Enhance. Expand.

MTA CAPITAL PROGRAM

mta.info/capital

As Approved by the MTA Board April 20, 2016
As Approved by the CPRB May 23, 2016


New Haven
New Haven
MIND THE GAP

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New York never stops. From morning-rush commuters to late-night club-goers, from school children on subways to seniors on buses, millions of people rely on the Metropolitan Transportation Authority to get them through their daily lives. Without a robust and well-maintained network of railroads, subways, bus routes, bridges, and tunnels, New York as we know it could not function.

I first joined the MTA in 1982 to help rebuild an aging network that struggled to move 5.3 million people every day. Today, farsighted investments by New York leaders over the past three decades have revitalized the MTA network—the engine for a New York metropolitan regional economy that accounts for 11 percent of our nation's GDP and now moves 8.7 million customers a day.

The key to keeping this system moving safely and reliably and to keeping our region vibrant has been the MTA's Capital Program.

Every five years, the MTA takes a hard look at its system and its infrastructure to identify and prioritize the investments that will be essential to renew, enhance, and expand the system to meet the changing needs of the region, its economy, and its residents.

The first MTA Capital Program was launched in 1982. That infusion of resources transformed a declining system and revitalized New York City and State, and we haven't stopped investing in our network since. More than 30 years and $115 billion later, the Capital Program has given us a system we can depend on 24 hours every day of the year.

Take our previous 2010-2014 Capital Program: We bought new subway cars, new commuter railroad cars, new local buses, and new express buses. We began installing modern, Communications-Based Train Control signals for faster and better service. We brought real-time service information to much of our network. We built new rail lines and connections that will serve New York for generations to come. And since Superstorm Sandy ravaged our network, we committed more than $2 billion to fix the damage and fortify against future storms.

With a fully-funded 2015-2019 Capital Program, we'll continue making our system more resilient against big storms. We'll bring Positive Train Control—a state-of-the-art signal system—to Metro-North and the Long Island Rail Road. We'll continue introducing new routes for Select Bus Service, which uses off-board fare collection, low-floor, high-capacity buses, and dedicated bus lanes to cut travel times by nearly 20 percent.

We'll replace 73 miles of subway track with safer, smoother track. And we'll complete hundreds of similar projects that keep our customers safe and on time. These types of projects may not be glamorous, but together with the normal scheduled replacement of our trains and buses, they are the key to moving 8.7 million people every day, safely and reliably.

We're going to need every cent we can get to accomplish these goals while keeping fares and tolls as low as possible, which is why Governor Cuomo issued us a challenge: Eliminate every possible inefficiency to deliver the Capital Program for less. We've taken this challenge seriously, and today, I am committing the MTA to reducing the cost of the Capital Program by more than $2.5 billion.

We'll accomplish this by incorporating the Governor's suggestions to use alternative delivery methods such as design-build and public-private partnerships, streamlined procurement processes, and a negotiated procurement process in non-traditional areas. We're also reducing administrative costs, eliminating cumbersome processes, leveraging new technologies, and ensuring that our management of the Program is as efficient and effective as possible.

And—as the Governor has asked—we'll do it all without impacting benefits or eliminating the projects that are critical to the reliability of our system and the growth of our region.

There's a simple reason why we're working so hard to overhaul the way we implement these vital investments: We know that continued capital funding relies on our ability to show that investments are being made wisely. At the same time, all the major cities of the world—London, Paris, Hong Kong, and others—are making significant investments in their transport systems in order to maintain their worldwide status as global financial and business centers. New York must do the same, because today, after more than 30 years of success, this basic fact is now clear:

An investment in the MTA's Capital Program is an investment in the future of New York.

Thomas F. Prendergast

Chairman and Chief Executive Officer
Metropolitan Transportation Authority

The Fulton Center's "Oculus." Natural light streams through this skylight into the entire station, even to the platform level.

2015-2019 Program Priorities and Major Objectives

Through the 2015-2019 Capital Program, the MTA will provide safe and reliable service by continuously improving our capital assets, funding projects based on the following priorities:

Renew: Our first priority is to protect the safety, reliability, and quality of our existing service. That means replacing trains, buses, and subway cars, and renewing track, signals, yards, depots, bridges, and stations.

Enhance: Service improvements like Help Points, ADA accessibility, and next train arrival information help make your trip better every day.

Expand: Expanding the MTA's reach, through projects like the Second Avenue Subway and access to Penn Station for Metro-North, allows us to ease crowding, accommodate and create growth, and deliver more extensive and resilient service.

We will also advance the following major investment objectives:

- **Complete the installation of Positive Train Control**—a state-of-the-art train-control system—at Metro-North and the Long Island Rail Road.
- **Expand Select Bus Service** to appropriate routes across New York City, in conjunction with our partners at NYCDOT.
- **Introduce new "contactless" fare payment technology** that will work with smartphones *and* across our entire network.
- **Design and begin construction on the next phase of the Second Avenue Subway** to ease congestion and improve mobility on Manhattan's East Side.
- **Begin Penn Access**, which will open a new Metro-North Railroad link directly into Penn Station, providing critical system resiliency to protect service for more than 275,000 daily customers in the event of natural or other disasters.
- **Complete the Long Island Rail Road Double Track project**, which will improve service and reliability by adding a second track to the LIRR's Ronkonkoma Branch.
- **Improve customer communications** with more real-time train information and by completing the installation of Help Points—high-tech, highly visible intercoms that instantly connect customers to information and emergency services—in every one of our 469 subway stations.

A Better Capital Program

In October 2014, we submitted to New York State our original $32 billion 2015-2019 Capital Program. Governor Cuomo reviewed the Program and issued us a simple—albeit formidable—challenge: Cut the Program's cost without impacting benefits or eliminating the projects that are critical to the reliability of our system and the growth of our region. We've taken this challenge seriously, and after an extensive analysis, here's how we'll meet it:

Make It In New York

A recent study by KPMG found that a fully-funded 2015-2019 Program will create more than 400,000 New York State jobs and generate nearly $52 billion in economic output. MTA capital investments also account for the State having the largest base of transit-related manufacturing firms in the U.S.—making rail cars, buses, and electronics.

These economic benefits can be multiplied by working with New York State's Economic State Development to bring more elements of the supply chain into the State, including more manufacturers of components and subcomponents. Doing so will increase State-wide manufacturing jobs, which create more ancillary jobs than other sectors. It will also generate new tax income, and—by lowering costs to primary suppliers in the State—result in lower overall costs to the MTA.

Innovative Project Delivery

We're working to incorporate more efficient design and construction techniques to deliver capital projects for less. For example:

- **Design-build** is a project delivery method where the same team that *designs* the project *builds* the project, and there's only one contract. This simple but fundamental difference transforms the relationship between designers and builders into an alliance that fosters innovation, collaboration, and teamwork. The MTA benefits from a reduction in initial design effort, while the contractor can introduce innovative design or construction methods to reduce the project's cost and schedule.
- Through **Public-Private-Partnerships** (PPPs), private entities help us build and finance a project in exchange for a return on their investment. PPPs can help us spread risk, pool expertise, increase innovation through competition, and tap entrepreneurial drive. When handled with proper oversight and transparency, these partnerships can lead to more efficient construction and cost savings.

Expand Component Replacement Program

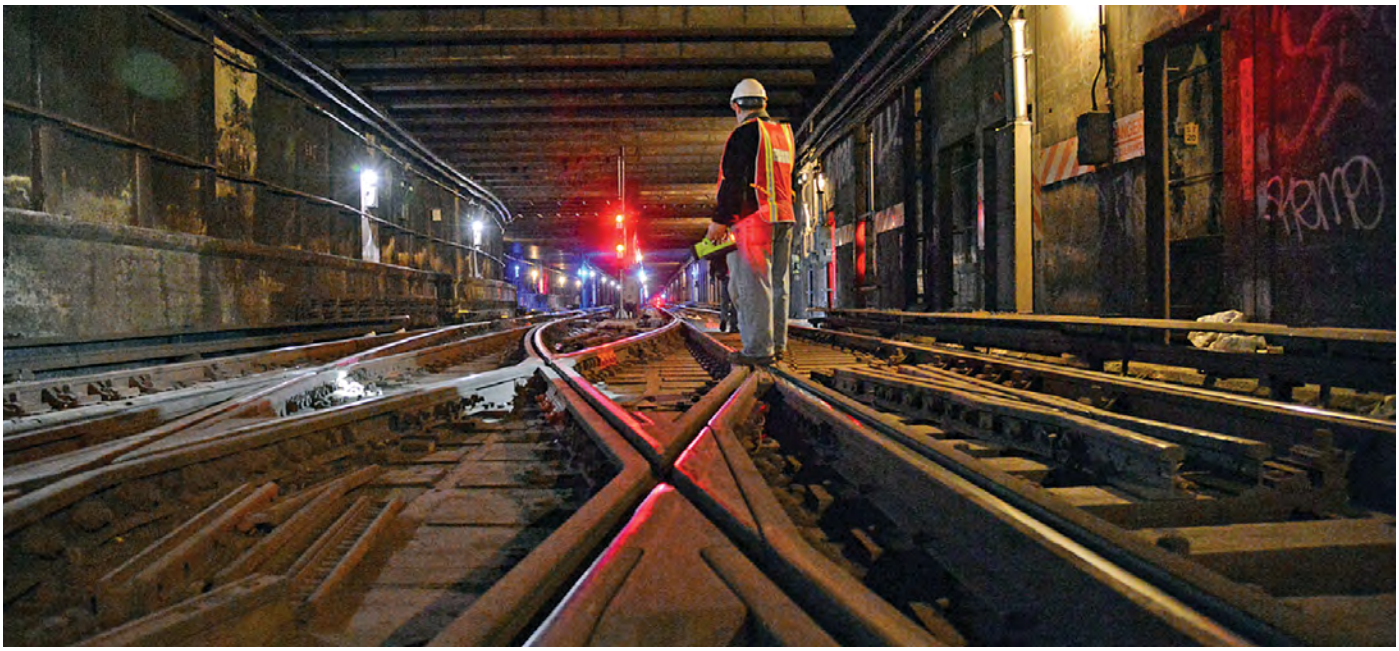
Through our Component Program, we're refreshing only the station components in need of repair, instead of full-station rehabilitations. This allows us to reach more stations, fix problems faster, and save money. We'll expand component repair to new areas like power, structures, and systems for the first time in the 2015-2019 Program.

Become a Better Business Partner

MTA contractors have told us what it takes to be better partners and work more efficiently. For example, we need to more fairly allocate risks instead of putting all the risk on them. We need to provide more hours for productive work along and within subway and railroad tracks, or what we call the "right-of-way." We need to involve all the right people in projects to avoid late-breaking problems, among other things. We've heard them, so today we're:

- Revising contracts to more equitably hold the MTA and contractors accountable for delays, and instituting a fairer dispute resolution system;
- Better coordinating MTA support services to maximize the time contractors have to work along the right-of-way;
- Reducing work changes by creating design teams that include project managers, engineers, and the operations and maintenance departments that will be responsible for a project throughout its entire life.

By becoming a better business partner, we can make it easier to do business with the MTA, reduce costs, and strengthen the case for investing in the transit system and the jobs that come with it.



Work with Labor Unions for Better Results

We're working to save money through Project Labor Agreements (PLAs), which designate the building trades as the exclusive collective bargaining representative for all workers on a portfolio of selected projects in exchange for work rule changes that lower costs.

In 2013, MTA Long Island Rail Road piloted a PLA—estimated to save the agency 10 percent on labor costs—covering seven projects in its 2010-2014 Capital Program. The gains made as a result of this PLA will form the basis of negotiations for a new PLA for the 2015-2019 Capital Program. By having more projects in this new PLA, and considering additional concessions in its negotiations, the LIRR expects to increase its savings over its pilot effort.

Improve Project Oversight

Our "Gates" strategy—originally implemented in the 2010-2014 Capital Program—allows us to review every capital project at each stage of development to ensure that we're on track to deliver intended benefits at the lowest cost. If a project doesn't pass its review, it won't move forward until we've fixed the problem. Gates has helped us deliver more projects at no extra cost, and it's an integral part of the 2015-2019 Capital Program.

Expand Risk Assessments

For large or complicated projects, a special committee of the MTA Board, aided by an independent engineer, reviews ongoing risk assessments. This process—which we'll expand for 2015-2019 capital projects—limits cost and schedule overruns and saves us money by ensuring that budgets and schedules are reasonable and risks are mitigated.

Better Asset Management

Capital upkeep of a $1 trillion asset base in a 24/7 system is costly and complex. That's why today we're implementing the principles of "Enterprise Asset Management," or EAM, across the entire MTA—a whole-life approach to asset management, guided by new federal legislation and international standards. EAM introduces a more systematic approach to asset upkeep that will keep our assets running longer, with less downtime and at lower costs.

Update Design Standards and Project Specifications

We're reevaluating design parameters and changing existing specifications to achieve the same benefits for less. For example, years ago we had a very prescriptive list of ingredients that had to be in a can of paint before we could buy it. This list made sense when it was created, but as time passed, the list kept us from advancing with the latest paint technology—and only one company was making the paint with all our ingredients. That's not a good way to increase competition and drive costs down. In addition to fixing these types of inefficiencies, we're finding efficiencies like standardization, cross-agency opportunities, and consulting with contractors at an earlier, pre-design phase.

Build on *FASTRACK* Method for Selected Closures

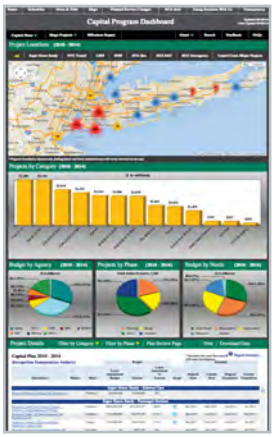
Our three-year-old *FASTRACK* program is one of the most successful maintenance innovations in the history of New York City Transit. Through *FASTRACK*, we shut down an entire subway line for about four consecutive nights, giving workers uninterrupted access to the system and allowing them to accomplish in a few nights what would normally take months. The program is generating huge productivity gains—and savings—even when you factor in overtime and alternate customer service costs. Now, in order to save even *more* time and money and reduce service disruptions, we're adding Capital Program work to *FASTRACK* closures. In addition, we'll:

- **Maximize Productive Work Time for All Line Closures**
  Any time we take a track or line out of service, we're undertaking intensive coordination to finish multiple projects and maximize the use of "piggy backing" on the same track outage. This will save time and money and minimize service disruptions.
- **Close Stations or Subway Lines to Finish Work More Efficiently**
  We're also looking—on a case by case basis—to close entire stations to get work done faster and more efficiently. This will make stations cleaner and safer, while reducing our costs. For example, our recent, year-long closure of Brooklyn's Smith and 9th Street station led to a faster and more cost-effective renovation.

  Similarly—for select complex infrastructure rehabilitations—we're considering full or partial line closures to get work done faster and cheaper. One recent example is our successful closure and rehabilitation of the Montague Street tunnel, which serves more than 65,000 R train customers a day and was severely damaged by Superstorm Sandy.

  It took 14 months of round-the-clock reconstruction, but we rebuilt that tunnel from the ground up and reopened it almost three weeks ahead of schedule. If we had closed it only on weekends, we wouldn't be done until around 2018.

In addition to overhauling the way we invest, we're improving the way we manage capital projects. For example:



Transparency

Our Web-based Capital Program Dashboard provides the public with easy access to in-depth information about every project in the Program. For large and complicated projects, an independent engineer assesses progress and reports to the MTA Board on how risks can be mitigated.

Small Business Development Program

Our Small Business Development Program helps us break down barriers that have historically made it harder for small businesses and M/W/DBEs to win MTA contracts. Through this program, we provide disadvantaged contractors with mentoring, training, and access to construction contracts worth up to $3 million. Our goal through the 2015-2019 Capital Program is to award SBDP contracts totaling more than $300 million.

Overall, thanks to these improvements:

- **New York City Transit cut nearly $1.3 billion from its original submission;**
- **Long Island Rail Road cut $285 million;**
- **Metro-North Railroad cut $232 million;**
- **MTA Bridges and Tunnels cut $200 million;**
- **MTA Capital Construction cut $500 million; and**
- **MTA Bus cut $61 million.**

All this will yield a total savings of more than $2.5 billion—or more than 8 percent less than the original 2015-2019 Program.

And we did it not by reducing benefits … not by eliminating projects … but by working smarter and finding better ways to implement the Program.

Twenty-Year Needs: Informing Investments for a 21st Century Transit System

To develop the 2015-2019 Capital Program, we analyzed the building blocks of our system and the trends that will shape the next 20 years of regional mobility—a process we call the Twenty-Year Capital Needs Assessment.*

Through this structured, two-year process, we developed a picture of the next twenty years of capital investment by merging investments that renew our assets—promoting what we call a "state of good repair"—with "vision" investments that enhance and expand the system in step with changing regional demands. Below are more details on these critically important investment categories.

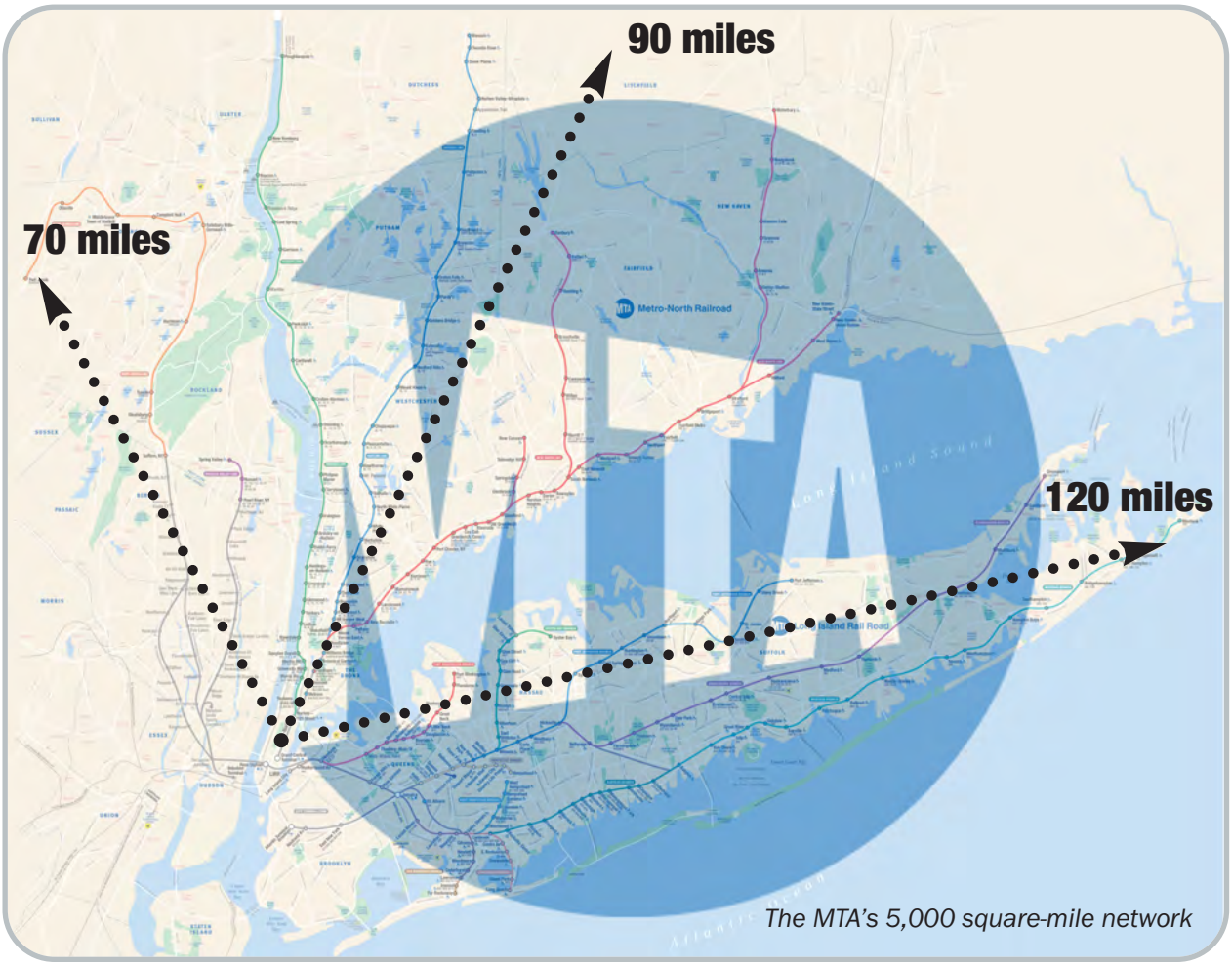
Asset Renewal

All five of our operating agencies—New York City Transit, Metro-North Railroad, Long Island Rail Road, MTA Bus Company, and MTA Bridges and Tunnels—perform comprehensive asset condition inventories to identify assets needing renewal. The results inform investments in the 2015-2019 Capital Program that promote safe and reliable service, including investments in fleets, track, signals, and power. Over the past 30 years, renewal investments have transformed the MTA system, and these investments remain our primary focus in the years to come.

Vision

Investments that enhance and expand the system are developed through a comprehensive analysis of regional trends, including travel patterns, shifts in employment, and technological developments. These lead to many of the investments in the 2015-2019 Program, from expanded Select Bus Service to contactless fare payment to more real-time travel information.

**The latest 2015-2034 Twenty-Year Capital Needs Assessment was released in October 2013 and is available for download at mta.info/capital.*



The MTA's 5,000 square-mile network

Renewing, Enhancing, and Expanding a $1 Trillion Asset Base

The Twenty-Year Needs Assessment informs investments in thousands and thousands of assets—from trains and buses to signals and track to seven highway bridges and two tunnels. All of these assets make up the MTA's indispensable transit network, which spans 5,000 square miles. We have more than 2,000 miles of track—enough to stretch from New York to Phoenix, Arizona. We use enough power to light the city of Buffalo, and our bridges have enough support cabling to circle the Earth more than 3.5 times. Put together, these assets are worth nearly $1 trillion and require ongoing investment to keep them safe and reliable.

700
Stations

2,411
Commuter Fleet

1,704
Track Miles

6,465
Subway Cars

9
Bridges and Tunnels

5,690
Buses

Investing to Ensure Safety ...

At today's MTA, safety is our top priority, and the 2015-2019 Capital Program is essential to our continuing efforts to make our network safer every day. Here are some of the ways we'll improve safety through the Program.

Positive Train Control for Railroads

Positive Train Control, or PTC, is a state-of-the-art system for monitoring and controlling commuter rail trains, and it will dramatically improve safety. The 2015-2019 Program includes $220 million to complete the installation of PTC at both Metro-North and the Long Island Rail Road.

Communications-Based Train Control for Subways

Through the 2015-2019 Program, we'll begin installing Communications-Based Train Control on the E, F, M, and R lines in Queens, the A, C, and E lines in Manhattan and the F line in Brooklyn. This system—which is fully in place on the L line and under construction on the 7 line—allows us to run more trains, move far more people, and provide better, safer service.

Enhanced Security

More than 4,500 security cameras are online throughout our system, and 1,500 buses have security cameras. The 2015-2019 Program includes investments that will continue the strategic expansion of camera coverage throughout our network. We're also piloting track intrusion detection technology—a system that automatically alerts train crews or the Rail Control Center if anything substantial falls onto the tracks.

Help Points

These high-tech intercoms are already installed in more than 200 subway stations, making our subway system safer and easier to use. By the end of the year, we'll approach 300 stations with Help Points. The 2015-2019 Program will complete the rollout of Help Points throughout the subway system, to every one of our 469 stations.

and Reliability

Reliability is the second highest priority of the 2015-2019 Program, because in a place as crowded as New York, it's the only way to move so many people quickly and efficiently, 24/7. Here are some of the ways we'll keep our system reliable through the 2015-2019 Capital Program.

New Fleet

Capital investments help us give you the most comfortable, dependable, and technologically-advanced vehicles in the business. Through the 2015-2019 Program, we'll replace aging M-3 commuter rail trains while adding hundreds of state-of-the-art, clean-fuel technology buses and high-tech R-211 subway trains.

Track Rehabilitation

We'll continue to roll out low-vibration subway track for a smoother, quieter ride. Our commuter railroads will continue their cyclical track programs, using high-tech measuring equipment to help us find defects and prioritize repairs.

Modernization of "Invisible Infrastructure"

We'll invest heavily in thousands of system components—like electrical substations, pumps, and tunnel lighting—that work every day behind the scenes to get you where you're going. We'll also upgrade systems at Jamaica Station to speed service through this critical transfer point for LIRR customers.

Bridges and Tunnels

Many of our bridges and tunnels are 50 to 70 years old. Ongoing repairs to their structures, cables, decks, and systems ensure that we can depend on these crossings for decades to come. Through the 2015-2019 Program, we'll continue to invest in the structural integrity and basic reliability of our bridges and tunnels.

Average Weekday Ridership

New Yorkers born between 1946 and 1964 comprise 26% of our regional population and many are choosing to retire "in place," creating a population increasingly dependent on public transit.

Transit travel to suburbs and boroughs outside Manhattan is growing fast. For example, reverse commutes to Westchester from New York City have nearly quadrupled since 1985.

The huge spike in transit use over the past 20 years is coming mostly from increased ridership during "off-peak" hours—mid-days, nights, and weekends.

Responding to Changing Needs and Demographics

Ridership today is at an all-time high, and customers depend on us more than ever. Daily transit ridership in our region is up 61 percent since 1992, and as busy as we are now, planners estimate that another 1.6 million people will live in the MTA region by 2035.

Many of these new customers are using our system differently than we've seen in the past, and they have different needs and expectations. Today, for example—in *addition* to our regular "9-to-5" crowd—more customers are using our system at all hours of the day and night, on weeknights and weekends. They're more likely to work part-time or from home, and they're reverse-commuting to jobs in the suburbs more than ever.

Here are just some of the ways we'll use the 2015-2019 Capital Program to prepare for and create growth, while meeting our customers' expectations:

- **Continue the progress we've made on two of the largest transportation projects in the nation:** the next phase of the Second Avenue Subway and East Side Access, which will bring the LIRR into Grand Central Terminal. Both of these projects will add capacity to our system, and improve the reliability of our service by giving customers new ways to get where they're going—to, from, and within New York City.
- **Complete the Long Island Rail Road Double Track project,** which will allow us to add off-peak service in both directions for intra-Island commuting.
- **Replace our 1930s-era subway signals with Communications-Based Train Control**, increasing capacity and reliability while improving safety.
- **Introduce a host of service improvements,** including a new fare payment system, mobile onboard ticketing, and more real-time service information with new apps to match.
- **Continue to modernize our system** with new trains, buses, and Help Points.
- **Review Transportation Reinvention Commission recommendations**, so Capital Program investments maximize economic growth and better address the challenges of climate change and regional population growth.

A More Sustainable New York *and* MTA

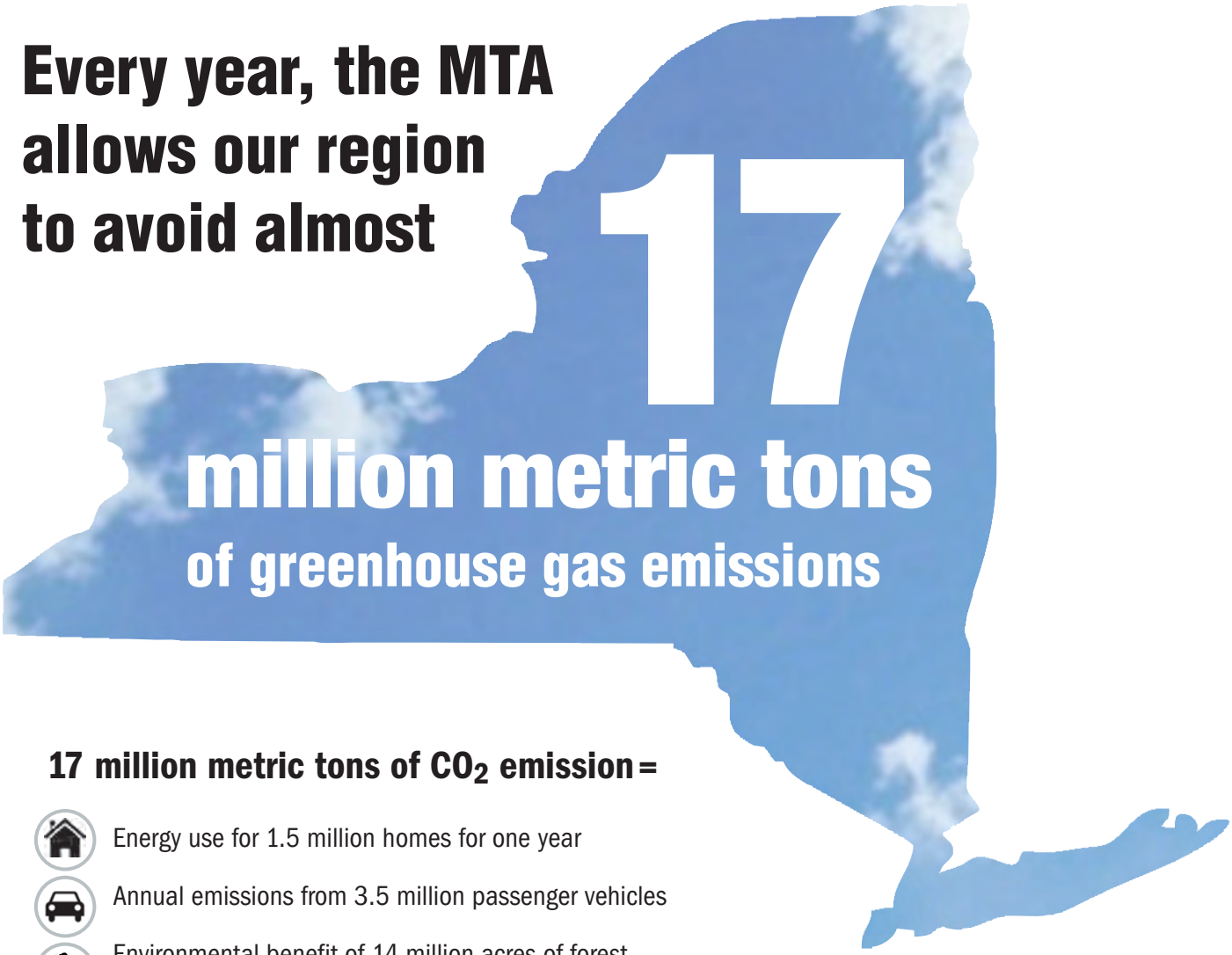
New York State has the lowest per capita energy consumption and greenhouse gas emissions in the United States, and it's mostly because of public transit. The MTA by itself moves 8.7 million people by transit every day, which translates into about 700,000 fewer cars in the city's Central Business District daily.

Still—with the nation's biggest subway system, its two largest commuter railroads, a vast infrastructure, and public facilities to handle millions daily—there's no denying we're a big energy customer. That's why we're working harder than ever to increase our energy efficiency and reduce our carbon footprint. We've implemented more than 100 energy-efficiency projects in our facilities and along the right-of-way. To name just a few:

- **New York City Transit** is buying subway cars and buses that are far more energy efficient and better for the environment. The new LEED-certifiable Mother Clara Hale bus depot also incorporates sustainable elements, including a green roof, rainwater collection system, and other features to minimize impacts on the community.
- **Metro-North Railroad** has new M-8 cars equipped with regenerative braking, which captures and reuses energy each time the train brakes. The Harmon Shop replacement project will also incorporate new features to reduce energy consumption, such as an insulated roof and increased natural lighting.
- **Long Island Rail Road** just opened a state-of-the-art, environmentally-friendly train washing facility that reuses more than 70 percent of its wash water.
- **Bridges and Tunnels** has switched to alternative fuels, installed LED lights on bridges, and started buying certified "green" cleaning agents—reducing greenhouse gas emissions by almost 20 percent since 2006.

But all the environmental improvements we're making are just a drop in the bucket compared to what we do for our environment every single day. In fact, every year, the MTA allows our region to avoid almost 17 million metric tons of greenhouse gas emissions. That's equal to more than three times the entire annual greenhouse gas emissions of San Francisco.

Our mass transit network isn't the *only* reason New York is so environmentally friendly. People also need to want to *use* it. It needs to work well and be reliable enough to get people where they need to go—safely and on time, every day. That's why—if you want to invest in the sustainability of our region—the best way to do it is by supporting the investments that maintain and improve our entire system: **the MTA's Capital Program**.



New York City Subways - $14.2 billion

This program will continue the revitalization of our subway system by purchasing 940 subway cars, modernizing six signal interlockings, replacing more than 73 miles of track, and many other critical investments. New cars will improve customer communication with electronic strip maps, automated announcements, and two-way customer intercoms. Station repairs and enhancements will improve customer comfort and safety throughout the system, while new elevators make 18 more stations fully accessible under the Americans with Disabilities Act. Signal improvements – including Communications-Based Train Control – will boost capacity and reliability.

NYC Transit Subway Capital Program Overview 2015-2019

Category	Budget	Highlights
Subway Cars	$2,956m	Purchase 940 sixty-foot R-211 subway cars to begin replacing R46 cars
Stations	$2,781m	Station renewal at 20 stations on six lines - $408m
		Station enhancements - $64m
		Station repairs system-wide to replace deficient components - $503m
		Reconfigure areas of Grand Central and Times Square to improve passenger circulation - $105m
		New Fare Payment System investments - $419m
		New elevators at 18 stations for ADA accessibility - $740m
		Replace 42 elevators and 32 escalators - $333m
Track	$1,845m	Replace 72 miles of track and 127 switches
Line Equipment	$377m	Replace tunnel lighting on various lines - $31m
		Install one new vent plant, rehab one vent plant, and repair fan plant components, which remove smoke and heat - $321m
		Rehabilitate pumping systems to remove water from the system - $25m
Line Structures	$927m	Rehabilitate segments and repair structural components on various elevated and subway lines - $637m
		Paint elevated structures on six lines - $242m
		Rehabilitate emergency exits - $48m
Shops & Yards	$353m	Make priority repairs at various car maintenance shops - $260m
		Replace or upgrade 1.2 miles of track and 20 switches, and improve lighting, fencing, and car cleaning facilities in train storage yards - $93m

New Subway Cars

New R-211 subway cars will make service more reliable and increase passenger capacity.

A Better Capital Program

NYCT is pursuing more efficient and less costly ways to restore escalators, such as those at Grand Central-42nd St. on the Lexington Avenue Line. Replacing controllers, electrical panels, or other key components in lieu of total replacement offers savings and less disruption to customers.

Category	Budget	Highlights
Signals & Communi-cations	$2,766m	Install advanced CBTC signals on the Queens Blvd., Culver and 8th Avenue lines - $1,045m Modernize six signal interlockings on three lines - $848m Improve conventional signals by replacing cables, control lines, and relays and other components - $259m Upgrade the communications networks, including telecommunications equipment, cabling, and radios - $309m Complete the rollout of Help Points to all subway stations to bolster customer communications and safety - $153m Upgrade rail traffic systems on the B Division - $122m Test and deploy platform and trackway safety systems - $30m

Category	Budget	Highlights
Traction Power	$773m	Modernize and repair power facilities like substations, circuit breaker houses, and other equipment - $211m Repair power cable and control systems - $225m Add or upgrade power facilities for service using advanced CBTC signals - $337m
Service Vehicles	$222m	Purchase heavy-duty rail and road vehicles to support construction and operations - $222m
Misc.	$860m	Progress designs, project scopes, engineering studies and services, and management information systems – $565m Install fire safety systems and remediate hazardous materials - $76m Repair and upgrade employee facilities, administrative and operations buildings, police facilities, and security systems -$218m
SIRTOA	$386m	Replace the SIR fleet - $232m Build three new power substations - $80m Upgrade and repair track, stations, structures, facilities and radio systems - $74m

Help Points

Help Points make traveling on the subway safer and easier, providing information to customers and assistance in times of emergency.

New York City Buses - $2.0 billion

The bus program reflects the MTA's continued commitment to realizing the full potential of a system that carries more than 2.5 million customers each day. In addition to purchasing more than 1,700 clean diesel, hybrid-electric and compressed natural gas buses and making priority repairs to maintenance facilities, the program includes bus purchases that will enable the expansion of Select Bus Service. It's all designed to improve bus system efficiency and increase bus ridership.

NYC Transit Bus Capital Program Overview 2015-2019 — $1,602m

Category	Budget	Highlights
Buses	$1,020m	Purchase 1,391 new buses for local and express service - $989m Automatic passenger counting systems - $6m
Depots	$582m	Reconstruct the Jamaica Depot - $298m Make priority repairs at various bus maintenance shops - $171m Purchase equipment to support additional Select Bus Service and begin design for dedicated BRT on the North Shore of Staten Island - $34m Replace bus depot equipment, such as bus washers, storage tanks and paint booths - $79m

Better Design

Standard buses will be designed with low-floor ramps that will cut in half the amount of wheel-chair lift maintenance and allow for faster boarding for wheelchair customers.

A Better Capital Program

NYCT will replace its 76 year old Jamaica Bus Depot using a design-build contract and a creative phasing plan to reduce costs and disruption and deliver benefits faster.

MTA Bus Capital Program Overview 2015-2019 $376m

Category	Budget	Highlights
Buses	$244m	Purchase 345 new buses for local and express service - $244m
Depots & Facilities	$132m	Make priority repairs at five depots - $32m Replace bus depot equipment, such as paint booths, service vehicles and chassis washers - $15m Complete joint project with New York City Transit for a new bus command center and new bus radio system - $35m Provide engineering support, design, and construction management - $27m

Improving Bus Service

Select Bus Service is now operating in all five New York City boroughs, and the 2015-2019 Program supports the introduction of new SBS routes. In partnership with the City of New York, New York City Transit has introduced a total of eight new SBS routes. The most recent – the M86 – began service in July of 2015. SBS combines state-of-the-art, low-floor buses with technologies and street improvements that speed up boarding and provide faster, more reliable service. The result is improved bus speeds and travel time savings up to 20 percent. In addition – by making bus service more attractive – SBS and related innovations like Bus Time reduce traffic, pollution, and the demand for parking.

Long Island Rail Road - $2.8 billion

The LIRR program will make crucial investments in rolling stock and infrastructure as the railroad looks to maintain and improve safety, reliability, and on-time performance. To be ready for East Side Access—when the LIRR will begin operating trains directly to Grand Central Terminal—the LIRR will expand capacity in Jamaica and add train storage and track capacity at key locations throughout its system. The railroad will purchase 164 M-9 electric cars to replace its aging M-3 fleet, and to expand service. The program also includes station upgrades in Brooklyn, Queens, and Nassau and Suffolk counties, as well as investments to maintain and improve state of good repair. The 2015-2019 Capital Program will allow the LIRR to complete the installation of the Positive Train Control system.

Long Island Rail Road Capital Program Overview 2015-2019

Category	Budget	Highlights
Rolling Stock	$500m	Purchase 88 M-9 cars to complete the replacement of the M-3 fleet
		Purchase up to 76 additional M-9 cars for service expansion and growth
Stations	$399m	Station rehabilitations, including platform improvements at Babylon, Nostrand Ave., Hunterspoint, and Port Washington - $95m
		Reconstruct and upgrade Mets-Willets Point Station - $78m
		Station enhancements at 5 stations - $25m
		Station component work system-wide to replace elevators and escalators, platform railings, platform lighting, and signage - $27m
		New station at Elmhurst - $31m
		New Fare Payment System investments - $5m
		Parking facility development and parking rehabilitation - $30m
		Investments to improve the customer experience at Penn Station - $71m
Shops & Yards	$211m	Replace shop equipment to support Reliability Centered Maintenance - $10m
		Progress efforts to build a new Huntington/ Port Jefferson Branch electric yard - $8m
		Diesel locomotive maintenance facility improvements - $108m
		Component improvements at key shops, yards, and facilities - $62m
Communi-cations & Signals	$378m	Replace or upgrade obsolete communications fiber optic network equipment - $34m
		Begin to replace or upgrade the station public address system - $5m
		Normal replacement of signal components system-wide, including renewal of the Babylon interlocking - $92m
		Investments in a signal system from Babylon to Patchogue and from Ronkonkoma to Yaphank - $73m
		Begin migrating towers to the Jamaica Control Center, continuing the Centralized Train Control initiative - $20m
		Complete Positive Train Control implementation - $126m

Positive Train Control

The LIRR will complete the installation of Positive Train Control through the 2015-2019 Program. PTC will prevent train-to-train collisions, over-speed derailments, injuries to workers as a result of unauthorized incursions by a train into a work zone, and the movement of a train through an improperly aligned switch.

Category	Budget	Highlights
Line Structures	$160m	Rehabilitate or replace railroad bridge structures at priority locations - $66m Component bridge renewals on the Main Line - $48m Structural painting and waterproofing of railroad bridges at priority locations system-wide - $17m
Track	$795m	Continue annual track program investments system-wide - $305m Right-of-way improvements, including retaining walls and fencing - $17m Amtrak-coordinated state of good repair investments - $68M The second phase of Jamaica infrastructure work to improve capacity - $140m Complete Double Track, adding a second track between Farmingdale and Ronkonkoma - $250m
Power	$227m	Replace aging traction power substations - $81m Traction power substation renewals and component work system-wide - $81m Design for new power substation in Queens to support ESA operations - $5m Replace and upgrade third rail system components - $28m Upgrade tunnel lighting in the Atlantic Avenue Tunnel - $12m
Misc.	$165m	Insurance, independent engineers, and other program management - $130m

Second Track

The LIRR will complete its Double Track project through the 2015-2019 Program, adding an entire second track between Farmingdale and Ronkonkoma. This will significantly increase capacity on the Main Line, and enhance service reliability.

A Better Capital Program

The LIRR partnered with the Town of Babylon in the 2010-2014 Program to share the cost and benefit of a new Wyandanch parking facility. The LIRR will continue this approach to reduce costs for parking investments in the 2015-2019 Program while ensuring the project fits with community development plans.

Metro-North Railroad - $2.3 billion

Nearly 85 percent of Metro-North's program is slated for projects that continue to bring assets to a state of good repair or protect investments that have already been made, including replacement of the Harmon Shop electric repair facility and the M-3 fleet. Station repairs and enhancements will improve customer comfort and safety throughout the system. Metro-North's program also includes targeted service improvements such as better customer information technology to provide real-time train information at stations, and early design efforts for a new midpoint yard to support West of Hudson service and ridership. The 2015-2019 Capital Program will allow MNR to complete the installation of the Positive Train Control system.

Metro-North Railroad Capital Program Overview 2015-2019

Category	Budget	Highlights
Rolling Stock	$532m	Purchase cars to replace the M-3 fleet
GCT	$210m	Continue priority infrastructure work on the GCT Trainshed - $134m
		Fire protection and utility work in GCT and the Park Avenue Tunnel - $17m
		Replace communications equipment, improving delivery of real-time customer information - $45m
Shops & Yards	$472m	Complete replacement of the Harmon Shop electric repair facility - $432m
		Begin environmental and design work for West of Hudson Midpoint Yard on the Port Jervis Line - $24M

Category	Budget	Highlights
Stations & Parking/ Strategic Facilities	$192m	Station enhancements at 5 stations - $15m
		Component-based priority repair work at stations on the Upper Harlem and Upper Hudson Lines - $40m
		Component-based renewal work at Lower Harlem Line stations - $31m
		Improve real-time customer information at stations east of the Hudson River - $60m
		New Fare Payment System investments - $5m
		Continue investments in parking and strategic facilities - $20m

A Better Capital Program

The 2015-2019 Harmon electric shop replacement work will complete the multi-Program Harmon shop replacement program. Applying design-build procurement efficiencies, this project will modernize a 100+ year-old shop and yard complex to support an expanded fleet of electric and diesel hauled rail cars.

Customer Communications

Through the 2015-2019 Program, Metro-North will improve customer communications at East of Hudson stations, including: real-time information on train arrivals and departures, visual information displays, an improved public address system, and safety and security enhancements.

Category	Budget	Highlights
East of Hudson Track & Structures	$391m	Continue cyclical track program $97m Continue track switch replacements system-wide, some using high-speed equipment at critical locations - $82m Drainage improvements and rock slope remediation system-wide - $30m Purchase equipment for track program - $22m Replace or repair more than 20 undergrade bridges - $65m Improve overhead bridges system-wide - $35m
Power	$101m	Harlem and Hudson Line power rehabilitation and improvements - $26m Continue to replace or rehabilitate critical components, including transformers, switchgear, and tunnel lighting and motor alternators - $22m Substation renewals and replacements - $29m Replace and upgrade third rail system components - $20m
Misc.	$173m	Insurance, independent engineers, and other program management - $96m
West of Hudson Track & Structures	$57m	Continue cyclical track program, including rock slope remediation at select locations - $25m Replace or repair undergrade bridges at priority locations - $15m Continue priority repairs to the Moodna and Woodbury viaducts - $14m
Communications & Signals	$194m	Replace or upgrade obsolete communications network equipment - $32m Replace critical components, including track relays and grade crossings - $8m Begin replacing or upgrading the Hudson Line signal system between Harmon and Poughkeepsie - $60m Complete Positive Train Control implementation - $94m

Positive Train Control

Along with the LIRR, Metro-North will complete the installation of Positive Train Control through the 2015-2019 Program.

Bridges and Tunnels - $2.9 billion

B&T's program focuses on maintaining the structural integrity of its bridges and tunnels to ensure safety and reliability. Other projects will provide drivers with new traffic information signs and investigate bicycle access for some of our bridges. These investments will improve travel across the region and ensure the continued flow of toll revenue that helps support nearly nine million daily customers across the MTA system. This program does not require Capital Program Review Board approval.

Bridges and Tunnels Capital Program Overview 2015-2019

Category	Budget	Highlights
Bronx-Whitestone Bridge	$137m	Rehabilitate miscellaneous structures - $29m
		Paint tower interior structures - $29m
		Inspect and rehabilitate cables and suspender ropes - $20m
Rockaway Crossings (Cross Bay and Marine Parkway Bridges)	$56m	Rehabilitate or repair underwater structure - $49m
Henry Hudson Bridge	$243m	Reconstruct toll plazas and southbound approach - $82m
		Retrofit structural arch supports - $83m
Hugh L. Carey Tunnel	$116m	Replace and rehabilitate ventilation fans and motors - $85m
Queens Mid-town Tunnel	$64m	Upgrade controls and communication systems - $42m
		Install smoke detection/alarm systems - $7m
Robert F. Kennedy Bridge	$747m	Replace Manhattan toll plaza structure and ramps (Phase I) - $224m
		Construct new ramp onto northbound Harlem River Drive - $141m
		Rehabilitate miscellaneous structures - $94m
		Retrofit structure against seismic and wind effects - $68m

Reconstructing Toll Plazas

We're introducing cashless Open Road Tolling (ORT) on the Henry Hudson Bridge. This puts tolling equipment overhead, enabling free-flowing traffic lanes with better visibility.

Category	Budget	Highlights
Throgs Neck Bridge	$578m	Replace suspended span deck panels - $310m
		Rehabilitate approach viaducts - $162m
Verrazano-Narrows Bridge	$530m	Reconstruct approach ramps (Phase I) - $286m
		Rehabilitate anchorage and piers - $49m
		Reconfigure Brooklyn approach - $31m
Agency Wide	$386m	Replace and rehabilitate toll collection systems - $67m
		Planning/strategic initiatives - $51m
		Install traveler information signs - $27m

New Connections for Improved Mobility

We're working with NYC DOT to build a ramp from the RFK Bridge onto the northbound Harlem River Drive, so you can get where you're going, without weaving through local streets.

A Better Capital Program

Seventeen B&T projects are targeted for design-build implementation, representing more than twenty percent of the Program's value.

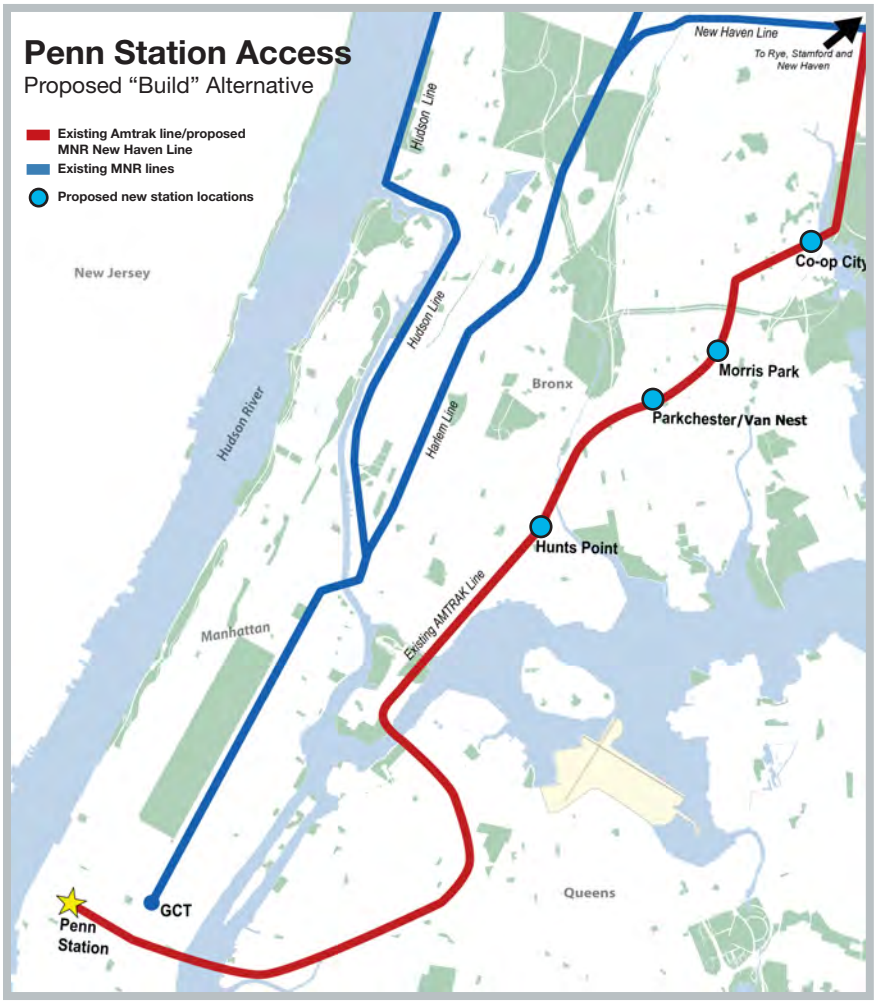
Network Expansion:
Easing Congestion and Creating Growth

These projects in the 2015-2019 Capital Program address long-standing capacity limitations and provide additional capacity for future growth.

Penn Station Access ***will take Metro-North's New Haven Line directly to Penn Station, adding four new stations in the Bronx.***

We're planning a project that will provide critical system resiliency by protecting service for more than 275,000 daily customers if Metro-North's service to Grand Central Terminal is ever interrupted. Only three miles of new track and no new tunnels are needed for the Penn Access project. For the most part, Metro-North's New Haven Line will take advantage of existing track, owned by Amtrak, to go directly to Midtown Manhattan's West Side.

As part of this project, we'll build four new Metro-North stations in the Bronx—near Co-op City, Morris Park, Parkchester, and Hunts Point. We'll also upgrade power and signal systems, install new track and realign existing track, and replace railroad bridges to accommodate more trains. Metro-North service to Penn Station will begin after completion of our East Side Access project.




Co-op City station


Morris Park station


Parkchester/Van Nest station


Hunts Point station

East Side Access ***will bring the LIRR directly to Grand Central, with a new two-level terminal constructed below the existing Terminal.***

During the morning rush hour, East Side Access will provide up to 65 percent more trains per hour from Queens and Long Island to Manhattan. The 24 peak-hour trains into Grand Central will add about 30,500 peak-hour seats. Commuters heading to the East Side will save up to 40 minutes on their daily commute, and those heading to Penn Station will enjoy a less crowded, more comfortable ride.

Significant investments will be made from 2015-2019 to improve the reliability and capacity of the LIRR's core network to support the new ESA service. This hugely ambitious project includes ongoing work in Manhattan and Queens, and more than 11 miles of tunneling.

Phase Two of the Second Avenue Subway ***will extend service from 96th Street to 125th Street along Second Avenue.***

The completion of the first phase of the Second Avenue Subway will mark New York City's first new subway line in over 60 years. Q train service will link the Upper East Side to Midtown and the West Side, and will help reduce overcrowding and delays on the Lexington Avenue line.

The northward extension, beginning in the 2015-2019 Capital Program, will improve travel for both city and suburban commuters, while providing better access to mass transit for residents on the far East Side of Manhattan. When completed, the line will stretch 8.5 miles along the length of Manhattan's East Side, from 125th Street in Harlem to Hanover Square in Lower Manhattan.

Funding the Capital Program

Program Funding Plan		2015-2019
Total Program Costs - $ in millions	**$**	**29,456**
Funding Currently Projected:		
Federal		6,875
City of New York		2,492
MTA/TBTA Bonds		8,165
State of New York		8,336
Other MTA Sources		3,588
Total Available Funds	**$**	**29,456**

The Capital Program is supported by a combination of local funding—including City, State and MTA sources—and federal sources. Taken together, these resources are expected to provide $29.5 billion to deliver the 2015-2019 Capital Program.

Moving forward with a Capital Program that moves *New York* forward.

Thanks to the Capital Program, we've been able to maintain and improve a truly indispensable transit network, with subways that offer both express and local service all day, every day. When combined with the two most heavily-used commuter railroads in the nation—and nearly 5,700 buses serving more than 300 routes—we have more transfer points, more stations, more flexibility, and more redundancy than any other transit network in the world.

We're incredibly fortunate to have this robust, interconnected transportation network as a foundation. *Now*, we have to take good care of it to make certain that it meets the changing needs of riders and the region's economy. That's easier said than done, but if we want to maintain our global competitiveness—if we want to continue growing our $1.4 trillion regional economy, second in the world only to Tokyo—we need to keep investing in our transit network.

In this way, the MTA will continue to provide safe and reliable service, while recommendations from the Transportation Reinvention Commission keep our investments forward-thinking, so the MTA system and our region continue to prosper in the century ahead.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Morris Park Avenue
East 180 St, Boston Rd
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MTA Capital Program 2015-2019
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MTA Capital Program 2015-2019
Overview

Underground Gallery, © 2009 Carlo Stanga, Commissioned by MTA Arts & Design

Investment Summary

The proposed MTA 2015-2019 Capital Program encompasses $29.5 billion of investments that renew, enhance, and expand the MTA network. The majority of the plan focuses on renewing the system to promote safe and reliable service. Enhancements are targeted toward improving system capabilities and the customer experience. Expansion projects extend the reach of the network to address evolving regional mobility needs.

The plan is organized into a MTA Capital Program Review Board (CPRB) portion that is subject to CPRB review and a Bridges and Tunnels portion that is not subject to CPRB review (Table 1). The CPRB portion is subdivided into "core" investments that renew and enhance, and "expansion" investments that extend the MTA network. The Agency sections of this book detail the projects included in the plan.

Table 1
MTA 2015-2019 Capital Program All Agency Summary ($ in millions)

	Proposed 2015-2019
CPRB Core Capital Program	
New York City Transit	$15,849
Long Island Rail Road	2,835
Metro-North Railroad	2,321
MTA Bus	376
MTA Interagency	264
CPRB Core Subtotal	$21,644
Network Expansion	**4,956**
CPRB Program Subtotal	$26,600
Bridges and Tunnels	**2,856**
Total Capital Program	**$29,456**

Numbers may not total due to rounding

Program Funding

Funds currently projected to be available for the proposed 2015-2019 MTA Capital Program total $29.5 billion (Table 2) and are described in the following narrative.

Table 2
MTA 2015-2019 Capital Program Funding Sources ($ in millions)

	Proposed 2015-2019
Total 2015-2019 Program Costs	**$29,456**
Funding Currently Projected	
Federal Formula, Flexible and Misc.	$6,275
Federal Core Capacity	100
Federal New Starts	500
MTA Bonds	5,889
Pay-as-you-go Capital (PAYGO)	1,846
State of New York	8,336
City of New York	2,492
Asset Sales / Leases	600
Other MTA Sources	562
Bridges and Tunnels Bonds ($2.3b) & PAYGO ($580m)	$2,856
Total 2015-2019 Funds Available	**$29,456**
Funding Gap	**$0**

Numbers may not total due to rounding

Funding Sources

Federal Formula, Flexible and Miscellaneous

The proposed 2015-2019 Capital Program assumptions for federal formula, flexible and miscellaneous funding keep annual transit subsidies flat at recent levels, for a total of $6.3 billion.

Federal Core Capacity

The MTA currently assumes $100 million in Section 5309 Core Capacity funding for the Canarsie Line Power and

Station Improvements project, subject to further guidance and approval of the FTA.

Federal New Starts

The revised proposed 2015-2019 Capital Program assumes $500 million in FTA New Starts funding for Phase 2 of Second Avenue Subway (SAS 2). This is in addition to the $535 million in local funding currently assumed for SAS 2, and will provide support for the project's commitments during the 2015-2019 period. This proposed New Starts funding is subject to further discussion with FTA, Congressional appropriations, and a future Plan amendment to make available the additional local funding required for the New Starts application process.

MTA Bonds

The proposed plan includes $5.7 billion in new MTA bonding capacity, as reflected in the MTA July financial plan for 2016-2019. This category also includes $200 million in bond proceeds generated by savings due to the low-interest FRA Railroad Rehabilitation & Improvement Financing (RRIF) loan supporting Positive Train Control (PTC) projects (previously accounted for in "Other MTA Sources").

PAYGO Capital

The proposed plan includes $1.6 billion in pay-as-you-go (PAYGO) capital, leveraging new debt service capacity until fully consumed by the debt service needs of MTA bonds. An additional $200 million in PAYGO is made available by the reduction in the needs (and required funding) for the B&T 2015-2019 Capital Program

State of New York

The capital plan includes $1 billion in capital funding from the State of New York to support core program projects ($750 million) and the Penn Station Access project ($250 million). An additional $7.3 billion will be provided by the State of New York for the proposed 2015-2019 plan. It is intended that the additional funds committed by the state and city shall be provided concurrently, and in proportion to the respective shares of each, in accordance with the funding needs of the capital program.

City of New York

The capital plan includes $625 million in the Mayor's Executive Budget, and $32 million in City matching funds to federal grants supporting the MTA Bus Capital Program. An additional $1.8 billion will be provided by the City of New York for the proposed 2015-2019 plan, including $600 million through alternative non tax levy revenue sources. It is intended that the additional funds committed by the state and city shall be provided concurrently, and in proportion to the respective shares of each, in accordance with the funding needs of the capital program.

Asset Sales / Leases

Funds reflect proceeds from East/West Rail Yards Payments in Lieu of Sales Tax/PILOST ($190 million), proceeds from the proposed development of MTA Madison Avenue property pursuant to the Vanderbilt Corridor zoning ($110 million), and resources from the disposition of assets including properties jointly owned with the City of New York ($300 million).

Other MTA Sources

The MTA currently anticipates $562 million in "other" bond and Pay-as-you-go (PAYGO) sources.

Bridges and Tunnels Program Funding

The proposed fund sources for MTA Bridges and Tunnels total $2.9 billion and include $2.3 billion in TBTA bonds and $580 million in PAYGO capital.

Program Evolution

In October 2014, MTA submitted to New York State our original $29 billion 2015-2019 Capital Program. Governor Cuomo challenged the MTA to cut the Program's cost by 6 to 8 percent without impacting benefits or eliminating the projects that are critical to the reliability of the MTA system. MTA is planning to do that in the following ways:

Innovative Project Delivery

MTA will incorporate more efficient design and construction techniques, to deliver capital projects for less. MTA will do this by incorporating more projects that include design-build project delivery and Public-Private-Partnerships.

Expand Successful Component Replacement Program

Through the Component Program, MTA's agencies will refresh only the station components in need of repair, instead of full-station rehabilitations. This allows us to reach more stations, fix problems faster, and save money. MTA will expand component repair to new areas like power, shops, depots, structures, and systems for the first time in the 2015-2019 Program.

Improve Design Standards and Project Specifications

MTA is reevaluating design parameters and changing existing specifications to achieve the same benefits for less. Changing design standards of materials in various asset groups including paint, elevators, escalators and power equipment will help MTA to save on project costs.

Become A Better Business Partner

MTA will engage in various changes to become a better business partner and cut costs. MTA is working to revise contracts to hold the MTA accountable for MTA's delays, and instituting a fairer dispute resolution system; coordinate better with MTA support services to maximize the time contractors have to work along the right-of-way; and reduce work changes by involving the operating and maintenance departments responsible for the project throughout the entire project.

Change Outdated Work Rules

Project Labor Agreements (PLAs) help to designate the building trades as the exclusive collective bargaining representative for all workers on a portfolio of selected projects, in exchange for work rule changes that lower costs.

Improve Project Oversight

The MTA's Capital Program Management "Gates" strategy—originally implemented in the 2010-2014 Capital Program—allows MTA to review every capital project at each stage of development to ensure that the project is on track to deliver intended benefits at the lowest cost. Gates is an integral part of the 2015-2019 Capital Program and will help save money.

Better Asset Management

MTA is implementing the principles of "Enterprise Asset Management," or EAM, across the entire system—an approach guided by new federal legislation and international standards. EAM introduces a more systematic approach to asset upkeep that will keep our assets running longer, with less downtime and at lower costs.

Build on Successful FASTRACK Method for Selected Closures

MTA's FASTRACK program is one of the most successful maintenance innovations in the history of New York City

Transit. Through FASTRACK, an entire subway line is shut down for about four consecutive nights, giving workers uninterrupted access to the system and allowing them to accomplish in a few nights what would normally take months. The program is generating huge productivity gains—and savings. To accomplish further savings, MTA will add more Capital Program work to FASTRACK closures. In addition, MTA will undertake intensive coordination to finish multiple projects and maximize the use of "piggy backing" on the same track outage. MTA is also looking—on a case by case basis—to close entire stations to get work done faster and more efficiently. This will make stations cleaner and safer, while reducing our costs. Similarly—for select complex infrastructure rehabilitations—MTA is considering full or partial line closures to get work done faster and cheaper. For these projects, MTA will survey customers to determine their preferences, so we can move forward with their support.

Table 3
MTA 2015-2019 Capital Program Efficiencies Reductions ($ in millions)

	Proposed 2015-2019
Agency	Reductions
New York City Transit	($1,273)
Long Island Rail Road	(285)
Metro-North Railroad	(232)
MTA Bus	(61)
MTA Capital Construction / Interagency	(540)
Bridges and Tunnels	(200)
Total	($2,590)
Percent Reduction	8%

Numbers may not total due to rounding

Capital Program Planning, Controls, and Transparency

The MTA Capital Program has applied a time-tested planning framework to develop this proposed 2015-2019 Capital Program. If approved, the program will be delivered in accordance with a series of program control and transparency measures that the MTA has already introduced and continues to refine.

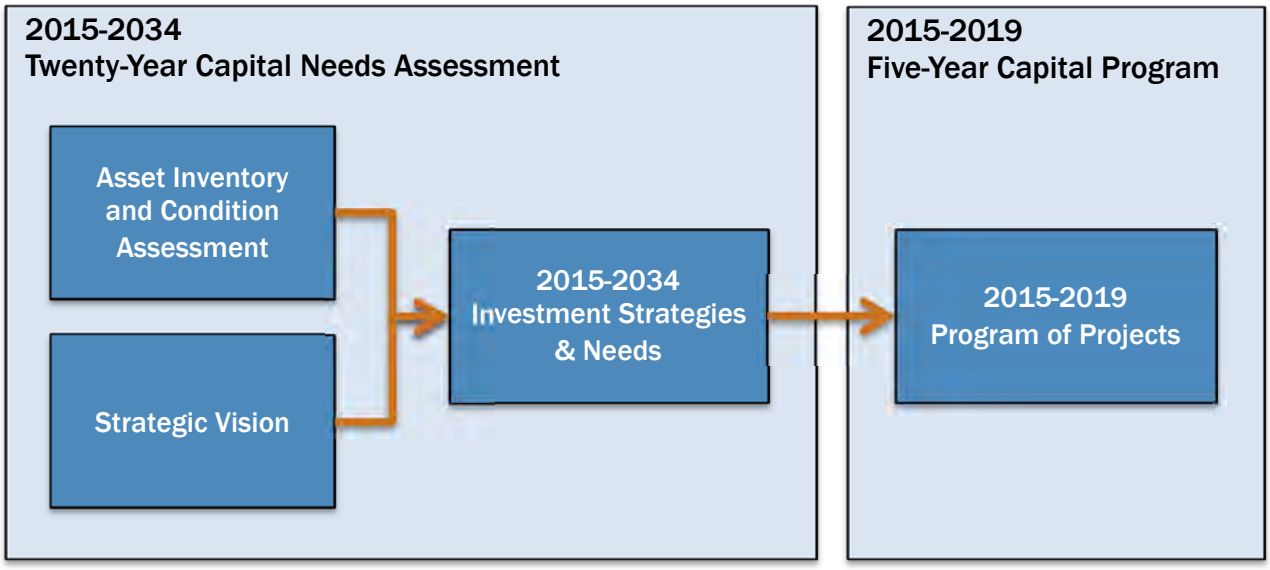
Capital Program Planning

The MTA Capital Program planning process originated in the early 1980s, when the MTA Capital Program first launched. It is a five-year cycle that begins with a Twenty-Year Capital Needs Assessment (TYNA). In creating the TYNA, an inventory and condition assessment of all existing MTA assets is compiled to identify assets that will need renewal to promote a state of good repair. The TYNA process also includes the development of a strategic "vision," which draws on observed and forecasted changes in the regional economy, travel patterns, and technology. These insights help to identify investments that can enhance and expand the MTA network to meet evolving customer needs and expectations. Merging the asset inventory findings with the strategic vision yields a set of investment strategies and prospective capital needs for the coming 20 years.

The completed TYNA provides the basis for developing the subsequent five-year Capital Program; a portfolio of actionable projects to be funded and delivered. This Capital Program aims to progress the first five years of the TYNA strategy, subject to the constraints of projected funding availability, marketplace capacity, and track access. After a Capital Program is approved, it may be periodically amended to reflect ongoing developments and evolving needs. For example, the 2010-2014 Capital Program was amended in the wake of Superstorm Sandy to incorporate new Fix & Fortify investments.

The latest planning cycle began with the development of the 2015-2034 Twenty-Year Capital Needs Assessment, which was released in October 2013. The results were then used to develop this proposed 2015-2019 Capital Program (Figure 1).

Figure 1
MTA 2015-2019 Capital Program Planning Process



Capital Program Controls

Various controls ensure that all projects are subject to multiple levels of ongoing oversight, from inception through to completion. Some of the key program control mechanisms are outlined below.

Capital Program Oversight Committee

The MTA Board convenes a monthly Capital Program Oversight Committee (CPOC) to provide broad oversight of Capital Program activities. CPOC is chaired by the MTA Chairman and CEO and reviews a wide variety of topics, ranging from periodic reviews of major capital projects, to updates on special initiatives. A series of monthly program-wide progress reports are also presented at every CPOC meeting, highlighting project status and funding (see "Transparency" section).

Project Gates

MTA capital projects are subject to Gate reviews at key project delivery milestones. The Gates process is based on industry best practices to ensure that projects:

- Deliver maximum benefits at minimum life-cycle cost (i.e., "best value"), and
- Are successfully delivered on schedule and on budget.

Each Gate represents an analytical "checkpoint" that must be passed before advancing to the next stage of project delivery:

- Gate 1 (prior to Design) – Ensures that the project scope addresses priority business needs, has undergone an alternatives analysis to ensure a "best value" approach, and incorporates adequate budget and schedule.
- Gate 2 (mid-Design) – Validates that the project design is developing in line with original scope objectives and that any variations in scope, cost, or schedule are being addressed.
- Gate 3 (prior to Construction) – Confirms that the final design meets the intended purpose of the project, that the budget includes adequate cost contingency, and that construction risks are identified and mitigated.
- Gate 4 (project completion) – Ensures that the project is on-course to deliver intended benefits in operation and that lessons learned are passed on to other projects.

Where issues are encountered, each Gate review provides an opportunity to make a "mid-course correction" before progressing a project any further, e.g., to revise a budget or reassess the project scope. The Gates Process is also designed to improve program management efficiency, by targeting MTA Headquarters oversight to the highest-value, highest-risk projects, and reducing administrative transactions.

Independent Engineering Consultant

The Independent Engineering Consultant (IEC) provides independent monitoring of Capital Program activities, typically focusing on the largest and most complex projects. Many of these projects are subject to risk assessments, which systematically evaluate projects with the aim of mitigating risks and ensuring adequate levels of budget and schedule contingency. The IEC generally presents key review findings at CPOC meetings.

Capital Program Transparency

The MTA Capital Program makes a comprehensive array of information available to the public via mta.info/capital and the MTA social media sites. Highlights of our transparency initiatives include the following:

Dashboard

The Capital Program Dashboard is the gateway to information about MTA Capital Program activities. It includes interactive features such as maps, charts, photos, and project lists that can be used to explore the entire Capital Program, or narrow in on details of a specific project. The Dashboard is updated quarterly to reflect the scope, schedule, and budget of hundreds of capital projects.

Board Materials

All MTA Board materials are available for download from the mta.info site. This includes materials presented to the Capital Program-focused CPOC committee, as well as various reports on Capital Program-related issues presented to the Agency committees. Streaming webcasts of MTA Board and committee meetings are also available for download.

Commitments and Completions Report

Published on a monthly basis in each CPOC committee book, this report provides a program-level overview of projects that are either starting or finishing a major stage of delivery in the course of the year. Explanations are also provided of any variances against the plan.

Funding Report

Published on a monthly basis in each CPOC committee book, this report provides an overview of planned fund sources by Capital Program and funding receipts to date.

Traffic Light Report

Published by the IEC, the Traffic Light report provides a prospective look at how individual capital projects are trending against budget and schedule. Projects that may be trending off course are flagged for further scrutiny. These projects are accompanied by a one-page write-up identifying the concerns and what is being done to put the project back on track.

MTA Flickr (www.flickr.com/photos/mtaphotos)

The MTA feed on the Flickr photo-sharing web site provides a behind the scenes look at dozens of capital projects. The images depict everything from choreographed cranes replacing elevated subway track, to the rebuilding of under river tubes as part of the post-Sandy Fix & Fortify efforts, to new Second Avenue Subway stations taking shape deep below Manhattan.

MTA YouTube (www.youtube.com/user/mtainfo)

The MTA feed on the YouTube video-sharing web site includes a wide variety of content, ranging from archived Board meeting webcasts to a playlist of videos highlighting various facets of the Capital Program.

Support for Minority, Women-Owned, and Disadvantaged Business Enterprises

Small Business Development Programs

During the 2010-2014 Capital Program, the MTA created and implemented a Small Business Development Program to increase contract awards to New York State-certified Minority and Women-owned Business Enterprises (MWBE), and MTA-certified Disadvantaged Business Enterprises (DBE). By changing the New York State Finance Law, the MTA now has the ability to prequalify program participants and set aside specific small projects for program participants to bid on as prime contractors. This includes NYS-funded construction projects up to $3 million and FTA-funded construction projects up to $3 million. Other program elements include classroom training, access to working capital, access to surety bonding assistance, and the ability to compete for prime construction contracts.

As of July 2015, 184 projects totaling $131 million were awarded to program participants within the NYS-funded MTA Small Business Mentoring Program (Tier 1 and Tier 2). An additional 30 projects totaling $60 million were awarded within the FTA-funded MTA Small Business Federal Program, for a grand total of $191 million. As a result, 4,600 jobs were created or maintained within the MWDBE communities.

Ongoing MWDBE Support

For this new 2015-2019 Capital Program, the MTA Department of Diversity and Civil Rights (DDCR) established both annual and individual goals on FTA-funded and New York State-funded contracts. Currently, the MTA has an annual goal of 17% DBE participation on FTA funded contracts and 30% (15% MBE and 15% WBE goals), on NYS-funded contracts. Once goals have been established, DDCR works in conjunction with the MTA operating agencies to monitor and enforce MWDBE goals.

MTA Capital Program 2015-2019
New York City Transit

Asset Base – New York City Transit

Table 4
Selected New York City Transit Assets

Category	Assets	
Subway Cars	6,465	Rail Cars
Buses	4,475	Buses
Passenger Stations	469	Stations
Track	637	Miles of Mainline Track
	1,764	Switches
Line Equipment	435	Miles of Tunnel Lighting
	199	Ventilation Plants
	233	Pump Rooms
Line Structures	138	Miles of Subway Structure
	70	Miles of Elevated Structure
	22	Miles of At-Grade Lines
Signals and Communications	730	Miles of Mainline Signal Equipment
	472	Miles of Fiber Optic Cable
Power	220	Substations
Shops & Yards	42	Shops
	24	Yards
Depots	23	Bus Depots
Service Vehicles	640	Work Vehicles
	496	Work Trains
Staten Island Railway	64	Rail Cars

Overview – New York City Transit

New York City is a place unlike any other in the U.S., where a majority of workers commute from home to work via public transportation, and a majority of households do not own a car. New York City Transit is the core of the MTA's regional network and is the overwhelming source of transit mobility within the city. With an annual ridership of 2.4 billion, NYC Transit is the largest public transportation system in the United States. NYC Transit subways supply two-thirds of all heavy rail transit trips in the U.S. NYC Transit buses carry more than twice as many daily riders as the bus system of Los Angeles, the second largest bus fleet in the U.S. NYC Transit assets include about 6,500 subway passenger railcars, about 4,500 buses, over 600 miles of mainline track, and 469 passenger stations (including the newest station at 34th Street Hudson Yards). The NYC Transit system operates 24 hours a day, seven days a week, 365 days a year. Intensely used, the rolling stock, infrastructure, and other assets of this extensive 100-year-old network require substantial and sustained investments to deliver the level and quality of services expected by our customers.

Before the capital program was established in 1982, the NYC Transit system was reeling from years of deferred maintenance and severe underinvestment. Service was hampered by derailments, bus and subway car mechanical failures, crime, and deteriorated stations. Today, after more than 30 years of sustained capital investment, a large portion of NYC Transit assets have been restored to a state of good repair. While further substantial investment is still required for the rehabilitation of core assets, it has also been possible in recent capital programs for NYC Transit to make investments that enhance the system and improve customer service. Overall, improvements in service reliability and the customer environment have been dramatic, and have attracted new customers to the transit system. NYC Transit has experienced near-record annual subway ridership – 1.8 billion in 2014, a total not seen since 1950. Booming transit ridership is beneficial to the region – helping to reduce automobile traffic and air pollution – but it also necessitates a robust transit infrastructure, capable of handling increased demand.

The system suffered a devastating blow in 2012 in the form of Superstorm Sandy. The post-storm service shutdown highlighted both the critical importance of NYC Transit service to the city and region, as well as the vulnerability of the system's infrastructure. Permanent repairs to NYC Transit's Sandy-damaged assets are ongoing, but these repairs are confined to selected areas of the system that were subjected to flooding; the vast remainder of the NYC Transit system still has investment needs through the traditional core capital program.

Proposed 2015-2019 Capital Program - $15.849 billion

The proposed 2015-2019 Capital Program totaling $15.849 billion provides the resources to build upon the achievements of prior capital programs to sustain the system's legacy for future generations and to avoid a repeat of the disinvestment and resulting crises of the past. In this program, NYC Transit continues normal replacement of key assets like rolling stock and mainline track/switches while also emphasizing overdue investments in signals and other infrastructure. Stations continue to be an important focus of investment given the importance of the station environment to NYC Transit's customers and their communities. Table 5 identifies these investments by asset category.

Table 5
New York City Transit Proposed 2015-2019 Capital Program by Category ($ in millions)

Category	Proposed 2015-2019	Percent
Subway Cars	$2,956	19%
Buses	1,020	6%
Passenger Stations	2,781	18%
Track	1,845	12%
Line Equipment	377	2%
Line Structures	927	6%
Signals and Communications	2,766	17%
Power	773	5%
Shops & Yards	353	2%
Depots	582	4%
Service Vehicles	222	1%
Miscellaneous	860	5%
Staten Island Railway	386	2%
Total	**$15,849**	**100%**

Numbers may not total due to rounding

Program Evolution

This plan for New York City Transit totals $15.849 billion, which is a reduction of $1.273 billion compared to the previous NYC Transit 2015-2019 capital plan proposal that was submitted in September 2014. This $1.273 billion reduction is the net effect of several factors:

Program Efficiencies

The plan assumes projected savings to be realized via more efficient design and construction of certain types of capital projects. The efficiencies that will be employed to generate these savings include:

- Coordination of multiple projects on the same section of track to minimize service diversions and reduce agency support costs;
- Component repair, rather than complete replacement, of certain capital assets;
- Alternative procurement strategies, such as separate contracts for furnishing and installation of equipment and design-build;
- Use of standard, off-the-shelf specifications, to the extent possible; and
- Exploration of new construction technologies.

Table 6 shows the elements in which these savings are assumed. Projects in these elements that are expected to realize savings via efficiencies are starred (**) in the "blue pages" listing of projects. The budgets of starred projects have been reduced by a fixed percentage (noted in Table 6) as compared to the agency's best estimate at the time of this plan resubmission. New York City Transit will strive to meet these reduced budgets, by incorporating efficiency strategies during project design. Some projects may yield greater savings opportunities than others, but achieving the overall savings by element, as listed in Table 6, is the agency's goal.

Revised Estimates

In the time that has elapsed since the September 2014 plan submission, projects have advanced further in the design process, resulting in better cost estimate information upon which to establish project budgets.

Priority Changes

NYC Transit has reevaluated all projects in the plan to consider new information available since September 2014 and confirm that all projects are critical to advance in the 2015-2019 timeframe. A number of projects were identified that should wait until after 2019 due to scheduling concerns and that do not impact operations and maintenance. Likewise, in a few cases, field conditions were found to exhibit less deterioration than expected and can be remedied without capital investment. At the same time, however, a small number of projects have been added to the plan resubmission to address newly emerging needs that had not been identified prior to September 2014.

Priority Substitutions Due to Track Access

Projects to repair damage from Superstorm Sandy and make the system more resilient are underway and will continue throughout the plan period. These projects often require track access and service changes during construction. In an effort to minimize customer inconvenience caused by multiple service changes in a given area, select projects in the September 2014 plan submission have been substituted for comparable projects on different lines.

Table 6

New York City Transit Capital Program Projected Savings Due to Program Efficiencies ($ in millions)

Element	Type of Project	% Red.	Assumed Savings	Likely Efficiencies
T70407	Escalators & Elevators	15%	$56	Component repair; refinement of life-cycle extension strategies
T70412	Station Components	20%	128	Project coordination and contract packaging; refinement of component repair strategies.
T70605	Ventilation Facilities	15%	56	Coordination of component work with collocated projects; synergies with private development for new fan plants; exploration of new construction technologies
T70803	Interlockings & CBTC	8%	171	Coordination of interlocking and CBTC projects on the same line; alternative procurement strategies; Exploration of new construction technologies
T70902	Substations	10%	47	Component repair; alternative procurement strategies, including design-build; coordination with collocated projects
T70903	Circuit Breaker Houses	15%	15	Component repair; alternative procurement strategies, including design-build; coordination with collocated projects
T71004	Shop Components	15%	13	Coordination with collocated projects; refinement of life-cycle extension strategies
T71203	Depot Components & Reconstruction	10%	50	Alternative procurement strategies, including creative phasing plans and design-build; refinement of life-cycle extension strategies
T71204	Depot Equipment	10%	8	Alternative procurement strategies; refinement of life-cycle extension strategies; use of standard, off-the shelf specifications
T71302	Work Trains & Rubber Tire Vehicles	15%	38	Alternative procurement strategies; use of standard, off-the shelf specifications
T71607	Employee Facilities	10%	5	Component repair; coordination with collocated projects
Total			$587	

Numbers may not total due to rounding

Major Investments

Priorities for the 2015-2019 Capital Program stem from the agency's 2015-2034 Twenty-Year Capital Needs Assessment. Built on the foundation of a comprehensive asset condition inventory, the assessment identified a significant need to modernize signal systems as well as the traditional investment areas of rolling stock (cars and buses), track and switches, and passenger stations.

The Signals and Communications category continues to be one of the largest categories, both in terms of identified needs as well as proposed investment. This is a reflection of the safety and operational importance of the signal system coupled with the age profile and conditions of existing installations.

Primary elements of this investment program include investments to maintain core infrastructure and smart investments that will enhance mobility, customer satisfaction, safety, and security. Within these elements, highlights of the proposed 2015-2019 Capital Program include:

- Signals
- Primary Operating Assets (Fleets and Track)
- Passenger Stations
- Component Repairs
- Communication Technology Enhancements

The discussion below, which elaborates on these investment priorities, provides a capsule of the twenty-year perspective as well as the proposed investments included in the 2015-2019 period.

Signals

About 30 percent of the line signal system (excluding interlockings) was installed before 1965 and has never been rehabilitated. As a result, signal failures are a leading cause of subway service delays. The proposed program will modernize six interlockings with current solid state technology. These projects will not only improve the reliability and safety of subway service but will also prepare the lines for the roll-out of communications-based train control (CBTC). Compared to traditional "fixed block" signals, CBTC offers a variety of benefits including the ability to run more trains per hour, improve safety, reduce maintenance costs, and provide timely information to passengers. CBTC is now complete on the Canarsie line and is in construction on the Flushing line. The proposed 2015-2019 Capital Program will continue to expand CBTC throughout the NYC Transit system, implementing the technology on 73.2 track miles on the Queens Blvd., 8th Avenue, and Culver lines. This will more than the double the 52 track miles of CBTC investments made so far on the Canarsie and Flushing lines.

CBTC can increase capacity on crowded train lines due to higher throughput – but complementary improvements in traction power may be needed to realize this increase. Accordingly, the proposed 2015-2019 Capital Program includes funding for five new substations (three on the Canarsie line and two on the 8th Avenue line) and enhancements to other power infrastructure, including supplemental negative cables. These power capacity investments total $337 million, which is in addition to the $2.152 billion signal program.

Primary Operating Assets (Fleets and Track)

Buses, subway cars, and the tracks they run on are NYC Transit's primary operating assets, and normal replacement of these assets remains a core mission in the proposed 2015-2019 Capital Program. Prior capital programs had brought all NYC Transit subway cars, buses, and track to a state of good repair – and the resultant improvements in

service reliability are one of the great success stories of the capital program. Capital investments in cars, in concert with the Scheduled Maintenance System (SMS), have increased reliability from approximately 7,000 miles between breakdowns in 1982 to over 140,000 miles today. Likewise, bus fleet reliability has improved from below 1,000 miles between breakdowns to over 4,400 miles today. Derailments, once common, now occur only rarely.

To maintain these gains in reliability, sustained investment is required. The proposed 2015-2019 Capital Program includes over $5.8 billion for subway cars, buses, and track replacement. This represents approximately 37 percent of the overall capital program, which is comparable to levels in past programs. The proposed 2015-2019 Capital Program includes the purchase of 940 R-211 railcars, 10 open-gangway prototype cars and 1,391 buses (1,041 standard, 300 articulated, and 50 express buses) to replace existing fleets that are approaching the end of their useful lives. NYC Transit will replace 127 mainline switches, 51 miles of mainline track and install 21 miles of continuous welded rail (CWR) to prevent broken rails, reduce damage to rolling stock, and improve ride quality. In yards, an additional 1.2 miles of track and 20 switches will be replaced.

Passenger Stations

Improving the station environment is a significant investment priority in the proposed 2015-2019 Capital Program, totaling $2.781 billion and 18 percent of the total program. NYC Transit will continue to follow the successful component-based repair strategy which was introduced in the 2010-2014 Capital Program to focus on eliminating the most deficient conditions system-wide in lieu of more comprehensive projects at a limited number of locations. This strategy is based on the results of a comprehensive condition survey of all stations in which each station component is rated on a scale of 1.0 (best) to 5.0 (worst). The survey is updated every five years and covers components such as stairs, platforms, mezzanines, windscreens, and canopies. The impact of the approach is a steep reduction in the number and severity of deficiencies system-wide. By the end of the 2010-2014 period the number of components rated 3.5 or worse will have decreased by 37 percent, as measured by the last two surveys. Complementing the component program, the proposed 2015-2019 Capital Program includes renewal projects to address 20 stations with high concentrations of deficient components. A new Enhanced Station Initiative will revamp the design guidelines for subway stations to improve their look and feel, then put them in place utilizing design-build procurement to deliver the projects more quickly.

NYC Transit is committed to making the subway system increasingly accessible to customers with disabilities. The proposed 2015-2019 Capital Program provides ADA accessibility improvements at the final 11 out of a total of 100 “Key Stations.” Additional non-Key Stations will be made fully accessible as well.

Times Square and Grand Central subway stations are the two busiest stations in the system and patronage is expected to increase. Accordingly, it is essential that the MTA secure adequate investment to make capacity improvements so these stations are prepared to handle future growth needs of the City and region. The proposed 2015-2019 Capital Program includes substantial access and circulation improvements at Grand Central station associated with the proposed development of the MTA Madison Avenue property. Similarly, at Times Square, work is planned to renew and reconfigure the Shuttle station to improve passenger circulation and provide ADA accessibility. The proposed 2015-2019 Capital Program also includes opening a second set of entrances at the 1st Avenue station and new stairs at the Bedford Avenue station on the Canarsie line (coordinated with ADA projects), the reopening of a second entrance at the 8th Avenue station on the Sea Beach line, and other improvements to regional mobility.

The proposed 2015-2019 Capital Program also supports the completion of the new fare payment system (NFPS) and miscellaneous station investments such as escalator and elevator replacements and signage.

Component Repairs

Based on the success of the component repair program in stations, NYC Transit will introduce a component-based strategy in other asset categories, including line structures, shops, and depots. The line structure repair program will focus on specific, known high-priority defects tracked through the continual inspection of all structures. Previously, defects were repaired by extensive line rehabilitations, but like stations, this strategy limited the number of locations that could be addressed. By focusing investment via a component approach, the 2015-2019 Capital Program will correct defects on 12 underground tunnels and six elevated structures throughout the system, greatly extending the reach of structure repair. As an alternative to demolition and reconstruction, a component-based approach will also be applied at shops and depots. The proposed program includes repairs at nine shops, six depots and one base shop, to address components such as HVAC systems, roofs, and structural elements. In addition, two depots—East New York and Grand Avenue—will be modified to accommodate articulated buses. Many component projects will be implemented as part of the MTA-wide Small Business Development Program.

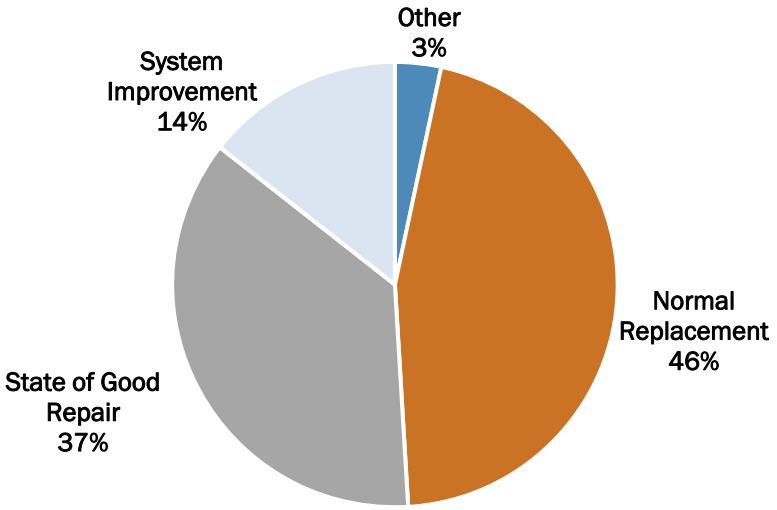
Communication Technology Enhancements

NYC Transit is committed to applying new technology to enhance the customer experience. Among other initiatives, the proposed 2015-2019 Capital Program provides funding to continue the rollout of the Integrated Service and Information Management - B Division (ISIM-B) project, which will enable real-time train arrival information to be provided to NYC Transit customers and personnel. Also included are communications technology projects to enhance passenger safety and security. The blue lights of Help Points will become ubiquitous throughout the subway system as the devices are installed at the remaining stations, completing the system-wide rollout. These highly visible, easy-to-use devices provide immediate access to assistance and information to passengers with the touch of a button at all 469 subway stations. Additionally, NYC Transit plans to pilot test and begin deployment of platform safety technology that would reduce the occurrence of passenger injury from intrusion onto the right-of-way.

System Condition

Figure 2 illustrates the mix of investments by needs category in the proposed 2015-2019 Capital Program. The program continues NYC Transit's emphasis on achieving good repair and maintaining that condition through normal replacement. Over 80 percent of the program's investments are dedicated to these activities.

Figure 2
New York City Transit Proposed 2015-2019 Capital Program by Needs

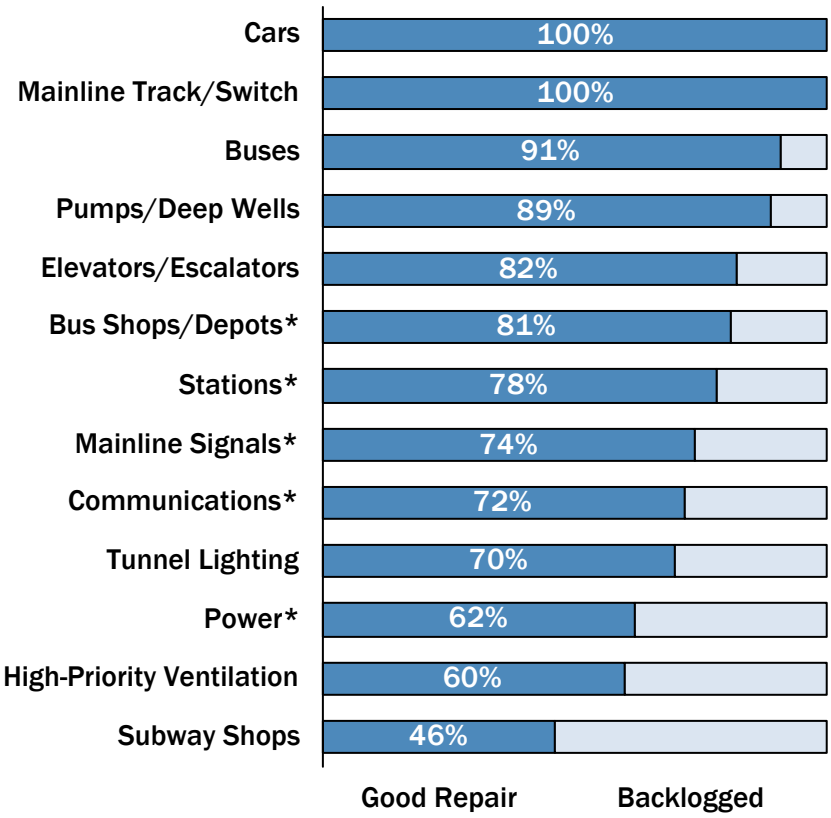


The System Investment Status (Figure 3), as developed for the 2015-2034 Twenty-Year Capital Needs Assessment in 2013, presents by investment category whether an asset is considered in good repair or has backlogged components in need of repair. NYC Transit has evaluated the assets that make up its vast infrastructure based on one or more of three asset attributes as appropriate for a particular asset category:

- Asset condition
- Asset age vs. useful life
- Asset performance vs. an identifiable performance standard it must meet

NYCT has used this dynamic approach since the 2010-2029 Twenty-Year Capital Needs Assessment, which differed from the previous, static methodology that considered an asset in good repair if it received investment in any past capital program, even as subcomponents aged and did not receive timely reinvestment.

Figure 3
New York City Transit System Investment Status



** Based on component-level condition assessment*

Note: The Line Structures category is not included above because a component-based investment strategy is in development.

New York City Transit
Subway Cars
Category T-701

As the largest subway network in the country NYC Transit currently operates a fleet of 6,465 railcars serving 469 stations and approximately 5.6 million customers each weekday. Due to differences in tunnel geometry, NYC Transit maintains two internal subway divisions: A and B, respectively corresponding to the numbered and lettered lines. There are 2,905 A division cars and 3,560 B division cars.

The subway car fleet reached a state of good repair as of 1991 through a combination of new car purchases and comprehensive overhauls. Since that time, a program has been in place with a goal to replace cars as they reach the end of their useful lives (currently 40 years). This normal replacement program also has introduced advanced technologies and improved customer accessibility features, automated public address systems and signage, improved lighting, customer emergency intercoms, and electronic route maps.

Proposed 2015-2019 Capital Program - $2.956 billion

Railcars are a critical service delivery asset. New York City Transit proposes to invest $2.956 billion for 940 new 60-foot R-211 railcars and 10 new open-gangway prototype cars that will replace the R-46 class on the B division that are reaching the end of their useful lives.

New York City Transit
Buses
Category T-703

NYC Transit's bus fleet - the largest in the country - contains a total of 4,475 buses comprised of 3,241 (72 percent) standard 40-foot buses, 741 (17 percent) 60-foot articulated buses, and 493 (11 percent) 45-foot express coaches. These quantities reflect completion of ongoing purchases in the 2010-2014 capital program. Since 1996, NYC Transit has diversified its fleet to more effectively meet its dynamic service requirements, including expanding its fleet of articulated buses for high-volume routes.

NYC Transit's long term fleet strategy will continue normal replacement based on a 12-year useful life for buses. At the completion of the 2010-2014 Capital Program, however, the bus fleet will still contain more than 400 buses that have exceeded their useful lives and are due for replacement. All of these buses will be replaced in the 2015-2019 Capital Program. Maintaining a normal cycle of bus replacement is critical for service reliability and the ongoing infusion of new technologies. It also allows for improved environmental standards.

Through preceding capital programs, NYC Transit has worked to make its bus fleet the cleanest major fleet in the world and has introduced many emissions-reducing technologies. The entire bus fleet is now composed of either clean diesel, hybrid diesel-electric, or compressed natural gas (CNG) fueled buses. With new regulation in place and new higher standards expected, manufacturers are standardizing into their fleets the emission reduction improvements that NYC Transit pioneered, promising greater availability and lower costs. Additionally, the fleet is fully air conditioned and accessible to the disabled.

This program also includes investment in buses to continue the implementation of Select Bus Service (SBS) on additional routes in partnership with the New York City Department of Transportation (NYCDOT). SBS combines bus technology with street improvements to provide faster and more reliable service on high-volume routes.

With purchases and retirements through the 2010-2014 Capital Program, 657 paratransit vans remain in service along with a fleet of sedans used in MTA's Access-a-Ride program to meet obligations under the Americans with Disabilities Act (ADA). The 2010-2014 Capital Program introduced a shift in the investment strategy for paratransit vehicles, purchasing wheel-chair accessible vehicles with a lower unit cost than traditional lift-equipped vans. This success has prompted a further change in procurement strategy for paratransit vehicles in the 2015-2019 Capital Program. During the 2015-2019 Capital Program period, replacement of paratransit vehicles will be covered under the operating budget, with the capital program funding enhancements including purchase of Automatic Vehicle Location and Monitoring System equipment.

Proposed 2015-2019 Capital Program - $1.020 billion

The proposed 2015-2019 Capital Program includes $1.020 billion in this category. A total of 1,391 new buses will be ordered, which includes 1,041 standard buses, 300 articulated buses, and 50 express buses. To maintain a diverse fleet, 248 buses will be CNG-fueled and 75 buses will utilize hybrid diesel-electric technology.

New York City Transit Passenger Stations Category T-704

NYC Transit's 469 passenger stations are used by millions of customers each day. At 16 million square feet, the total floor space contained within stations is greater than the commercial office space in many U.S. cities. The system has 278 underground stations, 142 on elevated structures, and 49 on viaduct, embankment, or open-cut structures. Almost all the stations reached their current configuration before 1940.

NYC Transit adopted a new strategy for stations investments in the 2010-2014 Capital Program, repairing deficient components at many stations system-wide in lieu of more comprehensive projects at a limited number of locations. The station component repair program emphasizes projects targeted to specific station elements such as stairs, platforms, mezzanine components, windscreens, and canopies. As an example of the success achieved to date, the 2012 condition survey shows a 37 percent reduction in the number of components rated 3.5 or worse compared to the 2007 survey, assuming completion of all programmed 2010-2014 work. The strategy addressed over 1,000 of the worst structural components at over 100 passenger stations, making critical repairs at a vastly larger number of stations in a shorter time period than would have been possible under the previous investment strategy. At locations where there are high concentrations of defects, broader station "renewal" projects continue to be effective. This strategy will eliminate all defects in a shorter timeframe and at a lower cost than relying on full rehabilitations.

As part of the long-range investment program to provide station accessibility under ADA, NYC Transit is on schedule to complete full accessibility at 100 "Key Stations" by 2020, plus full or partial accessibility improvements at several other non-Key Stations. Additionally, all station renewal projects include accessibility enhancements such as compliant platform edge warning strips and Braille signage.

NYC Transit is working to implement the next generation of fare payment equipment, continuing efforts that began in the 2010-2014 Capital Program. The new fare payment system will involve contactless "tap and go" technology, and promises to transform travel in the region much like the MetroCard did when first implemented.

Proposed 2015-2019 Capital Program - $2.781 billion

NYC Transit proposes $2.781 billion for station renewal and component work, accessibility investments, station structural reconfiguration, and improvements in fare collection, signage, escalators, and elevators.

Station Renewal, Enhancement and Component Investments - $975 million

The proposed program includes $408 million in station renewals, $64 million for station enhancements, and $503 million in component repairs. This represents the diversification in NYC Transit's station investment strategy. Twenty stations will receive renewal work over the course of the program, which will bring them into good repair. Enabled by projected efficiencies and reallocation of existing component work, the new Enhanced Station Initiative will revamp the design guidelines for subway stations, then put them in place using design-build procurement to deliver the projects more quickly. These cleaner, brighter stations will be easier to navigate, with better wayfinding and a modernized look and feel. Separate campaigns will address backlogged repair of ventilators, platform edges, station stairs, and other components at over 150 locations, which will bring those specific elements into good repair.

This proposal reflects anticipated programmatic savings of an average of 20 percent among select station component projects (see Table 6). Savings are expected as a result of enhanced coordination of work among station projects and with other types of projects on the same lines. For example, contract and project oversight costs may be reduced by creating contracts that bundle platform work with other component work at the same station(s). Track access costs may be reduced by scheduling or awarding platform work together with other non-stations projects

along the right-of-way. Component strategies will continue to be refined to ensure targeting highest-priority needs.

Accessibility for the Disabled - $740 million

NYC Transit is on pace to make 100 stations fully accessible in accordance with ADA standards by 2020. With investments made through the end of the 2010-2014 Capital Program, full ADA accessibility at 89 Key Stations will be complete or in progress. The proposed 2015-2019 Capital Program includes ADA investments at the final 11 Key Stations. These are: Times Square-42nd St./Shuttle and Chambers St./Nassau in Manhattan; Bedford Park Blvd./Concourse and Gun Hill Rd./Dyre in the Bronx; Astoria Blvd./Astoria in Queens; and Bedford Ave./Canarsie, 59th St./4th Ave., 86th St./4th Ave., Eastern Pkwy.-Brooklyn Museum/Eastern Pkwy., Greenpoint Ave./Crosstown, and Canarsie-Rockaway Pkwy./Canarsie in Brooklyn. In addition, $176 million of ADA improvements are planned at non-Key Stations including 1st Ave./Canarsie, Court Square/Crosstown, Woodhaven Blvd/Jamaica, the 149th St.-Grand Concourse complex, and the Livonia Ave.-Junius St. Complex.

Station Structural Reconfiguration - $192 million

NYC Transit proposes $30 million in access improvements at the Times Square-42nd St. Shuttle station (in concert with ADA accessibility improvements). The project will not only make the complex fully accessible, but will revamp the Shuttle's appearance and operations and improve customer circulation. Also proposed is $75 million for the next phase of access improvements at Grand Central-42nd Street associated with the proposed development of the MTA Madison Ave property. Mezzanine work at 8th Ave./Sea Beach including the reopening of a second entrance, and new street stairs at Bedford Ave. and 1st Ave./Canarsie are also included in the program. In addition, funds are included to plan, design and construct a new passenger connection between the Canarsie line at Livonia Ave. station and the New Lots line at Junius St. station in coordination with an ADA project at this location.

Fare Collection - $425 million

NYC Transit will continue the implementation of the next generation of fare payment equipment, including the use of contactless "tap and go" technology. This new approach offers many benefits to the MTA and our customers, including reducing labor and cash handling expenses, increasing bus speeds by shortening the boarding process, supporting intermodal fare payments options, and improving customer service.

Other Station Improvements - $449 million

The program includes replacement of 32 escalators and 42 elevators, completion of the reconstruction of the Cortlandt Street station on the Broadway/7th Avenue line and other World Trade Center recovery work, and other station improvements. $333 million is allocated for elevator and escalator replacements. Elevator work reflects the growing need for normal replacement investment in units initially installed for the purpose of wheelchair access.

The proposal reflects anticipated programmatic savings of an average of 15 percent among select escalators and elevators (see Table 6). Savings are expected in elevator and escalator replacement projects from performing component rather than full replacement of existing units. Lifecycle extension strategies will be pursued to craft investments that address the most critical components and the units most in need of repair.

Contract costs and initial funding for support activities for the Cortlandt Street station reconstruction were funded in the 2010-2014 Capital Program. $48 million for the balance of the support work is included in the proposed 2015-2019 Capital Program. Also included is $30 million to complete transportation infrastructure work along the Church Street corridor in Lower Manhattan. Both initiatives are being coordinated with redevelopment work at the World Trade Center site. Other proposed work includes replacement of station signage and railings at select locations throughout the system and the next update of the station condition survey.

New York City Transit
Track
Category T-705

The NYC Transit rail network consists of 637 miles of mainline track and 1,764 switches. Including switch length, the total system length is 664 miles. Mainline track has been in good repair since 1991 and mainline switches since 1997. To maintain that condition, NYC Transit has a regular program of normal replacement. The useful life of track and switches varies considerably – from 25 to 65 years – depending on factors such as traffic, track type, geometry, and exposure to weather. Generally, the useful life of track is significantly lower on grades or sharply curved sections of track than it is on tangent track.

The importance of track and switches to safe train operations is difficult to understate. NYC Transit track is traversed every weekday by hundreds of trains carrying the subway's over five million daily passengers. This heavy usage causes daily wear of the track, which is countered by frequent inspection and maintenance. NYC Transit uses multiple levels of inspection. All mainline tracks are inspected visually by track walkers twice weekly. Mainline switches are inspected, tested, and maintained by two-member teams monthly. All aspects of track geometry are measured and recorded four times a year. Rails are scanned for internal defects using either a Sperry rail car or Track Geometry Car at least three times per year. In addition, to support the capital replacement program, all track sections are surveyed every four years by an engineering team that estimates the number of years of useful life remaining for the section. The mainline track and switch investment strategy is based on the most recent track and switch condition surveys.

Proposed 2015-2019 Capital Program - $1.845 billion

The proposed 2015-2019 Capital Program includes $1.845 billion for normal replacement of 51 miles of mainline track and 127 mainline switches. The work includes the replacement of concreted subway track and prefabricated panel track on elevated and open-cut/at-grade structures. Additionally, as part of the mainline track program, traditional bolted rail will be replaced with continuously welded rail at critical locations to prevent the occurrence of broken rails. The proposed 2015-2019 Capital Program includes funding for 21 miles of CWR. Cost-saving strategies, such as the Scheduled Component Replacement program and solid-cast polymer tie blocks, will also continue to be applied where appropriate. These investments will ensure that NYC Transit track and switches remain in good repair.

Also included is $175 million for the track force account. The track force account is a series of annual projects funded by dedicated New York City funds for enhancement of the track.

New York City Transit
Line Equipment
Category T-706

The subway contains a diversity of electrical and mechanical equipment and support infrastructure along the right-of-way, including 435 track miles of tunnel lighting, 199 ventilation (fan) plants, 233 pump rooms, and deep wells at four locations.

Lighting in subway tunnels enhances safety and aids rescue workers in emergencies. All NYC Transit subway tunnels have lighting, but many rely on incandescent light systems put in when the tunnels were built. Modern systems feature compact fluorescent lamps on both sides of trackways; redundant power sources assure they will function during emergencies. Also, they provide more ambient light than old systems and are more reliable and energy-efficient.

Fan plants enhance passenger safety by directing heat and fumes away from passengers and providing sufficient ventilation to enable safe evacuations. Much of NYC Transit's system lacks fans meeting contemporary standards. Most existing fans are undersized and unable to attain the "critical velocity" of air required of new subway systems. Also, many tunnel segments were originally built without fans.

Currently, 60 percent of identified high priority tunnel segments meet new ventilation standards. New or expanded fan plants will be built at the highest priority locations. Work includes building a large enclosure, and installing multi-directional turbine-type fans, mechanical damper systems along the right-of-way, and control systems for remote operation. Additional smaller-scale investments ensure the continued operability of existing fan plants, such as replacement of control systems.

Pumps remove water that collects in tunnels from seepage, storm runoff, and water main breaks. Pump rooms serve all subway tunnels and under-river tubes; 89 percent of pumps are in a state of good repair. A pump room typically has two small pumps for regular use and one large pump on standby for flooding situations. Pump room projects may include substantial drain and discharge line repair and structural, electrical and control work, as well as replacing the pumps and motors. NYC Transit also has deep wells in areas with high water tables to extract groundwater and lower the water table below the subway structure, reducing infiltration and protecting its integrity.

Proposed 2015-2019 Capital Program - $377 million

NYC Transit proposes $377 million for line equipment investments, including:

- Tunnel lighting on various lines.
- Two fan plants on the Lexington and 6th Avenue lines, one new to protect an area that currently has no plants and one to replace an existing undersized unit.
- Replacement of fan components at various locations.
- Rehabilitation of various pump rooms.

This proposal reflects anticipated programmatic savings of an average of 15 percent among select ventilation facility projects (see Table 6). Savings are expected from coordination of component work with collocated projects, synergies with private development for new fan plants, and use of new construction technologies.

New York City Transit
Line Structures
Category T-707

NYC Transit's network has 230 miles of line structures, including 138 miles of subway, 70 miles of elevated structures and viaducts, and 22 miles of at-grade alignments. All line structures require periodic investment to preserve their integrity against water damage, corrosion, and normal wear-and-tear. Subway tunnels also feature 543 emergency exits, which require similar investment.

All types of line structures (subway, elevated, viaduct and at-grade alignments) are primarily threatened by water infiltration and/or corrosion. In addition, vibration and exposure to salt water (viaduct by the ocean) reduce the useful life of line structures. Rehabilitation of structures generally entails waterproofing, grouting, replacing corroded steel, replacing spalled concrete, and reconstructing drains.

Component Work

Beginning with the 2015-2019 Capital Program, NYC Transit will introduce a component repair program, similar to the process developed for stations, to address defects for both elevated and subway line structures. In the subway, areas on the right-of-way with concentrations of high-priority defects are targeted for investment. This component approach will allow NYC Transit to address the most critical defects faster and more efficiently than under the previous strategy, which was based on larger line segment rehabilitations. On elevated structures, component repairs will be closely coordinated with planned painting projects to take advantage of project execution efficiencies and prolong the useful life of the structure. In selected cases, more comprehensive projects may be required to address structures with unique physical characteristics.

Structural Painting

Steel elevated structures require regular painting to protect against corrosion, extend the life of the structure, and improve neighborhood aesthetics. Overcoat projects entail scraping loose paint and applying paint on top of the existing paint layers. The debris from old coatings is collected and disposed of properly.

Proposed 2015-2019 Capital Program - $927 million

NYC Transit proposes $927 million for component repairs, painting, line structure rehabilitation, and other enhancements, including:

- Rehabilitation of an underground tunnel on the 4th Avenue line.
- Component repairs to correct structural defects on 12 underground tunnels and six elevated structures throughout the system.
- Rehabilitation of a viaduct structure and bridge on the Myrtle line.
- Overcoat painting of elevated structures on the Dyre, Jamaica, Jerome, Flushing, and Myrtle lines as well as the leads to East New York Yard.
- Repairs to elevated structure on the White Plains Road and Rockaway lines, as well as retaining wall and overpass repairs at Livonia Yard.
- Rehabilitation of emergency exits at various locations throughout the subway system.

New York City Transit
Signals and Communications
Category T-708

NYC Transit's signals and communications systems include 730 track miles of mainline signal equipment, an automatic train supervision (ATS) system on the A Division, a rail control center (RCC), a carrier-grade communications network, subway and bus radio systems, and in-station communications applications such as intercoms and public address.

Signals

Signals ensure the safe and efficient movement of trains. There are 245 track miles of signals on the A Division and 485 miles on the B Division. Currently, 74 percent of the signal system is within its 50-year useful life, and the balance is in need of modernization. The signal system is made up of two major elements: interlockings, or a set of switches that are coordinated and controlled from a remote location, and the automatic signals between the interlockings. Most of the NYC Transit system relies on conventional "fixed block" signal systems, but the agency is beginning to transition to communications-based train control (CBTC) signals —a technology that allows the agency to run more trains per hour, improve safety, provide timely information to passengers, and reduce maintenance costs. Installation of CBTC entails the modernization of each interlocking along a line, a subsequent "overlay" of CBTC wayside equipment, and the outfitting of railcars with CBTC equipment.

In addition to signals, the other primary NYC Transit signal assets include ATS and the RCC. With continued investment, NYC Transit's signals have become increasingly automated. Train control has moved from local towers to master towers and now to the RCC, a state-of-the-art facility. The ATS overlay technology provides the critical information on train movements to enable centralized control and provides real-time train arrival information to customers.

Communications

To meet the communication needs of a transit system serving an average of 7.7 million passengers each weekday, NYC Transit has an extensive carrier-grade communications network. The network is supported by 472 miles of fiber optic cable, extensive copper telephone cable installations, eight major PBX sites, wireless radio systems for use in the subways by NYC Transit and the New York City Police and Fire Departments, 190 miles of subway antenna cable, and one or more communications rooms located in every station. Collectively, these assets are critical to providing service, responding to emergencies, enabling state-of-the-art customer communications, as well as administrative operations. Communication assets also include in-station applications such as public address / customer information signs (PA/CIS), closed-circuit television (CCTV) systems, and Help Points (customer intercom devices).

NYC Transit's main fiber optic network, known as SONET/ATM, is scheduled to receive upgrades of selected equipment in the 2015-2019 program to extend the life of the network. Various infrastructure investments will also be required to support the continued functionality of NYC Transit's communication systems, including the replacement of communication cables (i.e., fiber optic, antenna, and copper cables), telephone infrastructure, and radio equipment.

Ongoing communications projects are poised to dramatically enhance the NYC Transit customer experience. One major initiative is the roll-out of Help Points throughout the system. Help Points are highly visible intercom kiosks that enable customers to speak directly with a NYCT customer service agent for customer information and emergency assistance. Another key initiative is the Integrated Service and Information Management – B Division (ISIM-B) project, which will enable real-time train arrival information to be provided to NYC Transit customers and personnel throughout the system.

Proposed 2015-2019 Capital Program - $2.766 billion

NYC Transit proposes $2.152 billion for mainline signal modernization investments and $614 million for communication system improvements, for a total of $2.766 billion.

Signal Modernization

The proposed 2015-2019 signals program will modernize 73.2 track miles of signals by implementing CBTC on the 8th Avenue and Culver lines and completing phase two of CBTC on the Queens Blvd. line (the first phase was funded in the 2010-2014 Capital Program and covered the furnishing of both carborne and wayside equipment). Additionally, automatic signals on the Fulton and Crosstown lines will be upgraded to extend their useful lives. Also planned are several system-wide signal improvement projects, such as control line modifications and speed enforcement system replacements.

Six B Division interlockings are proposed for modernization, including two on the 8th Avenue line, three on the Culver line, and one on the Queens Boulevard line. These projects will improve the quality, reliability, and safety of subway service in addition to preparing lines for the roll-out of CBTC.

This proposal reflects anticipated programmatic savings of an average of 8 percent among select interlocking and CBTC projects (see Table 6). Savings are expected from coordinating interlocking and CBTC projects on the same line, alternative procurement strategies including separate contracts for furnishing and installation of equipment, and use of new construction technologies.

Communications Systems

The proposed 2015-2019 communications program will install Help Points at 244 stations, thus completing the rollout of these kiosks to all stations system-wide. The program will also continue the rollout of ISIM-B, which will enable NYC Transit to provide real-time train arrival information on the B Division.

Additionally, NYC Transit will continue to upgrade the SONET/ATM network and replace key communications infrastructure including copper cables, fiber optic cables, antenna cables, and PBX switches. Improvements are also proposed to communication rooms, which protect and consolidate communications equipment. The proposed program also includes the replacement of the UHF T-Band radio system, in compliance with an FCC mandate to vacate the currently-used portion of spectrum. Other investments include the replacement of PA/CIS electronic equipment on the Canarsie line. Lastly, investments are proposed to pilot and begin the rollout of Track Intrusion Detection and Platform Safety Technology to reduce the occurrence of passenger injury from intrusion onto the right-of-way.

New York City Transit
Traction Power
Category T-709

NYC Transit consumes nearly 2.2 billion kilowatt-hours of electricity annually, including 1.7 billion kilowatt-hours for train propulsion. The energy is supplied by the local electric utility but is delivered to the subway third rail via NYC Transit substations and power distribution infrastructure.

NYC Transit operates 220 substations, located throughout the subway system. Substations receive high-voltage alternating-current (AC) power from the external electric utility grid and convert it to 600-volt direct current (DC) power for use in train propulsion. To accomplish this conversion, each substation includes one or more transformers to reduce voltage, rectifiers to convert from AC to DC, and switchgear to control the connection to the external power. Power is then transmitted to the third rail by means of the power distribution system, which includes positive and negative cables and circuit breaker houses (CBHs). CBHs are small trackside enclosures, which feed power to the third rail and include remotely-actuated circuit breakers to disconnect power when necessary. There are currently 304 CBHs in service throughout the subway system.

For emergency removal of power from the wayside, alarm units and telephones are placed throughout the NYC Transit system. These Emergency Alarm Units (EAUs) allow NYC Transit personnel to shut off third rail power to a section of track, and also include telephones for emergency communication. There is a total of 2,647 EAUs system-wide.

The power network has received periodic reinvestment for modernization since the 1950s. In prior capital programs, some substations received comprehensive modernizations, including replacement of all antiquated equipment and rehabilitation of the substation enclosure. Many other substations, however, only received component-based investment to replace selected equipment (particularly obsolete rectifiers). Component replacement at various substations will continue, focusing on components like high tension switchgear and roofs and enclosures. Select substations will undergo more comprehensive renewals, which will replace multiple components that are not in good repair.

On lines that will be upgraded with CBTC, additional power is often required to support the higher train throughput enabled by the modernized signals. Providing this power may require system improvements, such as new substations and enhancements to other power infrastructure. These improvements will ensure that the full customer benefits of CBTC can be achieved - specifically, more frequent train service - and will also allow for improved reliability.

Proposed 2015-2019 Capital Program - $773 million

NYC Transit proposes $435 million for normal replacement and state of good repair investments in traction power, including:

- Rehabilitation of three substations and four substation enclosures.
- Replacement of frequency converters and switchgear at various locations.
- Rehabilitation of six circuit breaker houses and various circuit breaker house enclosures.
- Replacement of negative cables on the 4th Avenue line and rehabilitation of ducts on the 6th Avenue line.

- Supervisory system improvements, including upgrades to the SCADA system and the replacement of control and battery cables at various substation control zones.

NYC Transit also proposes $337 million in power system improvements to support high throughput on CBTC lines, including:

- Five new substations, including three on the Canarsie line and two on the 8th Avenue line.
- Supplemental negative cables and low-resistance contact rail.

These proposals reflect anticipated programmatic savings of an average of 10 percent among select substation projects and an average of 15 percent among select circuit breaker house projects (see Table 6). Savings are expected through enhanced coordination of collocated projects, alternative procurement strategies including design-build, and further use of the component repair approach.

New York City Transit
Shops and Yards
Category T-710

Shops are critical to ensure the proper condition, integrity, and safety of the NYC Transit railcar fleet and infrastructure. Modernized shops are especially important for the Scheduled Maintenance System and work on high-tech railcars entering the fleet. NYC Transit has a large number of shops to support the system, including two railcar overhaul shops, 14 railcar maintenance shops, and 26 Maintenance of Way (MOW) support shops. Shops include a variety of heavy equipment and specialized facilities.

The major overhaul and maintenance shops are used for the inspection, repair, and overhaul of railcars. The specialty support shops, which include track, signal, infrastructure, and electrical facilities, allow NYC Transit to repair and maintain specific, non-fleet assets by performing a wide variety of functions, including ironwork, signal maintenance, power cable maintenance, and track fabrication. Approximately 46 percent of shop components are in good repair.

The proposed 2015-2019 Capital Program will introduce a component repair strategy at shops that targets deficient components such as structural elements, heating/ventilation, lighting, and electrical systems. Larger-scale projects will continue to occur at select facilities with numerous deficiencies.

The NYC Transit system also contains 24 yards used for the storage of railcars and work trains. NYC Transit's yard facilities include 118 miles of yard track (including track occupied by switches), 895 yard switches, signal systems, perimeter fencing, and yard lighting. With investments through 2014, 93 percent of yard track and 94 percent of yard switches are in good repair. The most backlogged element of yards is their lighting; nearly 37 percent of yards have lighting that is in poor condition and does not meet current standards.

Proposed 2015-2019 Capital Program - $353 million

NYC Transit's proposed 2015-2019 Capital Program includes $260 million for repairs at various shops and facilities. Of this, $133 million is for component repair projects at nine shops to address deficient components such as HVAC systems, roofs, and structural elements. Additionally, $76 million is proposed to fund the first phase of rehabilitation at Livonia Maintenance Shop, which exhibits a high concentration of defects and is ill-configured for current industry practices. The remaining investments in shops include upgrades at two MOW facilities, replacement of heavy shop equipment, and structural repairs to the over 100 year old foundation at East 180th Street Maintenance Facility.

This proposal reflects anticipated programmatic savings of an average of 15 percent among select shop component projects (see Table 6). Savings are expected from several sources, including enhanced coordination of component projects with other yard track and signal projects to reduce overhead and costs related to service disruptions, creative contracting to combine similar component work across multiple depots, and greater use of life-extension techniques as opposed to complete replacement for various shop equipment.

NYC Transit also proposes $93 million in yard investments in the 2015-2019 Capital Program. The proposed program will invest $29 million in yard track and switches, replacing 1.2 miles of yard track and 20 yard switches. Additionally, $28 million is proposed for yard lighting improvements at 207th Street Yard and design and site-preparation for yard lighting at Coney Island Yard Complex in coordination with Sandy repairs. Yard security is another area of investment, with $33 million proposed to replace and/or upgrade fencing at two locations and install closed circuit television systems at various yards. NYC Transit also proposes $2 million for component repairs at car cleaning facilities at various yards.

New York City Transit Depots Category T-712

NYC Transit currently operates 21 depots and two major base shops located throughout New York City to support more than 4,400 buses. Depots collect revenue from buses, clean and fuel buses in preparation for service, perform routine maintenance and light repairs, and store buses when not in operation. Two depots, West Farms in the Bronx and Jackie Gleason in Brooklyn, are equipped to service buses that run on compressed natural gas and other depots have been modified to house articulated buses, which are a growing portion of the fleet. Base shops provide an extension to the maintenance capabilities of depots and perform scheduled bus overhaul/service, remanufacture components, and address other major repairs. Approximately 81 percent of bus depot and base shop components are in good repair.

The proposed 2015-2019 Capital Program will introduce a component repair strategy at depots and base shops that will address specific deficient components such as roofs, heating/ventilation systems and lighting. In parallel, NYC Transit will also continue to pursue depot reconstruction to accommodate recent and projected bus fleet growth.

In partnership with the NYC Department of Transportation, NYC Transit launched Select Bus Service (SBS) in 2008. NYC Transit has successfully implemented SBS on eight routes, improving bus speeds by approximately 20 percent and spurring ridership growth. Such improvements are made possible by the use of fewer stops, off-board fare payment, high-capacity articulated buses with boarding at all three doors, dedicated bus lanes, traffic signal priority, and distinctive branding.

Proposed 2015-2019 Capital Program - $582 million

A total of $171 million is proposed for depot and base shop component repairs. The component repair program will address deficient components such as HVAC systems, boilers, and roofs at six depots and one base shop as well as modifications at East New York and Grand Avenue Depots to accommodate articulated buses. Also proposed is $298 million to reconstruct the Jamaica Bus Depot. The project will address numerous functional deficiencies at the current depot, built in 1939, such as poor layout, inadequate work areas, and insufficient capacity. The project will help NYC Transit to reduce its reliance on outdoor street parking for buses, improving neighborhood conditions for nearby residents.

Additional investments of $113 million are planned for projects beyond depot reconstruction and component repairs. Projects include the replacement of bus washers, bus lifts, and depot equipment along with upgrades to elevators, storage tanks, and paint booths. Funding is also provided in the program for the expansion of SBS in continued partnership with the NYC Department of Transportation.

This proposal reflects anticipated savings of an average of 10 percent among select depot component, reconstruction, and equipment projects (see Table 6). Savings are expected from a possible design-build contract and creative phasing plan for the replacement of Jamaica Depot, contracting efficiencies from the coordination of component repairs across multiple depots, and greater use of life-extension techniques rather than full replacement for select components and equipment.

New York City Transit
Service Vehicles
Category T-713

NYC Transit owns and operates specialized fleets of non-revenue rubber-tire vehicles and work trains. Work trains are used system-wide and are the backbone of NYC Transit's right-of-way maintenance program. These vehicles support major construction (capital) and maintenance (operating) work, help to repair assets, and perform other critical services vital to supporting the successful and efficient operations.

The rubber-tire fleet consist of a total of approximately 640 specialized vehicles which are replaced through the capital program. Vehicles include armored trucks, tow trucks, mobile station washer trucks, and other miscellaneous vehicles. NYC Transit's approximately 496 work trains include diesel locomotives, refuse cars, hopper cars, snow throwers, flat cars, track geometry cars, and other vehicles. Locomotives transport non-propulsion work cars for various track, signal, and electrical projects. It is essential that service vehicles be maintained at a high level of reliability and availability. Delays or cancellations in the services provided by these vehicles may result in significant customer impacts, project delays, and operational inefficiencies.

Proposed 2015-2019 Capital Program - $222 million

The proposed 2015-2019 Capital Program includes $222 million to purchase new work trains and new non-revenue rubber tire vehicles.

$174 million is allocated for various work trains. More than half of this funding, $102 million, is to replace locomotives that have reached the end of their useful lives. The balance is to replace or upgrade specialized work train cars, including signal supply cars, refuse flat cars, and crane cars.

$49 million is allocated for the purchase of 294 non-revenue rubber-tire vehicles to replace vehicles at the end of their useful lives.

This proposal reflects anticipated savings of an average of 15 percent among select work train and rubber tire vehicle projects (see Table 6). Savings are expected through alternative contracting strategies to encourage more competition among bidders and the use of standardized design specifications.

New York City Transit Miscellaneous Category T-716

This category includes various investments to support the work of the capital program, such as insurance, engineering services, and environmental remediation. This category also includes investments in management information systems, passenger security, and administrative and employee facilities.

Proposed 2015-2019 Capital Program - $860 million

The proposed 2015-2019 Capital Program includes $860 million for miscellaneous investments. The program support components included in this category are in scale with previous capital programs. This investment includes insurance, engineering services, scope development, and the MTA independent engineer to support miscellaneous technical needs of the program. Among the engineering work is a study of the extension of the Eastern Parkway line to provide service on the 3 and 4 lines along Utica Avenue in Brooklyn. The study will be coordinated with the City of New York and may examine extension options, supporting land use changes, and financing strategies. The 2015-2019 Capital Plan includes funds to undertake critical station improvements at key locations such as Broadway Junction, Flushing Main Street, Vernon-Jackson Avenues, 86th Street Lexington Avenue, Sutphin/Archer/JFK, 149th Street-Grand Concourse, Jamaica Center Parsons/Archer, Marcy Avenue, Union Street and Fordham Road. These projects will seek to address station access, crowding, and other station issues and support the economic development and affordable housing strategy of the City of New York. Activities will include but are not limited to studies, planning, design and construction. In addition, $29 million is allocated for the administration of the Small Business Development Program, designed to provide a supportive framework for eligible firms to develop and grow within the construction industry and to establish stable, long-term business relationships with the MTA.

Other investments include improvements and repairs at assorted facilities including the consolidated revenue facility, Livingston Plaza, the Rail Control Center, Power Control Center, and many employee facility rooms located within passenger stations. Also, Police District Office #4 at 14th Street-Union Square will be rehabilitated. An additional $20 million is proposed for other passenger security measures. Various management information system projects are also proposed, such as data storage and server enhancements at 2 Broadway and an MTA-wide initiative for Enterprise Asset Management. NYC Transit will address various environmental and safety needs, such as asbestos monitoring and removal, fire alarm system replacement at various facilities, and environmental soil remediation.

This proposal reflects anticipated savings of an average of 10 percent among select employee facility projects (see Table 6). Savings are expected through greater use of component repairs and coordination with other co-located projects.

Staten Island Railway
SIR
Category S-707

Staten Island Railway was created in 1971 when the City of New York purchased the railroad from the Baltimore and Ohio Railroad Company. SIR serves over 15,000 daily riders and includes 64 railcars, 29 miles of mainline track, five track miles of yard track, 54 mainline switches, 20 yard switches, three support and maintenance shops, 29 bridge structures, and 6 power substations. SIR offers 24-hour service on a single line consisting of 21 stations from Tottenville at the southern end of the island to St. George Terminal in the north. (The count of stations reflects the consolidation of Atlantic and Nassau stations into the new Arthur Kill Station, now being constructed in the 2010-2014 Capital Program). Today, a number of SIR assets need investment to reach a state of good repair, including the line's railcars, stations, and portions of mainline track.

Proposed 2015-2019 Capital Program - $386 million

The proposed 2015-2019 Capital Program budgets $386 million for SIR, including significant investments in railcars and the power system. SIR's R44 railcar fleet, which has reached the end of its useful life, is proposed for replacement. To provide improved and reliable traction power for the new fleet, three new power substations will be constructed to increase the power supply on the line. Additionally, following a successful pilot, a capital project to support the rollout of customer information signs that will provide real-time train arrival information at all stations is included in the proposed program. Other SIR work includes mainline track replacement, radio system enhancement, and component repairs at various stations.

MTA Capital Program 2015-2019
Long Island Rail Road

Asset Base – Long Island Rail Road

Table 7
Selected Long Island Rail Road Assets

Category	Assets	
Rolling Stock	1,006	Electric Cars
	45	Locomotives
	134	Bi-Level Coaches
Passenger Stations	124	Stations
Track	515	Miles of Mainline Track
	537	Mainline Switches
Line Structures	162	Overhead Bridges
	478	Undergrade Bridges
Communications and Signals	440	Track Miles of Mainline Signal Equipment
Power	108	Substations
	328	Track Miles of Third Rail Power
Shops and Yards	25	Shops and Yards

Overview – Long Island Rail Road

The Long Island Rail Road is one of the largest and busiest commuter railroads in North America, carrying 85.9 million passengers in 2014. LIRR infrastructure includes 515 miles of main line track, 295 at-grade-crossings and 124 stations on 11 branch lines. On an average weekday, the LIRR carries 298,000 passengers on 740 trains.

Continued capital investment over the past three decades through five-year programs has allowed the LIRR to address deferred maintenance across the LIRR system. Asset inventory databases allow for the tracking and classification of all critical components and form the basis for developing the normal replacement portion of the LIRR's proposed 2015-2019 Capital Program. In addition to these investments - which maintain LIRR's ability to reliably run the current level of service, protecting the legacy of the oldest commuter railroad in the country - a significant portion of the 2015-2019 program is focused on service improvements which will maximize the benefits associated with new LIRR service into Grand Central Terminal (GCT) via the East Side Access project.

Proposed 2015-2019 Capital Program - $2.835 billion

The MTA LIRR's proposed 2015-2019 Capital Program demonstrates the agency's ongoing commitment to maintaining and enhancing mobility, economic health, and quality of life in the region. The proposed 2015-2019 Capital Program includes investments of $2.835 billion over the course of the program (Table 8). These investments work towards preserving LIRR assets through funding of its most essential components - rolling stock, stations, track, communications/signals, power, and shops and yards, along with continued investment in bridges/viaducts. In addition, system improvements identified within the Stations, Parking, Track, Shops & Yards, and Power categories will improve customer service and position the LIRR to serve new markets and more fully realize the benefits of service to two Manhattan Terminals – Penn Station and Grand Central Terminal. Finally, funds are allocated to provide for miscellaneous program costs to support these activities. LIRR has proposed funds in support of the MTA-wide Small Business Development Program, including its share of the cost to administer the program and $68 million in anticipated mentoring scope within its program to help meet the MTA mentoring goals.

Table 8 details the proposed 2015-2019 Capital Program by asset category and percentage of overall program.

Table 8
Long Island Rail Road Proposed 2015-2019 Capital Program by Category ($ in millions)

Category	Proposed 2015-2019	Percent
Rolling Stock	$500	18%
Stations	399	14%
Track	795	28%
Line Structures	160	6%
Communications and Signals	378	13%
Shops and Yards	211	7%
Power	227	8%
Miscellaneous	165	6%
Total	$2,835	100%

Numbers may not total due to rounding

Program Evolution

This plan for Long Island Rail Road totals $2.835 billion, which is a reduction of $285 million compared to the previous LIRR 2015–2019 capital plan proposal that was submitted in September 2014. This $285 million reduction is the net effect of several factors:

Program Efficiencies

The revised plan assumes savings to be realized by pursuing more efficient design and construction opportunities in project delivery. These savings are expected to be generated via the following efficiencies:

- Undertaking intensive coordination of track outages to facilitate multiple projects on the same branch / branch segment and maximizing the use of "piggy backing" for the same track outage. This works to minimize service disruptions and associated substitute busing costs, while also reducing agency support costs.
- Implement mid-day station closures (where feasible) to increase efficiency of station, track and signal construction

Table 9 below presents the elements in which these savings are assumed. Projects in these elements that are expected to realize savings via efficiencies are starred (**) in the "blue pages" listing of projects. The budgets of those projects which have been starred have been reduced to reflect the agency's best estimate at the time of this plan resubmission. LIRR will work to meet these reductions by incorporating efficiency strategies as the project progresses.

Table 9
Long Island Rail Road Capital Program Savings Due to Program Efficiencies ($ in millions)

Category	Type of Project	% Red.	Assumed Savings	Likely Efficiencies
L702	Stations	12%	$35	Undertake intensive coordination of track outages amongst multiple capital projects to maximize "piggy backing" opportunities, along with mid-day station closures for construction (where feasible) Leverage contributions from municipalities and private development towards construction of new LIRR stations.
L705	Communications and Signals	8%	32	Undertake intensive coordination of track outages amongst multiple capital projects to maximize "piggy backing" opportunities, along with mid-day station closures for construction (where feasible).
Total			$67	

Numbers may not total due to rounding

Revised Estimates

In the time that has elapsed since the September 2014 plan submission, projects have advanced further in the scope development and design process, resulting in better cost estimate information upon which to establish project budgets. This is particularly true for projects in the Bridges element.

Priority Changes

LIRR has been undertaking a review of all projects in the plan, to reflect new information since the September 2014 submission for the 2015 – 2019 time period. This includes a review of ongoing normal replacement / state of good repair programs as well as large investment efforts which span multiple capital programs to identify efforts which could be better progressed following the 2015 – 2019 Program without impact on operations or maintenance and inspection programs. In addition, needs addressed in this plan reflect the most up-to-date field condition data. This is particularly true for projects in the Track Asset Category. Finally, the LIRR has re-examined the anticipated power substation investments, adjusting the balance of work between substations identified for full replacement and those substations which would be part of the substation component program

Major Investments

Primary elements of this proposed program include investments to maintain core infrastructure and smart investments that will enhance mobility, customer satisfaction, safety, and security.

Core Infrastructure

The Long Island Rail Road continues the progress made since the inception of the first Capital Program in 1982, with significant infrastructure investments in the proposed 2015-2019 Capital Program. Investments to maintain the core infrastructure account for 67 percent of the proposed 2015-2019 Capital Program, across all asset categories. This intensive level of investment assures that system components are replaced at the end of their useful life, avoiding the service disruptions and added maintenance expenses that occur when components unexpectedly fail. All LIRR asset categories, with the exception of Bridges and Viaducts, are currently under a normal replacement cycle. Maintaining this classification is the goal of projects identified in the Stations, Track, Communications and Signals, Shops and Yards, and Power investment categories. Key projects include:

- Replacing platforms and associated station components at three stations: Babylon, Nostrand Avenue, and Hunterspoint Avenue.
- Reconstructing and upgrading Mets – Willets Point station.
- Upgrading the LIRR signal network by installing bi-directional Automatic Speed Control (ASC) using cab signaling in segments where it does not currently exist, including Dark Territory, and a more robust signal normal replacement program, which targets aging and deteriorated signal system components.
- Continuing multiple infrastructure improvement programs such as the Annual Track Program and the continued upgrade and build out of the Fiber Optic Network.
- Undertaking an expanded program of bridge painting and bridge waterproofing to address and prevent rust, corrosion and water infiltration.
- Implementing a substation component replacement program to address the most poorly rated components within aging substations thereby protecting operational reliability.

Regional Mobility

Close to 75 percent of Nassau and Suffolk County residents who commute to Manhattan for work use the LIRR, and that reliance on public transportation leads to cleaner air, improved mobility, and an all-around better quality of life for residents of this populous region. To remain the vital force in transportation that Long Islanders rely on and to continue contributing to the region's future growth and well-being, LIRR must prepare for the future. At present, capacity issues at key locations impact LIRR's ability to respond to market demand. Penn Station, LIRR's Manhattan terminal, is currently at capacity during many periods of the day. The station's 21 tracks – shared by the LIRR, Amtrak and New Jersey Transit – carry over 1,000 trains each day, and service growth is simply impossible. The East Side Access project, which will provide the LIRR with a second Manhattan terminal (Grand Central Terminal), will allow direct Long Island Rail Road service to the east side of Manhattan for the first time ever. This enhanced train service will bring Long Island residents closer to their final destination, thus reducing travel time and congestion at Penn Station and the subway lines serving it.

Building upon this, proposed investments in this program support the growing role Long Island Rail Road plays in the transportation of intra-Island riders and commuters working non-traditional hours, as well as leisure travelers taking

advantage of the region's wealth of cultural attractions. This program will complete a vision realized during the 1980s Main Line electrification project – a full second track on the Main Line between Farmingdale and Ronkonkoma. This tremendously important investment will greatly improve reliability and allow for expanded service in this very busy suburban travel corridor.

Customer Satisfaction

The MTA Long Island Rail Road has a long history of contributing to the quality of life of area residents. From its founding in 1834, the Long Island Rail Road has been a vital lifeline for Long Island and New York City, leading to the growth and development of the communities it serves and providing a gateway for the economic growth of the region. Today, as an essential component of the region's transportation infrastructure, the LIRR is looking to provide opportunities for further ridership growth, incorporate modern technology, and improve accessibility for all riders. The proposed 2015-2019 Capital Program includes a variety of such smart investments to enhance service capacity, create new system capabilities and increase customer satisfaction.

21st Century Electric Fleet

Between 2002 and 2007, the LIRR completed a major fleet replacement effort, retiring the almost 40 year old M-1 electric cars and replacing them with 836 M-7 cars. The state-of-the-art M-7 fleet has proven to be extremely reliable, as demonstrated by the increase in the number of miles traveled prior to unscheduled maintenance. The M-7 car sets the standard for a comfortable 21st century LIRR experience, reflecting feedback received from customer focus groups and incorporating improvements in seating, enhanced lighting, window design, public address systems and restrooms. Auxiliary power units and climate control units were also doubled for greater reliability and comfort and the cars meet all requirements of the Americans with Disabilities Act. Building on these successes, the proposed 2015 – 2019 Program will continue the purchase of new M-9 electric cars, an effort which began in the 2010 – 2014 Capital Program. This continued fleet modernization effort will complete the replacement of the aging M-3 electric fleet, which faces a number of service reliability challenges and dated system technology. New car purchases are also needed to support future operational needs associated with Grand Central service.

Station and Parking Improvements

The last 20 years have seen numerous investments in LIRR stations throughout the system, including installation of elevators and other improvements to make stations wheelchair accessible; renewal of public restrooms, waiting areas, and ticket offices; station plaza areas; platforms; and targeted parking rehabilitation and expansion to maximize availability for LIRR customers.

Among these investments, two of the LIRR's busiest stations, Jamaica and Atlantic Terminal, underwent tremendous transformation. As the LIRR's hub station, Jamaica has long served as the connecting point between 10 LIRR branches and the three Western Terminals (Penn Station, Atlantic Terminal and Hunterspoint Avenue). Since the Port Authority of New York and New Jersey's JFK AirTrain service began in December 2003, Jamaica Station has also become a busy transfer point for travelers to and from JFK International Airport. In 2013, rehabilitation work was completed on the historic Jamaica Station Building, which houses the station's ticket office and customer waiting room, as well as LIRR corporate offices and facilities for key operations. Restoration work on this century-old structure included roof replacement, repairs to terra cotta and façade ornamentation, extensive painting, replacement of exterior doors and windows, new exterior building lighting, amongst other work elements. With these recently completed capital investments, Jamaica Station ushers in the 21st century, with its vaulted glass and steel structure and adjacent iconic station building serving as a landmark within the community and providing a modern facility for current and future LIRR customers.

Since 2012, all 121 LIRR branch line stations have Audio Visual Paging System (AVPS), which uses electronic signs

on station platforms and in station buildings to provide customers with real time train information. This includes audio and visual message delivery with station stopping patterns for upcoming trains, critical safety reminders, and information about upcoming service changes.

Capital improvements which will transform numerous LIRR stations, including platform replacement and associated improvements are underway at Wantagh and Hicksville stations, and recently have been completed at Massapequa station. As well, installation of new elevators and station upgrades are underway at Flushing – Main Street station and recently have been completed at Queens Village. These projects are transforming the customer environment at key locations, enhancing customer safety, and greatly improving station access by providing ADA amenities.

This proposed program also features $25 million for the development and expansion of commuter parking. This will build upon previous parking investments made through the Capital Program, including the Mineola Intermodal Center and the Wyandanch Parking Facility, which opened for service in August 2015. The current parking needs for LIRR customers will grow in the future, particularly once East Side Access service opens. Site selection for the new parking facility will target the busiest LIRR electric branches, prioritizing stations also served by multiple bus routes to provide multi-modal transit opportunities. Where possible, consideration will also be given to Transit Oriented Development to partner with the community so that MTA investments can be coordinated with land use policies that encourage compact development and convenient access to the system for its customers.

Safety and Security

The Long Island Rail Road continues to embrace customer and employee safety as its highest corporate priority. Along with customer awareness and employee safety programs, safety is maintained and enhanced through the timely replacement of aging capital assets to maintain their structural and functional integrity. The proposed 2015-2019 Capital Program demonstrates this commitment through investments to enhance customer and employee safety on trains, in stations and terminals, in yards and employee facilities, and along LIRR's right-of-way. Most notable is the renewal work in the Line Structures, Signals and Power categories, with an enhanced Signal normal replacement program and a new, robust program for Substation Component Replacement, in addition to ongoing programs to rehabilitate and replace aging bridges. The efforts to address backlogged needs in line structures also continue with aggressive bridge painting and bridge waterproofing campaigns.

Security in LIRR terminals and stations and along the right-of-way is closely coordinated with the MTA as well as with other local, state and federal agencies. Continued emphasis is placed on structural hardening, surveillance, and physical barriers - such as fencing - to secure the LIRR system and its assets.

The Long Island Rail Road will also complete the federally mandated Positive Train Control project to enhance rail safety system-wide. Initial investment in this critical technology began in the 2010-2014 Capital Program.

This package of proposed rolling stock and infrastructure investments will work to maintain and improve service levels and on time performance. All system components must work reliably in order to continue to deliver the high quality, safe transportation service so vital to the region and its economy for another 180 years.

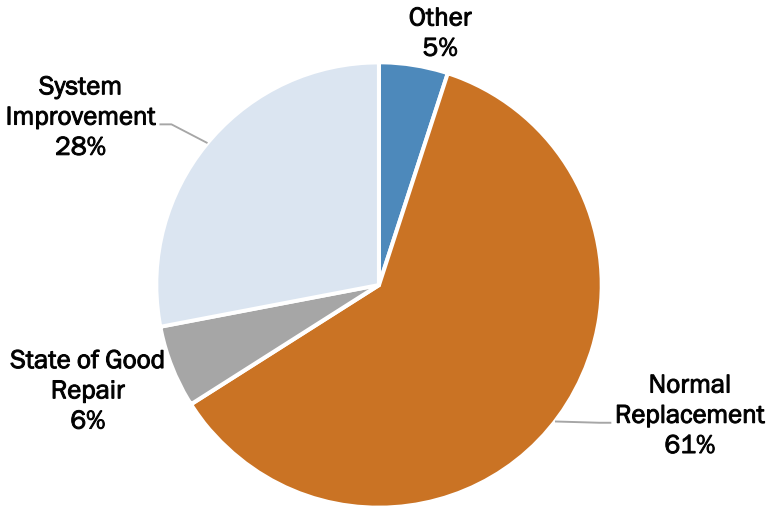
System Condition

Investments in its capital assets since 1982 have allowed the Long Island Rail Road to improve its operations, thus providing an invaluable service to the region by ensuring the legacy of the railroad. The MTA's proposed 2015-2019 Capital Program continues this legacy and looks to the future with system improvement projects that will expand

capacity, increase levels of service, and support new LIRR service to Grand Central Terminal.

The proposed 2015– 2019 Capital Program allocates 67 percent of its funding to state of good repair and normal replacement projects, and 28 percent to smart investments that will improve the system (System Improvements). Included in this system improvement funding are new stations, expansion and upgrades to track capacity, and new investments in signals and communications (Figure 4).

Figure 4
Long Island Rail Road Proposed 2015-2019 Capital Program by Needs



As described in the recently published 2015-2034 Twenty-Year Capital Needs Assessment, the MTA is recognizing the fiscal realities of maintaining its assets by revamping the strategies by which assets are repaired and modernized, placing much greater emphasis on lower-cost component replacement rather than complete reconstruction of facilities. This shift is an outgrowth of the component investment strategy that was successfully introduced for New York City Transit passenger stations in the 2010-2014 Capital Program, and is now being applied in certain areas of the LIRR programs for stations, line structures, signals, and power.

Line Structures is the only asset category LIRR has identified as not in a state of good repair. In recent years, the LIRR has made significant progress on this category with the completion of structural renewal on the Atlantic Avenue Viaduct. Regular bridge inspections and maintenance also ensure the safety and operation of these assets. In addition, other assets have components with replacement needs that will be reflected in future asset inventory updates.

Long Island Rail Road
Rolling Stock
Category L-701

MTA Long Island Rail Road currently has a fleet of 836 M-7 EMU cars, 170 M-3 EMU cars, 45 locomotives (including 22 DM and 23 DE), 134 bi-level coaches, and a fleet of work locomotives and other maintenance rolling stock.

From 2002 to 2007, LIRR rolling stock underwent its most dramatic transformation in over 30 years. The M-1 cars, which entered service in 1968-1972, were decommissioned and 836 new M-7 cars were put into service. The M-7 cars incorporate improvements in lighting, HVAC, and on-board announcements. The reliability of this new fleet has greatly exceeded contract goals, being able to travel hundreds of thousands of miles before unscheduled maintenance.

Another asset vital to service performance is work / protect locomotives. These locomotives are used to transport material, fight icing and fall leaf conditions, and haul disabled trains.

Proposed 2015-2019 Capital Program - $500 million

M-9 Procurement

This project will continue the purchase of new M-9 electric cars, which was initiated in the 2010 – 2014 Capital Program. This continued fleet purchase will allow for the replacement of the LIRR's remaining M-3 electric fleet (88 cars), which faces a number of service reliability challenges and dated system technology. In addition, a key system improvement component is the procurement of up to 76 new M-9 cars which will prepare the LIRR for future service to Grand Central Terminal, by expanding the size of the LIRR electric fleet. This procurement is being coordinated with cars purchased under the East Side Access project.

Long Island Rail Road Stations Category L-702

The Long Island Rail Road operates 11 rail branch lines and serves customers at 124 stations in Nassau and Suffolk Counties and New York City. The Stations and Parking Program works to maintain and modernize LIRR stations, focusing on replacing station components like staircases, elevators / escalators, platforms and canopies, as well as restoring station buildings. These projects ensure a safe and comfortable customer environment. As the gateway to the LIRR system, stations play an important role in the LIRR customer experience and an integral role in community identity.

The Long Island Rail Road, currently responsible for 60 percent of the train service into and out of Penn Station, contributes toward capital investment in Penn Station to ensure that this crucial part of the LIRR system continues to function smoothly as Long Island's entry to Manhattan. Because Penn Station is LIRR's most important and busiest terminal, it is essential that this facility be maintained and improved.

Proposed 2015-2019 Capital Program - $399 million

This proposed program includes initiatives to increase customer satisfaction by providing a comfortable and safe station environment. These projects invest in many station components, including platforms, staircases, shelters, waiting rooms, escalators, elevators, and station parking.

Babylon Station Platform Replacement - $39 million

This project includes design, demolition and reconstruction of the station's two platforms and platform waiting rooms, as well as renewal of the canopy roofing system, and replacement of platform lighting, staircases, escalators, and elevators.

Nostrand Avenue Station Rehabilitation - $21 million

Improvements to this viaduct station in Brooklyn include demolition and replacement of both platforms, replacement of staircases, canopies, railings, station lighting, along with security and communication systems. Two new elevators will be installed, making this station wheelchair accessible. Design for this station rehabilitation effort was performed in the 2010 – 2014 Program in conjunction with the recently completed multi-phased Atlantic Avenue Viaduct rehabilitation.

Mets-Willets Point Station - $78 million

Replacement and upgrade of the LIRR's Mets-Willets Point Station will include infrastructure upgrades to support full-time service. The station will continue to play an integral part in supporting sport and entertainment events at adjacent regional venues and will be designed to accommodate large volumes of railroad customers. The new station will feature seamless, direct access from the LIRR Station to the proposed LaGuardia Air Train Station.

LIRR will complete a Preliminary Design and Environmental Review to be transferred to the Port Authority of New York & New Jersey to procure a design-build contractor for a cohesive vision, design and construction of the Mets-Willets Transit Hub. The design will utilize a consultant to advise on industry best practices as a means to improve station amenities, transportation mode changeability, and access, as well as provide a world class customer experience.

New LIRR Stations - Elmhurst and Republic - $36 million

These projects will advance two new LIRR stations – Elmhurst, on the Port Washington Branch in Queens, and Republic, on the Main Line in Suffolk County. A new Elmhurst station will provide commuter railroad service to this vibrant community.

Proposed station elements for both locations include two new 12-car platforms, along with staircases, platform railings, platform shelters, ticket vending machines, as well as lighting, communication and security systems, and site improvements. Both stations will be fully ADA compliant, with elevator service at Elmhurst Station and ADA ramps at Republic. This proposed program includes the environmental review, design and construction of Elmhurst along with environmental review and design of Republic, supporting station construction in a future capital program.

Enhanced Station Initiative, 5 Stations - $25 million

This effort will target features to improve station aesthetics and the customer experience. Enhancements may include art components, safety/security, improved/renewed signage, passenger amenities, lighting, railings and staircases and customer information systems. This project will utilize the services of a consultant to advise on industry best practices as a means to enhance station aesthetics, amenities, and passenger experience and improving stations through design innovation and excellence, all with minimal disruptions to customers. This project could include work elements at the following stations: Bayside, East Hampton, Port Jefferson, Stewart Manor, and Wyandanch.

Other Station Improvements - $52 million

Other station improvement projects include a $22 million renewal of Hunterspoint Avenue Station, including replacement of the platform, canopy, lighting and other station components. Installation of a new elevator will make this station wheelchair accessible.

At Murray Hill Station, on the Port Washington Branch in Queens, new elevators will be installed, along with associated station improvements – making this station wheelchair accessible. At Port Washington Station, a number of improvements are planned, including replacement of the station overpasses and platform canopies, along with other station improvements. These improvements are $19 million.

Finally, the LIRR and MNR will each be contributing $11 million to a joint LIRR-MNR project in Grand Central Terminal, which constructs facilities to remove station trash and recycling and haul it away via rail.

Station Component Replacement Work - $21 million

The LIRR proposes a number of station component replacement investments, including programs to replace station signage, station platform lighting, platform railings, and station and building electrical systems at various station locations throughout the LIRR system. These efforts will work towards modernizing and improving LIRR stations, while enhancing the customer experience and safety.

New Fare Payment System - $5 million

The $5 million allocated to advancing the MTA-wide new fare payment system will support the MTA-wide efforts to allow customers to use a single smart card, or cell phone with a smart chip to ride the entire MTA network.

Penn Station Investments - $71 million

Investments in support of LIRR's busiest station, and the busiest train station on the North American continent, focus on customer improvements, including the replacement of two-decade old elevators and escalators in the LIRR area of the station, along with rehabilitation of stairs, platform lighting and other station components. The Penn

Station Complex Improvements project will advance early initiatives identified as part of the Penn Station Visioning effort. The Vision project recommended enhancements to corridors, access points, lighting, signage and wayfinding and a general improving of the space available for passenger circulation. The proposed program would begin initial implementation of these recommendations.

Parking - $30 million

The proposed 2015-2019 Capital Program includes a $25 million project for the development and expansion of commuter parking through the construction of a multi-story parking facility in order to increase the availability of commuter parking. The LIRR currently has a commuter parking space deficit at its busiest stations, and the need for commuter parking will grow in the future, particularly after direct LIRR service to Manhattan's East Side becomes available. While parking deck locations have not been determined yet, candidates are Level 1 stations (having more than 6,000 passenger trips per weekday) and Level 2 stations (having between 2,000 and 6,000 passenger trips per weekday) on the busiest electric branches. Priority consideration will be given to stations which are also served by multiple bus routes and other transit connections, in order to provide multi-modal transit opportunities.

A $5 million project for Parking Rehabilitation will undertake rehabilitation work at existing commuter parking facilities which are in need of capital renewal based on condition. The Ronkonkoma Parking Facility has been identified as priority for these funds, as this heavily-utilized facility has been in service for almost two decades, and requires capital rehabilitation.

Mentoring - $22 million

Various contracts supporting the station program will be awarded through the MTA Small Business Development Program (SBDP).

This proposal reflects anticipated programmatic savings of an average of 12 percent among selected station projects in this category (see Table 9). Savings are expected as a result of intensive coordination of track outages amongst multiple capital projects to maximize "piggy backing" opportunities, mid-day station closures for construction (where feasible), and leveraging of contributions from municipalities and private development towards construction of new LIRR stations.

Long Island Rail Road
Track
Category L-703

MTA Long Island Rail Road has 515 miles of main line track (with 537 mainline switches) and 155 miles of yard and siding track. The track program is focused on economically supporting the safe operation of trains at maximum allowable speed with full Federal Railroad Administration (FRA) compliance, while minimizing the impact of track outages on customers. Track assets are currently maintained through on-going annual track renewal programs, which replace components on a life-cycle basis. The cyclical replacement of track rail components is based on age, condition and physical inspection.

System enhancement initiatives include a project to expand track capacity on the Main Line in Suffolk County, as well as a project to continue to modernize and improve the track-level infrastructure in Jamaica.

Right-of-way projects consist of drainage control, track stability/retaining walls, demolitions and fencing, which are intended to improve the physical condition of the right-of-way, ensuring safe and efficient operation of trains system-wide.

Proposed 2015-2019 Capital Program - $795 million

Track investments build upon significant investments in previous programs in full support of LIRR long-term goals, based on a Track Strategy to maintain and upgrade the track system.

Track Program - $321 million

The track program consists of the normal replacement of track components, based upon component age and condition. Elements of the Track Program include installation of wood ties (mechanized), rail, wood switches, concrete switches, field welds, surfacing, drainage, rail profiling and track stability along the right-of-way, grade crossing investments and new construction equipment to support track projects.

Right-of-Way Improvements - $17 million

LIRR will also make various right-of-way improvements, including rehabilitation of retaining walls which hold back embankments to protect the track bed, along with work to address drainage and culvert deficiencies along the right-of-way, such as replacing concrete sluiceways, installation of drainage basins and some drainpipe replacement. In addition, high security fencing will be installed at sites which have been identified as priority, based upon site risk assessments and history of trespassers. Finally, demolition efforts will remove abandoned structures along the right-of-way that pose a potential danger to employees and customers and are eyesores in the communities where they are located.

Jamaica Capacity Improvements - Phase 2 - $140 million

Population forecasts for the New York region project increased population for Nassau, Suffolk and Queens Counties, creating a demand for additional LIRR service. In addition to growth in the LIRR's core market of commuters traveling between Long Island and Manhattan, the LIRR also anticipates growth in the intra-island and reverse commute markets, reflecting forecasted job growth in Nassau and Suffolk Counties.

In support of this future service demand, the LIRR is in the midst of a multi-phase effort to modernize and improve the infrastructure in Jamaica – a critical hub and main transfer location for LIRR, located in central Queens. Due to the vital role it plays in the LIRR's operations, infrastructure investments need to be made in the vicinity of Jamaica

Station to increase station throughput in conjunction with service expansion. Current constraints in track and station capacity limit the number of trains which Jamaica station can accommodate during peak periods. By implementing new configurations for the interlockings both east and west of Jamaica station, this complex will be modernized, through a new track layout, new signals, and new higher speed crossover switches. As East Side Access service begins, the public will benefit directly from these investments because trains will be able to enter and leave the station more quickly.

Building upon the Phase I work undertaken in the 2010 – 2014 Capital Program, the LIRR applied implementation efficiencies to the schedule for this latest phase, reducing the 2015 – 2019 investment by $205 million while continuing to modernize the track level infrastructure both east and west of Jamaica Station, installing higher speed switches and creating more streamlined track routings though the Jamaica complex. In doing so, this effort will also address selected state of good repair needs, by replacing and upgrading track, signal and switch components, many of which have exceeded their useful lives and are in need of modernization.

Amtrak Territory Investments - $68 million

This project provides funding for LIRR's Baseline Capital Contribution to the North East Corridor pursuant to the Passenger Rail Investment and Improvement Act (PRIIA) and other major investments in the Penn Station and East River Tunnel joint use territory. This includes the continuation of the total track replacement work in the East River Tunnels that began in the 2010-2014 Capital Program.

Main Line Double Track Phase 2 - $250 million

The LIRR's Main Line from Farmingdale to Ronkonkoma is largely single track, with double tracking only at stations and selected passing sidings. This results in a very fragile operation, where it is very challenging to recover from adverse operational conditions and service disruptions. Infrastructure challenges also create timetable limitations, particularly for off-peak trains. To address these challenges and to enhance service reliability and train service opportunities along this very critical corridor, the LIRR is currently constructing a full second track. The first phase, covering Ronkonkoma to Central Islip, is under construction and funded in the 2010 – 2014 Capital Program. Phase 2 in the proposed 2015 – 2019 Capital Program will complete the double track, by constructing the Central Islip to Farmingdale segment.

A full second track between Farmingdale and Ronkonkoma will greatly enhance customer satisfaction and operational performance on this segment of the LIRR. When Phase 2 is completed, the LIRR will be able to provide bi-directional, half-hourly off-peak service in this corridor, greatly enhancing service opportunities for customers.

Long Island Rail Road
Line Structures
Category L-704

MTA Long Island Rail Road maintains 30 viaducts and 640 bridges system-wide (including pedestrian, overgrade and undergrade bridges), along with the Atlantic and Bay Ridge Branch Tunnels. Of these, 478 are undergrade bridges. In conjunction with Amtrak, the LIRR advances Fire and Life Safety and other improvements within the four East River Tunnels. The long-term Bridge and Viaduct program aims to address backlogged capital renewal and asset investment needs. Currently, the Line Structures is the only asset category LIRR has identified as not currently in a normal replacement cycle. This does not mean that the asset is in an unsafe condition; it characterizes the level of cost and effort to maintain the asset through the operating budget.

Proposed 2015-2019 Capital Program - $160 million

This program consists of the renewal/replacement of bridges and viaducts in locations throughout the LIRR system. These investments will allow LIRR to continue its move towards addressing backlogged capital investment in this category.

Bridge Program - Structural - $66 million

This project provides for rehabilitation of bridges, including two structures – Buckram Road on the Oyster Bay Branch and Springfield Boulevard on the Main Line – where preliminary design work is being undertaken as part of the 2010 – 2014 Capital Program. The proposal includes a full replacement of the Buckram Road Bridge. For Springfield Boulevard, the rehabilitation plan consists of girder repairs, diaphragm and stiffener renewal, deck and under-deck rehabilitation. Other bridge locations, to be identified, will be included within this project.

Main Line Bridges - $48 million

A key element of this proposed project is the replacement of the Post Avenue Bridge in Westbury. Not only is this century old bridge deteriorated and in need of full replacement, but due to its limited clearance, it is subjected frequently to vehicular strikes, particularly from trucks. The Program Development project in the 2010 – 2014 Capital Program funded the preliminary design for replacement of this bridge. The design calls for a new bridge with increased clearance, which will improve safety and reduce the operational impacts associated with bridge strikes. The new bridge will consist of three bridge bays, providing the bridge width necessary to support a future third track along the Main Line. This project will also include renewal and rehabilitation of other bridges to be identified on the Main Line.

Bridge Painting/Waterproofing - $17 million

In order to continue to address capital investment needs on bridges and viaducts, the Railroad will continue the bridge painting program established in the 2005-2009 Capital Program. By addressing past deferred painting, these line structures will be protected from the elements, as painting provides a protective covering in addition to improving the structure's aesthetics. In addition to painting, waterproofing is a key aspect of the LIRR's strategy to bring the Line Structures category into a state of good repair. By replacing the bridge waterproofing – a membrane which is located between the track bed and the bridge structure itself – the bridge structure is better protected from water infiltration. This serves to inhibit bridge component deterioration which can negatively impact the bridge's function.

Other Line Structures Initiatives - $6 million

In conjunction with ongoing East Side Access-related construction being managed by the MTA Capital Construction Company, a portion of the Montauk Cut-off in western Queens will be demolished. The Montauk Cut-Off is an elevated structure which was previously utilized for freight train service but has been out of service for many years. This project will remove the portion of the viaduct located between the Mid-day Storage Yard and Arch Street Shop – two facilities in Queens which will support East Side Access operational needs by providing a location to store and maintain LIRR train equipment which provides service to Grand Central Terminal. Removing this portion of the Montauk Cut-Off will allow LIRR train equipment to operate between the Mid-Day Storage Yard and the Arch Street Facility, thereby supporting fleet maintenance needs.

Mentoring - $23 million

Various contracts supporting the line structures program will be awarded through the MTA Small Business Development Program (SBDP). These will include bridge painting and selected bridge structural renewal initiatives.

Long Island Rail Road
Communication and Signals
Category L-705

The various systems which make up the Communications asset serve three main purposes: communication with LIRR customers, communication between LIRR employees, and security-related assets. These functions are supported by the Communications Backbone, a fiber optic network and associated system components that support all applications, including Security, Radio, Telephone, etc., in addition to the corporate network.

Communication with LIRR customers includes station public address systems / digital displays. Communication between LIRR employees includes the vital voice hardware and telephone systems utilized by the Transportation Department. The Communications Backbone is the system-wide infrastructure, including fiber optic and copper cable, communication poles, and hardware, which supports various vital communications systems and allows transmission of voice, radio and data between locations within the LIRR service area. The Communications Asset also includes systems which monitor safety and security of LIRR stations, facilities, and structures, including fire alarms and the Atlantic Avenue Tunnel intrusion detection system.

Communication investments focus on the continued fiber optic network build-out, improvements to radio communications, and security-related investments.

The Long Island Rail Road's signal infrastructure ensures the safe routing of 740 scheduled trains each weekday. Because of the LIRR's age and size, the railroad has a very diverse collection of signal types and technologies, ranging from antiquated relay-based systems to modernized microprocessor technology. The LIRR's signal system includes the track circuit-based automatic speed control system as well as the crossing gate protection infrastructure at highway crossings over railroad tracks.

Signal investments are determined by the Signal Strategy, which considers the age, condition, reliability, and suitability of the equipment. One of the major focuses of the LIRR is to upgrade the signal network by installing bi-directional Automatic Speed Control (ASC) using cab signaling in segments where it does not currently exist.

Proposed 2015-2019 Capital Program - $378 million

The proposed program advances the efforts of the LIRR's Communications and Signals Strategies, addressing current and future needs, progressing component replacements and system improvements.

Communications - $57 million

The Long Island Rail Road's proposed 2015-2019 Capital Program includes a $34 million project to continue the multi-program effort to upgrade and build out the fiber optic network. This includes the replacement of aging, obsolete equipment which can no longer be maintained. The proposed fiber optic network project also includes installation of new fiber and fiber optic hardware throughout the LIRR network to facilitate the transmission of data, voice and video data from stations, signal and communication huts, substations, employee facilities, and other key locations. This program also includes continued replacement of communications poles and hardware and deteriorated copper cable infrastructure at various locations along LIRR right-of-way. In addition, the Federal Communications Commission (FCC) Compliance project will continue system migration to a narrow-band radio frequency by upgrading and replacing radios, radio equipment and infrastructure to be compatible with the narrow-band frequency. These projects total $15 million.

This proposed program includes two projects totaling $6 million: one to replace deteriorated radiax cable in Lines 3 and 4 of the East River Tunnels and selected track-level areas of Penn Station; and a public address system project to replace and upgrade station hardware and system components of the Audio Visual Paging System. The latter includes replacement of the control computer equipment at stations as well as installation of upgraded electronic display signs at select locations.

This program also includes select security investments to safeguard LIRR customers, employees, and infrastructure.

Signals - $321 million

The Long Island Rail Road's proposed 2015-2019 Capital Program includes funds to advance LIRR's long-term signal strategy. As part of its ongoing efforts to maintain signal assets, the LIRR has included a $40 million Signal normal replacement project to renew and upgrade existing signal component equipment at locations throughout the LIRR system.

Also, targeting one of the most critical needs for signal investment, the $52 million Babylon Interlocking Renewal project will replace and upgrade aging signal equipment in the vicinity of Babylon Station, including switches, signals, cables and other signal system components.

In order to increase safety and comply with federal mandates, a $126 million project is included to complete Positive Train Control (PTC) investments, which will include wayside and on-board train control elements. This builds upon PTC investments undertaken in previous capital programs.

The proposed Ronkonkoma to Yaphank Signalization project addresses some of the remaining areas of dark territory within the LIRR system. Currently, the area east of Ronkonkoma is not signalized. This $29 million project will upgrade the Ronkonkoma to Yaphank segment, including installing track circuits and automatic speed control (ASC).

The proposed $44 million Babylon to Patchogue project will upgrade and modernize the signal system within this segment of the Montauk Branch. In conjunction with other capital projects which are underway, this will provide for a modernized, speed control signal system between Babylon and Montauk.

This proposed program also continues efforts towards Centralized Train Control, with a total of $20 million to advance tower migration into the central control facility in Jamaica, thereby creating a greater concentration of the LIRR's train dispatching and supervision functions within a single location.

Finally, a design effort for a new Hunt to Post signal system will advance the replacement and modernization of signal technology along a portion of the Port Jefferson Branch, between Huntington and Smithtown. Finally, investments in system-wide Lightning Protection will focus on key interlocking locations, providing an upgrade to the latest surge protection standards. These two projects total $10 million.

This proposal reflects anticipated programmatic savings of an average of 8 percent among selected signal projects in this category (see Table 9). Savings are expected as a result of intensive coordination of track outages amongst multiple capital projects to maximize "piggy backing" opportunities, along with mid-day station closures for construction (where feasible).

Long Island Rail Road
Shops and Yards
Category L-706

Currently, the Long Island Rail Road operates 25 shops and yards for fleet storage, maintenance and inspection services. With the purchase of M-9 cars to support East Side Access service, it is necessary to construct new train yards to store and maintain the expanded fleet, ensuring that train consists are housed in locations that allow for full rush hour service.

Another key element of the LIRR's Shops and Yards Strategy is the replacement of Rolling Stock Support Equipment and continued implementation of the Reliability Centered Maintenance Program. These investments will allow the LIRR to improve the reliability and productivity of this equipment, enabling the shop personnel to not only maintain the fleet, but also conduct maintenance in the most cost efficient manner possible. This will reduce rolling stock service outages and increase fleet Mean Distance Between Failures. By developing and maintaining a programmed plan for equipment life-cycle management, the LIRR will be able to manage the equipment and required major investments more efficiently, thus reducing downtime, maintenance costs, and increasing service life and reliability.

Employee facilities are an important part of LIRR capital investments. These facilities are multi-functional, encompassing shops and material storage, traditional lockers, lunchroom and office space. The renewal of these facilities will support and improve LIRR employee safety, the work environment, storage and inventory control.

Proposed 2015-2019 Capital Program - $211 million

Program highlights include the proposed shop upgrades to support diesel locomotive maintenance, replacement of shop equipment, and renewal of Employee Facilities.

Yard Improvements - $48 million

The LIRR proposes to undertake environmental review, land acquisition and preliminary design in support of a new electric fleet storage yard on the Huntington / Port Jefferson Branch, in order to address current and future shortages of train storage capacity on this branch. Currently, westbound electric trains at Huntington Station begin at a linear track as this branch does not have an electric train storage yard. Efforts undertaken in this proposed capital program would support construction of a new yard in a future program.

The yard improvements project will complete work started in the 2010 – 2014 Capital Program to construct a new electric train storage yard on the Main Line in central Suffolk County. This is required to increase train storage capacity for LIRR in support of service to Grand Central Terminal.

Shop Improvements - $163 million

A project to make diesel locomotive shop improvements is planned to replace / renew facilities utilized to maintain diesel locomotives – this includes maintenance bays and associated work areas, employee facilities, parts storage and wayside power for storage tracks. This program allocates $108 million for this effort.

This proposed program also continues efforts to replace and upgrade aging and deteriorated shop equipment, as part of the Reliability Centered Maintenance program to maintain the LIRR's fleet. A $10 million Rolling Stock Support Equipment project reflects this ongoing shop investment initiative.

Improvements totaling $4 million are also planned for the facilities at Hillside and the nearby Upper Holban facility – work includes renewal of doors, electrical systems, flooring, restrooms, site work, and building systems. A $10

million Fire Protection Improvements project will replace and upgrade fire alarm and fire suppression systems at selected employee facility locations. The proposed program also includes an $8 million capital project for restoration and improvement of select employee facilities to address various building systems within selected shops, yard facilities, towers and administrative offices.

Finally, shops and yards investment efforts in support of the above projects, to be undertaken as part of the MTA's Small Business Development Program (SBDP), total $23 million. This includes replacement / renewal of building components within LIRR's employee facilities.

Long Island Rail Road
Power
Category L-707

The majority of Long Island Rail Road service is in electric territory; electric multiple-unit cars utilize 750 volts of electric traction power that is delivered via the third rail. To provide this traction power, the LIRR operates and maintains 108 substations/breaker houses and 328 miles of third rail system-wide. In addition to the traction power system, the Power department also operates and maintains lighting at LIRR facilities including yard and tunnel lighting and emergency generator systems.

The long-term goal of Power-related investments is to continue component replacements necessary to maintain the system and strengthen its reliability and safety. Of particular note, as part of this proposed Capital Program, the LIRR will invest substantially in the renewal of traction power substations by undertaking full substation replacement at selected locations and advancing a substation component replacement program at many locations throughout electric territory. Maintaining these assets ensures the safe operation of trains and contains the growth of operating costs.

Relying on industry standards as the basis for component life cycles, LIRR has performed asset condition surveys to establish priorities for cyclical normal replacement investments. The need to invest in substation replacement became evident following the conclusion of the traction power load study, which utilized a computer simulation model and incorporated physical characteristics, train schedules and train power consumption. This study considered the power needs (focusing on the increased power requirements of the newer electric fleets) of the current system as well as requirements to support projected system growth and expansion. Numerous aging substations need to be replaced and new substations constructed in critical high traffic locations, in order for the LIRR to reliably operate increased train service in the future.

Proposed 2015-2019 Capital Program - $227 million

The proposed 2015-2019 Capital Program will replace traction power substations in Queens and Nassau County that have reached the end of their useful lives. These substations have been identified as priority replacements, both due to their age and condition, as well as their critical location at high traffic locations along the Main Line, Port Washington Branch and the Babylon Branch. The six substations identified for replacement in this proposed program include Jamaica (Main Line), Meadowbrook (Babylon Branch), Forest Hills (Main Line), Bellmore (Babylon Branch), Murray Hill (Port Washington Branch), and Queens Breaker House (Main Line). The total cost of these substation replacements is $81 million.

More than half of the LIRR's 108 substations/breaker houses were constructed in the early 1970s. As such, these substations are rapidly aging and require investment in order to protect service reliability and address deteriorating substation components. In this regard, the LIRR will be rolling out substation renewal and substation component programs, which target specific substation components at particular locations. Components to be replaced / renewed as part of this effort include: high voltage cable, control cable, ballast, remote terminal units, substation roofs, motor generators, along with transformers. Total cost of these projects is $81 million.

The Traction Power Load Study forecasted the power demand of future LIRR service, given the projected future service and the traction power needs associated with the newer LIRR electric fleets. Recommendations from this study included the construction of new substations, primarily in Queens, in order to ensure adequate traction power to support future service demands. In this regard, the proposed 2015 – 2019 Program includes a $5 million project to advance design efforts in support of the new substations.

The proposal also calls for $31 million in traction power investments for the replacement and/or upgrade of sections of third rail protection board and replacement of conventional third rail with composite rail, as well as upgrades to third rail cable feeders, third rail disconnect switches, 2000 MCM cable, and negative reactors. Other projects within the power asset category, totaling $29 million, include replacement of substation batteries, DC relay controls, volt feeders, signal power motor generators, tunnel lighting, and signal and power pole line replacement.

Long Island Rail Road Miscellaneous Category L-709

Projects in this area provide for costs associated with the support and management of the Capital Program and projects with program-wide applicability such as system-wide environmental remediation, protective liability coverage, independent engineer services, value engineering services, and scope development, as well as administration costs to support the MTA Small Business Mentor Program.

Proposed 2015-2019 Capital Program - $165 million

This allocation is planned to fund miscellaneous projects. Included are: program administration, insurance, scope development, system-wide environmental remediation, and mentor program administration.

Environmental Remediation - $10 million

The Environmental remediation effort within this proposed program is the completion of chlordane remediation at selected substation locations. The 2010 – 2014 Capital Program included investigation of soil conditions at twenty substation sites which may have been contaminated with chlordane. This proposed project will complete the soil remediation efforts at these contaminated locations, addressing those sites not remediated in the 2010 – 2014 Program.

Small Business Development Program Administrations - $9 million

This category also includes Long Island Rail Road's allocation of $9 million as part of the MTA-wide cost to administer and support the Small Business Development Program (SBDP).

EAM Reserve - $8 million

Finally, funds have been allocated for a new MTA-wide initiative, Enterprise Asset Management. The LIRR's proposed program contains $8 million towards this effort.

MTA Capital Program 2015-2019
Metro-North Railroad

Asset Base – Metro-North Railroad

Table 10
Selected Metro-North Railroad Assets

Category	Assets	
Rolling Stock	881	Electric Cars
	278	Push-pull Coaches
	67	Locomotives
	14	Buses
Passenger Stations	86	Stations
Track	552	Miles of Mainline Track
	573	Mainline Switches
Structures	325	Overhead Bridges
	434	Undergrade Bridges
Communications and Signals	481	Track Miles of Mainline Signal Equipment
Power	59	Substations
	254	Track Miles of Third Rail Power
Shops & Yards	11	Shops and Yards

Overview – Metro-North Railroad

Metro-North Railroad is one of the largest commuter railroads in the country, carrying over 84.7 million riders in 2014 (nearly 80% New York State) on the Hudson, Harlem and New Haven Lines east of the Hudson River, and on the Pascack Valley and Port Jervis Lines west of the Hudson River. Metro-North infrastructure includes over 500 track miles and 86 stations in New York State and carries 289,000 passengers on an average weekday on 700 trains.

The past 33 years have seen major investments in rolling stock and the infrastructure of the railroad with the dedicated funding of the MTA Capital Program. Early focus was on large-scale reinvestment in a system in disrepair, restoring basic infrastructure to reliable condition and working to achieve a state of good repair. The last few years have been difficult for Metro-North, underscoring the need for continued investment to maintain the infrastructure and rolling stock to the highest standard, for both safety and reliability. This requires the appropriate inspection, maintenance, and replacement plans, but also that the railroad has the necessary resources to carry them out effectively. Strong, stable funding of a multi-year Capital Program is absolutely necessary to enable Metro-North to maintain and improve its assets. Much progress has been made, while protecting past investments and providing targeted improvements that resulted in increased ridership. However, significant repair work remains, particularly in Grand Central Terminal, on line structure assets, on our Port Jervis Line territory and in Shops and Yards.

Proposed 2015-2019 Capital Program - $2.321 billion

The 2015-2034 Twenty-Year Capital Needs Assessment identified nearly $9 billion in Metro-North investment needs through 2034 to ensure safe and reliable service with significant progress towards achieving a state of good repair during this period. Metro-North's $2.321 billion proposed 2015-2019 Capital Program addresses critical priority projects within New York State and demonstrates the agency's ongoing commitment to promoting a culture of safety while maintaining and enhancing reliability and customer service (Table 11). These investments will fund the most essential components - rolling stock, stations, track, communications, signals, power, and shops and yards. Funds are also allocated to provide for miscellaneous program costs to support these activities, including Metro-North's share of the cost to administer the MTA-wide Small Business Development Program. In addition, Metro-North has allocated over $39 million for mentoring scope and will work to identify another $22 million of scope to help meet MTA mentoring goals.

Table 11 details the proposed 2015-2019 Capital Program by asset category and percentage of overall program.

Table 11
Metro-North Railroad Proposed 2015-2019 Capital Program by Category ($ in millions)

Category	Proposed 2015-2019	Percent
Rolling Stock	$532	23%
GCT, Stations and Parking	402	17%
Track and Structures	448	19%
Communications and Signals	194	8%
Power	101	4%
Shops and Yards	472	20%
Miscellaneous	173	8%
Total	**$2,321**	**100%**

Numbers may not total due to rounding

Program Evolution

This plan for Metro-North Railroad totals $2.321 billion, which is a reduction of $232 million compared to the previous Metro-North 2015 – 2019 capital plan proposal that was submitted in September 2014. This $232 million reduction is the net effect of several factors:

Program Efficiencies

The revised plan assumes savings based upon more efficient design and construction, and modifications in project delivery. These savings are expected to be generated via the following efficiencies:

- Coordination of resources, work windows and work hour efficiencies to minimize service impacts and reduce agency support costs.
- Prioritize critical needs and utilize component repairs, rather than complete replacement, of certain assets where possible.
- Explore opportunities to leverage funding partnerships with municipalities and private development.
- Refine scoping and implementation practices.

Table 12 presents the elements in which these savings are assumed. Projects in these elements are expected to realize savings via efficiencies are starred (**) in the “blue pages” listing of projects. Budgets of those projects which have been starred have been reduced, based upon the agency’s best estimate at the time of this plan re-submission. Metro-North will work to meet these reductions by incorporating efficiency strategies as the projects progress.

Table 12
Metro-North Railroad Capital Program Savings Due to Program Efficiencies ($ in millions)

Category	Type of Project	% Red.	Assumed Savings	Likely Efficiencies
M702	Stations & Parking	4%	$15	Rigorous site selection process with careful consideration of opportunities to leverage funding partnerships with municipalities and private development
M703	Track & Structures	9%	39	Coordination of resources, work windows and work hour efficiencies to minimize service impacts and reduce agency support costs; Prioritize critical needs and utilize component repairs, rather than complete replacement, of certain assets where possible
M704	Communications and Signals	15%	30	Coordination of resources, work windows and work hour efficiencies to minimize service impacts and reduce agency support costs, as well as refined implementation plans
M705	Power	16%	16	Refine scoping and implementation practices and coordinate resources, work windows and work hour efficiencies to minimize service impacts and reduce agency support costs
Total			$100	

Numbers may not total due to rounding

Revised Estimates

In the time that has elapsed since the September 2014 plan submission, projects have advanced further in the scope development and design process, resulting in better project cost and schedule information upon which to establish overall project budgets. This is particularly true for some Grand Central Terminal, Communications and Signals, and Power projects.

Priority Changes

Metro-North has been undertaking a review of all projects in the plan, to incorporate new information since the September 2014 submission and evaluate investment priorities for the 2015 – 2019 time period. This includes a review of ongoing normal replacement/state of good repair programs as well as large investment efforts which span multiple capital programs to identify efforts which could be progressed following the 2015 – 2019 Program without posing undue burdens upon Metro-North operations or the railroad's maintenance and inspection program. In addition, some recently identified replacement needs have been incorporated in the plan submission, thus reflecting the most up-to-date field condition data. Metro-North has re-examined the anticipated power and signal substation investments and has adjusted the balance of work between various substation needs as well as the multiple signal projects identified for capital funding. The priority needs on the stations were re-examined to update the balance of rehabilitation and component work. Finally, funding was added to progress work towards a new midpoint yard and passing sidings on the Port Jervis Line to support Metro-North's West of Hudson service and ridership.

Major Investments

Primary elements of this investment program include investments that will enhance safety, security, reliability and customer service as described below (more detailed summaries of the projects are discussed in later sections).

Achieving a state of good repair and protecting past investments in rolling stock and infrastructure to promote and ensure safety and reliability remains one of the most critical elements of the proposed 2015-2019 Capital Program. Metro-North must progress critical rolling stock and state of good repair infrastructure work while ensuring that all the improvements resulting from the last 33 years of Capital Program work are maintained for future generations through the normal replacement of assets at the end of their useful life. Key projects include:

Rolling Stock Investments

Continue implementation of the Metro-North Rolling Stock strategy with the replacement of the M-3 fleet at the end of its useful life.

Safety Critical and State of Good Repair Projects

- Significant investment in the Grand Central Terminal Trainshed, to improve the condition and progress the $1 billion state of good repair backlog.
- Advance and enhance the Cyclical Track Program to continue to maintain this infrastructure in a state of good repair and to begin significant rail replacement system-wide.
- Expand the Undergrade Bridge Program – east and west of the Hudson River – as well as the east of Hudson Overhead Bridge Program to progress these bridges toward a state of good repair.
- Continue the investment in bringing the Port Jervis Line infrastructure to a state of good repair with track, viaduct and bridge work.
- Continue extensive traction power rehabilitation and improvements essential to maintaining reliable and dependable service and supporting service growth.
- Begin replacement of the aged Hudson Line signal system from Croton-Harmon to Poughkeepsie with a high capacity signal system.
- Complete the federally mandated Positive Train Control project to enhance rail safety system-wide. Initial investment in this critical technology was committed in the 2010-2014 Capital Program.
- Complete replacement of the Electric Shop at the Croton-Harmon Shop, finishing the majority of work at Harmon, the cornerstone of Metro-North's long-term shops and yards strategy to upgrade and adequately size shops and yards for storage, maintenance and inspection services.

Customer Experience Improvements

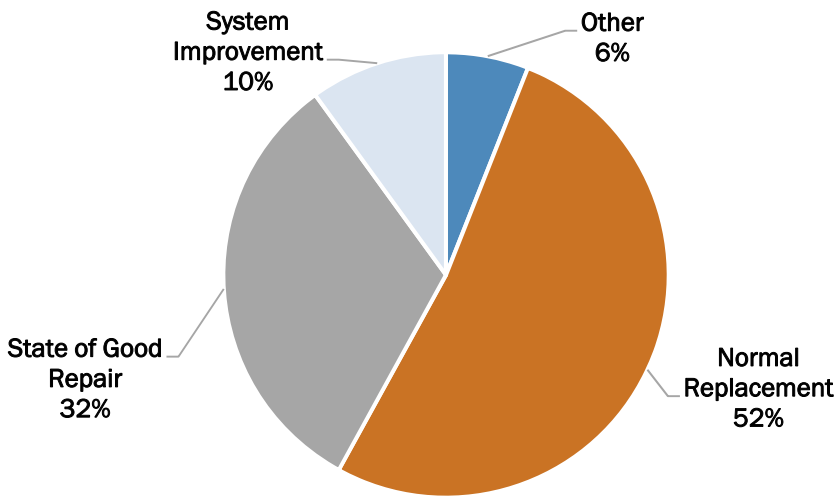
Continue investments in station renewal with rehabilitation and critical priority component repair projects to station facilities throughout the system to maintain these elements in good repair. Continue program to improve customer communications in Grand Central Terminal and at outlying stations East of the Hudson River by deploying the latest customer information technology to provide real-time performance information including departure time and destination, status, and track to customers and employees.

System Condition

Since 1982, when the first Capital Program began, Metro-North has committed a total of $6 billion to replace rail car equipment and restore a majority of its infrastructure to a state of good repair, establishing a normal replacement cycle for many of its assets and making select system improvements. Obsolete track was replaced by 1986 (with the exception of the more recently acquired Port Jervis Line). The work to bring the Communications and Signals assets to a state of good repair was completed by 2000 and the Power assets reached a state of good repair by the end of the 2000-2004 Capital Program. These assets are in a cycle of normal replacement and need continued significant investment in order to maintain a state of good repair and support safe, comfortable and reliable service for Metro-North customers.

In the proposed 2015–2019 Capital Program, 84 percent of the Metro-North investments are dedicated to state of good repair and normal replacement projects with 10 percent to investments to improve the system (System Improvements). Much of the system improvement funding is devoted to completing the Positive Train Control project, improved communications, and parking expansion and strategic intermodal facilities needed for our customers to access the railroad. (See Figure 5)

Figure 5
Metro-North Railroad Proposed 2015-2019 Capital Program by Needs



Metro-North has four asset categories identified as not in a state of good repair:

- Grand Central Terminal and Stations which includes the extensive Grand Central Terminal Trainshed; this structure requires a significant increase in level of investment over the next 20 years to progress toward a state of good repair.
- Structures, which based on a more comprehensive inspection program, require a significant increase in investments to progress work toward a state of good repair over the next 20 years.
- Port Jervis Line Infrastructure, for which Metro-North assumed responsibility under a lease agreement with Norfolk Southern in 2003, continues to require substantial additional investment to repair its 66 miles of track and bridges. These needs will continue to be addressed in future programs.
- Shops and Yards, for which state of good repair will largely be addressed by completion of the replacement of the Harmon Shop Electric Shop in the 2015-2019 Capital Program.

Metro-North Railroad
Rolling Stock
Category M-701

The goal for the proposed 2015-2019 Capital Program's $532 million investment in rolling stock is to maintain the fleet by replacing cars that have reached the end of their useful life and to accommodate projected growth in electrified territory served by the Harlem Line and Hudson Line service. Upon completion of the delivery of purchases made under the 2010-2014 Capital Program, the revenue fleet available for service will total 1,240 units. This includes 213 push-pull coaches, 881 electric cars, 52 locomotives, and 14 buses for East of Hudson service; and 15 locomotives and 65 coaches available for service on the Port Jervis and Pascack Valley Lines, operated by New Jersey Transit per an agreement among the parties. Through the 2015-2019 investments, Metro-North will continue fleet replacement efforts to enhance the quality of service for railroad customers.

Proposed 2015-2019 Capital Program - $532 million

Metro-North's purchase of rolling stock is needed to replace the M-3 fleet that has reached the end of its useful life and to provide additional seating as ridership continues to grow. Rolling Stock projects total $532 million and represents approximately 21 percent of the program for the 2015-2019 period.

M-3 Replacement

Metro-North will replace the 140-car M-3 fleet, which was built in 1984, including rolling stock to accommodate future projected ridership growth in the areas served by these vehicles.

Metro-North Railroad Stations Category M-702

There are 86 Metro-North passenger stations in New York State, 74 east of the Hudson River and 12 more west of the Hudson. The long-term objective of Grand Central Terminal, outlying station and parking investments is to achieve a state of good repair, improve operations, increase customer satisfaction, and conserve the historic stations along the system. In addition, Metro-North will make progress toward constructing new facilities to accommodate increased ridership and increase access and parking opportunities. These initiatives support local development opportunities as well.

Proposed 2015-2019 Capital Program - $402 million

Included in Metro-North's proposed 2015-2019 Capital Program is the continuing renewal of the historic Grand Central Terminal complex including the 75 acre Trainshed complex, as well as stations on the Hudson and Harlem Lines, and parking and strategic facilities. The GCT complex consists of the terminal building plus the multi-level, subsurface Trainshed. During the years of 1907 to 1913, the present GCT was designed and constructed and the railroad was electrified. Two underground train platform levels with 42 platform tracks were constructed between East 45th Street and East 51st Street, along with a 10-track approach area between East 51st and East 57th Streets. These two platform levels constitute what is called the upper level and the lower level of the Trainshed. The upper level's roof structure makes up the deck of Park Avenue and the adjoining side streets. The lower level's roof structure makes up the structural support for the upper level tracks.

These Grand Central Terminal and Stations projects total $402 million, approximately 17 percent of the total Metro-North Capital Program.

Grand Central Terminal Renewal Projects

Renewal of Grand Central Terminal will continue in the proposed 2015-2019 Capital Program with $215 million allocated for normal replacement and state of good repair projects. Major work continuing from the 2010-2014 Capital Program includes the ongoing structural work on the GCT Trainshed and the elevator renewal program. In 2013, a structural assessment of the Trainshed was completed that indicated $1 billion of investments (including priority replacement work) are necessary in order to bring the Trainshed to a state of good repair and improve the condition and safe operation of the tunnel and Trainshed. In addition, this program will replace the public address system and Central Control and GCT's Visual Information Systems, key elements to preserving vital customer communication. The continued phased replacement of 100 year old platform edges will provide a safe customer route to/from trains. Other projects in this category include Park Avenue Tunnel Fire Life Safety and GCT Fire Protection enhancements, GCT utilities investments, and the final phase of elevator improvements.

GCT Trainshed/Tunnel Structure (including Roof Expansion Joints) - $134 million

The project will increase the level of investment needed following an in-depth inspection and assessment of the 75 acre Trainshed condition completed in 2013 under the 2010-2014 Capital Program. As a result of continuing and accelerating deterioration, Metro-North will begin a systematic block by block reconstruction of the Trainshed as well as continue the spot priority repair program. Work in this capital program will include the design and superstructure replacement under Park Avenue Northbound and Southbound in the locations determined to be the highest priority.

Park Avenue Tunnel Fire and Life Safety Improvements - $1 million

The purpose of this project is to improve the emergency lighting and way finding signage of the Park Avenue Tunnel Emergency Exits located at 59th, 72nd, and 86th Streets.

GCT Platform Rehabilitation - $1 million

The purpose of this project is to continue the phased repair of the edges and expansion joints on the platforms.

GCT Fire Protection - $11 million

The purpose of this project is to complete the phased repair of the fire protection / standpipe system in the Upper and Lower Level Trainshed.

GCT Utilities - $5 million

The purpose of this project is to provide a comprehensive assessment and inventory of critical utilities in Grand Central Terminal, along with priority repairs based on the recommendations of the study. A strategy of repair/replacement projects to be funded in upcoming future Capital Programs will be developed as well.

GCT Elevator Improvements - $7 million

Grand Central Terminal is a multi-level facility, which is dependent upon its elevators to transport materials, employees and customers between the various levels. This project will replace elevators which have reached the end of their useful lives and are necessary for the terminal's continuing operations.

GCT Visual Information System (VIS) Replacement - $45 million

The purpose of this project is to replace the GCT VIS including central control, cable plant and information displays (the Big Boards, the Gate Boards, Digital Track Indicators, Recessed Wall-Mounted Directories/Departure Monitors, Free-Standing Directory/Departure Monitors, Platform displays and Employee Displays) with a more robust infrastructure that will improve communications, increase reliability and provide for future growth for new types of information to be displayed. Existing system components have reached the end of their useful lives and pose vulnerability in the event of failure. Connecticut Department of Transportation (CTDOT) will provide supplemental funding for this important project.

Mentoring - GCT - $5 million

The proposed 2015-2019 Capital Program includes an allocation of $5 million for GCT investment efforts in support of the above projects, to be undertaken as part of the MTA's Small Business Development Program (SBDP).

Stations Projects

Enhanced Station Initiative, 5 Stations - $15 million

The focus of this project is to improve the customer's comfort and convenience at select stations utilizing a visionary architect to refine underlying station aesthetics through design innovation and excellence. Types of Station Enhancement elements could include artistic lighting of the historic station buildings or architectural enhancement of the station building components to improve public perception. Metro-North has identified five (5) stations for these improvements: Harlem-125th Street, Riverdale, Crestwood, White Plains and Port Chester. These improvements will be coordinated with work under the phased Customer Communications project which will deploy customer information technology providing real-time performance information including departure time and destination, status, and track assignments.

Upper Hudson and Harlem Line Stations Priority Repairs - $40 million

Priority component repairs at stations along the Upper Hudson and Upper Harlem Line will improve the condition of the stations and provide an enhanced customer experience. In addition, potential intermodal improvements at White Plains based on an upcoming City of White Plains led study to be undertaken in conjunction with the MTA and other stakeholders.

Harlem Line Stations Improvements - $31 million

This project is a continuation of work begun in the 2010-2014 Capital Program. The 2015-2019 Capital Program will rehabilitate Botanical Gardens, Williams Bridge and Woodlawn, addressing those elements of the stations that are either in poor condition or that are at or beyond the end of their useful life. Station elements to be addressed include platforms, overpasses, and canopies.

Harlem-125th Street Station Improvements - $2 million

This project will restore or replace the historic stairways located on the south side of 125th Street under the viaduct. Metro-North will also improve the lighting around the station building and under the viaduct to increase safety and improve the customer environment.

Station Building Rehabilitation - $1 million

Many of Metro-North's station buildings are historic, built in the late 1800s or early 1900s, and in varied condition. The cost to renovate these structures can often be high because of building age and condition. The proposed scope includes improvements at stations buildings such as Ossining and Brewster.

West of Hudson Station Improvements - $2 million

Metro-North serves eleven stations in Orange and Rockland Counties on the Pascack Valley and Port Jervis Lines. Several of these stations are reaching the end of the normal service life and require priority component capital investments. For the 2015-2019 Capital Program, three (3) stations have been identified for normal replacement improvements: Spring Valley on the Pascack Valley Line and Harriman and Middletown on the Port Jervis Line.

Customer Communications - $60 million

This project, being designed in the 2010-2014 Capital Program, is part of a larger phased initiative to deploy the latest customer information technology, providing real-time performance information including departure time and destination, status, and track to customers and employees. It will provide the following improvements:

- Replace obsolete head end Public Address (PA) and Visual Information Systems (VIS) equipment and field PA and VIS communications equipment.
- Integrate the functionalities of the existing station public address, Train Time and GCT VIS systems to create a new Customer Communications Information System.
- Provide visual information displays with real-time information including hardware, software and applications and connections with Public Address (PA) systems for passenger stations.
- Provide outlying stations Infrastructure and fiber connectivity for station devices including station cable, conduit and communications rooms to support data requirements for all systems.
- Replacement of all wayside PA systems at passenger stations.
- Provide intercom/railroad telephone systems, including all necessary field/office systems for passenger stations.

- CCTV Video and Access Control Management - including central control equipment, access controllers, IP cameras and network video recorders for passenger stations and other Metro-North facilities.

- Elevator and Escalator Management- including central control equipment and controllers for all GCT and passenger station elevators and escalators.

These Customer Service Initiatives (CSI's) are intended to provide a higher level of service to Metro-North customers in a phased rollout east of the Hudson River, providing more accurate and usable systems to achieve the desired level of service. CSI improvements will be coordinated with work under the Station Enhancements project at Harlem-125th Street, Riverdale, Crestwood, White Plains and Port Chester. CTDOT will provide supplemental funding for this important project. In addition, Metro-North will work with the CTDOT to install these capabilities in Connecticut and with New Jersey Transit on the west of the Hudson River territory as well.

New Fare Payment System - $5 million

The $5 million is allocated to advancing the MTA-wide new fare payment system to support the MTA-wide efforts to allow customers to use a single smart card, or cell phone with a smart chip to ride the entire MTA network. This project will develop the next generation ticket vending machine to replace current aging and obsolete ticket vending machines in the next Capital Program.

Strategic Facilities - $20 million

The $20 million Strategic Facilities project will improve parking and access to Metro-North trains through parking expansion at location(s) to be determined with possible candidates for such facilities considered based on available land, demonstrated need and Transit Oriented Development (TOD) where possible. TOD initiatives, joint use of parking facilities and access provided in partnership with developers can enhance Metro-North's opportunities to expand rail access, grow ridership, reduce capital costs, increase revenues and establish a more sustainable, mixed-use station area. To progress these projects, Metro-North will look to partner and coordinate with various third party groups such as counties, local towns, communities and private organizations, as well as New York State agencies such as the New York State Department of Transportation.

Mentoring - Stations and Strategic Facilities - $18 million

The proposed 2015-2019 Capital Program includes an allocation of $18 million for station component and strategic facilities investments in support of the above projects, to be undertaken as part of the MTA's Small Business Development Program (SBDP).

This proposal reflects anticipated programmatic savings of as much as 4 percent in parking and strategic facilities projects (see Table 12). Savings are expected as a result of a rigorous site selection(s) process with careful consideration for potential developer/municipality partnerships.

Metro-North Railroad
Track and Structures
Category M-703

There are 387 route miles and 795 track miles (545 electrified) that constitute the Metro-North system in New York State and Connecticut. Of that, 552 mainline track miles and 573 mainline switches are in New York State, including Grand Central Terminal. The long-term objective of investments in this area is to maintain the condition of the majority of the existing assets that are in a state of good repair and achieve a state of good repair for structures. The ongoing renewal of the trackage is essential to providing customers with a safe, reliable, and comfortable ride. To accomplish this, Metro-North has developed a cyclical program of track and turnout renewal and replacement that maintains track structure components and switch facilities in proper operating condition. Similarly, the continued integrity of line structures along the railroad right-of-way is vital to its smooth and safe operation. There are more than 700 bridges in the New York Territory of Metro-North Railroad. This includes overhead and undergrade bridges, viaducts, tunnels and retaining walls. A key focus for line structures in this program will be on addressing the most critical needs for Metro-North's 434 undergrade bridges throughout the system.

Proposed 2015-2019 Capital Program - $448 million

A total of $448 million is allocated for track and structures projects, representing approximately 20 percent of the proposed 2015-2019 Capital Program.

Cyclical Track Program - $97 million

This project provides for the replacement of ties and rail along with cyclical surfacing on the Hudson, Harlem and New York portion of the New Haven Line. The project has been expanded and enhanced to ensure that Metro-North's track is maintained in a constant state of good repair so that the track structure does not deteriorate, and ensures conformance to Federal Railroad Administration track standards. The project includes a new effort for the phased replacement of 119 lb. rail in order to maintain a safe right-of-way, improve performance, reliability and condition. This program protects the capital investment already made between 1982 and 2014. The scope of work for this project includes the purchase of rail, ties, track ballast and other track materials associated with installation.

Turnout Replacement - Mainline/High Speed - $52 million

This project provides for the replacement of interlocking switches at select locations throughout the Metro-North territory in New York State as they reach the end of their useful life. The scope of work for this project includes, for some locations, turnout replacement in kind; and for select locations, improving existing standard turnouts with high-speed turnouts. High-speed turnouts will result in reduced travel time for Metro-North customers and greater flexibility for the railroad.

Grand Central Terminal Switch Renewal - $25 million

This project is a continuation of the switch replacement in Grand Central Terminal along with the stick/jointed rail that currently exists at the platform areas. In the upper and lower level of GCT, the high volume of traffic and tight configuration accelerates the wear of the switches. This project provides for the removal of existing switches and the annual renewal of switches within the terminal and tracks in the platform areas. These investments maintain a constant state of good repair ensuring that the terminal operation can operate reliably.

Turnout Replacement - Yards and Sidings - $5 million

This project provides for the normal replacement of turnouts as they reach the end of their useful life, and for the construction of track improvements at various yard and siding locations in New York State.

West of Hudson Track Improvements - $10 million

This project will replace rail and ties, as well as perform surfacing on selected track areas on the Port Jervis Line.

Undergrade and Overhead Bridge Program - $100 million

The focus of these projects is the repair and replacement of bridges over or supporting the railroad's right-of-way, which are approaching the end of their useful lives, or do not meet current loading standards. The project funding levels were increased in this program to progress work towards a state of good repair. The Undergrade Bridge program includes the design and/or repair or replacement of between twenty and thirty structures on the Hudson, Harlem and New Haven Lines based on detailed evaluation of needs and efficiencies identified during design and construction activities. Metro-North will continue its work to undertake intensive coordination of track outages amongst multiple capital projects to maximize outage opportunities. The Overhead Bridge program includes the replacement of bridges on the New Haven Line as well as funds for ongoing long-term Force Account bridge repairs.

Employee Welfare and Storage Facilities - $3 million

This project provides for the upgrade of employee welfare facilities to suitable and adequate space. The areas targeted for improvement in this program include locker rooms, bathroom facilities, meal and rest areas, and storage/work spaces in GCT and outlying field locations.

Harlem River Lift Bridge - $10 million

This project continues a rehabilitation program initiated in the 2010-2014 Capital Program. The work includes repairs to cracked piers that support the critical moveable bridge which provides the only access into Manhattan for all Metro-North trains traveling to and from Grand Central Terminal.

Moodna and Woodbury Viaducts - West of Hudson - $14 million

This project continues the state of good repair work that began on the Moodna and Woodbury viaducts on the Port Jervis Line under the 2005-2009 and 2010-2014 Capital Programs. The project includes the total replacement of ties on both viaducts, approximately 3,000 ties on Moodna and 600 ties on Woodbury.

Undergrade Bridge Program - West of Hudson - $15 million

This project includes the replacement of three bridges on the Port Jervis Line, as well as repairs to two additional bridges. There are approximately 80 undergrade bridges on the Port Jervis Line; this project provides for the continuing renewal of structures determined as top priorities based on condition surveys.

Other Track and Structures Projects - $115 million

Additional projects in the proposed 2015-2019 Capital Program for track includes work to maintain the system infrastructure as safe and reliable. Work includes cyclical insulated joints, rock slope remediation, rebuilding retaining walls, improvements to system-wide drainage and purchase of maintenance of way equipment.

Structures improvements to maintain reliability and that contribute to progress towards a state of good repair include bridge preservation rehabilitation, Beacon Line undergrade bridges, Park Avenue Direct Fixation, Railtop Culverts, Bridge Walkways, Replace Timbers on Undergrade Bridges, Hudson Line Tunnels Inspection, Catenary Painting and DC Substation/Signal House Roof Replacement and Right-of-Way Fencing.

Additional West of Hudson infrastructure improvements needed to progress Port Jervis Line state of good repair include Track Improvements and Rock Slope Remediation.

Mentoring - Structures - $3 million

The proposed 2015-2019 Capital Program includes an allocation for line structure component investments in support of the above projects, to be undertaken as part of the MTA Small Business Development Program (SBDP).

This proposal reflects anticipated programmatic savings of an average of 9 percent among selected Track and Structures projects (see Table 12). Savings are expected as a result of prioritizing critical needs and utilizing component repair strategies on certain assets where possible. Additional savings are expected from coordination of resources, work windows and work hour efficiencies.

Metro-North Railroad Communications and Signals Category M-704

There are 387 route miles and 795 track miles that constitute the Metro-North system in New York State and Connecticut. Of that amount, 579 track miles are signaled. The signal system includes 450 miles of cable transmission systems, 100 centralized control systems, and a 328 route-mile signal network. The long-term objective of investments in this area is to replace the aging signal system (wayside and operations control center) with the latest technology to accommodate current operations and provide compatibility for future needs. Over the previous capital programs, Metro-North has invested in a centralized control system and the infrastructure to operate it. To protect the past investment and keep the system up to current standards, Metro-North has established a cyclical program to replace and upgrade the elements of the overall signal system. In addition, Metro-North looks to optimize train capacity to accommodate the railroad's current needs, future service plans and future ridership projections. Metro-North will also make investments in Positive Train Control as required under the Rail Safety Improvement Act of 2008.

Proposed 2015-2019 Capital Program - $194 million

The communications and signals projects total approximately $194 million. This represents 8 percent of the total proposed 2015-2019 Capital Program budget.

Network Infrastructure Replacement - $32 million

This project will upgrade the Fiber Optic Communication System infrastructure. Metro-North's Fiber Optic Communication System consists of 41 node houses serviced by a core ring, which covers the entire New Haven Line, Hudson Line, Harlem Line, Grand Central Kit room, Mott Haven, Beacon Line, Waterbury Branch, Danbury Branch, and New Canaan Branch. The current Synchronous Optical Network (SONET) is approaching the end of its useful life. If not addressed, this will leave current communication infrastructure without replacement or support from the vendor. In order to meet future demands for such projects as security system upgrades along with passenger station and information upgrade projects, the next generation in Optical Transport Dense Wave Division Multiplexing (DWDM) is needed. The proposed 2015-2019 Capital Program includes $42 million for the project to address this need in New York State territory. Connecticut Department of Transportation (CTDOT) will provide supplemental funding for this important project.

Harmon to Poughkeepsie Signal System - $60 million

The existing wayside signal and communication systems and infrastructure located on the Hudson Line from Croton-Harmon (CP-33) to Division Post in Poughkeepsie (MP-75.8) have reached the end of their useful life. This project will begin replacement of the existing wayside signal and communication systems and infrastructure including communication and signal Central Instrument Locations (CILs) and fiber optic and copper cable system.

Positive Train Control - $94 million

On October 16, 2008, Congress passed the Rail Safety Improvement Act of 2008 which requires, among other things, the implementation of a Positive Train Control ("PTC") system on all non-exempt commuter railroad main-line tracks. PTC is a technology that is capable of preventing train-to-train collisions, over-speed derailments, and injuries to workers as the result of unauthorized incursions by a train into a work zone.

In 2013, a System Integrator contract was awarded by Metro-North and the Long Island Rail Road to design PTC systems and to furnish PTC on-board kits and wayside kits for installation by Railroad forces. The PTC installation is

based on the Amtrak Advanced Civil Speed Enforcement System (ACSES), which is an overlay to the Automatic Control Signal (ATS) System used in the Northeast Corridor. This project supplements the funding in the 2010-2014 Capital Program and is needed to complete this federal mandate. The proposed 2015-2015 Capital Program includes $94 million for the project. Connecticut Department of Transportation (CTDOT) participation will supplement this funding to support PTC investments in the state of Connecticut.

Other Communications and Signals projects - $8 million

The remainder of the communications and signals projects include Replace Signal Office Equipment/SCADA Office, PBX Replacement, Upgrade Grade Crossings, Replace High Cycle Relays and Fire Suppression Systems.

This proposal reflects anticipated programmatic savings of an average of 15 percent among selected Communications & Signal projects (see Table 12). Savings are expected as a result of coordination of resources, work windows and work hour efficiencies to minimize service impacts and reduce agency support costs, as well as refined implementation plans.

Metro-North Railroad
Power
Category M-705

There are 387 route miles and 795 track miles that constitute the Metro-North system in New York State and Connecticut. Of that amount, 545 track miles are electrified with 256 track miles of DC 3rd rail power and 289 track miles of AC catenary power. The power supply for this system in New York State includes 49 DC substations, seven AC substations and three yard distribution systems. The long-term objective of investments in this area is to maintain the condition of the existing assets and increase traction power capacity to support current service levels and projected service growth over the next 20 years.

Proposed 2015-2019 Capital Program - $101 million

The proposed 2015-2019 Capital Program allocates $101 million, or approximately 4 percent of the total capital program budget, to power projects.

Harlem/Hudson Power Rehabilitation - $15 million

This project will continue the multi-program phasing of component rehabilitation of Metro-North's 49 substations.

Harlem/Hudson Power Improvements - $11 million

This project will continue the multi-program phasing of improvements recommended in the Traction Power Study completed under the 2000-2004 Capital Program. These improvements are required to support future growth in ridership and service and to reduce equipment failures due to low voltage conditions. The traction power system is currently limiting capacity in some locations system-wide, in particular on the Upper Harlem Line. This project also includes funding to complete a new substation on the Upper Harlem Line.

Substation Replacements - $26 million

This project will design the replacement of three outdoor traction power substations that are beyond their useful life at Pelham, Bronxville and Mount Vernon with Metro-North's enclosed standard substation. This project will also construct at least two of the substations.

3rd Rail Replacement - $20 million

This project begins replacement of deteriorated 3rd rail components adversely impacting reliability, such as insulators, brackets, snow melters, reactors, bonds, and splice bars.

Other Power Projects - $26 million

Other power projects include: Replacement of Motor Alternator power supplies for signal power, tunnel lighting and alarms, transformer rehabilitation, circuit breaker/switchgear replacement and design for replacing Substations 128 and 178.

Mentoring - Power - $3 million

The proposed 2015-2019 Capital Program includes an allocation of $3 million for power component investments, in support of the above projects, to be undertaken as part of the MTA's Small Business Development Program (SBDP).

This proposal reflects anticipated programmatic savings of up to 16 percent among selected Power projects (see Table 12). Savings are expected as a result of refined scoping and implementation practices and coordination of resources, work windows and work hour efficiencies to minimize service impacts and reduce agency support costs.

Metro-North Railroad
Shops and Yards
Category M-706

Metro-North owns and operates 11 shops and/or yard facilities system-wide, including three shops at diesel/electric yards (Brewster, Harmon, Highbridge), two diesel yards East of Hudson (Poughkeepsie and Wassaic), two diesel yards West of Hudson (Port Jervis and Woodbine), one electric yard at North White Plains, Grand Central Terminal, and two yards for non-revenue equipment at MO Tower and Mount Vernon West. The shop and yard facilities provide for fleet storage, maintenance and inspection services. Metro-North's long-term shops and yards strategy is to upgrade and adequately size these facilities to accommodate additions to the rolling stock fleet (such as the M-7 electric cars), to support the Reliability Centered Maintenance program, to improve On-Time Performance, and to ensure customers are provided with a safe, reliable and comfortable ride. In support of the long-term strategy, Metro-North will continue to replace and upgrade its shop and yard infrastructure at Croton-Harmon yard and other critical locations to meet the demands of the current (and planned) fleet, and support efficient operating and maintenance practices.

Proposed 2015-2019 Capital Program - $472 million

There are three major projects within the $472 million shops and yards allocation (approximately 20 percent) in the proposed 2015-2019 Capital Program.

Harmon Shop Improvements - Phase V; Stage 2 - $432 million

The Harmon shop replacement program consists of investments to support the fleet of electric and diesel hauled rail cars and provide improved productivity as a result of a more modern and efficient complex that continues the emphasis on Reliability Centered Maintenance. This program funds the design-build of the new Running Repair and Support Shop facility (Phase V; Stage 2) that will complete the replacement of the functionally and physically obsolete existing facility. Functional work space will be maintained for a number of other campus-wide support functions such as Quality Control, Engineering, Training and Production, and Maintenance Planning. As a result of realized implementation efficiencies, a portion of the work previously planned was accelerated to the 2010-2014 Capital Program.

Brewster Yard Improvements - Design - $4 million

The $4 million project will provide design services for the expansion of Brewster Yard. This yard, adjacent to Southeast station and at capacity, will need to be expanded in order to accommodate longer trains anticipated following the M-3 fleet replacement. Construction of the yard expansion will occur in the 2020-2024 Capital Program.

Other Improvements - $26 million

Other projects will include the Harmon Wheel True Facility and West of Hudson Yard Improvements, including environmental and design efforts for a new midpoint yard and passing sidings on the Port Jervis Line to support West of Hudson service and ridership.

Mentoring - Shops & Yards - $10 million

The proposed 2015-2019 Capital Program includes an allocation of $10 million for shop and yard component investments in support of the above projects, to be undertaken as part of the MTA's Small Business Development Program (SBDP).

Metro-North Railroad Miscellaneous Category M-708

Projects in this category provide for costs associated with the support and management of the Capital Program and projects with program-wide applicability such as system-wide environmental remediation, protective liability coverage, independent engineer services, value engineering services, scope development and security.

Proposed 2015-2019 Capital Program - $173 million

This category also includes Metro-North's contribution of $15 million for a new, unified trash facility being constructed as part of the East Side Access project.

Finally, Metro-North has included allocations in this Category to support two MTA-wide initiatives. A budget of $7 million is proposed to provide administration and support for the Small Business Development Program (SBDP). Funds have also been allocated in the amount of $13 million in support of the MTA-wide Enterprise Asset Management initiative.

MTA Capital Program 2015-2019
MTA Bus Company

Asset Base – MTA Bus Company

Table 13
Selected MTA Bus Company Assets

Category	Assets	
Buses	646	Standard
	72	Articulated
	497	Express Coaches
Depots	8	Depots
	14	Bus Washers
	3	Paint Booths

Overview – MTA Bus Company

The MTA Bus Company operates the 11th largest bus fleet in the United States and Canada, serving over 400,000 riders daily. With a fleet of 1,215 buses and approximately 3,400 employees, the agency operates 45 local bus routes serving the Bronx, Brooklyn, and Queens and 35 express bus routes between Manhattan, the Bronx, Brooklyn, and Queens. In 2014, the MTA Bus Company provided approximately 126 million trips to riders. The Bus Company's round-the-clock service complements and is coordinated with subway, train and bus services provided by other MTA agencies.

MTA Bus was created in September 2004 to merge into one organization the services formerly provided by seven private bus companies under franchise agreements with the City of New York. Those companies included: Command Bus, Green Bus Lines, Jamaica Bus, Liberty Lines, New York Bus Company, Triboro Coach, and Queens Surface. Transition of service began in January 2005 and was completed in February 2006.

MTA Bus inherited a substantial bus fleet and maintenance network, all requiring significant operating and capital improvements. The fleet consisted of 15 different bus models with an average age over 13 years. The depots varied in condition and age, with several built before the 1950s. MTA Bus operates eight depots, including: Baisley Park, College Point, Eastchester, Far Rockaway, JFK, LaGuardia, Spring Creek, and Yonkers. The City of New York owns three of the depots (College Point, Spring Creek and Yonkers) and leases the others from private owners.

Prior to the creation of the MTA Bus Company, service was irregular, maintenance was substandard, bus reliability was poor, and passengers' discomfort and dissatisfaction were high. Since assuming control of operations, MTA Bus has taken many steps to improve customers' experience and satisfaction.

Improving service - with adjustments in service and schedules, better maintenance, new buses, and upgraded facilities - is a top priority for MTA Bus. Through evaluations of customer demand and operating constraints, MTA Bus has addressed a number of fundamental areas, making improvements in running times, crowding, service frequency, hours of service, and route structure. A centralized Road Operations Unit, Training Center, and Command Center have been introduced to ensure consistent service.

The agency also has instituted new maintenance practices, including scheduled operation inspections, heavy scheduled overhauls of undercarriage components every three years, exterior bus painting, engine in-chassis overhauls, and other measures. These steps have helped to more than double fleet reliability by increasing its MDBF (mean distance between failures) from 2,154 miles in 2005 to more than 5,600 miles today.

With investments through 2014, all of the buses from before the creation of MTA Bus have been retired. These retirements, along with the purchase of new buses, have reduced the average age of the fleet to approximately seven years. In the process, the MTA Bus fleet has become more environmentally friendly with the introduction of low-emission technology, such as hybrid-electric propulsion and ultra-low sulfur fuel.

The MTA Bus Company has also made numerous initial improvements and repairs to facilities. These include: asbestos abatement, electrical repairs, regulatory testing and repairs, select structural modifications and equipment replacement to accommodate new buses, installation of tailpipe exhausts, upgrade of paint booths, battery rooms and fire protection systems, and replacement of depot roofs and ventilation systems.

The proposed capital program builds on these successes and will allow MTA Bus to continue its commitment to deliver high quality, reliable service.

Proposed 2015-2019 Capital Program - $376 million

The MTA Bus Company's proposed 2015-2019 Capital Program, totaling $376 million, provides the resources needed to restore, replace, and modernize significant portions of the agency's fleet and infrastructure. Table 14 identifies these investments by asset category.

Table 14
MTA Bus Company Proposed 2015-2019 Capital Program by Category ($ in millions)

Category	Proposed 2015-2019	Percent
Buses	$244	65%
Facilities and Equipment	105	28%
Program Administration	27	7%
Total	$376	100%

Numbers may not total due to rounding

Program Evolution – MTA Bus Company

This plan for MTA Bus totals $376 million, which is a reduction of $61 million compared to the previous MTA Bus 2015-2019 capital plan proposal that was submitted in September 2014. This $61 million reduction is the net effect of several factors:

Program Efficiencies

The plan assumes savings of $4.2 million, to be realized via more efficient design and construction of depot component and equipment projects. Efficiencies to be employed include:

- Component repair, rather than complete replacement, of targeted equipment.
- Coordination of contracting and procurement across multiple depots.
- Greater use of life-extension techniques rather than full replacement.
- Use of standard, off-the-shelf specifications, to the extent possible.

MTA Bus projects that are expected to realize savings via efficiencies are starred (**) in the "blue pages" listing of projects. The budgets of starred projects have been reduced by 10 percent as compared to the agencies' best estimate at the time of this plan resubmission. MTA Bus will strive to meet these reduced budgets, by incorporating efficiency strategies during project design. Some projects may yield greater savings opportunities than others, but the total savings of $4 million is the agency's goal.

Table 15
MTA Bus Company Capital Program Projected Savings Due to Program Efficiencies ($ in millions)

Element	Type of Project	% Red.	Assumed Savings	Likely Efficiencies
U70302	Facilities and Equipment	10%	$4	Component repair; coordination of contracting and procurement; life extension techniques; use of standard specifications
Total			$4	

Numbers may not total due to rounding

Revised Estimates

In the time that has elapsed since the September 2014 plan submission, projects have advanced further in the design process, resulting in better cost estimate information upon which to establish project budgets.

Priority Changes

MTA Bus has reevaluated all projects in the plan to confirm that all projects are critical to advance in the 2015-2019 timeframe. Some work was identified that can wait until after 2019 without an impact on operations and maintenance, and has been excluded from the plan resubmission. At the same time, however, a small amount of other work has been added to the plan resubmission to address newly emerging needs that had not been identified prior to September 2014.

Major Investments

Bus fleets and depots are the core of MTA Bus investment needs. Highlights of the program follow.

Bus Fleet

The proposed 2015-2019 Capital Program includes $244 million to purchase a total of 345 new buses, including: 292 high capacity express buses and 53 articulated buses. All of the buses procured during the 2015-2019 period will be for normal placement of buses that are approaching the end of their useful lives.

Facilities and Equipment

The proposed 2015-2019 Capital Program includes $105 million for facility and equipment investments. This includes component repairs at five depots and the implementation of new bus system technology such as a system to provide on-board audio and visual information to customers. It also includes support of a new bus radio system as well as the procurement of depot equipment and non-revenue vehicles.

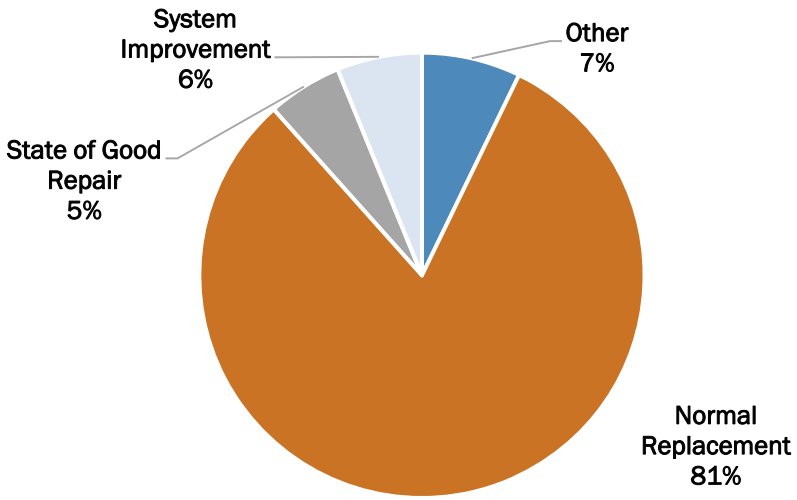
Program Administration

$27 million is set aside for in-house and third-party support of the projects proposed in the 2015-2019 Capital Program.

System Condition

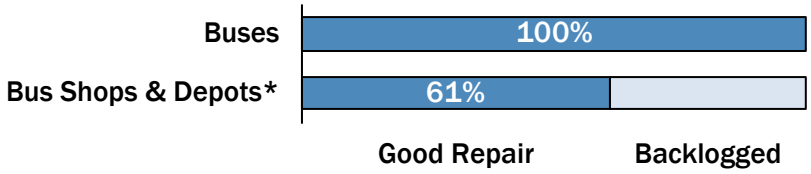
Figure 6 illustrates the mix of investments by needs category in the proposed 2015-2019 Capital Program. The program continues the MTA Bus emphasis on achieving and maintaining a state of good repair by devoting 88 percent of funding to replacing fleet and restoring facilities.

Figure 6
MTA Bus Company Proposed 2015-2019 Capital Program by Needs



MTA Bus assets are evaluated with the same benchmarks used for NYC Transit assets – namely asset condition, asset age vs. useful life, and asset performance vs. an identifiable performance standard. The System Investment Status (Figure 7) presents the percent of assets in good repair and those with backlogged components in need of repair.

Figure 7
MTA Bus Company System Investment Status



** Component-level condition assessment*

MTA Bus Company
Bus Company Projects
Category U-703

The MTA Bus Company operates the 11th largest bus fleet in the United States and Canada, serving nearly 400,000 riders daily. The fleet of 1,215 buses operates on 45 local bus routes serving the Bronx, Brooklyn, and Queens and 35 express bus routes between Manhattan, the Bronx, Brooklyn, and Queens. The fleet consists of 646 standard buses, 72 articulated buses, and 497 over-the-road coach buses for express service. Maintaining a normal cycle of bus replacement is critical for service reliability and the ongoing infusion of new technologies and improved environmental standards. The MTA Bus Company's fleet strategy is to achieve and continue a normal replacement cycle based on a 12-year useful life for buses and to invest in new buses and clean fuel technologies to reduce emissions. The average age of the fleet is approximately seven years.

The fleet operates out of eight depots: Baisley Park, College Point, Eastchester, Far Rockaway, JFK, LaGuardia, Spring Creek, and Yonkers. The City of New York owns three of the depots (College Point, Spring Creek and Yonkers) and leases the others from private owners. The facilities are needed to collect revenue from buses, clean and fuel buses in preparation for service, perform routine maintenance and repairs, and store buses when not in operation. In addition to maintenance areas, together the depots have 14 bus washers and three paint booths.

Proposed 2015-2019 Capital Program - $376 million

The proposed program includes $244 million for bus purchases, $105 million for facility and equipment projects, and $27 million for program administration and engineering support. A total of 345 new buses will be ordered for the normal replacement of buses approaching the end of their useful lives. These include 53 articulated buses ($48 million) for local service and 292 high capacity coaches ($196 million) for express service. Also included are component repairs at five depots: Spring Creek, College Point, LaGuardia, Baisley Park, and JFK. The development and rollout of new technology systems such as on-board audio/visual information for customers, automated passenger counters, and a depot bus location system are also proposed. The proposed program also includes $35 million to support the development of a new bus radio system. Finally, a variety of depot equipment, including two paint booths and an oil-water separator will receive component replacements, and various non-revenue vehicles will be procured to support operations.

This proposal reflects programmatic savings of an average of 10 percent in select depot component and equipment projects. Savings are expected through component repair, contracting efficiencies from the coordination of component repairs across multiple depots, greater use of life-extension techniques rather than full replacement for select components and equipment, and the use of standard design specifications.

MTA Capital Program 2015-2019
Interagency

Overview – MTA Interagency

This section of the program includes investments for the MTA Police Department and MTA Planning initiatives.

Proposed 2015-2019 Capital Program - $264 million

The MTA Police Department will complete the public safety radio system began in earlier programs, increasing the department's ability to respond to emergencies and enforce safety. The MTA Interagency program also allocates funds to support priority safety and customer initiatives with benefits across MTA agencies. Finally, MTA Planning initiatives provide support for planned MTA capital improvements (Table 16).

Table 16
MTA Interagency Proposed 2015-2019 Capital Program by Category ($ in millions)

Category	Proposed 2015-2019
MTA Police Department	$39
MTA Planning Initiatives	225
Total	$264

Numbers may not total due to rounding

MTA Interagency
MTA Police Department
Category N-710

The MTA Police Department is responsible for ensuring the safety and security of MTA's customers, employees, and facilities throughout the MTA service area. The service area encompasses over 4,400 square miles covering 14 counties in New York and Connecticut. On January 1, 1998, the MTA consolidated the police forces of the LIRR and Metro-North Railroad under the jurisdiction of the MTA Police. Subsequently, the Staten Island Rapid Transit Police was added to MTA Police on June 1, 2005. Prior to the consolidation, capital improvements associated with police needs at these Operating Agencies were addressed as part of the respective agency capital programs. Building upon the work begun with the 2005-2009 Capital Program and continued in the 2010-2014 Capital Program, the MTA Police Department's 2015 -2019 Capital Program will continue to assist the MTA Police Department to accomplish its mission of providing safety and security throughout the MTA network.

Proposed 2015-2019 Capital Program - $39 million

The MTA Police Department's 2015-2019 Capital Program includes projects to invest in facilities, vehicles and communication systems to allow the Police to effectively protect our customers and the overall transportation system (Table 17).

Table 17
MTA Police Department Proposed 2015-2019 Capital Program by Investment ($ in millions)

Project	Proposed 2015-2019
Public Safety Radio - Phase 3	$29
Poughkeepsie Facility	2
Other Facility, Vehicle and Administrative Projects	8
Total	$39

Numbers may not total due to rounding

Public Safety Radio - Phase 3 - $29 million

The goal of this investment is to have a dedicated MTA Police public safety radio system, built seamlessly to ensure system-wide radio coverage, allowing future interoperability among participating agencies and standardization of one system for the MTA Police. The 2005-2009 Capital Program included $45 million to fund design and early construction work intended to integrate the MTA police radio system with the New York State Wireless Network. The 2010-2014 Capital Program included an additional $60 million to fund construction. Favorable pricing for earlier phases of the project, coupled with refined estimates and implementation efficiencies, has resulted in a reduced cost to complete construction of the new system in this program from $50 million to $29 million.

Poughkeepsie Facility - $2 million

Investments in the district office in Poughkeepsie will address key deficiencies by making component improvements to upgrade the current facility, providing adequate space to operate an effective District Office.

Other Facility, Vehicle and Administrative Projects - $8 million

Additional MTA Police Department investments include a replacement firearms trailer, a parking solution for police personnel at Jamaica Station and the replacement of aged Emergency Service vehicles. Funding is also allocated to investigate opportunities to meet existing District Office facility needs in Queens, as well as to provide administrative support for the capital program.

MTA Interagency
MTA Planning Initiatives
Category N-711

The 2015-2019 Capital Program includes funds for research and analysis to sustain various planning initiatives. The planning initiatives support the MTA Long Range Planning Framework, which identifies long-term transportation needs and capital solutions to address those needs, as well as coordinate with emerging needs in the City of New York.

Proposed 2015-2019 Capital Program - $225 million

Table 18
MTA Planning Proposed 2015-2019 Capital Program Investments ($ in millions)

Project	Proposed 2015-2019
Core Planning Support	$10
Corridor Planning Support	10
Capital Program Support	125
Urban Core Infrastructure Reserve	80
Total	**$225**

Numbers may not total due to rounding

Core Planning Support - $10 million

Initiatives funded in this area include:

Upgrade MTA ridership and transportation models to identify current and future regional mobility needs and to evaluate impacts of transit network disruptions and closures.

Update regional travel surveys (including MNR, LIRR and NYCT city-wide surveys) to understand our customers' use of the system, remain eligible for New Starts funding, and inform the Capital Planning process.

Strategic planning evaluations responding to short- and long-term policy questions, such as data informing the impacts of possible fare policy revisions and analyses of regional demographic, economic, and travel trends.

Corridor Planning Support - $10 million

Initiatives funded in this area include:

In collaboration with NYCT:

- Queens Boulevard mobility needs survey/corridor analysis to identify factors contributing to growing congestion of E, F, M and R lines in Queens.

- Evaluation of Second Avenue Subway (SAS) future phasing opportunities (beyond Phase 2) in support of implementation of SAS Phase 2 construction. Phase 2 construction is advanced as part of the MTACC's program in 2015-2019.

In collaboration with MTA commuter railroads:

- Supporting analyses to inform regional rail capital initiatives.

- Evaluation of proposals by commuter railroads for service/network enhancements leading to capital investments including additional MNR West of Hudson capacity, LIRR diesel territory service enhancements and other LIRR Network Strategy outcomes and opportunities for "through running" of regional rail systems.

Evaluations of regional proposals by outside groups that could lead to MTA capital investments. Examples include new airport access proposals, new rail uses of dormant rights of ways and new trans–Hudson proposals.

Capital Program Support - $125 million

The 2015-2034 Twenty-Year Capital Needs Assessment and MTA Transportation Reinvention Commission highlighted the need for ongoing investment in the MTA network to support our diverse and dynamic service region. This investment is a critical element in maintaining New York's standing as one of the world's preeminent economic centers. Recognizing this vital need, funds are allocated to a variety of program support tasks, including:

- Evaluate and implement strategic recommendations of the MTA Transportation Reinvention Commission.

- Improve capital planning through Enterprise Asset Management (EAM) strategies and systems.

- Facilitate initiatives designed to enhance operational safety MTA-wide for customers and employees.

- Support implementation of new fare payment systems across the MTA family of Agencies.

- Evaluate the opportunity to expand SBS through the NYCT/MTA Bus service area.

- Develop pilot studies in support of these and additional strategic initiatives.

Urban Core Infrastructure Reserve - $80 million

The 2015-2019 Capital Plan includes funds reserved for the MTA to define projects in collaboration with the City of New York to study and develop initiatives to support coordination in areas of common interest. The intent is to bolster the existing MTA system to complement City initiatives on growth, development and mobility with such additional capital improvements as new access at stations in employment centers, new passenger connections between lines, and bus facilities. These activities will include a study of intra-city travel on the commuter rail network, as well as a study of a potential bus station, staging, and/or storage facility in Flushing, Queens. Proposals for capital improvement will be evaluated using standard planning, design, and engineering controls to ensure that they become projects that are affordable and achievable.

MTA Capital Program 2015-2019
Network Expansion

Overview – Network Expansion

In July 2003, the MTA Board authorized creation of the MTA Capital Construction Company (MTACC) as a new subsidiary with the specific mission to plan, design, and construct major MTA system expansion for the operating agencies. Since that time, the MTACC's expansion portfolio has focused on the construction of East Side Access (ESA), which will bring Long Island Rail Road commuters into Grand Central Terminal; and the initial phase of a new Second Avenue Subway (SAS), which will relieve the pressure on New York City Transit's overcrowded Lexington Avenue Line and improve access to downtown Manhattan. In addition, the MTACC remains responsible for the construction of other large scale projects that are nearing completion. Construction of the extension of the #7 subway line to support the redevelopment of the far West Side of Manhattan is funded by the City of New York. The construction of the Fulton Center, primarily federally funded with Lower Manhattan Recovery Office (LMRO) and federal American Recovery and Reinvestment Act (ARRA) funds in the 2000-2004 Capital Program, will improve transit service and access to many subway lines, PATH, and the World Trade Center site in downtown Manhattan.

These projects have achieved significant progress. The Fulton Center opened in November 2014. The #7 line extension opened in September 2015. Tunneling and blasting associated with Phase 1 of the Second Avenue Subway has been completed and all construction contracts have been awarded. SAS Phase 1 construction is approximately 85% complete. Phase 2 of the Second Avenue Subway will be advanced as well in the proposed 2015-2019 Capital Program, which will extend the tunnels and build new stations north from the 96th Street Station to 125th Street and 5th Avenue. The East Side Access project is well underway and has achieved major project milestones including the completion of the four major tunneling contracts and the award of its major Systems contract. Through June 2015, the project has committed $7.4 billion and expended $5.7 billion.

East Side Access Review

While East Side Access work continues, several factors have contributed to the establishment of a new budget of $10.178 billion and new revenue service date of December 2022, announced during the June 2014 MTA Capital Program Oversight Committee (CPOC) meeting. Following the rejection of bids for ESA's Manhattan Tunnels construction contract in October 2012, MTA and MTACC began a critical review of the project's cost and schedule to evaluate the impact of these events on the Project. This review continued through 2014, following the below sequence of events. Stakeholder participation throughout the review process included MTACC, the MTA Independent Engineering Consultant, the MTA Office of Construction Oversight, the Federal Transit Administration and their Program Management Oversight Consultant, as well as the Supplemental Independent Review Consultant. This review process timeline was as follows:

- **January 2013:** The Manhattan Tunnels scope was repackaged into three contracts; Manhattan South Structures, Manhattan North Structures, and Manhattan Caverns.
- **March 2013:** The MTA Chairman/CEO called for a Supplemental Independent Review of the schedule and costs, constructability, and the project's organizational structure.
- **April 2013:** Federal Transit Administration and their Program Management Oversight Consultant cited preliminary cost and Revenue Service Date ranges.
- **June 2013 to January 2014:** Conducted Program-Wide and Contract level analyses of cost and schedule, initiated risk assessments and advanced Supplemental Independent Review.
- **January 2014:** Presented at CPOC ESA preliminary cost and schedule ranges, initial findings of the Supplemental Independent Review and the new ESA organizational structure which includes an Executive

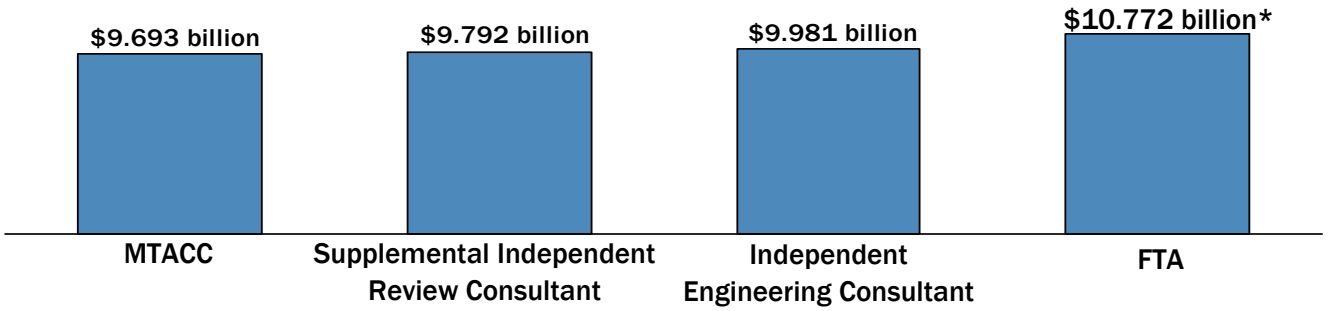
Steering Committee headed by the MTA Chairman, with representatives of MTACC, LIRR, and Amtrak (see Figure 8).

- **January 2014 to June 2014:** Completed the Program-Wide and Harold Interlocking risk assessments, additional independent studies and estimates, and review of the Integrated Systems Testing schedule by the Supplemental Independent Review Consultant.

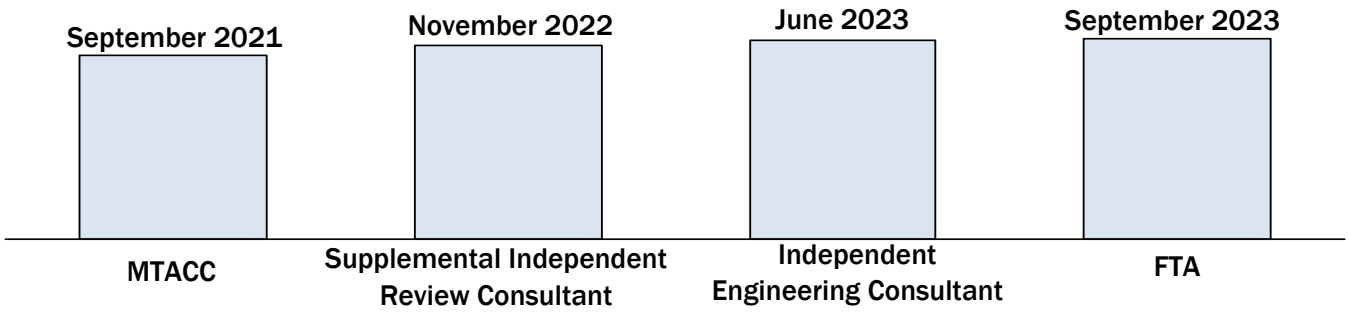
- **June 2014:** Presented at CPOC the revised ESA cost of $10.178 billion and Revenue Service Date of December 2022, including reasons for greater budget and schedule certainty, future risks and next steps.

All these steps were taken to ensure that the new budget and schedule sufficiently reflected the remaining type of work and associated risk, and that the most appropriate ESA organizational structure was in place to successfully manage the project going forward.

Figure 8
Budget and Schedule Ranges Presented to CPOC in January 2014



** FTA figure includes $463 million in rolling stock reserve*



Following this review effort, MTACC took further action to ensure ESA was able to advertise and award one of its critical contracts to maintain the new schedule. The MTA Board amended the MTACC portion of the 2010-2014 Capital Program to transfer $78.1 million from the ESA Rolling Stock Reserve/Liability Reserve project to the ESA project so ESA could award GCT Concourse and Facilities Fit-Out contract (CM014B) before the end of 2014. This action brought the approved ESA funding through the 2010-2014 Capital Program to $7.606 billion. The proposed 2015-2019 Capital Program includes $2.572 billion of additional local funds to complete the project. The proposed

2015-2019 Capital Program will also include $78.1 million to replenish the funds transferred from the ESA Rolling Stock Reserve/Liability Reserve project.

Regional Investment's overall budget has been impacted by ESA's revised budget and schedule as well. Driven by the schedule extension and re-sequencing of work at Harold Interlocking, the proposed 2015-2019 Capital Program includes $310 million in funds to complete this work.

Proposed 2015-2019 Capital Program - $4.956 billion

The proposed 2015-2019 Capital Program includes funding required to complete the East Side Access Project, including the Regional Investments which support East Side Access and provide improvements to the regional transportation network. It also includes funds to complete design and begin initial construction of Phase 2 of the Second Avenue Subway. A new project was added for funding design and construction of the infrastructure to allow Metro-North access into Penn Station from the New Haven Line via Amtrak's Hell Gate Line, to be managed by Metro-North Railroad. Funding is included to replenish previously borrowed funds from the ESA rolling stock reserve to match remaining needs as well. Finally, this proposal allocates funds to provide for miscellaneous project costs in support of these activities, including MTACC's share of the cost to administer the MTA-wide Small Business Development Program. In addition, with a goal of $61 million in scope, MTACC will make every effort to identify opportunities to contribute toward the overall MTA mentoring program objectives.

Table 19
MTA Network Expansion Proposed 2015-2019 Capital Program by Category ($ in millions)

Category	Funding In Prior Capital Program(s)	Proposed 2015-2019	All Programs
East Side Access	$7,606	$2,572	$10,178
Second Avenue Subway Phase 2	-	1,035	1,035
MNR Penn Station Access	-	695	695
Regional Investments	448	310	758
ESA Rolling Stock and Liability Reserve	558	209	767
Miscellaneous/Administration	215	135	350
Total	**$8,827**	**$4,956**	**$13,783**

Numbers may not total due to rounding

Capital Construction Company
East Side Access
Category G-709

Improved access between the Long Island transportation corridor (Suffolk, Nassau and Queens counties) and the East Side of Manhattan is recognized as a critical transportation link in the New York Metropolitan region. The roadways, transit system, and Pennsylvania Station, which serve this area, have reached their capacity and restrict travel options for residents and commuters in the region. The creation of direct LIRR service from the Long Island/Queens corridor into Grand Central Terminal (GCT) will have a number of significant regional transportation benefits. They include providing the LIRR with more opportunities to maintain and capture a greater share of the Long Island/Queens-to-Manhattan commuter market by offering more services and better reliability into Penn Station. Furthermore, after completion, ESA is expected to provide more than 160,000 rides per day. The travel time savings and convenience of the new service will directly benefit the 76,000 daily customers who will use the new terminal as well as provide a significant benefit to the over 30,000 daily customers who currently arrive at Penn Station on overcrowded trains.

Project Description

The East Side Access Project will connect the Long Island Rail Road's Port Washington and Main Lines to a new station at GCT. The connection will be made by constructing seven miles of new tunnels (3.5 miles in each direction) beginning in Queens, going under Amtrak's Sunnyside Yard, connecting to the lower level of the existing 63rd Street tunnel, and traveling under Park Avenue in Manhattan to reach GCT. Tail tracks under Park Avenue will extend to 38th Street.

Specific project construction details include:

- Construction of a new LIRR station at GCT.
- Construction of a new concourse and entrances at GCT.
- Construction of a new mid-day storage yard in Queens.
- Construction and reconfiguration of LIRR's Harold Interlocking, including boring soft ground tunnels in Queens under Sunnyside Yard.
- Reconstruction of a portion of Yard A for storing trains that serve GCT.
- Excavation of tunnels in Manhattan using Tunnel Boring machines.

Following the receipt of a high bid for the Manhattan Structures construction contract in October 2012, MTA Capital Construction Company in conjunction with the MTA, the Independent Engineering Consultant, the Federal Transit Administration and a Supplemental Independent Consultant, completed a comprehensive project cost, schedule, and organizational review, including conducting risk assessments. The results were presented to the MTA Board at the June 2014 Capital Program Oversight Committee meeting, revising the overall cost by $1.933 billion from $8.245 billion to $10.178 billion and adjusting the Revenue Service Date from August 2019 to December 2022.

Table 20
East Side Access Major Milestones and Forecasts

Major Milestone	Timing
Start Preliminary Design	March 1999
Obtain Record of Decision	May 2001
Start Early Construction Activities	September 2001
Award Tunnel Boring Machine Tunneling	July 2006
Award of the Full Funding Grant Agreement	December 2006
Complete Construction	November 2019
Begin Revenue Service to GCT	December 2022

Prior Program Highlights/Accomplishments

Overall funding through the 2010-2014 Capital Program is $7.606 billion. This total includes two amendments to the 2010-2014 Capital Program (see ESA Rolling Stock and Liability Reserve section for additional detail). Through June 2015, the project has committed $7.4 billion and expended $5.7 billion. The project has completed all TBM tunneling in Manhattan and Queens. Construction of permanent structural concrete lining, interior structures and fit-out for caverns and tunnels is underway. The major contract to procure, fabricate, test and commission systems has been awarded. The following is a summary of the project by capital program:

1995-1999 Capital Program

The 1995-1999 Capital Program included $157.7 million to fund preliminary engineering, preparation of the final environmental impact statement and early construction activities of ESA.

2000-2004 Capital Program

The 2000-2004 Capital Program included $1.5 billion of ESA funds and $33.5 million in non-ESA funds to continue design and to begin construction of major elements of the project. This included the following:

- Clean-up and preparation of the existing LIRR yards in Sunnyside, Queens and excavation of the existing 63rd Street tunnel bellmouth structure. This work is complete.
- Construction of a new Metro-North Railroad Highbridge maintenance facility and storage yard in the Bronx, replacing Metro-North's Madison Avenue Yard in GCT. This work is complete.
- Construction of the Arch Street LIRR Maintenance and Repair facility for the rail cars that will support LIRR's GCT service. This work is complete.

- Major demolition, civil and structural work and relocation of existing Metro-North tracks in the GCT Madison Avenue Yard in preparation of future construction of a passenger concourse for LIRR passengers. This work is complete.

- Open-cut excavation adjacent to the existing Sunnyside Yard in Queens and construction of permanent tunnel structures. This work is complete.

- Excavation of tunnels and station caverns in Manhattan from the existing 63rd Street tunnel at 2nd Avenue to the new station at GCT. This work is complete.

- Procurement of long lead materials for force account construction at Harold Interlocking and construction of new interlockings. This work is complete.

2005-2009 Capital Program

The 2005-2009 Capital Program contains $2.672 billion in ESA funds and $10.5 million funded directly in the LIRR capital program to continue major construction elements. Elements of project management, design, construction management, insurance, and real estate necessary to support construction are also funded. The program includes the following major construction elements:

- Construction of the new tunnels in Manhattan. This work is complete.

- Construction of bored tunnels under Sunnyside Yard and Harold Interlocking in Queens. This work is complete.

- Construction of the Northern Boulevard Crossing. This work is complete.

- Major demolition, civil and structural work and relocation of existing Metro-North tracks in the GCT Madison Avenue Yard in preparation of future construction of a passenger concourse for LIRR passengers. This work is complete.

- Begin the reconfiguration of the Harold Interlocking. This work is on-going.

- Construction of ventilation facility at 50th Street. This work is complete.

- Design and manufacture of elevators and escalators. This work is on-going.

- Purchase/acquisition of required real estate interests. This work is on-going.

2010-2014 Capital Program

The 2010-2014 Capital Program contains $3.232 billion in ESA funds to continue major construction elements. Elements of project management, design, construction management, and insurance necessary to support construction are also funded. The program includes the following major construction elements:

- Construction of the new tunnels in Manhattan. This work is complete.

- Construction and fit-out of the new LIRR caverns, concourse and mezzanines at GCT. This work is on-going.

- Reconfiguration of the Harold Interlocking and yard lead. This work is on-going.

- Procure, fabricate, install, test and commission communication, controls, security, fire detection, tunnel ventilation and facility power. This work is on-going.

- Procure signal equipment. This work is complete.

- Construction of ventilation, track, power, signals and ancillary systems. This work is on-going.
- Begin construction of a new entrance for LIRR customers at Grand Central Terminal. This work is on-going.

Proposed 2015-2019 Capital Program - $2.572 billion

The proposed 2015-2019 Capital Program will complete the construction of ESA to enable revenue service by December 2022. Elements of project management, design, construction management, and insurance necessary to support construction as well as support to testing and commissioning are also funded. The program includes the following major construction elements:

- Construction of Manhattan Caverns.
- Reconfiguration of the Harold Interlocking and yard lead.
- Construction of a mid-day storage yard in Queens for rolling stock.
- Construction of a new entrance for LIRR customers at Grand Central Terminal.
- Procure, fabricate, install, test and commission communication, controls, security, fire detection, tunnel ventilation and facility power.
- Procurement and installation of traction power equipment.
- Procurement of electric rail cars for opening day service (some rolling stock costs are included in the reserve described later in this section).

The scope of the East Side Access project remains substantially unchanged. Funds totaling $7.606 billion have been allocated in the MTA's 1995-1999, 2000-2004, 2005-2009, and 2010-2014 Capital Programs. The balance of funds required to complete the project is being proposed in this program. The ESA project Federal Full Funding Grant Agreement (FFGA) approved in December 2006 will provide $2.632 billion in federal new starts funds. The FFGA is currently being revised based on ESA's new budget and schedule.

Capital Construction Company
Second Avenue Subway
Category G-710

The purpose of the full-length Second Avenue Subway (SAS) is to address the problems and deficiencies in access and mobility associated with an overburdened transit infrastructure that is struggling to accommodate existing customers as well as new customers from the continuing growth of Manhattan's East Side.

The East Side is densely populated with residential, retail, and commercial office use. Every day, more than two million people travel in the area that would be served by a full-length Second Avenue Subway as they commute to and from work. Over three-quarters of people working in the area use the subway, bus, rail, or ferry to get to and from their jobs during rush hours.

NYC Transit's Lexington Avenue subway is the only north-south route serving the East Side. Carrying more passengers than any other subway line in the United States, the "Lex" alone carries 1.3 million riders each weekday, which is greater than the ridership of the entire transit systems in San Francisco, Chicago, and Boston combined.

The Lexington Avenue service operates significantly above guideline capacity during peak hours, resulting in overcrowded trains, congested stations, and delays for customers. During the morning peak hour, 29 southbound trains per hour are scheduled to run on the Lexington Avenue express line. However, due to the frequent congestion south of 125th Street, only 25 or fewer trains depart Grand Central-42nd Street during the peak hour. Because of excessive congestion, travel times are markedly longer than at other times, reducing service levels.

In addition, because the Lexington line is the only route serving most of the East Side, residents and workers often have to contend with poor access and long walks to and from the subway.

The Second Avenue Subway will address all of these issues, providing additional service and access to the East Side's dense residential, commercial and retail populations, and relieving overcrowding and service limitations currently experienced on the Lexington Avenue line by hundreds of thousands of people who travel to, from, and through the East Side of Manhattan.

Project Description

The goal of the project is to relieve crowding and improve reliability on the Lexington line and to improve mobility for commuters on Manhattan's East Side and throughout New York City and the metropolitan area. Numerous alternatives have been developed and analyzed for a new Second Avenue Subway since it was first conceived in the 1920s. The project is the result of the MTA's MESA (Manhattan East Side Alternatives) major investment study and subsequent environmental impact statements.

Specific project construction details for the full-length SAS include:

- Construction of a two-track 8.5 mile subway line from 125th Street to Lower Manhattan.
- Connection to the rest of the subway system via the 63rd Street line.
- Construction of 16 new, fully accessible subway stations.
- Construction of new transfers with other MTA services, including 125th Street (serving Metro-North and NYC Transit passengers) and Grand Street Other transfers are being evaluated for 55th, 42nd, 14th, and Houston Streets.

The full-length Second Avenue Subway will provide two new subway services. One will operate along the full length of the route between 125th Street and Hanover Square. The other will operate along Second Avenue from 125th Street to 63rd Street, then travel west along the existing 63rd Street line and join the Broadway (N/R/Q) line via an existing connection and serve express stations along 7th Avenue and Broadway before crossing the Manhattan Bridge to Brooklyn. Customers traveling to Lower Manhattan on this line can transfer to local services for destinations south of Canal Street.

The project will be implemented to provide for four operational phases. These could potentially overlap and include: 1) 105th Street to 62nd Street, including connection to the 63rd Street line; 2) 125th Street to 105th Street; 3) 62nd Street to Houston Street; and 4) Houston Street to Hanover Square. The MTACC is currently progressing Phase 1, including three new stations at 96th Street, 86th Street, and 72nd Street, and new entrances to the existing Lexington Avenue/63 Street Station at 63rd Street and Third Avenue.

Proposed 2015-2019 Capital Program - $1.035 billion

The proposed 2015-2019 Capital Program provides $1.035 billion to commence SAS Phase 2.

Implementation of the full SAS Phase 2 will span several capital programs. Initial funding of $535 million in this program will address environmental, design, and real estate and project support to undertake preliminary construction work, such as utility relocation.

This program also reserves $500 million to support progressing major construction activities. This may include site work to prepare for tunneling and station construction or other relevant activities. Continuing development and design of the project will provide MTA with a fuller understanding of project costs, schedule, contract packaging and risks, with the goal to progress Phase 2 to the extent possible.

The balance of the work necessary for operation will be funded in future capital programs.

In its entirety, SAS Phase 2 will complete the full project's East Harlem segment. Its alignment will run under Second Avenue to 120th Street, then will turn west along 125th Street, crossing Lexington Avenue and ending at 5th Avenue to accommodate storage tracks. SAS Phase 2 will utilize a tunnel section built in the 1970s from 110th Street to 120th Street and will be outfitted with tracks and other essential equipment. Three new stations will also be constructed at 125th Street, 116th Street, and 106th Street.

The completion of SAS Phase 2 will support two major objectives of the Second Avenue Subway Master Plan: alleviate the passenger congestion of the Lexington Avenue Line and provide an intermodal connection with Metro-North Railroad at the 125th Street and Park Avenue Station.

Capital Construction Company
Penn Station Access
Category G-711

On January 8, 2014, Governor Cuomo announced his support for MTA Metro-North Railroad expansion of New Haven Line service into Penn Station NY, taking advantage of the existing Amtrak Hell Gate Line. This project would provide added system resiliency against potential catastrophic service disruptions that could affect over 700 trains and 280,000 commuters daily through an alternate route and terminal in Manhattan for Metro-North New Haven Line customers. Customers with destinations on Manhattan's West Side, the fastest growing area in the Manhattan Central Business District will save travel time via a direct connection between the New Haven Line and Penn Station New York. Metro-North customers reverse commuting from Manhattan and new stations in the Bronx to the northern suburbs, a rapidly growing segment of Metro-North riders, similarly will experience substantial travel time reductions. This project will be delivered by Metro-North Railroad.

In constructing the necessary infrastructure to operate this service, four new stations will be constructed to provide commuter rail service in eastern Bronx, serving Co-op City, Morris Park, Parkchester/Van Nest, and Hunts Point. When built, MNR Penn Access will serve as an element of improved regional connectivity by completing the direct connections among all of the New York metropolitan regions' regional and intercity rail services (Metro-North, LIRR, New Jersey Transit and Amtrak) at Penn Station.

Penn Station Access is currently in the Environmental Review process. Upon completion, Metro-North would design and implement the following Hell Gate Line improvements:

- Track and structures work necessary to operate on the Hell Gate Line.
- Communications and signals work.
- Power improvements including 3rd rail, power substations, and catenary.
- Construction of 4 stations in the Bronx serving Co-op City, Morris Park, Parkchester/Van Nest, and Hunts Point.
- Rolling Stock specification development for the fleet needed to operate the service.

In addition, modification would be made to Penn Station Access service-related areas of Penn Station (as necessary).

Program Efficiencies

The plan assumes savings of $48 million to be realized by utilizing best value procurement practices and resource strategies in constructing the infrastructure elements of the Penn Station Access project. The types of efficiencies that will be employed to generate these savings include:

- Alternative procurement strategies, such as separate contracts for furnishing and installation of equipment and design-build.
- Coordination of multiple projects on the same section of track, to minimize service diversions and reduce agency support costs.

Table 21 below shows the elements in which these savings are assumed. Projects in these elements that are expected to realize savings via efficiencies are starred (**) in the "blue pages" listing of projects. The budgets of

starred projects have been reduced by a fixed percentage (noted in Table 21 below) as compared to the agency's best estimate at the time of this plan resubmission. Metro-North Railroad will strive to meet these reductions by incorporating efficiency strategies during project design. Savings may not be achieved consistently across all projects because some projects may yield greater opportunities than others, but achieving the overall savings by element, as listed in Table 21 below, is the agency's goal.

Table 21
MTA Capital Construction Company Capital Program Savings Due to Program Efficiencies ($ in millions)

Work Element	Type of Project	% Red.	Assumed Savings	Likely Efficiencies
G7110104	Track & Structures	10%	$26	Alternative procurement strategies; Work coordination
G7110105	Communication & Signals	10%	6	Alternative procurement strategies; Work coordination
G7110106	Power	10%	12	Alternative procurement strategies; Work coordination
G7110108	Shops & Yards	10%	3	Alternative procurement strategies; Work coordination
Total			$48	

Numbers may not total due to rounding

Proposed 2015-2019 Capital Program - $695 million

The proposed Capital Program includes design and construction of infrastructure and completion of specifications for rolling stock to operate Metro-North Railroad service on the New Haven Line into Penn Station NY via Amtrak's Hell Gate Line.

Capital Construction Company
Regional Investments
Category G-714

In the course of designing the East Side Access project, the MTA identified additional investments to be progressed concurrently with the East Side Access program in order to achieve ESA revenue service. The budget for this work totaled $484 million, which included $401 million in the 2010-2014 Capital Program and $83 million in future funds which would not be needed until the 2015-2019 Capital Program. These investments, while not required to meet the ESA project objectives, are necessary to meet the operational flexibility of the LIRR, Amtrak and New Jersey Transit (NJT) within Harold Interlocking and Sunnyside yard and contribute to the long term growth potential in the region.

Regional Investments include work at Harold interlocking, serving the busiest passenger rail corridor in the United States. The introduction of ESA service will result in an additional 24 trains in the peak hour traveling through this already busy interlocking. The MTA's Metro-North Railroad is also assessing the feasibility of bringing trains from the Hudson Valley and Connecticut through Harold Interlocking and Sunnyside Yard to Penn Station. Recognizing the long term regional benefit of building an operationally "robust" complex through Harold Interlocking that would accommodate the future needs of the LIRR, Amtrak, NJT and Metro-North, Regional Investments will provide critical operational flexibility for all the railroads to meet their long term service plans. Proposed investments include: an East Bound Reroute, which eliminates existing train conflicts between Amtrak and LIRR and increases speeds heading east and north; a West Bound Reroute, which will allow Amtrak and Metro-North to travel through the Harold complex without conflicting with other trains heading into or out of Penn Station; and a Loop Track Interlocking, which allows flexibility for access to both Penn Station and the Mid-day Storage yard and increases capacity and speeds for Amtrak and NJT entering Sunnyside Yard.

Regional Investments also include the purchase of a small number of LIRR cars to support ESA growth.

The cost and schedule impacts on ESA have had an effect on Regional Investment as well. When the ESA schedule was extended to August 2019, the total budget of Regional Investments increased from $484 million to $590 million. While this increase reflected the latest estimates and required support costs, the breakdown between federal and local funding had changed. Initially, Regional Investments was solely local funds. However, $294.8 million of the Regional Investments budget is now funded through the Federal Railroad Administration High-Speed Intercity Passenger Rail Program and $2.2 million is funded through an FTA Freedom Grant.

The 2010-2014 Capital Program was increased by $47 million from $401 million to $448 million in the Plan Amendment approved by the MTA Board in July 2013. The Regional Investment budget was further revised in June 2014 as a result of the comprehensive cost, schedule and risk review of the ESA project. As part of this review a Harold risk assessment was conducted which resulted in the re-sequencing of work and estimates were revised to reflect the availability of Railroad resources and productivity assumptions. The Regional Investment budget also includes funding for the design and the start of Sunnyside Station construction, as stated in the previously approved capital program. The revised cost for the Regional Investments is $758 million. To complete these projects the 2015-2019 proposed Capital Program includes $310 million.

2010-2014 Capital Program

A number of construction contracts are underway including the first major construction contract, Harold Structures Part 3 West Bound Bypass Structures (CH057A), primarily funded by the Federal Railroad Administration's High Speed Intercity Passenger Rail Program which was awarded in November 2013. Elements of project management,

design, construction management, and insurance necessary to support construction are also funded. The program includes the following major elements:

- Amtrak fabrication of Central Instrument Locations (CILS).
- Construction of the Westbound Bypass in Harold Interlocking.
- Purchase of a small number of LIRR cars to support ESA growth.
- Construction of an ADA elevator in Grand Central Terminal.
- Material procurement and labor for Harold stages 3 and 4.

Proposed 2015-2019 Capital Program - $310 million

Due to the latest schedule extension of ESA and the re-sequencing of Harold Interlocking activities, funds are needed for Regional Investments in the 2015-2019 Capital Program to complete construction. The program includes the following major construction elements:

- Demolition of existing and construction of a new Amtrak Car Washer (CH059).
- Construction of the Eastbound Reroute Harold Structures - Part 4 (CH058).
- Material procurement and labor for Harold stages 3 and 4.
- Design and begin construction of the Sunnyside Passenger Station.

Capital Construction Company
ESA Rolling Stock / ESA Risk Reserve
Category G-715

MTA Capital Construction Company is budgeting for the purchase of 160 rail cars to meet East Side Access opening day service needs. The 2015-2019 East Side Access and Regional Investment budgets include $194.5 million and $50 million respectively. In addition, a $463 million Rolling Stock Reserve was established in the 2010-2014 Capital Program to fund the balance of rail vehicles needed to operate opening day service to Grand Central Terminal, pending completion of a full simulation of the opening day service plan from LIRR to confirm the optimal operating plan and the full fleet requirements. The simulation is to evaluate service in the context of the capacity enhancements to be funded by LIRR as part of their 2010-2014 and 2015-2019 Capital Programs, including:

- Jamaica enhancements - signal upgrades and interlocking reconfigurations, infrastructure to facilitate new Cross-Borough Scoot service between Jamaica and Brooklyn.
- Yard enhancements - new Mid-Suffolk and Huntington / Port Jefferson branch yards.
- Pocket tracks - at strategic locations on the Port Washington and Babylon branches.
- Construction of a full second track from Ronkonkoma to Central Islip - as the first phase of a complete Double Track on the Main Line from Farmingdale to Ronkonkoma.

In 2014, the MTA Board amended the 2010-2014 Capital Program to transfer $78.1 million in funds from the ESA Rolling Stock Reserve to the ESA project in order to progress the GCT Concourse and Facilities Fit-Out contract. Without the additional funds, this contract could not have been bid and awarded in the scheduled timeframe unless it included a significant option. Based on the revised ESA Revenue Service Date, the electric rail cars do not need to be procured in the 2010-2014 Capital Program and therefore could be transferred to facilitate this short term need. This $78.1 million is included in the proposed 2015-2019 Capital Program to re-establish the full $463 million ESA Rolling Stock Reserve, to remain in reserve pending further confirmation of the results of the above simulation.

MTACC established the new ESA budget of $10.178 billion, announced during the June 2014 MTA Capital Program Oversight Committee (CPOC) meeting. At that time, the FTA projected the cost to complete this work to be $10.309 billion excluding Rolling Stock, a difference of $131 million. To recognize the concerns of our key stakeholder, an ESA reserve in this amount will also be established in the 2015-2019 Capital Program to help mitigate risk as the project moves toward completion.

Proposed 2015-2019 Capital Program - $209 million

An ESA Rolling Stock Reserve of $78.1 million is being established to restore the full $463 million reserve approved in the 2010-2014 Capital Program, replenishing funds that were transferred to the ESA program in 2014 for the GCT Concourse and Facilities Fit-Out contract (CM014B). In addition, an ESA reserve of $131 million is proposed to facilitate mitigation of further project risk.

Table 22
East Side Access Proposed 2015-2019 Capital Program Reserves ($ in millions)

Project	Proposed 2015-2019
ESA Rolling Stock Reserve	$78
ESA Liability Reserve	131
Total:	**$209**

Numbers may not total due to rounding

Capital Construction Company Miscellaneous Category G-716

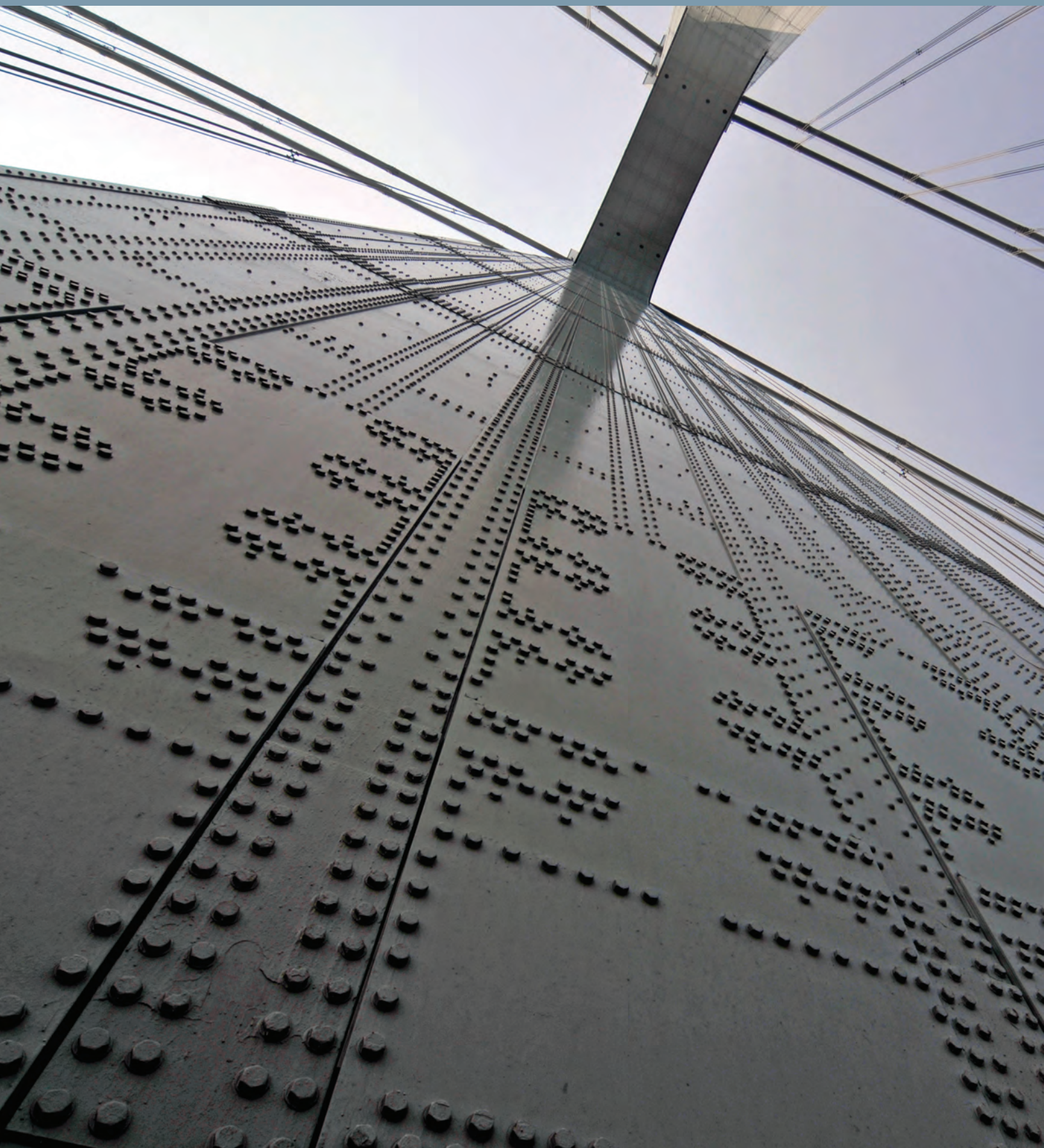
A key objective of the MTACC is to utilize a cost-efficient program management structure to oversee and manage the MTA system expansion projects. The structure will realize a 10 percent efficiency savings by maximizing the sharing of expertise and support services from project sponsor agencies, avoiding redundancies and duplication of functions between agencies.

To accomplish this, MTACC established an organization of core management personnel. Project support for planning, design and construction management is also provided by staff that is matrixed from the sponsor operating agencies and MTA headquarters. MTA Capital Construction Company established consistent procedures, standards and guidelines that are applied to all the projects under its management.

Proposed 2015-2019 Capital Program - $135 million

The proposed 2015-2019 Capital Program includes $135 million for these functions. Funds have been budgeted for MTACC administrative staff, the reimbursement of NYCT for administrative support staff and services, temporary expert services (such as indefinite quantity consultants and firms to support project controls, change order and claims management), independent engineering oversight, occupancy, legal and engineering services, workforce development through employee training, and other office costs such as supplies, communications and computer equipment. These are non-project specific expenses or project specific expenses that may not be eligible for reimbursement with that project's funding. Remaining funds have been budgeted for MTA Audit quarterly chargebacks, MTACC's contribution to the administration of the Small Business Development Program (SBDP), Hyperion financial reporting system, and catastrophic bond insurance expenses.

MTA Capital Program 2015-2019
Bridges and Tunnels



Asset Base – Bridges and Tunnels

Table 23
Bridges and Tunnels Facilities

Facility	Year Opened	Type of Structure	Length (Feet)
Bronx-Whitestone Bridge (BWB)	1939	Suspension Span	3,842
		Viaducts/Approaches	3,061
Cross Bay Bridge (CBB)	1970	High Level Fixed Bridge	3,023
		Viaducts/Approaches	2,472
Henry Hudson Bridge (HHB)	1936	Steel Arch Bridge	2,193
Hugh L. Carey Tunnel (HCT)	1950	Vehicular Tunnel	9,137
Marine Parkway Bridge (MPB)	1937	Lift Bridge	3,985
Queens Midtown Tunnel (QMT)	1940	Vehicular Tunnel	6,414
Robert F. Kennedy Bridge (RFK)	1936	Suspension Span	2,624
		Harlem River Lift Span	772
		Bronx Crossing Truss Span	1,600
		Viaducts/Approaches	11,742
		Ramps	10,935
Throgs Neck Bridge (TNB)	1961	Suspension Span	2,910
		Viaducts/Approaches	8,022
Verrazano-Narrows Bridge (VNB)	1964	Suspension Span	6,690
		Viaducts/Approaches	2,910
		Ramps	8,808

Overview – Bridges and Tunnels

MTA Bridges and Tunnels operates seven bridges and two tunnels that form essential links for vehicular highway transportation in the New York City metropolitan area (Table 23). In 2014, the nine crossings generated more than $1.6 billion in toll revenue and over the last five years have carried an average of over 285 million annual vehicle trips. With approximately 60 percent of its toll revenue dedicated to mass transit operations, Bridges and Tunnels performs a unique and vital function in support of regional transportation.

The proposed 2015-2019 Capital Program is the culmination of a rigorous ongoing planning process that is reflected in the 2015-2034 Twenty-Year Capital Needs Assessment. The Authority Master Plans for each bridge and tunnel are the foundation of the B&T capital planning process and are shaped by several factors, including detailed analyses of long-term needs based upon bridge and tunnel inspections and condition ratings of the various bridge and tunnel elements. These plans are very dynamic and demonstrate the agency's ongoing commitment to maintain the structural integrity of its facilities while, at the same time, modernize facilities to meet current standards, operate safely and securely to enhance regional mobility, customer satisfaction and the quality of life in the region.

Proposed 2015-2019 Capital Program - $2.856 billion

Table 24 and 25 outlines B&T needs for the 2015-2019 Capital Program for each facility and by category of work. The most significant investment needs have been identified in the Structures ($803 million, or 28%) and Roadways and Decks ($1.07 billion, or 38%) categories. As shown below, the largest proportion (65%) of this investment will be at three bridges: the Robert F. Kennedy Bridge ($747 million, or 26%), the Throgs Neck Bridge ($578 million, or 20%), and the Verrazano-Narrows Bridge ($530 million, or 19%).

Table 24
Bridges and Tunnels Proposed 2015-2019 Capital Program by Facility ($ in millions)

Facility	Proposed 2015-2019	Percent
Bronx-Whitestone Bridge (BWB)	$137	4%
Henry Hudson Bridge (HHB)	243	9%
Hugh L. Carey Tunnel (HCT)	116	4%
Queens Midtown Tunnel (QMT)	64	2%
Robert F. Kennedy Bridge (RFK)	747	26%
Rockaway Crossings (Cross Bay and Marine Parkway Bridges)	56	2%
Throgs Neck Bridge (TNB)	578	20%
Verrazano-Narrows Bridge (VNB)	530	19%
Agency Wide	385	14%
Total	$2,856	100%

Numbers may not total due to rounding

Table 25
Bridges and Tunnels Proposed 2015-2019 Capital Program by Category ($ in millions)

Category	Proposed 2015-2019	Percent
Structures	$803	28%
Roadways & Decks	1,073	38%
Toll Plazas & ITS	206	7%
Utilities	406	14%
Buildings & Sites	94	3%
Miscellaneous	86	3%
Structural Painting	188	7%
Total	$2,856	100%

Numbers may not total due to rounding

Program Evolution

This plan for MTA Bridges & Tunnels totals $2.856 billion, which is a reduction of $200 million compared to the previous B&T 2015-2019 capital plan proposal that was submitted in September 2014. This $200 million reduction is the net effect of several factors:

Best Value Procurement and Alternate Project Delivery Methods

The revised plan reflects efficiencies attributed to more streamlined design and construction of certain types of capital projects, as well as alternate project delivery and procurement methods, to achieve overall best value implementation. Bridges & Tunnels is pursuing a fairly aggressive design-build program in the 2015-2019 time frame which promises efficient and faster delivery of projects, while achieving best value benefits. In addition, as part of this plan resubmission other types of program efficiencies are being realized or are expected to be realized over the long-term. These include:

- Coordination of multiple projects with similar scope of work across various locations, to minimize lane closures and other customer impacts.
- Phased rehabilitation or replacement of bridge and tunnel elements, to allow for better coordination and utilization of resources across B&T facilities.
- Alignment of capital and operating initiatives to ensure addressing of full life-cycle needs for bridge and tunnel assets.
- Best value procurement strategies, such as combining multiple projects for solicitation under a single contract, coordinating capital and operating projects under a combined procurement process, etc.
- Continuation of best practices for project selection and delivery such as Value Engineering, Independent Constructability and Risk Assessment reviews.

Leveraging Efficiencies Achieved in Previous Capital Plans

Favorable bid savings and continuing progress on achieving project closeouts in previous capital programs have allowed Bridges & Tunnels to reprogram funds made available through these efforts towards the first group of priority projects in the 2015-2019 plan.

Revised Estimates

In the time that has elapsed since the September 2014 plan submission, ongoing inspections at B&T's facilities were conducted and projects have advanced further in the design process, resulting in better cost estimate information upon which to establish project budgets.

Priority Changes

Bridges & Tunnels has updated its Facility Master Plans and reevaluated all projects in the 2015-2019 capital program to consider new information available since September 2014 and confirm that all critical work is progressed in the 2015-2019 timeframe. The timing for implementation of some projects was refreshed for better definition of time lines for major inter-agency coordination, more optimal sequencing of certain multi-phased projects, and ensuring the most critical needs will be addressed in the capital program. Ongoing bridge and tunnel inspection results have also been incorporated in the plan resubmission to address newly emerging needs that were not identified prior to September 2014.

Major Investments

Core Infrastructure

Much of the proposed capital program focuses on preservation of assets and maintaining the structural integrity of the facilities to help reduce risk, modernize to meet current performance standards, optimize facility and operational efficiencies and improve overall financial performance. The replacement of aging facility components to ensure that the historic B&T facilities remain in a state of good repair is highly prioritized. To determine the most immediate structural needs, the seven bridges and two tunnels and other ancillary facilities undergo periodic, comprehensive condition inspections. The bridges are inspected every two years, in accordance with the New York State Biennial Bridge Inspection Program, and additional interim inspections are conducted in the years between biennial inspection cycles on critical components and/or conditions that warrant more in-depth inspection efforts. In addition, separate underwater and substructure inspections are performed per FHWA and NYSDOT requirements, which typically are based on a five year cycle. In-house engineering staff also assesses the overall condition of all B&T facilities on an ongoing basis. Unlike bridges, federal and state mandated inspection cycles were not previously specified for tunnels; However, in the 2010-2014 Capital Program, B&T embarked on comprehensive inspection efforts at the Queens Midtown Tunnel, as well as conducted post Hurricane Sandy tunnel inspections at both tunnels (HCT and QMT) to help inform major structural capital projects. Beginning in 2015, federal and state requirements for similar biennial inspection cycles at the tunnels will commence. In general, B&T inspection protocols have been highly regarded and were recently commended via an independent peer review.

The rehabilitation and replacement of aging equipment and facility components has been the primary focus of B&T in all of its capital programs. At the Robert F. Kennedy Bridge (RFK), a phased rehabilitation program that began in the mid-1990's has resulted in a variety of improvements being completed at the facility's complex array of roadways and structures that link Queens, Manhattan, and the Bronx. In the two most recent programs, the decks on both the southbound Manhattan to Queens ramp on Randall's Island and the on-board Harlem River Drive Ramp on the Manhattan side were replaced as part of projects that also rehabilitated the substructures of those decks. In addition, the design for the reconstruction of the Manhattan approach ramps at 124th-125th Streets was completed, and construction was awarded in late 2014. The replacement of the Bronx Toll Plaza deck also started during the 4th quarter of 2014.

The Bronx-Whitestone Bridge (BWB) has also benefitted from a wide range of recent investments with a strong emphasis on renewing the roadway and deck elements, reducing loads on the main cables and improving the bridge's aerodynamic performance in high wind conditions.

In the 2010-2014 Capital Program, repairs were made to the Bronx concrete anchorage and the Queens elevated and on-grade approaches were replaced. The completion of the Queens approach work in early 2015 was the final step in replacing all of the original 1930's era roadways of this facility. While major portions of the BWB roadway structure were being replaced, concurrent work was carried out at the Throgs Neck Bridge (TNB), including major repairs to the steel superstructure supporting the deck on the Queens and Bronx approaches.

The Verrazano-Narrows Bridge (VNB), the longest suspension bridge in North America, has multiple decks and an intricate system of ramps at both ends. The VNB requires continual investment in its roadways, structures and utilities. Recent improvements either completed or underway include: replacement of the original upper level suspended span decks with a new orthotropic steel deck, steel repairs and painting on the superstructure, improvements to the Toll Plaza east and westbound ramps, and a complete rehabilitation of the East-bound Toll Plaza roadways and Staten Island Expressway approach to the VNB.

At the Henry Hudson Bridge (HHB), the upper and lower level decks are being addressed for reconfiguration and/or replacement. Substructure rehabilitation at the Marine Parkway Bridge (MPB) is ongoing while at the Cross Bay Bridge (CBB), deck and superstructure rehabilitation, substructure and underwater work are in progress. The electrical and mechanical equipment associated with the lift span at the MPB will be rehabilitated and or replaced along with structural steel repairs as needed.

The Hugh L. Carey Tunnel (HCT) and Queens Midtown Tunnel (QMT) were severely affected by flooding during Super Storm Sandy. As a result, the 2010-2014 Capital Program includes Super Storm Sandy restoration and mitigation work at these facilities, in conjunction with pre-existing structural rehabilitation projects. Together, these investments will address all the tunnel assets destroyed when corrosive salt-waters inundated the tubes in October 2012, along with other tunnel elements that were already scheduled for capital renewal in the facility master plans.

The replacement and rehabilitation of the core infrastructure will continue in the proposed 2015-2019 Capital Program. As always, the suspension bridges will be a major area of investment. At the RFK, the initial phase of construction of the Manhattan toll plaza and associated enabling projects will begin. At the BWB, a key focus will be main cable investigation/monitoring, as well as structural repairs that address recent inspection findings. Similar steel repairs will be carried out at the TNB, but the key projects at this structure will be the replacement of the concrete grid deck on the suspended spans, dehumidification of anchorages, and addition of fire standpipes on the main span and Bronx approaches. At the VNB, the replacement of major approach decks will be initiated and anchorages and bridge piers will be rehabilitated.

Significant core work will also be carried out at the other facilities. At the HHB, the upper and lower level toll plaza and southbound lower level approach will be replaced. Furthermore, the skewbacks (concrete arch supporting structures) will be rehabilitated. Pier fender system rehabilitation will be performed at the Cross Bay and Marine Parkway Bridges.

At the HCT and the QMT, core infrastructure work will include structural, electrical and mechanical rehabilitation of the ventilation buildings and associated systems, including the tunnel control and monitoring systems and modernization of central control rooms.

B&T capital projects are planned and designed to minimize the impact of construction on motorists and are carried out in coordination with the surrounding communities. The agency is committed to maintaining the highest quality of service for its customers, even while major construction work is ongoing. While some projects can impose potentially significant operational constraints during construction, the end result of many of these facility improvements is to enhance the system and provide better ways for customers to travel through B&T facilities.

Regional Mobility and Customer Satisfaction

Bridges and Tunnels is not only committed to ensuring the continued state of good repair of its facilities, but also to enhancing regional resiliency and mobility, and customer satisfaction. In the 2010-2014 Capital Program, Bridges and Tunnels initiated a pilot project at the HHB to test All-Electronic Tolling (AET) operations. All motorists are now able to use any lane to drive through the toll plaza, without stopping. By early 2017, a gantry-based Open Road Tolling (ORT) system will be placed into revenue service. At that point, the existing toll plazas including the old toll booths will be demolished as part of a 2015-2019 capital plan project to reconstruct the HHB upper and lower level roadways and lower level southbound approach. The new ORT system will continue to utilize the current methods employed at the HHB to capture E-ZPass transponder-reads and license plate images, but will do so in an environment absent a traditional toll plaza, enabling customers to traverse the two tolling areas without narrowed lanes or restricted sight lines, thereby allowing for unrestricted flow of traffic across the toll plaza area.

The 2015-2019 Capital Program will also improve traffic throughput and customer satisfaction at other B&T facilities, through implementation of capacity and access enhancements. At the VNB, projects are in construction in the 2010-2014 Capital Program to replace the six-lane upper level suspended span with a new seven-lane upper level roadway and a Bus/HOV ramp on the Brooklyn Approach. This will result in a new deck configuration linking the HOV lanes on the Staten Island Expressway to the west and the Gowanus Expressway to the east. In the 2015-2019 Capital Program, another project at the VNB will eliminate a lane-drop that currently causes delays and traffic at the merge of lower level Brooklyn-bound traffic with the Gowanus Expressway. A design for the replacement and widening of the Belt Parkway ramps (elevated and on-grade) will also be part of the 2015-2019 program, with enabling work to be performed first in the 2015-2019 plan and full construction to follow in future capital programs.

At the TNB, the 2015-2019 Capital Program will replace the suspended span deck with a new deck configuration, which will improve traffic safety and will also be able to accommodate a future seventh lane if mobility demand dictates it. At the RFK, construction of a new connector ramp will complete a critical missing link to the northbound Harlem River Drive, eliminating the need for Manhattan-bound highway traffic to utilize local City streets. These investments will add to improvements already achieved in previous capital programs, such as the BWB roadway deck project, which replaced the roadway, widened the traffic lanes on the approaches, and improved the lighting and electrical systems.

On-going tunnel rehabilitation projects will also benefit B&T customers at both the HCT and QMT, with new wall tiles and lighting that will significantly improve the customer environment inside the tubes, as well as some replacement /rehabilitation work on the plaza slabs, which will improve the riding surface.

B&T also continues to implement Intelligent Transportation Systems (ITS) as part of its capital program. In previous years, TRANSMIT readers were installed at all facilities enabling E-ZPass tags in vehicles passing through to be anonymously read in order to measure general vehicular speeds on particular segments of roadway. This data is coordinated with B&T Variable Message Signs (VMS), enabling timely and accurate travel time information to be communicated to customers. Many of these signs will reach the end of their useful life during the 2015-2019 period and will be replaced by newer, updated versions. B&T will also be upgrading its fiber optic infrastructure in the proposed program, supporting the backbone for communications and implementation of ITS devices and systems.

No project in B&T's history has done more to improve regional mobility and customer satisfaction than E-ZPass. In the 2010-2014 Capital Program, B&T began replacing outdated components of the original E-ZPass system that was first implemented in 1995. Original power and communications cables were replaced or upgraded to increase data capacity and accommodate new ITS features. In the 2015-2019 Capital Program, B&T will continue replacing outdated E-ZPass components and tolling equipment, so customers can continue to enjoy the benefits of E-ZPass.

Safety and Security

Maintaining safety and security across B&T facilities starts with many of the projects already discussed, which improve the characteristics of roadway surfaces and physical elements such as lane widths, shoulders, median barriers, lighting and toll plaza configurations. Other investments improve the reliability and flexibility of systems and services at the facilities, enabling facility staff to respond to major events more quickly and effectively.

In recent programs, projects were initiated at the two tunnels to replace the electrical and ventilation systems to improve tunnel monitoring and systems control activities. At the bridges, new, modified or extended fire lines, risers and standpipes were recently installed at the BWB, TNB, VNB, CBB, and HBB. This improves the ability to fight fires and achieves conformance with national codes (National Fire Protection Association 502) and local fire department

requirements. Similar fire standpipe systems are being installed under the 2010-2014 Capital Program at the RFK Manhattan Approach Ramps, as part of the ramp reconstruction projects.

Building upon these efforts to implement fire safety enhancements, B&T plans to ensure that fire standpipe systems are installed at every facility. In the 2015-2019 timeframe, a new system will be installed at the MPB, additional coverage will be provided at BWB and TNB, and the systems on the RFK and TNB will be completed. At the VNB, the mooring platforms at the tower piers will be relocated to meet current Fire Department of New York (FDNY) standards, along with necessary modifications to the fire standpipes. Additional fire lines accessible by fireboats will also be added at the BWB. Other fire safety improvements in the 2015-2019 timeframe will include new smoke and heat detection and alarm systems at the BWB, RFK, HCT and QMT. Similar improvements are already underway at the TNB and MPB, under the 2010-2014 Capital Program.

The proposed 2015-2019 capital program also includes the replacement or upgrade of various tunnel electrical and ventilation systems. These will improve the reliability and safety of tunnel operations, including during emergencies, and conform to current tunnel safety codes and standards. At the QMT specifically, the outdated central control room will be modernized to improve day-to-day monitoring of power system controls and other systems such as traffic control and signaling, variable message signs, traffic speed sensors, radio rebroadcast, over height detection, drainage pumps, tunnel lighting, and digital CCTV recording.

Other safety investments will include the design-build installation of a fender protection system at the BWB to protect against vessel strikes as well as design for a similar protection system at the TNB. Finally, an electronic monitoring and detection system is in the process of being installed at the TNB and similar systems are planned in the 2015-2019 Capital Program at the BWB and RFK.

Resiliency

In the aftermath of Super Storm Sandy, the Governor's Office published the NYS 2100 Commission Report, "*To Improve the Strength and Resilience of the Empire State's Infrastructure*." The report examined key vulnerabilities faced by the State's infrastructure and developed recommendations for how to increase resiliency. The recommendations re-enforced B&T's existing resiliency strategies, which emphasized focus on seismic, marine vessel collisions, fire and wind vulnerability risks and reinforced the need to add additional emphasis on climate change induced hazards such as flood conditions. These directly affected facility master plans, focusing further attention on a multi-hazard approach to mitigate natural and man-made risks. The 2015-2019 program will address some of the major recommendations in the report, including retrofitting bridges and tunnels to withstand seismic activity, as well as wind and fire events.

Mitigating climate change risks requires an assessment of broad systemic vulnerabilities, including sea level rise, storm surge, changing precipitation, changing temperature, and other extreme events. The 2010-2014 Sandy Mitigation Program was a start towards addressing B&T risks at the two tunnels and Rockaway crossings. The proposed 2015-2019 program continues this strategy at these and other facilities, through initiatives that will help to ensure the bridges and tunnels remain resilient against future catastrophic events.

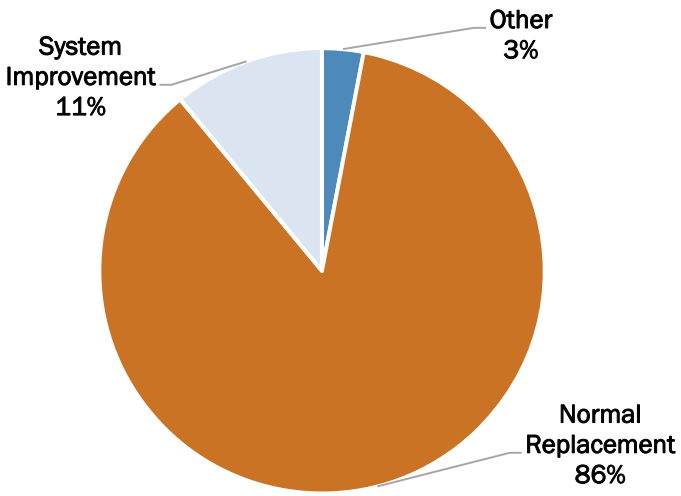
The 2015-2019 Capital Program will implement recommendations from a tunnel vulnerability assessment, providing a variety of structural and safety enhancements at the HCT and QMT. At the RFK, B&T will harden the structure against future seismic and wind events, while proposed structural and deck work at the TNB, VNB and HHB will incorporate seismic improvements whenever possible. This aligns with the MTA-wide strategy of incorporating appropriate resiliency elements across core infrastructure projects. B&T will also design and install bridge structural

health monitoring systems, which track how bridges react to daily and extreme loads. This data will enable better planning, design and construction of future projects that will preserve the structural integrity of these facilities.

System Condition

MTA Bridges and Tunnels developed its first multi-year capital program in 1992. Since then, the agency has invested approximately $5.7 billion in capital funding for its infrastructure. While all B&T facilities are in a state of good repair, more than half are over 70 years old. Even with regular maintenance, the structures and components of the bridges and tunnels eventually deteriorate and need replacement from the combined effects of traffic loads and environmental exposure. As B&T facilities continue to age, increasing levels of major improvements and life-cycle replacements have become necessary. As major components reach the end of their useful lives, higher levels of capital investment are needed just to keep them structurally sound. The goal for the 2015-2019 Capital Program is to carry out a fully funded capital program that will keep the facilities in a state of good repair, ensure a high level of reliability, resiliency and redundancy, and strategically improve facility operations and customer experience wherever appropriate. B&T average annual commitments are projected to increase from $416 million in the previous 2010-2014 Capital Program (excluding post-Sandy investments), to $571 million in the proposed program.

Figure 9
Bridges and Tunnels Proposed 2015-2019 Capital Program by Needs Category



Because B&T's facilities are considered to be in a state of good repair, the vast majority of proposed investments over the 2015-2019 time frame are classified as normal replacement (NR) work ($2.47 billion, or 86%) for assets that have reached or exceeded their useful life. System Improvement (SI) projects account for just 11% of the total program ($0.30 billion), while Other work comprises 3% of the total program ($0.08 billion). NR work renews facilities, ensuring safe and reliable transportation for B&T customers. SI projects enhance facility operations and security, enable customers to proceed through toll plazas more efficiently, and/or continue improvement of the workplace for B&T employees.

Bridges and Tunnels
Structures
Category D-701

Structural improvements on Bridges and Tunnels' facilities focus on maintaining the structural integrity of the facilities, while ensuring safety and minimizing customer inconvenience. The projects address either the components of the bridge superstructure, i.e., that part of the bridge above the foundation, such as the suspension system and roadway deck supporting system, or the substructure, i.e., those elements that support the superstructure, such as anchorages, piers, abutments and the foundations themselves. As components of both the superstructure and/or the substructure deteriorate over time, investments must be made, or the bridge will require much larger and more costly capital investments in the future. At the tunnels, the strategy is to continue previously phased tunnel rehabilitation work, coordinated with ongoing post-Sandy work. Tunnel investments address the structural needs of tunnel ceilings, walls, and plazas and upgrade tunnel facilities to meet National Fire Protection Association (NFPA) and National Electrical Code standards to the greatest extent possible.

Proposed 2015-2019 Capital Program - $803 million

Projects planned in the proposed 2015-2019 Capital Program under the category of structures represent the greatest share of investments, comprising 28% of the total 5-year program. Major projects include:

Throgs Neck Bridge: Approach Viaducts: Seismic Retrofit & Structural Rehabilitation - $162 million

This project at the Bronx and Queens approach viaducts will address all necessary superstructure steel repairs, catwalk upgrades, drainage rehabilitation, substructure and superstructure concrete repairs, seismic retrofits and bearing replacement, and work necessary to address deteriorated or deficient elements identified during the 2013 and 2015 Biennial Inspections. In addition, the lower garage, which is under the Bronx approach roadway and part of the structure, will be rehabilitated.

Robert F. Kennedy Bridge: Miscellaneous Structural Rehabilitation - $94 million

This project will address suspended span structural repair needs identified in recent biennial inspections. The results of ongoing prototype repair work will help determine the most cost-effective means to accomplish the repairs.

Henry Hudson Bridge: Skewback Retrofit - $83 million

This project will provide for the complete rehabilitation of the skewbacks, which transfer load from the bridge arch and support the bridge structure. The concrete foundations that support the approach viaducts will also be retrofitted, to ensure their structural integrity.

Robert F. Kennedy Bridge: Seismic/Wind Retrofit and Structural Rehabilitation Phase 1 - $68 million

Based on results of a study funded in the 2010-2014 Capital Program, this project will design and construct all necessary improvements and upgrades to ensure that the RFK suspended span structures, including the anchorages, meet current seismic, wind and load criteria, as well as design remaining substructure repairs and superstructure strengthening measures necessary to ensure that all structural members of the RFK facility meet current load standards.

Verrazano-Narrows Bridge: Anchorage & Piers Rehabilitation and Sealing - $49 million

This project will perform exterior and interior concrete repair and sealing of the Brooklyn and Staten Island anchorages, improvements to the anchorage lighting, drainage, fire detection systems, and catwalks, and rehabilitation of the eye bar dehumidification chambers and systems. The work will address water infiltration and lower humidity levels in the anchorages to help protect the main cables from deterioration.

Cross Bay Bridge: Rehabilitation of Pier Fender System at Cross Bay and Marine Parkway Bridges - $49 million

This project will rehabilitate or replace the pier fender protection systems at the Cross Bay and Marine Parkway bridges as necessary. Environmental mitigation measures will be incorporated, based on requirements of permitting agencies.

Verrazano-Narrows Bridge: Main Cable and Suspender Rope Testing - $43 million

This project will carry out cable inspections to determine the overall health of the cable system. Several panels on each main cable will be unwrapped and cable bands will be removed. Other tasks include inspection of the cables for corrosion, sampling of wires, and re-wrapping of the cables. Cable modeling will be performed using the data gathered to determine the remaining overall cable strength, and a cable health monitoring system will be evaluated for installation in the main cables. Design for this project is being performed in the 2010-2014 program. The construction phase will be carried out in the proposed 2015-2019 program.

Verrazano-Narrows Bridge: Main Steel Repair and Concrete Rehabilitation - $33 million

This project will perform structural repairs as necessary based on findings and recommendations from biennial inspections in 2014 and 2016, as well as steel and concrete repairs required in the near future to maintain or restore the bridge's intended level of service. Typical biennial recommended repairs include steel repairs, concrete repairs, bearing replacement/rehabilitation, etc.

Bronx-Whitestone Bridge: Miscellaneous Structural Rehabilitation - $29 million

This project will perform high priority repairs recommended in recent biennial inspections, as well as address potential findings from future inspections planned in 2015 and 2017. Select roadway framing connections will be upgraded to meet current load standards. The project will also remove the non-functional “Tuned Mass Damper” (relieving a substantial load on the bridge cables), the associated maintenance/inspection platforms, and remaining portions of the stiffening truss from the structure, while modifying the traveler rails. This will allow the travelers (i.e., moving maintenance platforms) full access to the under-deck area.

Bridges and Tunnels
Roadways and Decks
Category D-702

Deck replacement and rehabilitation work focuses on preserving primary bridge elements, upgrading to modern design standards, and enhancing regional mobility through improved traffic capacity and access to facilities. The rehabilitation of roadways, decks, approaches and drainage systems range from large-scale resurfacing, to total replacement of the roadway deck, or construction of new access ramps. Drainage system projects convey runoff of heavy rains away from the supporting structures. These investments not only help ensure a safer trip for customers using the facilities, but they forestall the need for more extensive work that would entail long-term lane closings and reduced throughput at the facilities.

Proposed 2015-2019 Capital Program - $1.073 billion

Deck replacement and rehabilitation work comprises 38% of the 5-year program. While this represents a significant level of investment, B&T will work to minimize disruption of bridge and tunnel traffic. Major projects in this category are:

Throgs Neck Bridge: Replacement of Grid Decks on Suspended Span - $310 million

This project will replace the existing suspended span deck with a new deck, permitting the future implementation of a seventh lane with a moveable median barrier. The deck will be designed to higher load criteria for current and anticipated commercial traffic to extend service life of the asset. The project will also replace electrical feeders, upgrade the bridge lighting system to energy-efficient LED luminaries, and install a dry fire standpipe system to meet current fire codes.

Verrazano-Narrows Bridge: Reconstruction of the Approach Ramps - Phase 1 - $286 million

This is the start of a three-phased initiative to address various structural, safety and access needs at the bridge's approach spans, entrances and connector ramps. The 2015-2019 Capital Program will focus on the roadway deck and associated structural elements at the upper level Brooklyn and Staten Island approaches. The scope includes the replacement of the approach deck and parapet, repair of the superstructure and substructure, seismic upgrades to the upper level approach ramps, replacement of the anchorage span deck, and the replacement and widening of the existing lower level eastbound connector ramp from the bridge to the Belt Parkway and rehabilitation of the West-bound Lily Pond Avenue exit ramp. Final design and construction will be informed by the results of a master plan development effort that is ongoing under the 2010-2014 program.

Robert F. Kennedy Bridge: Reconstruction of the Manhattan Toll Plaza Structure and Ramps - $224 million

This work is part of the overall RFK Rehabilitation program that began in the late 1990's. The design and construction for the Bronx Toll Plaza reconstruction is ongoing while the design and first phase of reconstruction for the Manhattan Toll Plaza, will be carried out in the 2015-2019 timeframe, including any necessary enabling investments and site work on or beneath the elevated structure.

Robert F. Kennedy Bridge: Construction of New Harlem River Drive Ramp - $141 million

This project continues a multi-phased effort to rehabilitate and/or replace the Manhattan Approach ramps (including 124th-125th Street, Harlem River Drive [HRD], and FDR Drive). It will carry out a design-build construction for a new ramp directly connecting the RFK Harlem River lift span with the northbound HRD. Design was initiated in the 2010-2014 Capital Program. This ramp is being closely coordinated with a New York City Department of Transportation (NYCDOT) project to reconstruct the nearby 127th Street Bridge on the HRD. When finished, the new ramp will

complete the highway interchange and eliminate the need for Manhattan-bound RFK traffic to utilize local city streets to reach the northbound HRD.

Agency Wide: Planning / Strategic Initiatives - $51 million

This project will encompass planning, design and/or construction efforts to address a variety of planning and strategic initiatives, which may include All-Electronic Tolling (AET), Open Road Tolling (ORT), customer information enhancements, reconstruction of the overhead plaza structures at the HCT Manhattan Plaza, and/or shared-use pathways.

Verrazano-Narrows Bridge: Brooklyn Approach Reconstruction - $31 million

This project will widen the existing eastbound Gowanus Expressway from 92nd Street to Fort Hamilton Parkway, improving the merge of Brooklyn-bound VNB lower level traffic with the Gowanus Expressway. The project will improve traffic flow and safety, and reduce traffic delays in the critical I-278 corridor between the VNB and HCT. This work will also require extensive interagency coordination with the New York State Department of Transportation (NYSDOT).

Bridges and Tunnels
Toll Plazas & Traffic Management/Safety Systems
Category D-703

Projects in this category focus on maintaining the condition of the toll plazas (via either replacement or rehabilitation), as well as maintaining the toll/revenue collection systems in a state of good repair, by addressing all elements including the tollbooths and islands, toll collection equipment, lighting and utilities. Investments in this category will include system improvements that enhance safety, and will also study longer term toll collection options to enhance the customer experience and enable motorists to proceed through toll plazas more quickly.

Another group of projects is geared towards implementing Advanced Traffic Management Systems (ATMS) and Intelligent Transportation Systems (ITS), which encompass diverse technologies including electronic messaging, information gathering, processing, communications, and control systems. Integration and use of these technologies increases the efficiency of facility operations, enhances safety and security, improves customer service, and fosters regional mobility and economic growth in the region.

Proposed 2015-2019 Capital Program - $206 million

Toll Plaza Improvements and Traffic Management and Safety Systems comprise 7% of the total program. The results of the All-Electronic Tolling (AET) pilot study at the HHB will be utilized to inform design and construction decisions as appropriate. Project highlights in this category of work include:

Henry Hudson Bridge: Reconstruction of Toll Plazas and Southbound Approach - $82 million

This initiative is being carried out in a phased approach, over two capital programs. In the 2010-2014 Capital Program, the northbound and southbound toll plazas are being permanently relocated to facilitate a cashless Open Road Tolling (ORT) system installed on gantries over free-flowing traffic lanes. In the 2015-2019 Capital Program, the upper and lower level toll plaza decks and southbound lower level approach decks will be replaced, along with associated equipment, utilities, electrical services, and roadway lighting. As part of the upper level reconstruction, supporting exterior columns will be eliminated for improved and safer traffic flow through the new ORT plazas and unimpeded sightlines.

Agency-Wide: Toll Collection Systems and Equipment Rehabilitation - $89 million

Many toll plazas, tolling systems, and associated equipment are nearing the end of their useful life and require replacement or rehabilitation. This project will address priority needs to maintain a state of good repair at these toll plazas until they can be completely addressed in future capital programs. In addition, to prepare for the future replacement of plaza equipment and systems, this project may perform enabling work providing necessary utility relocation and additional power and communication links to accommodate potential changes in toll policy. This project will also modernize tolling sub-systems and equipment at all facilities that have exceeded their useful service life.

Agency-Wide: Intelligent Transportation System Enhancements - $32 million

This project will complete the installation of CCTV cameras at the TNB and BWB, improving the monitoring and observation of traffic flow on these bridges. In addition, this project will design and install CCTV on the RFK. Hardware upgrades will also be made for the Advanced Traffic Management Systems (ATMS). Rotating Prism Signs will be installed at the BWB, TNB, and VNB toll plazas to help improve customer visibility and navigation in accordance with current AASHTO standards.

Bridges and Tunnels
Utilities
Category D-704

Investments in utilities ensure conformance with current codes and standards with respect to tunnel life safety systems to the greatest extent possible by replacing, rehabilitating or upgrading the mechanical, electrical and power distribution systems, including tunnel ventilation equipment. In addition, replacement of lighting systems with LED technology and electronic signage needs at the facilities are being addressed in this category. The long-term objective of investments in these areas is to carry out cost-effective improvements to enhance customer safety and convenience.

Proposed 2015-2019 Capital Program - $406 million

Work in this category constitutes 14% of the total program and includes the following projects:

Hugh L. Carey Tunnel: Rehabilitation of HCT Ventilation Systems - $85 million

This project will replace or rehabilitate 104 original fan motors, motor bearings, pedestals, mountings and related components. In addition, the motors in the Manhattan Underground Exhaust Building (MUEB) will be fire-hardened and a water mist system will be installed in that section of the tunnel to enhance safety systems and allow for the HCT to comply with current standards for emergency operations, monitoring, and control.

Bronx-Whitestone and Robert F. Kennedy Bridges: Installation of Facility-wide Electronic Monitoring and Detection Systems - $66 million

B&T began installing integrated electronic monitoring and detection systems in the 2005-2009 Capital Program, at the VNB and QMT. In the 2010-2014 Capital Program, this effort progressed at the TNB. The 2015-2019 Capital Program will continue this initiative at the BWB and the RFK. This project will install monitoring equipment in several locations, including detection equipment for fire, heat and smoke conditions, CCTV systems, intruder alarms and card access systems.

Queens Midtown Tunnel: Rehabilitation of Tunnel Controls and Communication Systems - $42 million

This project will modernize original 1940s equipment in the Facility Control Center, to incorporate functions such as ventilation and power systems control and monitoring. The expanded controls will be connected to other tunnel systems, including traffic control and signaling, variable message signs, tunnel lighting, and digital CCTV recording. The satellite control rooms for both tunnels will also be relocated in one of the ventilation buildings at each tunnel, as required by current standards.

Throgs Neck Bridge: Anchorage Dehumidification - $39 million

This project will install eye bar enclosure chambers with dehumidification equipment, controls and monitoring equipment in the anchorages, as well as electrical, LED lighting and fire detection systems. The dehumidification systems will ensure a low humidity environment for protection of the main cable and eye bar components within the anchorages. This work will also perform concrete repairs and sealing to eliminate water infiltration.

Henry Hudson Bridge: Replacement of Facility Lighting System & Substation Replacement & Upgrades - $34 million

The existing early-1960s parkway lighting system will be replaced with LED energy-efficient luminaries. The power supply from the Dyckman Street substation will also be upgraded, providing full electrical redundancy for the facility.

Bridges and Tunnels
Buildings and Sites
Category D-705

Investments in this category maintain a normal replacement cycle for building components and increase operational efficiency by improving working conditions through enhancements and modernization of employee facilities. Projects address assets such as service buildings, ventilation buildings, and garages, while also removing hazardous materials and carrying out abatement work as needed and required.

Proposed 2015-2019 Capital Program - $94 million

Work in this category comprises 4% of the total program. The major projects are:

Robert F. Kennedy Bridge: Rehabilitation of the Robert Moses Building and Ancillary Facilities - $50 million

The Robert Moses Building (RMB), the Bronx and Manhattan Service buildings, and other ancillary facilities on Randall's Island require various building envelope, utility, functional improvements and fire safety upgrades to maintain a safe working environment. This project will carry out upgrades or repairs to the roofs and façades and rehabilitate or replace deficient mechanical, electrical, and plumbing components in all three buildings.

Rehabilitation/Replacement of the Operation Command Center (OCC) - $26 million

This project is for the rehabilitation/replacement of the OCC located on Randall's Island. A study is currently in progress under the 2010-2014 Capital Program, which includes an analysis of location options and overall alternatives for addressing replacement/rehabilitation needs that encompass infrastructure-related items such as the communication network, power, cabling, consoles, video wall structure, projectors, and wall monitors.

Agency-Wide: Hazardous Materials Abatement - $11 million

This project will remove hazardous materials at various facility work sites.

Bridges and Tunnels
Miscellaneous
Category D-706

Projects in this category provide for costs associated with the support and management of the capital program. The proposed 2015-2019 Capital Program includes projects with program-wide applicability such as protective liability coverage, independent engineer services, value engineering services, small business mentoring, scope development and NYC traffic enforcement agent support, and for the MTA-wide Enterprise Asset Management System.

Proposed 2015-2019 Capital Program - $86 million

Miscellaneous projects comprise 3% of the total program.

Bridges and Tunnels
Structural Painting
Category D-707

Projects in this category traditionally involve removal of existing lead paint and repainting the bridge structures with new high performance coatings. Much of the lead paint removal efforts have already been accomplished and therefore, the focus of structural painting work is now on replacement of paint overcoats for various bridge elements to provide vital corrosion protection and maintain the structural integrity of all facilities. Most of this work is carried out in conjunction with structural projects, to achieve efficiencies in procurement and construction staging.

Proposed 2015-2019 Capital Program - $188 million

Painting projects comprise 7% of the total program. The major investments are:

Verrazano-Narrows Bridge: Overcoat Replacement of Suspended Span Upper & Lower Level Steel & Truss - $42 million

This project will clean and remove paint from corroded areas on the upper and lower levels of the suspended spans and re-paint these structures with a high performance coating.

Robert F. Kennedy Bridge: Painting of Suspended Spans/Bronx Truss - $32 million

Corroded areas on the suspended spans, Bronx Truss, Manhattan to Bronx and Bronx to Manhattan Ramps will be cleaned and re-painted with a high performance coating.

Agency-Wide: Miscellaneous Agency-Wide Painting - $30 million

This project provides for additional unplanned painting needs that may arise from ongoing biennial inspections. It also includes painting toll plazas, the HCT and QMT ventilation buildings and facility buildings, and emergency lead paint removal.

Bronx-Whitestone Bridge: Painting of the Suspended Span and Tower Interior Base Cells and Struts - $29 million

The tower interiors will be blast-cleaned and repainted with a high performance coating. The tower interiors are the only remaining portions of the facility that have the original lead coating.

Throgs Neck Bridge: Painting of Suspended Spans - $26 million

The corroded portions of the suspended span deck will be cleaned and re-painted with a high performance coating.

Henry Hudson Bridge: Replacement of HHB Overcoat System - $21 million

This project will clean and replace the overcoat for the entire bridge with a high performance coating.

MTA Capital Program 2015-2019
Project Listings

Project Listings

Here are some helpful tips for navigating the project listings that follow.

Organization

Capital investments are organized and coded according to an Agency / Category / Element / Project (ACEP) hierarchy:

- Agency: MTA Agency responsible for project delivery (e.g., “New York City Transit”);
- Category: Agency subset, typically focused on a particular asset type (e.g., “Stations” or “Track”);
- Element: Category subset containing related projects (e.g., “Signal Modernization” element in “Signals & Communications” category);
- Project: Basic unit of the Capital Plan, reflecting a specific scope, schedule, and budget.

For example, the first project listing page is identified in the upper-left corner as Agency “New York City Transit,” and in the upper-right corner as Category “Subway Cars.” Below that, “T - 701" represents the Agency (“T” for New York City Transit) and the category code (“701” for subway cars). Further down the page, “01 Subway Cars” refers to the element, which in this case happens to have the same name as the parent category. Finally, this element has a single project with identifier code “01,” to “Purchase 940 ‘B’ Division Railcars.” Combining all of the codes, the unique ACEP for this project is T7010101.

Needs Codes

The focus of each project is indicated by its needs code:

- State of Good Repair (SGR) projects renew assets that have surpassed their useful life, to achieve SGR.
- Normal Replacement (NR) projects renew assets that are nearing the end of their useful life, to preserve SGR.
- System Improvement (SI) projects enhance the network, providing new capabilities and a better customer experience.
- Network Expansion (NE) projects extend the reach of the MTA network, expanding the service offering.
- Administrative projects (e.g., insurance, scope development) are not assigned needs codes.

Commitments

Columns indicate the share of the project budget that is planned to be committed (i.e., started) in each year of the 2015-2019 period, along with the total for all years. Selected projects are starred (**), indicating that they are expected to realize savings via efficiencies.

Commitments
($ in millions)

ELEMENT DESCRIPTION/PROJECT	NEEDS CODE	2015	2016	2017	2018	2019	Total All Years
01 SUBWAY CARS							
01 Purchase 940 "B" Division Railcars	NR	0.0	800.0	0.0	920.0	1,184.0	2,904.0
02 Purchase B-Div Railcars - Open Gangway Prototype	SI	0.0	52.4	0.0	0.0	0.0	52.4
Element Total 01		**$0.0**	**$852.4**	**$0.0**	**$920.0**	**$1,184.0**	**$2,956.4**
Category Total 701		**$0.0**	**$852.4**	**$0.0**	**$920.0**	**$1,184.0**	**$2,956.4**

* Represents values less than $50,000

** Savings expected due to efficiencies

Numbers may not add due to rounding

Commitments
($ in millions)

ELEMENT DESCRIPTION/PROJECT		NEEDS CODE	2015	2016	2017	2018	2019	Total All Years
02	**BUS REPLACEMENT**							
01	Purchase 628 Standard Diesel Buses	SGR	0.3	397.5	0.0	0.0	0.0	397.8
02	Purchase 138 Standard CNG Buses	NR	0.3	84.8	0.0	0.0	0.0	85.1
03	Purchase 200 Standard Diesel Buses	NR	0.0	0.0	0.0	0.4	127.4	127.8
04	Purchase 75 Standard Hybrid-Electric Buses	NR	0.0	0.0	0.0	0.4	66.6	67.0
05	Purchase 190 Diesel Articulated Buses	NR	0.0	0.2	168.1	0.0	0.0	168.3
06	Purchase 50 Express Buses	NR	0.0	0.3	0.0	0.0	36.2	36.6
12	Depot Bus Location System - NYCT	SI	0.6	5.8	0.0	0.0	0.0	6.4
13	Automatic Passenger Counting - Pilot & Ph1	SI	0.5	5.1	0.0	0.0	0.0	5.7
14	Purchase 110 CNG Articulated Buses	NR	0.1	106.3	0.0	0.0	0.0	106.4
15	AVLM for Paratransit Vehicles	NR	0.0	19.0	0.0	0.0	0.0	19.0
Element Total 02			**$1.9**	**$619.0**	**$168.1**	**$0.8**	**$230.2**	**$1,020.0**
Category Total 703			**$1.9**	**$619.0**	**$168.1**	**$0.8**	**$230.2**	**$1,020.0**

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** Savings expected due to efficiencies

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Commitments ($ in millions)

ELEMENT DESCRIPTION/PROJECT		NEEDS CODE	2015	2016	2017	2018	2019	Total All Years
04	**FARE COLLECTION**							
01	New Fare Payment System, Phase 2	SI	0.0	0.0	318.1	0.0	100.5	418.6
02	AFC Low Turnstile Procurement	SI	0.0	6.6	0.0	0.0	0.0	6.6
	Element Total 04		**$0.0**	**$6.6**	**$318.1**	**$0.0**	**$100.5**	**$425.2**
07	**STATION ESCALATORS / ELEVATORS**							
01	Replace 11 Hydraulic Elevators / Various **	SGR	0.0	0.0	4.7	0.0	36.7	41.4
02	Replace 12 Traction Elevators BW7 **	NR	3.8	0.0	40.9	0.0	0.0	44.7
03	Replace 8 Traction Elevators / Various **	NR	2.9	0.0	24.9	0.0	0.0	27.9
04	Replace 6 Traction Elevators 8AV **	NR	0.0	1.9	0.0	22.4	0.0	24.3
05	Replace 5 Hydraulic Elevators / Various **	SGR	0.9	9.7	0.0	12.9	0.0	23.4
06	Replace 2 Escalators: Grand Central-42 St LEX **	SGR	1.5	0.0	11.8	0.0	0.0	13.3
07	Replace 7 Escalators / Various **	SGR	0.0	0.0	2.1	0.0	35.2	37.2
08	Replace 12 Escalators / Various **	SGR	0.0	3.1	2.1	31.1	23.5	59.8
09	Replace 9 Escalators / Various **	SGR	0.0	2.7	0.0	43.7	0.0	46.4
10	Escalator Relocation: Jay St-MetroTech FUL	NR	1.5	0.0	13.5	0.0	0.0	15.0
	Element Total 07		**$10.6**	**$17.4**	**$100.0**	**$110.1**	**$95.4**	**$333.5**

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** Savings expected due to efficiencies

Numbers may not add due to rounding

Commitments ($ in millions)

ELEMENT DESCRIPTION/PROJECT		NEEDS CODE	2015	2016	2017	2018	2019	Total All Years
12	**STATION WORK**							
01	Water Remediation - Renewal: Borough Hall LEX	SGR	1.9	0.0	41.5	0.0	0.0	43.4
02	Renewal: 138 St-Grand Concourse JER	SGR	1.4	20.6	0.0	0.0	0.0	22.0
03	Renewal: Astoria-Ditmars Blvd AST	SGR	1.1	11.8	0.0	0.0	0.0	12.9
04	Renewal: Astoria Blvd AST	SGR	1.6	0.0	16.4	0.0	0.0	18.0
05	Renewal: 30 Av AST	SGR	1.2	16.3	0.0	0.0	0.0	17.5
06	Renewal: Broadway AST	SGR	1.0	13.8	0.0	0.0	0.0	14.8
07	Renewal: 36 Av AST	SGR	1.1	15.9	0.0	0.0	0.0	17.0
08	Renewal: 39 Av AST	SGR	1.0	13.7	0.0	0.0	0.0	14.8
09	Renewal: Mets-Willets Point FLS	SGR	1.4	0.0	0.0	46.9	0.0	48.2
10	Renewal: 111 St FLS	SGR	1.3	0.0	0.0	15.1	0.0	16.4
11	Renewal: 103 St-Corona Plaza FLS	SGR	1.3	0.0	0.0	17.1	0.0	18.4
12	Renewal: 82 St-Jackson Heights FLS	SGR	1.4	0.0	0.0	20.8	0.0	22.2
13	Renewal: Woodhaven Blvd JAM	SGR	1.1	0.0	17.3	0.0	0.0	18.4
14	Renewal: 85 St-Forest Parkway JAM	SGR	1.1	0.0	15.3	0.0	0.0	16.4
15	Renewal: 75 St-Elderts Lane JAM	SGR	1.1	0.0	14.5	0.0	0.0	15.6
16	Renewal: Cypress Hills JAM	SGR	1.2	0.0	15.2	0.0	0.0	16.3
17	Renewal: 69 St FLS	SGR	0.0	0.0	1.5	0.0	15.6	17.1
18	Renewal: 61 St-Woodside FLS	SGR	0.0	0.0	1.6	0.0	16.1	17.7
19	Renewal: 52 St FLS	SGR	0.0	0.0	1.6	0.0	17.0	18.5
20	Renewal: 3 Av-138 St PEL	SGR	0.0	0.0	0.0	1.5	21.4	22.8
21	Station Components: Vents at Various Locs **	SGR	0.7	6.2	0.0	0.0	0.0	6.8
22	Platform Components: 4 Locs 4AV **	SGR	0.0	1.0	0.0	9.6	0.0	10.6
23	Platform Walls/Ceilings: Kingston-Throop Av FUL **	SGR	0.3	1.2	0.0	0.0	0.0	1.5
24	Platform Components: 4 Locs JER **	SGR	0.2	2.3	0.0	0.0	0.0	2.5
25	Platform Components: Pelham Pkwy DYR **	SGR	0.3	4.0	0.0	0.0	0.0	4.4
26	Elevated Street Stairs: 2 Locs BW7 [SBDP] **	SGR	4.0	0.0	0.0	0.0	0.0	4.0
28	Interior Stairs: 9 Locs [SBDP] **	SGR	14.0	0.0	0.0	0.0	0.0	14.0
29	Street Stairs: 6 Locs [SBDP] **	SGR	0.3	4.3	0.0	0.0	0.0	4.6
31	Station Lighting: 8 Locs [SBDP] **	SGR	0.6	5.1	0.0	0.0	0.0	5.7
32	Station Components: Vents at Various Locs **	SGR	0.7	0.0	6.5	0.0	0.0	7.1
34	Platform Components: 167 St BXC **	SGR	0.3	0.0	2.8	0.0	0.0	3.0
35	Platform Components: 3 Locs XTN **	SGR	0.9	0.0	12.4	0.0	0.0	13.3
36	Platform Components: 2 Locs PEL **	SGR	0.0	0.5	4.7	0.0	0.0	5.2
37	Platform Components: 3 Locs LEN **	SGR	0.5	0.0	5.1	0.0	0.0	5.6
38	Platform Components: 2 Locations FLS **	SGR	0.0	0.5	5.3	0.0	0.0	5.9
40	Elev Interior Stairs: 3 Locs PEL, FLS [SBDP] **	SGR	0.3	2.0	0.0	0.0	0.0	2.3
41	Interior Stairs: 5 Locs / Various [SBDP] **	SGR	0.0	0.0	0.8	0.0	8.3	9.1
42	Elev Street Stairs: 2 Locs WPR [SBDP] **	SGR	0.1	0.5	0.0	0.0	0.0	0.5

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** Savings expected due to efficiencies

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Commitments ($ in millions)

ELEMENT DESCRIPTION/PROJECT		NEEDS CODE	2015	2016	2017	2018	2019	Total All Years
12	**STATION WORK**							
43	Street Stairs: 10 Locs [SBDP] **	SGR	0.4	5.2	0.0	0.0	0.0	5.6
44	Mezz Columns: Atlantic Av CNR [SBDP] **	SGR	0.2	0.8	0.0	0.0	0.0	0.9
45	Mezz Ceiling Finish: 2 Locs ARC, FLS [SBDP] **	SGR	0.3	3.3	0.0	0.0	0.0	3.6
46	Platform Components: 6 Locs / QBL, ARC**	SGR	6.5	1.8	17.4	0.0	0.0	25.6
47	Station Lighting: 11 Locs / Various [SBDP] **	SGR	0.7	6.1	0.0	0.0	0.0	6.8
48	Station Components: Vents at Various Locs **	SGR	0.0	0.7	0.0	6.8	0.0	7.5
50	Platform Components: 3 Locs NAS **	SGR	0.0	1.1	0.0	12.2	0.0	13.4
51	Platform Components: 7 Locs CNR **	SGR	1.3	0.0	23.6	0.0	0.0	25.0
52	Platform Components: 3 Locs EPK, CLK **	SGR	0.0	0.6	5.1	0.0	0.0	5.7
53	2017 Station Painting at Components Locs	SGR	0.0	0.0	9.6	0.0	0.0	9.6
54	Elev Int Stairs: Atlantic Av CNR [SBDP] **	SGR	0.0	0.0	0.3	0.0	0.0	0.4
56	Elev Street Stairs: Atlantic Av CNR [SBDP] **	SGR	0.1	0.0	0.6	0.0	0.0	0.7
57	Street Stairs: 11 Locs [SBDP] **	SGR	0.5	0.0	5.5	0.0	0.0	5.9
58	Mezz Components: Nevins St EPK [SBDP] **	SGR	0.2	0.0	1.5	0.0	0.0	1.7
59	Mezz Wall Finishes: Bowery NAS [SBDP] **	SGR	0.1	0.0	0.7	0.0	0.0	0.9
60	Platform Components: 3 Locs QBL **	SGR	1.1	0.0	8.8	0.0	0.0	9.9
61	Platform Edges: 4 Locs QBL **	SGR	0.0	0.0	1.9	0.0	11.4	13.4
62	Station Lighting: 8 Locs [SBDP] **	SGR	0.5	0.0	4.8	0.0	0.0	5.3
63	Platform Components: 3 Locs NOS **	SGR	0.8	0.0	10.2	0.0	0.0	11.0
64	Station Components: Vents Various Locs **	SGR	0.0	0.0	0.7	0.0	7.1	7.8
65	Platform Components: 2 Locations BRT **	SGR	0.0	1.3	0.0	12.4	0.0	13.6
66	Platform Components: 9 Locs 8AV **	SGR	0.0	3.2	0.0	37.4	0.0	40.5
67	Platform Components: 11 Locs BW7 **	SGR	0.0	4.7	0.0	46.9	0.0	51.6
68	2018 Station Painting at Components Locs	SGR	0.0	0.0	0.0	6.0	0.0	6.0
69	Interior Stairs: Ocean Pkwy BRT [SBDP] **	SGR	0.0	0.1	0.0	0.4	0.0	0.5
70	Interior Stairs: 7 Locs 8AV, BW7 [SBDP] **	SGR	0.0	1.1	0.0	11.3	0.0	12.4
71	Elevated Street Stairs: 2 Locs BRT [SBDP] **	SGR	0.0	0.2	0.0	1.3	0.0	1.5
72	Street Stairs: 11 Locs 8AV, BW7 [SBDP] **	SGR	0.0	0.3	0.0	3.3	0.0	3.7
73	Mezz Components: 4 Locs 8AV, LEX [SBDP] **	SGR	0.0	0.3	0.0	1.8	0.0	2.2
74	Station Lighting: 11 Locs / Various [SBDP] **	SGR	0.0	0.7	0.0	6.7	0.0	7.4
75	Station Components: Vents Various Locs **	SGR	0.0	0.0	0.7	0.0	7.1	7.8
76	Platform Components: 7 Locs / 6AV, E63 **	SGR	0.0	0.0	1.4	0.0	18.7	20.1
77	Platform Components: 7 Locs LEX **	SGR	0.0	0.0	1.9	0.0	20.6	22.5
78	Platform Edges: 2 Locs WPR **	SGR	0.0	0.0	0.3	0.0	1.3	1.6
79	2019 Station Painting at Components Locs	SGR	0.0	0.0	0.0	0.0	8.0	8.0
80	Interior Stairs: 4 Av-9 St 6AV [SBDP] **	SGR	0.0	0.0	0.0	0.0	0.3	0.4
81	Interior Stairs: 8 Locs 8AV, WPR [SBDP] **	SGR	0.0	0.0	1.4	0.0	13.8	15.2
82	Elevated Street Stairs: 3 Locs WPR [SBDP] **	SGR	0.0	0.0	0.0	0.0	0.3	0.3

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** Savings expected due to efficiencies

Numbers may not add due to rounding

Commitments ($ in millions)

ELEMENT DESCRIPTION/PROJECT		NEEDS CODE	2015	2016	2017	2018	2019	Total All Years
12	**STATION WORK**							
83	Street Stairs: 4 Locs 8AV [SBDP] **	SGR	0.0	0.0	0.3	0.0	1.1	1.4
84	Mezz Components: 4 Locs 8AV, WPR [SBDP] **	SGR	0.0	0.0	0.5	0.0	2.3	2.8
85	Mezz Floors: 23 St 8AV [SBDP] **	SGR	0.0	0.0	0.2	0.0	1.2	1.4
86	Station Lighting: 6 Locs 8AV, WPR [SBDP] **	SGR	0.0	0.0	0.5	0.0	3.9	4.4
87	Station Components: 3 Locs 8AV **	SGR	0.0	0.8	0.0	6.8	0.0	7.5
88	Interior Stairs: 59 St 4AV **	SGR	0.0	0.2	0.0	1.8	0.0	2.0
89	Street Stairs: 59 St 4AV **	SGR	0.0	0.1	0.0	1.0	0.0	1.1
90	Enhanced Station Initiative	NR	0.0	63.9	0.0	0.0	0.0	63.9
	Element Total 12		**$56.1**	**$215.9**	**$260.4**	**$267.1**	**$175.7**	**$975.3**
13	**DISABLED ACCESSIBILITY**							
01	ADA: Bedford Av CNR	SI	3.2	36.0	0.0	0.0	0.0	39.3
02	ADA: Astoria Blvd AST	SI	4.3	0.0	30.7	0.0	0.0	35.0
03	ADA: Bedford Pk Blvd BXC	SI	3.6	26.5	0.0	0.0	0.0	30.2
04	ADA: 86 St 4AV	SI	3.2	0.0	25.6	0.0	0.0	28.9
05	ADA: Gun Hill Road DYR	SI	3.4	38.0	0.0	0.0	0.0	41.5
06	ADA: Eastern Pkwy-Bklyn Museum EPK	SI	3.6	0.0	27.5	0.0	0.0	31.1
07	ADA: Times Square Complex, Ph 3 - Shuttle	SI	9.6	0.0	235.4	0.0	0.0	245.0
08	ADA: Chambers St NAS	SI	3.3	0.0	29.1	0.0	0.0	32.4
09	ADA: Greenpoint Av XTN	SI	0.0	3.3	0.0	22.4	0.0	25.7
10	ADA: 59 St 4AV	SI	3.7	0.0	0.0	44.9	0.0	48.6
11	ADA: Rockaway Parkway CNR	SI	0.6	5.5	0.0	0.0	0.0	6.1
12	ADA: 1 Av CNR	SI	4.7	54.4	0.0	0.0	0.0	59.1
14	ADA: Court Square XTN	SI	3.0	20.1	0.0	0.0	0.0	23.1
15	ADA: 149 Street-Grand Concourse Complex	SI	4.1	0.0	40.5	0.0	0.0	44.6
16	ADA: Woodhaven Boulevard JAM	SI	2.4	0.0	21.6	0.0	0.0	24.0
17	ADA: Systemwide Study	SI	0.0	0.0	10.0	0.0	0.0	10.0
18	Visual Identification of ADA Boarding Areas PILOT	SI	0.0	0.0	0.2	0.0	0.0	0.2
19	ADA: Livonia Av-Junius St	SI	0.0	0.0	0.0	15.0	0.0	15.0
	Element Total 13		**$52.7**	**$183.9**	**$420.6**	**$82.3**	**$0.0**	**$739.5**

* Represents values less than $50,000

** Savings expected due to efficiencies

Numbers may not add due to rounding

Commitments
($ in millions)

ELEMENT DESCRIPTION/PROJECT		NEEDS CODE	2015	2016	2017	2018	2019	Total All Years
14	**OTHER STATION IMPROVEMENTS**							
01	Station Signage Improvements	NR	1.1	9.7	0.0	0.0	0.0	10.8
02	Access Improvements: Grand Central, Phase 2	SI	0.0	0.0	75.0	0.0	0.0	75.0
03	Station Entrance and Structural Work: 8 Av / SEA	SI	1.5	13.5	0.0	0.0	0.0	15.0
04	Reconstruction: Times Sq Complex, Ph3 - Shuttle	SGR	1.1	0.0	28.9	0.0	0.0	30.0
05	2015 Water Condition Remedy	SGR	0.2	8.6	0.0	0.0	0.0	8.8
06	Station Railings	SGR	0.3	3.5	0.0	0.0	0.0	3.8
07	Station Condition Survey Update	NR	8.9	0.0	0.0	0.0	0.0	8.9
08	2017 Water Condition Remedy	SGR	0.0	0.0	0.2	5.0	0.0	5.2
09	Reconstruct Cortlandt St Station BW7	SGR	48.4	0.0	0.0	0.0	0.0	48.4
10	Church St Corridor Improvements	NR	30.0	0.0	0.0	0.0	0.0	30.0
11	New Street Stairs: 2 Locs CNR	SI	2.6	38.0	0.0	0.0	0.0	40.5
12	42nd Street Shuttle - Study	SGR	1.0	0.0	0.0	0.0	0.0	1.0
13	Livonia Av-Junius St Station Connector	SI	0.0	0.0	0.0	30.0	0.0	30.0
Element Total 14			**$95.0**	**$73.3**	**$104.1**	**$35.0**	**$0.0**	**$307.5**
Category Total 704			**$214.4**	**$497.1**	**$1,203.3**	**$494.6**	**$371.5**	**$2,781.0**

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** Savings expected due to efficiencies

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Commitments
($ in millions)

ELEMENT DESCRIPTION/PROJECT		NEEDS CODE	2015	2016	2017	2018	2019	Total All Years
02	**MAINLINE TRACK REHABILITATION**							
01	2015 Mainline Track Replacement	NR	255.1	0.0	0.0	0.0	0.0	255.1
02	2016 Mainline Track Replacement	NR	2.1	192.1	0.0	0.0	0.0	194.2
03	2017 Mainline Track Replacement	NR	0.0	2.3	227.9	0.0	0.0	230.3
04	2018 Mainline Track Replacement	NR	0.0	0.0	2.2	216.8	0.0	219.0
05	2019 Mainline Track Replacement	NR	0.0	0.0	0.0	2.2	216.8	219.0
06	2020 Mainline Track Replacement DEO	NR	0.0	0.0	0.0	0.0	2.1	2.1
07	2015 Continuous Welded Rail	NR	64.4	0.0	0.0	0.0	0.0	64.4
08	2016 Continuous Welded Rail	NR	0.0	88.9	0.0	0.0	0.0	88.9
09	2017 Continuous Welded Rail	NR	0.0	0.0	35.9	0.0	0.0	35.9
10	2018 Continuous Welded Rail	NR	0.0	0.0	0.0	35.9	0.0	35.9
11	2019 Continuous Welded Rail	NR	0.0	0.0	0.0	0.0	35.9	35.9
12	2015 Track Force Account	NR	35.0	0.0	0.0	0.0	0.0	35.0
13	2016 Track Force Account	NR	0.0	35.0	0.0	0.0	0.0	35.0
14	2017 Track Force Account	NR	0.0	0.0	35.0	0.0	0.0	35.0
15	2018 Track Force Account	NR	0.0	0.0	0.0	35.0	0.0	35.0
16	2019 Track Force Account	NR	0.0	0.0	0.0	0.0	35.0	35.0
Element Total 02			**$356.6**	**$318.3**	**$301.0**	**$289.9**	**$289.7**	**$1,555.4**
03	**MAINLINE SWITCH REPLACEMENT**							
01	2015 Mainline Switch Replacement	NR	45.6	0.0	0.0	0.0	0.0	45.6
02	2016 Mainline Switch Replacement	NR	3.6	52.6	0.0	0.0	0.0	56.3
03	2017 Mainline Switch Replacement	NR	0.0	4.0	65.8	0.0	0.0	69.8
04	2018 Mainline Switch Replacement	NR	0.0	0.0	3.3	54.1	0.0	57.3
05	2019 Mainline Switch Replacement	NR	0.0	0.0	0.0	3.3	54.1	57.3
06	2020 Mainline Switch Replacement DEO	NR	0.0	0.0	0.0	0.0	3.4	3.4
Element Total 03			**$49.2**	**$56.6**	**$69.1**	**$57.3**	**$57.5**	**$289.8**
Category Total 705			**$405.8**	**$374.9**	**$370.1**	**$347.2**	**$347.2**	**$1,845.2**

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** Savings expected due to efficiencies

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Commitments
($ in millions)

ELEMENT DESCRIPTION/PROJECT	NEEDS CODE	2015	2016	2017	2018	2019	Total All Years
05 LINE EQUIPMENT							
01 Tun Lighting: Various Locations	SGR	0.0	1.1	29.6	0.0	0.0	30.7
02 Replace Vent Plant Motor Control Sys Var Locs **	SGR	1.6	0.0	12.2	0.0	0.0	13.8
03 Replace Supervisory Vent Controls - Var Locs **	SGR	4.2	0.0	35.8	0.0	0.0	40.0
04 New Vent Plant: Grand Central LEX **	SGR	0.0	0.0	5.0	0.0	95.0	100.0
05 Rehab Vent Plant Damper System - Var Locs **	SGR	0.0	0.0	5.9	56.9	0.0	62.8
06 Rehab Forsyth St Vent Plant **	SGR	0.0	0.0	6.2	0.0	93.8	100.0
07 Ventilation System Strategy Study	SGR	0.0	5.0	0.0	0.0	0.0	5.0
08 Rehab Pump Rooms: Various Locations	SGR	0.0	0.0	3.0	0.0	22.0	25.0
Element Total 05		**$5.9**	**$6.1**	**$97.7**	**$56.9**	**$210.8**	**$377.3**
Category Total 706		**$5.9**	**$6.1**	**$97.7**	**$56.9**	**$210.8**	**$377.3**

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Commitments
($ in millions)

ELEMENT DESCRIPTION/PROJECT		NEEDS CODE	2015	2016	2017	2018	2019	Total All Years
03	**LINE STRUCTURE REHABILITATION**							
01	Struct Rehab: Boston Rd - E 180th St Abutt WPR	NR	20.3	0.0	0.0	0.0	0.0	20.3
02	Struct Rehab: Bridge over Atlantic RR MYT	NR	1.1	11.2	0.0	0.0	0.0	12.2
03	Struct Rehab: Livonia Yard Overpass & Retain Wall	NR	0.0	1.2	14.4	0.0	0.0	15.7
04	Struct Rehab: Viaduct and Deck MYT	NR	1.6	59.8	0.0	0.0	0.0	61.3
05	Struct Repair: Over land Section RKY	NR	0.0	2.0	0.0	18.0	0.0	20.0
06	Rehab Emergency Exits (ICC) - 16 Locs	NR	0.0	12.0	0.0	0.0	0.0	12.0
07	Rehab Emergency Exits (ICC) - 22 Locs	NR	0.0	0.0	17.0	0.0	0.0	17.0
08	Rehab Emergency Exits (3rd Party) - Various Locs	NR	0.0	2.1	16.7	0.0	0.0	18.8
10	Overcoat: 17 Bridges & Flyover at E 180 St DYR	SGR	2.2	22.9	0.0	0.0	0.0	25.0
11	Overcoat: Williamsburg Bridge - Myrtle Av JAM	SGR	1.0	32.1	0.0	0.0	0.0	33.1
12	Overcoat: 157 St Portal - 164 St JER	SGR	0.7	10.3	0.0	0.0	0.0	11.0
13	Overcoat: 72 St - 103 St FLS	SGR	0.9	0.0	31.9	0.0	0.0	32.8
14	Overcoat: Myrtle Av - DeSales JAM	SGR	0.0	1.1	0.0	0.0	44.8	45.9
15	Overcoat: East New York Leads & Loops	SGR	0.0	1.2	26.7	0.0	0.0	27.9
16	Overcoat: Broadway - End of Line MYR	SGR	1.2	36.7	0.0	0.0	0.0	37.9
17	Overcoat: 48 St - 72 St FLS	SGR	0.0	0.0	1.1	0.0	27.5	28.5
19	Line Structure Repair Program	SGR	5.8	6.0	290.4	82.9	41.5	426.4
20	Struct Repair: Vent Chambers Between Stations	SGR	0.0	11.0	10.0	10.0	9.0	40.0
21	Struct Rehab: s/o 36 St - 59 St Station 4AV - Ph2	SGR	0.0	40.0	0.0	0.0	0.0	40.0
22	Overcoat: 9 Av Portal to 79 Street WST - DEO	SGR	0.0	0.0	1.2	0.0	0.0	1.2
Element Total 03			**$34.8**	**$249.6**	**$409.4**	**$110.9**	**$122.7**	**$927.3**
Category Total 707			**$34.8**	**$249.6**	**$409.4**	**$110.9**	**$122.7**	**$927.3**

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** Savings expected due to efficiencies

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Commitments ($ in millions)

ELEMENT DESCRIPTION/PROJECT		NEEDS CODE	2015	2016	2017	2018	2019	Total All Years
03	**SIGNAL MODERNIZATION**							
01	CBTC: QBL West Ph2 (50 St - Union Tpke) **	SGR	6.1	332.1	0.0	0.0	0.0	338.2
02	CBTC Technical Support Contract FLS	NR	0.0	0.0	0.0	1.0	0.0	1.0
04	CBTC: 8AV (59 St - High St) **	SGR	0.0	10.6	0.0	528.6	0.0	539.1
06	Install Automatic Signals for Work Trains / CNR	SGR	0.8	4.3	0.0	0.0	0.0	5.0
07	Interlocking Modernization: Ditmas CUL **	SGR	2.4	0.0	113.9	0.0	0.0	116.3
08	Interlocking Modernization: Kings Highway CUL **	SGR	6.1	163.9	0.0	0.0	0.0	170.1
17	Interlocking Modernization: 30 St 8AV **	SGR	0.0	3.9	0.0	125.8	0.0	129.7
18	Interlocking Modernization: 42 St-North 8AV **	SGR	0.0	3.7	0.0	115.6	0.0	119.3
19	Signal Control Line Modifications, Ph6	NR	15.2	0.0	17.8	0.0	0.0	33.0
21	AC to DC Line Relay Upgrade Ph2 - FUL	NR	13.5	0.0	0.0	0.0	0.0	13.5
22	AC to DC Line Relay Upgrade BCT	NR	0.0	0.0	28.8	0.0	0.0	28.8
23	Signal Key-By Modifications, Ph4	NR	0.0	18.8	0.0	0.0	0.0	18.8
24	Code Cable Replacement BW7	NR	0.0	0.0	0.5	0.0	6.9	7.4
25	Signal Room Fire Suppression, Phase 2	SGR	1.5	0.0	14.1	0.0	0.0	15.6
26	Life Cycle Replacement of Code Systems	NR	0.0	0.0	4.8	65.6	0.0	70.4
27	Life Cycle Mod - Speed Enforcement Systems	NR	0.0	0.0	4.5	40.5	0.0	45.0
29	Upgrade 25 Hz AC Main Cable and De-Ion Switches	NR	0.0	0.0	1.1	0.0	0.0	1.1
30	Interlocking Modernization: Parsons Blvd QBL **	SGR	0.0	0.0	5.1	0.0	160.5	165.7
31	Eliminate Single Point of Failure Intrlckng Cntrl	SI	0.0	0.0	10.0	0.0	0.0	10.0
32	CBTC: CUL (Church Av to W8 St) **	SGR	4.6	0.0	162.1	0.0	0.0	166.6
33	Interlocking Modernization: Ave X CUL **	SGR	4.5	0.0	142.4	0.0	0.0	146.9
34	Signal Component Replacement	NR	0.0	0.0	10.0	0.0	0.0	10.0
Element Total 03			**$54.8**	**$537.3**	**$515.1**	**$877.0**	**$167.4**	**$2,151.7**

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Commitments ($ in millions)

ELEMENT DESCRIPTION/PROJECT		NEEDS CODE	2015	2016	2017	2018	2019	Total All Years
06	**COMMUNICATIONS SYSTEMS**							
01	SONET/ATM Equipment Upgrade, Ph1	NR	6.1	0.0	54.9	0.0	0.0	61.0
02	Upgrade Fiber Optic Network to SONET, Ph2	NR	1.0	44.4	0.0	0.0	0.0	45.5
03	Replace PBX Switches, Ph2	NR	21.0	0.0	0.0	0.0	0.0	21.0
04	Fiber Optic Cable Replacement Ph2	SGR	0.0	0.0	28.7	0.0	0.0	28.7
05	Copper Cable Upgrade/Replacement Ph4	SGR	1.0	7.9	8.5	0.0	0.0	17.4
06	Antenna Cable Replacement, Ph2	SGR	0.0	2.5	22.5	0.0	0.0	25.0
07	UHF T-Band Radio System Replacement	NR	0.0	3.9	0.0	31.0	0.0	34.9
09	Communication Room Upgrade and Expansion Ph2	SGR	2.5	0.0	22.5	0.0	0.0	25.0
10	Help Point: 65 Stations (Transit Wireless)	SI	36.9	0.0	0.0	0.0	0.0	36.9
11	Help Point: 28 Stations (I/H)	SI	17.3	0.0	0.0	0.0	0.0	17.3
12	Help Point: 22 Stations [SBDP]	SI	3.0	15.4	0.0	0.0	0.0	18.5
13	PA/CIS Electronics Replacement CNR	NR	0.0	0.8	7.6	0.0	0.0	8.4
14	ISIM-B Module 3: Rail Traffic Systems	SI	0.0	0.0	121.7	0.0	0.0	121.7
17	LiftNet Transition to Ethernet	NR	1.4	0.0	0.0	16.4	0.0	17.8
18	Platform Safety Technology Rollout	SI	0.0	5.0	10.0	10.0	5.0	30.0
19	Comm Room Upgrade and Expansion Ph2 [SBDP]	SGR	2.5	0.0	22.5	0.0	0.0	25.0
20	Help Point: 129 Stations	SI	0.0	55.8	24.3	0.0	0.0	80.1
Element Total 06			**$92.7**	**$135.8**	**$323.1**	**$57.4**	**$5.0**	**$614.0**
Category Total 708			**$147.4**	**$673.1**	**$838.3**	**$934.4**	**$172.4**	**$2,765.7**

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Commitments
($ in millions)

ELEMENT DESCRIPTION/PROJECT		NEEDS CODE	2015	2016	2017	2018	2019	Total All Years
02	**SUBSTATIONS**							
01	Substation Renewal: Burnside Av BXC **	SGR	0.0	2.6	28.5	0.0	0.0	31.1
02	Substation Renewal: Av Z CUL **	SGR	1.7	32.9	0.0	0.0	0.0	34.7
03	Substation Rnwl & New Rectifier: Centrl SS 6AV **	SGR	2.1	0.0	0.0	34.7	0.0	36.8
04	Substation Roof Repair: Wash Heights 8AV [SBDP] **	SGR	0.0	0.9	0.0	8.1	0.0	9.0
05	Repl 25Hz Freq Converters at 10 Substations **	SGR	1.1	0.0	23.8	0.0	0.0	24.9
06	Replace HT Switchgear - Various Locs **	SGR	5.3	0.0	0.0	47.8	0.0	53.1
07	Replace HT Switchgear- Lightng & Conc [SBDP] **	SGR	0.0	0.0	0.0	2.3	0.0	2.3
08	Replace Roof at 1 Substation **	SGR	1.1	6.8	0.0	0.0	0.0	8.0
09	Replace Roofs at 2 Substations [SBDP] **	SGR	1.4	9.5	0.0	0.0	0.0	10.9
10	Install Low-Resistance Contact Rail - CNR Tube	SI	0.7	19.3	0.0	0.0	0.0	19.9
11	Three New Substation CNR **	SI	5.5	98.3	0.0	0.0	0.0	103.7
15	Supplemental Negative Cables QBL	SI	0.0	0.0	2.2	0.0	85.9	88.1
18	Install Low-Resistance Contact Rail - QBL Tube	SI	0.7	0.0	20.3	0.0	0.0	20.9
19	New Canal St Substation 8AV **	SI	0.0	0.0	4.5	0.0	40.5	45.0
20	New 34th St Substation 8AV **	SI	0.0	0.0	2.5	0.0	57.5	60.0
Element Total 02			**$19.6**	**$170.2**	**$81.7**	**$92.8**	**$183.9**	**$548.3**
04	**POWER DISTRIBUTION**							
01	Rehab CBH # 586 - 18th Av CUL **	SGR	0.0	1.8	12.7	0.0	0.0	14.4
03	Rehab CBH # 210 - 239th St WPR **	SGR	2.3	0.0	27.8	0.0	0.0	30.1
04	Rehab CBH #86 Wilson Av CNR	SGR	0.5	0.0	2.0	0.0	0.0	2.5
06	Rehab CBH # 85 Myrtle Av CNR **	SGR	1.6	0.0	14.5	0.0	0.0	16.1
07	Rehab CBH # 5 - 53rd St BWY **	SGR	0.0	1.5	0.0	12.2	0.0	13.7
10	Rehab Various CBH Enclosures	SGR	0.0	0.0	0.0	1.0	9.0	10.0
11	Rehab Ducts: Stanton St. Substation	NR	1.4	0.0	12.8	0.0	0.0	14.2
12	Repl Neg Cables: 36 St - Pacific St 4AV, Ph 3	SGR	5.0	0.0	45.0	0.0	0.0	50.0
13	Upgrade SCADA System	SGR	0.0	2.5	0.0	22.5	0.0	25.0
14	Repl Control & Bat Cables: Substation CZs	SGR	3.0	0.0	27.0	0.0	0.0	30.0
15	Reconstruct CBH # 392 Flushing River Bridge FLS **	SGR	0.0	0.9	0.0	7.7	0.0	8.5
16	Rebuild Ducts: Central Substation	SGR	0.0	0.0	0.0	10.0	0.0	10.0
Element Total 04			**$13.8**	**$6.6**	**$141.8**	**$53.4**	**$9.0**	**$224.5**
Category Total 709			**$33.4**	**$176.8**	**$223.5**	**$146.2**	**$192.9**	**$772.8**

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Commitments
($ in millions)

ELEMENT DESCRIPTION/PROJECT		NEEDS CODE	2015	2016	2017	2018	2019	Total All Years
04	**SHOPS AND YARDS**							
01	DCE Shop Compnts Ph1: 180 St, CI, PEL, PEL Dsl **	SGR	2.3	0.0	23.5	0.0	0.0	25.7
02	207 St Maint. and OH Shop Roof & Component Repl	SGR	3.3	0.0	56.7	0.0	0.0	60.0
03	DCE Shop Compnts Ph2: 239 St, Concrs, ENY [SBDP]**	SGR	0.0	2.2	0.0	28.8	0.0	31.0
04	DCE Shop Components, Ph 3: Jerome [SBDP] **	SGR	0.0	0.0	0.8	0.0	3.0	3.8
05	DCE Shop Components, Ph 4: 207 St Admin [SBDP] **	SGR	0.0	0.0	1.1	0.0	11.4	12.5
06	Rehab Livonia Maintenance Shop, Ph 1	SGR	0.0	0.0	3.5	62.2	0.0	65.7
07	Upgrade Central Electronics Shop: Woodside	SGR	1.4	0.0	13.4	0.0	0.0	14.8
08	Upgrade Atlantic Av Cable Shop, Ph 1 [SBDP]	SI	0.0	1.9	0.0	15.6	0.0	17.5
09	Heavy Shop Equipment	NR	0.0	10.0	0.0	0.0	0.0	10.0
10	2015 Yard Track Replacement	SGR	1.0	0.0	0.0	0.0	0.0	1.0
11	2016 Yard Track Replacement	SGR	0.1	3.0	0.0	0.0	0.0	3.1
12	2017 Yard Track Replacement	SGR	0.0	0.0	2.3	0.0	0.0	2.3
13	2018 Yard Track Replacement	SGR	0.0	0.0	0.0	2.3	0.0	2.3
14	2019 Yard Track Replacement	SGR	0.0	0.0	0.0	0.0	2.3	2.3
15	2020 Yard Track Replacement DEO	SGR	0.0	0.0	0.0	0.0	0.1	0.1
16	2015 Yard Switch Replacement	SGR	2.0	0.0	0.0	0.0	0.0	2.0
17	2016 Yard Switch Replacement	SGR	0.1	4.6	0.0	0.0	0.0	4.7
18	2017 Yard Switch Replacement	SGR	0.0	0.1	3.7	0.0	0.0	3.8
19	2018 Yard Switch Replacement	SGR	0.0	0.0	0.1	3.7	0.0	3.8
20	2019 Yard Switch Replacement	SGR	0.0	0.0	0.0	0.1	3.7	3.8
21	2020 Yard Switch Replacement DEO	SGR	0.0	0.0	0.0	0.0	0.1	0.1
22	Yard Lighting: 207th St Yard	SGR	2.0	0.0	21.3	0.0	0.0	23.3
23	Yard Lighting: CI Yard Design and Ph 1 Site Prep	SGR	0.0	5.0	0.0	0.0	0.0	5.0
24	Yard Fencing: 2 Locations (38 St and Linden Yard)	NR	11.0	0.0	0.0	0.0	0.0	11.0
27	Yard CCTV - Ph 3	SI	0.0	4.5	17.6	0.0	0.0	22.1
28	Car Cleaning Facility Component Repairs [SBDP]	NR	0.0	0.0	2.0	0.0	0.0	2.0
29	Struc. Remed. at E 180 St Maint. Fac. & Ret Wall	SGR	0.0	6.1	0.0	0.0	0.0	6.1
30	DCE Shops Industrial Engineering Study	SI	0.0	0.0	3.0	0.0	0.0	3.0
31	Rehab Livonia Maintenance Shop, Ph 1 [SBDP]	SGR	0.0	0.0	0.0	10.0	0.0	10.0
Element Total 04			**$23.1**	**$37.5**	**$149.0**	**$122.6**	**$20.5**	**$352.8**
Category Total 710			**$23.1**	**$37.5**	**$149.0**	**$122.6**	**$20.5**	**$352.8**

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ELEMENT DESCRIPTION/PROJECT	NEEDS CODE	2015	2016	2017	2018	2019	Total All Years
03 DEPOT REHAB AND RECONSTRUCTION							
01 Articulated Modification: ENY Depot [SBDP] **	SI	0.8	0.0	10.3	0.0	0.0	11.1
02 Gun Hill Depot Component Rehab	NR	1.0	0.0	11.0	0.0	0.0	12.0
03 Queens Village Depot Component Rehab [SBDP] **	NR	2.8	0.0	32.9	0.0	0.0	35.7
04 Grand Av Depot - Articulated Bus Mods. [SBDP] **	SI	0.2	0.0	2.4	0.0	0.0	2.6
05 Casey Stengel Depot Component Rehab [SBDP] **	NR	1.7	0.0	19.2	0.0	0.0	20.8
06 Yukon Depot Component Rehab **	NR	0.0	1.7	0.0	19.9	0.0	21.6
07 Fresh Pond Depot Component Rehab [SBDP] **	NR	0.0	1.9	0.0	28.1	0.0	30.0
08 Manhattanville Depot Component Rehab [SBDP] **	NR	0.0	2.1	0.0	24.9	0.0	27.0
10 Jamaica: New Depot **	NR	12.9	0.0	0.0	285.3	0.0	298.2
11 Zerega CMF Component Rehab [SBDP]	NR	0.0	0.0	10.0	0.0	0.0	10.0
Element Total 03		**$19.3**	**$5.7**	**$85.9**	**$358.2**	**$0.0**	**$469.0**
04 DEPOT IMPROVEMENTS							
01 6 Bus Washers: FP; QV; JG [SBDP] **	SGR	1.2	0.0	8.7	0.0	0.0	9.8
02 Paint Booths - YK, KB, CS [SBDP] **	NR	0.5	0.0	7.0	0.0	0.0	7.6
03 Select Bus Service 2015-19	SI	5.8	3.8	4.8	4.8	4.8	24.0
04 SBS: Traffic Signal Priority, Ph 2	SI	0.5	0.0	4.5	0.0	0.0	5.0
05 Storage Tank Replacement **	NR	1.6	20.8	0.0	0.0	0.0	22.4
06 Depot Equipment Replacement [SBDP]	NR	0.0	2.5	0.0	0.0	0.0	2.5
07 Kingsbridge Shoreline Upgrade [SBDP] **	NR	0.8	0.0	4.7	0.0	0.0	5.5
08 Elevator Upgrades: JG,GH,MTV,CS,ENY **	NR	2.1	0.0	14.0	0.0	0.0	16.1
10 North Shore BRT: Environmental and Design	SI	0.0	0.0	5.0	0.0	0.0	5.0
11 Oil-Water Separator: Casey Stengel	NR	0.0	0.0	0.0	6.6	0.0	6.6
12 Portable Lift Replacement **	NR	8.9	0.0	0.0	0.0	0.0	8.9
Element Total 04		**$21.4**	**$27.1**	**$48.7**	**$11.4**	**$4.8**	**$113.3**
Category Total 712		**$40.7**	**$32.8**	**$134.5**	**$369.6**	**$4.8**	**$582.4**

* Represents values less than $50,000

** Savings expected due to efficiencies

Numbers may not add due to rounding

Commitments
($ in millions)

ELEMENT DESCRIPTION/PROJECT		NEEDS CODE	2015	2016	2017	2018	2019	Total All Years
02	**SERVICE VEHICLES**							
01	Purchase 116 Non-Revenue Vehicles **	NR	17.8	0.0	0.0	0.0	0.0	17.8
02	Purchase 49 Non-Revenue Vehicles **	NR	0.0	7.9	0.0	0.0	0.0	7.9
03	Purchase 63 Non-Revenue Vehicles **	NR	0.0	0.0	10.0	0.0	0.0	10.0
04	Purchase 42 Non-Revenue Vehicles **	NR	0.0	0.0	0.0	9.1	0.0	9.1
05	Purchase 24 Non-Revenue Vehicles **	NR	0.0	0.0	0.0	0.0	4.0	4.0
06	Purchase 2 Signal Supply Cars **	SGR	1.2	12.2	0.0	0.0	0.0	13.4
07	Purchase 27 Refuse Flats **	NR	1.8	0.0	22.9	0.0	0.0	24.6
08	Purchase 12 3-Ton Crane Cars **	NR	2.0	0.0	26.5	0.0	0.0	28.5
10	Track Inspn Car: Platform Meas/Video Recording Sys	SI	4.5	0.0	0.0	0.0	0.0	4.5
11	Purchase Locomotives **	SGR	2.2	0.0	100.3	0.0	0.0	102.5
Element Total 02			**$29.5**	**$20.1**	**$159.7**	**$9.1**	**$4.0**	**$222.3**
Category Total 713			**$29.5**	**$20.1**	**$159.7**	**$9.1**	**$4.0**	**$222.3**

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** Savings expected due to efficiencies

Numbers may not add due to rounding

Commitments ($ in millions)

ELEMENT DESCRIPTION/PROJECT		NEEDS CODE	2015	2016	2017	2018	2019	Total All Years
02	**MISCELLANEOUS**							
01	All-Agency Liability Insurance & Deductible		0.0	1.6	1.6	1.6	1.6	6.4
02	Property Insurance Self-Insured Retention		5.0	0.0	5.0	0.0	5.0	15.0
03	2015 Capital Revolving Fund		5.0	0.0	0.0	0.0	0.0	5.0
04	2016 Capital Revolving Fund		0.0	5.0	0.0	0.0	0.0	5.0
05	2017 Capital Revolving Fund		0.0	0.0	5.0	0.0	0.0	5.0
06	2018 Capital Revolving Fund		0.0	0.0	0.0	5.0	0.0	5.0
07	2019 Capital Revolving Fund		0.0	0.0	0.0	0.0	5.0	5.0
	Element Total 02		**$10.0**	**$6.6**	**$11.6**	**$6.6**	**$11.6**	**$46.4**
04	**MANAGEMENT INFORMATION SYSTEMS**							
01	Upgrade Copper Cable: Livingston Plaza	NR	3.6	0.0	0.0	0.0	0.0	3.6
02	Data Storage and Server Enhancements at 2 Bwy/LP	SI	5.0	0.0	0.0	0.0	0.0	5.0
03	HP SAN Hardware for Disaster Recovery: 2 Bwy	NR	1.4	0.0	0.0	0.0	0.0	1.4
04	IBM P-Series/SAN Disaster Recovery: 2Bwy/130 Liv	NR	0.6	0.0	0.0	0.0	0.0	0.6
05	Replace Superdome Server: 2 Broadway	NR	1.4	0.0	0.0	0.0	0.0	1.4
06	CADD-BIM-DMS Disaster Recovery-Bus. Continuity	SI	0.0	1.2	0.0	0.0	0.0	1.2
08	Enterprise Asset Management (EAM)		0.0	20.5	0.0	20.5	0.0	41.0
	Element Total 04		**$12.0**	**$21.7**	**$0.0**	**$20.5**	**$0.0**	**$54.2**
05	**ENGINEERING SERVICES**							
01	Scope Development		0.0	12.5	12.5	12.5	12.5	50.0
02	Design Reserve		0.0	0.0	45.0	50.0	0.0	95.0
03	Engineering Services		2.3	4.5	4.5	4.5	4.5	20.3
04	MTA Independent Engineering Consultant		1.5	3.0	0.0	3.0	3.0	10.5
05	General Order Support: Traffic Checkers		9.0	9.0	9.0	9.0	9.0	45.0
06	Value Engineering Services		2.6	0.0	0.0	0.0	0.0	2.6
07	Small Business Development Program Administration		1.5	7.0	6.7	6.9	7.1	29.1
08	Construction Support Services		0.0	6.5	0.0	6.5	0.0	13.0
09	Concrete Batch Plant Inspection		0.0	0.0	1.6	0.0	0.0	1.6
10	Boring Services: Bk/Q/SI	NR	0.0	0.0	1.9	0.0	0.0	1.9
11	Boring Services: M/Bx	NR	0.0	0.0	2.3	0.0	0.0	2.3
12	Test Pits	NR	0.0	0.0	12.4	0.0	0.0	12.4
13	Concrete Cylinder Testing	NR	0.0	0.0	0.0	1.0	0.0	1.0
15	Utica Avenue Subway Extension Study	SI	0.0	0.0	5.0	0.0	0.0	5.0
16	Core Station Improvement Project Reserve	SI	0.0	25.0	50.0	50.0	50.0	175.0
	Element Total 05		**$16.9**	**$67.5**	**$151.0**	**$143.3**	**$86.1**	**$464.7**

* Represents values less than $50,000

** Savings expected due to efficiencies

Numbers may not add due to rounding

Commitments ($ in millions)

ELEMENT DESCRIPTION/PROJECT		NEEDS CODE	2015	2016	2017	2018	2019	Total All Years
06	**ENVIRONMENTAL AND SAFETY**							
01	Fire Alarm System Replacement - 3 Locs	NR	1.5	0.0	24.8	0.0	0.0	26.3
02	Asbestos / Lead Air Monitoring	NR	0.0	0.0	11.0	0.0	0.0	11.0
03	Asbestos Abatement	NR	0.0	0.0	12.0	0.0	0.0	12.0
04	Asbestos Disposal	NR	0.0	0.0	1.1	0.0	0.0	1.1
05	Consultant Services-USTs & Remediation	NR	6.5	0.0	0.0	0.0	0.0	6.5
06	Groundwater and Soil Remediation	NR	0.0	0.0	0.0	11.5	0.0	11.5
07	Consultant Services: USTs & Remediation	NR	0.0	0.0	0.0	8.1	0.0	8.1
Element Total 06			**$8.0**	**$0.0**	**$48.8**	**$19.6**	**$0.0**	**$76.4**
07	**EMPLOYEE FACILITIES**							
01	Rehab: PD Office 14 St - Union Square	SGR	2.4	0.0	25.4	0.0	0.0	27.9
02	Passenger Security Systems	SI	2.0	0.0	18.0	0.0	0.0	20.0
03	Emp Fac Consolidation: 2 Av 6AV **	SGR	1.4	13.9	0.0	0.0	0.0	15.3
04	Emp Fac Component Repairs: 10 Locs / Manhattan **	SGR	0.0	9.7	0.0	0.0	0.0	9.7
05	Emp Fac Component Repairs: 7 Locs / Queens **	SGR	0.0	4.9	0.0	0.0	0.0	4.9
06	Reconstruct Elev & Escal Fac - E Bway 6AV **	SGR	0.4	3.7	0.0	0.0	0.0	4.1
07	Emp Fac Line Repairs: 20 Locs 8AV **	SGR	0.5	4.6	0.0	0.0	0.0	5.1
08	Emp Fac Reloc: Track Qtrs at 14 St-Union Square **	SGR	0.2	0.0	2.4	0.0	0.0	2.7
14	Livingston Plz Electrical / Mechanical Sys Imps	NR	2.5	0.0	53.4	0.0	0.0	56.0
15	Rail Control Center: Annex	SI	0.0	25.0	0.0	0.0	0.0	25.0
16	Power Upgrade: RCC, PCC - Ph 2	NR	31.7	0.0	0.0	0.0	0.0	31.7
17	Refurbish Keene Vacuum Systems	NR	0.0	0.0	5.2	0.0	0.0	5.2
18	Consolidated Revenue Fac: Security System Upgrade	NR	0.0	0.0	3.3	0.0	5.0	8.3
21	EDR Rprs: DO #20 - Briarwood-Van Wyck [SBDP]	SGR	0.1	0.9	0.0	0.0	0.0	1.0
22	Medical Assessment Center # 3 Repairs [SBDP]	SGR	0.2	1.4	0.0	0.0	0.0	1.5
Element Total 07			**$41.4**	**$64.1**	**$107.9**	**$0.0**	**$5.0**	**$218.3**
Category Total 716			**$88.2**	**$159.9**	**$319.2**	**$190.0**	**$102.6**	**$860.0**
TOTAL PROGRAM			**$1,025.1**	**$3,699.1**	**$4,072.8**	**$3,702.3**	**$2,963.8**	**$15,463.0**

* Represents values less than $50,000

** Savings expected due to efficiencies

Numbers may not add due to rounding

Commitments
($ in millions)

ELEMENT DESCRIPTION/PROJECT		NEEDS CODE	2015	2016	2017	2018	2019	Total All Years
01	**SIR: MISCELLANEOUS**							
01	SIR: Replace Car Fleet	NR	0.0	231.7	0.0	0.0	0.0	231.7
02	SIR Station Component Program	SGR	0.8	0.0	8.3	0.0	0.0	9.1
03	SIR Mainline Track Replacement	SGR	0.0	17.4	0.0	0.0	0.0	17.4
04	UHF T-Band Radio System Replacement, SIR	NR	0.0	3.8	0.0	21.9	0.0	25.7
05	New Power Substation: Tottenville	SI	2.5	23.0	0.0	0.0	0.0	25.5
06	New Power Substation: New Dorp	SI	2.8	26.1	0.0	0.0	0.0	28.9
07	New Power Substation: Clifton	SI	2.5	23.0	0.0	0.0	0.0	25.5
08	SIR: Install Customer Information Signs	SI	1.2	0.0	0.0	0.0	0.0	1.2
09	SIR Station Component Program [SBDP]	SGR	0.4	0.0	4.6	0.0	0.0	5.0
10	Rehabilitation of Amboy Rd Bridge	NR	5.9	0.0	0.0	0.0	0.0	5.9
11	Relocate HQ to Clifton Shop	SI	0.0	10.0	0.0	0.0	0.0	10.0
Element Total 01			**$16.0**	**$335.0**	**$12.8**	**$21.9**	**$0.0**	**$385.8**
Category Total 707			**$16.0**	**$335.0**	**$12.8**	**$21.9**	**$0.0**	**$385.8**
TOTAL PROGRAM			**$16.0**	**$335.0**	**$12.8**	**$21.9**	**$0.0**	**$385.8**

* Represents values less than $50,000

** Savings expected due to efficiencies

Numbers may not add due to rounding

New York City Transit Agency Summary

AGENCY	Commitments ($ in millions) 2015	2016	2017	2018	2019	Total All Years
TOTAL New York City Transit	$1,025.1	$3,699.1	$4,072.8	$3,702.3	$2,963.8	$15,463.0
TOTAL Staten Island Railway	$16.0	$335.0	$12.8	$21.9	$0.0	$385.8
TOTAL NEW YORK CITY TRANSIT AGENCY PROGRAM	$1,041.1	$4,034.2	$4,085.6	$3,724.2	$2,963.8	$15,848.8

* Represents values less than $50,000

** Savings expected due to efficiencies

Numbers may not add due to rounding

Commitments
($ in millions)

ELEMENT DESCRIPTION/PROJECT	NEEDS CODE	2015	2016	2017	2018	2019	Total All Years
01 REVENUE EQUIPMENT							
ME M-9 Procurement	NR	0.0	22.0	265.0	213.1	0.0	500.1
Element Total 01		**$0.0**	**$22.0**	**$265.0**	**$213.1**	**$0.0**	**$500.1**
Category Total 701		**$0.0**	**$22.0**	**$265.0**	**$213.1**	**$0.0**	**$500.1**

* Represents values less than $50,000

** Savings expected due to efficiencies

Numbers may not add due to rounding

Commitments
($ in millions)

ELEMENT DESCRIPTION/PROJECT	NEEDS CODE	2015	2016	2017	2018	2019	Total All Years
04 Station And Buildings							
UG Mets-Willets Point Station	SI	0.0	3.9	42.7	31.3	0.0	77.9
UJ Enhanced Station Initiatives, 5 Stations	NR	0.0	5.0	10.0	10.0	0.0	25.0
UL Station Platform Lighting	NR	0.0	0.0	1.5	1.3	1.3	4.0
UM Murray Hill Station - New Elevators	SI	0.0	5.7	0.0	0.0	0.0	5.7
UN Nostrand Ave. Station Rehabilitation **	NR	0.0	21.0	0.0	0.0	0.0	21.0
UP Port Washington Station Improvements	NR	0.0	0.0	5.0	0.0	8.0	13.0
UQ Babylon Station Platform Replacement **	NR	0.0	5.0	33.9	0.0	0.0	38.9
UR Station Platform Railing Replacement	NR	0.0	0.0	1.5	1.3	1.3	4.0
US Station Signage Program	NR	0.0	0.0	2.5	3.0	2.5	8.0
UT Station & Building Electrical Systems	NR	0.0	0.0	1.5	1.5	2.0	5.0
UU Mentor Allowance - Stations	NR	0.0	4.7	5.5	5.1	6.6	22.0
UV New Fare Payment System	SI	0.0	0.0	0.0	0.0	5.0	5.0
UW GCT/ESA Unified Trash Facility	SI	8.7	0.0	2.4	0.0	0.0	11.1
UX Hunterspoint Avenue Station Renewal **	NR	0.0	2.6	19.5	0.0	0.0	22.1
UY Elmhurst Station - New Station **	SI	0.0	0.0	0.0	0.0	30.5	30.5
UZ New Republic Station on Main Line	SI	0.0	0.0	0.0	0.0	5.0	5.0
Element Total 04		**$8.7**	**$47.9**	**$126.0**	**$53.4**	**$62.1**	**$298.2**
05 PARKING							
V1 Parking Rehabilitation	NR	0.0	5.0	0.0	0.0	0.0	5.0
V2 Parking Facility Development	SI	0.0	3.0	0.0	0.0	22.0	25.0
Element Total 05		**$0.0**	**$8.0**	**$0.0**	**$0.0**	**$22.0**	**$30.0**
06 PENN STATION							
VP Penn Sta Elevator/Escalator Replacement	NR	0.0	0.0	34.3	0.0	5.7	40.0
VQ Penn Station Customer Facilities	NR	0.0	4.0	19.5	0.0	0.0	23.5
VR Penn Station Complex Improvements	SI	0.0	7.0	0.0	0.0	0.0	7.0
Element Total 06		**$0.0**	**$11.0**	**$53.8**	**$0.0**	**$5.7**	**$70.5**
Category Total 702		**$8.7**	**$66.9**	**$179.8**	**$53.4**	**$89.8**	**$398.7**

* Represents values less than $50,000

** Savings expected due to efficiencies

Numbers may not add due to rounding

Long Island Rail Road

TRACK
L - 703

Commitments
($ in millions)

ELEMENT DESCRIPTION/PROJECT	NEEDS CODE	2015	2016	2017	2018	2019	Total All Years
01 ANNUAL TRACK REHAB PROGRAM							
WA 2015 Annual Track Program	NR	65.0	0.0	0.0	0.0	0.0	65.0
WB 2016 Annual Track Program	NR	0.0	60.0	0.0	0.0	0.0	60.0
WC 2017 Annual Track Program	NR	0.0	0.0	60.0	0.0	0.0	60.0
WD 2018 Annual Track Program	NR	0.0	0.0	0.0	60.0	0.0	60.0
WE 2019 Annual Track Program	NR	0.0	0.0	0.0	0.0	60.0	60.0
WF Right of Way Fencing	SI	0.0	0.9	1.4	1.4	1.4	5.2
WG Construction Equipment	NR	0.0	10.0	5.5	0.0	0.0	15.5
WH Retaining Walls / Right of Way Projects	NR	0.0	0.9	3.6	3.8	3.8	12.0
Element Total 01		**$65.0**	**$71.8**	**$70.6**	**$65.2**	**$65.2**	**$337.7**
04 OTHER TRACK IMPROVEMENTS							
WU Jamaica Capacity Improvements Ph 2	SI	0.0	51.0	0.0	89.0	0.0	140.0
WV Amtrak Territory Improvements	NR	0.0	17.0	22.8	27.7	0.0	67.5
WX Main Line Double Track Phase 2	SI	0.0	78.0	0.0	0.0	172.0	250.0
Element Total 04		**$0.0**	**$146.0**	**$22.8**	**$116.7**	**$172.0**	**$457.5**
Category Total 703		**$65.0**	**$217.8**	**$93.4**	**$181.9**	**$237.2**	**$795.2**

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** Savings expected due to efficiencies

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Commitments
($ in millions)

ELEMENT DESCRIPTION/PROJECT	NEEDS CODE	2015	2016	2017	2018	2019	Total All Years
01 BRIDGES							
BQ Bridge Program - Structural Renewals	SGR	0.0	47.2	18.8	0.0	0.0	66.0
BR Main Line Bridge Component Renewals	SGR	0.0	20.3	12.0	15.5	0.0	47.8
BS Bridge Painting / Waterproofing	SGR	0.0	1.1	5.4	5.4	5.4	17.1
BT Removal of Montauk Cut-Off Viaduct	SGR	0.0	5.7	0.0	0.0	0.0	5.7
BU Mentor Allowance - Line Structures	SGR	0.0	7.2	4.4	5.4	6.0	23.0
Element Total 01		**$0.0**	**$81.5**	**$40.6**	**$26.3**	**$11.3**	**$159.6**
Category Total 704		**$0.0**	**$81.5**	**$40.6**	**$26.3**	**$11.3**	**$159.6**

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** Savings expected due to efficiencies

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Commitments ($ in millions)

ELEMENT DESCRIPTION/PROJECT	NEEDS CODE	2015	2016	2017	2018	2019	Total All Years
01 COMMUNICATIONS IMPROVEMENTS							
SD Fiber Optic Network	NR	0.0	2.9	18.4	13.2	0.0	34.5
SE Comm. Pole Line	NR	0.0	1.6	1.6	1.6	2.9	7.7
SF Improve RadioCoverage Initiatives/FCC Mandate	SI	0.0	0.0	4.8	0.0	0.0	4.8
SJ LIRR Public Address System	NR	0.0	2.0	3.0	0.0	0.0	5.0
SN Penn Sta Radio Retrofit/ERT Antenna	NR	0.0	0.0	1.1	0.0	0.0	1.1
SQ Atlantic Ave Tunnel Security Improvements	SI	0.0	1.5	1.6	0.0	0.0	3.1
SR Station Platform CCTV Cameras	SI	0.0	0.0	0.0	0.0	1.2	1.2
Element Total 01		**$0.0**	**$8.0**	**$30.5**	**$14.8**	**$4.1**	**$57.4**
02 SIGNAL IMPROVEMENTS							
LH Babylon Interlocking Renewal **	NR	0.0	5.2	0.0	28.0	18.7	51.9
LJ Signal Normal Replacement Program	NR	0.0	4.4	11.9	11.9	11.9	40.0
LK Positive Train Control (PTC)	SI	0.0	45.0	81.0	0.0	0.0	126.0
LL Ronkonkoma to Yaphank Signalization **	SI	0.0	0.0	0.0	0.0	29.4	29.4
LM Hunt to Post Design	NR	0.0	0.0	0.0	5.0	0.0	5.0
LN Babylon to Patchogue **	NR	0.0	10.0	33.6	0.0	0.0	43.6
LP Lightning Protection	SI	0.0	0.0	5.0	0.0	0.0	5.0
LQ Centralized Train Control	SI	0.0	0.0	10.0	0.0	10.0	20.0
Element Total 02		**$0.0**	**$64.6**	**$141.4**	**$44.9**	**$70.0**	**$320.9**
Category Total 705		**$0.0**	**$72.6**	**$171.9**	**$59.7**	**$74.1**	**$378.3**

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Commitments
($ in millions)

ELEMENT DESCRIPTION/PROJECT	NEEDS CODE	2015	2016	2017	2018	2019	Total All Years
01 SHOPS AND YARDS							
YG Diesel Locomotive Shop Improvements	NR	0.0	0.0	108.3	0.0	0.0	108.3
YH Rolling Stock Support Equipment	NR	9.5	0.0	0.5	0.0	0.0	10.0
YR Yard Improvements	SI	0.0	40.0	0.0	0.0	0.0	40.0
YS New Huntington/PortJeff Branch ElectricYard	SI	0.0	0.0	0.0	0.0	8.0	8.0
Element Total 01		**$9.5**	**$40.0**	**$108.8**	**$0.0**	**$8.0**	**$166.3**
04 EMPLOYEE FACILITIES							
YJ Mentor Allowance - Shops & Yards	NR	0.0	5.1	7.1	6.4	4.4	23.0
YV Hillside Facility/Upper Holban Improvements	NR	0.0	2.0	2.0	0.0	0.0	4.0
YW Rehabilitation of Employee Facilities	NR	0.0	2.0	2.0	2.0	2.0	8.0
YX Fire Protection Improvements	NR	0.0	2.5	2.5	2.5	2.5	10.0
Element Total 04		**$0.0**	**$11.6**	**$13.6**	**$10.9**	**$8.9**	**$45.0**
Category Total 706		**$9.5**	**$51.6**	**$122.4**	**$10.9**	**$16.9**	**$211.3**

* Represents values less than $50,000

** Savings expected due to efficiencies

Numbers may not add due to rounding

Commitments
($ in millions)

ELEMENT DESCRIPTION/PROJECT	NEEDS CODE	2015	2016	2017	2018	2019	Total All Years
01 POWER							
XA Substation Replacements	NR	0.0	1.2	42.2	20.1	17.5	81.0
XB Substation Components	NR	0.0	0.8	7.2	26.6	7.8	42.4
XC 3rd Rail - 2000 Million Cubic Meter Cable	NR	0.0	0.4	0.7	0.7	0.7	2.4
XD 3rd Rail - Disconnect Switches	NR	0.0	0.3	0.5	0.5	0.5	1.6
XE 3rd Rail - Protection Board	NR	0.0	1.0	2.6	2.6	2.6	8.8
XF 3rd Rail -Composite Rail	NR	0.0	0.3	3.9	3.9	3.9	12.0
XG 3rd Rail - Feeder Cable Upgrade	NR	0.0	0.3	1.0	1.0	1.0	3.2
XH Negative Reactor Upgrade	NR	0.0	0.1	1.0	1.0	1.0	3.2
XJ Substation Battery Replacement	NR	0.0	0.3	0.2	0.2	0.2	0.8
XK Signal PowerMotor Generator Replacement	NR	0.0	1.0	2.0	1.5	2.0	6.4
XL DC Relay Controls Replacement	NR	0.0	0.4	0.4	0.4	0.4	1.6
XM Signal Power Line Replacement	NR	0.0	0.3	1.0	1.0	1.0	3.2
XN Power Pole Replacement	NR	0.0	0.3	1.0	1.0	1.0	3.2
XP Atlantic Avenue Tunnel Lighting	NR	0.0	0.0	4.5	4.5	3.0	12.0
XQ 4,160 Volt Feeders	NR	0.0	0.1	0.5	0.5	0.5	1.6
XR New Substations	SI	0.0	0.0	0.0	5.0	0.0	5.0
XS Substation Renewals	NR	0.0	0.0	13.7	13.7	11.2	38.6
Element Total 01		**$0.0**	**$6.6**	**$82.2**	**$83.9**	**$54.2**	**$227.0**
Category Total 707		**$0.0**	**$6.6**	**$82.2**	**$83.9**	**$54.2**	**$227.0**

* Represents values less than $50,000

** Savings expected due to efficiencies

Numbers may not add due to rounding

Commitments
($ in millions)

ELEMENT DESCRIPTION/PROJECT	NEEDS CODE	2015	2016	2017	2018	2019	Total All Years
04 MISCELLANEOUS							
N5 20 Substations Chlordane Remediation - Ph 2	NR	0.0	0.0	10.0	0.0	0.0	10.0
NJ Program Development		0.0	1.5	2.0	2.0	2.0	7.5
NK Insurance		0.0	1.6	2.1	2.1	2.1	8.0
NL Independent Engineer		0.0	1.4	2.0	2.0	2.1	7.4
NM Mentor Program Administration		0.0	2.3	2.2	2.2	2.2	9.0
NQ Program Administration		21.8	22.5	23.2	23.5	24.0	115.0
NR EAM Reserve		0.0	8.0	0.0	0.0	0.0	8.0
Element Total 04		**$21.8**	**$37.3**	**$41.5**	**$31.8**	**$32.4**	**$164.9**
Category Total 709		**$21.8**	**$37.3**	**$41.5**	**$31.8**	**$32.4**	**$164.9**
TOTAL PROGRAM		**$105.0**	**$553.4**	**$1,009.1**	**$651.6**	**$516.0**	**$2,835.1**

* Represents values less than $50,000

** Savings expected due to efficiencies

Numbers may not add due to rounding

Commitments
($ in millions)

ELEMENT DESCRIPTION/PROJECT	NEEDS CODE	2015	2016	2017	2018	2019	Total All Years
01 REVENUE EQUIPMENT							
01 M-3 Replacement	NR	0.0	206.7	324.9	0.0	0.0	531.6
Element Total 01		**$0.0**	**$206.7**	**$324.9**	**$0.0**	**$0.0**	**$531.6**
Category Total 701		**$0.0**	**$206.7**	**$324.9**	**$0.0**	**$0.0**	**$531.6**

* Represents values less than $50,000

** Savings expected due to efficiencies

Numbers may not add due to rounding

Commitments
($ in millions)

ELEMENT DESCRIPTION/PROJECT	NEEDS CODE	2015	2016	2017	2018	2019	Total All Years
01 GRAND CENTRAL TERMINAL							
01 GCT Trainshed/Tunnel Struct (incl Roof Exp. Jts)	SGR	0.0	19.5	10.0	27.9	76.3	133.7
02 Park Av Tunnel Fire&LifeSafetyImpvmts	NR	0.0	1.0	0.0	0.0	0.0	1.0
03 GCT Platform Rehabilitation	SGR	0.0	0.0	1.2	0.0	0.0	1.2
04 GCT Fire Protection	NR	0.0	0.0	11.4	0.0	0.0	11.4
05 GCT Utilities	NR	0.0	0.0	5.0	0.0	0.0	5.0
06 GCT Elevator Imprvmnts-Final Phase	NR	0.0	0.0	1.0	0.0	6.2	7.2
07 GCT PA Head End and VIS Systems	NR	0.0	37.5	7.5	0.0	0.0	45.0
08 Mentoring - GCT	NR	0.0	2.0	3.0	0.0	0.0	5.0
Element Total 01		**$0.0**	**$60.0**	**$39.1**	**$27.9**	**$82.6**	**$209.6**
02 OUTLYING STATIONS							
01 Harlem - 125th Street Improvements	NR	2.0	0.0	0.0	0.0	0.0	2.0
02 Lower Harlem Line Station Imprvmnts	NR	0.0	0.0	30.6	0.0	0.0	30.6
03 Upper Hudson Station Improvements	NR	2.5	0.0	15.0	0.0	0.0	17.5
04 Harlem Line Station Improvements	NR	2.5	0.0	20.0	0.0	0.0	22.5
05 West of Hudson Station Improvements	NR	0.0	0.0	0.3	1.2	0.0	1.5
06 Station Building Rehabilitation	NR	0.0	0.1	0.4	0.0	0.0	0.5
07 Customer Communication	SI	0.0	45.0	15.0	0.0	0.0	60.0
08 New Fare Payment	SI	0.0	0.0	5.0	0.0	0.0	5.0
09 Mentoring Program - Stations	NR	0.0	3.0	10.0	2.0	0.0	15.0
10 Enhanced Station Initiative, 5 Stations	NR	0.0	3.0	10.0	2.0	0.0	15.0
Element Total 02		**$7.0**	**$51.1**	**$106.2**	**$5.2**	**$0.0**	**$169.6**
03 PARKING							
01 Strategic Facilities **	SI	0.0	2.5	6.5	2.0	8.7	19.7
02 Mentoring Program - Strategic Facilities	SI	0.0	0.0	1.0	0.0	2.0	3.0
Element Total 03		**$0.0**	**$2.5**	**$7.5**	**$2.0**	**$10.7**	**$22.7**
Category Total 702		**$7.0**	**$113.6**	**$152.9**	**$35.1**	**$93.3**	**$401.9**

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** Savings expected due to efficiencies

Numbers may not add due to rounding

Commitments
($ in millions)

ELEMENT DESCRIPTION/PROJECT		NEEDS CODE	2015	2016	2017	2018	2019	Total All Years
01	**TRACK**							
01	Cyclical Track Program	NR	0.0	22.0	24.0	25.0	26.0	97.0
02	Cyclical Repl. Insulated Joint	NR	0.4	0.4	0.4	0.4	0.4	2.0
03	Rock Slope Remediation	NR	0.0	13.2	0.0	0.0	6.5	19.7
04	Turnouts - Mainline/High Speed **	NR	9.4	10.7	10.6	14.6	6.2	51.5
05	GCT Turnouts/Switch Renewal	NR	3.1	4.5	4.6	4.7	8.0	24.9
06	Turnouts - Yards/Sidings	NR	0.0	1.4	1.9	0.0	1.9	5.2
07	Rebuild Retaining Walls	NR	0.0	2.1	0.0	5.4	0.0	7.5
08	Systemwide Drainage	NR	0.0	10.0	0.0	0.0	0.0	10.0
09	Purchase MoW Equipment	NR	0.0	12.0	5.4	2.2	2.4	22.0
	Element Total 01		**$12.9**	**$76.3**	**$46.9**	**$52.3**	**$51.4**	**$239.8**
02	**STRUCTURES**							
01	Overhead Bridge Program - E of H	SGR	0.0	14.0	4.1	16.9	0.0	35.0
02	Bridge Preservation Program	SGR	0.0	0.0	1.8	0.0	0.0	1.8
03	Undergrade Bridge Rehabilitation **	SGR	0.0	13.0	18.4	17.9	15.3	64.7
04	Beacon Line Undergrade Bridges	SGR	0.0	0.0	5.0	2.5	0.0	7.5
05	Park Avenue Direct Fixation	SGR	0.0	0.0	1.3	0.0	1.3	2.5
06	Railtop Culverts	SGR	2.1	1.3	0.0	0.0	0.0	3.4
07	Bridge Walkways	NR	1.0	0.7	0.3	0.0	0.0	2.0
08	Replace Timbers - Undergrade Bridges	SGR	2.5	1.3	1.2	0.0	0.0	5.0
09	Harlem River Lift Bridge	NR	1.0	0.0	9.0	0.0	0.0	10.0
10	Hudson Line Tunnels Inspection	SGR	0.0	0.0	2.0	0.0	0.0	2.0
11	ROW Fencing	SGR	0.2	0.2	0.2	0.2	0.2	1.0
12	Catenary Painting	SGR	0.0	0.0	1.6	0.0	3.5	5.0
13	DC Substation/SignalHse Roof Replacement	NR	0.0	1.2	1.2	1.3	1.3	5.0
14	Employee Welfare & Storage Facilities	NR	0.0	0.0	3.0	0.0	0.0	3.0
15	Mentoring Program - Structures	NR	0.0	0.0	3.0	0.0	0.0	3.0
	Element Total 02		**$6.8**	**$31.7**	**$52.0**	**$38.8**	**$21.5**	**$150.8**
03	**WEST OF HUDSON INFRASTRUCTURE**							
01	Rock Slope Remediation	NR	0.0	15.0	0.0	0.0	0.0	15.0
02	West of Hudson Track Improvements	SGR	5.6	0.9	3.5	0.0	0.0	10.0
03	Undergrade Bridge Rehabilitation	SGR	0.0	0.0	6.9	8.1	0.0	15.0
04	Moodna/Woodbury Viaduct (incl timbers/walkways)	SGR	0.0	0.0	14.0	0.0	0.0	14.0
05	West of Hudson Improvements	SGR	0.7	0.7	0.7	0.7	0.7	3.5
	Element Total 03		**$6.3**	**$16.6**	**$25.1**	**$8.8**	**$0.7**	**$57.5**
	Category Total 703		**$26.0**	**$124.5**	**$123.9**	**$99.9**	**$73.6**	**$448.0**

* Represents values less than $50,000

** Savings expected due to efficiencies

Numbers may not add due to rounding

Commitments ($ in millions)

ELEMENT DESCRIPTION/PROJECT		NEEDS CODE	2015	2016	2017	2018	2019	Total All Years
01	**COMMUNICATIONS AND SIGNALS**							
01	Network Infrastructure Replacement	NR	0.0	17.0	10.0	4.5	0.0	31.5
02	Harmon to Poughkeepsie SignalSystem **	NR	0.0	40.0	0.0	0.0	20.0	60.0
03	Positive Train Control	SI	0.0	54.0	37.9	1.9	0.0	93.8
04	Repl Signal OfficeEqpmt/SCADA Office	NR	0.0	3.5	0.0	0.0	0.0	3.5
05	PBX Replacement	NR	0.0	1.5	0.0	0.0	0.0	1.5
06	Upgrade Grade Crossings	NR	0.0	1.5	0.0	0.0	0.0	1.5
07	Replace High Cycle Relays	NR	0.0	1.0	0.0	0.0	0.0	1.0
09	Fire Suppression Systems	NR	0.0	0.0	0.8	0.0	0.0	0.8
Element Total 01			**$0.0**	**$118.5**	**$48.7**	**$6.4**	**$20.0**	**$193.6**
Category Total 704			**$0.0**	**$118.5**	**$48.7**	**$6.4**	**$20.0**	**$193.6**

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** Savings expected due to efficiencies

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Commitments
($ in millions)

ELEMENT DESCRIPTION/PROJECT		NEEDS CODE	2015	2016	2017	2018	2019	Total All Years
01	**POWER**							
01	Replace MA's in Signal Substations	NR	0.0	2.0	10.0	0.0	0.0	12.0
02	Transformer Rehabilitation	NR	2.2	0.7	0.7	0.7	1.0	5.2
03	ReplaceAC Circuit Breaker/Switchgear	NR	1.4	1.5	0.7	0.2	0.0	3.9
04	Harlem & Hudson Power Rehabilitation	NR	15.0	0.0	0.0	0.0	0.0	15.0
05	Harlem and Hudson Power Improvements	NR	0.0	0.0	11.0	0.0	0.0	11.0
06	Three Substation Replacements **	NR	0.0	0.0	3.0	0.0	22.5	25.5
07	3rd Rail Component Replacement	NR	0.0	10.0	5.0	5.0	0.0	20.0
08	Replace 3rdRail SectionalizingSwitches	NR	0.0	0.0	0.4	0.0	0.0	0.4
09	Replace Substations 128 and 178 **	NR	0.0	0.0	2.8	0.0	0.0	2.8
10	Park Avenue Tunnel Alarm	NR	0.0	1.5	0.0	0.0	0.0	1.5
11	Replace Tunnel Lighting	NR	0.0	0.5	0.0	0.0	0.0	0.5
12	Mentoring - Power	NR	0.0	3.0	0.0	0.0	0.0	3.0
Element Total 01			**$18.6**	**$19.2**	**$33.6**	**$5.9**	**$23.5**	**$100.8**
Category Total 705			**$18.6**	**$19.2**	**$33.6**	**$5.9**	**$23.5**	**$100.8**

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** Savings expected due to efficiencies

Numbers may not add due to rounding

Commitments
($ in millions)

ELEMENT DESCRIPTION/PROJECT		NEEDS CODE	2015	2016	2017	2018	2019	Total All Years
01	**SHOPS AND YARDS**							
01	Harmon Shop Replacement - Phase V	SGR	0.0	0.0	0.0	385.6	46.0	431.6
02	Harmon Wheel True Improvements	NR	0.0	0.0	2.0	0.0	0.0	2.0
03	Brewster YD Improvements - Design	SI	0.0	0.0	4.2	0.0	0.0	4.2
04	West of Hudson Yard Improvements	SI	0.0	9.2	8.0	7.0	0.0	24.2
05	Mentoring Program - Shops and Yards	SGR	0.0	0.0	10.0	0.0	0.0	10.0
Element Total 01			**$0.0**	**$9.2**	**$24.2**	**$392.6**	**$46.0**	**$472.0**
Category Total 706			**$0.0**	**$9.2**	**$24.2**	**$392.6**	**$46.0**	**$472.0**

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** Savings expected due to efficiencies

Numbers may not add due to rounding

Commitments
($ in millions)

ELEMENT DESCRIPTION/PROJECT		NEEDS CODE	2015	2016	2017	2018	2019	Total All Years
01	**MISCELLANEOUS**							
01	Systemwide Lead/Asbestos Abatement	NR	0.2	0.8	4.0	0.0	0.0	5.0
02	Environmental Remediation	NR	0.3	0.0	2.3	0.0	0.0	2.5
03	Railroad Protective Liability		0.9	0.9	0.9	0.9	0.9	4.5
04	Independent Engineer		3.1	0.0	4.9	0.0	0.0	8.0
05	Mentoring Program Administration		1.4	1.4	1.4	1.4	1.4	7.1
06	Program Administration		10.0	11.0	11.0	11.0	11.0	54.0
07	Program Scope Development		3.0	3.6	4.2	3.6	3.6	18.0
08	OCIP - Insurance		15.0	0.0	0.0	0.0	14.0	29.0
09	GCT/ESA Unified Trash Facility	SI	12.9	0.0	0.0	2.2	0.0	15.1
10	Systemwide Security Initiatives	SI	0.0	7.9	9.0	0.0	0.0	16.9
11	EAM Reserve		0.0	4.0	4.0	5.0	0.0	13.0
Element Total 01			**$46.8**	**$29.6**	**$41.6**	**$24.1**	**$30.9**	**$173.1**
Category Total 708			**$46.8**	**$29.6**	**$41.6**	**$24.1**	**$30.9**	**$173.1**
TOTAL PROGRAM			**$98.4**	**$621.4**	**$749.7**	**$564.1**	**$287.3**	**$2,321.0**

* Represents values less than $50,000

** Savings expected due to efficiencies

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Commuter Railroad Agency Summary

AGENCY	Commitments ($ in millions) 2015	2016	2017	2018	2019	Total All Years
TOTAL Long Island Rail Road	$105.0	$556.2	$996.8	$661.1	$516.0	$2,835.1
TOTAL Metro-North Railroad	$98.4	$621.4	$749.7	$564.1	$287.3	$2,321.0
TOTAL COMMUTER RAILROAD AGENCY PROGRAM	$203.5	$1,177.7	$1,746.5	$1,225.2	$803.3	$5,156.1

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** Savings expected due to efficiencies

Numbers may not add due to rounding

Commitments
($ in millions)

ELEMENT DESCRIPTION/PROJECT		NEEDS CODE	2015	2016	2017	2018	2019	Total All Years
02	**BUS COMPANY PROJECTS**							
01	Purchase 53 Articulated Buses	NR	0.0	0.0	48.1	0.0	0.0	48.1
02	Purchase 292 Express Buses	NR	0.0	0.0	196.1	0.0	0.0	196.1
04	Depot Bus Location System - MTA Bus	SI	0.0	5.2	0.0	0.0	0.0	5.2
05	On-Board Audio Visual Ph 2 - MTA Bus	SI	0.0	12.0	0.0	0.0	0.0	12.0
06	Automated Passenger Counting Pilot & Ph 1	SI	0.0	0.0	0.0	6.0	0.0	6.0
07	Component Rehab: LaGuardia, Baisley Pk [SBDP] **	SGR	10.8	0.0	0.0	0.0	0.0	10.8
08	Rehab and Facility Upgrade: Spring Creek [SBDP] **	NR	0.0	8.2	0.0	0.0	0.0	8.2
09	Rehab and Facility Upgrade: College Pt (SBDP] **	SGR	0.0	9.5	0.0	0.0	0.0	9.5
10	Paint Booths: Eastchester, College Point **	NR	0.0	0.0	0.0	4.9	0.0	4.9
11	Bus Radio System - MTA Bus Share	NR	34.5	0.0	0.0	0.0	0.0	34.5
12	Environmental Remediation **	NR	0.0	4.5	0.0	0.0	0.0	4.5
13	Chassis Wash & Oil-Water Separator at Eastchester	NR	0.0	0.0	2.5	0.0	0.0	2.5
14	MTA Bus Rubber Tire Service Vehicles 2015-19	NR	0.0	0.0	3.6	0.0	0.0	3.6
15	Project Administration		1.5	3.0	3.0	3.0	3.0	13.5
16	Design/Engineering Management Services		0.8	1.5	1.5	1.5	1.5	6.8
17	Construction Management Services		0.8	1.5	1.5	1.5	1.5	6.8
18	JFK Windows Replacement [SBDP]	NR	0.0	0.0	0.0	3.0	0.0	3.0
Element Total 02			**$48.3**	**$45.5**	**$256.2**	**$19.9**	**$6.0**	**$376.0**
Category Total 703			**$48.3**	**$45.5**	**$256.2**	**$19.9**	**$6.0**	**$376.0**
TOTAL PROGRAM			**$48.3**	**$45.5**	**$256.2**	**$19.9**	**$6.0**	**$376.0**

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** Savings expected due to efficiencies

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Commitments
($ in millions)

ELEMENT DESCRIPTION/PROJECT	NEEDS CODE	2015	2016	2017	2018	2019	Total All Years
01 MTA POLICE DEPARTMENT							
01 Public Radio Phase 3	SI	0.0	28.5	0.0	0.0	0.0	28.5
02 Poughkeepsie Facility	NR	0.0	0.0	2.0	0.0	0.0	2.0
03 Other Facilities	NR	0.0	0.0	2.3	0.0	0.0	2.3
04 REP-ESU Fleet	NR	0.0	0.0	0.7	0.0	0.0	0.7
05 Program Management	NR	0.0	1.0	1.0	1.5	1.5	5.0
Element Total 01		**$0.0**	**$29.5**	**$6.0**	**$1.5**	**$1.5**	**$38.5**
Category Total 710		**$0.0**	**$29.5**	**$6.0**	**$1.5**	**$1.5**	**$38.5**

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** Savings expected due to efficiencies

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Commitments
($ in millions)

ELEMENT DESCRIPTION/PROJECT	NEEDS CODE	2015	2016	2017	2018	2019	Total All Years
01 MTA PLANNING INITIATIVES							
01 Core Planning Support	SI	0.0	2.5	2.5	2.5	2.5	10.0
02 Corridor Planning Support	SI	0.0	2.5	2.5	2.5	2.5	10.0
03 Capital Program Support	SI	0.0	20.0	35.0	35.0	35.0	125.0
04 Urban Core Infrastructure Reserve	SI	0.0	20.0	20.0	20.0	20.0	80.0
Element Total 01		**$0.0**	**$45.0**	**$60.0**	**$60.0**	**$60.0**	**$225.0**
Category Total 711		**$0.0**	**$45.0**	**$60.0**	**$60.0**	**$60.0**	**$225.0**
TOTAL PROGRAM		**$0.0**	**$74.5**	**$66.0**	**$61.5**	**$61.5**	**$263.5**

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** Savings expected due to efficiencies

Numbers may not add due to rounding

MTA Interagency Summary

Commitments
($ in millions)

AGENCY	2015	2016	2017	2018	2019	Total All Years
TOTAL MTA POLICE DEPARTMENT	$0.0	$29.5	$6.0	$1.5	$1.5	$38.5
TOTAL MTA PLANNING	$0.0	$45.0	$60.0	$60.0	$60.0	$225.0
TOTAL MTA INTERAGENCY	$0.0	$74.5	$66.0	$61.5	$61.5	$263.5

* Represents values less than $50,000

** Savings expected due to efficiencies

Numbers may not add due to rounding

Commitments
($ in millions)

ELEMENT DESCRIPTION/PROJECT		NEEDS CODE	2015	2016	2017	2018	2019	Total All Years
01	**EAST SIDE ACCESS**							
01	Program Management	NE	10.4	9.7	7.5	4.9	0.0	32.6
02	Design - GEC	NE	18.0	10.5	6.5	3.2	0.8	39.0
03	MTA Management	NE	12.0	9.9	9.3	12.6	0.0	43.9
05	Manh Structures 1-MNR ForcAcct	NE	0.0	10.9	8.1	0.0	0.0	19.0
11	OCIP	NE	20.9	76.2	0.0	0.0	0.0	97.1
13	Construction Management	NE	47.9	51.3	38.3	20.4	0.0	157.9
15	Vertical Circulation Elements	NE	0.0	0.0	5.6	0.0	0.0	5.6
16	General Conditions	NE	11.1	9.2	8.8	7.4	0.0	36.5
18	Harold Interlocking ForceAcct	NE	0.0	19.6	21.9	15.5	8.5	65.5
21	Mid-Day Storage Yard Facility	NE	266.0	0.0	0.0	0.0	0.0	266.0
23	Harold Structures EBRR & WBBP	NE	0.0	26.6	1.3	0.0	0.0	27.9
24	EBRR	NE	0.0	0.0	77.3	2.3	1.0	80.5
27	FA Systems Testing & Commissioning	NE	0.0	0.8	6.2	8.9	9.6	25.4
28	Rolling Stock	NE	194.5	0.0	0.0	0.0	0.0	194.5
32	Management Reserve	NE	0.0	20.3	20.8	0.0	75.0	116.0
34	Protect Locomotives	NE	7.5	0.0	0.0	0.0	0.0	7.5
35	Systems Package 1 - Facilities	NE	225.2	0.0	13.3	0.0	0.0	238.5
36	Systems Package 2 - Tunnel Systems	NE	37.5	0.0	0.0	0.0	0.0	37.5
38	Force Account Warehouse	NE	0.0	2.9	1.3	0.5	0.0	4.7
39	Utilities	NE	7.0	10.3	6.3	5.4	6.3	35.3
40	Construction Management - Other	NE	5.4	10.4	7.2	1.4	0.0	24.4
41	A Tunnel/D Approach Structure	NE	42.9	4.7	0.0	0.0	0.0	47.6
42	GCT Caverns	NE	777.4	0.0	0.0	0.0	0.0	777.4
44	Arts For Transit	NE	0.0	1.7	0.0	0.0	0.0	1.7
45	48th St Entrance at 415 Madison Ave	NE	0.0	16.8	0.0	0.0	0.0	16.8
46	Caverns and Concourse Detailing	NE	0.0	5.0	10.0	5.0	0.0	20.0
47	Building Owner Cost	NE	1.0	0.0	0.0	0.0	0.0	1.0
49	Material Warranties	NE	7.2	7.2	0.0	0.0	0.0	14.3
50	Operational Readiness Training	NE	0.0	0.0	0.0	3.6	0.0	3.6
51	Test Trains	NE	0.0	0.0	0.0	1.8	0.0	1.8
52	Force Account Support	NE	0.0	2.2	0.0	0.0	0.0	2.2
53	Project Management Contingency	NE	0.0	0.0	35.0	0.0	29.0	64.0
54	Cab Simulator	NE	0.0	4.3	0.0	0.0	0.0	4.3
55	Program Contingency	NE	21.5	25.0	15.0	0.0	0.0	61.5
Element Total 01			**$1,713.3**	**$335.5**	**$299.8**	**$92.9**	**$130.2**	**$2,571.7**
Category Total 709			**$1,713.3**	**$335.5**	**$299.8**	**$92.9**	**$130.2**	**$2,571.7**

* Represents values less than $50,000

** Savings expected due to efficiencies

Numbers may not add due to rounding

Commitments
($ in millions)

ELEMENT DESCRIPTION/PROJECT	NEEDS CODE	2015	2016	2017	2018	2019	Total All Years
01 FULL LENGTH SECOND AVE SUBWAY							
01 SAS 2 PE, Design & Environmental	NE	0.0	135.0	0.0	0.0	0.0	135.0
04 SAS 2 Construction Management	NE	0.0	0.0	0.0	50.0	0.0	50.0
05 SAS 2 Project Support	NE	0.0	20.0	0.0	20.0	0.0	40.0
07 SAS 2 Prelim Const/Utilities	NE	0.0	0.0	0.0	0.0	270.0	270.0
98 SAS 2 Real Estate	NE	0.0	0.0	40.0	0.0	0.0	40.0
99 SAS 2 Reserve	NE	0.0	0.0	0.0	0.0	500.0	500.0
Element Total 01		**$0.0**	**$155.0**	**$40.0**	**$70.0**	**$770.0**	**$1,035.0**
Category Total 710		**$0.0**	**$155.0**	**$40.0**	**$70.0**	**$770.0**	**$1,035.0**

* Represents values less than $50,000

** Savings expected due to efficiencies

Numbers may not add due to rounding

Commitments
($ in millions)

ELEMENT DESCRIPTION/PROJECT		NEEDS CODE	2015	2016	2017	2018	2019	Total All Years
01	**PENN STATION ACCESS**							
01	Design	NE	0.0	31.1	0.0	0.0	0.0	31.1
02	Program Management	NE	0.0	9.3	0.0	0.0	0.0	9.3
03	Construction Management	NE	0.0	0.0	0.0	16.1	15.0	31.1
04	Track & Structures **	NE	0.0	0.0	0.0	237.6	0.0	237.6
05	Communication and Signals **	NE	0.0	0.0	0.0	56.3	0.0	56.3
06	Power **	NE	0.0	0.0	0.0	106.2	0.0	106.2
07	Stations	NE	0.0	0.0	0.0	0.0	188.0	188.0
08	Shops & Yards **	NE	0.0	0.0	0.0	0.0	30.6	30.6
09	Rolling Stock Specification	NE	0.0	0.0	0.0	0.0	4.9	4.9
Element Total 01			**$0.0**	**$40.4**	**$0.0**	**$416.2**	**$238.5**	**$695.0**
Category Total 711			**$0.0**	**$40.4**	**$0.0**	**$416.2**	**$238.5**	**$695.0**

* Represents values less than $50,000

** Savings expected due to efficiencies

Numbers may not add due to rounding

Commitments
($ in millions)

ELEMENT DESCRIPTION/PROJECT	NEEDS CODE	2015	2016	2017	2018	2019	Total All Years
01 REGIONAL INVESTMENTS							
01 WBBP & EBRR F/A Connections	NE	0.0	0.0	0.0	12.2	5.9	18.1
02 East Bound Re-Route	NE	0.0	0.0	0.0	0.0	148.8	148.8
04 Loop & T Interlockings	NE	0.0	0.0	0.0	3.9	3.9	7.9
07 GCT Concourse & Facilities Part 2	NE	0.0	0.0	0.8	0.0	0.0	0.8
12 Sunnyside Station	NE	0.0	0.0	10.0	0.0	66.5	76.5
13 Harold Loop Civil Structures - Part 4	NE	0.0	0.0	0.0	0.0	57.8	57.8
Element Total 01		**$0.0**	**$0.0**	**$10.8**	**$16.2**	**$282.8**	**$309.8**
Category Total 714		**$0.0**	**$0.0**	**$10.8**	**$16.2**	**$282.8**	**$309.8**

* Represents values less than $50,000

** Savings expected due to efficiencies

Numbers may not add due to rounding

Commitments
($ in millions)

ELEMENT DESCRIPTION/PROJECT	NEEDS CODE	2015	2016	2017	2018	2019	Total All Years
01 ESA RS / ESA RISK RESERVE							
01 ESA Rolling Stock Reserve	NE	0.0	78.1	0.0	0.0	0.0	78.1
02 ESA Risk Reserve	NE	0.0	0.0	0.0	0.0	131.0	131.0
Element Total 01		**$0.0**	**$78.1**	**$0.0**	**$0.0**	**$131.0**	**$209.1**
Category Total 715		**$0.0**	**$78.1**	**$0.0**	**$0.0**	**$131.0**	**$209.1**

* Represents values less than $50,000

** Savings expected due to efficiencies

Numbers may not add due to rounding

Commitments
($ in millions)

ELEMENT DESCRIPTION/PROJECT	NEEDS CODE	2015	2016	2017	2018	2019	Total All Years
01 MISCELLANEOUS							
01 Misc Engineering/Prog Support		0.0	27.9	27.9	27.9	27.9	111.6
02 MTA Indep. Engineering Consultant		0.0	4.2	4.2	4.2	4.2	16.8
03 MTA SBDP Administration		0.0	1.6	1.6	1.6	1.6	6.5
Element Total 01		**$0.0**	**$33.7**	**$33.7**	**$33.7**	**$33.7**	**$135.0**
Category Total 716		**$0.0**	**$33.7**	**$33.7**	**$33.7**	**$33.7**	**$135.0**
TOTAL PROGRAM		**$1,713.3**	**$642.7**	**$384.4**	**$629.0**	**$1,586.2**	**$4,955.6**

* Represents values less than $50,000

** Savings expected due to efficiencies

Numbers may not add due to rounding

CPRB Agency Summary

AGENCY	Commitments ($ in millions) 2015	2016	2017	2018	2019	Total All Years
TOTAL New York City Transit	$1,041.1	$4,034.2	$4,085.6	$3,724.2	$2,963.8	$15,848.8
TOTAL Long Island Rail Road	$105.0	$556.2	$996.8	$661.1	$516.0	$2,835.1
TOTAL Metro-North Railroad	$98.4	$621.4	$749.7	$564.1	$287.3	$2,321.0
TOTAL MTA Bus Company	$48.3	$45.5	$256.2	$19.9	$6.0	$376.0
TOTAL MTA Interagency	$0.0	$74.5	$66.0	$61.5	$61.5	$263.5
Core Subtotal	$1,292.9	$5,331.8	$6,154.4	$5,030.7	$3,834.6	$21,644.4
TOTAL Capital Construction Company	$1,713.3	$642.7	$384.4	$629.0	$1,586.2	$4,955.6
TOTAL 2015-2019 CPRB PROGRAM	$3,006.2	$5,974.5	$6,538.8	$5,659.7	$5,420.8	$26,600.0

* Represents values less than $50,000

** Savings expected due to efficiencies

Numbers may not add due to rounding

Bridges and Tunnels

Commitments ($ in millions)

ELEMENT DESCRIPTION/PROJECT	NEEDS CODE	2015	2016	2017	2018	2019	Total All Years
AW AGENCY-WIDE							
98 Tunnel Vulnerability Improvements - Phase 2	NR	0.0	0.0	4.6	0.0	10.5	15.1
X4 Design for Physical Barriers	SI	0.0	0.0	0.0	0.1	7.0	7.0
Element Total AW		**$0.0**	**$0.0**	**$4.6**	**$0.1**	**$17.5**	**$22.1**
BW BRONX-WHITESTONE BRIDGE							
07 Fender Protection around Tower Piers (Const)	NR	0.0	1.6	0.0	19.1	0.0	20.7
14 Miscellaneous Structural Rehabilitation	NR	29.3	0.0	0.0	0.0	0.0	29.3
84 Cable & Suspender Rope Investigation/Testing	NR	20.2	0.0	0.0	0.0	0.0	20.2
Element Total BW		**$49.5**	**$1.6**	**$0.0**	**$19.1**	**$0.0**	**$70.1**
CB CROSS BAY BRIDGE							
18 CB Scour Protect/Repair/Rpl CB/MP Pier Fender Sys	NR	0.1	1.6	0.0	47.2	0.0	48.9
24 Conceptual Design Rehab/Reconst Rockaway Crossings	NR	0.0	0.0	0.0	6.6	0.0	6.6
Element Total CB		**$0.1**	**$1.6**	**$0.0**	**$53.9**	**$0.0**	**$55.6**
HC HUGH L. CAREY TUNNEL							
28 Miscellaneous Tunnel Structural Repairs- Phase III	NR	0.0	0.0	0.0	0.1	4.5	4.6
48 Design for Rehabilitation of Manhattan Plaza	NR	0.0	0.0	0.0	0.1	3.5	3.5
Element Total HC		**$0.0**	**$0.0**	**$0.0**	**$0.1**	**$8.0**	**$8.1**
HH HENRY HUDSON BRIDGE							
07 Structural Rehabilitation	NR	0.1	1.7	0.0	2.2	19.7	23.7
89 Skewback Retrofit	NR	0.0	83.2	0.0	0.0	0.0	83.2
Element Total HH		**$0.1**	**$84.9**	**$0.0**	**$2.2**	**$19.7**	**$106.9**
QM QUEENS MIDTOWN TUNNEL							
18 Manhattan/Queens Plaza Structural Rehab	NR	0.1	6.7	0.0	0.0	0.0	6.7
40 Conceptual Design-Misc Tunnel Structural Repairs	NR	0.0	0.0	0.0	0.0	4.5	4.6
Element Total QM		**$0.1**	**$6.7**	**$0.0**	**$0.0**	**$4.5**	**$11.3**
RK ROBERT F. KENNEDY BRIDGE							
04 Queens Anchorage Rehabilitation	NR	1.5	0.0	0.0	0.0	0.0	1.5
19 Seismic/Wind Retrofit & Structural Rehab Ph1	NR	0.1	5.1	0.0	11.3	51.8	68.2
20 Cable Inspection and Rehabilitation	NR	0.0	0.9	2.2	1.9	11.3	16.3
22 Interim Repairs - FDR Ramp	NR	0.0	0.0	25.9	0.0	0.0	25.9
70 Miscellaneous Structural Rehabilitation	NR	0.1	4.7	0.0	7.4	81.6	93.8
Element Total RK		**$1.6**	**$10.7**	**$28.1**	**$20.6**	**$144.7**	**$205.7**

* Represents values less than $50,000

** Savings expected due to efficiencies

Numbers may not add due to rounding

Commitments ($ in millions)

ELEMENT DESCRIPTION/PROJECT		NEEDS CODE	2015	2016	2017	2018	2019	Total All Years
TN	**THROGS NECK BRIDGE**							
53	Approach Viaduct Seismic Retrofit/Structural Rehab	NR	10.3	0.0	13.0	139.1	0.0	162.5
87	Design for Anchorage & Tower Protection	NR	0.0	2.1	11.2	0.0	0.0	13.2
	Element Total TN		**$10.3**	**$2.1**	**$24.2**	**$139.1**	**$0.0**	**$175.7**
VN	**VERRAZANO-NARROWS BRIDGE**							
10	Anchorage & Piers Rehabilitation and Sealing	NR	4.3	0.0	44.9	0.0	0.0	49.2
32	Steel Repair & Concrete Rehabilitation	NR	0.0	0.0	0.5	1.8	31.6	33.8
34	Main Cable & Suspender Rope Testing - Phase 1	NR	0.0	0.0	43.1	0.0	0.0	43.1
89	Tower Pier Rehab/Construct Mooring Platform	NR	0.8	0.0	2.8	18.1	0.0	21.6
	Element Total VN		**$5.0**	**$0.0**	**$91.2**	**$19.9**	**$31.6**	**$147.7**
	Category Total 701		**$66.6**	**$107.5**	**$148.1**	**$255.0**	**$226.0**	**$803.2**

* Represents values less than $50,000

** Savings expected due to efficiencies

Numbers may not add due to rounding

Commitments ($ in millions)

ELEMENT DESCRIPTION/PROJECT	NEEDS CODE	2015	2016	2017	2018	2019	Total All Years
AW AGENCY-WIDE							
X1 Agency Wide: Planning/Strategic Initiatives	SI	0.0	0.0	0.0	0.0	50.8	50.8
Element Total AW		**$0.0**	**$0.0**	**$0.0**	**$0.0**	**$50.8**	**$50.8**
RK ROBERT F. KENNEDY BRIDGE							
23 Construction of New Harlem River Drive Ramp	SI	0.0	26.4	0.5	0.0	114.4	141.3
65 Reconstruct Manhattan Toll Plaza Structure & Ramps	NR	0.0	0.1	12.5	0.0	211.5	224.1
Element Total RK		**$0.0**	**$26.4**	**$13.0**	**$0.0**	**$325.9**	**$365.3**
TN THROGS NECK BRIDGE							
49 Replacement of Grid Decks on Suspended Span	NR	0.0	0.0	310.4	0.0	0.0	310.4
55 Study for Bx/Queens Approach Viaduct Replacement	NR	0.0	16.2	0.0	0.0	0.0	16.2
Element Total TN		**$0.0**	**$16.2**	**$310.4**	**$0.0**	**$0.0**	**$326.6**
VN VERRAZANO-NARROWS BRIDGE							
11 Brooklyn Approach Reconstruction	NR	0.6	2.0	0.0	28.6	0.0	31.2
80 Prelim Design for Suspended Span Lower Level Deck	NR	0.0	0.0	0.1	8.6	0.0	8.7
84 Reconstruction of VN Approach Ramps - Phase1	NR	4.1	12.5	0.0	0.0	269.5	286.0
86 Design for Belt Parkway Ramps Widening	NR	0.0	0.1	4.2	0.0	0.4	4.6
Element Total VN		**$4.6**	**$14.6**	**$4.3**	**$37.2**	**$269.8**	**$330.5**
Category Total 702		**$4.6**	**$57.2**	**$327.6**	**$37.2**	**$646.5**	**$1,073.2**

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** Savings expected due to efficiencies

Numbers may not add due to rounding

Commitments ($ in millions)

ELEMENT DESCRIPTION/PROJECT		NEEDS CODE	2015	2016	2017	2018	2019	Total All Years
AW	**AGENCY-WIDE**							
32	Installation of Rotating Prism Signs	NR	13.6	0.0	0.0	0.0	0.0	13.6
36	Install CCTV/FiberOptic Infrastructure/Integration	SI	0.0	0.0	1.2	0.0	9.5	10.7
52	Traffic Detection/Incident Mgmt Systems	SI	0.0	0.0	3.2	0.0	0.0	3.2
57	Advanced Traffic Mgmt Systems Enhancement/Upgrade	SI	0.0	0.4	0.0	7.7	0.0	8.1
63	Replace Toll Equipment & New Toll Initiatives	NR	0.0	8.5	0.0	12.8	0.0	21.3
65	Toll Collection System Rehabilitation/Upgrades	NR	3.7	0.0	48.2	0.0	15.6	67.5
	Element Total AW		**$17.3**	**$8.9**	**$52.6**	**$20.4**	**$25.0**	**$124.3**
HH	**HENRY HUDSON BRIDGE**							
88	Toll Plazas & Southbound Approach Reconstruction	NR	0.0	81.7	0.0	0.0	0.0	81.7
	Element Total HH		**$0.0**	**$81.7**	**$0.0**	**$0.0**	**$0.0**	**$81.7**
	Category Total 703		**$17.3**	**$90.6**	**$52.6**	**$20.4**	**$25.0**	**$206.0**

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** Savings expected due to efficiencies

Numbers may not add due to rounding

Commitments ($ in millions)

ELEMENT DESCRIPTION/PROJECT	NEEDS CODE	2015	2016	2017	2018	2019	Total All Years
AW AGENCY-WIDE							
73 Facility Monitoring & Safety Systems Replacement	NR	0.0	0.0	0.0	0.0	2.3	2.3
80 Advanced Traveler Information Systems (ATIS)	SI	0.0	0.8	10.8	1.3	0.0	12.9
X3 Bridge Structural Health Monitoring Initiatives	NR	0.0	0.0	3.7	4.7	11.6	20.0
Element Total AW		**$0.0**	**$0.8**	**$14.6**	**$6.0**	**$13.8**	**$35.2**
BW BRONX-WHITESTONE BRIDGE							
32 Installation of Fire Standpipe Connections	NR	0.1	0.3	0.0	6.9	0.0	7.3
39 Install Electronic Monitoring & Detection Systems	SI	0.1	31.0	0.0	0.0	0.0	31.1
Element Total BW		**$0.1**	**$31.3**	**$0.0**	**$6.9**	**$0.0**	**$38.3**
HC HUGH L. CAREY TUNNEL							
07 Rehabilitation of HCT Ventilation Systems	NR	0.0	0.1	0.8	84.7	0.0	85.5
30 Installation of Smoke Detection/Alarm Systems	NR	0.0	0.3	1.2	9.1	0.0	10.6
64 Brooklyn Service Building Electrical Rehab.	NR	0.0	0.3	1.5	5.5	0.0	7.3
Element Total HC		**$0.0**	**$0.6**	**$3.5**	**$99.3**	**$0.0**	**$103.4**
HH HENRY HUDSON BRIDGE							
13 Replacement of Facility Lighting System	NR	1.4	17.3	0.0	0.0	0.0	18.7
19 Replacement and Upgrade of Substations	NR	0.0	0.4	1.3	1.5	12.1	15.3
Element Total HH		**$1.4**	**$17.7**	**$1.3**	**$1.5**	**$12.1**	**$34.0**
QM QUEENS MIDTOWN TUNNEL							
81 Rehab of Tunnel Controls & Communication Systems	NR	0.0	0.0	0.0	42.2	0.0	42.2
91 Installation of Smoke Detection/Alarm Systems	NR	0.0	0.3	1.0	5.8	0.0	7.0
Element Total QM		**$0.0**	**$0.3**	**$1.0**	**$48.0**	**$0.0**	**$49.2**
RK ROBERT F. KENNEDY BRIDGE							
07 Electrical/Mechanical Rehab of HR Lift Span	NR	0.1	0.3	15.3	0.0	0.0	15.6
21 Install Fire Standpipe/Upgrade Protection System	NR	1.1	22.8	0.0	0.0	0.0	23.8
60 Install Electronic Monitoring & Detection Systems	SI	0.0	35.4	0.0	0.0	0.0	35.4
66 Relocation of 13KV Substation	NR	0.0	0.0	0.0	19.2	0.0	19.2
Element Total RK		**$1.1**	**$58.4**	**$15.3**	**$19.2**	**$0.0**	**$94.0**
TN THROGS NECK BRIDGE							
58 Replace Electrical Eqmt & Rehab Tower Elevators	NR	0.0	0.0	0.6	0.0	2.2	2.8
60 Anchorage Dehumidification	NR	39.1	0.0	0.0	0.0	0.0	39.1
Element Total TN		**$39.1**	**$0.0**	**$0.6**	**$0.0**	**$2.2**	**$41.8**

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** Savings expected due to efficiencies

Numbers may not add due to rounding

Commitments ($ in millions)

ELEMENT DESCRIPTION/PROJECT	NEEDS CODE	2015	2016	2017	2018	2019	Total All Years
VN VERRAZANO-NARROWS BRIDGE							
30 Elevator Rehabilitation	NR	0.0	0.7	1.5	0.0	7.6	9.8
Element Total VN		**$0.0**	**$0.7**	**$1.5**	**$0.0**	**$7.6**	**$9.8**
Category Total 704		**$41.7**	**$109.8**	**$37.7**	**$180.9**	**$35.8**	**$405.8**

* Represents values less than $50,000

** Savings expected due to efficiencies

Numbers may not add due to rounding

Commitments ($ in millions)

ELEMENT DESCRIPTION/PROJECT	NEEDS CODE	2015	2016	2017	2018	2019	Total All Years
AW AGENCY-WIDE							
12 Hazardous Material Abatement	NR	0.0	1.5	9.2	0.0	0.0	10.7
66 Operations Command Center Rehab/Replacement	NR	0.0	0.1	0.1	25.4	0.0	25.5
Element Total AW		**$0.0**	**$1.6**	**$9.3**	**$25.4**	**$0.0**	**$36.2**
HC HUGH L. CAREY TUNNEL							
80 Rehabilitation of Ventilation Buildings	NR	0.0	1.1	3.7	0.0	0.0	4.7
Element Total HC		**$0.0**	**$1.1**	**$3.7**	**$0.0**	**$0.0**	**$4.7**
QM QUEENS MIDTOWN TUNNEL							
36 Rehabilitation of Ventilation Building	NR	0.0	0.8	2.4	0.0	0.0	3.2
Element Total QM		**$0.0**	**$0.8**	**$2.4**	**$0.0**	**$0.0**	**$3.2**
RK ROBERT F. KENNEDY BRIDGE							
58 Rehab Robert Moses Bldg & Ancillary Facilities	NR	0.1	2.8	0.0	33.4	13.9	50.2
Element Total RK		**$0.1**	**$2.8**	**$0.0**	**$33.4**	**$13.9**	**$50.2**
Category Total 705		**$0.1**	**$6.2**	**$15.3**	**$58.8**	**$13.9**	**$94.3**

* Represents values less than $50,000

** Savings expected due to efficiencies

Numbers may not add due to rounding

Commitments
($ in millions)

ELEMENT DESCRIPTION/PROJECT	NEEDS CODE	2015	2016	2017	2018	2019	Total All Years
AW AGENCY-WIDE							
10 Enterprise Asset Management	SI	0.0	4.0	0.0	0.0	0.0	4.0
15 MTA Independent Engineer		0.0	1.4	0.0	0.0	1.1	2.5
18 Protective Liability Insurance		0.0	2.5	2.5	2.5	5.6	13.1
21 Program Administration		4.7	4.7	4.7	4.7	5.2	24.0
22 Miscellaneous		0.1	3.5	2.6	0.0	0.0	6.1
28 Scope Development		0.0	6.7	1.6	1.6	2.5	12.5
85 Traffic Enforcement Support		0.0	7.8	0.0	0.0	0.0	7.8
94 Small Business Mentoring Program		0.0	15.6	0.0	0.0	0.0	15.6
Element Total AW		**$4.8**	**$46.2**	**$11.4**	**$8.8**	**$14.4**	**$85.6**
Category Total 706		**$4.8**	**$46.2**	**$11.4**	**$8.8**	**$14.4**	**$85.6**

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** Savings expected due to efficiencies

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Commitments ($ in millions)

ELEMENT DESCRIPTION/PROJECT	NEEDS CODE	2015	2016	2017	2018	2019	Total All Years
AW AGENCY-WIDE							
95 Miscellaneous Agency Wide Painting	NR	0.0	30.4	0.0	0.0	0.0	30.4
Element Total AW		**$0.0**	**$30.4**	**$0.0**	**$0.0**	**$0.0**	**$30.4**
BW BRONX-WHITESTONE BRIDGE							
84 Paint Tower Interior Base Cells and Struts	NR	28.8	0.0	0.0	0.0	0.0	28.8
Element Total BW		**$28.8**	**$0.0**	**$0.0**	**$0.0**	**$0.0**	**$28.8**
HH HENRY HUDSON BRIDGE							
30 Replacement of HHB Overcoat System	NR	0.0	0.9	0.0	2.6	17.2	20.6
Element Total HH		**$0.0**	**$0.9**	**$0.0**	**$2.6**	**$17.2**	**$20.6**
RK ROBERT F. KENNEDY BRIDGE							
70 Paint Suspended Span/Bronx Truss Steel	NR	0.0	0.5	0.0	3.9	27.7	32.1
Element Total RK		**$0.0**	**$0.5**	**$0.0**	**$3.9**	**$27.7**	**$32.1**
TN THROGS NECK BRIDGE							
49 Painting of Suspended Span	NR	0.0	0.0	26.3	0.0	0.0	26.3
60 Anchorage Dehumidification - Painting	NR	7.9	0.0	0.0	0.0	0.0	7.9
Element Total TN		**$7.9**	**$0.0**	**$26.3**	**$0.0**	**$0.0**	**$34.2**
VN VERRAZANO-NARROWS BRIDGE							
49 Paint Suspended Span Upper & Lower Level Steel	NR	0.1	1.1	5.8	34.8	0.0	41.7
Element Total VN		**$0.1**	**$1.1**	**$5.8**	**$34.8**	**$0.0**	**$41.7**
Category Total 707		**$36.8**	**$32.9**	**$32.1**	**$41.2**	**$44.9**	**$187.9**
TOTAL PROGRAM		**$171.8**	**$450.5**	**$624.8**	**$602.3**	**$1,006.5**	**$2,856.0**

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** Savings expected due to efficiencies

Numbers may not add due to rounding

All Agency Summary

AGENCY	Commitments ($ in millions) 2015	2016	2017	2018	2019	Total All Years
TOTAL New York City Transit	$1,041.1	$4,034.2	$4,085.6	$3,724.2	$2,963.8	$15,848.8
TOTAL Long Island Rail Road	$105.0	$556.2	$996.8	$661.1	$516.0	$2,835.1
TOTAL Metro-North Railroad	$98.4	$621.4	$749.7	$564.1	$287.3	$2,321.0
TOTAL MTA Bus Company	$48.3	$45.5	$256.2	$19.9	$6.0	$376.0
TOTAL MTA Interagency	$0.0	$74.5	$66.0	$61.5	$61.5	$263.5
Core Subtotal	$1,292.9	$5,331.8	$6,154.4	$5,030.7	$3,834.6	$21,644.4
TOTAL Capital Construction Company	$1,713.3	$642.7	$384.4	$629.0	$1,586.2	$4,955.6
TOTAL 2015-2019 CPRB PROGRAM	$3,006.2	$5,974.5	$6,538.8	$5,659.7	$5,420.8	$26,600.0
TOTAL Bridges and Tunnels	$171.8	$450.5	$624.8	$602.3	$1,006.5	$2,856.0
TOTAL 2015-2019 CAPITAL PROGRAM	$3,178.0	$6,425.0	$7,163.6	$6,262.0	$6,427.3	$29,455.9

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** Savings expected due to efficiencies

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