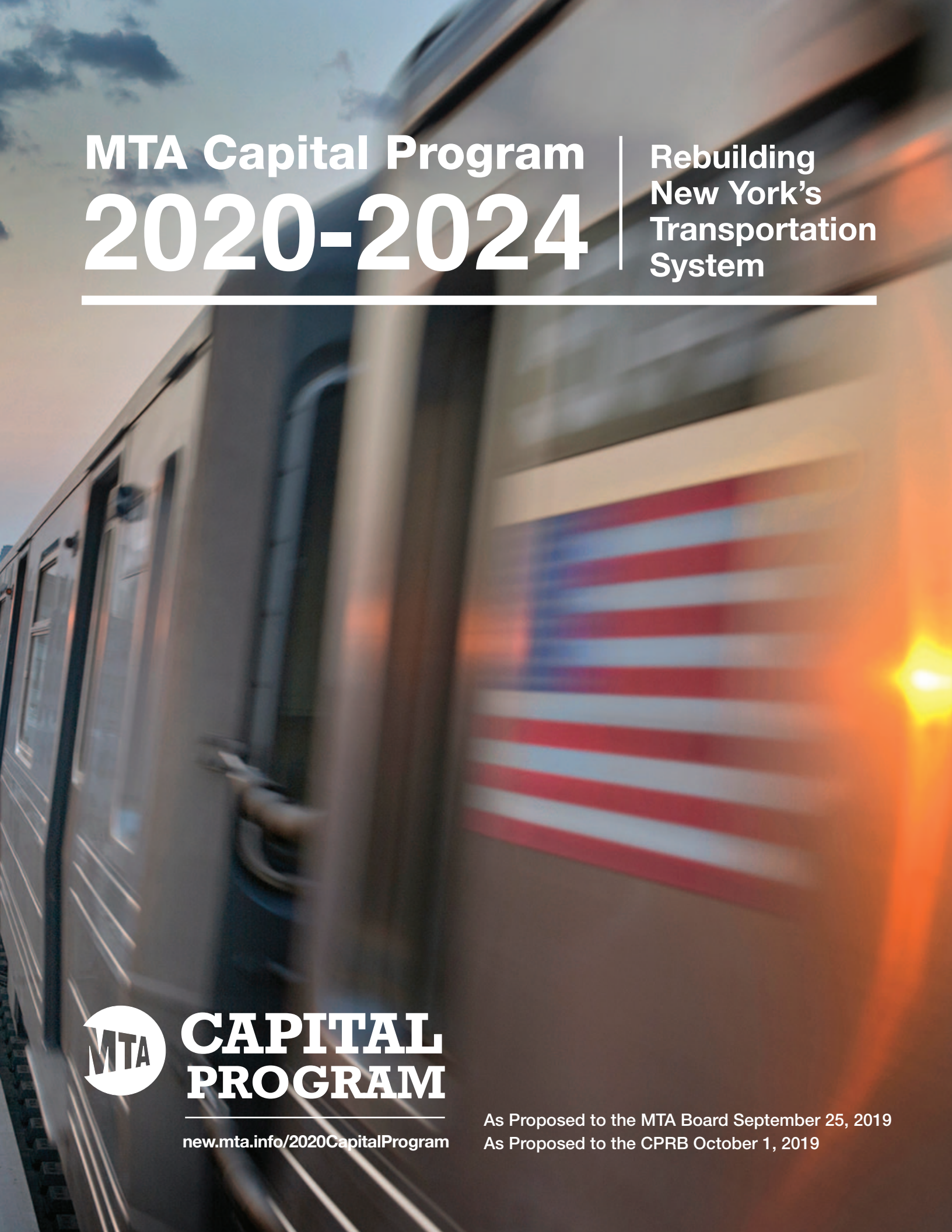

MTA Capital Program 2020-2024

Rebuilding New York's Transportation System

MTA CAPITAL PROGRAM

new.mta.info/2020CapitalProgram

As Proposed to the MTA Board September 25, 2019
As Proposed to the CPRB October 1, 2019


J1
335
Z
MTA
New York City
Subway
X
320

MTA Capital Program 2020-2024

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It’s Time to Re-invest in New York’s Transportation System.

Hello New York,

As the new Chairman and CEO of the MTA, and – more importantly – a lifelong rider and daily customer of our system, I am pleased to present the proposed 2020-2024 MTA Capital Program. This historic and transformational plan is the largest ever, outlining unprecedented levels of investment across all of the MTA's assets, from subways, buses and railroads to bridges and tunnels. This program represents a bold vision for what it will take to deliver the world-class transit system New York deserves.

Our proposed $51.5 billion capital investment plus $3.3 billion for MTA Bridges and Tunnels over the next five years is 70 percent larger than the 2015-2019 Program, addressing core system priorities that will deliver major benefits. Signal modernization on six line segments will speed up the system, providing safer, more reliable and more frequent service to over half of all subway riders. Our commitment to full accessibility begins now, with ADA accessibility projects for 70 stations which would result in serving over 60 percent of passengers. An unprecedented investment of over 1,900 subway cars and 2,400 new buses – including 500 zero-emission All-Electric Buses – will improve air quality and invest in sustainability, resulting in the last order for a non-electric bus in 2029 and an All-Electric Bus fleet by 2040. Other major projects including Phase 2 of the Second Avenue Subway and Penn Station Access will create transformative new travel options for residents of East Harlem, the Bronx, and Westchester increasing the reach, capacity and accessibility of the regional transportation system.

Delivering a transportation system worthy of the 21st century and beyond will require more than an ambitious Capital Plan. Our transit revitalization efforts will be bolstered by major initiatives to transform the MTA into a world-class organization that provides its customers with the service they deserve. The MTA's Transformation Plan, approved by the Board in July 2019, outlines a path to bring truly innovative and meaningful reform to the agency. Transformation priorities include improving overall service through business efficiencies, driving clearer lines of accountability, ending cost overruns and project delays, and reducing waste and duplication.

There's no question that we continue to face significant challenges, and we still have a great deal of work ahead as we transform the MTA into a more streamlined, efficient, and effective organization. We're taking a fresh look at how we deliver capital projects, in ways that will bring greater transparency and accountability to how projects are scoped, planned, designed, built, and managed. With these changes to internal operations, and the support of our local, State and Federal partners, we're certain that we can deliver a more modern, efficient, accessible, and reliable system that New Yorkers deserve.

Patrick J. Foye
MTA Chairman and CEO

9 million

customers rely on the MTA every weekday

17 million

metric tons of greenhouse gas avoided annually, making New York the nation's most carbon-efficient state

7,300 jobs

created in New York State for every $1 billion in MTA Capital investment sourced or performed in-state

23 million

freight trucks per year use MTA Bridges and Tunnels crossings, supporting America's largest regional economy by moving its goods and materials

An Investment in the MTA Capital Program is an Investment in the Future of New York.

The MTA's transit system powers our region – and the MTA Capital Program powers our transit system. This upcoming Capital Program will modernize our network from top to bottom.

The MTA network is vital to the social and economic fabric of our region, bringing nearly 9 million people to their jobs, to school, to entertainment, to doctor's appointments–everywhere they need to go, every single day. Our transit system allows New York City to have about four times the job and population density of the next largest city and enables the most valuable real estate market in the nation. It is, quite simply, the engine that powers our $1.4 trillion regional economy.

The maintenance and continual improvement of the transit system relies on the MTA Capital Program, a series of five-year investment plans which began in 1982. Over the past 37 years, we have invested more than $128 billion in our system. The Program's success is evident. In almost every performance metric we track – from reliability and safety to crime and major incidents – capital investments have revitalized our transit network.

And capital investments do far more than improve transit. They are powerful job creators and catalysts for a thriving New York State economy. Based on a March 2019 analysis by Ernst & Young, the MTA's five-year capital investment strategy could generate more than $75 billion of statewide economic activity, and create nearly 350,000 jobs throughout the State.

While capital investments have addressed repair backlogs and infrastructure needs since the 1980s, the fact of the matter is that our system is old, our region is growing more and more crowded, and investments have not kept pace with growing needs. This combination led to a sharp decline in service in 2017. Our Subway Action Plan arrested this decline, but we must invest to build on this progress.

That's one of the reasons this Capital Program is so ambitious. Through this Program, we will deliver the modern, world-class transit system that our region deserves. We will deliver state-of-the-art signals, new subway and rail cars, buses, and 70 additional accessible subway stations. We will make our system safer, more reliable, cleaner, more modern, and more customer-friendly.

Thanks to the leadership of Governor Cuomo, Speaker Heastie, and Majority Leader Stewart-Cousins, the MTA has a head start on the funding we need to successfully implement this ambitious Capital Program. As we work with our partners to fully fund this Program, we do so with an understanding that our stakeholders expect us to demonstrate that we are investing wisely.

For more than 100 years, our transit network has done so much more than serve New Yorkers' needs. It created our region as we know it. When this Capital Program is fully funded, we will have the tools we need to shape our region again – for its next 100 years.

MTA Transformation

The 2019-20 New York State Budget resulted in significant changes for the MTA, including new funding sources for the next Capital Program and a requirement to institute major reforms on how the MTA operates.

A complete reorganization is underway to determine how best to share and consolidate those common functions and develop cost efficiencies through management reforms.

A forensic audit of the Capital Program is also underway to provide a thorough examination of each agency's capital needs, as well as a review of the current Capital Program for cost overages and duplication.

New Funding Sources

This year, the NYS Legislature authorized new significant revenue sources to fund the MTA Capital Program, including:

- Central Business District Tolling Program to ease congestion
- Progressive Tax on High-End Real Estate Sales
- Elimination of Internet Tax Advantage

Across the MTA, agencies are pursuing ambitious plans to target critical needs

The MTA regularly evaluates the condition of its assets and analyzes regional transportation needs and future travel demands. These assessments support the long range capital planning process and lead to investment strategies that address safety, state of good repair and capacity needs in the next 5-Year Capital Plan.

With a focus on arresting the decline of subway and railroad performance, agencies have been proactively attacking the root causes of the system's problematic areas. The result has been dramatic improvement in on-time performance across the MTA network.

Rising to the Challenge

In the summer of 2017, Governor Andrew Cuomo declared a state of emergency, and the resulting Subway Action Plan infused more than $800 million to stabilize the system. The initiative targets the root causes of subway delays. Work done through the Subway Action Plan includes plugging 4,000 leaks, cleaning drains along over 400 miles of track, repairing 20,000 track defects and rebuilding 200 signal stops.

In May 2018, LIRR announced plans to upgrade the 10 switches that caused 44% of switch failures in 2017, conduct inspections and upgrades on 370 track circuits that caused 36% of track-circuit failures, clear 180 miles of overgrown vegetation along the right of way, and increase the frequency of station cleaning at all 124 stations by 30%.

In October 2018, Metro-North announced plans to replace seats and floors in more than 100 coaches to revitalize its locomotive-hauled fleet, replace 1,200 power transmission poles, complete the replacement of its overhead power system, and accelerate delivery of real-time train information to displays at an additional 21 stations.

Targeted Investments Have Led to Improvements

These extraordinary measures to arrest the performance decline are paying off. Throughout the subway system, the monthly number of incidents that delay 50 or more trains dropped from 105 in January 2018 to 38 in August 2019. Over the same period, weekday on-time performance rose from 58% to 84%.

At Long Island Rail Road, on-time performance rose from 84% in January 2018 to 92% in August 2019. Over the same period, there was a 76% reduction in cancelled or terminated trains, and a 73% reduction in trains delayed by more than 15 minutes.

At Metro-North, on-time performance rose from 92% in January 2018 to 93% in August 2019. Over the same period, there was a 64% reduction in cancelled or terminated trains, and a 16% reduction in trains delayed by more than 15 minutes.

The next Capital Program will build on these achievements, ensuring that the improvements put in place will be sustainable for years to come.

The MTA is Delivering Capital Projects Faster, Better, and More Cost-Effectively.

76 percent

fewer approvals needed to authorize a change order

40 percent

more work done on the Subway thanks to better track access

$25 million

all projects exceeding $25 million require design-build

Agency-wide, the MTA has been transforming internal operations and culture to reduce costs, streamline burdensome processes, and bring greater transparency and accountability to the way capital projects are scoped, planned, designed, built, and managed.

Rebalancing risk

More design-build

By combining responsibility for both design and construction in one group, the MTA is shortening project schedules, identifying potential issues earlier, increasing accountability, and better sharing risk with contractors. This year's State budget requires any MTA capital project over $25 million to use design-build, saving the MTA time and money.

More performance-based incentives

Linking compensation to project performance encourages efficiency. This can include additional awards for early completion of key milestones, or sharing the savings identified through value-engineering with the contractor.

Sharing risk

The MTA has begun to reduce risks that shouldn't be borne by contractors alone. This includes guaranteeing track access so that contractors do not bear the cost of cancelled work, as well as working with the contracting community to accept alternate types of financial guarantees that cost contractors less.

Reducing red tape

Faster payments

Reducing the MTA's internal payment cycle means suppliers and contractors can get paid faster, which will result in lower costs. Allowance of partial payments further reduces barriers to working with the MTA.

Shorter change order and submittal processing times

The faster change orders and submittals are processed, the faster the MTA and its contractors can get work done and adapt to changing conditions. All MTA agencies have recently reduced the time it takes to execute a change order.

Less customization and more performance-based specifications

Complicated technical specifications that demand a high degree of customization drive up construction and maintenance costs. The MTA is simplifying specifications to focus on outcomes giving suppliers and contractors greater flexibility to recommend the best solution.

Strengthening project management

Greater ability to get work done on nights and weekends

One of the greatest obstacles to accelerating capital projects is the amount of time available to perform work, given the 24/7 operation of the subway and the extended hours of the MTA's commuter railroads. The amount of work done in the subway system has now been increased by 40% by managing resources more effectively.

Empowered project leads

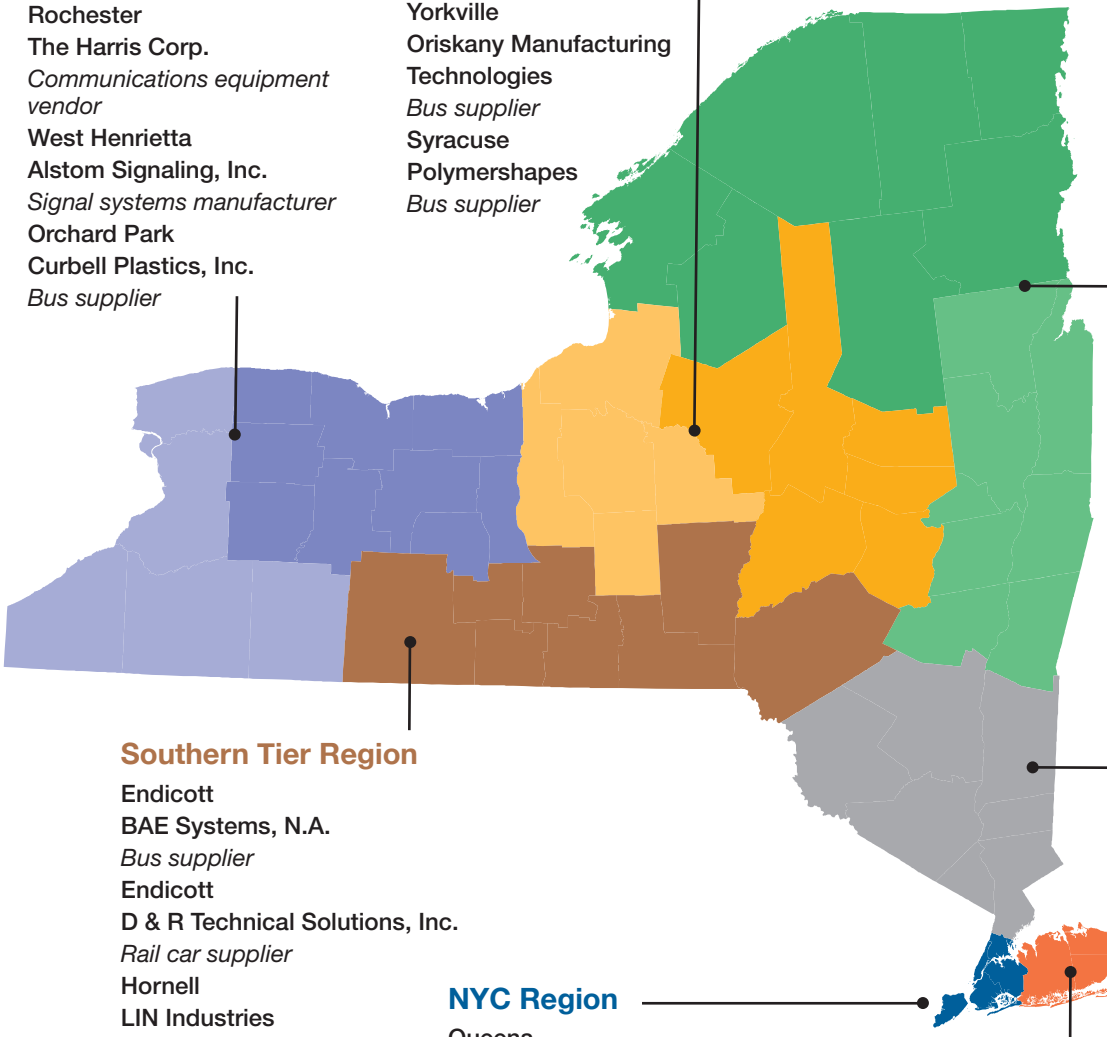
Empowering strong project leads who have full control over project scope, budget, and schedule provides greater accountability. With enhanced authority to veto unwarranted demands or upgrades, Project CEOs or leads are now in place for major projects across the MTA.

Informed, project-based cost forecasting

The more robust cost forecasting is, the more reliable project budgets are. By adopting value-engineering and risk analysis practices, the MTA is identifying and modeling project risks more quickly in order to minimize potential cost overruns.

New Construction and Development Organization responsible for:

- Planning – build the right projects establishing MTA-wide vision and priorities to meet regional needs
- Development – build projects the right way by maximizing use of design/build and optimizing project bundling to drive down costs.
- Delivery – build efficiently and effectively with accountable Project CEOs who are involved from preliminary concept to project close out.



Western New York & Finger Lakes Regions

Rochester
The Harris Corp.
Communications equipment vendor
West Henrietta
Alstom Signaling, Inc.
Signal systems manufacturer
Orchard Park
Curbell Plastics, Inc.
Bus supplier

Central New York & Mohawk Valley Regions

Utica
Metal Solutions
Bus supplier
Yorkville
Oriskany Manufacturing Technologies
Bus supplier
Syracuse
Polymershapes
Bus supplier

North Country & Capital Regions

Plattsburgh
Nova Bus LFS
Bus manufacturer
Plattsburgh
Bombardier Transit Corp.
Subway car manufacturer
Champlain
Elegance Coating Ltd.
Bus supplier

Mid-Hudson Region

Yonkers
Kawasaki Rail Car, Inc.
Subway and rail car manufacturer
Nanuet
Halmar International LLC
Bridge structures and stations enhancement
Elmsford
Wabtec Passenger Transit
Rail car supplier

Southern Tier Region

Endicott
BAE Systems, N.A.
Bus supplier
Endicott
D & R Technical Solutions, Inc.
Rail car supplier
Hornell
LIN Industries
Rail car supplier

NYC Region

Queens
J-Track LLC
Signals, communication & traction power repairs
Bronx
Hellman Electric Corp.
Electrical upgrades for bridge monitoring and detection systems
Bronx
B&S Ironworks LLC (NYSM/WBE)
Passenger station railing installation
Brooklyn
SH5 Construction Corp. (NYSM/WBE)
Station work and bus facility upgrades

Long Island Region

East Farmingdale
L.K. Comstock & Company, Inc.
Signal modernization/power distribution contractor
Holbrook
Tap Electrical Contracting Services, Inc.
Signals, communication/traction power repairs
Lynbrook
Zion Contracting LLC (NYSMBE)
Building rehabilitation work
South Huntington
K.O Technologies (NYSMBE)
Stair rehabilitation work

Our investments drive the New York economy:

The MTA's Capital Program and the jobs it creates are an integral part of our region's economy and economic growth. According to the New York Building Congress, the MTA alone accounts for about 25% of New York City's construction industry in some years. But Capital Program jobs aren't just in New York City, they're in every corner of our state, thanks to the manufacturers, suppliers, and businesses that have opened and expanded to do MTA work.

$75 billion

estimated statewide economic activity generated by MTA's five-year Capital Program

350,000 jobs

estimated to be created over five years in every corner of New York State

89 percent

of capital investments are sourced or performed in-state

$1 billion

of capital projects awarded to NYS certified Minority and Women-owned Business Enterprises since 2015

Investing to Improve Reliability

New York's 24/7 system puts a high premium on reliable service. It's the only way to move so many people quickly and efficiently.

To improve reliability, we must continue to focus on our network's core infrastructure, including the track, signals, switches, and thousands of components customers never even see. These projects may not be glamorous, but they are the key to moving nearly nine million people a day, safely and reliably.

Signal modernization

We will dramatically accelerate the modernization of our aging signal system. New lines will be outfitted with state-of-the-art technology. This system—which is fully in place on the 7 Line and L Line—allows us to run more trains and provide better, safer service. We will modernize six line segments in this capital plan, including the Lexington Avenue Line.

Ultra-Wideband (UWB) Signaling/Axle Counters

UWB and axle counters are emerging innovative technologies currently being tested by the MTA that have the potential to enable conversion to modernized signaling to be executed more quickly, more cheaply, and in a less intrusive manner – supporting this capital program's goal of resignaling six lines in five years.

Jamaica Station expansion

At Jamaica Station, which serves 10 of the 11 LIRR Branches, we're spending $235 million dollars to rebuild the signals, tracks, and infrastructure. This will dramatically improve both the reliability and train speed through Jamaica, and improve what we all know as the "Jamaica Crawl."

1,900 cars

including replacement of over 1,500 aging subway cars, and increasing the fleet by 437 cars for more reliable service

2,400 buses

including replacement of over 2,200 older buses, and increasing the fleet by 186 buses for more frequent and reliable service

6 lines

modified with modernized signaling to provide greater safety and reliability

160 cars

increasing the size of the LIRR electric fleet for more frequent service including East Side Access

We are committed to environmental sustainability:

The MTA creates the most transit-rich environment in the nation, allowing for dense energy-efficient land use patterns, and making New York the state with the smallest carbon footprint. But we are not resting on our laurels. With the purchase of hundreds of new all-electric and hybrid buses, this Capital Program puts the MTA's transition to zero-emission on a fast track.

17 million

metric tons of greenhouse gas avoided annually through mass transit

$100 million

estimated annual health cost savings from reduced harmful emissions due to Central Business District Tolling

1.6 billion

gallons of fuel consumption reduced through Open Road Tolling

10.5 lbs

GHG emissions avoided by an average MTA ride

MTA Solar

Renewable electricity production on roofs and parking lots will generate clean, emission-free power and revenues for the MTA

Building an Accessible Transit System for *All* New Yorkers

New York City's transit system has 493 stations, more than any other subway system in the world, and 5,900 buses serving more than 300 routes.

97% of New York City's population lives within a quarter mile of a bus stop, and 71% lives within a half mile of a subway station. One hundred and twenty three of these stations – serving nearly 50% of our ridership – are accessible under the Americans with Disabilities Act. We know that's not good enough, so we are making historic investments to bring our century-old system up to a state of full accessibility.

We've allocated more than $5.2 billion toward accessibility improvements in this Capital Program, and we will make 70 additional stations ADA accessible including four that may be advanced into an earlier program. By 2029, over 50% of stations will be fully accessible. The pace of investment will continue, with the goal of achieving maximum possible system-wide accessibility by 2034.

The commuter railroads have 209 stations in New York State, of which 168 are currently accessible or under construction. The LIRR has allocated $377 million toward station rehabilitation, renewal and stand-alone accessibility projects, which will accomplish new ADA accessibility at up to 7 additional stations. Additionally, the LIRR has programmed $39 million systemwide for replacing and enhancing accessibility components at other stations.

Metro-North will make ADA accessibility improvements at up to 4 stations - 3 on the Harlem Line and 1 on the Hudson Line. With these investments, 93% of customers will be served by accessible stations.

43 percent

of NYCT stations, serving over 60% of riders, will be fully accessible – meaning no subway rider is more than 2 stations away from an ADA station.

93 percent

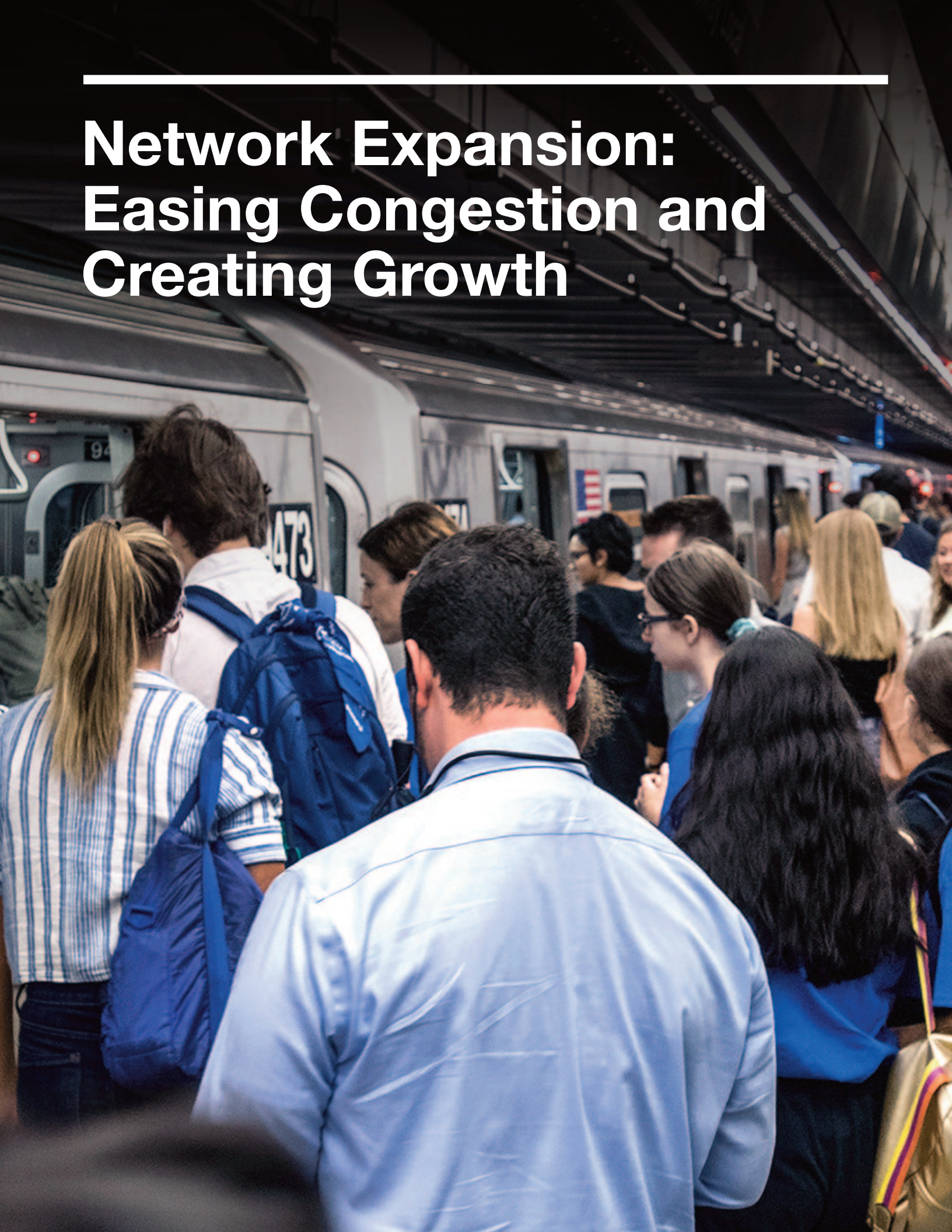
of LIRR stations will be accessible – with a long term goal of 100% accessibility in 10 years.

78 percent

of Metro-North stations serving 93% of customers will be accessible.


Exit
John Street & Broadway
E R W PATH / WTC 1
EL#717X
OUT OF SERVICE

Network Expansion: Easing Congestion and Creating Growth



New York City subways and buses moved more than 1.7 billion people last year. The LIRR's 2018 ridership was nearly 90 million – the highest in nearly seven decades. Metro-North achieved its highest-ever ridership in 2017, more than 86.6 million.

The growth in ridership has strained the system. Six subway lines operate at or above passenger load capacity during the morning peak. Subway delays cost the city $307 million annually in lost work time. And as busy as the system is today, the region is growing and changing fast.

Over the next two decades, the region served by the MTA will grow by about 1.4 million people, and more than 700,000 new jobs are projected—more than the population of the entire city of Boston. Significantly more work trips are being made today to the outer boroughs than 20 years ago, and more subway and bus commuters are traveling off-hours. In the decades to come, the region will need its transportation system to adapt to support these changes.

If we want to accommodate all of these new New Yorkers and maintain safety and reliability, future expansion projects must meet the demands of a changing region. Without them, continued population and employment growth will lead to worsening overcrowding on key subway and commuter rail lines. Insufficient coverage, particularly in outlying areas of the outer boroughs, will lead to congestion and ridership losses to private automobiles and Transportation Network Companies (TNCs). And a changing travel geography will mean missed opportunities to carry an increasing number of non-Manhattan intra-borough and interborough trips.

The MTA's large-scale capacity expansion projects focus on adding capacity to the system, expanding the reach of the network, and serving changing travel patterns throughout the region. New stations and increased service will support local land use and economic development strategies, revitalizing the region through new job opportunities, more housing and increased mobility. Additional travel options make our region more resilient and able to respond to disruptions in emergencies.

The MTA evaluates and prioritizes system and capacity expansion projects that:

Add capacity
to satisfy growing demand or relieve overcrowding

Expand the reach of the network
to connect underserved or new communities to educational and employment opportunities

Support local land-use
and economic development strategies

Serve changing travel patterns
by enabling trips to new business districts or borough to borough travel

Enhance network resiliency
by increasing travel options and redundancy in the overall transit network

Improving Safety and Customer Service Through Technology

We must continue to maximize our use of technology—both internally and for our customers—in ways that make our transit system better every day.

We want to be one of the most technologically advanced transit networks in the world – because it's the best way to mitigate the limitations of our aging infrastructure, improve reliability, and keep our customers safe.

These innovations have helped us streamline operations, improve the daily lives of our riders, and meet the public's expectation that government agencies today run more like a business, and less like a bureaucracy.

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. PTC installation at both railroads will meet their federally-mandated completion date.

All-Electric Buses

Since 2018, the MTA has been operating zero-emission All-Electric Buses. In this Capital Program, we will begin the process of completely transforming our bus fleet to All-Electric operation with the purchase of 500 electric buses reducing emissions and improving sustainability.

OMNY: The New Fare Payment System

OMNY (One Metro New York) is part of an effort to modernize the MTA that will make your trips faster and more convenient. It is built with the latest payment technology and backed by the latest payment security standards. Once OMNY has been rolled out everywhere we serve, you can just tap and go, from Pleasant Plains to Poughkeepsie. We are One Metro New York.

Proposed 2020-2024 Capital Program

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

Agency*	($ in millions)
NYCT Subways	$ 37,303
Buses	$ 3,512
Long Island Rail Road	$ 5,714
Metro-North Railroad	$ 4,689
Other	$ 254
CPRB Capital Program Total	**$ 51,472**
Bridges & Tunnels**	$ 3,327

** Includes capacity projects budgeted in MTACC*
*** B&T does not require CPRB approval*

70 percent increase in investments

$21 billion more capital investments over current 2015-2019 plan

Accelerated program of priority projects

Signal upgrades and accessibility projects will be advanced on a more aggressive timeline

Cost-containment and reform measures

More design-build and organizational reforms to deliver more for less

New York City Subways

The New York City Subway, including Staten Island Railway, is the busiest subway system in North America. Since 1990, it has seen ridership climb 60% to 1.7 billion customers annually. As ridership has increased, so has the strain on an aging system. Six subway lines are now operating at or over capacity. Antiquated signals, insufficient power and constraining chokepoints limit speed, reliability, and capacity. Hundreds of stations remain inaccessible for those with disabilities.

Priority Investments

Signals

Signals regulate train movements, and upgrading them to modern standards will improve service, reliability, throughput and safety. Importantly, modernized signals will allow us to run trains closer together, thereby providing the ability for more service. It will also help to eliminate traffic bottlenecks.

Subway Cars

Expanding the fleet size and installing advanced signal equipment on cars are necessary to get the benefits of re-signaling and allows us to provide more service. Additionally, replacing cars at the end of their 40-year lives sustains reliable service and provides a more comfortable environment for customers.

Stations

We're adding new elevators at 70 stations – 4 may be advanced to the 2015-2019 Program – so that customers will be no more than two stations away from an accessible station, bringing us closer to the goal of maximum possible system-wide accessibility. Repairing existing elevators and escalators and other station components ensures a safe and comfortable customer experience.

Track

Track is the highway of the transit system. Timely replacement of track and switches, the subway's fundamental service delivery assets, ensures that trains can operate at optimal speeds safely. In some areas, upgrades from bolted rail to welded rail will provide smoother rides and also improve the useful life of rails.

Structures

Concrete and steel underground and elevated structures–the bones of the subway–endure harsh service conditions year in and year out. Repairing deficient structural elements, as well as painting steel sections, preserves the long-term safety and integrity of the subway, and allows continual operation.

Power

Replacing and renewing existing traction power equipment and cabling improves the reliability of the subway, which is totally dependent on electricity. Where needed, we're adding new equipment to support future service increases enabled by signal modernization and fleet expansion.

MTA NYC Transit Subway Capital Program – $37.3 billion total ($32.75B Core | $4.56B Capacity)

Category	Budget	Priority Investment Highlights
Subway Cars	$6,057m	Purchase approximately 900 A-division cars on numbered lines, equipped for modernized signaling Purchase 1,077 new B-division cars to replace existing cars and expand the fleet on lettered lines, including Second Avenue Subway Phase 2
Stations	$9,204m	New elevators for ADA accessibility at 70 stations in all boroughs, including 4 that may be advanced to an earlier program Renewal work at up to 13 stations on 10 lines in the Bronx, Brooklyn, Manhattan and Queens Station circulation & access improvements and reconfiguration Replace up to 65 escalators and up to 78 elevators Component replacement and repair at stations system-wide Install wider fare-gates for all ADA stations
Track	$2,558m	Rehabilitate approximately 60 miles of main-line track systemwide Install approximately 20 miles of continuous welded rail
Signals & Communi-cations	$7,119m	Replace approximately 250 mainline switches Install state-of-the-art signals on the Fulton, Queens Blvd East, Crosstown, 63rd St., Astoria, and Lexington Avenue lines Modernize or modify 33 interlockings Install modernized signaling equipment on 1,077 B-division subway cars Upgrade the communications networks, including telecommunications equipment and cables, and complete installation of passenger ID cameras system-wide
Line Structures	$2,384m	Repair structural components on various elevated and subway lines Paint elevated structures on lines throughout the system Install protective netting on elevated structures Rehabilitate bridges on up to 3 lines
Traction Power	$2,600m	Install new power substations, circuit breaker houses (CBH), contact rail and cables to support modernized signaling Renew up to 6 existing substations and up to 11 circuit breaker houses (CBH) system-wide
Staten Island Railway	$373m	New elevators/ramps for ADA accessibility as part of the total investment at 70 stations Replace approximately 8 miles of mainline track and approximately 4 mainline switches Improve various right-of-way facilities

Category	Budget	Hidden Investment Highlights
Line Equipment	$412m	Rehabilitate up to 2 miles of tunnel lighting Rehabilitate up to 6 pump rooms to remove water from the system
Shops & Yards	$563m	Make priority repairs and improvements at maintenance facilities system-wide including major work at the Livonia Maintenance and Atlantic Ave Power & Cable shops Replace approximately 2 miles of yard track and approximately 15 yard switches
Service Vehicles	$354m	Purchase heavy-duty rail and road vehicles to better support capital construction needs
Misc/ Emergency	$1,123m	Repair and upgrade employee facilities, police facilities, and administrative and operations buildings Install fire safety systems and remediate hazardous materials at various facilities Progress designs, project scopes, engineering services, and management information systems

Hidden Investments

The subway depends on a wide array of facilities and equipment for maintenance, right-of-way safety, construction support, storage, and workers. We're fixing pumps, shops, fire-standpipes and many other behind-the-scenes support infrastructure to ensure that we can operate the system and deliver service safely, reliably, and efficiently.

Phase 2 – Second Avenue Subway

SAS Phase 2 will add 3 new fully accessible stations, and a connection with Metro-North. Serving 300,000 daily riders together with Phase 1, it will further relieve congestion on the 4/5/6 trains, and strengthen access to jobs and education for Harlem and East Harlem residents. Together with 2015- 2019 program funding, the 2020-2024 plan provides the entire $6.9B project cost, shared approx. 50/50 between federal and local sources.

Numbers are rounded

New York City Buses

Each work day, New York's fleet of 5,700 accessible buses—the largest bus fleet in the nation—serves more than 2 million customers on over 300 routes. With New York ranked among the world's most congested cities, each bus combats congestion and greenhouse gas emissions by carrying far more people than a car can. Redesigned routes and effective traffic enforcement measures promise to cut through congestion, but they require a larger fleet and cleaner technology to succeed.

Priority Investments

Replacement Buses

Replacing existing buses at the end of or over their 12-year useful lives will improve reliability and service efficiency and provide a more comfortable environment for customers. We're evaluating new bus designs to expand service options, streamline passenger flow, increase capacity, and improve reliability.

Electric Buses

We're accelerating our transition to a zero-emission, all-electric bus (AEB) fleet. AEBs will transform our fleet while reducing greenhouse gas emissions and improving air quality. After 2029 all our bus purchases will be electric buses.

Additional Buses

The bus fleet is being expanded based on customer input, demographic changes and travel demand analysis. As part of the redesign of the bus network, we're expanding the fleet for more frequent and more reliable service.

Improve Customer Experience

New buses will have digital signs and route and service announcements and other amenities. We're working to speed up boarding by installing tap readers as part of the new fare payment system and introducing all door boarding so buses spend less time at stops.

Bus Lane Enforcement

We're working to bring faster and more reliable bus service to routes with dedicated bus lanes by installing cameras on the front of buses. More consistent lane enforcement will help increase bus travel speeds by countering illegally standing or parked vehicles.

MTA New York City Buses Capital Program – $3.5 billion

Category	Budget	Priority Investment Highlights
NYC Transit Buses	$1,820m	Purchase a total of 1,548 new buses for local and express services throughout the network. New bus purchases include 475 standard and articulated all-electric buses, accelerating NYCT's transition to a zero-emission fleet. The fleet is being expanded to provide better connectivity and more direct service
MTA Bus Company Buses	$722m	Purchase a total of 874 new buses for local and express services throughout the network. New bus purchases include 25 standard all-electric buses, commencing MTA Bus's transition to a zero-emission fleet. The fleet is being expanded to provide better connectivity and more direct service

Category	Budget	Hidden Investment Highlights
NYC Transit Depots	$821m	Reconstruct the Jamaica Depot Modify up to 7 depots to support all-electric buses Make priority repairs and improvements at bus depots and maintenance shops throughout the system Replace bus depot equipment, such as bus washers, lifts, and paint booths. Purchase equipment to support automated bus lane enforcement
MTA Bus Company Depots	$149m	Modify first depot to support all-electric buses Make priority repairs at up to 5 depots, targeting structural elements, heating/ ventilation, and electrical systems Replace bus depot equipment, such as bus lifts

Revitalizing the Bus Network

The route network has not been holistically updated in decades. To deliver the improvements that New Yorkers want with a modern network, we're redesigning it to provide better connectivity and more direct service.

The effort includes:

* optimizing the existing bus network by removing underutilized stops and making street design changes on select corridors in coordination with NYC DOT.
* expanding traffic signal priority and strengthening traffic enforcement for SBS and other routes in partnership with the City of New York.
* expanding the fleet to meet the travel needs of customers.
* improving the convenience and quality of the customer experience with real-time information, new on-board amenities, and faster boarding through OMNY, the new fare payment system.
* enhancing our world-class fleet with sustainable technology, design improvements, and new safety features.

The plan is a road map to building the world-class bus system New Yorkers deserve.

Hidden Investments

The facilities for maintaining the bus fleet will be improved. As the fleet size grows and All-Electric Bus (AEB) technology develops, we're making key upgrades and repairs to the systems, equipment and buildings that support it to ensure that our bus network operates safely, reliably, and efficiently.

Numbers are rounded

Long Island Rail Road

The Long Island Rail Road is the largest, busiest, and oldest commuter railroad in North America, carrying 89.8 million passengers in 2018. While ridership has grown over 20% since 1990, key elements of the LIRR network have fallen behind. Many signals date from the 1950s and 1960s, and over half the power substations exceed their 35-year useful life. Sixteen LIRR stations remain inaccessible to those with disabilities. Realizing the benefit of capacity expansion projects requires a larger fleet and a range of other infrastructure improvements.

Priority Investments

Rolling Stock

LIRR needs more cars to mitigate its challenges of too many short trains and standees. In addition, fleet growth will help prepare for increased services upon completion of East Side Access and the LIRR Expansion project.

Stations

Customers' first experience with the railroad is in the stations – they need to be accessible, safe, and comfortable. LIRR will renew 14 stations, replace as many as 8 elevators and escalators, and make 7 stations ADA accessible (in addition to the 108 stations already accessible or under construction) – progress towards the railroad's goal for 100% accessibility by 2029.

Track

Maintaining track in a state of good repair and upgrading it with continuous welded rail, which removes gaps in the rail surface, increases durability and is critical to a safe, reliable and smooth-running railroad. Improvements at Jamaica Station will enhance capacity allowing more and faster trains to pass through.

Line Structures

Structurally-sound bridges, tunnels and viaducts are critical to the operation of the railroad – preventing slow speed zones and ensuring safety. In this program, 10 railroad and highway bridges, as well as one tunnel, will be replaced or rehabilitated and viaduct renewals will begin.

Signals

The signal system enforces safe spacing and speeds for trains. Better and more reliable service depends on signal components being replaced and upgraded at the end of their useful lives – a focus of LIRR's program. Additionally, a new Centralized Train Control system will improve service systemwide.

Power

The electric power system is vital to providing a reliable and robust train network. This program will focus on the replacement of 5 substations and systemwide component replacement. Electrification of the Central Branch will increase operational reliability and give flexibility to reroute services when needed.

MTA Long Island Rail Road Capital Program – $5.7 billion ($3.7B Core / $2B Capacity)

Category	Budget	Priority Investment Highlights
Rolling Stock	$242m	Purchase up to 17 coaches and 12 revenue locomotives
Stations	$910m	Install new elevators at up to 7 stations achieving 93% systemwide ADA accessibility
		Replace up to 5 elevators and 3 escalators
		Platform extensions at up to 5 stations
		Station rehabilitation and renewal work at up to 14 stations
		Replace and add ticketing machines, as well as shelter sheds
		Rehabilitate Penn Station platforms and utility systems
Track	$1,018m	Annual track program work to maintain a state of good repair
		Install concrete ties on up to 32 track miles on 5 branches for improved longevity
		Reconfigure interlockings, make switch and signal improvements, and construct a new closed deck rail bridge – all part of Phase 2 of improving Jamaica capacity
		Contribute annually to Amtrak-coordinated state of good repair investments
Line Structures	$344m	Replace or rehabilitate approximately 10 railroad and highway bridges
		Advance restoration of navigability of the Dutch Kills by demolishing an unused bridge & designing one bridge rehabilitation
		Structural rehabilitation of the Atlantic Avenue Tunnel
		Assess structural condition of bridges and viaducts systemwide & begin viaduct renewals
		Paint and waterproof bridges at priority locations
Signals & Communications	$364m	Upgrade obsolete communications fiber optic network equipment
		Implement and install new customer information and communications system technology
		Complete renewal of Babylon Interlocking
		Upgrade and modernize signals at locations on two branches
		Normal replacement of signal components systemwide
		Implement & install Centralized Train Control including replacing obsolete tower operations
Power	$426m	Replace approximately 5 substations
		Electrify the Central Branch to improve service reliability and operational flexibility
		Renewal and replacement of components systemwide

Category	Budget	Hidden Investment Highlights
Shops & Yards	$203m	Begin Phase 2 of the new Mid-Suffolk electric train yard in Ronkonkoma, which will accommodate electric fleet growth for East-Side Access
		Component improvements at key shops and yards
		Improve and extend track at Port Washington Yard to increase branch capacity
		Rehabilitation of employee facilities at priority locations
		Consolidation of engineering disciplines and material storage in Bethpage to improve efficiency and space
Misc.	$231m	Upgrade security equipment and systems at stations, tunnels, substations, facilities, etc.
		Progress and support program development and administration

Hidden Investments

The LIRR relies on extensive infrastructure outside of public view to run reliable service – such as shops and yards, where trains are maintained and stored.

East Side Access (ESA) / Regional Investments

ESA will bring LIRR trains to Grand Central Terminal and East Midtown's dense business district – saving commuters up to 40 minutes per day and reducing congestion on Midtown's streets and subways. ESA is purchasing electric cars for expanded LIRR service.

LIRR Main Line Expansion

The LIRR Main Line Expansion project will add a third track to the Main Line on a 10-mile corridor from Floral Park to Hicksville, used by 40% of LIRR customers. Together with the ongoing Jamaica Capacity Improvements project, a robust reverse commute operation will be enabled – increased by 60% versus today. Using the new terminal capacity of East Side Access, the third track will also enable a 50% increase in LIRR peak service to Manhattan from Long Island and Queens.

Numbers are rounded

Metro-North Railroad

With yearly ridership that has doubled since 1983, Metro-North is one of the most heavily traveled commuter railroads in the country. Today, much of Metro-North service operates at or near capacity. As demands on the system grow, major structures serving the vast majority of Metro-North customers are more than 100 years old and in need of replacement, including the Grand Central Terminal train-shed and the Park Avenue Viaduct. Many other assets are aging and in need of investment as well.

Priority Investments

Rolling Stock

Modernizing the fleet ensures more reliable service and increased passenger comfort. In this plan, Metro-North will replace train cars and locomotives that have reached the end of their useful lives – as many as 80 M-3 electric cars and 30 locomotives.

Stations

Metro-North will continue to address critical state of good repair needs at its 85 NYS stations, such as reinforcing platforms and fixing stairs and roofs. Up to 4 stations will receive ADA improvements on the Harlem and Hudson lines, ensuring the railroad continues to become more accessible for all passengers.

Track

Vitally important to the day-to-day reliability of the system is keeping tracks in a state of good repair. The cyclical replacement of track, ties, and ballast will continue in this Capital Program – ensuring customers experience a safe, smooth, and reliable ride.

Power

Power improvements are required to deliver reliable and safe service in a system near capacity with growing demands. This program will construct 2 new upper Harlem Line substations, supporting increased train capacity and reliability, and preparing for a future third track. Normal replacement of equipment, cables, and 3 substations will help preserve continued safe electric operations.

Structures

Structurally sound bridges, tunnels, and viaducts are vital to the continued operation of the system. The 1.8 mile Park Avenue Viaduct, carrying all trains into Grand Central, will begin Phase 1 of a multi-program replacement. Also, up to 5 bridges will be repaired or replaced and priority repairs will be made to 2 viaducts.

Grand Central Terminal

The trainshed of Grand Central Terminal, a 2-story, 47 platform structure hidden beneath 75 acres of Midtown, serves 4 out of 5 Metro-North passengers. This program will focus on the first phase of a multi-program replacement of this structure, in addition to updating building systems.

MTA Metro-North Railroad Capital Program – $4.7 billion ($3.6B Core / $1.1B Capacity)

Category	Budget	Priority Investment Highlights
Rolling Stock	$853m	Purchase as many as 80 new electric train cars to begin replacing M-3 EMU fleet
		Purchase up to 30 new locomotives for East of Hudson services
Stations	$1,129m	First phase of multi-program Grand Central Terminal trainshed replacement
		Park Avenue Tunnel addition of 4 new emergency exits
		Replace 5 escalators and 1 elevator in Grand Central Terminal
		Renewal and repair of Grand Central Terminal systems, such as fire standpipes, utilities, and ventilation
		ADA Improvements on the Harlem Line at up to 3 stations
		ADA Improvements at Ludlow Station on the Hudson Line
		Station renewals on the Harlem Line in the Bronx and Lower Westchester, including platform replacements, canopy repairs, and new customer amenities
		Station priority repairs on the Upper Harlem and Upper Hudson Lines, including platform and stair repairs
		Relocate/expand Southeast parking to enable future yard expansion
Track & Structures	$1,021m	Phase 1 of the multi-program Park Avenue Viaduct replacement
		Cyclical track replacement
		Replacement of high speed turnouts on main lines
		Renewal of turnouts and switches in Grand Central Terminal
		Rehabilitation of retaining walls, remediation of rock slopes, and drainage improvements systemwide
		Bridge repairs and replacements at priority locations including in Mt. Vernon
		West of Hudson priority repairs to the Moodna and Woodbury viaducts, as well as track and bridge improvements
		West of Hudson capacity expansion

Category	Budget	Hidden Investment Highlights
Power	$202m	Construct 2 new substations on the Harlem Line
		Replace 2 AC traction power substations
		Replace 1 mobile substation with a permanent substation
		Electrification of select segments of Track 1 on the Hudson Line
Signals & Communi-cations	$182m	Upgrade Harmon to Poughkeepsie signal system on the Hudson Line
		Communications infrastructure replacement and system upgrades
Shops & Yards	$23m	New Haven Line yard improvements planning for existing New Haven Line service
Misc.	$148m	Progress and support program development and administration
		Implement systemwide security initiatives

Hidden Investments

Metro-North depends on more than what customers see every day to run safely, efficiently, and reliably. We're making investments in the signal system that controls train movements and the communications networks that relay data.

Penn Station Access (PSA)

PSA will carry Metro-North New Haven Line customers directly to West Midtown, reducing travel times, while also providing critical system resiliency if Metro-North's service to Grand Central Station is ever interrupted.

The project includes:

* building 4 new stations in the underserved neighborhoods of Co-op City, Morris Park, Parkchester/Van Nest, and Hunts Point
* upgrading power and signal systems
* installing new track, realigning existing track, and replacing railroad bridges to accommodate more trains

Numbers are rounded

Bridges & Tunnels

MTA Bridges and Tunnels, the largest bridge and tunnel authority in the country, is central to the movement of people and freight in our region. All nine facilities are in a state of good repair; work focuses on preserving assets and maintaining the structural integrity to help reduce risk, optimize facility and operational efficiencies and improve overall financial performance. With the majority of $1.9 billion in tolls collected annually supporting mass transit, these facilities are critical to the fiscal health of the MTA's system.

Priority Investments

Verrazzano Narrows Bridge

Approach ramps will be reconstructed while reconfiguring the non-standard left-exit Belt Parkway off ramps into a modern set of right-hand exits. The Belt Parkway will be widened between its east-bound VNB merge ramp and the Bay Parkway exit to eliminate its substandard traffic merge, reducing traffic congestion and improving motorist safety.

RFK Bridge

The next phase of work includes upgrades to support modern load criteria for trucks, meet seismic standards, and eliminate wind vulnerabilities. Design for new or widened ramps will reduce delays at specific traffic choke points at junctions with the Major Deegan and FDR drive.

Throgs Neck Bridge

Work focuses on providing fenders to protect the bridge towers and anchorages from accidental marine vessel collisions as well as marine security threats. The suspended spans meet current seismic criteria. The bridge approaches will be upgraded in phases, with immediate seismic upgrades in the near term.

Henry Hudson Bridge

As a result of investments to date, all original roadways and most of the structure itself have been replaced or modernized to meet current seismic criteria. So, work will focus on upgrading Dyckman St. Bridge substructure to address seismic needs, while also replacing substations to add power system redundancy.

Hugh L. Carey and Queens Midtown Tunnels

These facilities underwent considerable restoration following Superstorm Sandy. The current needs concern rehabilitating ventilation/service buildings at both tunnels.

Central Business District (CBD) Tolling

To support the Congestion Pricing Plan enacted as part of the New York State budget, B&T will design and build the CBD Tolling system and infrastructure.

MTA Bridges and Tunnels Capital Program – $3.3 billion

Category	Budget	Priority Investment Highlights
Verrazzano-Narrows Bridge	$1,127m	Reconstruction of upper level approach, Phase 2
		Steel repair & concrete rehabilitation
		Lower level main span deck replacement
		Facility-wide painting program
Robert F. Kennedy Bridge	$719m	Ward's Island/Queens anchorage rehabilitations
		Deck rehabilitation & overlay
		Replace Randall's Island ramps
		Suspended span retrofit
Throgs Neck Bridge	$241m	Miscellaneous structural rehabilitation
		Anchorage & tower protection
Henry Hudson Bridge	$135m	Dyckman St. Bridge abutment replacements and substation upgrades
Rockaway Crossings (Cross Bay and Marine Parkway Bridges)	$139m	MP - Electrical rehabilitation (elevator)
		Miscellaneous steel repairs at both bridges
		Facility-wide painting program at the MP
		Rehabilitation/reconstruction of Rockaway Crossings-Design
Bronx-Whitestone Bridge	$111m	Bridge structural lighting, power redundancy and resiliency improvements
		Miscellaneous structural rehabilitation
		BW facility-wide painting program
Queens Mid-town Tunnel	$46m	Rehabilitation ventilation/service buildings
Hugh L. Carey Tunnel	$53m	Rehabilitation of ventilation/service buildings

Category	Budget	Hidden Investment Highlights
Agency-Wide	$756m	Overhaul and replace facility monitoring and safety systems
		Upgrades for traffic detention, incident management, operational command, safety systems, and other agency-wide systems.

Hidden Investments

B&T's seven bridges and two tunnels rely on operations management systems to monitor traffic, safe operations and the assets themselves. Intelligent Transportation Systems investments will include new and innovative operational technologies to support these critical activities. Examples include Traffic Incident Management, Special Event Management, Road Weather Management and Traveler Information Systems. The goal is to get the most performance out of existing transportation capacity without new physical infrastructure.

CBD Tolling Program

Implementation of a first-in-the-nation CBD Tolling Program

MTA Bridges & Tunnels will develop a plan for a cordon-based tolling system for the Central Business District – defined as Manhattan south of and inclusive of 60th Street to the southern tip of Manhattan, but not including the FDR Drive and West Side Highway. The program will be established, operated and maintained by the TBTA, in close collaboration with key partners.

The CBD Tolling program is expected to reduce roadway congestion and emissions in the Central Business District, Manhattan, and New York City, allowing for increased bus speeds while providing net revenue sufficient to generate an estimated $15 billion to support this Capital Program, after providing for implementation costs. B&T will seek to minimize the footprint of the new system while making the technology/infrastructure "fit" within the urban landscape.

Numbers are rounded

Funding the Capital Program

Since 1982, we have secured over $89 billion from our federal, state and local funding partners–in addition to investing $55 billion of our own funds–to provide the capital resources needed to deliver the MTA Capital Program. Continuing this tradition, we are committed to delivering the proposed 2020-2024 Capital Program through provisions from a combination of local and federal resources.

New Revenue Streams

Capital from Central Business District Tolling Sources – To support the MTA Capital Program, the enacted State FY 2020 Budget establishes a Central Business District (CBD) Tolling Program. Net revenue generated from the tolling program is authorized to fund $15 billion of the 2020-2024 Capital Program. In addition, the program will finance the cost of the associated tolling program infrastructure projects.

Capital from New Revenue Sources – To support the MTA Capital Program, the enacted State FY 2020 Budget approves a progressive tax on high-end real estate sales, and eliminates the Internet Sales Tax Advantage. These new tax revenues are expected to support $10 billion of the 2020-2024 Capital Program.

Program Funding Plan	($ in millions)
Capital from Central Business District Tolling	$ 15,000
Capital from New Revenue Sources	$ 10,000
MTA Bonds & PAYGO	$ 9,792
Federal Formula	$ 7,500
State of New York	$ 3,000
City of New York	$ 3,000
Federal New Starts (Second Ave Subway Ph. 2)	$ 2,905
Federal Flexible	$ 275
CPRB Capital Program Total	**$ 51,472**
Bridges & Tunnels Self-Funded	$ 3,327

State/City of New York Capital

The proposed program assumes a total of $6 billion in capital contributions from both the City and State of New York ($3 billion each) to support projects in the core program.

MTA Bonds & PAYGO

The proposed program includes $9.8 billion in MTA Bonds and PAYGO to support the 2020–2024 program of projects.

Federal Funding

The MTA's proposed 2020–2024 Capital Program is expected to coincide with the next federal transportation funding reauthorization. However, for planning purposes, the proposed program assumes federal formula funding to the MTA will remain flat at recent levels, plus escalation, for a total of $7.8 billion.

To support the funding needs for Phase 2 of Second Avenue Subway, the proposed program assumes $2.9 billion in potential New Starts funding. The New Starts application is in process; any potential Full Funding Grant Agreement (FFGA) approval or funding is subject to further discussion with the Federal Transit Administration.

Apportionment of CBD Tolling and New Revenue Sources

80 percent
NYCT/SIRTOA/MTA Bus Company

10 percent **LIRR**

10 percent **MNR**

MTA Capital Plan Highlights

The 2020-2024 Capital Program is:

- The MTA's largest-ever capital plan by far – 70% larger than the 2015-2019 Program – making unprecedented investments in the region

- An unprecedented investment of $51.5 billion, including more than $40 billion for New York City Transit – revitalizing the system and building on the successful investment of the Subway Action Plan

The Program will deliver major benefits, including:

- More frequent and reliable service on 6 line segments, including the Lexington Avenue Line, serving over 50% of riders through modernized signaling

- 70 new ADA-accessible stations, beginning now. Stations serving over 60% of passengers will be ADA-accessible

- Over 1,900 new subway cars, more than 2,400 new buses and hundreds of new commuter rail cars

- Full funding for Second Avenue Subway Phase 2 and construction of four new Metro-North stations in the Bronx

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MTA Capital Program 2020-2024

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Investment Summary

The proposed 2020-2024 Capital Program encompasses $51.472 billion of investments as well as additional investments for MTA Bridges and Tunnels. This plan focuses on rebuilding the system to promote safe and reliable service. Enhancements are targeted toward making the system more accessible for all riders and increasing the quality and frequency of service. Network expansion projects extend the reach of the network to address regional needs for more capacity that eases congestion and promotes regional growth. This new program reflects significant changes at the MTA and will result in a program of projects that will be built better, faster and more efficiently.

The proposed program is organized into a MTA Capital Program Review Board (CPRB) portion that is subject to CPRB review and a B&T portion, including the new Central Business District Tolling Program, that are not subject to CPRB review (see Exhibit 1). The agency sections of this book detail the projects included in the program.

Exhibit 1
MTA Proposed 2020-2024 Capital Program All-Agency Summary
($ in millions)

	Proposed 2020-2024
CPRB Core Capital Program	
New York City Transit (NYCT)	$35,389
Long Island Rail Road (LIRR)	3,737
Metro-North Railroad (Metro-North)	3,558
MTA Bus	871
MTA Interagency	119
CPRB Core Subtotal	$43,674
MTA Capital Construction Company (MTACC)	7,798
CPRB Program Subtotal	$51,472
MTA Bridges and Tunnels (B&T)	3,327

Numbers may not total due to rounding

Program Funding

Funds currently projected to be available for the proposed 2020-2024 CPRB Capital Program total $51.472 billion (Exhibit 2). Funds dedicated to the B&T's 2020-2024 Capital Program total $3.327 billion.

Exhibit 2
MTA Proposed 2020-2024 Capital Program Funding Sources
($ in millions)

	Proposed 2020-2024
Funding Currently Projected	
Capital from Central Business District Tolling Sources	$15,000
Capital from New Revenue Sources	10,000
MTA Bonds & PAYGO	9,792
Federal Formula	7,500
State of New York	3,000
City of New York	3,000
Federal New Starts (Second Avenue Subway Phase 2)	2,905
Federal Flexible	275
CPRB Capital Program Total	**$51,472**
Bridges and Tunnels Bonds (Self-Funded)	3,327

Numbers may not total due to rounding

Funding Sources:

Capital from Central Business District Tolling Sources

To support the funding needs of the proposed 2020-2024 Capital Program, the enacted State Fiscal Year 2020 Budget establishes a CBD Tolling Program. Net revenue generated from the

tolling program is authorized to fund $15 billion of the 2020-2024 Capital Program. In addition, the program will finance the cost of the tolling program infrastructure projects.

Revenues from the tolling program, after covering the infrastructure cost, will be apportioned to support capital costs for NYCT, the LIRR and Metro-North. These funds will be prioritized to support NYCT's new subway signaling, cars, track, accessibility, as well as buses and bus system improvements and further investments to expand transit availability in the outer boroughs (80%). The CBD Tolling revenues will also support parking facilities, rolling stock, capacity enhancements, accessibility, and expand transit availability at the LIRR (10%) and Metro-North (10%).

Capital from New Revenue Sources

To support the MTA capital programs, the enacted State Fiscal Year 2020 Budget approves an increase to progressive tax on high-end real estate sales and eliminates the internet sales tax advantage. The new revenues are expected to support $10 billion of the 2020-2024 Capital Program.

Proceeds from these new revenue sources will be apportioned to support capital costs for NYCT (80%), the LIRR (10%), and Metro-North (10%).

MTA Bonds & PAYGO Capital

The proposed plan includes $9.8 billion in new MTA bonds and pay-as-you-go (PAYGO) funding to support the 2020-2024 program of projects.

Federal Formula

The proposed 2020-2024 Capital Program is expected to coincide with the next federal transportation funding reauthorization. For planning purposes, the proposed program assumes federal formula funding to the MTA will remain flat at recent levels plus escalation, for a total of $7.5 billion.

State of New York

The proposed 2020-2024 Capital Program assumes $3 billion in State of New York capital funds to support core program projects.

City of New York

The proposed 2020-2024 Capital Program assumes $3 billion in City of New York capital funds to support core program projects.

Federal New Starts

The proposed 2020-2024 Capital Program budgets $4.6 billion for Phase 2 of Second Avenue Subway (SAS Phase 2). This includes $1.65 billion in MTA local funding and $2.905 billion in potential federal New Starts funding, noting that the federal application process is still ongoing. Combined with the $500 million in New Starts funding assumption programmed in the 2015-2019 Capital Program, the proposed budget brings MTA's total New Starts funding proposal for SAS Phase 2 to $3.405 billion. Project costs are to be shared approximately 50/50 between federal and local sources. Any potential Full Funding Grant Agreement (FFGA) approval or funding is, however, subject to further discussion with the Federal Transit Administration.

Federal Flexible

For planning purposes, the MTA assumes federal flexible funding will remain flat at $275 million while awaiting reauthorization of the next federal transportation bill.

Bridges and Tunnels Program (Self-Funded)

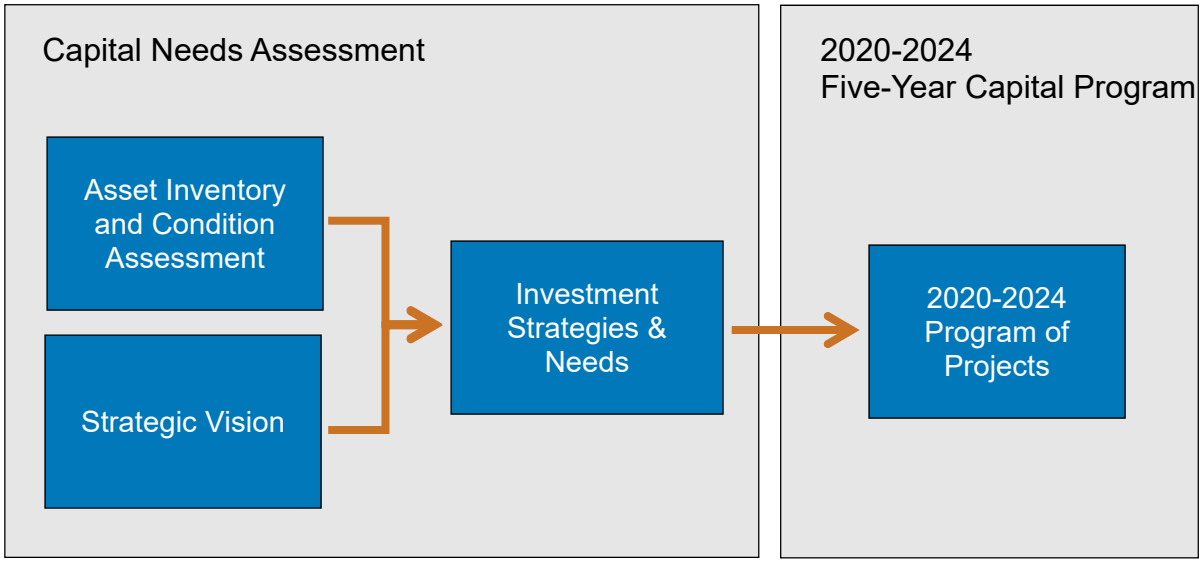
The proposed fund sources dedicated to support the B&T 2020-2024 Capital Program total $3.3 billion, including the CBD Tolling infrastructure projects (see Capital from CBD Tolling Sources, above).

Program Planning and Development

The proposed 2020-2024 Capital Program's development began using the traditional processes that have driven past capital programs. All critical assets are assessed by looking at key factors such as their age, condition, performance, location, and safety history. This is done every five years as part of the Capital Needs Assessment. A prioritization process takes place to determine what investments we need to make to bring or keep our most critical assets in a state of good repair and maintain the safety and reliability of the system for our customers. Potential investments are then prioritized into five-year buckets by the major categories of work. This process takes into consideration constraints, such as service impact, availability of contractors, community input, availability of resources, and timing. At that point the MTA proposes a 5-year capital program to ensure efficient use of public funds.

The latest planning cycle began with the development of the Capital Needs Assessment. The initial results were then used to inform the development of the proposed 2020-2024 Capital Program (see Exhibit 3).

Exhibit 3
MTA Capital Program Planning Process



The current effort has been remarkably different from past experiences. The 2019-20 New York State Budget resulted in significant changes for the MTA, including new funding sources for the next capital program and a requirement to institute major reforms on how the MTA operates. Legislation provided new revenue sources including CBD Tolling as well as revenues from the elimination of internet sales tax advantage and a progressive tax on high end real estate sales. In addition, legislation mandated that the MTA engage in reforms that change the ways it does business. As part of the reform effort the MTA is developing a complete reorganization. In addition, the MTA is now engaged in a forensic audit of its capital program.

Meanwhile, the MTA has already been rising to the challenge of addressing the need for change. In June 2017, Governor Cuomo declared a State of Emergency that led to the $836 million Subway Action Plan (SAP). This plan recognized there was a problem with service quality and sought to immediately address problems in NYCT's system. The SAP resulted in key improvements such as plugging 4,000 leaks in the system, cleaning drains along 418 miles of track, the repairing 20,000 track defects, 200 signal stops rebuilt and the repair of 1,000 door control units. These actions and more have resulted in performance gains since January 2018. Through June 2019, NYCT's on-time performance increased from 58% to 82%. The LIRR and Metro-North made similar targeted investments to address urgent needs in their systems resulting in increases to on-time performance from 84% to 91% and from 92% to 94%, respectively.

Underpinning all of this is a vision of the capital program that integrates the need to maintain the assets we have with a recognition that the MTA needs to focus more on the customer experience. The MTA plans to add more stations to its growing list that are accessible for all New Yorkers. The MTA is committed to expanding its network and adding capacity not only through expansion of the network, but with investments within the current network that add capacity. Examples of capacity driven investments include increasing the number of lines with advanced signaling in the subway system and electrifying the LIRR's Central Branch.

MTA Transformation

The MTA has already begun transforming the way it does business.

A complete restructuring of the organization has been proposed that will enable the MTA to consolidate common functions, operate more efficiently and better deliver capital work on time and within budget. Initial findings were shared with the MTA Board at the July 2019 meeting. In the second half of 2019 it is expected that additional details and planning will be shared while a new Chief Transformation Officer will be charged with implementation.

A forensic audit of the capital program is also underway to provide a thorough examination of each agency's capital needs, as well as a review of the current capital program. This audit was mandated as part of the New York State budget for 2019-2020. The audit is expected to be completed by January 1, 2020.

The MTA has already begun internal transformations. Particularly important to this capital program are changes that will benefit the delivery of projects including efforts to:

- **Strengthen project management**. The MTA is working to empower project "CEOs" with full control to make decisions over project scope, schedule, and budget; better coordination of work with track outages; increase productivity and "wrench time" when track outages are secured; and improve estimates and cost forecasting;
- **Reduce red tape**. New processes will result in faster vendor payments; reducing change order and submittal processing time; and eliminate over-customization while increasing performance-based specifications;
- **Rebalance the risk equation between the MTA and its contractors**. Going forward, all projects over $25 million will be design-build, consistent with the recent New York State legislation. In addition, the MTA will implement more performance-based incentives for contracts and seek to expand competition in the market.

New York City Transit

MTA Capital Program 2020-2024

Asset Base – New York City Transit

Exhibit 4
Selected New York City Transit Assets

Category	Count	Asset
Subway Cars	6,684	Rail Cars
Buses	4,471	Buses
Passenger Stations	472	Stations
Track	637	Miles of Mainline Track
	1,779	Switches
Line Equipment	441	Miles of Tunnel Lighting
	202	Ventilation Plants
	237	Pump Rooms
Line Structures	147	Miles of Subway Structure
	69	Miles of Elevated Structure
	24	Miles of At-Grade Lines
Signals and Communications	737	Track-miles of Mainline Signal Equipment
Power	225	Substations
Shops & Yards	44	Shops
	24	Yards
Depots	20	Bus Depots
Staten Island Railway (SIR)	64	Rail Cars

Overview – New York City Transit

New York City is a place unlike any other in the U.S., where most workers commute from home to work via public transportation, and a majority of households do not own a car. NYCT 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 2.3 billion, NYCT is the largest public transportation system in the United States and one of the largest in the world. NYCT subways provides two-thirds of all heavy rail transit trips in the U.S. NYCT 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. NYCT assets include about 6,600 subway passenger railcars, about 4,500 buses, over 600 miles of mainline track, and 472 passenger stations (including the newest stations on the Second Avenue subway line). The NYCT 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.

Proposed 2020-2024 Capital Program - $35.389 billion

This proposed 2020-2024 Capital Program totaling $35.389 billion embodies the major capital investment strategies and priorities of the program:

- Accelerated investments in state-of-the-art signal systems, and associated fleets and infrastructure, to transform the reliability and capacity of the subway system;
- Accelerated investments in accessibility for customers with disabilities;
- Accelerated state of good repair investments in critical subway infrastructure and stations;
- An enhanced, zero-emission bus fleet to serve a reimagined route network.

Exhibit 5, on the next page, identifies these investments by asset category.

Exhibit 5
New York City Transit Proposed 2020-2024 Capital Program by Category
($ in millions)

Category	Proposed 2020-2024	Percent
Subway Cars	$6,057	17%
Buses	1,820	5%
Passenger Stations	9,204	26%
Track	2,558	7%
Line Equipment	412	1%
Line Structures	2,384	7%
Signals & Communications	7,119	20%
Traction Power	2,600	7%
Shops & Yards	563	2%
Depots	821	2%
Service Vehicles	354	1%
Miscellaneous/Emergency	1,123	3%
Staten Island Railway	373	1%
Total	**$35,389**	**100%**

Numbers may not total due to rounding

Major Investments

Priorities for the 2020-2024 Capital Program reflect the significant need to modernize signal systems and improve passenger stations as well as the traditional investment areas of rolling stock (cars and buses), track and switches, and other infrastructure.

The Signals and Communications category continues to be one of the largest categories due to proposed investment to modernize the system and to enhance reliability. This reflects the safety and operational importance of the signal system coupled with the age profile and conditions of existing installations. Similarly, the Stations category is a major investment area, as we advance the pace of improving accessibility to the system as well as improving the customer environment.

Highlighted areas of investment of the proposed 2020-2024 Capital Program include:

- Signals;
- Accessibility;
- Component Repairs: Stations and Core Infrastructure;
- Fleet Improvements.

The discussion below, which elaborates on these investment priorities, provides a capsule of the overall strategic perspective and highlights the proposed investments included in the 2020-2024 period.

Signals

Signal failures are a leading cause of subway service delays. The proposed program features modernizing signals and 33 interlockings on six lines. This work will improve the reliability and safety of subway service with advanced signaling. Compared to traditional “fixed block” signals, modern signal technology offers a variety of benefits including the ability to run more trains per hour, improve safety, reduce maintenance costs, and provide timely information to customers.

Of the signal modernization work funded in prior capital programs, installation is complete on the Canarsie and Flushing lines, is underway on the Queens Blvd. West and Culver lines, and is being prepared to begin on the 8th Ave. line. The proposed program will expand modern signal technology throughout the NYCT system, implementing it on the Fulton, Crosstown, Queens Blvd. East, Astoria, 63rd St. and Lexington Ave. lines. This will add approximately 134 track miles of modernized signals to the 132 miles already in place or being installed.

Advanced signaling 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 capital program includes funding for new substations, new contact rail, and power cables to enhance the power infrastructure on lines receiving modernized signals.

Accessibility

In the proposed 2020-2024 Capital Program, NYCT will significantly increase the pace of investment to make more stations accessible to customers with disabilities, on both the subway system and SIR. In the 2020-2024 period, up to 70 stations will be made fully accessible (four stations may be advanced to the 2015-2019 Capital Program), which is more than double the pace of accessibility investments in recent capital programs. With these investments, system-wide coverage will be increased so that all subway and SIR customers are no more than two stations away from an accessible station. In parallel, NYCT will purchase and install wider turnstiles/gates for improved access, and will increase the pace of replacement of existing elevators to ensure reliable operation.

Component Repairs: Stations and Core Infrastructure

NYCT also proposes work on core infrastructure assets in various investment categories that are fundamental to service delivery. The goals of this investment are to improve the customer environment and to improve system reliability and safety by reducing the backlog of assets that are not in good repair. All assets categories will be addressed, notably Line Structures, Passenger Stations, Power, and Track. In Line Structures, component-based repairs will target the highest-priority defects system-wide and more significant repair projects will address conditions that warrant a higher level of investment beyond component repairs to ensure the continuity of safe and efficient operation.

Similarly, in the Passenger Stations category, NYCT continues to employ a component-based strategy, which focuses on repairing specific station components (such as individual stairs or platforms), plus a number of more comprehensive “renewal” projects at stations with high concentrations of deficient components. The goal is to prioritize addressing the “worst of the worst” components in each station, while furthering progress toward the long-term goal of eliminating all major defects.

In the Traction Power category, besides work to support capacity increases enabled by advanced signaling, NYCT is addressing state of good repair needs through comprehensive renewal investments and component repairs at substations. Likewise, circuit breaker houses, cables, and other power distribution equipment will be addressed to ensure reliability in the system.

As the most fundamental service-delivery asset category, track and switches will be the focus of normal replacement investments to maintain service reliability and safety. Also, service will be improved through installation of continuous welded rail and replacement of switches in connection with signal modernization initiatives.

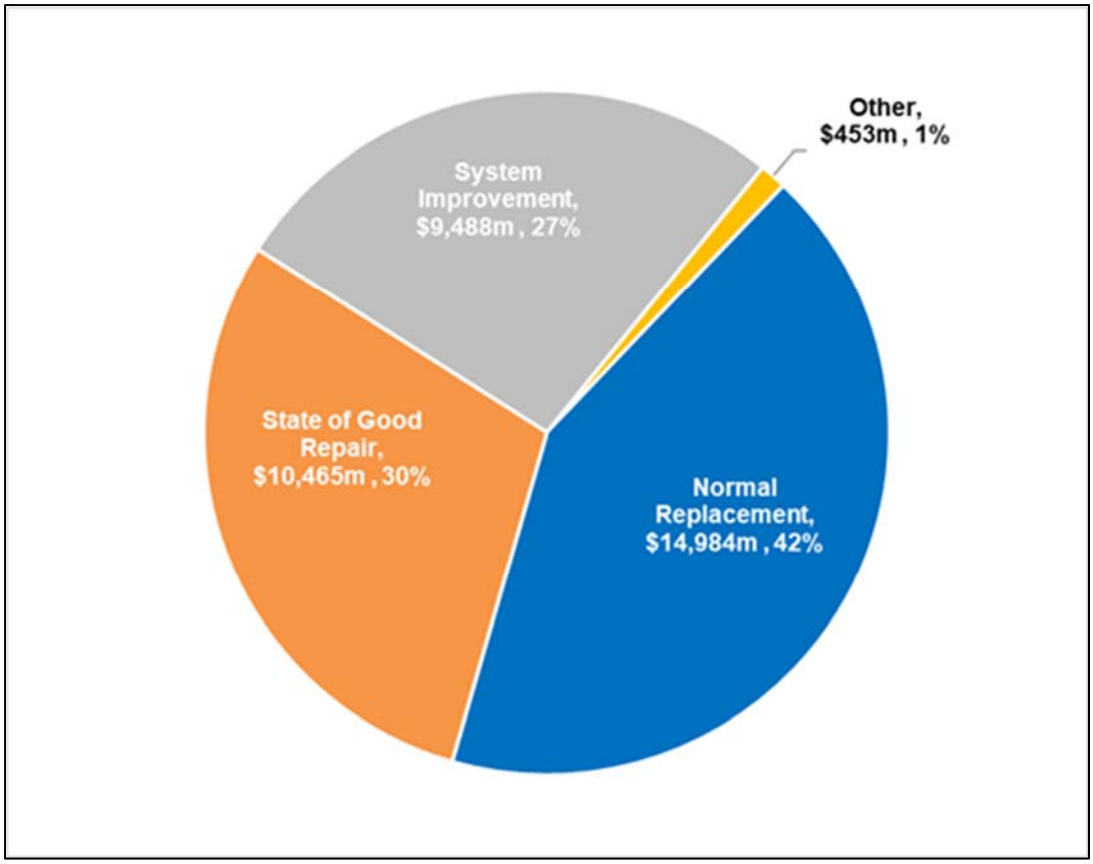
Fleet Improvements

The proposed 2020-2024 Capital Program includes purchases of subway cars and buses that will modernize and transform these most important service assets. The new subway cars will all be able to utilize advanced signals being installed throughout the system, bringing enhanced service and improved reliability to New Yorkers. Through this capital program, NYCT (in conjunction with MTA Bus) will add 500 zero-emission, all-electric buses to the fleet, replacing older diesel-fueled buses and improving air quality. Related modifications in depots will be made to support this transition. In addition, both subway and bus fleets will be expanded to address growth needs and provide better service to customers.

System Condition

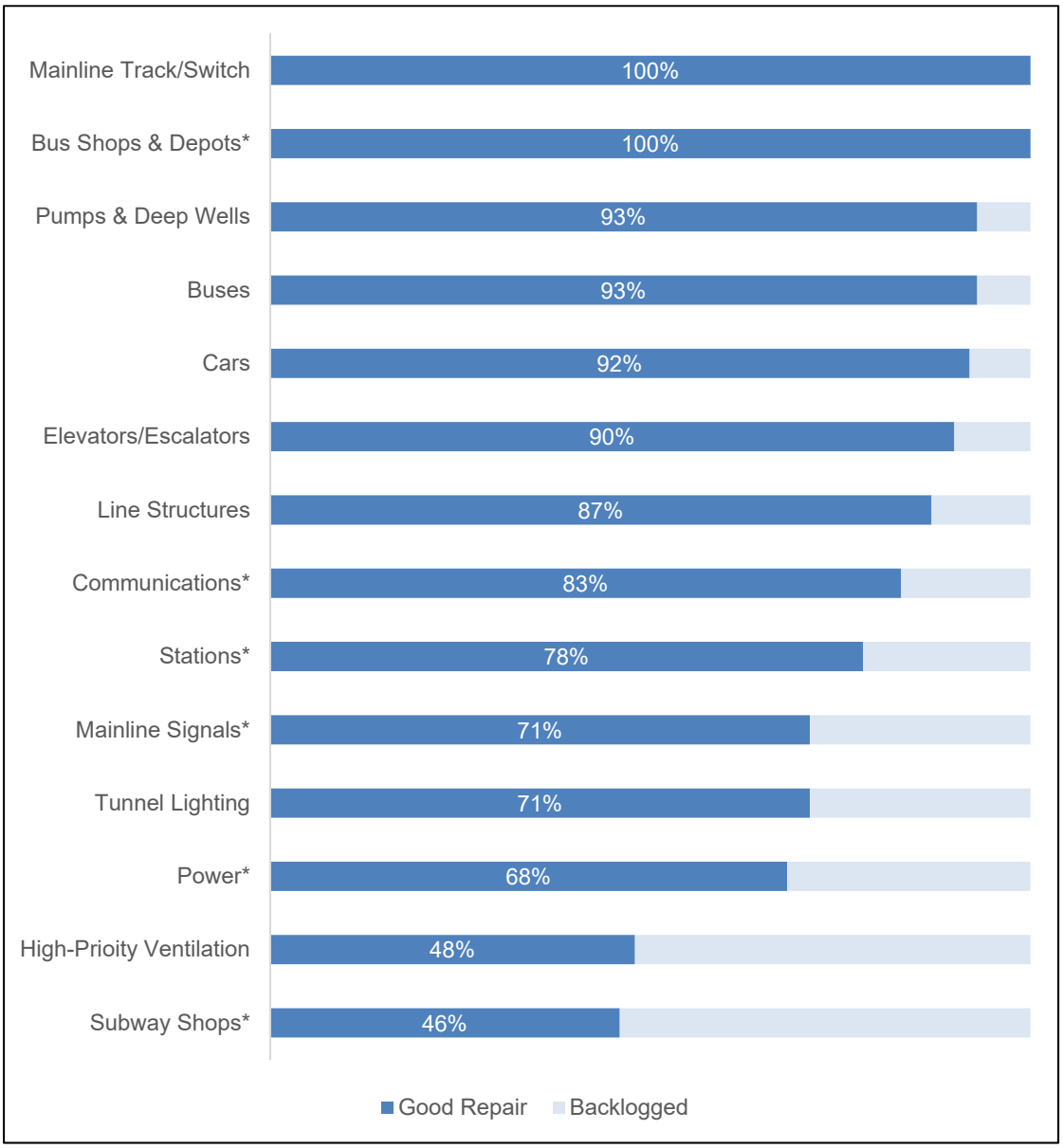
Exhibit 6 illustrates the mix of investments by needs category in the proposed 2020-2024 Capital Program. The program continues NYCT's emphasis on achieving and maintaining a state of good repair and on improving service.

Exhibit 6
New York City Transit Proposed 2020-2024 Capital Program by Needs



The System Investment Status (Exhibit 7) presents by investment category whether an asset is considered in good repair or has backlogged components in need of repair. NYCT 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 versus useful life; and asset performance vs. an identifiable performance standard it must meet.

Exhibit 7
System Investment Status
New York City Transit Major Investment Categories



** Based on component-level condition assessment*

New York City Transit
Subway Cars
Category T-801

Subway cars are fundamental to the delivery of service to customers. As of the conclusion of the 2015-2019 Capital Program, NYCT's railcar fleet has 2,895 cars in the A Division (numbered subway routes, or IRT lines) and 3,789 cars in the B Division (lettered routes, or IND and BMT lines) for a combined fleet of 6,684 cars.

NYCT has a multi-pronged strategy for railcar investment:

- Normal replacement of railcars based on a 40-year useful life. Continued investment in railcars is critical for reliability. Thanks to past purchases and a comprehensive maintenance program, the mean distance between failures (MDBF) of the fleet has increased from an average of 7,000 miles in 1982 to more than 120,000 miles today. With the completion of purchases in the 2015-2019 program, only the R46 cars (44+ years old) will be overdue for replacement. These R46 cars have an MDBF of 65,000 miles, and will be replaced with new cars that are expected to have an MDBF of at least 150,000 miles. New cars will have automated announcements, display screens, brighter lighting, ADA features, and other modern customer amenities meeting today's standards;
- Align railcar investments to facilitate the rollout of advanced signaling technology. Modern signals (discussed in the Signals section) require specialized equipment onboard each train. NYCT's newest railcars are ready to receive this equipment, but older-generation railcars will require retrofits, and the oldest railcars cannot be practically adapted for new signals and must be replaced;
- Purchase additional cars to accommodate projected ridership growth. The ability to operate more frequent train service is a key benefit of advanced signals (in conjunction with accompanying investments to address power and other capacity constraints). New cars are needed for this added service, which will reduce crowding. Fleet growth needs are based on NYCT's projections of ridership growth and calculations of how many trains per hour can be operated on each line.

Proposed 2020-2024 Capital Program - $6.057 billion

To achieve these goals NYCT will undertake the following projects:

- For the B Division, NYCT will purchase 640 cars to complete the replacement of the R46 fleet, and purchase an additional 437 cars for fleet growth, including for Second Avenue Subway Phase 2. These cars will be purchased via options to the ongoing R211 contract.

These investments will provide a sufficient number of railcars compatible with new signal technology;

- For the A Division, car investments need to be accelerated to align with signal modernization that is planned for the 2020-2029 period. NYCT will purchase approximately 900 cars to replace a portion of the R62/62A fleet (36-39 years old). The purchases will be coordinated to support the rollout of advanced signal technology on the A Division. Production of the new cars is anticipated to extend into the 2025-2029 program.

Overall, the 2020-2024 program will invest $6.057 billion in subway cars, including $3.2 billion for B Division cars and $2.9 billion for A Division cars.

New York City Transit
Buses
Category T-803

NYCT (in conjunction with MTA Bus) operates the nation's largest bus network, which serves as an essential companion to the subway system in some parts of New York City and as the primary transit service in others. The NYCT fleet consists of 4,471 buses including 3,079 standard-length buses; 895 higher-capacity articulated buses that are used on high-frequency, high-ridership routes; and 497 "coach"-style express buses that are used on routes connecting more distant areas of the city with Manhattan business districts. 40% of the buses in the current fleet has an alternative fuel propulsion system. This includes 1,254 hybrid buses, 527 CNG buses, and 10 all-electric buses. New buses will continue to improve the fuel efficiency and reliability of the fleet. MDBF for the fleet has grown from less than 1,000 miles in 1982 to over 6,000 miles today. Recent purchases have an MDBF of 12,700 miles, double the reliability of the fleet-wide average.

NYCT's strategy for bus investment includes these goals:

- Normal replacement of buses based on a 12-year useful life, with some smoothing. Replacing buses reliably after 12 years of service is critical to fleet performance. Minor adjustments to this replacement schedule will be included to reduce the unevenness of purchase quantities across years, to achieve more predictable procurement and maintenance cycles;
- Ramp up towards an all-electric fleet by 2040. NYCT is committed to transitioning to a zero-emissions all-electric fleet by 2040 to improve air quality and reduce greenhouse gas emissions. The share of new bus purchases that are all-electric will gradually increase to 100% by 2030, with all remaining non-electric buses retired from the fleet by 2040;
- Improve service for bus customers. New buses feature front-of-bus ramps for faster and more convenient wheelchair boarding, as well as automated announcements, digital information screens, and other state-of-the-art technologies that will enhance safety and the customer experience. In addition to the normal replacement of buses, some buses are purchased for fleet growth to meet changing service requirements and to facilitate planned service improvements.

Proposed 2020-2024 Capital Program - $1.820 billion

To achieve these goals NYCT will undertake the following projects:

- For NYCT, 1,548 buses are to be purchased, including 1,088 standard buses, 345 articulated buses, and 115 express buses;

- 1,454 of the buses to be purchased will replace buses that have reached the end of their useful life, and the other 94 buses will provide fleet growth;
- 375 of the standard buses and 100 of the articulated buses will feature all-electric propulsion. These purchases, in concert with the electric buses purchased under the MTA Bus program, are projected to yield an annual reduction of over 37,000 tons of carbon emissions.

Overall, the 2020-2024 program will invest $1.820 billion in buses.

New York City Transit
Passenger Stations
Category T-804

Stations are the front door of the transit system. They are where customers first experience the system, get information, and make their way to the right train. The system has 472 stations, comprised of a vast number of individual components with different investment needs, including more than 5,000 stairs, more than 1,000 platform edges, and more than 500 elevators and escalators. Investments enhance the customer environment both inside and outside the stations. Repairs to stairs, platform edges, elevators, escalators, and other critical station components will ensure a continued safe, reliable, and welcoming environment for customers. All structural components are rated every five years by a Station Condition Survey, on a scale of 1.0 (best) to 5.0 (worst). The 2017 survey found that 23% of components were not in SGR (i.e., rated 3.0 or worse), out of 15,000 total components, even after completion of ongoing projects in the 2015-2019 Capital Program.

Because of the volume of work and the significant variation in conditions even within each station, NYCT has employed a component-based investment strategy for stations, aiming to:

- Focus investments to address the highest-priority needs system-wide, with component projects to address specific elements like stairs, platform edges, and ventilators;
- Perform work at more stations, in a shorter period, than would be possible with other approaches;
- Establish a sustainable pace of reinvestment that incorporates the varying useful lives of individual station components. Even within the same station, some components last longer than others, depending on usage, environmental exposure, and other factors.

Proposed 2020-2024 Capital Program - $9.204 billion

To achieve these goals NYCT will undertake the following projects:

- Component projects to address specific stairs, platform and mezzanine components, and ventilators system-wide; in the next program we will seek to address all components rated 4.0 or worse system-wide, as well as all stairs rated 3.5, and selected other components rated 3.0 and 3.5 where it is synergistic to include them with other work. Over 160 stations will receive investment;
- Stations with a high number of component defects may be considered for a more significant and comprehensive investment level known as station renewal. Up to 13 stations will be renewed in the next program. While many stations are eligible for this approach, NYCT will select renewal stations according to need and synergies with other capital work, to minimize

impact on customers during construction and lower the cost, such as by combining renewals with other initiatives such as ADA improvements;
- Elevator and escalator replacement based on a replacement cycle designed to ensure reliable performance for our customers. The program anticipates investment in up to 78 elevators and up to 65 escalators with a priority on the backlog of 27 escalators/17 elevators which are already past due for replacement.

Overall, the 2020-2024 program will perform component or renewal work at approximately 175 stations, representing over 35% of all stations in the system, with a total investment of $2.3 billion. This amount represents a funding envelope that addresses the most significant component repairs to ensure a safe, reliable environment, and renewing stations where the approach is cost-effective. An additional $1.4 billion will be devoted to elevator and escalator replacement, because elevators and escalators are essential part of accessing transit for many customers.

Additional ancillary investments in stations ($385 million) include:

- The construction of a new customer connection between Livonia Avenue station on the Canarsie (L) line and Junius Street station on the New Lots (3) line, to be coordinated with ADA investments;
- Purchase of turnstiles and other fare collection equipment, including wider turnstiles/gates for improved access for customers with disabilities;
- Water condition remediation and other miscellaneous station investments.

Station Accessibility

The subway system is crucial for connecting millions of New Yorkers with employment, opportunity, culture, recreation, and community. As such, it should give all members of the public a reliable way to travel. An accessible system benefits all customers, because at some point, many people will find getting around more challenging. This includes wheelchair users, the elderly, travelers carrying luggage, and parents traveling with children in strollers. Currently 110 subway stations are fully accessible to customers with disabilities, with elevators and/or ramps providing stair-free access to station platforms, and an additional eight stations are accessible in one direction of travel. Projects to provide full accessibility at an additional 24 stations are currently underway, which will mean that approximately 30% of the system’s 472 stations will be accessible.

NYCT is committed to significantly increasing the pace of investment in station accessibility compared to prior capital programs.

To achieve these goals NYCT will undertake the following projects:

- Make up to 70 subway and SIR stations accessible. (SIR investments are discussed in a later section);
- Four of these stations may be advanced into the 2015-2019 Capital Program.

This capital program's plan for MTA New York City Transit and the Staten Island Railway includes accessibility investments at up to 70 selected subway stations, including any stations accelerated into earlier programs, for a total commitment not to exceed $5.2 billion in the 2020-2024 Capital Program. If, however, the MTA determines or is compelled by a third party to progress major accessibility capital investments at any station other than one of the selected stations, the MTA reserves the right to substitute such station for one of the selected stations.

These projects will increase the percentage of total stations that are accessible to approximately 43%. The maximum distance to an accessible station will decrease from seven stops away (in some areas that are currently lacking coverage) to no more than two stops away, system-wide.

To select these stations, NYCT primarily considered the following factors:

- Coverage - ensuring that no customer will be more than two stations away from an accessible station;
- Transfer Points - preference for subway and subway/bus transfer locations.
- Community Interest - NYCT solicited input from the disability community, which reflected local knowledge about which stations serve important community destinations;
- Synergies - where appropriate, combine accessibility work with station component/renewal work, and leverage elevator investments made by private developers.

Overall, the 2020-2024 program will invest $5.1 billion in station accessibility at up to 63 subway stations, plus additional funding in the SIR category.

New York City Transit
Track
Category T-805

Track and switches are fundamental to the delivery of safe and reliable subway service. NYCT track is traversed every weekday by thousands of trains carrying the subway's over five million daily passengers. The NYCT rail network consists of 637 miles of mainline track and 1,779 switches. Including switch length, the total system length is 665 miles.

Mainline track and switches have been in a state of good repair since 1991 and 1997, respectively. Maintaining this infrastructure in good repair is a critical priority of the capital program, and NYCT employs the following strategies to do so:

- To maintain track and switches in good repair, NYCT has a regular program of normal replacement. The useful life of track and switches varies considerably – from 25 to 65 years on the average – depending on factors such as traffic, track type, geometry, and exposure to weather and other environmental conditions. Maintaining track in good repair is necessary to prevent reliability problems, including derailments and reduced speed limits ("red tags") imposed in areas with degraded track conditions;
- In addition to the mainline track replacement program, traditional bolted rail is converted to continuously welded rail (CWR) at critical locations that are not soon due for full track replacement, to prevent the occurrence of broken rails and track failures. CWR is a key investment strategy for the continued safety of the rail system. Other benefits of CWR are increased remaining useful life, reduced damage to rolling stock, and better ride quality; and
- An additional principle for mainline switch replacement is to align investment with signals projects. In support of the accelerated rollout of advanced signal technology (discussed in the Signals section), all switches within the limits within signal modernization projects will be analyzed to determine their utility and confirm if they should be replaced or removed, based on an evaluation of how each switch contributes to flexible rail operations. A portion of the planned switch investment will be contractually packaged with this signal work.

Proposed 2020-2024 Capital Program - $2.558 billion

To achieve these goals, NYCT will undertake the following projects:

- Replacement of nearly 60 miles of mainline track. This pace of mainline investment is to maintain a state of good repair, and is largely consistent with prior programs;
- Replacement of approximately 250 mainline switches. This pace of mainline switch replacements in 2020-2024 is accelerated to coordinate with signal modernization; and
- New investments in CWR will address approximately 20 miles in the 2020-2024 program. CWR will reach 90% coverage of all possible locations.

Overall, the 2020-2024 program will invest $2.558 billion in mainline track and switches.

New York City Transit
Line Equipment
Category T-806

Line equipment refers to an array of equipment distributed along the right-of-way including 441 track miles of tunnel lighting, 202 ventilation plants, 237 pump rooms, and four deep well systems. This “hidden infrastructure” is important for a safe and reliable subway system.

The investment goals for line equipment assets are described below:

- Tunnel Lighting: Replace incandescent lighting to meet current standards. Nearly 130 track miles of tunnel lighting in the system uses inefficient incandescent lighting that does not meet current standards for illumination and energy efficiency. Investments to replace this lighting with compact fluorescent or LED lighting systems enhances safety for employees and contractors performing work along the right-of-way and for customers in the event of an emergency train evacuation. Locations are generally prioritized for tunnel lighting investment in coordination with other right-of-way work;
- Ventilation Plants: Enhance existing fans and keep them in good working order. NYCT’s 202 ventilation plants (or “fan plants”) protect all under-river tubes and a share of the rest of the subway system. In an emergency, they are used to direct heat and noxious fumes away from passengers and evacuation routes. Many of NYCT’s existing fans are undersized and do not meet contemporary standards for sufficient “critical velocity.” NYCT performs component repairs on existing fan plants to keep them in good repair, and is exploring opportunities to upgrade fan plants to achieve higher velocities, where practicable;
- Pump Room and Deep Wells: Achieve and maintain a state of good repair. Pump rooms expel the groundwater that naturally infiltrates the subway tunnels and other runoff that enters the system. Only 17 of the pump rooms in the system are not in a state of good repair and need rehabilitation. Deep wells are pumps that lower the water table near the subway structure to reduce water infiltration and protect structural integrity. Deep wells require regular cleaning or “back-flushing” to ensure they do not become clogged.

Proposed 2020-2024 Capital Program - $412 million

To achieve these goals NYCT will undertake the following projects:

- Upgrade up to two miles of tunnel lighting to meet current standards, in coordination with the ongoing Queens Boulevard West signal modernization project;
- Replace fan components at various locations;
- Rehabilitate up to 6 pump rooms at various locations;
- Back-flush the deep wells on up to 3 lines.

Overall, the 2020-2024 program will invest $412 million in line equipment projects.

New York City Transit
Line Structures
Category T-807

Line structures provide a safe right-of-way for subway trains above and below ground. NYCT's network has approximately 240 miles of line structure, including 147 miles of subway structure, 69 miles of elevated structures and viaducts, and 24 miles of at-grade alignments. All line structures require periodic investment to preserve their integrity against water damage, corrosion, and normal wear-and-tear; otherwise, spalling concrete, corroding steel, and other defects could potentially impact safe operations or require slow travel speeds. Subway tunnels feature nearly 550 emergency exits, which also require periodic investments.

The goals of line structure investment are:

- Address priority subway structural defects. NYCT will continue performing subway structural component repairs in the 2020-2024 program. This approach enables NYCT to target high-priority defects and, whenever possible, take advantage of track access opportunities made available by other capital work. Beyond component repairs, select projects will feature more robust scopes, such as comprehensive bridge rehabilitations or replacements;
- Paint and repair elevated lines to preserve the structures and improve neighborhood aesthetics. NYCT aims to paint its steel elevated structures on a regular cycle, normally every 15 years (some paint application methods have a longer life). Elevated structural painting projects also repair priority component defects that are within their limits;
- Install protective netting below elevated structures. As part of NYCT's commitment to safety, protective netting will be installed underneath elevated structures in priority locations;
- Rehabilitate emergency exits. NYCT is continually improving emergency exits system-wide in the unlikely event of an incident that requires passengers to evacuate the subway.

Proposed 2020-2024 Capital Program - $2.384 billion

To achieve these goals NYCT will undertake the following projects:

- Nearly $650 million for subway component repairs, a significant increase compared to the 2015-2019 program, to be focused on locations with the highest concentrations of priority defects;
- Extensive rehabilitation or replacement of elevated structures on up to five subway lines, to address priority conditions identified by NYCT engineering assessments;
- Continue the installation of netting beneath elevated structures;
- Paint more than 16 miles of elevated structure on various elevated lines;
- Over $50 million for emergency exit rehabilitation.

Overall, the 2020-2024 program will include $1.0 billion for structural repairs, $1.0 billion for overcoat painting on elevated structures, and $325 million to install protective netting.

New York City Transit
Signals & Communications
Category T-808

Proposed 2020-2024 Capital Program - $7.119 billion

Signals - $5.936 billion

Signals govern the movement of trains along the right-of-way (ROW) to ensure that trains operate at safe speeds and to prevent collisions. The NYCT system includes 737 track miles of mainline signals and 184 mainline interlockings—complex signaling areas where tracks cross, merge, or diverge. While most of NYCT signal system relies on conventional fixed-block signals, NYCT is transitioning to a state-of-the-art modernized signal system. By the end of the 2015-2019 program, advanced signals will either be installed or in construction on 18% of the mainline system, or approximately 132 track miles.

The installation of advanced signals has a variety of benefits:

- Modernized signals allow NYCT to operate more frequent train service, which will enable the expansion of subway service to accommodate growing ridership on capacity-constrained lines. Note, however, that related investments in fleets, power, and other infrastructure are typically required to achieve the capacity increases enabled by advanced signal technology;
- Signal failures are one of the leading causes of subway service disruptions. Based on NYCT's experience with the L and 7 trains (the first lines to be modernized), it is anticipated that upgraded lines will have fewer signal delays. In fact, only 1% of all trips on the L experience delays due to signals – the lowest of the all lines in the system except for the shuttles, which cover much shorter distances;
- Compared to the existing fixed block signals, the new technology also provides enhanced safety, reliability, customer information, and other operational benefits, including superior information and control systems that allow for more effective management of rail operations.

To achieve these goals NYCT will undertake the following projects:

- Contracts will be awarded to install modernized signals on segments of six lines, covering approximately 133 track miles and 33 interlockings:
    - Queens Boulevard Line East (E,F from Kew Gardens Union Turnpike to Jamaica 179 St and Jamaica Center Parsons / Archer)
    - Crosstown (G from Court Square to Hoyt Schermerhorn)
    - Fulton (A,C from Jay St to Euclid Av)
    - Astoria (N,W from Astoria Ditmars Blvd to 57 St-7 Av)
    - 63rd Street (F from 21-Queensbridge to 57th St-6 Av)

- Lexington Avenue (4,5,6 149th St-Grand Concourse to Nevins St)

These investments will expand the share of the system that is equipped with advanced signals from 18% to 36% of the system. These lines were prioritized based on a combination of state of good repair, ridership, capacity considerations, and coordination with other work;

- All railcars purchased in the 2020-2024 program will be provided with necessary equipment to operate in upgraded territories. Funding is also included to provide compatible equipment for work train locomotives;
- Funding is also allocated for various system-wide signal component upgrades and other investments to improve the reliability of existing signals.

Overall, the 2020-2024 program will invest $5.936 billion in signals, including $5.7 billion for signal modernization projects and related investments.

Communications - $1.183 billion

NYCT maintains a carrier-grade communications network that is critical to many aspects of daily operations. Communications assets include system-wide fiber optic and copper cable networks and infrastructure, which handle voice and data communications; local area networks within each passenger station (PSLAN); and private branch exchanges (PBXs) for telephone communications. Utilizing this infrastructure are numerous internal and customer-facing communications applications, including public address systems and customer information signs (PA/CIS) and Help Points (HP) in passenger stations; systems for the remote control and monitoring of equipment; safety and security systems in stations and tunnels; and radio systems used for daily operations and emergency response.

Investment in communications infrastructure is crucial to maintaining good service and enhancing the customer experience. NYCT's strategy for investment in communications seeks to:

- Ensure the continued reliability of communications networks. NYCT's communications system is critical to nearly every aspect of daily operations. Technology investments in particular require regular upgrades due to rapidly changing standards and technological obsolescence. Some of NYCT's communications networks (such as the first-generation "asynchronous" fiber optic network) are based on technology that was developed decades ago. These systems can be challenging to maintain as replacement parts are no longer manufactured, and they may be incompatible with today's applications;
- Provide sufficient capacity to meet future needs. Communications investments are often driven by the needs and priorities of the various applications utilizing the system. The ongoing expansions of signal modernization, OMNY fare payment system, numerous

initiatives to improve customer communications, security upgrades, and other planned investments will continue to increase the demands placed on the existing networks;

- Enhance customer information and security. NYCT has committed to improving customer communications and ensuring that all stations have state-of-the-art public address (PA) and customer information screens (CIS). Investments in elevator and escalator monitoring systems are planned in support of station accessibility efforts. Security investments will mitigate system-wide vulnerabilities and risks such as unauthorized entry into non-public areas.

To achieve these goals NYCT will undertake the following projects:

- PA/CIS upgrades at approximately 76 stations on the B Division (lettered subway lines). These locations are the last remaining stations still utilizing antiquated analog PA systems with very limited announcement capabilities and signage. New state-of-the-art PA/CIS systems with clearer audio, digital signage, and remote announcement capabilities will improve communication with customers, under both normal operations and in the event of a service disruption;
- Various network investments, including the completion of Connection-Oriented Ethernet (COE), which has been prioritized in coordination with security projects that require additional bandwidth;
- Upgrades to the LiftNet elevator and escalator monitoring system to provide customers and maintenance personnel with more reliable and timely notification of outages;
- System-wide rollout of passenger identification closed circuit television (CCTV) at stations that do not already have the technology, and security enhancements in under-river tunnels and other strategic locations;
- Normal replacement of selected phone and radio system equipment and communications cables, to address known failures and operational liabilities.

The 2020-2024 program will invest a total of $1.183 billion in communications projects.

New York City Transit
Traction Power
Category T-809

The traction power system provides the electricity needed to keep trains moving. NYCT's traction power assets include substations, circuit breaker houses (CBHs), and cabling. There are over 200 substations spaced throughout the NYCT system. Substations receive high-voltage alternating current (AC) and convert it into 600-volt direct current (DC) power. This DC power is transmitted to the contact rail (third rail) by means of the power distribution system, which includes positive and negative cables and CBHs. There are over 300 CBHs spread throughout the subway network.

There are two main goals of traction power investments:

- Bring more assets to a state of good repair. With investments through the end of the 2015-2019 program, one or more critical pieces of equipment is in poor condition at 93 substations. Similarly, 56 of NYCT's CBHs are not in good repair. State of good repair investment in power assets improves reliability by reducing equipment failures that can lead to service disruptions and insufficient power to operate trains at the desired speed and throughput;
- Provide power improvements for advanced signals. As signals are modernized throughout the subway system (as discussed in the Signals section), NYCT is in parallel ensuring that there is sufficient traction power to support higher train throughputs made possible by the upgraded signaling system. Investments include constructing new power substations and installing additional power cabling and low resistance contact rail. In addition to enabling increased service, these power investments will also improve the reliability of passenger service.

Proposed 2020-2024 Capital Program - $2.600 billion

To achieve these goals NYCT will undertake the following projects:

- Comprehensive renewals of up to six substations;
- Targeted component repairs or replacement of equipment at various substations;
- Rehabilitate up to 11 CBHs;
- Upgrades to power cables and related assets system-wide;
- Power improvements on up to seven lines to improve reliability and support higher train throughput made possible by signal modernization.

Overall, the 2020-2024 program will invest $2.600 billion in traction power, including $1.1 billion for investments that will increase the percent of substations in good repair from 59% to 66%, and CBHs in good repair from 82% to 85%. Over $1.5 billion is included for signal modernization-related power improvements.

New York City Transit
Shops and Yards
Category T-810

NYCT manages a network of facilities dedicated to keeping its fleet and subway infrastructure in good working order. Investment in these facilities helps to ensure that critical maintenance activities can be performed efficiently and effectively.

The Division of Car Equipment (DCE) manages 14 railcar maintenance facilities that handle daily maintenance and cleaning tasks, as well as Scheduled Maintenance System (SMS) component change-outs. In addition, two DCE overhaul shops house the six- and twelve-year SMS program and other major railcar repairs. NYCT also has 28 Maintenance of Way (MOW) shops dedicated to maintaining the track, signals, and electrical infrastructure of the subway system. Additionally, the NYCT system contains 24 yards used for the storage of railcars and work trains. Yard components include 102 miles of yard track and 874 yard switches, plus signal systems, yard lighting, and perimeter fencing.

NYCT's strategy for shop and yard investments seeks to accomplish the following goals:

- Targeted investments in shop components to address high-priority deficiencies and continue reducing the backlog of deficient components. The 2010-2014 Capital Program introduced a component repair strategy that has been successful at addressing the most urgent needs in a timely manner. However, ongoing investment is necessary to continue reducing the backlog of deficient components;
- Replace yard track and switches to work toward a state of good repair. Nearly 20% of yard track and switches are not in good repair. Investments will focus on locations that pose the greatest risk of impacting service reliability;
- Investments in yard fencing and lighting. These investments maintain a secure environment for equipment and personnel.

Proposed 2020-2024 Capital Program - $563 million

To achieve these goals NYCT will undertake the following projects:

- Component repair projects to address deficient shop components at various DCE maintenance and MOW support shops, as well as both DCE overhaul facilities. Components targeted for investment include structural elements, heating/ventilation, lighting, and electrical systems;
- Larger-scale investments are planned at the Livonia Maintenance Shop and the Atlantic Avenue Power Cable Shop due to a high number of defective components and functionally obsolete layouts of the existing facilities that hamper their effectiveness;

- Replacement of more than two miles of yard and non-revenue track and more than 15 yard switches;
- Upgrade of fencing and lighting at one yard.

In total, the 2020-2024 program will invest $563 million in shop and yard projects.

New York City Transit
Depots
Category T-812

NYCT's 20 bus depots support bus service throughout the five boroughs of New York City by fueling, servicing, maintaining, and storing buses as required. As the bus fleet diversifies, so must the facilities that support it. Two of the bus depots – West Farms in the Bronx and Jackie Gleason in Brooklyn - are equipped to service buses that run on compressed natural gas (CNG). Other depots have been modified to house articulated buses, which comprise approximately 20% of the fleet. Supporting the maintenance functions at depots are two base shops, which handle heavier work such as major bus chassis and engine repairs, as well as smaller support shops at various locations. NYCT's bus depot and base shop components are considered in good repair.

The strategy for depot investments seeks to accomplish the following goals:

- Continue addressing high-priority deficient components at depots. NYCT will continue investing in depot components, with targeted projects aimed at addressing deficient components such as roofs, heating/ventilation systems, and lighting, in addition to the normal replacement of depot equipment. Facilities with higher concentrations of deficiencies may be considered for more comprehensive investment;
- Align depot investments to accommodate the roll-out of electric buses. NYCT plans to transition their entire bus fleets to zero-emission all-electric vehicles, and depots will require upgrades to accommodate the servicing needs of an all-electric fleet.

Proposed 2020-2024 Capital Program - $821 million

To achieve these goals NYCT will undertake the following projects:

- Electric fleet modifications are proposed for up to seven NYCT depots, and will include power upgrades, the installation of depot chargers, and other improvements necessary to maintain an all-electric fleet;
- Component repair projects will address deficient shop components at up to eleven depots along with one base shop. Components targeted for investment include structural elements, heating/ventilation, and electrical systems;
- The reconstruction of Jamaica Bus Depot will address long-standing functional deficiencies including poor layout, inadequate work areas, and insufficient capacity. The project will help NYCT reduce its reliance on outdoor street parking for buses, improving neighborhood conditions for nearby residents;

- The ongoing rollout of Automated Bus Lane Enforcement (ABLE) will aid in improving bus travel speeds and reliability. More than half of the existing fleet with be retrofitted with ABLE systems;
- Continued investment in miscellaneous depot equipment, including bus lifts and facility elevators.

In total, the 2020-2024 program will invest $821 million in NYCT depot projects.

New York City Transit
Service Vehicles
Category T-813

The performance of the transit system relies on a service fleet of over 500 specialized railcars for work trains and 600 heavy-duty rubber tire vehicles such as trucks and vans. These fleets support both routine maintenance activities as well as the execution of capital work. As NYCT looks to accelerate the pace of signal investment and other capital needs, it is vital that these support fleets are reliable enough to get the job done.

Goals of NYCT's 2020-2024 service vehicle investments include:

- Bolster the locomotive and flat car fleets. Enhanced reliability of these core work train sub-fleets will be necessary to support the faster rate of investment proposed for signal modernization (discussed in the Signals section) and other initiatives in this and future programs;
- Replace other work train cars and rubber-tire vehicles based on age, condition, and functional needs. Each work train and vehicle type have a specialized role to play in keeping the system running for our customers. Investments will be focused on the replacement of over-age, low-performing, and service-critical portions of the work fleet.

Proposed 2020-2024 Capital Program - $354 million

To achieve these goals NYCT will undertake the following projects:

- Purchase locomotives and flat cars to replace older models;
- Purchase selected other classes of work train cars, such as tampers, crane cars, signal supply cars, and a track geometry car;
- Purchase approximately 200 rubber-tire vehicles, types to be selected based on condition and performance.

In total, $354 million is included in the 2020-2024 program for service vehicles, including nearly $200 million for locomotives and flat cars.

New York City Transit
Miscellaneous
Category T-816

Employee Facilities

The investments in this category include improvements to various employee, administrative, and police facilities that are essential to NYCT's operations.

Major goals in this category include:

- Increased investment in employee facilities. Improving the conditions at facilities in which our employees serve, particularly our customer-facing employees in the field, is a priority. Better facilities will lead to higher worker productivity and morale, ultimately improving both our employees' and our customers' experiences in the system;
- Continue to address specific capital needs of the NYPD Transit Bureau. In accordance with the 1995 merger agreement with the City of New York, NYCT is responsible for capital improvements to most police facilities in the system. Like the facilities for our own employees, investments in the facilities used by those who keep the system secure will enhance the safety of all our riders.

Proposed 2020-2024 Capital Program - $1.123 billion

To achieve these goals NYCT will undertake the following projects:

- More employee facility repairs at more locations. The program will improve the conditions of numerous employee facility locations through large-scale rehabilitations and smaller-scale component repairs. Locations will include station rooms, larger crew quarters, police facilities, and administrative sites.

The 2020-2024 Capital Program includes nearly $400 million for employee, administrative, and police facilities.

Miscellaneous

This category also contains investments to support the implementation of the capital program, including funding for environmental remediation, Enterprise Asset Management (EAM) consultant support services, insurance, and scope development and design for future projects.

A major goal for this category is to ensure proper funding for consultant services and necessary program reserves. Standing consultant contracts are an efficient means of providing many of the engineering services for capital projects. Reserves are also included in the program to fund

some of the in-house support necessary for capital contracts, and for other programmatic needs.

To achieve this goals NYCT will undertake the following projects:

- Various investments to support the implementation of the capital program, including funding for environmental remediation, consultant support services, insurance, and scope development and design for future projects;
- This category also includes miscellaneous investments in information technology and fire safety systems.

The 2020-2024 program includes over $500 million for environmental and system safety items, engineering services, insurance, and other program reserves to support the entire capital program; and nearly $200 million for other miscellaneous investments.

Staten Island Railway
Category S-807

SIR was created in 1971 when the City of New York purchased the right-of-way from the Baltimore and Ohio Railroad Company. 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. Its infrastructure includes 29 track miles of mainline track, four track miles of yard and non-revenue track, 54 mainline switches, two support and maintenance shops, 29 bridge structures, and nine power substations. SIR's current fleet of 64 R44 railcars is scheduled to be replaced by 75 new R211 cars as part of the 2015-2019 Capital Program.

SIR is a freestanding railroad, requiring investment in a variety of asset categories to maintain reliable service for customers. The major goals of investment include:

- Station component repairs and station accessibility improvements. Mirroring the investment philosophy of the subway system, investment in SIR stations will address all components rated 4.0 or worse by the Station Condition Survey, and will make additional stations accessible to customers with disabilities so that no customer will be more than two stations away from an accessible station. Currently, five stations (less than 25% of the system) are accessible;
- Track and switches are fundamental to the delivery of safe and reliable rail service. Maintaining this infrastructure in a state of good repair is a critical priority of the capital program;
- Painting and repairing bridges lines preserves structures and improves neighborhood aesthetics. Steel bridge structures require repainting on a regular cycle, and repair projects are planned for structures that require more extensive remediation.

Proposed 2020-2024 Capital Program - $373 million

To achieve these goals NYCT will undertake the following projects:

- As part of the total investment in accessibility of up to 70 stations, up to three SIR stations will be made accessible to customers with disabilities, with elevators and/or ramps providing stair-free access to station platforms, to fulfil the goal of ensuring that no customer is more than two stations away from an accessible station;
- Component repairs at up to eight stations, to address specific stairs and platform and mezzanine components system-wide;
- Mainline track and switch replacement at locations system-wide;
- Comprehensive rehabilitation of up to two elevated structures and overcoat painting at up to six additional bridges.

Overall, the 2020-2024 Capital Program will include $373 million for SIR, including over $150 million for stations, over $100 million for track and switch replacement, and over $50 million for elevated structure/bridge repairs and painting.

Long Island Rail Road

MTA Capital Program 2020-2024

Asset Base – Long Island Rail Road

Exhibit 8
Selected Long Island Rail Road Assets

Category	Count	Asset
Rolling Stock	1,006	Electric Cars
	45	Locomotives
	134	Bi-Level Coaches
Passenger Stations	124	Stations
Track	502	Miles of Mainline Track
	564	Mainline Switches
Line Structures	232	Overhead Bridges
	517	Undergrade Bridges
Communications and Signals	485	Track Miles of Mainline Signal Equipment
Power	105	Substations
	328	Track Miles of Third Rail Power
Shops and Yards	25	Shops and Yards
	60	Facilities

Overview – Long Island Rail Road

The LIRR is the largest and busiest commuter railroad in North America, carrying 89.8 million passengers in 2018. LIRR infrastructure includes 502 miles of main line track, 295 at-grade-crossings and 124 passenger stations on 11 branch lines. On an average weekday, the LIRR carries over 312,000 passengers on 740 trains.

Much of infrastructure across the LIRR system represents legacy investments which were made decades ago and following years of intensive use, require replacement and renewal. Asset inventory databases allow for the tracking and classification of all critical components and form the basis for developing the state of good repair and normal replacement portion of the LIRR's capital needs addressed in the proposed 2020–2024 Capital Program. In addition to these investments which maintain LIRR's ability to reliably run the current level of service, a significant portion of the capital needs which have been identified focus on service improvements which will maximize the benefits associated with new LIRR service into Grand Central Terminal (GCT) via the East Side Access (ESA) project, the LIRR Expansion project, adding a third track between Floral Park and Hicksville, and the recently completed Main Line Double Track between Farmingdale and Ronkonkoma. Beyond these investment strategies, other key strategies include improving service by replacing and expanding the fleet, and providing for additional station accessibility with a goal of making 100% of LIRR stations accessible over the next 10 years.

Proposed 2020-2024 Capital Program - $3.737 billion

The MTA LIRR's proposed 2020-2024 Capital Program demonstrates the agency's ongoing commitments to maintaining and enhancing mobility, economic health, and quality of life in the region. The proposed 2020-2024 Capital Program includes investments of $3.737 billion over the course of the program (Exhibit 9). These investments work towards addressing SGR needs, preserving and enhancing LIRR assets through funding the network's most essential infrastructure – Stations, Track, Bridges and Viaducts, Communications and Signals, Power, and Shops & Yards. In addition, system improvements identified within the Stations, Power, Track, and Shops & Yards categories will improve the customer experience and position the LIRR to serve new markets and more fully realize the benefits of service to two Manhattan Terminals: Penn Station and GCT. Finally, funds are allocated to provide for miscellaneous program costs to support these activities and to support the LIRR's commitment to keep the system secure. In addition, LIRR has proposed funds in support of the MTA-wide Small Business Development (SBD) Program; $85 million in anticipated mentoring scope has been identified within the program to help meet the MTA mentoring goals.

Exhibit 9 details the proposed 2020-2024 Capital Program by asset category and percentage of overall program.

Exhibit 9
Long Island Rail Road Proposed 2020-2024 Capital Program by Category
($ in millions)

Category	Proposed 2020-2024	Percent
Rolling Stock	$242	7%
Stations	910	24%
Track	1,018	27%
Line Structures	343	9%
Communications and Signals	364	10%
Shops & Yards	203	5%
Power	426	11%
Miscellaneous	231	6%
Total	**$3,737**	**100%**

Numbers may not total due to rounding

This LIRR program totals $3.737 billion. The development of this program was driven by the need to improve the customer experience, improve on-time performance, and address the LIRR's SGR backlog with a forward-thinking approach. The program of investments was developed based on current, actual asset conditions and a reevaluation of SGR status.

Major Investments

Primary elements of this proposed program include investments to maintain and improve core infrastructure along with strategic investments to enhance mobility, customer satisfaction, safety and security.

Core Infrastructure Modernization

The LIRR continues the progress made since the inception of the first Capital Program in 1981, with significant infrastructure investments in the proposed 2020-2024 Capital Program. Investments to maintain the core infrastructure account for 71% of the proposed 2020-2024 Capital Program, across all asset categories. This level of investment assures system components are replaced at the end of their useful life, and will progress the LIRR's effort to address the reevaluated SGR backlog in all asset categories.

Power

More than half the Power category assets are classified as backlogged – 52%, one of the highest of the LIRR asset categories. The largest driver behind this is the existence of older power substations. More than half of the LIRR's substations were constructed in the early 1970s, and thus they have all exceeded their useful life of 35 years. Substation replacements are major undertakings and involve balancing the production levels of equipment manufacturers, LIRR Engineering forces, local utility companies and operational requirements to maintain the supply of traction power during the construction period. Moving forward, LIRR will look to increase the replacement rate of substations by utilizing the design-build method of construction and grouping multiple substations in a single procurement package. This approach will allow LIRR to increase its rate of substation replacements and address the driver of asset backlog within the Power category. Lighting at stations, yards, and tunnels is also a contributor to the backlog. Targeted efforts across multiple capital programs will address deficient lighting and replace it with LED fixtures which meet modern standards for lighting and energy efficiency.

In addition to the LIRR's SGR efforts, investments are planned to electrify a segment of non-electrified territory: the Central Branch. Electrifying the Central Branch will provide the LIRR network with additional operating flexibility and redundancy during both planned and unexpected service disruptions, by making available an alternative travel route for electric trains in Suffolk County by utilizing the Babylon Branch and the Main Line.

Signals

A well-functioning signal system is critical for reliable service; currently, signal failure is a leading cause of train service delays. Many LIRR branches have legacy signal systems that were designed and constructed in the 1950s and 1960s. Today, it is extremely challenging to maintain these systems and to obtain replacement parts. Even when fully functioning, these aged systems do not reflect the latest standards of signal technology. In recent years, many of LIRR's signal resources (both funding and manpower) were dedicated to installation of the Federally-mandated PTC system and to restoration of Long Beach Branch signaling, which was decimated during Superstorm Sandy. These two resource-intense initiatives were not part of the LIRR's earlier signal investment strategy. This has contributed to the backlog of signal investment needs; 53% of signal assets are backlogged.

Moving forward, the LIRR will look to progress a robust signal modernization program which targets backlog and addresses obsolete technology. Replacement signal systems will reflect bi-directional functionality, automatic speed control, limited aspect signal technology (instead of Pennsylvania Railroad-era position light signal systems) and will utilize microprocessor technology. An additional modernization program is the LIRR's plan to implement Centralized Train Control (CTC) giving LIRR the ability to monitor all trains from a centralized location

improving operations, communication and the ability to respond to service disruptions. It will also replace the LIRR's legacy train tower control system.

Station Work and Accessibility

A key focus of the LIRR's proposed 2020-2024 Capital Program is undertaking investments in stations, which play a key role in the LIRR customer experience. This program targets many deteriorated station locations which have poorly rated station components and historically have seen a lack of capital investment. Not only will the structural deficiencies at these stations be addressed, but the stations will be upgraded and modernized to address current standards. This includes LED lighting, CCTV security cameras, tactile warning strips, elevators, and customer amenities such as Wi-Fi and USB charging ports.

Improving ADA accessibility to stations is a key driver behind the LIRR's 2020-2024 capital investment strategy supporting the goal of making all stations accessible by 2029. The number of wheelchair accessible LIRR stations has increased steadily over the years, with over 85% of the LIRR's 124 stations currently being accessible. Under prior capital programs, ADA ramps were installed at LIRR stations where a ramp solution was feasible. The remaining 16 non-accessible stations require the construction of new elevators in order to be made ADA accessible. At many station locations, replacement of deteriorated components such as platforms and station electrical systems are required to support elevator installation.

Penn Station

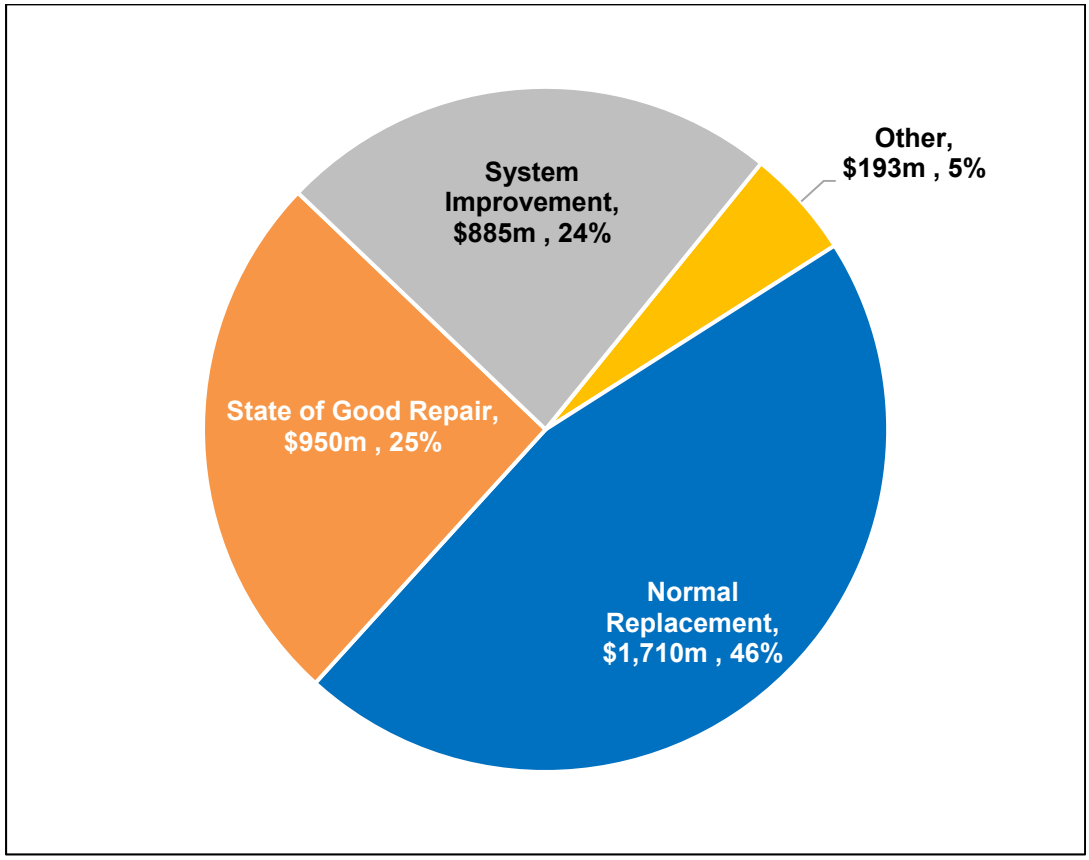
Penn Station, the busiest train station in North America owned by Amtrak with the LIRR having partial capital responsibility, is identified separately from the rest of LIRR station assets here. Of the LIRR's portion of the station, 57% of components are not considered to be in a state of good repair. Penn Station assets are comprised of many systems, including electrical, mechanical, structural and plumbing assets. Also included are infrastructure systems (power, track, signal and communications) located in the East River Tunnels or in Penn Station, as well as the various systems and asset components which make up the public areas and the back-of-house operational areas within the Penn Station complex.

When it comes to undertaking major capital construction, the Penn Station environment presents unique challenges such as 24/7 operations, three rail operators and high train and passenger volume. Moving forward, the LIRR will be targeting both areas utilized by customers (staircases, platform level components), as well as critical back-of-house systems, such as the air handlers for the HVAC system.

System Condition

Exhibit 10, on the next page, illustrates the mix of investments by needs category in the proposed 2020-2024 Capital Program. The LIRR's $3.737 billion in investments proposed for the 2020-2024 Capital Program represents a significant effort to provide for the continued safe operation of the railroad, with two-thirds of the program emphasizing SGR and NR, including replacing rolling stock and rehabilitating/ replacing core infrastructure. Critical elements of LIRR infrastructure have reached the end of their useful life, with many systems becoming increasingly difficult to repair, necessitating a shift towards more comprehensive rehabilitation and reconstruction programs and innovative solutions. In addition to the SGR and NR investments, one third of the proposed program provides for future growth and improved customer service with SI investments, such as expanding the railcar fleet and making improvements at Jamaica Station to increase capacity.

Exhibit 10
Long Island Rail Road Proposed 2020-2024 Capital Program by Needs

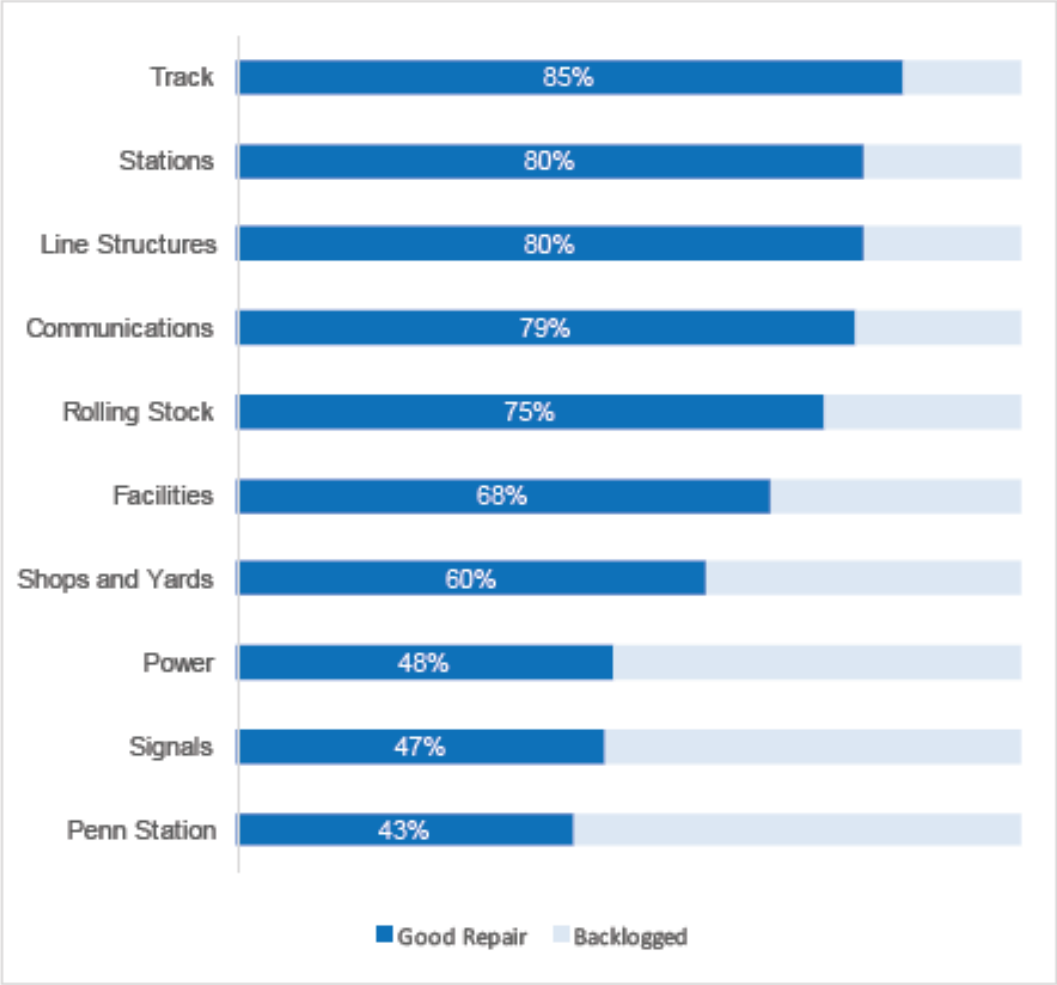


The System Improvement Status (Exhibit 11), indicates the level of SGR backlog by asset category based on a new approach reflecting current, actual asset conditions. The LIRR evaluated its vast assets based upon one or more of three attributes:

- Asset condition;
- Asset age versus useful life;
- Asset performance versus an identifiable performance standard (including safety and reliability).

As seen in Exhibit 11 below, all asset categories have some degree of investment backlog.

Exhibit 11
System Investment Status
Long Island Rail Road



The proposed 2020-2024 Capital Program finds a balance between addressing priority SGR and NR needs with making improvements needed to enhance customer comfort, implement technological advances and increase capacity for current and future ridership.

Long Island Rail Road
Rolling Stock
Category L-801

The LIRR's current rolling stock consists of a fleet of 836 M-7 EMU cars, 170 M-3 EMU cars, 45 revenue locomotives, 134 bi-level coaches, and a fleet of work locomotives and other maintenance rolling stock.

The LIRR's strategy is to continue the normal replacement of railcars as they reach the end of their useful lives, with additional cars being purchased to support ridership growth. This includes the replacement of work locomotives which are utilized for operations and track maintenance, as well as the purchase of additional electric cars during the course of multiple capital programs. New fleet will include customer amenities such as USB charging ports, improved customer communication systems and digital screens and push-button controls for end-of-car doors.

The 2015-2019 Capital Program includes investment to replace the aging M-3 cars which have been in service since the mid-1980's. In 2019, the latest generation of MTA commuter rail rolling stock, the M-9 cars, are entering revenue service. This fleet incorporates modern customer amenities and other new features. Investing in LIRR's fleet will increase the MDBF, while the M-3 fleet has an average MDBF of 65,000 miles, the new M-9 cars are designed to have an MDBF of 400,000 miles. Improving the fleet performance will mitigate up to 11% of train delays.

The fleet investments in the 2015-2019 Capital Program also include growing the electric fleet by approximately 54 cars, funded by a $243 million loan from Penn Station Access being repaid in this capital program. This will support ESA service, projected ridership growth, and future service operations. This is in addition to 160 cars provided under the ESA project, for a total of 214 new electric cars, which will expand LIRR's fleet by 15%, or 23,000 seats.

Proposed 2020-2024 Capital Program - $242 million

This program will purchase 12 revenue locomotives and 17 coaches to support service to the LIRR's non-electrified territory and address peak period service demands.

To address service needs and ridership growth, the LIRR will expand the non-electric fleet. Around 20% of LIRR customers begin their trips at non-electrified territory stations on the Montauk Branch, the Port Jefferson Branch, the Oyster Bay Branch and east of Ronkonkoma.

Expanding this fleet will support future projected ridership growth and future service operational needs. It will also address the current fleet's reliability issues and will provide new ADA amenities. An expanded fleet will allow the LIRR to better address current operational and

ridership constraints during peak periods.

In addition to the major rolling stock purchases, the LIRR is purchasing eight new “green” work locomotives, which will replace older technology locomotives with the latest environmentally-friendly models.

Long Island Rail Road
Stations
Category L-802

There are 124 LIRR stations across Nassau and Suffolk Counties and in New York City.

A key driver of the LIRR's station investment is the replacement of structurally deficient platforms, many of which date from the post-World War II era during Long Island's explosive population growth. Platform investments ensure an even surface for customers, address structural issues and, in some cases, increase reliability and capacity through lengthened platforms. The longer platforms will improve operations by reducing station dwell time and allow more even customer distribution throughout the train. Along with platforms, replacement of staircases, lighting, and other components, new CCTV security cameras will ensure a continued safe environment for customers. Incorporating customer amenities, such as Wi-Fi and USB charging ports, make for a better experience and overall enhancements.

This investment strategy will be coupled with the goal of making all LIRR stations ADA accessible by the end of the 2025-2029 Capital Program. The LIRR has many stations on viaducts or earthen embankments which are currently not accessible for customers who utilize wheelchairs or other mobility aids. In many of these locations, LIRR will demolish structurally deteriorated platforms and will install new platforms, elevators, tactile warning strips, and other accessibility features to address stations which are currently not ADA accessible. Stations not requiring structural work on platforms will receive new elevators and new tactile warning strips.

In addition, parking and station access improvements will alleviate parking shortages and accommodate future ridership growth while also supporting station access via biking, walking, drop-off, and other means of access.

Proposed 2020-2024 Capital Program - $910 million

Stations and Buildings - $807 million

At the completion of the 2020–2024 Capital Program, 92% of stations and their related assets will be in a state of good repair, 3 out of 7 stations on the Main Line and the Babylon Branch with short platforms will be extended, and up to 7 additional LIRR stations will be made ADA accessible.

The proposed program focuses investment around those stations with the worst rated platforms, as per the most recent LIRR Asset Condition Assessment. Replacement of platforms will be paired with platform extensions where applicable and with ADA elevators, tactile strips and braille signage. These stations include Hollis, Forest Hills, Hunterspoint Avenue, and Copiague. In addition, replacement and upgrade of the LIRR's Mets-Willets Point Station will include platform, track

and station infrastructure upgrades, including new elevators and a seamless, direct access from the LIRR Station to the proposed LaGuardia AirTrain Station, to support full-time service. The design and construction of this project will be closely coordinated with the Port Authority of New York and New Jersey. At Locust Manor and St. Albans, new elevators will be installed to make these stations ADA accessible, building upon other station investments undertaken in the 2015-2019 Capital Program.

Based on condition assessments, stations with concentrations of poorly rated components will be identified for the 2020-2024 Capital Program which will renew station buildings and replace platform signage, shelters sheds, pedestrian overpasses, railings and lighting. In addition, elevators and escalators reaching the end of their useful life will be replaced and ticket vending machines and ticket selling equipment will be upgraded as part of the overall MTA-wide OMNY new fare payment program.

Parking - $28 million

The final stage of the Ronkonkoma Parking Garage Rehabilitation will include interior steel renewal and painting, completing the parking garage rehabilitation. This parking garage, which was constructed in 1996, supports Ronkonkoma's role as a magnet station for Suffolk County, with the station having the second highest ridership on Long Island. A facility inspection of Ronkonkoma Parking Garage found it to have many deteriorated systems which needed renewal to keep the facility in safe operating condition. Under this capital program, LIRR will complete the final phase of capital work identified for the parking garage. Rehabilitation and expansion of surface parking will be undertaken in selected locations, with surface parking lots in deteriorated condition being selected for this investment, while station access improvements to selected LIRR stations are also included, some awarded through the SBD Program.

Penn Station & Grand Central Terminal - $74 million

The LIRR has partial capital responsibility for Penn Station, the busiest train station in North America, which is a shared operation between LIRR, Amtrak and New Jersey Transit. It is a major station facility, with numerous integral systems, including extensive track, signal, communications, electrical, mechanical, plumbing and other infrastructure. The last major complex-wide renovation in LIRR's portion of Penn Station was undertaken in 1994 and its systems need repair and replacement. A major platform level renewal and upgrade has been identified for Penn Station. This will include staircase replacement, platform surface and tactile renewal, architectural column cladding and ceiling treatments, upgraded LED lighting, new signage, and other targeted investments. Also planned for Penn Station is the replacement of aging air handlers for the HVAC system, upgrades to the radio antenna system, and targeted replacement/upgrade of the complex's various building systems. The 2015-2019 Capital Program began elements of this overall renovation process (33rd Corridor projects).

With completion of ESA bringing the LIRR into GCT, an allowance has been identified to address various needs of the new LIRR section of GCT. This includes elements such as back of house fit-outs, safety and security equipment, and other station components.

Long Island Rail Road
Track
Category L-803

The LIRR currently has 502 miles of main line track and 564 main line switches.

The Annual Track Program is crucial for improving the state of track infrastructure and the customer experience. It includes installation of wood ties (mechanized), rail, wood switches, concrete switches, field welds, surfacing, drainage, rail profiling and track stability and grade crossing renewals. The program ensures that LIRR continues to meet all Federal Railroad Administration (FRA) and LIRR track standards. The cyclical replacement of track components is based on age, condition, and physical inspection. The ongoing maintenance of the track system includes the replacement of component assets on a life-cycle basis. Replacing worn track components, improves the ride quality for LIRR customers. By installing concrete ties in place of wood ties in selected areas, track replacement lasts longer ensuring longer periods between track outages, thus minimizing the impact on customers. Grade crossing renewal enhances both safety and comfort of LIRR customers and motorists traveling over grade crossings.

Track construction equipment, investments in right-of-way infrastructure (including retaining walls, culverts, and drainage systems), and installation of right-of-way fencing are also important, as well as targeted track replacement efforts within selected yards and the East River Tunnels. Rehabilitation and renewal of yard tracks enhances reliability and on-time performance by reducing the risk of derailments within yards, which can result in operational delays and train cancellations.

LIRR also plans major investments at Jamaica and an associated yard to support the capacity improvement associated with the opening of ESA and the other LIRR expansion projects.

Proposed 2020-2024 Capital Program - $1.018 billion

Annual Track Rehabilitation Program - $683 million

At the completion of 2020-2024, 94% of track assets will be in a state of good repair. The track program will replace and upgrade up to 32 miles of wood ties with new concrete ties. LIRR has targeted the busiest segments of the network to upgrade to longer-lasting concrete ties to reduce the customer and community impact associated with more frequent wood tie replacement including segments of the Main Line, Atlantic Branch, Port Washington Branch, Port Jefferson Branch, and the Babylon Branch. Right of Way investments will include addressing various culvert, drainage, track stability, and retaining wall SGR needs, along with the installation of high security fencing. For these investments, priority will be given to locations which are prone to flooding, have deteriorated retaining walls / track structures, as well as right-

of-way locations in need of high security fencing, due to a history of trespassers and/or illegal dumping.

Rehabilitation of yard track systems includes the installation of switch heaters, rehabilitation of walkways, replacement of switches, as well as other track work, and is targeted for West Side Storage Yard, Jamaica Storage Yard, and Port Washington Yard. These yards are critical operational locations for LIRR and together impact train service on all electric branches.

Construction Equipment and Geometry Cars includes equipment to be purchased to support the delivery of the Track Rehabilitation Program, such as new ballast cars, a crane, and a tamper. A new track geometry car will be purchased, which unlike the current car, will meet the tunnel profile to fit in to the ESA tunnels.

Other Track Improvements – $335 million

In support of anticipated service demand following the opening of ESA, the LIRR continues to undertake 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. Current track and station capacity constraints limit the volume of train service which Jamaica can accommodate during peak periods. Building upon the Phase I and II projects undertaken in the 2010–2014 and 2015-2019 Capital Programs, the 2020-2024 program will focus on replacing, upgrading and modernizing the signal system which serves the Jamaica area. In addition, the Jamaica E Yard Extension will construct a new closed-deck rail bridge over 150th Street to allow for increased train capacity in the Jamaica Complex. This work will provide a new train route from east of the station directly into the station tracks. Completing these projects will improve operational reliability, reduce unscheduled infrastructure maintenance, and lay the ground work for implementing future aspects of Jamaica Capacity Improvements, including reconfiguration of both Hall and Jay Interlockings, located just east and west of Jamaica Station.

Amtrak Territory Investments provides funding for LIRR's Baseline Capital Contribution to the Northeast Corridor pursuant to the Passenger Rail Investment and Improvement Act (PRIIA) and other major investments in the Penn Station and East River Tunnel including the continuation of the total track replacement work in the East River Tunnels.

Long Island Rail Road
Line Structures
Category L-804

The Line Structures asset category consists of 232 overhead bridges (which includes signal bridges and pedestrian bridges), 517 undergrade bridges which carry LIRR trains, 29 viaduct spans, 3 tunnel segments, as well as 176 culverts. Investments are prioritized based on asset conditions, structural inspections, and occurrences of bridge strikes so as to replace assets not in good repair, replace assets to address lifecycle needs, and improve service reliability.

Some LIRR bridges have low vertical clearance and are subjected to numerous strikes throughout each year, which further deteriorate bridges, cause widespread delays and service disruptions, and generate traffic on local roadways. To address this, an ongoing effort targets LIRR-owned low-clearance bridges which are frequently subjected to bridge strikes by trucks.

To address deferred investments in bridge painting, bridge drainage and waterproofing, the LIRR has included increased funding for these efforts. Several other bridge replacement and bridge renewal projects have been identified to target bridges with structural deterioration and/or bridges which are nearing the end of their service lives. By addressing 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.

Proposed 2020-2024 Capital Program - $343 million

At the completion of the proposed 2020–2024 Capital Program, 85% of structures and related components will be in a state of good repair.

Bridges – $269 million

Bridge rehabilitation and bridge replacement are the core of the Line Structures program with the proposed capital program including rehabilitation or replacement of up to ten bridges which address both railroad bridge and highway bridge investment needs. This includes replacement of the Cherry Valley Road Bridge which will have an increased vertical clearance, reducing the risk of oversized vehicles striking the bridge, and the replacement of the Webster Avenue Highway Bridge, one of the oldest highway bridges in the LIRR system, which is in deteriorated condition and is functionally obsolete. This bridge has been the subject of complaints from the community / elected officials. The new highway bridge will be built to the latest standards and will increase safety. The LIRR also will rehabilitate three bridges located in Brooklyn and five bridges in Nassau and Suffolk counties, all of which have poor structural ratings, renew concrete retaining walls on the Port Washington Branch, and demolish selected abandoned bridges in Queens, to enhance safety.

The LIRR will be looking to undertake a systemwide viaduct condition assessment by third party structural Engineers, followed by renewal and replacement of selected viaducts, based upon structural condition prioritization. A similar systemwide bridge assessment will be undertaken for all LIRR-owned bridges and associated line structures.

To address capital investment needs on bridges and viaducts, the LIRR will continue the bridge painting program established in the 2005-2009 program. The strategy for the 2020-2024 Capital Program includes undertaking painting (protective coating) on bridges and viaducts which recently have undergone rehabilitation, and which are beyond their targeted painting cycle. Addressing painting on these structures will protect the recently completed structural rehabilitation work and will prevent premature component deterioration due to weather elements. These bridge painting efforts have been deferred in the past. As the paint systems deteriorate further, the structures are susceptible to accelerated structural deterioration.

In addition to painting, drainage improvements and waterproofing are key elements of the LIRR's strategy. Drainage improvements will target track-level drains on bridges and viaducts which are no longer functioning as designed. Renewing and upgrading these drains will counteract the bridge deterioration caused by improper drainage. 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. Coupled with improved drainage, this serves to inhibit bridge component deterioration which can negatively impact the bridge's function and overall service life.

The LIRR also plans to demolish abandoned and out-of-service structures, including the Main Line Cut-Off and Montauk Cut-Off structures, as well as Cabin M Bridge, all in Long Island City.

Various construction contracts supporting the Line Structures program will be awarded through the MTA SBD Program. These will include bridge painting structural renewal initiatives.

Tunnels - $75 million

Over the past three capital programs, the LIRR has undertaken structural renewal / improvements on the Atlantic Branch in Brooklyn and Queens. This includes the full reconstruction of the Atlantic Avenue Viaduct and Nostrand Avenue station, along with advancing the renewal of the tunnel hatchways. The proposed 2020-2024 Capital Program will continue these efforts by addressing structural components of the Atlantic Avenue Tunnels. This includes completing the tunnel hatchway work (located between East New York and Jamaica), progressing reconstruction of deteriorated tunnel floor beams (located in Brooklyn between Washington Avenue and Bedford Avenue) and rehabilitating the Bedford Avenue Tunnel Portal. These improvements will support the operation of all LIRR train service to and from Brooklyn. Also included are tunnel systems replacement and upgrades to include waterproofing, drainage, and lighting, as well as fire life safety systems.

Long Island Rail Road
Communications and Signals
Category L-805

The LIRR has a diverse set of Communications and Signals assets, which directly support the effective and safe operation of daily railroad service. The fiber optic network is the heart of the Communications assets and it serves as the backbone for LIRR Communications operations through the support of many railroad systems. This includes the signal system, power substations, ticket vending machines, station-based public-address systems, and numerous other functions. Communications has a wide expanse of assets, including radios and radio hardware, public address systems at stations, and various alarm systems.

The primary focus of the Communications projects is to address state of good repair and cyclical normal replacement of assets such as communications poles, communications component replacement, and the fiber optic network. In addition, projects have been identified to improve customer communication and dissemination of information.

Prioritization was based primarily on addressing LIRR's inventory of assets which have continued to operate beyond their designed life span, which are experiencing poor reliability, and which require frequent repairs/maintenance. Currently, 21% of LIRR's Communications assets are not in SGR. This program will address 3% of the Communications SGR backlog.

The LIRR has numerous types of signal systems, ranging from the recently installed state-of-the art signal technology on the Montauk Branch between Speonk to Montauk, to obsolete legacy systems installed during the Pennsylvania Railroad-era. Across the LIRR network, there are 485 miles of main line signal equipment.

Proposed 2020-2024 Capital Program - $364 million

Communications – $75 million

Upgrading the fiber optic network and the cyclical replacement of communication pole lines and other communications components form the core of the Communications investment needs. Replacement and upgrades to radio system components, along with the radio head-end replacement, and improving radio coverage in-line with regulatory mandates are also key investments for Communications. Replacing and upgrading these assets directly supports daily train operations, as radio communications between train crew members, towers and the Movement Bureau in Jamaica are central in the daily dispatching and management of train movement. These radio investments support federal regulatory requirements, including both the FRA and the Federal Communications Commission.

The Communications investment strategy also includes the roll-out of Help Points at LIRR branch line stations and terminals, implementing new communications system technology, as well as station technology upgrades and the installation of new cameras at LIRR grade crossings. Finally, responding to feedback from customers, a new Customer Information Technology project has also been established. These investments will improve the safety, security and comfort of LIRR customers and will improve customer communication – addressing both communication needs on a day-to-day basis and during service disruptions/service changes.

Signals – $289 million

Signals projects will modernize and upgrade segments of LIRR's signal systems, bringing them in-line with the latest LIRR and industry standards. The upgraded signal systems and improved signal technology will provide for improved service reliability, greatly reducing the signal-related delays and service disruptions experienced along the Babylon/Montauk Branch and the Huntington/Port Jefferson Branch, two of the busiest branches within the LIRR.

Also, moving forward, the LIRR will look to replace and upgrade legacy signal equipment. Targeting one of the most critical needs for signal investment, the Babylon Interlocking Renewal project will replace and upgrade aging signal equipment near Babylon Station, including switches, signals, cables and other signal system components, completing an effort which was initiated in the 2015-2019 Capital Program. Babylon Interlocking serves a key role in delivering service to LIRR's busiest branch and the second busiest commuter railroad branch in North America. Babylon Interlocking has legacy signal technology, replacement of which has been deferred from past capital programs, and requires intensive maintenance and repairs.

The construction of a new signal system between Hunt to Post on the Port Jefferson Branch, which is being designed in the 2015-2019 Capital Program, will address replacement of the 1962 vintage signal system. Two new signal system designs will be undertaken during the 2020-2024 Capital Program to seamlessly progress the LIRR's signal strategy.

The Babylon to Patchogue project will upgrade and modernize the signal system within this segment of the Montauk Branch. This effort began under the 2015-2019 Capital Program. In conjunction with other capital projects which are underway or recently completed, this will provide for a modernized, automatic speed control signal system between Babylon and Montauk.

This proposed capital program will target some of oldest and least reliable signal systems across the LIRR. Currently, 53% of LIRR's signals are not in SGR. This program will reduce the backlog to 31%.

Another key area of investment within Signals is the implementation of CTC, which will enable the LIRR to monitor all trains from a centralized location improving operations, communications and the ability to respond to service disruptions. Additionally, a design effort will be undertaken for new interlockings and strategic sidings on the Montauk Branch (which will enable construction in a future capital program), signal improvements to Divide Interlocking in Hicksville will improve operational flexibility, and there will be continued investment in lighting protection upgrades and replacement.

In the Signals area, the LIRR will undertake a significant signal replacement program in the 2020-2024 Capital Program, which targets relays, cables, batteries, switch machines, huts, and signals for replacement and upgrading.

Long Island Rail Road
Shops and Yards
Category L-806

The LIRR currently has 25 shops and yards and 60 facilities. These include critical locations to inspect, repair, clean, maintain and store LIRR train equipment, as well as locations for the warehousing and storage of equipment and materials, train dispatching, crew report locations, and LIRR administrative facilities.

Upgrading and expanding Shops and Yards facilities is key to the ongoing delivery of LIRR service. Shops and Yards provide the locations needed to perform FRA inspections, while also allowing for critical fleet repair, maintenance and cleaning.

Priorities target shop equipment or shop components which are difficult to maintain and/or poorly performing, or where shop and yard facilities are inadequate to address current and future operational demands and service guidelines for interior and exterior train cleaning. Employee facility investments which address deficient conditions, enhance safety and worker productivity and code compliance issues, have also been prioritized.

Proposed 2020-2024 Capital Program - $203 million

Shops & Yards – $119 million

These Shops and Yards investments will support future service increases and planned fleet growth, while upgrading the facilities for undertaking critical fleet inspections, repairs, maintenance and cleaning, and thus supporting fleet reliability and maintaining interior and exterior fleet appearance. At the completion of 2020–2024 Capital Program, 65% of the LIRR's shops and yards will be in a state of good repair.

The LIRR looks to build upon ongoing investments in Morris Park and in Ronkonkoma to improve / expand the facilities available to maintain LIRR rolling stock. This includes the construction of new shop facilities to prepare for future fleet expansion and better address train cleaning cycles. Construction of new consolidated employee facilities, at key strategic locations, has also been identified as a driving need during this period (addressed in the next section).

In the Shops and Yards area, a series of Rolling Stock Support Equipment investments will include wheel truer upgrades and disposal systems, rail car movers, train wash renewals, and other equipment at various locations. A new Extraordinary Interior Cleaning platform in Ronkonkoma and yard improvements in Jamaica are also included, along with improvements to shop facilities in Hillside and West Side Shop. These investments replace shop facilities and

shop equipment which are poorly performing and difficult to maintain, to better support the maintenance of the LIRR's electric fleet at three of its most critical operating locations.

Also included is the second phase of enhancing Maintenance of Equipment facilities at Mid-Suffolk Yard in Ronkonkoma and progressing an environmental review for a new East End Maintenance Shop.

Additional Shops and Yards investments include Port Washington Track extensions, as well as design the replacement of the Morris Park Turntable. Mentor contracts will be awarded through the MTA SBD Program supporting execution of Shops and Yards projects.

Employee Facilities - $84 million

These projects will enhance the operational facilities for the LIRR's Engineering, Maintenance of Equipment, Stations, Transportation, and Training employees, addressing various structural, mechanical, electrical, plumbing and other systems within these employee facilities. This will enhance safety and operational efficiency, while also bringing facilities into code compliance.

For Employee Facilities, the investments include rehabilitation of Atlantic Terminal facilities, systems renewal at the Jamaica Corporate Building, and continued upgrades to fire protection systems at the Hillside Support Facility. Component renewal at numerous employee facilities in Nassau, Suffolk and Queens counties, and paving work at various locations targeting parking lots, sidewalks and roadways will improve employee safety and upgrade working conditions. This program will also include renewal of the Boland's Landing platform which is located at an employee-only station. Finally, construction fit-out of a new consolidated employee facility along with construction of improved space for signal employee training operations has also been included. Employee Facilities also includes an allowance towards third party contracts awarded under the MTA SBD Program.

Long Island Rail Road
Power
Category L-807

The LIRR's Power asset category includes 105 substations and 5 breaker houses, which control, regulate and convert traction power. Also included within the LIRR's power assets are various third rail system components, electric light and power assets (including lighting in station buildings, platforms, tunnels and yards), as well as high tension assets, including high tension towers, power poles and power lines throughout the LIRR's territory.

The most critical power investment need is the cyclical replacement of traction power substations. Over half of the LIRR's current inventory of substations were constructed in the early 1970s and have exceeded the useful life of 35 years

Proposed 2020-2024 Capital Program - $426 million

The proposed 2020-2024 Capital Program will replace as many as five traction power substations in Queens and Nassau County that have reached the end of their useful lives. These substations have been identified as priority needs, both due to their age and condition, as well as their critical location at high traffic locations. Candidate substations identified for priority replacement in this proposed program include Queens Breaker House, Rosedale, Murray Hill, Grand Avenue, Bayside, Jamaica, Winfield and Forest Hills.

The substation component project will complement substation investments by replacing key components including AC switchgear and transformers to extend the useful life of the substations.

By replacing substations and their components which are beyond their designed service life, the LIRR will enhance reliability and ensure that adequate traction power is available, particularly during AM and PM peak periods, when power demands are at their greatest. This will support reliable train service by avoiding stalled trains, slow-zones and train cancellations which become necessary during a substation failure. Investments planned for this capital program reflect the use of the design-build method to increase the number of power substations which can be replaced in a single five-year capital program.

In addition to replacing substations and substation components, the LIRR will also target various traction power components for replacement and upgrade. This includes cyclical replacement of cables, disconnect switches, protection board, and third rail, along with replacement of negative reactors, substation batteries, DC relay controls, 4,160-volt feeders, signal power motor generators, and both signal power and power pole lines systemwide. Also, yard lighting and amenities will be addressed at Hillside Yard and other priority locations.

Power investments also include completing the final phase of the Atlantic Avenue Tunnel Lighting replacement / upgrade between Dunton and Woodhaven and the replacement of station and building electrical systems and platform lighting. Older style platform lighting will be replaced with new LED lighting, thereby bringing approximately four station locations up to the latest LIRR lighting standards and enhancing customer safety and security. These station lighting replacement efforts will be coordinated with other investments taking place at stations, to deliver upgrades in a cost-effective and efficient manner, as well as to minimize customer disruption.

Currently the LIRR's power SGR backlog is 52% and the identified investments will address 6% of the overall backlog.

The electrification of the Central Branch - a single track diesel-only branch between Bethpage and Babylon which connects two of the LIRR’s major branches (the Main Line and the Babylon Branch) - is a leading priority for this capital investment period. This modernization investment will improve LIRR operations and reliability by allowing for rerouting of trains to mitigate delays and cancellations.

Long Island Rail Road
Miscellaneous
Category L-809

The LIRR's assets within the Miscellaneous category includes Security assets such as CCTV security cameras, access control devices, perimeter hardening infrastructure, and other security systems.

Proposed 2020-2024 Capital Program - $231 million

LIRR Security investments identified include security camera replacement systemwide - replacing obsolete camera technology with the latest industry standards, along with improvements to access control and physical perimeter hardening at key locations, such as stations, yards, and employee facilities. Additional Security investments include equipment upgrades for three security command centers, a modern centralized video storage solution system, and a physical assessment of the LIRR right-of-way to enhance security. A project to enhance security in the Atlantic Avenue Tunnels in Brooklyn and Queens has also been identified. These projects will serve to enhance the security of LIRR customers, employees and the general public.

Finally, an allowance for future environmental remediation, along with projects for program administration, insurance, Enterprise Asset Management (EAM), program development, the LIRR's contribution to the MTA's Independent Engineer and administration of the SBD Program are also included within this category.

Metro-North Railroad

MTA Capital Program 2020-2024

Asset Base – Metro-North Railroad

Exhibit 12
Selected Metro-North Railroad Assets*

Category	Count	Asset
Rolling Stock	630	Electric-Powered Railcars
	225	Push-pull Coaches
	58	Locomotives
	16	Buses
Passenger Stations	85	Stations
Track	549	Miles of Mainline Track
	618	Mainline Switches
Structures	346	Overhead Bridges
	455	Undergrade Bridges
	9	Tunnels
	4	Viaducts
Signals and Communications	512	Signalized Track Miles
Power	59	Substations
	254	Track Miles of Third Rail Power
Shops & Yards	11	Shops and Yards

**Only includes assets in New York*

Overview – Metro-North Railroad

Metro-North Railroad is one of the largest commuter railroads in the country, carrying over 86.5 million riders in 2018 on the Hudson, Harlem and New Haven Lines (NHL) 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 85 stations in New York State and carries 290,000 passengers on an average weekday on over 750 trains.

Beginning in 1982 with the first MTA Capital Program, Metro-North has made 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. Targeted investments in our infrastructure have had a dramatic effect on our service reliability: on-time performance has surged from 80% in 1983 to 94% in 2019. Providing a more reliable, robust train service has attracted additional customers. Indeed, today Metro-North provides service to more than double the 42 million annual riders it carried in 1983.

As Metro-North strives to maintain its accomplishments and provide reliable service to growing and changing customer demands, its aging infrastructure is straining to meet service and capacity demands. Metro-North's investments in previous capital programs helped to restore the critical basic infrastructure elements of a system in disrepair; however, key assets remain largely as originally built and have met or exceeded the end of their useful life. Significant work remains on some vital aging assets that have deteriorated past the ability to continue with routine maintenance and must be substantially repaired, rehabilitated or replaced, such as the 125-year-old Park Avenue Viaduct, the 106-year-old GCT trainshed and the over 110-year-old Moodna and Woodbury viaducts on the Port Jervis Line.

Metro-North's investment strategy and strategic priorities proactively respond to growing ridership, changing demographics, and the evolving needs of our customers. The plan places emphasis on improving safety for customers and Metro-North's workforce, improving communication between the railroad and customers, improving the customer experience and investing in critical infrastructure. A strong, stable funding stream from the multi-year capital program is essential for Metro-North to maintain and improve its assets and meet these goals. Much progress has been made over the years protecting past investments and providing targeted improvements that resulted in increased ridership. However, the SGR needs of Metro-North's infrastructure remain significant and require investment to preserve the accomplishments of past years and allow Metro-North to continue to meet the needs of its customers today and in the future.

Proposed 2020-2024 Capital Program - $3.558 billion

Metro-North proposes investments totaling to $3.558 billion for the 2020-2024 Capital Program to address critical priority projects within New York State and demonstrate the agency's ongoing commitment to promote safe and reliable service to our customers (Exhibit 13). As detailed in the asset category summaries provided in later sections, key investments of the 2020-2024 Capital Program include: procuring new rolling stock; renewing stations and providing accessibility improvements for our customers; installing signal and power system upgrades; and repairing, rehabilitating and replacing some of Metro-North's expansive network of bridges, viaducts and other structures throughout its territory, including two multi-phased, multi program major projects to replace the GCT Trainshed and the Park Avenue Viaduct. Funds are also allocated to provide for miscellaneous program costs to support these activities, including Metro-North's allocation of $66 million for mentoring projects to help meet MTA SBD Program goals.

Exhibit 13 details the proposed 2020-2024 Capital Program by asset category and percentage of overall program.

Exhibit 13
Metro-North Railroad Proposed 2020-2024 Capital Program by Category
($ in millions)

Category	Proposed 2020-2024	Percent
Rolling Stock	$853	24%
GCT, Stations and Parking	1,129	32%
Track and Structures	1,021	29%
Communications and Signals	182	5%
Power	202	6%
Shops and Yards	23	1%
Miscellaneous	148	4%
Total	**$3,558**	**100%**

Numbers may not total due to rounding

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).

New rolling stock will be purchased to help support fleet reliability and service capacity. Improvements to traction power and communication and signal systems will be implemented to help ensure continued service reliability and allow for future capacity improvements in key segments of the system. The program also includes renewals or repairs to some outlying stations, as well as select accessibility improvements. To address the extensive SGR needs of its aging infrastructure assets, while making capacity improvements to increase service for its growing ridership, Metro-North has prepared an investment strategy which balances the railroad's replacement and rehabilitation needs, across multiple asset categories, allowing for the greatest needs to be addressed first. The largest expenditure areas address Metro-North's major structural needs, such as the multi-phased, multi-program initiatives to bring the GCT trainshed to a state of good repair, replace the Park Avenue Viaduct, and progress critical rolling stock procurements, while also advancing other SGR infrastructure work throughout the system, promoting and ensuring the safety and reliability of the railroad.

Key projects of the proposed 2020-2024 Capital Program include:

Rolling Stock Investments

- Commence the replacement of the M-3 electric multiple unit fleet that will exceed its expected useful life in 2020;
- Complete the new locomotive purchase to address reliability challenges for East of Hudson service, initiated in the 2015-2019 Capital Program.

Safety Critical and State of Good Repair Projects

- Significant investment in the GCT trainshed – Begin construction to replace the first critical sector of the trainshed and advance design work for the next sector;
- Progress the first phase of the multi-phased replacement of the Park Avenue Viaduct including: in-depth inspections, design work and the initial construction phase;
- Undertake important safety enhancements in the Park Avenue Tunnel;
- In West of Hudson territory, perform prioritized repairs to the over 100-year-old Moodna and Woodbury viaducts;
- Continue to progress Undergrade and Overhead Bridge programs to address significant state of good repair backlog to maintain Metro-North bridges in a safe, serviceable condition by rehabilitating or replacing bridges at prioritized locations;

- Continue the annual programs to replace track and switches throughout Metro-North territory in the State of New York;
- Complete the upgrade of the aging Hudson Line signal system from Croton-Harmon to Poughkeepsie;
- Construct two new substations on the Harlem Line and replace three existing substations on the NHL;
- Begin the first phase of the Brewster Yard improvements initiative by relocating and improving parking at the Southeast station, critical to allow for future expansion of the yard.

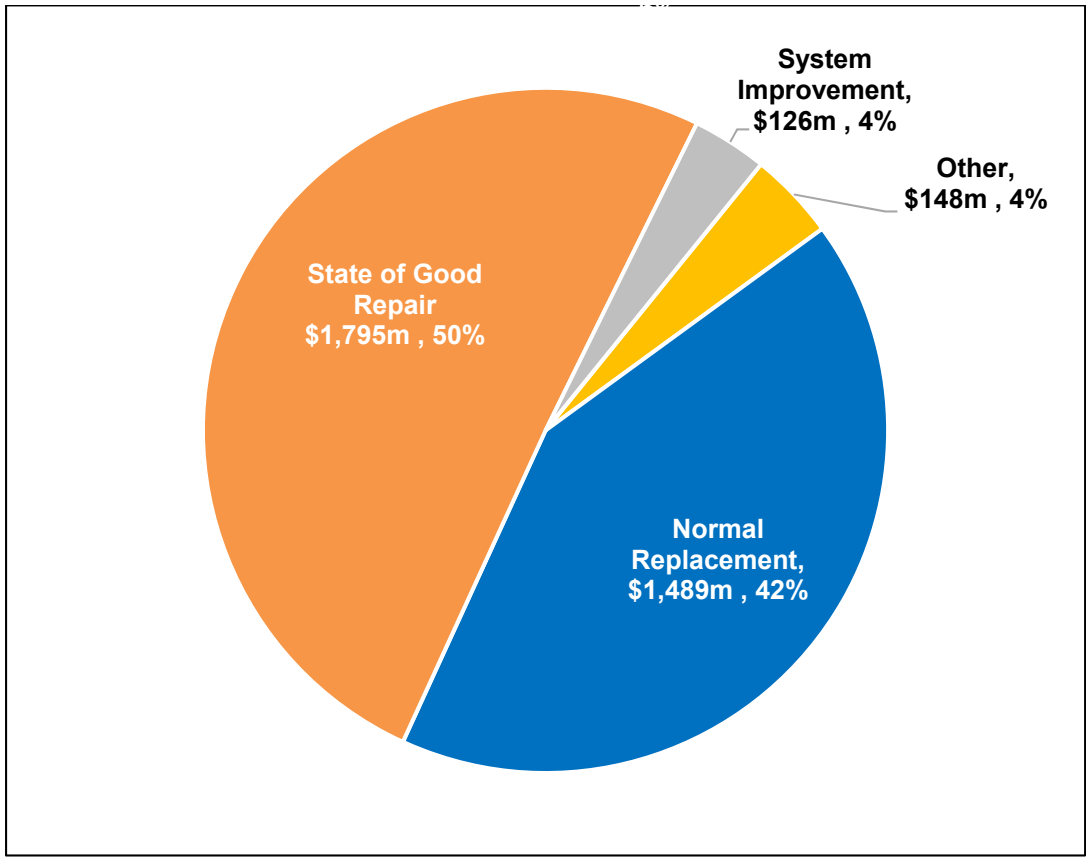
Customer Experience Improvements

- Accessibility improvements at up to four stations on the Harlem and Hudson Lines;
- Renew select stations on the Harlem line including platform replacements, canopy repairs and new customer amenities;
- Infrastructure investments to enable West of Hudson service improvements for our Port Jervis Line customers.

System Condition

Exhibit 14 illustrates the mix of investments by needs category in the proposed 2020–2024 Capital Program. The program continues Metro-North's emphasis on SGR and NR investments with 92% of the program dedicated to these efforts, including replacing rolling stock and rehabilitating/replacing sections of the GCT trainshed and the Park Avenue Viaduct. Another 4% of the program is for SI investments to improve the system, highlighted by capacity improvements on the Port Jervis Line.

Exhibit 14
Metro-North Railroad Proposed 2020-2024 Capital Program by Needs

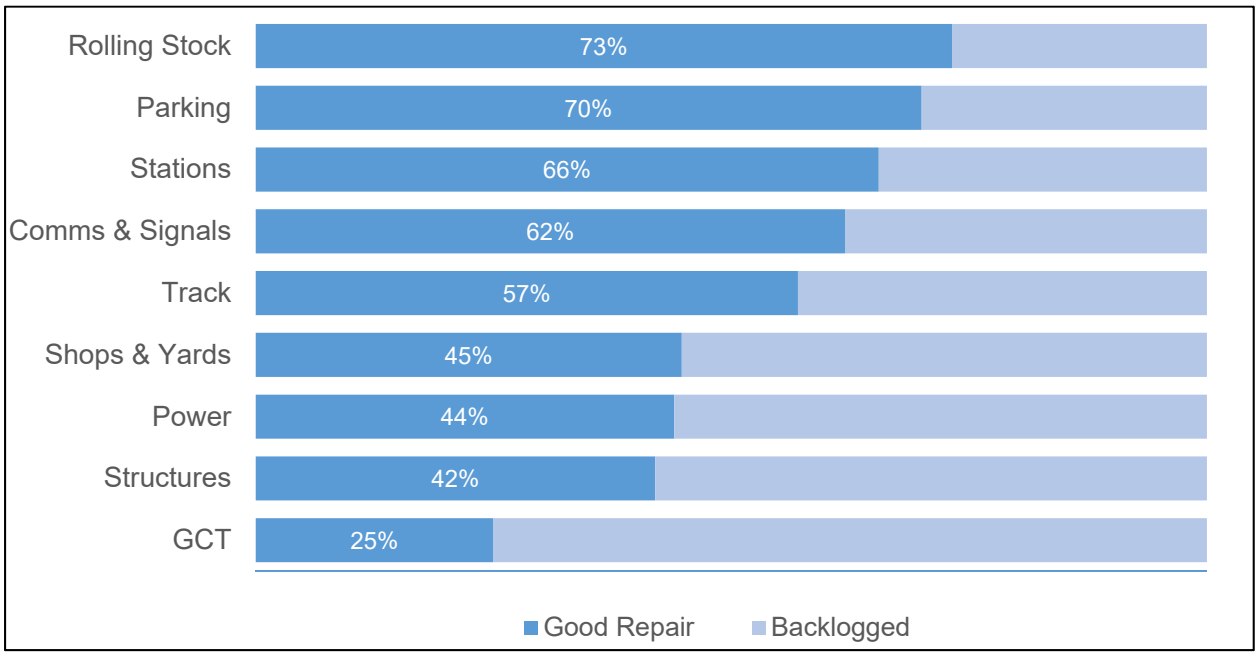


The System Investment Status (Exhibit 15), as developed for the Capital Needs Assessment, indicates the level of SGR backlog by asset category. Metro-North evaluated the assets that comprise its vast infrastructure based on one or more of three attributes:

- Asset condition;
- Asset age versus useful life;
- Asset performance versus an identifiable performance standard (including safety and reliability).

Historically, each asset category includes assets that are not in a state of good repair. As part of the Capital Needs Assessment effort, Metro-North transitioned to this methodology which shows non-SGR assets in terms of a backlog percentage, as opposed to only those that have historically been considered not in SGR, thus providing a greater level of detail as SGR status is shown for all asset categories.

Exhibit 15
System Investment Status
Metro-North Railroad



The investment strategies of the 2020-2024 Capital Program balance SGR needs with other factors, such as customer convenience, capacity, regulatory requirements, and technical obsolescence. However, for those categories with significant non-state of good repair assets, the work to restore assets is prioritized, as many have exceeded their expected useful life. A continued level of investment across all asset categories is required to avoid a compounding growth in SGR backlog.

Metro-North Railroad
Rolling Stock
Category M-801

The fleet of electric cars, coaches, and locomotives are fundamental to the delivery of commuter rail service for our customers. Cars must be replaced on a regular schedule to keep service reliable. In addition, the number of cars must increase to accommodate growing ridership. Currently, Metro-North's revenue fleet totals 1,300 units. This includes 208 push-pull coaches, 943 electric cars, 53 locomotives, and 16 buses for East of Hudson service, as well as 15 locomotives and 65 coaches for service on the Port Jervis and Pascack Valley Lines (operated by New Jersey Transit). East of Hudson, the New York owned cars total: 160 push-pull coaches, 630 electric cars, 43 locomotives and the 16 buses. Connecticut-owned Metro-North operated cars total 48 push-pull coaches, 313 electric cars and 10 locomotives.

The proposed 2020-2024 investments support the basic strategic goal of modernizing the aging fleet to improve overall fleet performance, as existing fleets experience significant decreases in reliability due to condition, age, and parts obsolescence. Mean Distance Between Failure (MDBF) is an industry standard that measures the mechanical reliability of the fleet by tracking the mean distance between breakdowns or failures. A mechanical failure is any incident that precludes a revenue vehicle from completing its trip or beginning its next scheduled trip. As cars reach obsolescence, their reliability drops rapidly. Newer car design standards add passenger amenities and enhanced safety features on board including positive train control (PTC) equipment. Finally, passenger car replacement purchases are sized to accommodate projected ridership growth in their service territory until the next generation of vehicles are due for replacement

Proposed 2020-2024 Capital Program - $853 million

Rolling Stock investments align with these goals by prioritizing the worst performing fleets, factoring in age and obsolescence. The proposed 2020-2024 Capital Program allocates $853 million, or approximately 24% of the total capital program budget, to investments in this category.

The current 140-car M-3 fleet was originally built in 1984 and the cars will begin to exceed their useful life in 2020. These cars typically serve customers in electrified territory on the Harlem Line from GCT to Southeast and on the Hudson Line from GCT to Croton-Harmon. Since 2015, the annual MDBF of this fleet has decreased by more than 30% and the out of service rate has nearly doubled. Balancing this need for new cars with the needs of the rest of the system and available funding, Metro-North will replace the worst-performing units in the 2020-2024 Capital Program and continue in the next capital program to replace the remainder of the existing M-3 fleet, and provide for growth.

Metro-North operates a fleet of 27 Genesis dual-mode locomotives in New York State East of Hudson territory. Metro-North will complete the replacement of the Genesis dual-mode locomotive fleet, which provides East of Hudson service, most prominently in the Upper Hudson Line territory between Croton-Harmon and Poughkeepsie, as well as the Upper Harlem Line between Southeast and Wassaic. This locomotive fleet has been plagued by maintenance challenges due to failing car bodies, truck issues, and increasing parts obsolescence. Since 2015, the annual MDBF of this fleet has decreased by 50% with the out of service rate up by nearly 50%. Metro-North is progressing a base order to begin replacing these locomotives in the 2015-2019 Capital Program with the remainder of the Genesis locomotives to be replaced in the 2020-2024 Capital Program.

Metro-North Railroad
Grand Central Terminal, Stations & Parking
Category M-802

Metro-North has 85 passenger stations including GCT, with 74 stations east of the Hudson River and 11 stations west of the Hudson River. These stations connect our communities with the rail network, providing safe, convenient access between Midtown Manhattan and the surrounding counties north and west of New York City. Over the last decades Metro-North has made significant investments to transform the station area to meet the changing needs of its customers, including improved customer information (both audio and visual), new amenities and conveniences such as shelters and station buildings, elevators and ramps to provide greater accessibility, and expanded parking and intermodal connections. Since Metro-North's creation in 1983 ridership has doubled, a result of a 40% service increase, nearly a 24 hour/day operation and the development of a robust reverse peak commute and significant off-peak discretionary travel occurring at all hours throughout the day and night.

GCT in the heart of Midtown Manhattan is a designated New York City Landmark and listed on the National Register of Historic Places. The 100+ year old facility is a complex consisting of the terminal building plus a multi-level, subsurface trainshed spread over 75 acres, including 44 operating tracks, 47 platforms and a myriad of utilities and conveyance systems. Directly north of GCT the Park Avenue Tunnel extends 2 miles under city streets from 56th Street to 97th Street in Manhattan. Over a century old, this critical tunnel carries all Metro-North customers to and from Midtown on the Hudson, Harlem and New Haven Lines.

Over 81% of all Metro-North customers travel by way of GCT and millions of annual visitors enjoy its retail shops, restaurants and ambience. To continue providing service for our customers and visitors, and as responsible stewards of the historic terminal, Metro-North takes a balanced approach to prioritize the most critical of its vast array of structural, architectural, utility, safety and security needs, to progress much needed state of good repair investments.

Currently many outlying stations need significant investment to replace aging components such as platforms, canopies, overpasses and stairs, or rehabilitate or add new elevators and ramps for improved accessibility. Investments in this asset category seek to address the highest priority state of good repair or normal replacement station needs, ensuring customer and employee safety and improving the customer environment. A combination of station renewals and component-based repairs are used to address the most deteriorated asset conditions, while accessibility improvements focused on stations not currently considered fully wheelchair accessible allow for safe, convenient use of the rail system for all our customers.

Parking investments improve access to the system by expanding and/or repairing existing facilities, and constructing new facilities in strategic locations. Metro-North continues to leverage

opportunities for local partnerships, including Transit Oriented Development, to improve access to transit and maintain the rail service as a lifeline to the region and New York State residents.

Proposed 2020-2024 Capital Program - $1.129 billion

Central to the investments for the GCT, Stations, and Parking asset category of the proposed 2020-2024 Capital Program is a significant investment to the GCT trainshed and the Park Avenue Tunnel, both structures constructed over a century ago. Metro-North will also continue to aggressively invest to address the critical needs of the historic GCT terminal building, as well as its program to enhance the customer environment and improve safety at its outlying stations and parking locations throughout Metro-North territory in New York State. Investments to outlying station and parking assets will address deteriorating elements and maintain station assets in a state of good repair, including repairs to station buildings, platforms, overpasses and underpasses, while providing accessibility improvements at select locations.

The proposed 2020-2024 Capital Program allocates $1.129 billion, or approximately 32% of the total capital program budget, to investments in this category.

GCT Renewal Projects - $651 million

The GCT complex consists of two underground train platform levels with 47 platform tracks 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 GCT 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.

The less visible GCT trainshed is the operational backbone of Metro-North's train service, with more than 700 daily trains carrying over 200,000 riders in and out of Midtown Manhattan. Metro-North is planning aggressive investments to address critical SGR needs of the GCT trainshed. A recent study identified areas of significant degradation of the GCT trainshed roof and its supports due to water and salt intrusion from Park Avenue and other areas over decades. Addressing the deteriorating condition of the trainshed is critical to operating one of the busiest passenger railroads in the country. Priority repairs continue to preserve safe operations, but the deteriorating condition of the trainshed has reached the point where critical elements of this over 100-year-old structure needs to be replaced. To minimize the impact on train service, the trainshed will be replaced in sections over several phases, with critical construction work undertaken in the first section while design work prepares Metro-North for construction of the next section to be completed as part of the 2025-2029 Capital Program. Investments in the trainshed address structural integrity and help to lower the risk of train service disruptions. The Park Avenue Tunnel project will construct four additional emergency exits in two new locations,

improving egress from six to ten exits along in this critical tunnel running under the streets of Manhattan.

The ongoing renewal of the historic GCT building will continue in the proposed 2020-2024 Capital Program including completing escalator replacement in GCT North, replacing a key freight elevator in the terminal, replacing GCT fire and sprinkler standpipe infrastructure, repairing leaks in the terminal building, renewing elements of the vast systems of utilities in GCT and allocating funds for the MTA SBD Program.

Outlying Stations Projects - $340 million

Stations between Botanical Garden and North White Plains will be considered for renewal investment based primarily on the severe deterioration of the hollow core platforms initially constructed in the 1980s, and balanced with service level and track outage requirements, resource constraints, and other work within this segment. Station upgrades may include new platforms, new lighting, improved customer information systems, new platform canopies, and modernized passenger waiting areas.

Mobility access for customers will be improved at up to three stations on the Lower Harlem Line and at Ludlow on the Hudson Line. Work targeted for this investment will also balance service, outage and resource constraints. Upgrades may include new elevators and/or ramps. Following the completion of accessibility improvements in this program, 93% of Metro-North riders will use stations with full wheelchair access.

Priority component repairs at select stations along the Upper Hudson and Upper Harlem Lines will improve the condition of these stations and provide an enhanced customer experience, including station repairs such as platforms and edges, railings, and stairs.

In cooperation with its operating agencies, the MTA is developing OMNY, an MTA-wide, integrated fare payment system. As part of this effort, the machines and equipment serving Metro-North’s current ticket selling system, which has surpassed its useful life, will be replaced as part of the New Fare Payment Equipment project. Component investments in stations are also planned to be undertaken as part of the MTA SBD Program.

Parking Projects - $138 million

The Brewster Yard Improvements – Southeast Parking project will improve parking at the Southeast Station by relocating, upgrading and expanding the existing parking to a new parking structure east of the existing station. The project includes an access route from existing roadways as well as numerous other passenger amenities, such as a pedestrian bridge from the parking facility to the platform, an intermodal area for connecting services, upgrades to the existing station overpass/elevator, and convenient Kiss & Ride drop-off/pick-up zones within the

parking facility. The new garage will replace surface parking spaces on the western side of the station that must be relocated to make room for the critical northern expansion of Brewster Yard in a future capital program. The future yard expansion is essential to accommodate additional and longer trains, and to improve future capacity on the Harlem Line in conjunction with power, signal, third track and fleet improvements. Component investments in parking assets are also planned to be undertaken as part of the MTA SBD Program.

Metro-North Railroad Track and Structures Category M-803

There are 386 route miles and 791 track miles (490 electrified) that constitute the Metro-North system in New York State and Connecticut. Of that, 549 mainline track miles and 618 mainline switches are in New York State, including GCT. The ongoing renewal of track assets and the surrounding right of way elements such as rock slope, retaining walls, and fencing, is essential to providing customers with a safe, reliable, and comfortable ride. To accomplish this, Metro-North utilizes a variety of means and methods to assess the condition of the system, including automated geometry inspection equipment which is installed on trains and takes measurements throughout the system. Inspections detect issues ranging from metal fatigue inside the steel running rails and deterioration in concrete and wood ties to vertical clearances and third rail/catenary condition. These efforts inform a cyclical program of track and turnout renewals and replacements that maintain track structure components and switch facilities in proper operating condition.

Metro-North service territory includes a substantial inventory of bridges and tunnels, nearly 50% more than on the LIRR. There are 493 overhead bridges that cross over Metro-North, 346 in New York State and 147 in Connecticut. Additionally, there are 455 undergrade railroad bridges in New York State and 198 in Connecticut which carry Metro-North, Amtrak and freight service. These structures include six moveable bridges and three over-100-year-old viaducts: Park Avenue Viaduct, the Moodna Viaduct and the Woodbury Viaduct. There are nine tunnels within New York State territory that allow trains to travel through rock cuts along the Hudson River and through a mountain in Otisville, New York. Like track, the continued integrity of line structures along the railroad right-of-way is vital to its smooth and safe operation. Metro-North has an established process for monitoring, rating and prioritizing bridge condition and corrective actions, utilizing a bridge management system to catalog a variety of inventory, load and condition data on these assets. Inspections are conducted both by Metro-North forces as well as third party consultants to help inform the recommended treatment for structures throughout the system.

The long-term objective of investments in this area is to achieve a state of good repair for track and structures. The large volume of structures with high level of need in this asset category is attributable to the age and condition of the track and structures in Metro-North’s service territory. One major area of investment is the replacement of the aging and deteriorating 125-year old Park Avenue Viaduct, which carries all East of Hudson service into Midtown Manhattan. On a typical weekday, this 1.8 -mile, 4-track structure delivers 83% of Metro-North customers into GCT, which serves over 200,000 daily riders on over 700 trains. West of Hudson, the over 100-year-old Woodbury and Moodna viaducts must continue with a significant priority repair program

to help preserve safe train operations. In addition to the major infrastructure work on Metro-North's viaducts, the Undergrade and Overhead Bridge programs continue for all East of Hudson lines, addressing prioritized assets from the significant SGR backlog, while maintaining bridges in a safe and serviceable condition. Other investments include a bridge preservation program to help slow the pace of deterioration, priority repairs to Hudson Line tunnels and rebuilding retaining walls along the right of way.

Proposed 2020-2024 Capital Program - $1.021 billion

The proposed 2020-2024 Capital Program allocates $1.021 billion, or approximately 29% of the total capital program budget, to investments in this category.

Track - $262 million

Track investments provide for the replacement of ties and rail along with cyclical rail surfacing on the Hudson, Harlem and New York portion of the NHL to ensure that Metro-North's track is maintained and so that the track structure does not deteriorate, ensuring conformance to FRA track standards. This includes continuing the phased replacement of 119 lb. rail to maintain a safe right-of-way, and improve performance, reliability and condition. Additionally, this program provides for the replacement of interlocking switches and turnouts at locations throughout the Metro-North territory in New York State as switches and turnouts reach the end of their useful life. In select locations, turnouts are replaced with high-speed turnouts to help reduce travel time for Metro-North customers and provide greater flexibility for the railroad. In GCT, the cyclical replacement of switches and stick/jointed rail in the platform areas continues in this program as well to keep pace with the high volume of traffic and tight configuration within the terminal, accelerating the wear of the switches. These investments help maintain a state of good repair for Metro-North track assets, so that service may operate reliably.

Other investments in this element help preserve the track right-of-way, supporting safe and reliable service for Metro-North passengers on the East of Hudson lines. This includes continuing the multi-phased rock slope remediation program to stabilize rock slope at priority locations in Metro-North's East of Hudson territory on all three lines, as well as the phased rebuild of the retaining wall near the Marble Hill Station on the Hudson Line. At this location the right-of-way is set into a cut and the retaining wall supports the surroundings and assures the stability of the right-of-way. Inspections have identified deteriorated sections, requiring rebuild. Metro-North also operates a fleet of Maintenance of Way Equipment that assists in maintaining track, ensuring that the physical plant does not deteriorate and that track and related infrastructure are maintained. More than 80% of this non-revenue fleet has either reached or exceeded its useful life benchmark. Maintenance of Way Equipment items will be replaced in this program on a priority basis.

Additional projects in the proposed 2020-2024 Capital Program for track include investments to maintain the system infrastructure as safe and reliable. Work includes cyclical insulated joints, turnouts for yards and sidings and drainage improvements along the right of way.

Structures - $573 million

A critical investment in the Structures element is the project to begin the multi-program, multi-phased replacement of the deteriorated 125-year old Park Avenue Viaduct, which carries all East of Hudson service into Midtown Manhattan. Following a fire in May 2016 which caused the viaduct to be severely damaged resulting in significant delays to service, Metro-North completed a thorough condition assessment of the entire structure which identified areas in urgent need of replacement. The 2020-2024 Capital Program will advance the first phase to replace critical sections of the existing viaduct that will improve its reliability and lower the risk of service disruptions. Replacement of the Park Avenue Viaduct will continue in subsequent capital programs. Investments in undergrade and overhead bridges on all three East of Hudson lines also continue in this program. The focus 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 Undergrade Bridge Program includes the design and/or repair or replacement of undergrade bridges at priority locations on the Hudson, Harlem and New Haven Lines. The idge program includes the design and/or repair or replacement of bridges at priority locations primarily sited on the NHL in New York State. Metro-North will continue its work to undertake intensive coordination of track outages amongst multiple ongoing capital projects to maximize outage opportunities.

Other structures' improvement projects to maintain reliability and that contribute to progress towards a state of good repair include Railtop Culverts, Bridge Walkways, Replace Timbers on Undergrade Bridges, Hudson Line Tunnels Inspection, and Right-of-Way Fencing. Component investments in structures are also planned to be undertaken as part of the MTA SBD Program.

West of Hudson Infrastructure - $187 million

A critical investment West of Hudson is the project for priority repairs to both Moodna and Woodbury viaducts, vital to allow for continued safe train operations on the Port Jervis Line. In addition, Metro-North will build upon the 2015-2019 Capital Program efforts to evaluate ways of improving service for West of Hudson customers, such as the use of passing sidings and a new midpoint yard to provide capacity improvements on the Port Jervis Line. Phased investments will support future additional off-peak and reverse peak passenger service on the line. Projects in this program will include the design and construction of a new passing siding near Tuxedo. At the same time, Metro-North continues to make SGR investments to address the deteriorated West of Hudson infrastructure, including the cyclical program to maintain track

assets, undergrade bridge repairs and rock slope remediation. Component investments in structures are also planned to be undertaken as part of the MTA SBD Program.

Metro-North Railroad
Communications and Signals
Category M-804

There are 512 total signaled track miles in the Metro-North system in New York State, including 86 track miles on the Port Jervis Line west of the Hudson River in New York. The signal system includes 450 miles of cable transmission systems, 100 centralized control systems, and a 328 route-mile signal network. Communications and Signals (C&S) assets are essential elements of rail infrastructure and among its most safety-critical systems. Their impact on delivery of rail service is fundamental to meeting Metro-North's safety and on-time performance goals, as well as providing improved customer service, information and security. As C&S asset components get older, failures occur more frequently and can require time-consuming troubleshooting, excavation and repair work, resulting in associated delays to train service. In some cases, the age of the system is such that parts are no longer available, requiring Metro-North to develop alternative solutions to restore the system to full operation. Through regular inspections, Metro-North collects a variety of data, including inspection of switches, interlockings and grade crossings. Incidents are entered in the Chief's Log and managed by a trouble desk used to inform the scheduling of maintenance activities as well as planned capital investments.

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, address critical obsolescence issues, and provide compatibility for future needs. Metro-North has devoted substantial resources in previous capital programs for the installation of a PTC system to meet the critical FRA safety mandate. With the completion of the PTC system installation, the multi-phased replacement of signal power and communications infrastructure, started in previous capital programs, will resume in the 2020-2024 Capital Program, prioritizing the most deteriorated/obsolete assets as well as those that have either reached or exceeded the end of their useful life.

Proposed 2020-2024 Capital Program - $182 million

The proposed 2020-2024 Capital Program allocates $182 million, or approximately 5% of the total capital program budget, to investments in this category. This includes the Harmon to Poughkeepsie Signal System. The existing wayside signal and communication systems and infrastructure located on the Hudson Line from Croton-Harmon to Poughkeepsie have reached the end of their useful life. This program will continue the 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. In addition, priority component investments will address needs and obsolescence in Metro-North's Communications Infrastructure System (CIS), which consists of 41 node houses serviced by a core ring covering

the entire NHL, Hudson Line, Harlem Line, Grand Central Kit room, Mott Haven, Beacon Line, Waterbury Branch, Danbury Branch, and New Canaan Branch. The system is based on Dense Wave Division Multiplexing (DWDM) architecture and the communication infrastructure supports telephone services, radio, CTC, Supervisory Control and Data Acquisition (SCADA), Public Address (PA), fare collection, security services and Corporate Information Technology requirements. These high-technology assets are critical to reliable system operation.

Other communications and signals projects include PBX Replacement, Voice Recorder Replacement, Station PA System, Radio Systems, Fire Alarm and Suppression Systems, CCTV, Grade Crossing Improvements, Hot Box and Dragging Equipment, Replace High Cycle Relays, and Track Circuit Reliability.

Metro-North Railroad
Power
Category M-805

There are 386 route miles and 791 track miles that constitute the Metro-North system in New York State and Connecticut. Of that amount, 490 track miles are electrified with 254 track miles of DC 3rd rail power and 236 track miles of AC catenary power (192 miles are owned by Connecticut Department of Transportation). Metro-North's power infrastructure is comprised of traction power and auxiliary power systems. The power supply for this system in New York State includes 49 DC substations, seven AC substations and three yard distribution systems. Sufficient traction power allows electric-powered cars to operate at an optimal performance level, achieving maximum allowable speeds and contributing to Metro-North meeting its customer focused reliability and on-time performance goals. Metro-North utilizes an inspection maintenance management system that provides inspection checklists and records to inform condition ratings of existing assets. To assess the capacity of the catenary and 3rd rail power systems, Metro-North factors in projected increases in service demand and an expanded electric fleet which has significantly greater power demands than when the territory was originally electrified.

The long-term objective of power investments is to maintain the condition of the existing assets and improve substation (third rail power) capacity, to support current train operations and future service expansion. Many of the components of Metro-North's traction power supply system are approaching or have passed the end of their useful life and require replacement. A key element of the investment needs is the construction of new, or replacement of existing, substations on all East of Hudson lines. Metro-North will also continue to replace third rail power components and motor alternators in signal substations. Without these vital investments, inadequate traction power can result in reduced speeds and affect the operating and mechanical characteristics of electric-powered railcars.

Proposed 2020-2024 Capital Program - $202 million

The proposed 2020-2024 Capital Program allocates $202 million, or approximately 6% of the total capital program budget, to investments in this category.

On the Harlem Line, Power Improvements investments in this program include constructing two new power substations that are needed to support current and future service levels on the Line, currently in design in the 2015-2019 Capital Program. Design for the next three new substations on the Harlem Line is also included in this program, to be constructed in future capital programs. These new substations are an integral piece of a strategy to improve reliability and capacity on the Harlem Line, along with future signal system upgrades; a future mid-Harlem 3rd track; and expanded, reconfigured shop facilities. NHL power investments include the construction of a

permanent substation at Pelham to replace the current mobile substation that has long exceeded its useful life. Two AC traction autotransformer power substations will also be replaced, located at Mamaroneck and Harrison in Westchester County, New York on the NHL. Design of these substations is included in the 2015-2019 Capital Program. On the Hudson Line, an allowance is included for the preliminary estimate to electrify Track 1 on the Hudson Line at select locations between Hastings and Croton-Harmon. The program to replace motor-alternator (MA) sets at all six Metro-North sites with a signal substation continues as well with one site to be designed and constructed.

Power investments also include replacement of deteriorated 3rd rail components adversely impacting reliability, such as insulators, brackets, snow melting equipment, reactors, bonds, and splice bars. Other projects include replacement of MA power supplies for signal power, substation rehabilitation, upgrade of NHL power feeders, replacement of signal power transformers and section switches and transformer rehabilitation work.

Metro-North Railroad
Shops and Yards
Category M-806

Metro-North owns and operates 11 shops and/or yard facilities system-wide, including three shops at yards (Brewster, Harmon and Highbridge), three yards East of Hudson (North White Plains, Poughkeepsie and Wassaic), two yards West of Hudson (Port Jervis and Woodbine), GCT, 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, to support the Reliability Centered Maintenance program, improve On-Time Performance, and ensure customers are provided with a safe, reliable and comfortable ride.

A recently completed study of Metro-North's facilities informs the many significant interrelated investment needs for Metro-North's shops and yards and related facilities, including supporting service expansion, train lengthening and yard improvements. The study defines the future needs of Metro-North's Harlem and Hudson Lines and includes the improvements required so that yard and shop facilities that are currently at capacity can accommodate the projected future needs. These proposed improvements will allow Metro-North to more efficiently support planned operations and service levels and this work will aid in prioritizing investments in future capital programs, necessary due to funding constraints.

Using this study as a roadmap, Metro-North will make readiness investments in this capital program to relocate the Southeast Station parking facility in support of a significant overhaul and expansion of its Brewster facility to occur in future capital programs. The existing Brewster yard is over capacity, restricting Metro-North's ability to meet projected ridership growth.

Proposed 2020-2024 Capital Program - $23 million

The proposed 2020-2024 Capital Program allocates $23 million, or approximately 1% of the total capital program budget, to investments in this category.

In this program, Metro-North will replace and upgrade the aged, deteriorated Automotive Fuel Systems located at Harmon, North White Plains, and Brewster. These assets have passed their useful life and no longer meet current environmental compliance codes, resulting in New York State Department of Environmental Conservation (DEC) notice of violation which mandates Metro-North to remedy these violations in a timely manner or face additional fines. Planning work needed for a new yard on the NHL to support existing non-Penn Station Access NHL service and operational needs is also scheduled to begin in this program. Component shops and yards investments are also planned to be undertaken as part of the MTA SBD Program.

Metro-North Railroad Miscellaneous Category M-808

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 2020-2024 Capital Program - $148 million

The proposed 2020-2024 Capital Program allocates $148 million, or approximately 4% of the total capital program budget, to investments in this category.

Metro-North has included allocations in this category to support two MTA-wide initiatives: administration and support for the MTA SBD Program and support for the MTA-wide Enterprise Asset Management initiative. Projects are included to support MTA managed insurance coverage for Railroad Protective Liability insurance and Owner Controlled Insurance (OCIP), as well as Metro-North scope development and program management and implementation costs.

MTA Bus Company

MTA Capital Program 2020-2024

Asset Base – MTA Bus Company

Exhibit 16
Selected MTA Bus Company Assets

Category	Count	Asset
Buses	668	Standard
	115	Articulated
	517	Express Coaches
Depots	8	Depots
	14	Bus Washers
	3	Paint Booths

Overview – MTA Bus Company

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. New York City owns three of the depots (College Point, Spring Creek and Yonkers) and leases the others from private owners.

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 several fundamental areas, making improvements in running times, crowding, service frequency, hours of service, and route structure. The agency also has instituted maintenance practices to improve fleet reliability. Complementing these efforts have been capital investments to modernize the fleet and improve facilities.

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

Proposed 2020-2024 Capital Program - $871 million

MTA Bus' proposed 2020-2024 Capital Program, totaling $871 million, provides the resources needed to restore, replace, and modernize significant portions of the agency's fleet and infrastructure. Exhibit 17 identifies these investments by asset category.

Exhibit 17
MTA Bus Proposed 2020-2024 Capital Program by Category ($ in millions)

Category	Proposed 2020-2024	Percent
Buses	$722	83%
Depots & Program Support	149	17%
Total	$871	100%

Numbers may not total due to rounding

Major Investments

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

Bus Fleet

The proposed 2020-2024 Capital Program includes $722 million to purchase a total of 874 new buses.

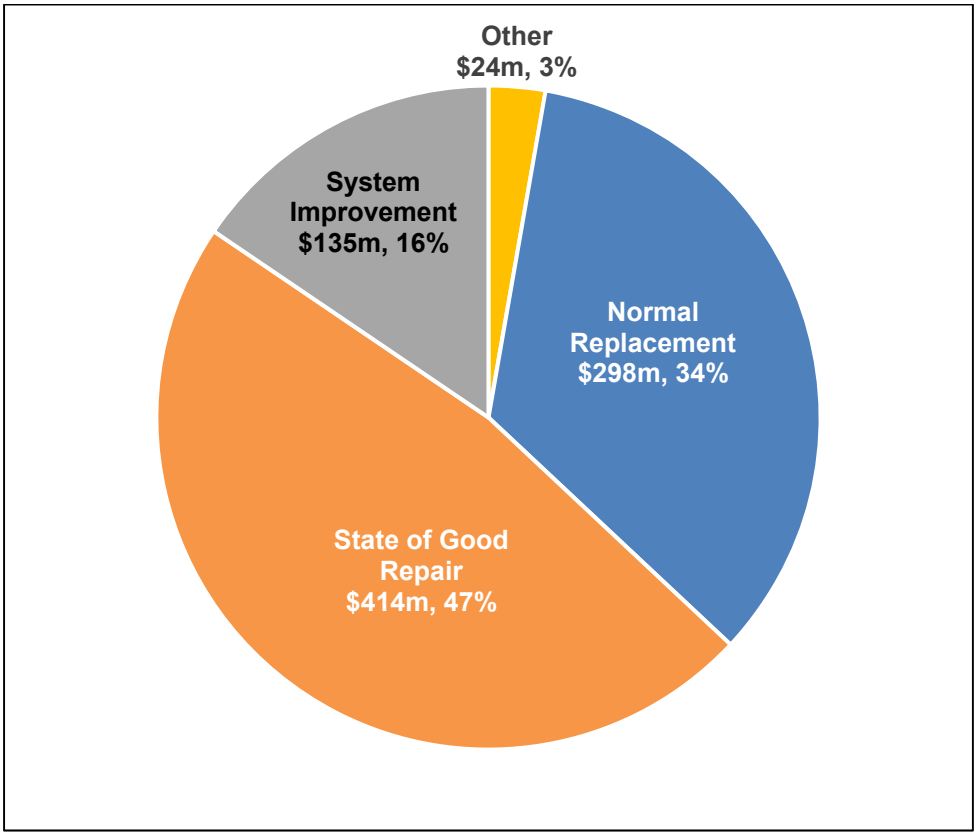
Facilities and Program Support

The proposed 2020-2024 Capital Program includes $149 million for facility and equipment investments and program support services.

System Condition

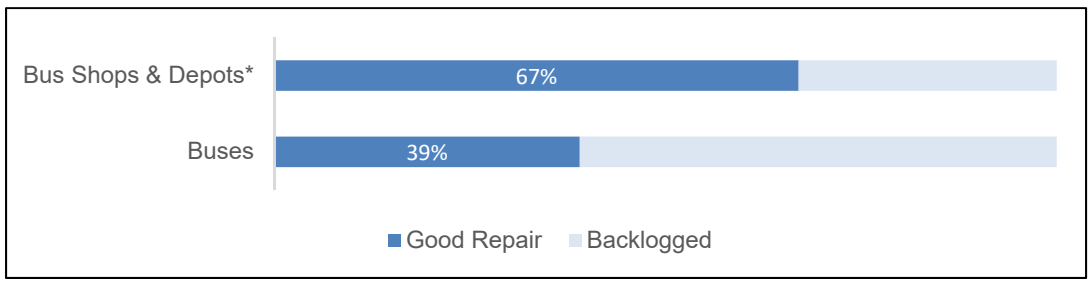
Exhibit 18 illustrates the mix of investments by needs category in the proposed 2020-2024 Capital Program. The program continues the MTA Bus emphasis on achieving and maintaining a state of good repair by devoting approximately 81% of funding to replacing fleet and restoring facilities.

Exhibit 18
MTA Bus Company Proposed 2020-2024 Capital Program by Needs



MTA Bus assets are evaluated with the same benchmarks used for NYCT assets – namely asset condition, asset age vs. useful life, and asset performance versus an identifiable performance standard. The System Investment Status (Exhibit 19) presents the percent of assets in good repair and those with backlogged components in need of repair.

Exhibit 19
System Investment Status
MTA Bus Company Major Investment Categories



** Based on component-level condition assessment*

MTA Bus Company
Bus Company Projects
Category U-803

MTA Bus operates 1,300 buses, consisting of 668 standard-length buses; 115 higher-capacity articulated buses that are used on high-frequency high ridership routes; and 517 “coach”-style express buses that are used on routes connecting more distant areas of the city with Manhattan business districts. It is a clean fleet, with half having an alternative fuel propulsion system. This includes 411 hybrid buses and 213 CNG buses. MTA Bus’ eight bus depots in the Bronx, Queens, Brooklyn, and Yonkers support the fleet by fueling, servicing, maintaining, and storing buses. Two depots –College Point in Queens and Spring Creek in Brooklyn - are equipped to service buses that run on CNG.

MTA Bus’ investment strategy includes these goals:

- Eliminate the backlog of over-age buses in the MTA Bus fleet. Over 60% of the MTA Bus fleet is currently past its useful life, stemming from the fact that many of the agency's buses were purchased in 2004-06, shortly after the formation of MTA Bus. Reducing this backlog and reestablishing a 12-year replacement cycle is a major goal. (In contrast, with the completion of funded projects in 2015-2019, NYCT's backlog of over-age buses is minimal.);
- Ramp up towards an all-electric fleet by 2040. Along with NYCT, MTA Bus is committed to transitioning to a zero-emissions all-electric fleet by 2040, to improve air quality and reduce greenhouse gas emissions;
- Improve service for bus customers. New buses feature front-of-bus ramps for faster and more convenient wheelchair boarding and other state-of-the-art technologies to enhance safety and customer experience. Some buses are purchased for fleet growth to meet changing service requirements and to facilitate planned service improvements;
- Continue addressing high-priority deficient components at depots. Approximately 70% of bus depot components are in good repair. Investments will address deficient components and the normal replacement of depot equipment;
- Align depot investments to accommodate the roll-out of electric buses. As zero-emission vehicles enter the fleet, depots will be upgraded to service all-electric buses.

Proposed 2020-2024 Capital Program - $871 million

To achieve these goals MTA Bus will undertake the following projects:

- 874 buses are to be purchased, including 545 standard buses, 79 articulated buses, and 250 express buses. 782 of these new buses will replace existing buses, including some that will be up to 15 years old at the time of their retirement, and the other 92 buses will provide fleet growth. 25 of the standard buses will feature all-electric propulsion;

- Deficient components at up to five MTA Bus depots will be addressed, targeting structural elements, heating/ventilation, and electrical systems. Continued investment in miscellaneous depot equipment, including bus lifts;
- The first MTA Bus depot will be modified to support an electric fleet with power upgrades, the chargers, and other improvements necessary to maintain this fleet.

Overall, MTA Bus will invest $871 million, including $722 million for fleet renewal and nearly $149 million for depot improvements and program support.

Interagency

MTA Capital Program 2020-2024

Overview – MTA Interagency

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

Proposed 2020-2024 Capital Program - $119 million

MTA PD will continue to rehabilitate or replace assets at the end of their useful lives while modernizing communications equipment, increasing the department's ability to respond to emergencies and enforce safety. MTA Planning initiatives provide support for planned MTA capital improvements (see Exhibit 20).

Exhibit 20
MTA Interagency Proposed 2020-2024 Capital Program by Category
($ in millions)

Category	Proposed 2020-2024
MTA Police Department	$39
MTA Planning	80
Total	**$119**

Numbers may not total due to rounding

MTA Interagency
MTA Police Department
Category N-810

MTA PD 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 under the jurisdiction of the MTA Police. Subsequently, the Staten Island Rapid Transit Police was added to MTA PD 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 and 2015-2019 programs, the MTA PD's 2020-2024 Capital Program will continue to assist MTA PD accomplish its mission of providing safety and security throughout the MTA network.

Proposed 2020-2024 Capital Program - $39 million

MTA PD's proposed 2020-2024 Capital Program includes projects to invest in facilities, vehicles and communication systems to allow the Police to effectively protect our customers, employees and the overall transportation system.

MTA Police Department Projects

MTA PD's investment strategy remains consistent with past capital programs with one deviation: this capital program does not include an allocation for the dedicated MTA Police public safety radio system. That project is funded in prior capital programs and is well into construction. Aside from that important initiative, investments in the 2020-2024 Capital Program largely focus on long-standing goals of achieving a state of good repair at the various district offices. In this program, particular focus is placed on the Mount Vernon District Office which will either be rehabilitated or replaced. In addition to facility needs there are allocations to provide for the normal replacement of communications equipment and systems as they reach the end of their useful lives. Equipment will be upgraded or replaced in-kind depending on the requirements and evolution of technologies. Finally, the program includes an allocation to address several smaller needs in the areas of other facility requirements, large vehicle replacements (not including patrol cars) and program administration.

MTA Interagency
MTA Planning Initiatives
Category N-811

The proposed 2020-2024 Capital Program includes provisions 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.

The MTA aims to invest in the future, laying out a program of investments that, when combined with projects that rebuild the system will enable the MTA's services to keep pace with the changes in the New York region's economy and population and help transform the network into a world-class, 21st century transit system.

Investment Principles

The following investment principles will guide the development of system enhancement projects and initiatives through 2024:

- **Increase capacity and reliability.** Inadequate capacity on several subway lines results in overcrowded and unreliable service. The MTA will enhance its system to deliver reliable capacity to meet record ridership while incorporating new technologies to reduce costs and enhance service delivery;
- **Improve geographic coverage.** Regional development is creating new employment opportunities and access needs beyond the reach of the rail network, exacerbating existing accessibility issues in the furthest areas of the outer boroughs and the suburbs. The MTA will partner with key stakeholders to optimize new expansion opportunities, recognizing local smart growth policies and encouraging value participation;
- **Serve a changing travel geography.** Robust development and population growth are revitalizing neighborhoods across the City, and new travel patterns are less oriented to the Manhattan CBD. The MTA will augment the existing radial CBD-oriented network to serve the growing intra-borough and inter-outer borough travel markets;
- **Increase Sustainability and Resiliency.** The impacts of climate change will continue to challenge MTA's operations throughout the region. The MTA will protect, preserve and promote sustainability, and be prepared to address environmental threats that could pose risks to MTA's renewal efforts.

Investing for the Future

Investing for the Future describes a regional strategic vision crafted through a structured assessment of existing and projected customer needs based on a review of regional trends in

employment and ridership; technological advancements in the industry; and the growth of bicycle travel and bike-sharing services. Assessment activities are supported by the Core and Corridor planning investments (see Exhibit 21) in this capital program, described below. Collectively, these investments look at metrics that include the following:

- Population trends throughout the region;
- Employment trends in New York City and throughout the region;
- Work related travel throughout the region;
- Ridership within the MTA's network;
- Technological advances that impact commutation in the region including bicycle and bike sharing services, and the emergence of autonomous vehicles.

Exhibit 21
MTA Planning Proposed 2020-2024 Capital Program Investments ($ in millions)

Elements	Proposed 2020-2024
Core Planning Support	$10
Corridor Planning Support	10
Other Capital Planning Initiatives	60
Total	**$80**

Numbers may not total due to rounding

Core Planning Support, Corridor Planning Support and Planning Initiatives

Projects in Core and Corridor planning and other Capital Planning initiatives areas directly provide for the activities needed to support efforts required to invest in the future. Specific activities funded in these projects 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 to understand our customers' uses of the system, remain eligible for New Starts funding, and inform the Capital Programming process; and
- 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.

- Improvements to capital program planning with emphasis on new strategies and systems;
- Facilitate initiatives designed to enhance operational safety MTA-wide for customers and employees; and
- Development of pilot studies in support of these and additional strategic initiatives.

In addition to the above activities, planning investments might include specific initiatives to evaluate new directions for investing in New York's future. These initiatives might very well lead to future capacity projects depending on their outcomes.

Network Expansion

MTA Capital Program 2020-2024

Overview – MTA Capital Construction

To meet the demands of a changing region, MTACC manages system and capacity expansion projects that:

- Add capacity to satisfy growing demand or relieve overcrowding;
- Expand the reach of the network to connect underserved or new communities to educational and employment opportunities;
- Serve changing travel patterns by enabling trips to new business districts or borough-to-borough travel;
- Support local land-use and economic development strategies;
- Enhance sustainability and network resiliency by increasing travel options and redundancy in the overall transit network.

The first phase of Second Avenue Subway (SAS) provided three new ADA accessible stations at 72nd, 86th, and 96th Streets, and a rebuilt station at Lexington Ave./63rd St., connecting the upper and far east side of Manhattan to West Midtown, Union Square, Chinatown and on to Coney Island via the existing Broadway Line. Servicing 190,000 riders per day, it has decreased A.M. peak period overcrowding Upper East Side portion of the 4, 5 and 6 lines by 40%, and 26% overall. Phase 1 has successfully added capacity, accessibility, and resiliency to the system.

Similarly, the #7 Line extension has supported the rapid development of the far West Side of Manhattan, with the secondary entrance being opened in August of 2018. The new station links to 18 subway lines, essentially connecting the rest of the city to this dynamic new neighborhood and offering easy access to the Jacob Javits Convention Center, the High Line, the newly opened Hudson River Park, and ferries. It is the only station south of 59th Street to provide service west of 9th Avenue. The station is designed to handle 25,000 people in a peak hour and is anticipated to become the busiest single line station in the NYCT Subway system once Hudson Yards is fully developed.

Proposed 2020-2024 Capital Program - $7.798 billion

In the 2020-2024 Capital Program, MTACC will deliver ESA, LIRR Expansion (3rd Track), and Penn Station Access (PSA), and will continue advancement of SAS Phase 2. A total of $7.798 billion is proposed.

New and innovative methods to deliver these projects are being utilized, including design-build, finding efficiencies in project designs and in project management, and by reducing the impacts of projects on the surrounding communities. These methods as well as others are key to delivering projects on time and within budget.

Capital Program Highlights:

- ESA will allow approximately 162,000 LIRR customers a day to travel in and out of GCT, shaving up to 40 minutes off daily commutes from Long Island and Queens;
- Regional Investments in Harold Interlocking will continue – supporting more reliable LIRR operations and Amtrak service throughout the Northeast Corridor;
- LIRR Expansion (3rd Track) will enable greater capacity and reliability on the Main Line and for the first time allow for reverse commuting, as well as eliminating all grade crossings along the project corridor. The project will replace seven substations and replace railroad bridges with improved clearance to avoid bridge strikes. In addition, the project will improve quality-of-life in adjacent communities by improving the appearance and functionality of stations within the corridor by extending platforms to fit 12 railcars, reducing noise using noise attenuation walls, and reducing air pollution and eliminating wait time associated with idling vehicles at grade crossings;
- On Metro-North's NHL, the PSA project will provide direct service to Penn Station, along with four new Bronx stations and improved infrastructure;
- The SAS extension to 125th Street will include three new stations in East Harlem and new connections to the Bronx and northern counties. It will serve an estimated 100,000 new riders a day, many of whom will see current travel times cut by up to 12 minutes. Together with Phase 1, this project will allow the SAS to carry more passengers daily than the entire Philadelphia SEPTA system.

Table 22
MTACC Proposed 2020-2024 Capital Program
By Investment Category
($ in millions)

Project	Funding in Prior Capital Program (s)	Proposed 2020-2024	Project Total
East Side Access (ESA)	$10,335	$798	$11,133
Regional Investments	601	540	1,141
Penn Station Access (PSA)	452	1,131	1,583
Second Avenue Subway (SAS), Ph. 2	1,735	4,555	6,290
LIRR Expansion (3rd Track)	2,050	539	2,589
Miscellaneous	280	235	515
Total	**$15,453**	**$7,798**	**$23,251**

Numbers may not total due to rounding

MTA Capital Construction
East Side Access
Category G-809

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 GCT in Manhattan's East Midtown will have many significant regional transportation benefits. They include critical infrastructure upgrades and improvements to Harold Interlocking that will allow the LIRR to maintain and capture a greater share of the Long Island/Queens-to-Manhattan commuter market by expanding capacity and offering 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

ESA will connect the LIRR's Port Washington Branch and its Main Line to a new station at GCT. The connection includes 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 St. tunnel, and traveling under Park Avenue in Manhattan to reach GCT. Tail tracks under Park Avenue extend south to 38th Street.

Specific project construction details include:

- Construction of a new eight track LIRR station at GCT;
- Construction of a new 350,000 square foot concourse and six new entrances at GCT;
- Construction of a new mid-day storage yard for the LIRR in Queens;
- Complete construction and reconfiguration of the 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;
- Complete excavation of tunnels in Manhattan using tunnel boring machines.

Budget and Schedule Status

The total cost of the project is $11.133 billion including $2.632 billion in federal New Starts funds.

Harold Interlocking work has seen substantial improvement with increased support from Amtrak and continued support from LIRR; productivity gains allowed for the Tunnel B/C Approach Structure, the last heavy civil contract for ESA, to mobilize several weeks ahead of schedule; and a new incremental integrated systems testing program will ensure that the 29 different systems including 30,000 individual devices are operational prior to the planned December 2022 opening.

Of note, MTACC's 2010-2014 Capital Program, includes a rolling stock reserve of $463 million for the base purchase of M-9A railcars for the LIRR to support ESA growth. This is an active procurement with an award date assumed for late 2019. The 2020-2024 Capital Program includes additional support for the M-9As.

Proposed 2020-2024 Capital Program - $798 million

This Capital Program will fund $798 million to complete ESA and begin Revenue Service by December 2022. Key initiatives to control both cost and schedule have been implemented to deliver this critical regional asset.

Below contains additional detail on the breakdown of the $798.2 million requested in the proposed 2020-2024 Capital Program:

- **$349.6 million:** Rescheduled work from 2010-2014 and 2015-2019 Capital Programs, including additional Rolling Stock reserves, Real Estate reserves, the construction of the 48th Street Entrance, Harold Interlocking Force Account, Force account Systems Testing, Utilities reserves, Construction Management, Arts for Transit, Caverns and Concourse Detailing, Materials Warranties, training reserves and Test Trains;
- **$328.7 million:** Ongoing 3rd Party Construction, Force Account, Design, Construction Phase Services, Project Management, Construction Management, Real Estate and OCIP needs;
- **$119.9 million**: ESA project contingency to support remaining project risks.

MTA Capital Construction
Second Avenue Subway – Phase 2
Category G-810

The purpose of the full-length 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. SAS Phase 1 opened for revenue service January 1, 2017.

Project Description

Phase 2 will extend the tunnels from the 96th St. Station to the 125th St. and Park Avenues Stations and create three new stations: 106th St. / 2nd Ave; 116th St. / 2nd Ave.; and 125th St. / Park-Lexington Avenues.

East Harlem is New York City's most transit dependent neighborhood with one of the largest concentrations of public housing in the City. 72% of residents use public transportation to get to work versus the city-wide average of 55%. Residents need access for jobs, education and health care. In addition to benefits for East and Central Harlem residents, Phase 2 will improve reliability and reduce crowding along the Lexington Avenue Line – the busiest transit line in North America, and provide intermodal connection with Metro-North at the Harlem-125th St. Station.

Proposed 2020-2024 Capital Program - $4.555 billion

The proposed 2020-2024 Capital Program budgets $4.555 billion for Phase 2. This includes $1.650 billion in MTA local funding and $2.905 billion in potential federal New Starts funding, noting that the federal application process is still ongoing. Combined with the $1.735 billion programmed in the 2015-2019 Capital Program, the proposed budget brings the MTA's total proposal for Phase 2 to $6.290 billion. Project costs are to be shared approximately 50/50 between federal and local sources. Any potential Full Funding Grant Agreement approval or funding is, however, subject to further discussion with the Federal Transit Administration.

MTA Capital Construction
Penn Station Access
Category G-811

PSA will bring new Metro-North service into Penn Station in Manhattan. The project is an important element in the development of the regional rail network. There is region-wide consensus for growth, with the need for more flexible and resilient transit service to and from Manhattan. Connectivity between the New York metropolitan area's rail services will be improved by completing the direct connections between Metro-North, LIRR, New Jersey Transit, and Amtrak at Penn Station.

The PSA project will also support the vibrant transformation of the Bronx, whose population grew by over 6% between 2010 and 2017, making it the fastest growing county in the state. Although economic development and job creation are on the rise on the Bronx, large sections of the East Bronx do not have rail service. PSA will improve access to jobs in Manhattan and employment centers in Westchester and Connecticut. This rail service will enhance the growth potential of major medical centers and other employers in the area.

The project will also provide added system resiliency against potential catastrophic service disruptions that could affect over 700 trains and approximately 300,000 commuters daily by providing an alternate route and terminal in Manhattan for Metro-North NHL customers. Customers with destinations on Manhattan's West Side, the fastest growing area in the Manhattan CBD, will save travel time via a direct connection between the NHL and Penn Station. 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.

Project Description

Operation of Metro-North service to Penn Station will begin after the ESA project has been completed.

The project includes:

- Four new stations in eastern Bronx at Co-op City, Morris Park, Parkchester/Van Nest, and Hunts Point;
- Track and civil work, including the rehabilitation of four bridges necessary to operate on the Hell Gate Line;
- Communications and signals work;
- Power improvements including 3rd rail, power substations, and catenary; and
- Modifications to PSA service-related areas of Penn Station.

Budget and Schedule Status

After entering into a Memorandum of Understanding with Amtrak in February 11, 2019, allowing the MTA to advance design and construction and to run service on the Hell Gate Line, a Notice to Proceed was issued to the General Engineering Consultant on February 12, 2019.

Recent progress includes the commencement of preliminary design in which alternative track alignments are being developed. The Design Phase Agreement with Amtrak was executed in August 2019. Additionally, a revised Environmental Assessment is being finalized in advance of securing Congestion Mitigation/ Air Quality (CMAQ) funding for the project.

A pre-design estimate was developed with a total project cost of $1.583 billion. Reductions to the total cost will be targeted during preliminary design, incorporating cost containment principals.

Proposed 2020-2024 Capital Program - $1.131 billion

The proposed 2020-2024 Capital Program contains $1.131 billion, which will fully fund completion of the PSA Project.

It also includes the replenishment of $243 million, which LIRR is borrowing in the 2015-2019 Capital Program to advance the purchase of M-9 railcars for fleet growth related to future ESA service assumptions.

All elements of project management, design, construction management, insurance, and real estate necessary to support construction are also funded.

Funds totaling $452 million have been allocated in the MTA’s 2015-2019 Capital Program. The balance of funds required to complete the project is being proposed in this program.

MTA Capital Construction
LIRR Expansion Project
Category G-813

The LIRR Expansion Project is a key transportation infrastructure initiative and a strategic component of the comprehensive plan to transform and expand New York's vital regional transportation infrastructure and to enhance Long Island's economy, environment, and future. The project extends approximately 9.8 miles along the LIRR's Main Line between the Floral Park and Hicksville stations, where five branches converge, carrying 41% of the LIRR's daily ridership. The number of tracks along the Main Line corridor varies: it primarily has four tracks west of Floral Park, but narrows to two tracks east of Floral Park to Hicksville. The construction of a third track through this segment will increase track capacity through the corridor, making it easier to run trains. This will improve service reliability and make transit more attractive, with further goals of getting travelers out of cars, reducing traffic congestion, and reducing adverse environmental impacts.

This 9.8-mile stretch also includes seven street-level train crossings ("grade crossings") where road traffic must stop and loud train horns must blow each time a train passes. The project will eliminate these grade crossings through grade separation (e.g., underpasses) or, in two cases, closure to vehicular traffic (with pedestrian access maintained). This is anticipated to substantially reduce noise, traffic congestion, delays, and air pollution, and greatly improve safety for residents, motorists, and pedestrians.

Project Description

The LIRR Expansion Project entails the following major components, which will be performed across both the 2015-2019 Capital Program as well as the proposed 2020-2024 Capital Program:

- Installation of a third Main Line track from the Floral Park to Hicksville stations;
- Elimination of seven grade crossings to provide grade-separated crossings or, in two cases, full closures to vehicular traffic;
- Modification of overpasses, signal systems, substations, culverts, interlockings, crossovers, sidings, track bed, power systems, communications and signals;
- Construction of retaining walls along portions of the corridor;
- Installation of sound attenuation walls along portions of the corridor;
- Relocation of utilities including electric, signal, communications, gas, water, and sewer systems;
- Modification of/improvement to passenger rail stations, platforms, overpasses, ramps, and parking, including ADA enhancements and construction of new parking facilities at selected stations; and

- Construction of new pedestrian overpasses with elevators and ADA-compliant pedestrian underpasses.

Proposed 2020-2024 Capital Program - $538 million

The total project budget remains $2.589 billion. Construction completion remains scheduled for 4th Quarter 2022 and substantial completion of the Design-Build contract remains scheduled for April 2023. The $538.5 million included in the proposed 2020-2024 Capital Program will fully fund completion of the LIRR Expansion Project. This will allow the following critical activities to occur:

- Award the Design-Build “Completion” option and restore contingency used to advance critical grade crossing work which provided schedule benefits for the project and accelerated safety improvements;
- Award 2 one-year options for the Program Management Consultant; and
- Complete all LIRR related force account work.

All other elements of project management, design, construction management, insurance, and real estate necessary to support construction are also funded.

MTA Capital Construction
Regional Investment
Category G-814

In the course of designing the ESA project, the MTA identified additional investments to be progressed concurrently with the ESA program in order to achieve ESA revenue service. 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.

Project Description

Regional Investments include work at Harold interlocking, the busiest railway junction in the country and 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 work includes Metro-North 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. The investments include: an East Bound Re-route, which eliminates existing train conflicts between Amtrak and LIRR and increases speeds heading east and north; a Westbound Bypass, which will allow Amtrak and Metro-North to travel through the Harold complex without conflicting with 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.

Proposed 2020-2024 Capital Program - $540 million

The proposed 2020-2024 Capital Program restores work which had been rescheduled as part of the 2015-2019 Capital Program amendment approved in May 2018.

These include the following:

- Work included as part of FRA’s High Speed Intercity Passenger Rail Program grant, including the completion of the Westbound Bypass, construction of the Eastbound Re-route, associated force account as well as ongoing Loop & T Interlocking force account; and
- Purchase of a small number of LIRR cars to support ESA growth.

Eastbound Re-route work would be completed in advance of the rehabilitation of the East River Tunnel #2 (scheduled to begin in the first half of 2023). The completion of the Westbound Bypass would then follow during the rehabilitation of East River Tunnel #2. This is the optimal sequence to reduce the overall Regional Investments schedule, provide the operational flexibility benefits necessary in Harold Interlocking and avoid further cost increases.
All elements of project management, design, construction management, and insurance necessary to support construction are also funded.

The scope of the Regional Investments project remains unchanged. Funds totaling $600.7 million have been allocated in the MTA's 2010-2014, and 2015-2019 Capital Programs. The additional $540.5 million included in the proposed program would complete the Eastbound Re-route and Westbound Bypass, as well as restore Rolling Stock funds for the M-9As. The Amtrak Car Washer and balance of Loop & T Interlocking work is anticipated to be included in a future 2025-2029 Capital Program.

MTA Capital Construction Miscellaneous Category G-816

A key objective of the MTACC is to establish a cost-efficient program management structure to oversee and manage the MTA system expansion projects. The structure will maximize the sharing of expertise and support services from project sponsor agencies and avoid 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. MTACC established consistent procedures, standards and guidelines that are applied to all the projects under its management.

Proposed 2020-2024 Capital Program - $235 million

The proposed 2020-2024 Capital Program includes $135 million to manage MTACC's proposed 2020-2024 Capital Program, as well as projects included in other agency Capital Programs, including the L-Train Canarsie Tube and the NY Penn Station LIRR Train Hall Renovation projects.

This budget will support the following:

- MTACC-wide personnel (including integrated consultant staff), including Legal, Procurement, Program Controls, Finance and Human Resources;
- MTACC's share of 2 Broadway occupancy costs;
- Allocations for MTA consolidated services;
- NYCT procurement and capital payments staff supporting MTACC projects;
- Other personnel and office related costs;
- Incidental project costs not eligible for federal reimbursement; and
- Independent Engineering Oversight services.
- Additional Program Support

Bridges & Tunnels

MTA Capital Program 2020-2024

Asset Base – Bridges and Tunnels

Exhibit 23
MTA Bridges and Tunnels Facilities

Facility	Year Opened	Type of Structure	Length (Feet)
Bronx-Whitestone Bridge (BWB)	1939	Suspension Span	3,770
		Viaducts/Approaches	3,362
Cross Bay Bridge (CBB)	1970	High Level Fixed Bridge	3,000
		Viaducts/Approaches	2,472
Henry Hudson Bridge (HHB)[1]	1936	Steel Arch Bridge	2,029
Hugh L. Carey Tunnel (HCT)	1950	Vehicular Tunnel	9,117
Marine Parkway Bridge (MPB)	1937	Lift Bridge	3,840
Queens Midtown Tunnel (QMT)	1940	Vehicular Tunnel	6,414
Robert F. Kennedy Bridge (RFK)	1936	Suspension Span	2,724
		Harlem River Lift Span	705
		Bronx Crossing Truss Span	1,530
		Viaducts/Approaches	11,742
		Ramps	10,935
Throgs Neck Bridge (TNB)	1961	Suspension Span	2,910
		Viaducts/Approaches	8,154
Verrazzano-Narrows Bridge (VNB)[2]	1964	Suspension Span	6,690
		Viaducts/Approaches	3,175
		Ramps	12,504

[1] HHB is a double-decked bridge with northbound traffic on the upper level and southbound traffic on the lower level.
[2] VNB is a double-decked bridge with two bi-directional roadways that can be operated independently.

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. In 2018, the nine crossings generated nearly $1.9 billion in toll revenue and carried an all-time high of over 322 million annual vehicle trips. With the majority of its toll revenue dedicated to mass transit operations, B&T performs a unique and vital function in support of regional transportation.

The proposed 2020-2024 Capital Program is the culmination of a rigorous planning process that began with the Capital Needs Assessment. The Authority's Master Plans for each of its bridges and tunnels are the foundation of the B&T capital programming process and are shaped by master planning studies as well as the 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 maintaining the structural integrity of its facilities while, at the same time, operating safely and securely, and enhancing regional mobility, customer satisfaction and the quality of life in the region.

Proposed 2020-2024 Capital Program - $3.327 billion

The proposed B&T capital program totals $3.327 billion over the next five years. Exhibit 24 outlines B&T needs for the 2020-2024 capital program for each facility and Exhibit 25 outlines those needs by category of work. The most significant investment needs have been identified in the Structures ($1.005 billion, or 30%) and Roadways and Decks ($830 million, or 25%) categories. Over half of the capital program is devoted to two of the agency's largest bridges – the Verrazzano-Narrows Bridge (VNB) with $1.127 billion (34%), and the Robert F. Kennedy Bridge (RFK) with $719 million (22%).

Exhibit 24
Bridges and Tunnels Proposed 2020-2024 Capital Program by Facility
($ in millions)

Facility	Proposed 2020-2024	Percent
Bronx-Whitestone Bridge (BWB)	$111	3%
Henry Hudson Bridge (HHB)	135	3%
Hugh L. Carey Tunnel (HCT)	53	2%
Queens Midtown Tunnel (QMT)	46	1%
Robert F. Kennedy Bridge (RFK)	719	22%
Rockaway Crossings: Cross Bay (CBB) and Marine Parkway (MPB) Bridges	139	4%
Throgs Neck Bridge (TNB)	241	7%
Verrazzano-Narrows Bridge (VNB)	1,127	34%
Agency-Wide	756	23%
Total	**$3,327**	**100%**

Numbers may not total due to rounding

Exhibit 25
Bridges and Tunnels Proposed 2020-2024 Capital Program by Category
($ in millions)

Category	Proposed 2020-2024	Percent
Structures	$1,005	30%
Roadways & Decks	830	25%
Transportation Systems Management Operations	65	2%
Utilities	217	7%
Buildings & Sites	91	3%
Miscellaneous	714	21%
Structural Painting	406	12%
Total	**$3,327**	**100%**

Numbers may not total due to rounding

Program Development

Much of the proposed capital program focuses on preservation of assets and maintaining the structural integrity of the facilities to help reduce risk, optimize facility and operational efficiencies and improve overall financial performance. Priority has been given to the replacement of aging facility components to ensure that the historic B&T facilities remain in a state of good repair. To determine the most immediate structural needs, the seven bridges and two tunnels and other ancillary facilities undergo periodic, comprehensive condition inspections. The bridges and tunnels are inspected every two years, in accordance with the New York State Biennial B&T Inspection Program. In addition, separate underwater and substructure inspections are periodically performed while in-house engineering staff assesses the overall condition of all B&T facilities on an ongoing basis. In general, B&T inspection protocols have been highly regarded and indeed commended via independent peer review.

Investments to Maintain Core Infrastructure

The rehabilitation and replacement of facility components and aging equipment has been the primary focus of B&T in all of its capital programs. At the RFK, a phased rehabilitation program that began in the mid-1990s has resulted in a variety of improvements 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 the Bronx Toll Plaza, the southbound Manhattan to Queens ramp on Randall's Island and the Harlem River Drive Ramp on the Manhattan side were replaced under projects that also rehabilitated the substructures of those decks. In addition, the Manhattan approach ramps at 124th-125th Streets were reconstructed. Starting in 2019, a new direct connector ramp connecting the Harlem River Lift Span to the north bound Harlem River Drive will be constructed. The main cables will undergo an in-depth inspection and assessment of their remaining cable strength, and superstructure retrofits will be performed on the majority of the structures to address any necessary seismic and loading upgrades.

The BWB has also benefitted from a wide range of recent investments with a strong emphasis on renewing the roadway and deck elements. In the two most recent programs, repairs were made to the Bronx Anchorage and the Queens elevated and on-grade approaches were replaced. The completion of the Queens approach work in late 2014 was the final step in replacing all of the original 1930's era roadways of this facility. In addition, a main cable investigation was performed. The remainder of the aerodynamic retrofits on the suspended span as well as the construction of a fender protection system for the towers will begin in 2019. While major construction on the BWB was ongoing, concurrent work was carried out at the TNB, including dehumidification of the anchorages, and the design for the replacement of the suspended span deck which will begin construction in 2019.

The VNB, the longest suspension bridge in North America, has multiple decks and an intricate system of ramps at both ends. The VNB continues to require investment in its roadways, structures and utilities in every plan. Recently completed improvements include: replacement of the original upper level suspended span decks with a new orthotropic steel deck and reconfiguration of the upper level to carry a seventh reversible Bus/HOV lane, construction of a new Bus/HOV Ramp connecting the Gowanus Expressway HOV lane to the new HOV lane on the upper level, improvements to the Toll Plaza's east and westbound ramps, and a complete rehabilitation of the Toll Plaza and Staten Island Expressway Interchange. These improvements together resulted in a continuous Bus/HOV access from Staten Island to Manhattan. The current 2015-2019 program is also carrying out a cable investigation, along with the rehabilitation of the anchorage and tower pier structures. Starting in 2019, steel repairs and painting on the superstructure from anchorage to anchorage will be performed, and a portion of the upper level approaches reconstructed.

At the HHB, the final portions of the both levels of the toll plaza decks and supporting structures are being upgraded or replaced. In addition, rehabilitation of the concrete skewbacks, which are the foundation for the steel arch span, is underway. Substructure rehabilitation at the MPB was completed, as well as steel rehabilitation, painting and electrical/mechanical of the lift span. At the CBB, deck and superstructure rehabilitation, substructure and underwater work, and concrete and drainage repairs to the Rockaway approach promenade and seawall have all been completed in the past two programs. Fender system replacement at both the MPB and the CBB will begin in 2019 to ensure the structures are protected from marine vessel impacts.

In 2018, the Authority completed major rehabilitation projects at the HCT and QMT tunnels, that addressed damage caused by Superstorm Sandy, while also installing flood mitigation measures at both tunnels. In addition, under the 2015-2019 program, several projects addressing life safety systems and their controls are underway, including the rehabilitation of the ventilation system at the HCT and the rehabilitation of the tunnel control room at the QMT.

Major Investments

Facility Master Plans

B&T has revised its Facility Master Plans as part of the Capital Needs Assessment process and evaluated all projects previously planned for the 2020-2024 Capital Program. The Master Plan for each bridge and tunnel includes projects that improve resiliency and redundancy, minimize customer impact, and plan for future needs. Whenever feasible, projects address multiple goals, such as improving our customers' experience, as well as:

- Achieving a state of good repair and extending service life;

- Increasing our facilities' structural and non-structural (systems) resiliency for extreme events;
- Upgrading facilities to current design standards, account for overweight vehicles and eliminate functional obsolescence;
- Improving accessibility and safety for maintenance (travelers, platforms, stairs, etc.);
- Mitigating risks to the structures such as vessel impact, scour, etc.;
- Enhancing regional mobility;
- Employing sustainable practices to provide environmental benefits.

This process ensures proper timing and coordination of improvements, leverages opportunities to address functional obsolescence and maintain State of Good Repair, and allows for responding for potential future needs such as emerging technologies and adaptation to changing regional traffic patterns, while simultaneously limiting the burden of construction on the efficient operation of the crossings.

Core Infrastructure

The replacement and rehabilitation of the core infrastructure will continue in the proposed 2020-2024 Capital Program. As always, the suspension bridges will be a major area of investment. At the RFK, rehabilitation of the anchorages will be performed along with structural retrofits of the roadway supporting steel on the suspended spans, the initial phase of enabling projects for the eventual reconstruction of the elevated Manhattan plaza structure, and upgrades to the fender system protecting the lift span. At the BWB, a key focus will be design for the dehumidification of the main cables. Work at the TNB will focus on the replacement of the fender protection system for the towers. At the VNB, the second phase of the upper level approach ramp reconstruction along with the rehabilitation of the lower level suspended span deck will be a key focus. Improvements to the VNB-Belt Parkway ramp merge will be constructed to facilitate the future reconstruction of the upper level Belt Parkway ramps.

Significant core work will also be carried out at the other facilities. At the MPB, the key focus will be the rehabilitation of the lift span elevators, while at the CBB the focus will be on the design for the replacement of the navigational spans.

At the HCT and QMT, core infrastructure work will include structural, electrical and mechanical rehabilitation of the ventilation buildings. In addition, preliminary design will be initiated for the structural rehabilitation of the roadway slab at the QMT.

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 and regional agency projects. 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 use of alternative project

delivery methods such as Design-Build, Cost-plus-Time, Best Value Request for Proposal (RFP) procurements, as well as contractor incentives, minimize customer impacts during construction. The revised program reflects the State of New York's new focus on design-build delivery of construction projects.

Investments in Regional Mobility and Customer Satisfaction

B&T is not only committed to ensuring the continued state of good repair of its facilities, but also to enhancing regional mobility and customer satisfaction.

In the 2015-2019 program, the TNB the suspended span deck will be replaced thereby providing an operationally more flexible roadway. 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. At the VNB, a project is beginning construction in the 2015-2019 program for Phase 1 of the replacement of the upper level approach ramps, while another project at the VNB will eliminate a lane-drop that currently causes heavy delays and traffic weaving at the merge of lower level Brooklyn-bound traffic with the Gowanus Expressway. These investments will add to the improvements of 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.

In 2017, B&T converted all nine of its facilities to Cashless Tolling, removing all tollbooths and reconfiguring the plaza roadways for higher traffic speeds as part of that conversion, significantly improving regional mobility and customer satisfaction throughout the region.

The 2020-2024 capital program will also improve traffic throughput and customer satisfaction through implementation of capacity and access enhancements. Phase 2 of the VNB upper level approach ramp replacement will continue the reconstruction of those ramps, while also reconfiguring the non-standard left-exit Belt Parkway off ramps into a modern set of right-hand exit ramps that meet current standards. In addition, the Belt Parkway will be widened between its VNB merge ramp and the Bay Parkway exit to eliminate its substandard traffic merge, to reduce traffic congestion on that portion of the Belt Parkway as well as the east-bound VNB mainline.

Transportation Systems Operations Management

The conversion of B&T operations to Cashless Tolling in 2017 has resulted in a shift towards a Transportation Systems Management Operations paradigm (TSMO) for the Authority. As defined by the Federal Highway Administration (FHWA), "TSMO is a set of strategies that focus on operational improvements that can maintain and even restore the performance of the existing transportation system before extra capacity is needed. The goal is to get the most performance out of the transportation facilities we already have. This requires knowledge, skills,

and techniques to administer comprehensive solutions that can be quickly implemented at relatively low cost, which could potentially enable transportation agencies to “stretch” their funding to benefit more areas and customers. TSMO also helps agencies balance supply and demand and provide flexible solutions to match changing conditions.”

B&T is expanding the traditional investment strategy in Intelligent Transportation Systems (ITS) to include other operational technologies including asset condition monitoring tools, security and enforcement systems. Now that the toll plazas are gone, the category of work in the Capital Program that previously focused on toll plazas, tolling and ITS systems, focuses on TSMO-type initiatives that support operations such as Work Zone Management, Traffic Incident Management, Special Event Management, Road Weather Management, Traveler Information, Ramp Management, Congestion Pricing, Active Transportation and Demand Management, Integrated Corridor Management, Access Management, and pedestrian improvements.

The 2020-2024 Capital Program includes investments that implement innovative technologies to support these operational activities. These investments include enhanced traffic management systems for the Operations Control Center and improved Variable Message Signs (VMS) for communicating with motorists. This group of investments provides a foundation for continual improvements in customer service delivery, safety, and revenue protection.

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, 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 have either been completed or are ongoing at the two tunnels to upgrade or replace the electrical and ventilation systems to improve tunnel monitoring and systems control activities. At the bridges, new or extended fire lines, risers and standpipes were recently installed at the BWB, TNB, CBB and HBB and the MPB. These investments improve the emergency services’ 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 2015-2019 program on significant portions of the RFK facility, as well as the additional fire standpipes at the TNB, the BWB, and the VNB to complete the systems and meet current Fire Department of New York requirements. Other fire safety improvements in the 2015-2019 timeframe included new smoke and heat detection and alarm systems at the BWB, RFK, HCT and QMT. Similar improvements were recently completed at the TNB, under the 2010-2014 program.

Building upon these efforts to implement fire safety enhancements, B&T plans to ensure that fire standpipe systems are completed at the RFK in the 2020-2024 program, and design for fire suppression systems within the tunnels will be initiated.

The 2015-2019 Capital Program also included 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 is being modernized to improve day-to-day monitoring of life safety systems, and back-up control rooms will be constructed at both the HCT and the QMT to meet NFPA 502 requirements.

Other safety investments in the 2015-2019 program include the construction of a fender protection system at the BWB, to protect against vessel strikes, and a collision warning system at the MPB. Finally, an electronic monitoring and detection system was recently completed at the TNB and similar systems are being installed in the 2015-2019 program at the BWB and RFK.

Planned safety investments in the 2020-2024 program include the reconstruction of the fender protection systems at the TNB and the RFK lift-span, to protect against vessel strikes, and the upgrades to the electronic monitoring and detection systems at the VNB. The electronic security systems at the VNB were installed soon after the September 11 attacks, and use legacy technologies. In the 2020-2024 Capital Program, the Authority intends to replace this system with a more up-to-date and modern system. This will serve as a model for the future replacement of the electronic security systems at the HCT and QMT, which have been partially deferred to a following program.

The Authority will also begin implementation of the recommendations of previous Tunnel Fire Vulnerability studies by designing a tunnel-wide fire suppression system at both the QMT and HCT. This water-mist fire hardening system, once in place under the next capital program, will enhance public safety by reducing fire risk in our two tunnels.

Investments in Resiliency

In the aftermath of Superstorm 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 resilience. The recommendations re-enforced B&T pre-Sandy concerns and directly affected facility master plans, further focusing attention on a multi-hazard approach to mitigate natural and man-made hazards. The 2015-2019 program addresses some of the major recommendations in the report, including retrofitting bridges and tunnels to withstand seismic activity, as well as wind and fire events. The 2020-2024 program will continue to address these recommendations.

Mitigating climate change risks requires an assessment of broad systemic vulnerabilities, including sea level rise, storm surge, changing precipitation, changing temperature, wind, seismic, and other extreme events. Recently completed projects under the 2010-2014 Sandy Mitigation Program addressed B&T risks at the two tunnels and Rockaway crossings. Recently completed projects at the VNB and BWB further increased the suspended spans' wind resistance. Structural and deck work either completed or ongoing in the 2015-2019 program at the RFK, TNB, VNB and HHB incorporated seismic improvements whenever possible.

The 2020-2024 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. 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 complex facilities.

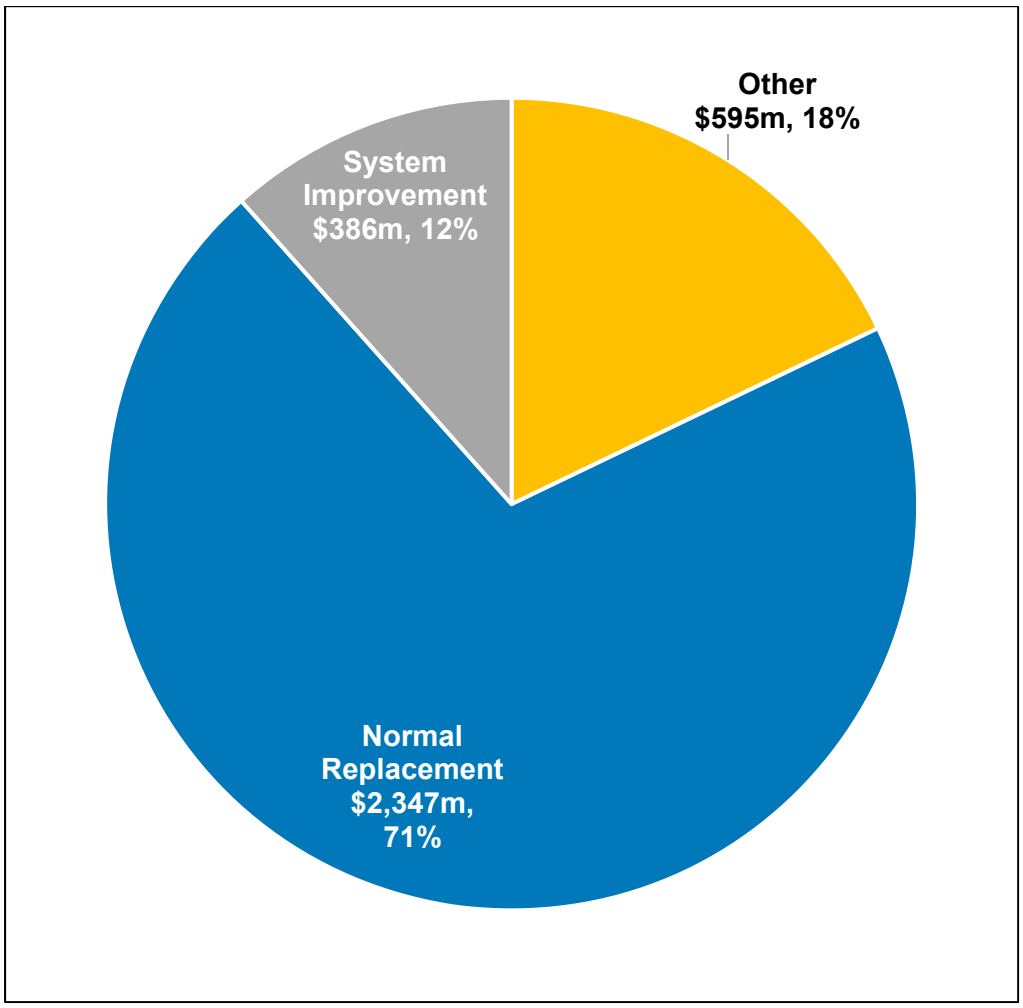
More detailed summaries of the proposed 2020-2024 projects are discussed in the Program Plan section.

Program Plan

System Condition

B&T developed its first multi-year capital program in 1992. Since that time, the Authority has made investments in its crossings and other associated structures worth $9.2 billion in capital funding. These investments have ensured that B&T facilities remain in SGR, but even with these investments, more than half of the Authority's crossings are over 75 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 some B&T facilities approach the 100-year mark, 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 2020-2024 Capital Program is to carry out a focused and efficiently executed capital program that will keep the facilities in SGR, ensure a high level of reliability, resiliency and redundancy, and strategically improve facility operations and customer experience wherever appropriate.

Exhibit 26
Bridges and Tunnels Proposed 2020-2024 Capital Program by Needs Category



Because B&T's facilities are already in a state of good repair, the vast majority of proposed investments contained in the 2020-2024 program are classified as NR work ($2.35 billion, or 71%) for assets that have reached or exceeded their useful life. SI projects, in contrast, will account for just a smaller share (12%) of the total program ($0.39 billion), while Other work comprises 18% of the total program ($0.59 billion). NR work is planned over a multi-program cycle to rehabilitate or replace critical bridge/tunnel components or associated structures to ensure their continued service to the region for decades to come. SI projects are intended to enhance facility operations and security, to enable customers to cross our facilities more easily, and/or to improve the workplace for the B&T employees who keep the agency's facilities running safely.

Bridges and Tunnels
Structures
Category D-801

Structural improvements on B&T facilities focus on maintaining the structural integrity of those facilities, while ensuring safety and minimizing customer inconvenience. These 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 bridge components of both the superstructure and/or the substructure deteriorate over time, these components must be rehabilitated or replaced. Otherwise, larger and more costly capital investments will be required in the future.

Proposed 2020-2024 Capital Program - $1.005 billion

Projects planned in the 2020-2024 Capital Program under the category of structures represent the greatest share of investments, comprising 30% of the program. Major projects include:

Robert F. Kennedy Bridge: Anchorage Rehabilitation- $172 million

This project will retrofit both anchorages of the RFK suspended span, since the anchorages are critical structures for the suspension bridge. Under the RK-04 study funded in the current 2015-2019 Capital Program, long-term anchorage monitoring and concrete testing work is being performed to help develop a planned design-build project to address any structural mitigation measures for the Queens and Wards Island anchorages necessary to preserve them in a state of good repair. This project in the 2020-2024 Capital Program will perform final design and construction of the selected alternative to rehabilitate these two anchorages which support the suspended span. This project is expected to continue into the following capital program.

Throgs Neck Bridge: Anchorage & Tower Protection- $145 million

This project will provide American Association of State Highway and Transportation Officials (AASHTO) compliant tower fenders for accidental marine vessel allision as well as marine security threats. Design for the upgrades to the fender system at the TNB is being performed in the 2015-2019 Capital Program, with construction planned in the 2020-2024 Capital Program.

Robert F. Kennedy Bridge: Suspended Span Retrofit- $137 million

This project at the RFK will address structural repairs necessary on the Suspended span to eliminate yellow flags and ensure the structural integrity of the bridge. Aerodynamic retrofits on the suspended spans have been deferred to a later plan so as to avoid placing unnecessary weight on the span at this time. This project will also include $38 million for the structural

painting of a portion of the steel on the suspended span to take advantage of platform access under Category D-807.

Henry Hudson Bridge: Dyckman St. Abutment Replacement and Substation Upgrades- $121 million

This project will completely replace or reconstruct both abutments of the Dyckman Street Bridge to meet all current standards. In addition, a new electrical substation enclosure will be constructed at Dyckman Street and the substation upgraded from 225 kVA to 750 kVA to match the power output from the Kappock substation, thereby ensuring full redundancy of the power system for both the facility and the tolling equipment. The Kappock substation will also be replaced and/or upgraded to meet current codes.

Robert F. Kennedy Bridge: Reconstruct/Relocate RI Ramps (QR & RM to and from Manhattan Plaza) - $92 million

This project will design and construct new Randall's Island (RI) Ramps to replace the existing ramps. The current location of the RI Ramps (Queens to RI and RI to Manhattan) does not meet highway standards. Relocation of the ramps is necessary to improve traffic management for the Manhattan Leg of RI Interchange, facilitate future reconstruction of the old Manhattan Plaza concrete cellular structure, and improve access to and from Randall's Island.

Robert F. Kennedy Bridge: Structural Repairs/Flag Repairs - $62 million

This project will address miscellaneous structural needs associated with the bridge. The structural work includes flag repairs and high priority conditions identified in recent biennial inspections, as well as potential findings that may arise from future inspections. Each successive capital program has a planned structural steel repair project that addresses any deteriorated steel member revealed by the ongoing biennial inspections.

Verrazzano-Narrows Bridge: Steel Repair & Concrete Rehabilitation - $33 million

This project will address any structural repair needs noted during the past or future Biennial Inspections. Each successive capital program has a planned steel repair project that addresses any deteriorated steel members revealed by the ongoing biennial inspections.

Throgs Neck Bridge: Miscellaneous Structural Rehabilitation- $27 million

This project will address any structural repair needs noted during the past and future Biennial Inspections.

Bridges and Tunnels
Roadways and Decks
Category D-802

Deck replacement and rehabilitation work focuses on preserving primary bridge elements, upgrading them to modern design standards, and enhancing regional mobility through improved traffic capacity and access. 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 B&T customers, but they forestall the future need for more extensive work.

Proposed 2020-2024 Capital Program - $830 million

Deck replacement and rehabilitation work comprises 25% of the 5-year program. Many of the crossings' roadway decks have already been replaced in previous Capital Programs, so this plan will be laying the ground-work for the completion of the deck replacement cycle, while also keeping a focus on the bridge approaches and ramps. Major projects in this category are:

Verrazzano-Narrows Bridge: Replacement of Upper Level Elevated Approach Decks - Phase 2 - $604 million

The reconstruction of the upper level approaches has been broken down into three Phases with Phase 1 starting construction within the 2015-2019 program. This multi-phased project is part of a multitude of projects identified within the master plan study to rehabilitate the VNB and upgrade it to current standards. Phase 2 construction will reconstruct the eastbound mainline approach and reconfigure both the upper and lower level Belt Parkway off ramps to a right-hand exit configuration (currently both are left hand exits). Eliminating the left-hand exits will significantly improve both safety and operations and meet current standards.

Verrazzano-Narrows Bridge: Lower Level Main Span Deck Rehabilitation - $102 million

Due to the sequencing of work required under the VNB Master Plan, the replacement of the lower level suspension deck at the VNB cannot be accomplished for many years. This project will perform all necessary rehabilitation of the existing lower level deck and joints to extend the service life of the deck until it can be replaced.

Verrazzano-Narrows Bridge: Widening Belt Parkway, Phase 1B - $82 million

This project will reconfigure the eastbound VNB exit ramp merge with the Belt Parkway, and address the need to widen the eastbound Belt Parkway to add an auxiliary lane, from the VNB

exit ramp merge to the Bay Parkway exit ramp. The improvement will eliminate an existing lane drop that is the root cause of traffic backups and is a major safety improvement that will directly address B&T's to traffic safety hotspot.

Robert F. Kennedy Bridge: Deck Rehabilitation & Overlay - $23 million

Most of the decks have been replaced over the past 15-20 years. In order to maintain these decks in SGR and maximize their service life, rehabilitation of deficient areas and pavement overlays are necessary. This project will address deck rehabilitation and overlay replacement on areas such as Bronx approach, Junction Structure, Queens approach, Manhattan to Bronx ramp and Manhattan to Randall's Island ramp.

Bridges and Tunnels
Transportation Systems Management Operations
Category D-803

Projects in this category focus on TSMO initiatives. The conversion of B&T operations to a Cashless Tolling environment has resulted in a shift towards a TSMO paradigm at B&T. TSMO programs defined by the FHWA are “a set of integrated strategies to optimize the performance of operations on existing infrastructure through implementation of multimodal, cross-jurisdictional systems, services, and projects designed to preserve capacity and improve security, safety, and reliability of a transportation system.”

The category of work in the capital program previously focused on toll plazas and tolling systems, but is now refocused towards TSMO-type initiatives that support operations such as Work Zone Management, Traffic Incident Management, Special Event Management, Road Weather Management, provision of Traveler Information and Travel Times, and pedestrian-oriented improvements.

Proposed 2020-2024 Capital Program - $65 million

TSMO projects comprise 2% of the total program. Project highlights in this category include:

Advanced Traveler Information Systems - $20 million

Most of B&T’s existing VMS signs are reaching the end of their life cycle. This programmatic capital investment will fund the design and implementation necessary to add variable speed limit signs and targeted safety-related color variable message signs at the VN, TN, BW, and RFK bridge facilities on an as-needed basis. The new VMS signs will be integrated with the Authority’s wide area network and ITS System of Systems based on national standards.

Advanced Traffic Management Systems Enhancements and Upgrades - $12 million

The Authority will update the Operations Command and Control Center (OCCC)’s System of Systems to incorporate new equipment and functions including: new IP cameras, security new video management system, Incident Detection/Management Systems, SCADA Systems, and Traveler Information Systems. AW-57 will also add new functions, such as WAZE integration, and will fund the installation of systems and equipment necessary for opening an OCCC backup command center at the VNB (by repurposing space within the existing building). Lastly these funds will design a new Computer Aided Dispatch (CAD) System to support B&T Operations.

Fiber Optic Infrastructure and Integration - $10 million

This project will convert existing analog traffic cameras at five B&T Bridges to digital IP cameras and integrate those cameras into B&T's ITS System of Systems, while also implementing additional IP cameras at B&T facilities for 100% roadway coverage. In addition, AW-36 will also fund development of a conceptual plan for communications investments to support connected-vehicle infrastructure, undertake necessary fiber upgrades to support existing and new systems implemented by on-going capital projects and support MTA IT's initiatives to build a new virtual B&T Operations network, while also maintaining compliance with cyber security standards.

SCADA Systems - $9 million

SCADA is crucial for controlling operations at each B&T facility, but most of the current systems are standalone and can only be controlled and monitored locally. This project will fund several initiatives related to Life Cycle replacement or integration of these SCADA systems at B&T facilities. The scope includes end-of-life replacement of multiple existing stand-alone SCADA systems at the MPB and VNB with newer integrated systems. Together these will provide an architecture for future remote monitoring and control of facility systems from a remote facility or command center, based on modern cyber security standards.

Traffic Detection/Incident Management Systems - $7 million

The implementation of Cashless Tolling in 2017 enhanced the traffic throughput capacity of the former toll plazas at the TNB, VNB and RFK facilities. This has resulted in additional queuing on certain approach ramps (e.g. at the Belt Parkway) due to off-property road capacity constraints. This project will design and construct traffic queue detection and warning systems to provide advance warning to drivers of sudden changes in average traffic speeds. This project will also integrate the traffic queue detection systems with the Authority's wide area network and the ITS System of Systems. Installation is already in progress at the BWB and design is complete for the VNB under the 2015-2019 program, and this work will inform the plans for the other facilities in the 2020-2024 program.

Toll Collection System Rehabilitation/Upgrades - $7 million

This project will plan, design, and implement technology to enhance B&T's toll collection system in an open-road environment, to ensure maximum revenue collection through the use of the most up-to-date and efficient toll collection technologies. Examples may include self-triggering side-fire cameras and alternative vehicle detectors (e.g. Bluetooth).

Bridges and Tunnels
Utilities
Category D-804

All the Authority's facilities are heavily dependent on functioning utility systems. 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 mechanical, electrical and power distribution systems, including tunnel ventilation equipment. In addition, this category addresses the replacement of lighting systems with LED technology, as well as electronic signage needs. The long-term objective of these investments is to carry out cost-effective improvements to enhance customer safety and convenience, while also protecting facility resiliency.

Proposed 2020-2024 Capital Program - $217 million

Work in this category constitutes 7% of the total program and includes the following projects:

Bronx Whitestone Bridge: Bridge Structural lighting, Power Redundancy and resiliency Improvements- $55 million

This project will replace the backup generator for the BWB service building with a new generator capable of supporting the entire facility. It will also provide a direct feed to the Bronx Substation from the generator so as to ensure fully automated electrical redundancy for the facility and toll collection systems thereby ensuring that critical toll collection functions are fully backed up. Finally, this project will replace both aviation and structural lighting at the BWB.

Agency-Wide: Overhaul and Replace Facility Monitoring and Safety Systems - $36 million

This project will replace the existing, coaxial cable-based access control systems at the VNB, which is one of the two oldest security systems in the Authority.

Marine Parkway Bridge: Electrical Rehabilitation (Elevator) - $35 million

The tower elevators are the only major electro-mechanical element not recently upgraded at this crossing. These elevators provide the only access to the lift equipment located at the top of the bridge towers. This project will replace or rehabilitate them to keep them in safe working condition and to ensure safe access to this part of the bridge.

Bridges and Tunnels
Buildings and Sites
Category D-805

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

Proposed 2020-2024 Capital Program - $91 million

Work in this category comprises 3% of the total program. The major projects are:

Queens Midtown Tunnel: Rehabilitation Ventilation/Service Buildings - $26 million

As part of the next stage of the rehabilitation of the authority's two tunnels, B&T intends to rehabilitate the QMT's two ventilation buildings and service building. The project will upgrade the tunnel ventilation buildings to meet modern codes and standards. Architectural seismic retrofits and structural repairs on the ventilation buildings and service building will address the structural/architectural and space planning/functional needs of the ventilation buildings, service building, and associated parking lots. Design will be completed in the current 2015-2019 program, while construction is anticipated to be procured in phases in the 2020-2024 program.

Hugh L. Carey Tunnel: Rehabilitation Ventilation/Service Buildings - $26 million

As part of the next stage of the rehabilitation of the agency's two tunnels, B&T intends to rehabilitate the HCT's three ventilation buildings, one blower building and Brooklyn service building. The project will upgrade the tunnel ventilation buildings to meet modern codes and standards. Architectural seismic retrofits and structural repairs on the ventilation buildings and service building will address the structural/architectural and space planning/functional needs of the buildings, service building, and associated parking lots. Design will be completed in the 2015-2019 program and construction is anticipated to be procured in phases in the 2020-2024 program.

Robert F. Kennedy Bridge: Storage Facility - $19 million

This project will construct a new storage facility for agency equipment and materials on Randall's Island near the RFK that will serve all of B&T's crossings. This new pre-engineered building will be built on existing agency property and will replace storage areas beneath the RFK that were lost with the start of construction work near the old Manhattan toll plaza. This project will address the need to develop a centralized storage facility for spare parts,

equipment and emergency response equipment, ensuring that parts and equipment are stored under appropriate conditions and can be easily located and retrieved when needed, consistent with a sound asset management program. This project will coordinate with the EAM project under which the inventory management system will be developed.

Bridges and Tunnels
Miscellaneous
Category D-806

Proposed 2020-2024 Capital Program - $714 million

Miscellaneous projects comprise 21% of the total program. Projects in this category provide for costs associated with the support and management of the capital program. The proposed 2020-2024 Capital Program includes projects with program-wide applicability such as protective liability coverage, independent engineer services, value engineering services, the MTA SBD Program, scope development, New York City traffic enforcement agent support, and the MTA-wide EAM System.

CBD Tolling Program

On April 11, 2019, legislation was signed into law enabling the Triborough Bridge and Tunnel Authority (TBTA) to implement the nation's first ever Congestion Pricing Program, known as the CBD Tolling Program, as part of the Fiscal Year 2020 New York State Budget. The planning, design, construction, operations and maintenance of the CBD Tolling Program will primarily be the responsibility of TBTA though it will also require the involvement of various other regional agencies and stakeholders.

Founded in 1933, the TBTA serves over 300 million vehicles per year and carries more traffic than any other tolling authority in the United States. The Authority has extensive experience in the on-time and under-budget implementation of new technology (such as Cashless Tolling) at its seven bridges and two tunnels.

The CBD Tolling Program will require an investment to reduce congestion and enhance mobility in Manhattan's Central Business District (south of, and inclusive of 60th Street*), while also allowing TBTA to collect net revenue sufficient to generate $15 billion for the MTA Capital Program.

The CBD Tolling Program's 2020-2024 Capital Program will include Exploratory Work, Program Management, Design-Build Integration and Customer Service Center Build-Out. The Federal Environmental review process is ongoing and will take into account all applicable regulations, such as the National Environmental Policy Act (NEPA). B&T presently expects to commit the better part of the project's budget in 2019.

Program delivery execution will require three main elements: Infrastructure, Toll Collection and Back Office Systems.

The Infrastructure will be designed to mount tolling equipment and to provide electricity and communications to the Toll Collection System, which comprises hardware, software, communications network and power systems. Both the Infrastructure and Toll Collection System will be procured through a single Design-Build Operate and Maintain (DBOM) contract.

The Back Office System will include all back-office software and hardware, as well as the customer service center to manage customer accounts and transactions, and will utilize the existing New York Customer Service Center (NYCSC) contract. The delivery of the program will be supported and monitored by existing TBTA employees, as well as some key new employees approved by the MTA vacancy board.

* According to the Statute: “The central business district shall include any roadways, bridges, tunnels, approaches or ramps that are located within, or enter into, the geographic area in the borough of Manhattan south of and inclusive of sixtieth street to the extent practicable but shall not include the FDR Drive, and New York state route 9A otherwise known as the "West Side highway" including the Battery Park underpass and any surface roadway portion of the Hugh L. Carey Tunnel connecting to West St. The boundaries of the central business district shall not be modified, expanded, or reduced and shall incorporate the outer bounds of the aforementioned district to the extent practicable.”

Bridges and Tunnels
Structural Painting
Category D-807

Projects in this category traditionally involved removal of existing lead paint and repainting the bridge structures with new high-performance coatings. Much of the lead paint removal efforts were completed in previous years and therefore, the focus of structural painting work in the Capital Program is now on replacement of paint overcoats for various bridge elements to provide vital corrosion protection and maintain the structural integrity of all facilities. These investments will extend the life of the underlying assets which are comprised primarily of steel structures. Most of this work is carried out in conjunction with structural projects, to achieve efficiencies in both procurement and construction staging (e.g. lane closures and maintenance platforms, etc.).

Proposed 2020-2024 Capital Program - $406 million

Painting projects comprise 12% of the total program. The major investments are:

Verrazzano-Narrows Bridge: Facility-Wide Painting Program - $184 million

Painting work at the VNB planned for the 2020-2024 Capital Program includes (but is not limited to): cleaning and painting of the Suspended Span Towers (exterior); cleaning and painting of the Main Cable, Suspender ropes and eyebars; cleaning and painting of portions of the anchorages and approaches; and cleaning/painting the Lily Pond overpass with a high-performance coating.

Robert F. Kennedy Bridge: Facility-Wide Painting Program- $79 million

Painting Work at the RFK planned for the 2020-2024 Capital Program includes (but is not limited to): cleaning and painting portions of the Suspended Span; including painting of the Main Cable, Suspender ropes, and eyebars; cleaning and painting portions of the Manhattan Plaza, Harlem River Lift Span, and Bronx Truss; and painting the exterior of the Anchorages with a high-performance coating.

Throgs Neck Bridge: Facility-Wide Painting Program - $63 million

Painting Work at the TNB planned for the 2020-2024 Capital Program includes (but is not limited to): cleaning and painting of the Suspended Span Towers (interior and exterior); cleaning and painting of the Main Cable, Suspender ropes, and eyebars; and cleaning/painting of portions of the Queens Approach with a high-performance coating.

Bronx Whitestone Bridge: Facility-Wide Painting Program - $26 million

Painting Work at the BWB planned for the 2020-2024 Capital Program includes: cleaning and painting of the Suspended Span Wind Fairings, including application of a fireproof coating on the fairings; cleaning and painting of the exterior of the Suspended Span Towers; and cleaning/painting of the Main Cable, Suspender ropes, and eyebars.

Marine Parkway Bridge: Facility-Wide Painting Program - $17 million

Painting Work at the MPB planned for the 2020-2024 Capital Program includes, but is not limited to: cleaning and painting of the through and deck trusses and corrosion-prone areas below the roadway; and cleaning/painting of Steel above the roadway with a high-performance coating.

Project Listings

MTA Capital Program 2020-2024

Capital Program Organization

Capital investments are organized and coded according to an Agency / Category / Element / Project (ACEP) hierarchy:

- Agency: MTA Agency identified with the project budget (e.g., “New York City Transit”);
- Category: Agency subset, typically focused on an 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 Program, reflecting a specific scope.

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 - 801" represents the Agency (“T” for New York City Transit) and the category code (“801” 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 “A Division Car Purchases.” Combining all the codes, the unique ACEP for this project is T8010101.

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;
- Various (VAR) projects include multiple needs codes in one project;
- 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 by element (i.e., started) in each year of the 2020-2024 program period, along with the total for all years.

New York City Transit

SUBWAY CARS
T - 801

Commitments
($ in millions)

ELEMENT DESCRIPTION/PROJECT		NEEDS CODE	2020	2021	2022	2023	2024	Total All Years
Category Total	**801**		**$1,500.0**	**$0.0**	**$1,842.1**	**$1,314.8**	**$1,400.0**	**$6,056.8**
01 SUBWAY CARS			**$1,500.0**	**$0.0**	**$1,842.1**	**$1,314.8**	**$1,400.0**	**$6,056.8**
01	A-Division Car Purchases	NR						1,500.0
02	Purchase 640 B-Division Cars (R211 Option 1)	NR						1,842.1
03	Purchase 437 B-Division Cars (R211 Option 2)	SI						1,314.8
04	Purchase A-Division Cars (Option)	NR						1,400.0

Numbers may not add due to rounding

New York City Transit

BUSES
T - 803

Commitments
($ in millions)

ELEMENT DESCRIPTION/PROJECT		NEEDS CODE	2020	2021	2022	2023	2024	Total All Years
Category Total	**803**		**$498.5**	**$383.9**	**$396.2**	**$327.7**	**$213.7**	**$1,820.0**
02	**BUS REPLACEMENT**		**$498.5**	**$383.9**	**$396.2**	**$327.7**	**$213.7**	**$1,820.0**
01	Purchase 375 Standard Electric Buses	NR						704.0
02	Purchase 713 Standard Buses	NR						543.6
03	Purchase 100 Articulated Electric Buses	NR						206.1
04	Purchase 245 Articulated Buses	NR						266.0
05	Purchase 92 Express Buses	NR						70.2
06	Purchase 23 Express Buses	SI						18.1
07	Advanced Tech Bus Development	SI						12.0

Numbers may not add due to rounding

New York City Transit

PASSENGER STATIONS
T - 804

Commitments
($ in millions)

ELEMENT DESCRIPTION/PROJECT		NEEDS CODE	2020	2021	2022	2023	2024	Total All Years
Category Total	**804**		**$1,749.2**	**$4,426.9**	**$1,547.2**	**$854.4**	**$626.0**	**$9,203.7**
04	**FARE COLLECTION**		**$153.6**	**$10.7**	**$14.8**	**$0.0**	**$0.0**	**$179.1**
01	New Fare Payment System (NFPS): Add Support Costs	SI						87.6
02	Turnstiles: Refurbishment (excl. electronics)	NR						3.4
03	Low Turnstiles: Procurement	SI						7.7
04	Wide Turnstiles: Procurement/Installation	SI						25.0
05	Additional Work: Fare Collection	SGR						55.4
07	**STATION ESCALATORS / ELEVATORS**		**$0.0**	**$790.8**	**$364.6**	**$235.6**	**$0.0**	**$1,391.1**
01	Replace 17 Hydraulic Elevators	SGR						120.3
02	Replace 61 Hydraulic Elevators	NR						460.9
03	Replace 27 Escalators	SGR						331.4
04	Replace 38 Escalators	NR						478.6
12	**STATION WORK**		**$588.1**	**$1,027.8**	**$469.3**	**$218.8**	**$221.0**	**$2,525.0**
01	Station Renewals at 10 ADA Locations	SGR						629.5
02	Station Renewals at 3 Locations	SGR						195.6
03	Plat, Mezz, & Interior Stair Comps: ADA Locations	SGR						133.4
04	Platform Components: Various Locations	SGR						625.7
05	Station Ventilators: Various Locations	SGR						52.9
06	Small Business Mentoring Program - Stations	SGR						203.4
07	Station Painting: Various Locations	SGR						32.4
08	Misc. Station Component/Renewal Work	SGR						446.3
09	Livonia Av-Junius St Station Connector	SI						38.4
10	Water Condition Remedy: Various Locations	SGR						32.2
11	Miscellaneous Station Investments	NR						59.4
12	Other Station Work	SI						75.8

Numbers may not add due to rounding

New York City Transit

PASSENGER STATIONS
T - 804

Commitments
($ in millions)

ELEMENT DESCRIPTION/PROJECT	NEEDS CODE	2020	2021	2022	2023	2024	Total All Years
Category Total 804		**$1,749.2**	**$4,426.9**	**$1,547.2**	**$854.4**	**$626.0**	**$9,203.7**
13 ACCESSIBILITY	SI	**$1,007.5**	**$2,597.6**	**$698.5**	**$400.0**	**$405.0**	**$5,108.6**

The following stations are identified for the proposed 2020-2024 Program:

Manhattan
01 ADA: 42nd St - Bryant Park - 5th Ave 6AV/FLS
02 ADA: 96th St 8AV
03 ADA: Dyckman St (northbound) BW7
04 ADA: 168th St BW7
05 ADA: 137th St BW7
06 ADA: 86th St LEX
07 ADA: Essex St NAS
08 ADA: Delancey St 6AV
09 ADA: 81 St - Museum of Natural History 8AV

Brooklyn
10 ADA: Myrtle Ave JAM
11 ADA: Borough Hall LEX
12 ADA: Junius St NLT
13 ADA: Avenue H (northbound) BRT
14 ADA: Sheepshead Bay BRT
15 ADA: Kings Hwy SEA
16 ADA: Norwood Ave JAM
17 ADA: Grand St CNR
18 ADA: Hoyt - Schermerhorn Sts FUL
19 ADA: 7th Av CUL
20 ADA: Avenue I CUL
21 ADA: Kings Hwy CUL
22 ADA: Classon Ave XTN
23 ADA: New Lots Av NLT
24 ADA: Broadway Junction JAM
25 ADA: Broadway Junction CNR
26 ADA: 36th St 4AV
27 ADA: Lorimer St CNR
28 ADA: Metropolitan Ave XTN
29 ADA: Church Avenue BRT
30 ADA: Neptune Ave CUL

Bronx
31 ADA: Parkchester PEL
32 ADA: East 149th St PEL
33 ADA: Mosholu Pkwy JER
34 ADA: 242 Street BW7
35 ADA: Brook Av PEL

Queens
36 ADA: Rockaway Blvd LIB
37 ADA: Beach 67th St FAR
38 ADA: Woodhaven Blvd QBL
39 ADA: Steinway St QBL
40 ADA: Briarwood QBL
41 ADA: Broadway AST

Locations To Be Identified
42 ADA: 2 Stations to be Identified
43 ADA Advance Planning / Design / Real Estate
44 ADA: 20 Additional Stations

Numbers may not add due to rounding

New York City Transit

TRACK
T - 805

Commitments
($ in millions)

ELEMENT DESCRIPTION/PROJECT		NEEDS CODE	2020	2021	2022	2023	2024	Total All Years
Category Total	**805**		**$599.7**	**$431.5**	**$489.2**	**$517.5**	**$520.3**	**$2,558.2**
02	**MAINLINE TRACK REHABILITATION**		**$429.2**	**$326.7**	**$336.1**	**$355.7**	**$355.8**	**$1,803.5**
01	Mainline Track Replacement	NR						1,453.5
02	Continuous Welded Rail	SI						175.0
03	Track Force Account	NR						175.0
03	**MAINLINE SWITCH REPLACEMENT**		**$170.5**	**$104.8**	**$153.1**	**$161.8**	**$164.5**	**$754.7**
01	Switch Replacement: SigMod Locations	NR						88.2
02	Switch Replacement: Various Locations	NR						666.5

Numbers may not add due to rounding

New York City Transit

LINE EQUIPMENT
T - 806

Commitments
($ in millions)

ELEMENT DESCRIPTION/PROJECT		NEEDS CODE	2020	2021	2022	2023	2024	Total All Years
Category Total	**806**		**$199.4**	**$9.8**	**$83.6**	**$119.5**	**$0.0**	**$412.3**
05	**LINE EQUIPMENT**		**$199.4**	**$9.8**	**$83.6**	**$119.5**	**$0.0**	**$412.3**
01	Tunnel Lighting: Various Locations	SGR						21.1
02	Fan Plants: Various Locations	VAR						159.5
03	Pump Rooms & Deep Wells: Various Locations	VAR						102.4
04	Additional Work: Line Equipment	SGR						129.3

Numbers may not add due to rounding

New York City Transit

LINE STRUCTURES
T - 807

Commitments ($ in millions)

ELEMENT DESCRIPTION/PROJECT		NEEDS CODE	2020	2021	2022	2023	2024	Total All Years
Category Total	**807**		**$1,190.9**	**$466.9**	**$358.4**	**$335.7**	**$32.0**	**$2,383.9**
03	**LINE STRUCTURE REHABILITATION**		**$1,190.9**	**$466.9**	**$358.4**	**$335.7**	**$32.0**	**$2,383.9**
01	Subway Structure Repairs: Various Locations	SGR						702.3
02	Elevated Structure Repairs: Various Locations	VAR						324.4
03	Line Structure Overcoating: Various Locations	SGR						1,011.8
04	Elevated Structure Netting	SGR						325.0
05	Miscellaneous Line Structure Investments	VAR						20.4

Numbers may not add due to rounding

New York City Transit

SIGNALS & COMMUNICATION
T - 808

Commitments ($ in millions)

ELEMENT DESCRIPTION/PROJECT	NEEDS CODE	2020	2021	2022	2023	2024	Total All Years
Category Total 808		**$1,326.8**	**$989.1**	**$3,349.7**	**$1,402.9**	**$50.9**	**$7,119.4**
03 SIGNAL MODERNIZATION		**$1,115.3**	**$589.9**	**$2,978.2**	**$1,252.9**	**$0.0**	**$5,936.2**
01 Interlocking SSI Replacement: Bergen St CUL	NR						47.4
02 System-Wide Signal Improvements	VAR						181.1
03 SigMod Equipment for Cars and Locomotives	SI						211.3
04 SigMod: 8 Av and 2 Interlockings (Add supp costs)	SGR						143.6
05 Miscellaneous SigMod Supporting Investments	VAR						30.7
The following lines are identified for the proposed 2020-2024 Program:							5,322.1
06 SigMod: 63rd St Line and 4 Interlockings							
07 SigMod: Astoria Line and 5 Interlockings							
08 SigMod: Crosstown Line and 3 Interlockings							
09 SigMod: Fulton Line and 5 Interlockings							
10 SigMod: Queens Blvd Line East and 5 Interlockings							
11 SigMod: Lexington Ave Line and 11 Interlockings							
06 COMMUNICATION SYSTEMS		**$211.5**	**$399.2**	**$371.6**	**$150.0**	**$50.9**	**$1,183.2**
01 Comm Network Upgrades: Various Locations	VAR						217.0
02 Phone PBX Switch Upgrades: Various Locations	NR						39.7
03 Fiber Optic Cable Replacement: Various Locations	SGR						47.2
04 Copper Cable Replacement: Various Locations	NR						10.0
05 Antenna Cable Replacement: Various Locations	SGR						24.0
06 Subway Radio Equipment Replacement	NR						43.1
07 Station Comm Room Upgrades: Various Locations	SGR						36.0
08 Station Information Systems: Various Locations	VAR						385.3
09 Passenger ID: Various Locations	SI						202.4
10 Security Technology Upgrades: Various Locations	VAR						130.9
11 Small Business Mentoring Program - Communications	SI						47.6

Numbers may not add due to rounding

New York City Transit

TRACTION POWER
T - 809

Commitments
($ in millions)

ELEMENT DESCRIPTION/PROJECT		NEEDS CODE	2020	2021	2022	2023	2024	Total All Years
Category Total	**809**		**$692.6**	**$712.5**	**$891.9**	**$303.4**	**$0.0**	**$2,600.4**
02	**SUBSTATIONS**		**$514.6**	**$712.5**	**$771.7**	**$56.7**	**$0.0**	**$2,055.5**
01	Substation Renewals: Various Locations	SGR						317.6
02	Substation Equipment: Various Locations	SGR						136.3
03	Substation Enclosures: Various Locations	SGR						87.0
04	Power Improvements for SigMod: Various Locations	SI						514.6
05	SigMod: Power Improvements Lexington Line	SI						1,000.0
04	**POWER DISTRIBUTION**		**$178.0**	**$0.0**	**$120.2**	**$246.7**	**$0.0**	**$544.9**
01	Circuit Breaker Houses: Various Locations	VAR						251.8
02	Traction Power Cables: Various Locations	SGR						159.4
03	Miscellaneous Power Investments	VAR						133.7

Numbers may not add due to rounding

New York City Transit

SHOPS & YARDS
T - 810

Commitments
($ in millions)

ELEMENT DESCRIPTION/PROJECT		NEEDS CODE	2020	2021	2022	2023	2024	Total All Years
Category Total	**810**		**$137.0**	**$22.0**	**$350.4**	**$46.7**	**$6.7**	**$562.8**
04	**SHOPS & YARDS**		**$137.0**	**$22.0**	**$350.4**	**$46.7**	**$6.7**	**$562.8**
01	Shop Component Repairs: Various Locations	VAR						269.7
02	Shop Rehab/Reconstruct: Various Locations	SGR						239.4
03	Yard/Non-Revenue Track Replacement	SGR						18.9
04	Yard Switch Replacement	SGR						19.6
05	Yard Fencing/Lighting/Misc. Investments	VAR						15.3

Numbers may not add due to rounding

New York City Transit

DEPOTS
T - 812

Commitments
($ in millions)

ELEMENT DESCRIPTION/PROJECT		NEEDS CODE	2020	2021	2022	2023	2024	Total All Years
Category Total	**812**		**$199.1**	**$124.4**	**$418.2**	**$70.9**	**$8.4**	**$821.0**
03	**DEPOT REHAB & RECONSTRUCTION**		**$114.1**	**$122.4**	**$411.2**	**$54.8**	**$8.4**	**$710.8**
01	Depot Component Repairs: Various Locations	VAR						229.7
02	Electric Fleet Modifications	SI						100.0
03	Jamaica Depot Reconstruction	NR						381.2
04	**DEPOT IMPROVEMENTS**		**$85.0**	**$2.0**	**$7.0**	**$16.1**	**$0.0**	**$110.1**
01	Automatic Bus Lane Enforcement (ABLE), Phase 2	SI						85.0
02	Miscellaneous Depot Investments	NR						25.1

Numbers may not add due to rounding

New York City Transit

SERVICE VEHICLES
T - 813

Commitments
($ in millions)

ELEMENT DESCRIPTION/PROJECT	NEEDS CODE	2020	2021	2022	2023	2024	Total All Years
Category Total 813		**$229.5**	**$65.4**	**$40.0**	**$18.8**	**$0.0**	**$353.7**
02 SERVICE VEHICLES		**$229.5**	**$65.4**	**$40.0**	**$18.8**	**$0.0**	**$353.7**
01 Purchase Rubber Tire Vehicles	NR						40.0
02 Purchase Various Work Train Cars/Locomotives	VAR						313.7

Numbers may not add due to rounding

New York City Transit

MISC./EMERGENCY
T - 816

Commitments
($ in millions)

ELEMENT DESCRIPTION/PROJECT	NEEDS CODE	2020	2021	2022	2023	2024	Total All Years
Category Total 816		**$496.7**	**$147.8**	**$224.5**	**$155.0**	**$99.2**	**$1,123.2**
02 MISCELLANEOUS		**$152.0**	**$8.3**	**$8.4**	**$8.5**	**$8.7**	**$185.9**
01 Capital Revolving Fund							25.0
02 Insurance to Support Capital Program							160.9
04 MANAGEMENT INFORMATION SYSTEMS		**$20.0**	**$0.0**	**$47.9**	**$0.0**	**$0.0**	**$67.9**
01 Enterprise Asset Management (EAM)	NR						45.4
02 Information Systems Upgrades	VAR						22.5
05 ENGINEERING SERVICES		**$104.3**	**$53.2**	**$51.5**	**$49.0**	**$54.6**	**$312.6**
01 Utica Ave Corridor Study EIS	SI						5.0
02 Engineering Services to Support Capital Program							159.7
03 Scope Development and Design Reserve							100.9
04 MTA Independent Engineering Consultant							27.0
05 Small Business Mentoring Program Administration							20.0
06 ENVIRONMENTAL SAFETY		**$0.0**	**$19.2**	**$52.0**	**$53.9**	**$35.9**	**$161.0**
01 Fire Alarms and Sprinklers: Various Locations	NR						105.9
02 Asbestos/Lead Air Monitoring	NR						25.5
03 Environmental Remediation	NR						29.6
07 EMPLOYEE FACILITIES		**$220.4**	**$67.2**	**$64.7**	**$43.6**	**$0.0**	**$395.9**
01 Subways Employee Facility Repairs: Various Locs	SGR						269.4
02 Facility Elevator Replacement: Various Locations	NR						34.4
03 Misc./Administrative Facility Investments	VAR						92.0
NYCT TOTAL PROGRAM		**$8,819.4**	**$7,780.1**	**$9,991.4**	**$5,467.4**	**$2,957.3**	**$35,015.5**

Numbers may not add due to rounding

Staten Island Railway

STATEN ISLAND RAILWAY
S - 807

Commitments
($ in millions)

ELEMENT DESCRIPTION/PROJECT	NEEDS CODE	2020	2021	2022	2023	2024	Total All Years
Category Total 807		**$150.6**	**$25.9**	**$10.0**	**$176.2**	**$10.8**	**$373.5**
01 SIR: MISCELLANEOUS		**$150.6**	**$25.9**	**$10.0**	**$176.2**	**$10.8**	**$373.5**
01 Station Components: Various Locations	SGR						39.5
02 Track and Switch Replacement	SGR						137.0
03 Bridge Structures: Various Locations	VAR						53.7
04 Purchase Various Work Train Cars	VAR						15.5
05 Purchase Rubber Tire Vehicles	SGR						5.0
The following stations are identified for the proposed 2020-2024 Program:							122.8
06 ADA: Clifton SIR	08 ADA: New Dorp SIR						
07 ADA: Huguenot SIR							
SIR TOTAL PROGRAM		**$150.6**	**$25.9**	**$10.0**	**$176.2**	**$10.8**	**$373.5**

Numbers may not add due to rounding

New York City Transit Agency Summary

Commitments
($ in millions)

AGENCY	2020	2021	2022	2023	2024	Total All Years
TOTAL New York City Transit	$8,819.4	$7,780.1	$9,991.4	$5,467.4	$2,957.3	$35,015.5
TOTAL Staten Island Railway	$150.6	$25.9	$10.0	$176.2	$10.8	$373.5
TOTAL NEW YORK CITY TRANSIT AGENCY PROGRAM	$8,970.0	$7,806.0	$10,001.4	$5,643.5	$2,968.0	$35,389.0

Numbers may not add due to rounding

Long Island Rail Road

ROLLING STOCK
L - 801

Commitments
($ in millions)

ELEMENT DESCRIPTION/PROJECT	NEEDS CODE	2020	2021	2022	2023	2024	Total All Years
Category Total 801		**$12.3**	**$67.1**	**$26.8**	**$70.4**	**$65.6**	**$242.2**
01 REVENUE EQUIPMENT		**$12.3**	**$67.1**	**$26.8**	**$70.4**	**$65.6**	**$242.2**
01 Work Locomotives	NR						30.0
02 Purchase Dual-Mode Locomotives	NR						150.0
03 Purchase Coaches	NR						60.0
04 Other Rolling Stock	SI						2.2

Numbers may not add due to rounding

Long Island Rail Road

STATIONS
L - 802

Commitments ($ in millions)

ELEMENT DESCRIPTION/PROJECT	NEEDS CODE	2020	2021	2022	2023	2024	Total All Years
Category Total 802		**$152.6**	**$312.3**	**$208.6**	**$141.8**	**$94.2**	**$909.5**
04 STATIONS AND BUILDINGS		**$121.1**	**$294.3**	**$194.9**	**$114.7**	**$81.8**	**$806.8**
01 Station Renewals: Various Locations	NR						88.2
02 Station Platform Components: Various Locations	VAR						252.1
03 Station Building Components: Various Locations	VAR						6.9
04 Escalator Replacement	NR						10.0
05 Elevator Replacement	NR						16.4
06 Fare Collection Program	NR						35.0
07 Community Development Fund Contribution	SI						5.0
08 Small Business Mentoring Program - Stations	NR						16.0
The following stations are identified for the proposed 2020-2024 Program:							377.2
09 ADA: Hollis Station Platform Replacement							
10 ADA: Hunterspoint Station Rehabilitation							
11 ADA: Locust Manor - New Elevators							
12 ADA: Forest Hills Platform Extensions & Elevators							
13 ADA: Copiague Platform Extension & New Elevator							
14 ADA: St. Albans New Elevator							
15 New Mets - Willets Pt Station (ADA)							
05 PARKING		**$11.5**	**$10.8**	**$1.3**	**$2.3**	**$2.4**	**$28.3**
01 Parking Rehabilitation & Access Improvements	VAR						17.1
02 Small Business Mentoring Program - Parking	NR						11.2
06 PENN STATION		**$0.0**	**$7.2**	**$2.4**	**$24.8**	**$10.0**	**$44.4**
01 Penn Station HVAC, Platform,& Building Improvement	SGR						39.4
02 Radio Antenna Improvements	NR						5.0
07 GRAND CENTRAL TERMINAL		**$20.0**	**$0.0**	**$10.0**	**$0.0**	**$0.0**	**$30.0**
01 GCT Facility Needs	SI						30.0

Numbers may not add due to rounding

Long Island Rail Road

TRACK
L - 803

Commitments
($ in millions)

ELEMENT DESCRIPTION/PROJECT		NEEDS CODE	2020	2021	2022	2023	2024	Total All Years
Category Total	**803**		**$283.0**	**$189.0**	**$188.1**	**$162.5**	**$195.4**	**$1,018.0**
01	**ANNUAL TRACK REHAB PROGRAM**		**$183.0**	**$149.0**	**$115.0**	**$117.8**	**$118.2**	**$683.0**
01	Construction Equipment & Geometry Cars	SGR						55.0
02	Various Right of Way Projects	VAR						15.0
03	Yard Track Rehabilitation	VAR						28.0
04	Annual Track Program	NR						585.0
04	**OTHER TRACK IMPROVEMENTS**		**$100.0**	**$40.0**	**$73.1**	**$44.7**	**$77.2**	**$335.0**
01	Amtrak Territory Investments	NR						100.0
02	Jamaica Capacity Improvements	SI						135.0
03	E Yard Extension	SI						100.0

Numbers may not add due to rounding

Long Island Rail Road

LINE STRUCTURES
L - 804

Commitments
($ in millions)

ELEMENT DESCRIPTION/PROJECT		NEEDS CODE	2020	2021	2022	2023	2024	Total All Years
Category Total	**804**		**$89.5**	**$39.7**	**$86.1**	**$67.3**	**$61.0**	**$343.5**
01	**BRIDGES**		**$74.5**	**$34.7**	**$49.1**	**$58.3**	**$52.0**	**$268.5**
01	Painting, Drainage, & Waterproofing of Bridges	SGR						36.2
02	Replacement & Rehabilitation of Bridges	SGR						126.1
03	Miscellaneous Bridge Work	VAR						72.4
04	Small Business Mentoring Program - Bridges	NR						33.8
02	**TUNNELS**		**$15.0**	**$5.0**	**$37.0**	**$9.0**	**$9.0**	**$75.0**
01	Atlantic Avenue Tunnel Structural Work	SGR						50.0
02	Tunnel Replacements & Upgrades	NR						5.0
03	ERT Fire and Life Safety	NR						20.0

Numbers may not add due to rounding

Long Island Rail Road

COMMUNICATIONS & SIGNALS
L - 805

Commitments
($ in millions)

ELEMENT DESCRIPTION/PROJECT		NEEDS CODE	2020	2021	2022	2023	2024	Total All Years
Category Total	**805**		**$156.7**	**$18.0**	**$37.5**	**$106.3**	**$45.4**	**$363.9**
01	**COMMUNICATIONS IMPROVEMENTS**		**$13.9**	**$12.9**	**$13.5**	**$22.0**	**$12.7**	**$75.0**
01	Comm. Pole Line	SGR						8.0
02	Comm Component Replacement	SGR						8.0
03	Fiber Optic Network	NR						20.0
04	Station Technology Upgrades	SI						3.0
05	Portable Mobile Radio Replacement	NR						1.0
06	Radio Head-End Replacement	NR						10.0
07	Improved Radio Coverage Initiative/FCC Mandates	SI						5.0
08	Help Points	SI						5.0
09	Implement New Communications Systems Technology	SI						5.0
10	Grade Crossing Cameras	SI						5.0
11	Customer Information Technology Upgrade	SI						5.0
02	**SIGNAL IMPROVEMENTS**		**$142.8**	**$5.1**	**$24.0**	**$84.3**	**$32.7**	**$288.9**
01	Babylon Interlocking Renewal & New Sidings	VAR						60.9
02	Hunt to Post	SGR						67.6
03	Babylon to Patchogue	SGR						50.0
04	Centralized Train Control	SI						50.0
05	Signal Replacement and Interlocking Improvements	VAR						60.4

Numbers may not add due to rounding

Long Island Rail Road

SHOPS AND YARDS
L - 806

Commitments
($ in millions)

ELEMENT DESCRIPTION/PROJECT		NEEDS CODE	2020	2021	2022	2023	2024	Total All Years
Category Total	**806**		**$42.0**	**$56.3**	**$34.7**	**$37.7**	**$32.2**	**$202.9**
01	**SHOPS AND YARDS**		**$22.0**	**$34.3**	**$23.7**	**$21.7**	**$17.2**	**$118.9**
01	Rolling Stock Support Shop Equipment	NR						43.4
02	Shop Improvements at Various Locations	VAR						12.6
03	Yard Improvements at Various Locations	VAR						60.5
04	Small Business Mentoring Program - Shops & Yards	NR						2.4
04	**EMPLOYEE FACILITIES**		**$20.0**	**$22.0**	**$11.0**	**$16.0**	**$15.0**	**$84.0**
01	Rehabilitation of Employee Facilities - Various Lo	VAR						43.2
02	Consolidation of Employee Facilities	SI						10.0
03	Fire Protection Improvements	NR						7.0
04	New Signal Training Facility	SI						2.0
05	Small Business Mentoring Program - Emp. Facs.	NR						21.8

Numbers may not add due to rounding

Long Island Rail Road

POWER
L - 807

Commitments
($ in millions)

ELEMENT DESCRIPTION/PROJECT		NEEDS CODE	2020	2021	2022	2023	2024	Total All Years
Category Total	**807**		**$176.4**	**$138.4**	**$20.8**	**$21.6**	**$68.8**	**$426.0**
01 POWER			**$176.4**	**$138.4**	**$20.8**	**$21.6**	**$68.8**	**$426.0**
01	Substation Replacements	SGR						80.0
02	Lighting Improvements	SGR						18.0
03	Power Component Repairs and Replacements	VAR						55.0
04	3rd Rail Upgrades	NR						43.0
05	Central Branch Electrification	SI						230.0

Numbers may not add due to rounding

Long Island Rail Road

MISCELLANEOUS
L - 809

Commitments
($ in millions)

ELEMENT DESCRIPTION/PROJECT		NEEDS CODE	2020	2021	2022	2023	2024	Total All Years
Category Total	**809**		**$44.6**	**$44.9**	**$48.2**	**$48.7**	**$44.6**	**$231.0**
04	**MISCELLANEOUS**		**$44.6**	**$44.9**	**$48.2**	**$48.7**	**$44.6**	**$231.0**
01	Security Camera Replacement Program	NR						5.0
02	Access Control at Stations, Platforms, Yards & Fac	NR						5.0
03	Perimeter Physical Hardening Project	SI						3.0
04	Equipment Upgrades for Security Command Centers	NR						3.0
05	Atlantic Avenue Tunnels Security Improvements	SI						4.0
06	Centralized Video Storage/Management Solution	SI						5.0
07	Physical Assessment of all LIRR Right of Way	SI						3.5
08	Environmental Remediation	NR						2.0
09	EAM Development	SI						8.0
10	Program Administration							138.0
11	Program Development							10.0
12	Insurance							9.0
13	Independent Engineer							10.5
14	SBDP Administration							9.0
15	OCIP							16.0
LIRR TOTAL PROGRAM			**$957.1**	**$865.7**	**$650.8**	**$656.3**	**$607.1**	**$3,737.0**

Numbers may not add due to rounding

Metro-North Railroad

ROLLING STOCK
M - 801

Commitments
($ in millions)

ELEMENT DESCRIPTION/PROJECT	NEEDS CODE	2020	2021	2022	2023	2024	Total All Years
Category Total 801		**$484.6**	**$368.1**	**$0.0**	**$0.0**	**$0.0**	**$852.7**
01 REVENUE EQUIPMENT		**$484.6**	**$368.1**	**$0.0**	**$0.0**	**$0.0**	**$852.7**
01 M-3 Replacement	NR						484.6
02 Locomotive Replacement	NR						368.1

Numbers may not add due to rounding

Metro-North Railroad

STATIONS
M - 802

Commitments
($ in millions)

ELEMENT DESCRIPTION/PROJECT		NEEDS CODE	2020	2021	2022	2023	2024	Total All Years
Category Total	**802**		**$367.0**	**$123.0**	**$354.5**	**$274.9**	**$9.9**	**$1,129.2**
01	**GRAND CENTRAL TERMINAL**		**$314.0**	**$68.3**	**$171.6**	**$97.1**	**$0.0**	**$651.0**
01	GCT Trainshed	SGR						348.8
02	Park Avenue Tunnel Improvements	SGR						159.6
03	GCT Building Component Repairs/Replacements	VAR						134.2
04	Small Business Mentoring Program - GCT	SGR						8.4
02	**OUTLYING STATIONS**		**$49.9**	**$54.7**	**$47.5**	**$177.8**	**$9.9**	**$339.9**
01	Upper H&H Stations Priority Repairs	NR						21.1
02	Harlem Line Station Renewals	SGR						193.5
03	Harlem ADA Improvements	NR						52.3
04	East of Hudson Priority Repairs	SGR						12.0
05	Ludlow Station Accessibility Improvements	NR						11.0
06	New Fare Payment Equipment	NR						25.0
07	Small Business Mentoring Program - Stations	SGR						25.0
03	**PARKING**		**$3.0**	**$0.0**	**$135.4**	**$0.0**	**$0.0**	**$138.4**
01	Brewster Yard Improvements-SE Parking	NR						129.4
02	Small Business Mentoring Program - Parking	SGR						9.0

Numbers may not add due to rounding

Metro-North Railroad

TRACK & STRUCTURES
M - 803

Commitments ($ in millions)

ELEMENT DESCRIPTION/PROJECT		NEEDS CODE	2020	2021	2022	2023	2024	Total All Years
Category Total	**803**		**$113.7**	**$151.6**	**$148.6**	**$470.2**	**$137.2**	**$1,021.4**
01	**TRACK**		**$56.6**	**$56.6**	**$63.3**	**$42.3**	**$42.7**	**$261.5**
01	Cyclical Track Program	NR						117.4
02	Cyclical Replacement of Insulated Joints	NR						2.3
03	Turnouts - Mainline, GCT, & Yards	NR						86.7
04	Rock Slope Remediation - East of Hudson	SGR						15.0
05	Rebuild Marble Hill Retaining Wall - Phase 1	NR						15.0
06	RoW Drainage Improvements	SGR						8.6
07	MoW Equipment	SGR						16.6
02	**STRUCTURES**		**$46.8**	**$65.8**	**$47.4**	**$409.0**	**$3.8**	**$572.9**
01	Park Avenue Viaduct Replacement	SGR						386.9
02	Undergrade Bridge Program - EoH	SGR						77.6
03	Overhead Bridge Program	SGR						76.0
04	Railtop Culverts	SGR						4.5
05	Bridge Walkways	SGR						2.3
06	Replace Timbers UG Bridges	NR						4.5
07	Right-of-Way Fencing	NR						1.1
08	Hudson Line Tunnels	SGR						5.7
09	Small Business Mentoring Program - Structures	SGR						14.1
03	**W OF HUDSON INFRASTRUCTURE**		**$10.3**	**$29.1**	**$38.0**	**$18.9**	**$90.7**	**$187.0**
01	WoH Rock Slope Remediation - Pt Jervis Line	SGR						11.4
02	WoH Track Program - Pt Jervis Line	SGR						15.9
03	WoH Undergrade Bridges - Pt Jervis Line	SGR						10.5
04	Moodna/Woodbury Viaduct Repairs	SGR						40.0
05	WoH Improvements	SGR						3.5
06	Small Business Mentoring Program - West of Hudson	SGR						5.7
07	WoH Capacity Improvements - Pt Jervis Line	SI						100.0

Numbers may not add due to rounding

Metro-North Railroad

COMM & SIGNALS
M - 804

Commitments
($ in millions)

ELEMENT DESCRIPTION/PROJECT		NEEDS CODE	2020	2021	2022	2023	2024	Total All Years
Category Total	**804**		**$4.0**	**$50.3**	**$59.0**	**$65.9**	**$3.0**	**$182.2**
01	**COMM & SIGNALS**		**$4.0**	**$50.3**	**$59.0**	**$65.9**	**$3.0**	**$182.2**
01	Harmon to Poughkeepsie Signal System	SGR						142.5
02	PBX Replacement/Upgrade	NR						2.9
03	Voice Recorder Replacement	NR						1.0
04	Network Infrastructure	NR						12.5
05	Station PA System	NR						1.5
06	Radio System	NR						10.0
07	Fire Alarm & Suppression Systems	NR						3.0
08	CCTV	NR						2.5
09	Grade Crossing Improvements	NR						3.0
10	Hot Box & Dragging Equipment	NR						0.3
11	Replace High Cycle Rate Relays	NR						0.5
12	Track Circuit Reliability	NR						2.4

Numbers may not add due to rounding

Metro-North Railroad

POWER
M - 805

Commitments
($ in millions)

ELEMENT DESCRIPTION/PROJECT		NEEDS CODE	2020	2021	2022	2023	2024	Total All Years
Category Total	**805**		**$32.7**	**$46.2**	**$80.9**	**$36.2**	**$6.2**	**$202.2**
01	**POWER**		**$32.7**	**$46.2**	**$80.9**	**$36.2**	**$6.2**	**$202.2**
01	Repl. MA's in Signal Substations	SGR						20.0
02	Substation Rehabs	SGR						14.8
03	Harlem Line Power Improvements	NR						55.4
04	NHL Substation Improvements	VAR						83.2
05	3rd Rail Component Replacement	SGR						11.1
06	Hudson Line Track 1 Electrification	SI						11.1
07	Repl Signl Pwr Transformer & Signl Sect. Switches	NR						3.2
08	Transformer Rehabilitation	NR						3.4

Numbers may not add due to rounding

Metro-North Railroad

SHOPS & YARDS
M - 806

Commitments
($ in millions)

ELEMENT DESCRIPTION/PROJECT	NEEDS CODE	2020	2021	2022	2023	2024	Total All Years
Category Total 806		**$14.5**	**$0.0**	**$5.0**	**$0.0**	**$3.5**	**$23.0**
01 SHOPS & YARDS		**$14.5**	**$0.0**	**$5.0**	**$0.0**	**$3.5**	**$23.0**
01 Upgrade Automotive Fuel System	SGR						4.5
02 NHL Yard Improvements (non-PSA)	SI						15.0
03 Small Business Mentoring Program - Shops & Yards	SGR						3.5

Numbers may not add due to rounding

Metro-North Railroad

MISCELLANEOUS
M - 808

Commitments
($ in millions)

ELEMENT DESCRIPTION/PROJECT	NEEDS CODE	2020	2021	2022	2023	2024	Total All Years
Category Total 808		**$25.6**	**$17.5**	**$64.4**	**$17.5**	**$22.5**	**$147.5**
01 MISCELLANEOUS		**$25.6**	**$17.5**	**$64.4**	**$17.5**	**$22.5**	**$147.5**
01 Environmental Remediation							3.0
02 Systemwide Lead/Asbestos Abatement							3.0
03 Railroad Protective Liability							4.5
04 Independent Engineer							8.0
05 Program Administration							50.0
06 Program Scope Development							20.0
07 OCIP							34.0
08 Systemwide Security Initiatives							10.0
09 Small Business Mentoring Program Administration							7.0
10 EAM Reserve							8.0
MNR TOTAL PROGRAM		**$1,042.1**	**$756.6**	**$712.4**	**$864.7**	**$182.3**	**$3,558.2**

Numbers may not add due to rounding

Commuter Railroad Agency Summary

AGENCY	Commitments ($ in millions) 2020	2021	2022	2023	2024	Total All Years
TOTAL Long Island Rail Road	$957.1	$865.7	$650.8	$656.3	$607.1	$3,737.0
TOTAL Metro-North Railroad	$1,042.1	$756.6	$712.4	$864.7	$182.3	$3,558.2
TOTAL COMMUTER RAILROAD AGENCY PROGRAM	$1,999.2	$1,622.4	$1,363.2	$1,521.0	$789.5	$7,295.2

Numbers may not add due to rounding

MTA Bus Company

BUS COMPANY PROJECTS
U - 803

Commitments
($ in millions)

ELEMENT DESCRIPTION/PROJECT		NEEDS CODE	2020	2021	2022	2023	2024	Total All Years
Category Total	**803**		**$334.7**	**$98.0**	**$231.3**	**$162.3**	**$44.4**	**$870.7**
02	**BUS COMPANY PROJECTS**		**$334.7**	**$98.0**	**$231.3**	**$162.3**	**$44.4**	**$870.7**
01	Purchase 25 Standard Electric Buses	NR						49.1
02	Purchase 237 Standard Buses	SGR						163.3
03	Purchase 228 Standard Buses	NR						193.4
04	Purchase 55 Standard Buses	SI						37.9
05	Purchase 250 Express Buses	SGR						188.4
06	Purchase 42 Articulated Buses	NR						42.6
07	Purchase 37 Articulated Buses	SI						39.4
08	Bus Systems	SI						5.0
09	Depot Component Repairs: Various Locations	VAR						61.8
10	Purchase Rubber Tire Vehicles	NR						2.0
11	Electric Fleet Mod at 1 MTA Bus Depot	SI						20.0
12	Miscellaneous Depot Investments	VAR						36.3
13	Traffic Signal Priority	SI						2.5
14	Project Engineering and Administration							29.0
MTA BUS TOTAL PROGRAM			**$334.7**	**$98.0**	**$231.3**	**$162.3**	**$44.4**	**$870.7**

Numbers may not add due to rounding

MTA Interagency

MTA POLICE DEPARTMENT
N - 810

Commitments
($ in millions)

ELEMENT DESCRIPTION/PROJECT		NEEDS CODE	2020	2021	2022	2023	2024	Total All Years
Category Total	**810**		**$6.8**	**$5.4**	**$8.8**	**$4.5**	**$13.4**	**$38.9**
01	**MTA POLICE DEPARTMENT**		**$6.8**	**$5.4**	**$8.8**	**$4.5**	**$13.4**	**$38.9**
01	Mt Vernon District Office Rehab/Replacement	NR						12.0
02	MRRS Antenna Systems and Transmitters	SI						8.0
03	Communications Radio Equipment	SI						12.6
05	ESA Grand Central Terminal	NR						2.0
06	REP-ESU Fleet Vehicle Purchases	NR						1.8
07	Other Facility, Vehicle and Admin Support	NR						2.5

Numbers may not add due to rounding

MTA Interagency

MTA PLANNING
N - 811

Commitments
($ in millions)

ELEMENT DESCRIPTION/PROJECT		NEEDS CODE	2020	2021	2022	2023	2024	Total All Years
Category Total	**811**		**$14.0**	**$15.0**	**$16.0**	**$17.0**	**$18.0**	**$80.0**
01	**MTA PLANNING INITIATIVES**		**$14.0**	**$15.0**	**$16.0**	**$17.0**	**$18.0**	**$80.0**
01	Core Planning Support	SI						10.0
02	Corridor Planning Support	SI						10.0
03	Other Capital Planning Initiatives	SI						60.0
MTA INTERAGENCY TOTAL PROGRAM			**$20.8**	**$20.4**	**$24.8**	**$21.5**	**$31.4**	**$118.9**

Numbers may not add due to rounding

MTA Interagency Summary

Commitments
($ in millions)

AGENCY	2020	2021	2022	2023	2024	Total All Years
TOTAL MTA POLICE DEPARTMENT	$6.8	$5.4	$8.8	$4.5	$13.4	$38.9
TOTAL MTA PLANNING	$14.0	$15.0	$16.0	$17.0	$18.0	$80.0
TOTAL MTA INTERAGENCY	$20.8	$20.4	$24.8	$21.5	$31.4	$118.9

Numbers may not add due to rounding

Capital Construction Company

EAST SIDE ACCESS
G - 809

Commitments
($ in millions)

ELEMENT DESCRIPTION/PROJECT	NEEDS CODE	2020	2021	2022	2023	2024	Total All Years
Category Total 809		$0.0	$518.9	$279.3	$0.0	$0.0	$798.2
01 EAST SIDE ACCESS	NE	$0.0	$518.9	$279.3	$0.0	$0.0	$798.2

Numbers may not add due to rounding

Capital Construction Company

FULL LENGTH SECOND AVE SUBWAY

G - 810

Commitments
($ in millions)

ELEMENT DESCRIPTION/PROJECT	NEEDS CODE	2020	2021	2022	2023	2024	Total All Years
Category Total 810		**$190.0**	**$2,215.0**	**$1,850.0**	**$150.0**	**$150.0**	**$4,555.0**
01 SECOND AVE SUBWAY - PHASE 2	NE	**$190.0**	**$2,215.0**	**$1,850.0**	**$150.0**	**$150.0**	**$4,555.0**

Numbers may not add due to rounding

Capital Construction Company

PENN STATION ACCESS
G - 811

Commitments
($ in millions)

ELEMENT DESCRIPTION/PROJECT	NEEDS CODE	2020	2021	2022	2023	2024	Total All Years
Category Total 811		$964.3	$57.8	$57.8	$51.3	$0.0	$1,131.1
01 PENN STATION ACCESS	NE	$964.3	$57.8	$57.8	$51.3	$0.0	$1,131.1

Numbers may not add due to rounding

Capital Construction Company

LIRR EXPANSION PROJECT
G - 813

Commitments
($ in millions)

ELEMENT DESCRIPTION/PROJECT	NEEDS CODE	2020	2021	2022	2023	2024	Total All Years
Category Total 813		**$312.2**	**$132.3**	**$78.1**	**$15.9**	**$0.0**	**$538.5**
01 LIRR EXPANSION PROJECT	NE	**$312.2**	**$132.3**	**$78.1**	**$15.9**	**$0.0**	**$538.5**

Numbers may not add due to rounding

Capital Construction Company

REGIONAL INVESTMENTS
G - 814

Commitments
($ in millions)

ELEMENT DESCRIPTION/PROJECT	NEEDS CODE	2020	2021	2022	2023	2024	Total All Years
Category Total 814		$0.0	$301.4	$50.6	$142.7	$45.8	$540.5
01 REGIONAL INVESTMENTS	NE	$0.0	$301.4	$50.6	$142.7	$45.8	$540.5

Numbers may not add due to rounding

Capital Construction Company

MISCELLANEOUS
G - 816

Commitments
($ in millions)

ELEMENT DESCRIPTION/PROJECT	NEEDS CODE	2020	2021	2022	2023	2024	Total All Years
Category Total 816		**$0.0**	**$32.5**	**$33.3**	**$134.0**	**$34.8**	**$234.6**
01 MISCELLANEOUS		**$0.0**	**$32.5**	**$33.3**	**$134.0**	**$34.8**	**$234.6**
01 Misc Engineering/Prog Support	NE						117.8
02 MTA Indep. Engineering Consultant	NE						16.8
03 Additional Program Support	NE						100.0
MTACC TOTAL PROGRAM		**$1,466.5**	**$3,258.0**	**$2,349.1**	**$494.0**	**$230.6**	**$7,798.0**

Numbers may not add due to rounding

CPRB Agency Summary

Commitments
($ in millions)

AGENCY	2020	2021	2022	2023	2024	Total All Years
TOTAL New York City Transit	$8,970.0	$7,806.0	$10,001.4	$5,643.5	$2,968.0	$35,389.0
TOTAL Long Island Rail Road	$957.1	$865.7	$650.8	$656.3	$607.1	$3,737.0
TOTAL Metro-North Railroad	$1,042.1	$756.6	$712.4	$864.7	$182.3	$3,558.2
TOTAL MTA Bus Company	$334.7	$98.0	$231.3	$162.3	$44.4	$870.7
TOTAL MTA Interagency	$20.8	$20.4	$24.8	$21.5	$31.4	$118.9
Core Subtotal	$11,324.7	$9,546.8	$11,620.7	$7,348.3	$3,833.3	$43,673.8
TOTAL Capital Construction Company	$1,466.5	$3,258.0	$2,349.1	$494.0	$230.6	$7,798.0
TOTAL 2020-2024 CPRB PROGRAM	$12,791.1	$12,804.8	$13,969.8	$7,842.2	$4,063.9	$51,471.8

Numbers may not add due to rounding

Bridges and Tunnels

STRUCTURES
D - 801

Commitments
($ in millions)

ELEMENT DESCRIPTION/PROJECT	NEEDS CODE	2020	2021	2022	2023	2024	Total All Years
Category Total 801		**$36.5**	**$25.7**	**$379.2**	**$275.3**	**$288.6**	**$1,005.3**
AW AGENCY-WIDE		**$0.0**	**$0.0**	**$0.0**	**$0.0**	**$20.8**	**$20.8**
X3 Structural Health Monitoring	SI						20.8
BW BRONX-WHITESTONE BRIDGE		**$0.0**	**$2.7**	**$0.0**	**$19.4**	**$0.0**	**$22.0**
14 Miscellaneous Structural Rehabilitation	NR						22.0
CB CROSS BAY BRIDGE		**$9.6**	**$8.2**	**$21.9**	**$0.0**	**$0.0**	**$39.8**
24 Rehabilitation/Reconstruction of Rockaway Crossing	NR						8.2
30 Structural Rehabilitation of CBB	NR						31.5
HC HUGH L. CAREY TUNNEL		**$0.0**	**$0.0**	**$10.4**	**$13.5**	**$0.0**	**$24.0**
28 Tunnel Rehabilitation	NR						7.4
48 Rehabilitation of Tunnel Entrance/Exit - Manhattan	NR						6.3
84 Rehabilitation of Pipe Gallery	NR						10.4
HH HENRY HUDSON BRIDGE		**$3.1**	**$0.1**	**$120.0**	**$0.0**	**$0.5**	**$123.6**
36 Dyckman St. Abutment Repl. & Substation Upgrade	NR						120.5
37 Upper Level North Abutment & Retaining Wall Recon.	NR						3.1
MP MARINE PARKWAY BRIDGE		**$0.0**	**$2.2**	**$25.7**	**$0.0**	**$0.0**	**$27.9**
16 Miscellaneous Steel Repairs	NR						27.9
QM QUEENS MIDTOWN TUNNEL		**$0.1**	**$3.3**	**$13.7**	**$0.0**	**$0.5**	**$17.5**
40 Tunnel Rehabilitation	NR						3.8
84 Rehabilitation of Pipe Gallery	NR						13.7
RK ROBERT F. KENNEDY BRIDGE		**$23.8**	**$9.2**	**$186.0**	**$216.1**	**$89.6**	**$524.6**
04 Ward's Island/Queens Anchorage Rehabilitation	NR						172.5
19 Suspended Span Retrofit	NR						137.0
70 Structural Repairs/Flag Repairs	NR						62.1
80 New Major Deegan to Bronx Approach Ramp	SI						7.4
81 Facility Interoperability Improvements	NR						8.8
83 Lift Span Fender Upgrades	NR						44.7
93 Reconstruct / Relocate RI Ramps (QR & RM)	SI						92.1

Numbers may not add due to rounding

Bridges and Tunnels

Commitments
($ in millions)

ELEMENT DESCRIPTION/PROJECT		NEEDS CODE	2020	2021	2022	2023	2024	Total All Years
TN	**THROGS NECK BRIDGE**		**$0.0**	**$0.0**	**$1.6**	**$0.0**	**$170.1**	**$171.7**
52	Miscellaneous Structural Rehabilitation	NR						27.2
87	Anchorage & Tower Protection	NR						144.5
VN	**VERRAZZANO-NARROWS BRIDGE**		**$0.0**	**$0.0**	**$0.0**	**$26.3**	**$7.1**	**$33.4**
32	Steel Repair & Concrete Rehabilitation	NR						33.4

Numbers may not add due to rounding

Bridges and Tunnels

ROADWAYS & DECKS
D - 802

Commitments
($ in millions)

ELEMENT DESCRIPTION/PROJECT		NEEDS CODE	2020	2021	2022	2023	2024	Total All Years
Category Total	**802**		**$2.6**	**$47.0**	**$184.6**	**$595.6**	**$0.0**	**$829.8**
BW	**BRONX-WHITESTONE BRIDGE**		**$0.4**	**$0.0**	**$0.1**	**$2.8**	**$0.0**	**$3.2**
63	Facility Interoperability Improvements	SI						3.2
HH	**HENRY HUDSON BRIDGE**		**$0.9**	**$10.3**	**$0.0**	**$0.0**	**$0.0**	**$11.1**
14	Deck Rehabilitation and Resurfacing	NR						11.1
RK	**ROBERT F. KENNEDY BRIDGE**		**$1.4**	**$21.7**	**$0.0**	**$3.3**	**$0.0**	**$26.5**
75	Deck Rehabilitation & Overlay	NR						23.1
90	Widening of S/B FDR Drive - 125 St to 116 St	SI						3.3
VN	**VERRAZZANO-NARROWS BRIDGE**		**$0.0**	**$15.0**	**$184.5**	**$589.5**	**$0.0**	**$789.0**
81	Lower Level Main Span Deck Rehabilitation	NR						102.5
84	Ph.2 -Reconstruction of Upper Level Approach	NR						604.5
86	Widening Belt Parkway, Phase 1B	SI						82.0

Numbers may not add due to rounding

Bridges and Tunnels

TSMO
D - 803

Commitments ($ in millions)

ELEMENT DESCRIPTION/PROJECT		NEEDS CODE	2020	2021	2022	2023	2024	Total All Years
Category Total	**803**		**$37.9**	**$14.4**	**$10.2**	**$2.1**	**$0.0**	**$64.6**
AW	**AGENCY-WIDE**		**$37.9**	**$14.4**	**$10.2**	**$2.1**	**$0.0**	**$64.6**
36	Fiber Optic Infrastructure and Integration	SI						10.2
52	Traffic Detection/Incident Mgmt. Systems	SI						6.7
57	ATMS Enhancements & Upgrades/OCCC System	SI						11.6
65	Toll Collection System Rehabilitation/Upgrades	NR						7.1
74	SCADA Systems	NR						8.5
80	Adv. Traveler Info. Systems (ATIS) & VMS Upgrades	NR						20.5

Numbers may not add due to rounding

Bridges and Tunnels

UTILITIES
D - 804

Commitments
($ in millions)

ELEMENT DESCRIPTION/PROJECT	NEEDS CODE	2020	2021	2022	2023	2024	Total All Years
Category Total 804		**$8.4**	**$6.7**	**$195.5**	**$6.1**	**$0.0**	**$216.8**
AW AGENCY-WIDE		**$1.0**	**$1.5**	**$45.1**	**$0.0**	**$0.0**	**$47.6**
11 Replacement & Upgrade of Fueling Systems	NR						11.3
73 Rehab/Replace Facility Monitoring & Safety Systems	NR						36.3
BW BRONX-WHITESTONE BRIDGE		**$1.5**	**$4.0**	**$53.5**	**$0.0**	**$0.0**	**$59.0**
96 Lighting, Power Redundancy & Resiliency Imprvmts	NR						54.9
98 Cable Dehumidification and Miscellaneous Work	SI						4.0
HC HUGH L. CAREY TUNNEL		**$0.0**	**$0.0**	**$0.0**	**$3.1**	**$0.0**	**$3.1**
83 Installation of Fire Suppression System	SI						3.1
MP MARINE PARKWAY BRIDGE		**$0.9**	**$0.0**	**$34.5**	**$0.0**	**$0.0**	**$35.4**
09 Electrical Rehabilitation (Elevator)	NR						35.4
QM QUEENS MIDTOWN TUNNEL		**$0.0**	**$0.0**	**$0.0**	**$3.1**	**$0.0**	**$3.1**
85 Installation of Fire Suppression System	SI						3.1
RK ROBERT F. KENNEDY BRIDGE		**$0.0**	**$1.2**	**$31.0**	**$0.0**	**$0.0**	**$32.2**
21 Install Fire Standpipe/Upgrade Protection System	NR						32.2
TN THROGS NECK BRIDGE		**$0.0**	**$0.0**	**$7.0**	**$0.0**	**$0.0**	**$7.0**
85 Bridge Structural Lighting & Misc Struct Upgrades	NR						7.0
VN VERRAZZANO-NARROWS BRIDGE		**$5.0**	**$0.0**	**$24.5**	**$0.0**	**$0.0**	**$29.5**
12 Misc. Bridge Lighting & Electrical Improvements	NR						26.2
94 Rehabilitation of Fire Standpipe System	NR						3.3

Numbers may not add due to rounding

Commitments
($ in millions)

ELEMENT DESCRIPTION/PROJECT	NEEDS CODE	2020	2021	2022	2023	2024	Total All Years
Category Total 805		**$13.5**	**$69.2**	**$0.0**	**$0.0**	**$8.2**	**$90.9**
AW AGENCY-WIDE		**$12.3**	**$0.0**	**$0.0**	**$0.0**	**$8.2**	**$20.5**
12 Hazardous Materials Abatement	NR						12.3
X9 Service Building Upgrades	NR						8.2
HC HUGH L. CAREY TUNNEL		**$0.0**	**$25.7**	**$0.0**	**$0.0**	**$0.0**	**$25.7**
80 Rehabilitation of HCT Ventilation/Service Building	NR						25.7
QM QUEENS MIDTOWN TUNNEL		**$0.0**	**$25.7**	**$0.0**	**$0.0**	**$0.0**	**$25.7**
36 Rehabilitation Ventilation/Service Buildings	NR						25.7
RK ROBERT F. KENNEDY BRIDGE		**$1.2**	**$17.8**	**$0.0**	**$0.0**	**$0.0**	**$19.0**
82 Storage Facility for Spare Parts & Materials	SI						19.0

Numbers may not add due to rounding

Bridges and Tunnels

MISCELLANEOUS
D - 806

Commitments
($ in millions)

ELEMENT DESCRIPTION/PROJECT		NEEDS CODE	2020	2021	2022	2023	2024	Total All Years
Category Total	**806**		**$555.2**	**$111.1**	**$42.3**	**$0.2**	**$4.8**	**$713.6**
AW	**AGENCY-WIDE**		**$555.2**	**$0.0**	**$42.3**	**$0.2**	**$4.8**	**$602.5**
10	EAM	SI						7.8
15	MTA Independent Engineer							3.9
18	Protective Liability Insurance							13.0
21	Program Administration							12.3
22	Miscellaneous							507.1
28	Scope Development							11.1
85	TEA - Reserve							7.3
94	Small Business Mentoring Program							40.1
CB	**CROSS BAY BRIDGE**		**$0.0**	**$8.0**	**$0.0**	**$0.0**	**$0.0**	**$8.0**
X1	Operational Improvement	SI						8.0
MP	**MARINE PARKWAY BRIDGE**		**$0.0**	**$11.3**	**$0.0**	**$0.0**	**$0.0**	**$11.3**
X1	Operational Improvement	SI						11.3
VN	**VERRAZZANO-NARROWS BRIDGE**		**$0.0**	**$91.8**	**$0.0**	**$0.0**	**$0.0**	**$91.8**
X1	Operational Improvement	SI						91.8

Numbers may not add due to rounding

Bridges and Tunnels

STRUCTURAL PAINTING
D - 807

Commitments
($ in millions)

ELEMENT DESCRIPTION/PROJECT	NEEDS CODE	2020	2021	2022	2023	2024	Total All Years
Category Total 807		**$1.7**	**$77.6**	**$55.5**	**$88.0**	**$183.1**	**$405.9**
BW BRONX-WHITESTONE BRIDGE		**$0.0**	**$0.0**	**$0.6**	**$25.7**	**$0.0**	**$26.3**
PT BW Facility-Wide Painting Program	NR						26.3
MP MARINE PARKWAY BRIDGE		**$0.2**	**$0.0**	**$16.3**	**$0.0**	**$0.0**	**$16.5**
PT MP Facility-Wide Painting Program	NR						16.5
RK ROBERT F. KENNEDY BRIDGE		**$1.5**	**$77.6**	**$37.7**	**$0.0**	**$0.0**	**$116.8**
19 Zone/Maintenance Painting of Suspended Spans	NR						37.7
PT RK Facility-Wide Painting Program	NR						79.1
TN THROGS NECK BRIDGE		**$0.0**	**$0.0**	**$0.5**	**$62.2**	**$0.0**	**$62.7**
PT TN Facility-Wide Painting Program	NR						62.7
VN VERRAZZANO-NARROWS BRIDGE		**$0.0**	**$0.0**	**$0.5**	**$0.0**	**$183.1**	**$183.6**
PT VN Facility-Wide Painting Program	NR						183.6
B&T TOTAL PROGRAM		**$655.9**	**$351.8**	**$867.3**	**$967.4**	**$484.8**	**$3,327.1**

Numbers may not add due to rounding

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All Agency Summary

Commitments
($ in millions)

AGENCY	2020	2021	2022	2023	2024	Total All Years
TOTAL New York City Transit	$8,970.0	$7,806.0	$10,001.4	$5,643.5	$2,968.0	$35,389.0
TOTAL Long Island Rail Road	$957.1	$865.7	$650.8	$656.3	$607.1	$3,737.0
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TOTAL MTA Bus Company	$334.7	$98.0	$231.3	$162.3	$44.4	$870.7
TOTAL MTA Interagency	$20.8	$20.4	$24.8	$21.5	$31.4	$118.9
Core Subtotal	$11,324.7	$9,546.8	$11,620.7	$7,348.3	$3,833.3	$43,673.8
TOTAL Capital Construction Company	$1,466.5	$3,258.0	$2,349.1	$494.0	$230.6	$7,798.0
TOTAL 2020-2024 CPRB PROGRAM	$12,791.1	$12,804.8	$13,969.8	$7,842.2	$4,063.9	$51,471.8
TOTAL Bridges and Tunnels	$655.9	$351.8	$867.3	$967.4	$484.8	$3,327.1
TOTAL 2020-2024 CAPITAL PROGRAM	$13,447.0	$13,156.6	$14,837.1	$8,809.6	$4,548.7	$54,798.9

Numbers may not add due to rounding

CAPITAL PROGRAM

new.mta.info/2020CapitalProgram