OFFICE OF THE NEW YORK STATE COMPTROLLER

Thomas P. DiNapoli, State Comptroller Rahul Jain, Deputy Comptroller

A Review of Capital Needs and Resilience at the MTA

Highlights

- Since 2015, only $700,000 has been expended on completed subway car projects. Another $1.5 billion has been committed. The 2013 capital assessment projected needs of $4.9 billion on new subway train cars from 2015 through 2024.
- Delivery of all 460 cars ordered in the 2015-2019 capital program to replace some of the oldest subway cars (which are more than 40 years old and are the most prone to breakdowns) is not expected until 2025.
- Subway signals had the largest anticipated need of any component in the assessment, totaling more than $8.7 billion through 2024. The agency has completed $900 million in subway signals work from 2015 through September 2021.
- Since 2015, only $56 million has been expended on completed line equipment projects, including pump rooms, and another $189 million has been committed, together only 14 percent of the $1.7 billon that the needs assessment calls for.
- Pump room projects are critical for climate resilience enabling the MTA to remove excess water from the system. As of the beginning of the 2020-2024 capital program, 17 of 237 pump rooms still were not in good repair.
- Subway stations are scheduled to receive $9 billion more in funding in the 2015-2019 and 2020-2024 capital programs than identified in the 2013 needs assessment, as the MTA has decided to accelerate the start of new accessible station projects into the 2020-2024 program.

The Metropolitan Transportation Authority (MTA) is facing significant long-term financial challenges, including risks to its capital plan and pressure from escalating debt, while the impacts of climate change demand a sharper focus on preparation for and response to extreme weather events. The passage of the Infrastructure Investment and Jobs Act ("IIJA") offers a boost for the agency's capital plan, but also heightens the need for appropriate prioritization of capital projects.

A critical element in prioritizing capital spending is the capital needs assessment. The MTA did not publicly release a 20-year capital needs assessment in 2018 when it was preparing its 2020-2024 capital program. It last published a needs assessment in 2013, which covered the period from 2015 to 2034 and did not directly address climate resilience or the impact of Superstorm Sandy. (Subsequent changes in State law require the MTA to release a needs assessment every five years, starting in 2023.) Recently, the MTA has also acknowledged that it must update its needs assessment and reprioritize spending to address the impacts of climate change.

This report uses the latest needs assessment to measure the progress in completing projects and making capital commitments, as of September 2021. While work in some areas (e.g., subway stations) is receiving more funding than called for, many areas, including those necessary to make the MTA system more resilient, require improved targeting and accelerated investment. The report also highlights the potential effects of certain climate risks on the system's assets and operational indicators to consider for prioritization in the next update to the needs assessment and capital plan.

Background

The MTA's last 20-year capital needs assessment was released in 2013. The assessment includes projects that cover three types of capital investment in the system:

- State of good repair (SGR) projects renew assets that have surpassed their useful life to achieve SGR.
- Normal replacement projects renew assets that are near the end of their useful life to preserve SGR.
- System improvement projects enhance the network, providing new capabilities and a better customer experience. (The 2013 needs assessment does not include any proposed network expansion projects.)

The following sections lay out the largest MTA capital elements and the level of need by capital element for the ten-year period from 2015 through 2024, according to the 2013 needs assessment. The needs for each element are then compared to what has been completed and committed through September 2021 in the 2015-2019 and 2020-2024 capital programs.[1]

While the 2013 needs assessment is outdated, it is the latest data available. The assessment is unconstrained in that it does not consider available funding. However, the MTA did adjust for the number of projects that could be reasonably implemented in the time period, meaning capital needs were even greater than what was included in the assessment due to the large backlog of SGR needs.

Since the assessment was not intended to be constrained by funding availability, it is unreasonable to expect spending and commitment figures to approximate the full level of needs identified in the assessment. In addition, the 2015-2019 capital program was approved late and the 2020-2024 capital program was delayed by the COVID-19 pandemic.

Nevertheless, the needs assessment operates as a measuring stick for capital investments and provides the long-term planning context for developing the MTA's five-year capital programs. Significant lack of progress on spending and commitments over time towards needs could suggest the MTA may not be maintaining the safety and reliability of its assets.

In addition, the 2013 needs assessment is unlikely to have sufficiently considered the impact of inclement weather events on the useful life of infrastructure and does not discretely break out resilience work. The MTA Climate Adaptation Task Force has completed separate reports, which this report utilizes, identifying major climate change hazards and their potential effect on capital asset types.

Increasingly frequent climate change hazards with potential negative implications for the MTA's assets include coastal storm surges, heavy precipitation and flooding, and acute variations in temperature that could lead to the disabling or deterioration of assets. Completed Superstorm Sandy mitigation projects are expected to protect against coastal storm surge risks, but not all of these projects have been completed.

This report also offers performance indicators, where available, to show the impact of the asset on riders. In certain instances, the report makes use of SGR indicators, the latest of which are from September 2019, when the 2020-2024 capital program was released, the timeliness of which is a limitation of data available from the MTA and of this analysis.

[1] Some limitations of the analysis are an exclusion of spending and commitments from the 2010-2014 capital plan during the analysis period and the lack of data on projects that have not been completed but are of "beneficial use" where partial completion improves the ridership experience.

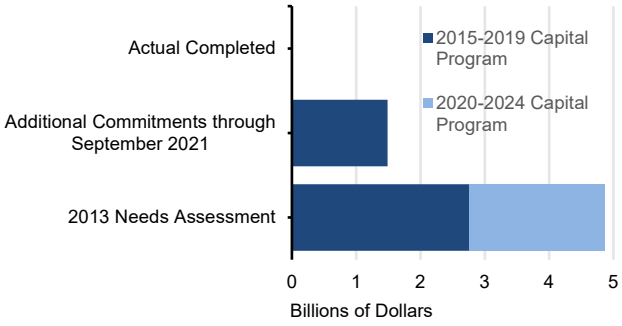
New York City Transit (NYCT)

Subway Cars

Subway cars are fundamental to service delivery and must be replaced regularly as cars have a life expectancy of 40 years. Currently, NYCT maintains a fleet of nearly 6,500 subway cars, 39 percent of which are over 30 years old with 53 percent being 10 to 19 years old.

Since 2015, only $700,000 has been expended on completed subway car projects. Another $1.5 billion has been committed. The 2013 capital assessment projected needs of $4.9 billion on new subway train cars from 2015 through 2024 (see Figure 1).

FIGURE 1
Progress of NYCT Subway Car Purchases



Note: Needs assessment totals are adjusted for inflation.
Sources: Metropolitan Transportation Authority; OSC

Of further concern, the delivery of all 460 cars ordered in the 2015-2019 capital program to replace some of the oldest cars (which are more than 40 years old and have the lowest mean distance between failures) is not expected until early 2025 as a result of contactor problems compounded by the COVID-19 pandemic.

Impact of Climate Change

Climate change hazards with potential negative implications for subway cars include coastal storm surge and heavy precipitation potentially causing flooding leading to electrical equipment failures and saltwater corrosion; and temperature increases and heat waves leading to potential overheating of equipment and necessitating additional air conditioning for passenger comfort and safety. There is also the likelihood of failure of aging equipment resulting in diminished useful life.

Key Performance Indicator: MDBF

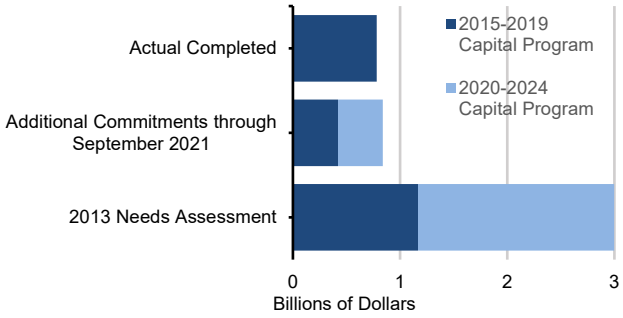
The mean distance between failures (MDBF) for subway cars has declined in the past year, from 145,858 miles in October 2020 to 141,709 miles in October 2021, but is higher than the 127,950 miles recorded in October 2019.

Buses

Similarly, normal replacement of NYCT buses is necessary since buses have a useful life of 12 years. The fleet is thus scheduled to be replaced nearly twice in a 20-year period.

Since 2015, bus fleet commitments of completed projects was $783 million and another $840 million of bus purchases are in progress (see Figure 2). Together, these constitute about 54 percent of the anticipated needs through 2024.

FIGURE 2
Progress of NYCT Bus Purchases



Note: Needs assessment totals are adjusted for inflation.
Sources: Metropolitan Transportation Authority; OSC analysis

Impact of Climate Change

Climate change hazards with potential negative implications for buses include coastal storm surge and heavy precipitation potentially causing flooding rendering buses totally inoperable; and temperature increases and heat waves potentially leading to overheating of equipment and necessitating additional air conditioning for passenger comfort and safety and additional

stress on vehicles due to road buckling and potholes. There is also the likelihood of failure of aging equipment, resulting in diminished useful life.

Key Performance Indicator: MDBF

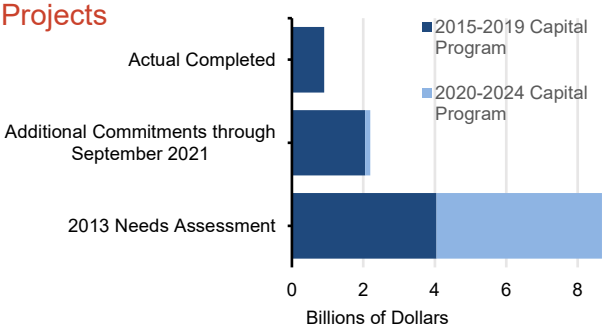
The MDBF for the bus fleet has declined in the past two years, from 8,393 miles in October 2019 to 7,065 miles in October 2021.

Signals & Communications

A well-functioning signal system is critical for the provision of reliable service. Currently, signal failure is a leading cause of train service delays.

Signals had the largest anticipated need of any component in the 2013 assessment, at more than $8.7 billion through 2024. Nonetheless, the agency has completed just $907 million in work through September 2021 (see Figure 3).

FIGURE 3
Progress of NYCT Signal and Communication Projects



Note: Needs assessment totals are adjusted for inflation.
Sources: Metropolitan Transportation Authority; OSC analysis

Another $2.2 billion of work has been committed. Together this represents 36 percent of the capital need through 2024. The 2020-2024 program plans another $5.9 billion for signals and communications.

Impact of Climate Change

Climate change hazards with potential negative implications for signals include corrosion of equipment from saltwater with sea level rise and coastal storm surge and coastal storm surge and heavy precipitation causing the flooding of equipment and partial system failures. There is also the likelihood of failure of aging equipment, resulting in diminished useful life.

Key Performance Indicator: Signal Failure

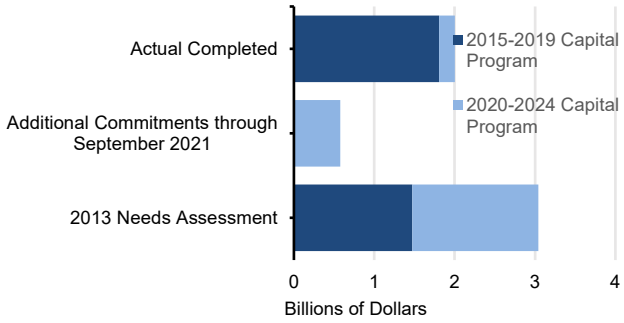
The number of subway trains delayed by signal failures and emergency remediation decreased in the past two years, from 4,653 delays in October 2019 to 3,380 delays in October 2021.

Track

Tracks and switches are two of the most critical assets for safe, efficient and reliable service delivery. According to the needs assessment, the MTA plans to replace an estimated 229 miles of track between 2015 and 2034, or approximately 57 miles per capital program.

Since 2015, $2 billion of track work has been completed and another $593 million has been committed. (see Figure 4). Together, this represents 85 percent of needs by 2024.

FIGURE 4
Progress of NYCT Track Projects



Note: Needs assessment totals are adjusted for inflation.
Sources: Metropolitan Transportation Authority; OSC analysis

Impact of Climate Change

Climate change hazards with negative implications for track include sea level rise and coastal storm surge causing saltwater corrosion; coastal storm surge and heavy precipitation flooding below ground rail and subway network, the potential undermining of track support, rail beds and embankments; extreme winds sending excessive debris from outside of property onto

the right of way causing damage to tracks and potentially undermining track support; and heat induced expansion of steel rails in elevated structures and at grade sections of track, rail buckling and kinking in track. There is also the likelihood of failure of aging equipment, resulting in diminished useful life.

Key Performance Indicator: Track Failure

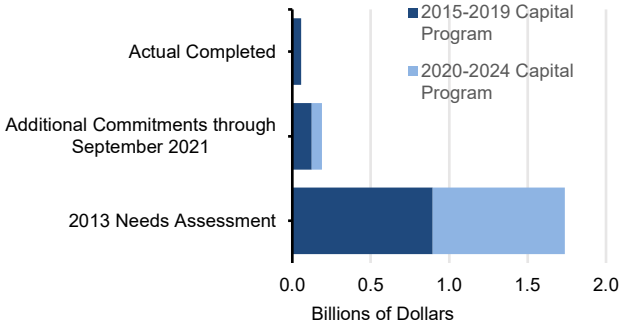
The number of subway trains delayed by track failures and emergency remediation decreased in the past two years, from 2,566 delays in October 2019 to 1,114 delays in October 2021.

Line Equipment

Line equipment refers to the array of equipment distributed along the right of way. Broadly, there are four distinct types of line equipment: tunnel lighting, ventilation plants, pump rooms and deep wells.

Since 2015, only $56 million has been expended on completed line equipment projects and another $189 million has been committed, together only 14 percent of the $1.7 billon that the needs assessment calls for in the 2015 through 2024 period (see Figure 5).

FIGURE 5
Progress of NYCT Line Equipment Projects



Note: Needs assessment totals are adjusted for inflation.
Sources: Metropolitan Transportation Authority; OSC analysis

In particular, pump room projects and their ability to prevent and mitigate flooding are critical for climate resilience. At the beginning of the 2020-2024 capital program, 17 of 237 pump rooms were still not in a state of good repair.

Impact of Climate Change

Climate change hazards with negative implications for line equipment include sea level rise and coastal storm surge causing flooding of facilities in low lying coastal areas and corrosion of equipment from saltwater exposure; and coastal storm surge and heavy precipitation causing water infiltration potentially overloading pumps and the drainage system causing subsequent problems with backflow from outlets potentially impacting fan plants and air circulation in underground networks leading to increased fire hazards. There is also the likelihood of failure of aging equipment, resulting in diminished useful life.

Key Performance Indicator: State of Good Repair

According to the 2020-2024 capital program, only 48 percent of high-priority ventilation plants, 71 percent of tunnel lighting and 93 percent of pumps and deep wells are in a state of good repair.

Line Structures

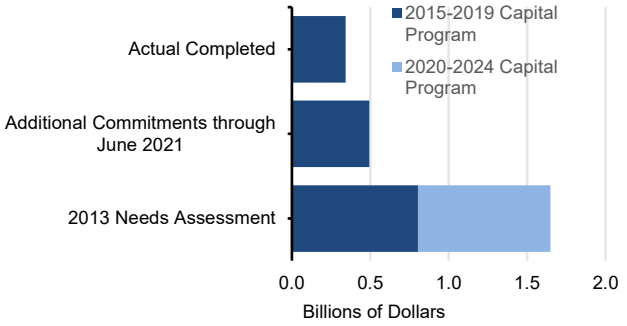
The subway system has 240 miles of line structures. These include 147 miles of subway structures (including 13 miles of under-river tubes), 69 miles of elevated structures and 24 miles of at-grade structures. For subway structures, the MTA plans to address the SGR backlog of all known defects by 2024.

Since 2015, $344 million has been spent on completed line structure projects and another $515 million has been committed (see Figure 6). Together, this represents 52 percent of the stated need by 2024.

Impact of Climate Change

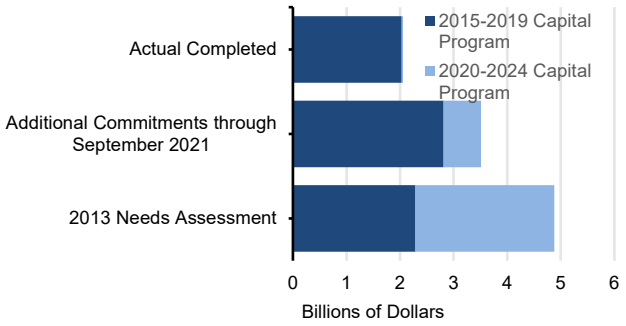
Climate change hazards with negative implications for line structures include coastal storm surge and heavy precipitation causing flooding leading to severe or irreparable structural

FIGURE 6
Progress of NYCT Line Structure Projects



Note: Needs assessment totals are adjusted for inflation.
Sources: Metropolitan Transportation Authority; OSC analysis

FIGURE 7
Progress of NYCT Subway Station Projects



Note: Needs assessment totals are adjusted for inflation.
Sources: Metropolitan Transportation Authority; OSC analysis

damage; and extreme winds causing damage to line structures and infrastructure damage to above ground networks. There is also the likelihood of failure of aging equipment, resulting in diminished useful life.

Key Performance Indicator: State of Good Repair

According to the 2020-2024 capital program, 87 percent of line structures are in a state of good repair.

Passenger Stations

Passenger stations are intended to provide riders with a safe and comfortable environment for boarding and disembarking from trains. The MTA has abandoned its old strategy of comprehensive rehabilitation projects in favor of targeting investments to address the most critical deficient components (such as stairs and platform edges) at stations systemwide.

Since 2015, $2.1 billion in passenger station projects have been completed and another $3.5 billion of station work has been committed (see Figure 7).

Together, this represents 114 percent of the amount called for in the 2013 needs assessment. Subway stations are scheduled to receive $9 billion more in funding in the 2015-2019 and 2020-2024 capital programs than identified in the assessment as the MTA has decided to accelerate the start of $5 billion worth of accessibility projects into the 2020-2024 program.

Impact of Climate Change

Climate change hazards with negative implications for passenger stations include coastal storm surge and heavy precipitation causing service interruptions, flooding of stations, ground erosion from flooding in and around facilities, impediments to operations and extreme winds and high temperatures causing safety concerns. There is also the likelihood of failure of aging equipment, resulting in diminished useful life.

Key Performance Indicator: State of Good Repair

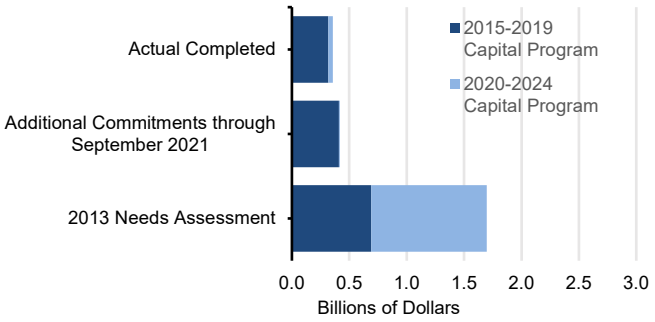
According to the 2020-2024 capital program, 78 percent of station components are in a state of good repair.

Traction Power

Electricity is essential to the operation of NYCT's subway cars. There are 225 electrical substations throughout the subway system that convert high-voltage alternating current to 600-volt direct current power for use in train propulsion.

Since 2015, $419 million in traction power projects have been completed and another $355 million has been committed (see Figure 8). Together, this represents 46 percent of anticipated needs through 2024.

FIGURE 8
Progress of NYCT Traction Power Projects



Note: Needs assessment totals are adjusted for inflation.
Sources: Metropolitan Transportation Authority; OSC analysis

Impact of Climate Change

Climate change hazards with negative implications for traction power include sea level rise causing equipment corrosion from salt water; coastal storm surge corrosion to aging equipment and wiring; and loss of power due to blackout/brownout and damaged substations. There is also the likelihood of failure of aging equipment, resulting in diminished useful life.

Key Performance Indicator: State of Good Repair

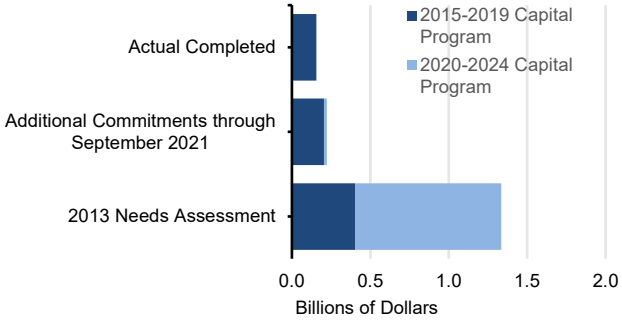
According to the 2020-2024 capital program, 68 percent of traction power components are in a state of good repair.

Shops and Yards

The mission of NYCT's system of shops and yards is to keep the subway system in good working order. There are 14 railcar maintenance facilities that handle daily maintenance and cleaning, two "overhaul shops" that house the six- and 12-year car overhaul program, and 26 maintenance-of-way shops that maintain the track, signals and electrical infrastructure.

Since 2015, $159 million in shop and yard projects have been completed and another $223 million has been committed (see Figure 9). Together, this represents 29 percent of anticipated needs through 2024.

FIGURE 9
Progress of NYCT Shops and Yards Projects



Note: Needs assessment totals are adjusted for inflation.
Sources: Metropolitan Transportation Authority; OSC analysis

Impact of Climate Change

Climate change hazards with negative implications for shops and yards include sea level rise, coastal storm surge and heavy precipitation increasing flooding risks to maintenance facilities and storage yards; extreme winds damaging the structural integrity of maintenance facilities and storage yards; and high temperatures providing the need for air tempering to provide habitable workspaces. There is also the likelihood of failure of aging equipment, resulting in diminished useful life.

Key Performance Indicator: State of Good Repair

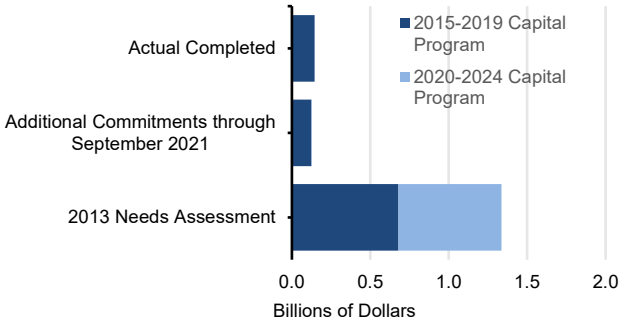
According to the 2020-2024 capital program, only 46 percent of components in shops and yards are in a state of good repair.

Bus Depots

NYCT's 20 bus depots support bus service throughout the City, providing fueling, servicing, maintenance and storage. About half of the depots are relatively new, built in the last 30 years.

Since 2015, $145 million in bus depot projects have been completed and another $126 million has been committed (see Figure 10). Together, this represents 20 percent of anticipated needs through 2024.

FIGURE 10
Progress of NYCT Depot Projects



Note: Needs assessment totals are adjusted for inflation.
Sources: Metropolitan Transportation Authority; OSC analysis

Impact of Climate Change

Climate change hazards with negative implications for bus depots include coastal storm surge and heavy precipitation increasing flooding risks potentially damaging buses and structures; and extreme wind damaging the structural integrity of buildings. Recent weather events illustrate vulnerabilities.

On August 31, 2021, the Casey Stengel Depot in Queens and the Castleton Depot on Staten Island suffered heavy flooding during Tropical Storm Ida. High temperatures could necessitate air tempering to provide habitable workspaces. There is also the likelihood of failure of aging equipment, resulting in diminished useful life.

Key Performance Indicator: State of Good Repair

According to the 2020-2024 capital program, all depots are in a state of good repair. There are no other metrics publicly available to track the status of bus depots.

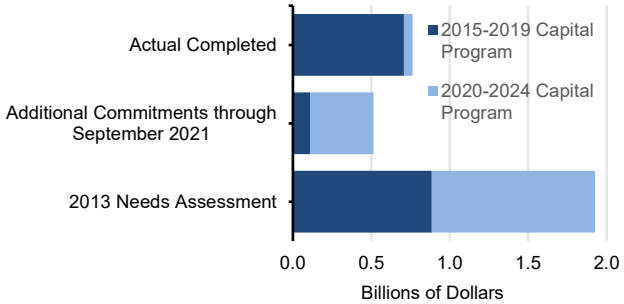
Long Island Rail Road

Track

The Long Island Rail Road (LIRR) has 502 miles of mainline track. The LIRR provides ongoing maintenance of the rail system and replaces track and track components on a life-cycle basis. Replacement is based on age, condition and physical inspection. The LIRR also converts wood ties to concrete and performs infrastructure upgrades at its Jamaica terminal.

Since 2015, $762 million in LIRR track projects have been completed (see Figure 11), including the completion of a second electrified track from Farmingdale to Ronkonkoma. Another $513 million has been committed. Together, this represents 66 percent of anticipated needs through 2024.[2]

FIGURE 11
Progress of LIRR Track Projects



Note: Needs assessment totals are adjusted for inflation.
Sources: Metropolitan Transportation Authority; OSC analysis

Impact of Climate Change

Climate change hazards with negative implications for track include sea level rise and coastal storm surge causing saltwater corrosion; coastal storm surge and heavy precipitation flooding below ground rail, the potential undermining of track support, rail beds and embankments; extreme winds sending excessive debris from outside of property onto the right of way causing damage to tracks and potentially undermining track support; and heat induced expansion of steel rails in elevated structures and at grade sections of track, rail buckling and kinking in track. There is also the likelihood of failure of aging equipment, resulting in diminished useful life.

[2] The LIRR Third Track project, expected to cost $2.5 billion, is characterized as an expansion project by the MTA and is not included in this analysis but is also providing benefits to the current system such as updating existing tracks and grade crossings and improving five stations.

Key Performance Indicator: State of Good Repair

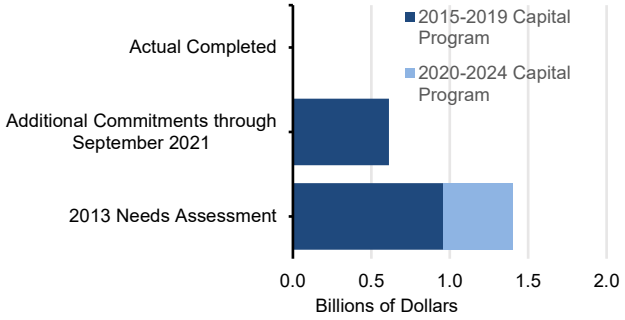
According to the 2020-2024 capital program, 85 percent of LIRR track is in a state of good repair.

Passenger Trains

In its 2013 capital needs assessment, the LIRR noted that they will be replacing their fleet of M-3 train cars, which have been in service since the mid 1980's, with modern M-9 cars. In addition, it planned a fleet expansion of up to 318 additional M-9 cars to support East Side Access service to Grand Central Terminal. It is anticipated these investments will enable improvements in on-time performance.

Since 2015, there has not been any LIRR rolling stock projects completed but $611 million has been committed and the M-9 cars are currently being delivered (see Figure 12). As of September 2021, the LIRR fleet includes 104 M-9 cars and expects to receive an additional 110 cars by 2022.

FIGURE 12
Progress of LIRR Rolling Stock Projects



Note: Needs assessment totals are adjusted for inflation.
Sources: Metropolitan Transportation Authority; OSC analysis

Impact of Climate Change

Climate change hazards with potential negative implications for rolling stock include coastal storm surge and heavy precipitation potentially causing flooding leading to electrical equipment failures and saltwater corrosion; and temperature increases and heat waves leading to potential overheating of equipment necessitating additional air conditioning for passenger comfort and safety. There is also the likelihood of failure of aging equipment and wiring, resulting in diminished useful life.

Key Performance Indicator: MDBF

The MDBF for LIRR train cars improved over the past two years from 169,889 miles in September 2019 to 182,117 miles in September 2021.

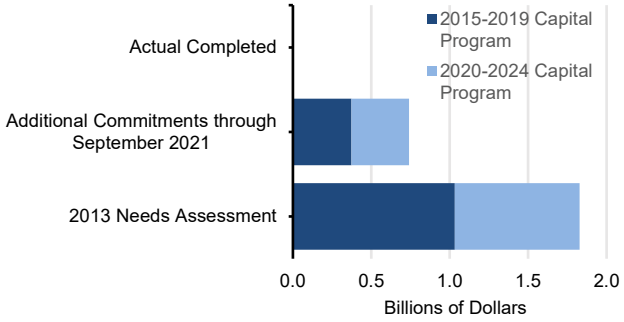
Metro-North Railroad

Passenger Trains

Metro-North Railroad noted in its 2013 capital needs assessment that it has a significant need to replace aging rolling stock over the 20-year period from 2015 to 2034. In its plan, Metro-North stated that its oldest fleet would begin to be replaced in the 2015 through 2019 period, and that three other train fleets are due to be replaced in the 2020 through 2024 period.

Since 2015, just $7 million in Metro-North rolling stock projects have been completed and another $741 million has been committed (see Figure 13). Together, this represents 41 percent of anticipated needs through 2024.

FIGURE 13
Progress of MNR Rolling Stock Projects



Note: Needs assessment totals are adjusted for inflation.
Sources: Metropolitan Transportation Authority; OSC analysis

Impact of Climate Change

Climate change hazards with potential negative implications for rolling stock include coastal storm surge and heavy precipitation potentially causing flooding leading to electrical equipment failures and saltwater corrosion; and temperature

increases and heat waves leading to potential overheating of equipment necessitating additional air conditioning for passenger comfort and safety. There is also the likelihood of failure of aging equipment and wiring, resulting in diminished useful life.

Key Performance Indicator: State of Good Repair

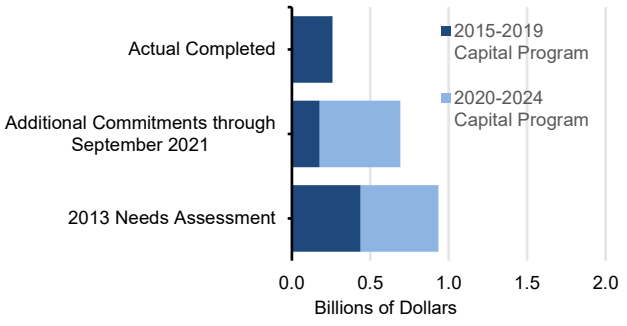
According to the 2020-2024 capital program, 73 percent of Metro-North railcars are in a state of good repair.

Track & Structures

The Metro-North system in New York is composed of 549 miles of mainline track. In addition, there are 346 vehicular, pedestrian and utility bridges that cross over Metro-North track and 455 bridges that carry Metro-North, Amtrak and freight traffic. Metro-North has developed a cyclical program of track rehabilitation and replacement that maintains track structure components and switch facilities in proper operating condition without safety hazards or speed restrictions.

Since 2015, $259 million in Mero-North track and structure projects have been completed and another $691 million has been committed (see Figure 14). Together, this represents 102 percent of anticipated needs through 2024.

FIGURE 14
Progress of MNR Track & Structure Projects



Note: Needs assessment totals are adjusted for inflation.
Sources: Metropolitan Transportation Authority; OSC analysis

Impact of Climate Change

Climate change hazards with negative implications for track and structures include sea level rise and coastal storm surge causing saltwater corrosion; coastal storm surge and heavy precipitation flooding below ground rail, overloading the drainage system, the potential undermining of track support, rail beds and embankments, partial system failures and safety concerns as water levels reach the third rail; extreme winds sending excessive debris from outside of property onto the right of way causing damage to tracks and potentially undermining track support; and heat induced expansion of steel rails in elevated structures and at grade sections of track, rail buckling and kinking in track. There is also the likelihood of failure of aging equipment, resulting in diminished useful life.

Key Performance Indicator: State of Good Repair

According to the 2020-2024 capital program, 57 percent of MNR track and 42 percent of structures are in a state of good repair.

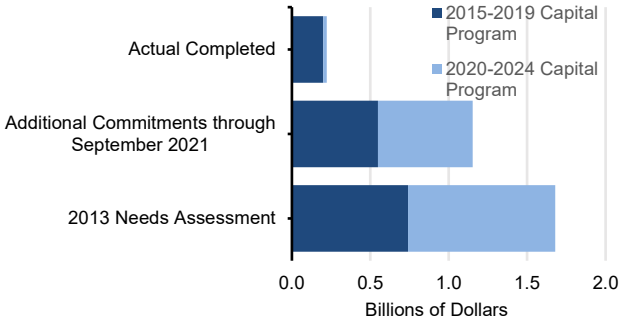
MTA Bridges and Tunnels

Roadways & Decks

All of the bridges under the purview of MTA Bridges and Tunnels (B&T) are scheduled for significant roadway and deck projects in the 2013 capital needs assessment. For example, the bridge deck on the Throgs Neck Bridge suspended span was to be replaced with a lighter but stronger deck, and the original concrete decks on the Verrazano-Narrows Bridge upper-level approaches were to be replaced and upgraded to current design load criteria.

Since 2015, $223 million in roadway and deck projects have been completed and another $1.2 billion has been committed (see Figure 15). Together, this represents 82 percent of anticipated needs through 2024.

FIGURE 15
Progress of B&T Roadway & Deck Projects



Note: Needs assessment totals are adjusted for inflation.
Sources: Metropolitan Transportation Authority; OSC analysis

Impact of Climate Change

Climate change hazards with negative implications for roadways and decks include sea level rise impacting ship clearances and scour on bridge structures and infrastructure in tidal areas; coastal storm surge eroding structures, machinery and wiring; and extreme winds damaging structural integrity and high temperatures straining roadway beds and decks. There is also the likelihood of failure of aging equipment, resulting in diminished useful life.

Key Performance Indicator: Not Available

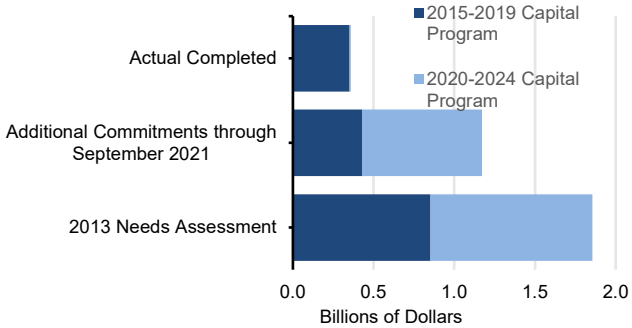
There are no publicly available MTA metrics that track the status of roadways and decks. According to the State Department of Transportation as of August 2021, only one bridge section owned by B&T is in poor condition.

Structures

The needs assessment included significant structural repairs and upgrades for all of B&T's bridges and tunnels. For example, investments in the Bronx-Whitestone Bridge will focus on aging bridge structure elements and structural investments at the Robert F. Kennedy Bridge will focus on upgrades to the substructure and the superstructure.

Since 2015, $359 million in MTA Bridge structural projects have been completed and $1.2 billion has been committed (see Figure 16). This represents 82 percent of anticipated needs by 2024.

FIGURE 16
Progress of TBTA Structures Projects



Note: Needs assessment totals are adjusted for inflation.
Sources: Metropolitan Transportation Authority; OSC analysis

Impact of Climate Change

Climate change hazards with negative implications for structural projects include sea level rise impacting ship clearances and scour on bridge structures and infrastructure in tidal areas; heavy precipitation and coastal storm surge flooding tunnels and eroding structures; extreme winds damaging structural integrity; and heat induced expansion straining metal structures. There is also the likelihood of failure of aging equipment, resulting in diminished useful life.

Key Performance Indicator: Not Available

There are no publicly available MTA metrics that track the status of structures. According to the State Department of Transportation as of August 2021, only one bridge section owned by B&T is in poor condition.

Superstorm Sandy Projects

The MTA's original 2010-2014 capital program was amended several times to include projects to restore assets damaged by Superstorm Sandy in October 2012 and to mitigate against future storms. As of September 30, 2021, nearly nine years after Sandy, less than half (46 percent) of the $7.7 billion in projects are complete (see Figure 17). Another $2.6 billion (33 percent of the program) in projects are currently in construction.

NYCT has completed $2.7 billion (46 percent) of its $5.9 billion storm program including repairs to and mitigation of all nine impacted subway tunnels, but more than $1.2 billion in projects (21 percent) have not begun. This includes: $374 million for shops and yards, mostly to replace storm-damaged signals and associated track and switches at the Culver Yard in Coney Island; $310 million for traction power, mostly for repairs of storm-damaged circuit breaker houses and for hardening of substations; and $256 million for line structures, mostly for multiple projects on the Rockaway line.

The LIRR has only completed 20 percent of its $569 million program, with 54 percent of the program not even begun. Projects still waiting to be started include $179 million for the Amtrak-led restoration of systems in the East River tunnels (lines 1 and 2) and $128 million for shops and yards, mostly for resiliency measures in the West Side Yards and portals including the Long Island City Yard and the Queens entrance to the East River Tunnel.

Metro-North has only completed $20 million of its $463 million program, with most of the remaining projects in construction, including $224 million for power-related projects (all scheduled to be completed by December 2021) and $166 million for projects involving communications and signals, mostly along the Hudson Line's right of way.

MTA Bridges & Tunnels has completed 92 percent of its program, which mostly consisted of now completed work restoring and adding resiliency measures to the Queens Midtown and Hugh Carey tunnels that were flooded during Superstorm Sandy.

FIGURE 17
Status of MTA Superstorm Sandy Projects as of September 30, 2021
(in millions)

	Complete	In Construction	Not Begun	Total
New York City Transit	$ 2,689	$ 1,964	$ 1,209	$ 5,862
Long Island Rail Road	117	145	307	569
Metro-North Railroad	20	399	44	463
Bridges & Tunnels	689	48	15	752
MTA Bus and Miscellaneous	10	- - -	- - -	10
Total	**$ 3,525**	**$ 2,555**	**$ 1,575**	**$ 7,656**

Source: Metropolitan Transportation Authority, OSC analysis

Conclusion

The analysis of capital spending and commitments compared to projected capital needs provides a measure for assessing capital investment in MTA assets and identifying elements that may be lagging in their schedule to be brought into SGR. The pace of spending and commitments, as of September 2021, shows a mix of progress among different asset types.

Subway stations are on pace to exceed spending on needs identified by the MTA's assessment. Major Bridge and Tunnel capital elements, including roadways and decks are also expected to achieve what was called for in the needs assessment. Subway cars, line equipment, signals, subway shops and yards and NYCT bus depots, however, are lagging, and should be considered as areas to accelerate work going forward.

This analysis also highlights the limitations in the MTA's presentation of data in its capital program dashboard. Improvements could include tracking interim spending associated with projects achieving beneficial use in addition to project completions, updating the SGR status of assets as projects are completed, and aligning capital spending with operating indicators of ridership safety and reliability. The MTA's submittal for the Governor's recent transparency initiative did not specifically address how it would improve its reporting to the public on capital spending and commitments, which should be an area of continued enhancement for the agency.

The MTA has also not clearly defined resiliency projects in its post-2014 capital programs, so it is difficult to track the MTA's progress in protecting its system against the effects of climate change. In general, the MTA has revised design standards which include integrated resiliency standards in more recent project designs, as appropriate to individual projects and climactic risks. The Office of the State Comptroller recommends that the MTA distinguish such projects on its capital program dashboard to help stakeholders track progress. Better reporting on such projects will allow all stakeholders to track the MTA's progress in making its system more resilient.

The MTA has said that future resiliency projects may be added to the 2020-2024 capital program and/or included in future programs. Recent discussion of updating the agency's capital needs assessment and focusing on system resiliency are important first steps to ensuring the system will be prepared when new challenges emerge.

Given the intensifying impacts of climate change and the increasing risk to the MTA's assets throughout the region, it is also imperative that the MTA incorporate the impact of climate change into its next needs assessment and release it as soon as possible before the October 2023 deadline to inform public debate and ensure targeted investment.

The passage of the IIJA should reduce federal funding risks and offer additional funding for the MTA's capital programs. It should also usher in an effort to provide greater detail on the selection of projects, their progress toward improving performance and resilience of the system and their impact on riders and toll payers, so that the region can recover and thrive.

Prepared by the Office of the State Deputy Comptroller for the City of New York

Leonard Liberto, Chief Municipal Financial Analyst
Barry Del Mastro, Administrative Specialist

Office of the New York State Comptroller
110 State Street, Albany, NY 12236

(518) 474-4044 www.osc.state.ny.us

Like us on Facebook at
Facebook.com/nyscomptroller
Follow us on Twitter @nyscomptroller
Follow us on Instagram @nys.comptroller