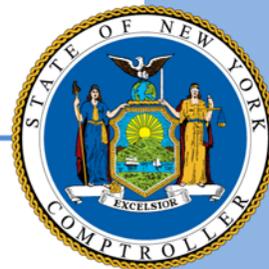


Financial Outlook for the Metropolitan Transportation Authority

Report 7-2018

OFFICE OF THE NEW YORK STATE COMPTROLLER

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Executive Summary

The Metropolitan Transportation Authority (MTA) is the largest mass transit agency in the nation, providing services to nearly one-third of the nation's mass transit commuters. These services are critically important to the economies of New York State and New York City, transporting workers and tourists from around the region. Last year, 1.76 billion riders used New York City's subways and more than 170 million used the Long Island and Metro-North railroads. The buses operated by the MTA carried another 764 million riders, and the nine bridges and tunnels operated by the MTA logged a record of 307 million crossings.

The performance of the Long Island Rail Road (LIRR) and the subway system has deteriorated in recent years. On-time performance on the LIRR fell sharply during the first half of 2017 and was on pace for the worst year in 17 years, largely as a result of an increase in delays related to Amtrak-owned tracks, signals and switches, as well as to the LIRR itself.

By 2016, the average distance that subway trains traveled before breaking down had fallen by one-third to 112,000 miles, the shortest distance since 2001, and on-time performance had fallen sharply. Almost one-third of the subway fleet is now more than 30 years old and about 40 percent of the signals in the system are more than 50 years old. The sharp growth in subway ridership over the past 15 years is also straining the system.

On June 27, 2017, a southbound subway on the A line derailed near the 125th Street station in Harlem, filling the tunnel with smoke and injuring more than 40 passengers. Two days later, the Governor declared a state of emergency for New York City's subways and the Long Island Rail Road. On July 25, 2017, the MTA chairman announced a two-phase Subway Action Plan to address the deterioration of the subway system. Phase 1, with an estimated cost of \$836 million, focuses on stabilizing and improving the system. Phase 2, with an estimated cost of \$8 billion, will focus on modernizing the system and will be included in the 2020-2024 capital program.

Phase 1 will address the key drivers that cause 79 percent of the delays in the system, including signal malfunctions, track issues, subway car breakdowns, failing power infrastructure, water-related damage and track fires. The MTA has suggested that the State and the City split the cost of Phase 1, but an agreement has not yet been reached. In the absence of a funding agreement, the MTA has been drawing on reserves to begin Phase 1.

The MTA has not yet explained how the cost of increased subway maintenance will be funded after State and City funds are exhausted. The recurring cost could exceed \$300 million annually, the equivalent of an unscheduled fare and toll increase of about 4 percent.

Although the MTA has invested more than \$120 billion in capital improvements since 1982, the pace of investment has not kept up with the need. Some of the largest funding needs remain in the New York City subway system, where signals, power, stations, repair shops, pumps and emergency ventilation equipment have not been restored to a state of good repair, and subway car purchases have been delayed. More than one-third of the 201 emergency ventilation plants in the subway system are more than 50 years old and have never been rehabilitated, including five that are more than 100 years old.

The MTA is contributing 43 percent of the funds for the 2015-2019 capital program, a much larger share than any of its funding partners. The cumulative impact of the 2015-2019 program and prior capital programs has placed a heavy burden on the operating budget and on those who use the transit system in the form of higher fares and tolls. Debt service and other operating resources that support the

capital program are projected to increase by 22 percent over the next five years to \$3.5 billion, consuming one-fifth of all MTA revenues. Even before taking into consideration the 2020-2024 capital program, debt outstanding is projected to reach \$42.6 billion by 2022, \$7 billion more than five years earlier.

The MTA is scheduled to release its 2020-2024 capital program in the fall of 2019. While it has not revealed the size of the program, the MTA chairman has stated that the next program will require an additional investment of \$8 billion in the City's subways. The 2015-2019 capital program had a funding gap of \$15 billion when it was first proposed, and the 2020-2024 capital program could have an even larger gap in the absence of a robust commitment from the State and the City, or a new funding source.

It took 17 months for the State, the City and the MTA to agree on a funding formula to close the gap in the 2015-2019 capital program, and a number of projects were delayed as a result. To avoid such delays in the future, the State and the City should reach agreement on a long-term funding formula for the nonfederal share of the MTA's capital program.

Without additional assistance from its traditional funding partners, the MTA may have to raise fares and tolls faster than planned to maintain, modernize and expand the system. While the Governor and the Mayor have both expressed support for new revenue sources for the MTA (rather than funding the MTA's capital program from existing State and City resources), they disagree on the approach.

The MTA is counting on the federal government to fund almost one-quarter of its capital program, but there is uncertainty regarding the size of the federal commitment. For example, the President has proposed eliminating the New Starts program, which the MTA assumes will fund one-third (\$2 billion) of the estimated cost of Phase 2 of the Second Avenue Subway.

Although the State is committed to contributing \$8.5 billion to the 2015-2019 capital program, it has not yet identified the source of \$7.3 billion of its commitment. Under State law, the State commitment could be met through MTA bonds backed by an existing or new State revenue source. The Governor recently announced the State's intention to contribute an additional \$1 billion to the current capital program, but the source of that funding has also not been identified.

In July 2017, the MTA released a preliminary budget for 2018 and a revised four-year financial plan (the "July Plan"). The July Plan projects a balanced operating budget through 2019, but it projects budget gaps in the following years that grow from \$112 million in 2020 to \$493 million in 2021, despite planned biennial fare and toll increases of 4 percent in 2019 and 2021. (The MTA has already raised fares and tolls by 4 percent in 2017.) These estimates assume uninterrupted economic growth, \$1.4 billion in unidentified cost savings, and the restoration by the State of \$65 million in annual funding to offset the revenue loss to the MTA from a reduction in the payroll mobility tax on small businesses.

Maintaining, modernizing and expanding the regional mass transit system is critically important to New York City's future. Doing so, however, will require a sustained effort not just from the MTA, but also from its traditional funding partners. In the absence of adequate funding, the system could deteriorate further, and fares and tolls could increase faster than already planned by the MTA. While an agreement has yet to be reached, the MTA, the State and the City are focusing on solutions to prevent such an outcome.

Utilization Trends

Average weekday subway ridership grew by 67 percent between 1991 and 2015, reaching 5.65 million riders before levelling off in 2016 (see Figure 1). Average weekend ridership more than doubled to nearly 6 million riders, but declined by 3 percent in 2016 to 5.8 million riders. The MTA speculates that weekend maintenance and an increase in the popularity of ride-sharing services, such as Uber, contributed to the decline.

Annual subway ridership increased by 11 percent between 2009 and 2016 to 1.76 billion rides. The July Plan assumes subway ridership will level off in 2017, but ridership is 1 percent below last year's level as of August 2017. Ridership is expected to increase slowly through 2020 along with job growth.

Ridership on the LIRR (the largest commuter railroad in the nation) reached 89.4 million riders in 2016 (see Figure 2), the highest level since 1949. The July Plan assumes ridership will increase slightly in 2017 (0.6 percent) and continue to grow through 2020.

As shown in Figure 2, Metro-North ridership has increased by more than 58 percent over the past 30 years to a record of 84.8 million riders in 2016 (86.5 million including the West of Hudson lines). The July Plan assumes ridership will increase slightly in 2017 (0.3 percent) and in subsequent years, setting new records each year.

Bridge and tunnel crossings declined by 7 percent between 2007 and 2012 because of the recession and higher gas prices. Crossings set a record of 307 million in 2016 (an increase of 9 percent since 2012) on strong job growth and lower gas prices (see Figure 3). The July Plan assumes crossings will decline slightly in 2017 (0.4 percent), but will resume growing in 2018.

Ridership on the MTA's buses fell by 12 percent between 2008 and 2016 to 764 million. According to the MTA, riders are abandoning slow bus routes for other modes of transportation. The July Plan assumes bus ridership will decline by 4 percent in 2017, but then increase slowly through 2020.

FIGURE 1
Subway Ridership

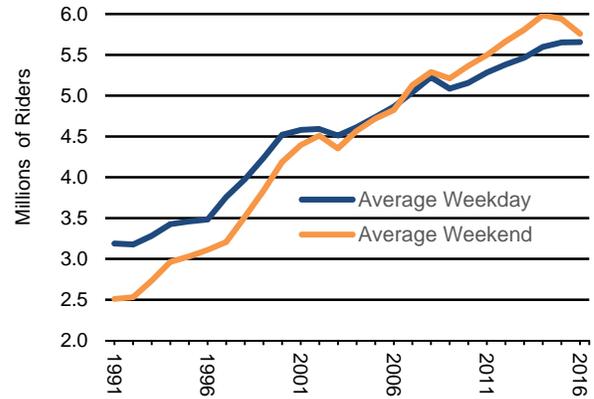


FIGURE 2
Commuter Rail Ridership

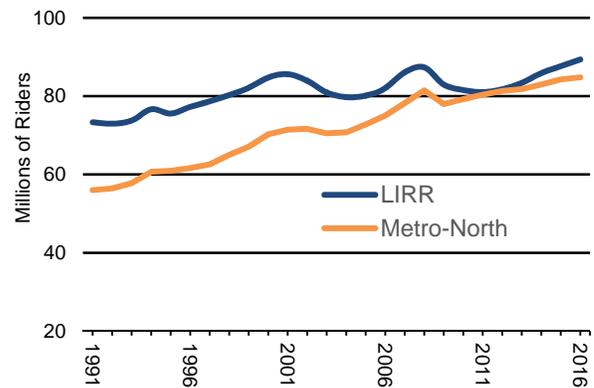
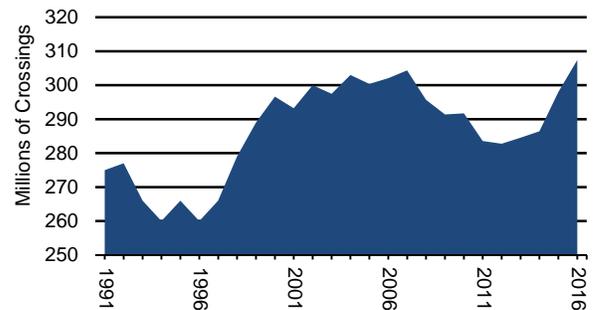


FIGURE 3
Bridge and Tunnel Crossings



Source: Metropolitan Transportation Authority

Selected Performance Measures

The performance of the subways and the Long Island Rail Road (LIRR) has deteriorated in recent years, as demonstrated by the following performance measures.

New York City Subway

In 1981, subway trains had a mean distance between failures (MDBF) of 6,600 miles. As new rolling stock was purchased and the existing trains were better maintained, the MDBF reached a record 178,000 miles in 2005 (see Figure 4). The MDBF declined for three straight years after that, although by 2011 it had recovered to near the 2005 level as new subway cars were brought into service.

Since 2011, the MDBF has declined for five consecutive years, the longest decline since the capital program was established in 1982. By 2016, the MDBF had fallen to 112,000 miles (a decline of 35 percent), the lowest level since 2001. Despite the decline, the MDBF was still much higher than during the 1980s. The MDBF increased by 5 percent through the first seven months of 2017.

Subway delays have also increased significantly in recent years. As shown in Figure 5, the number of weekday subway delays increased by 83 percent between 2013 and 2016 (from 360,141 to 657,413). Consequently, on-time performance fell from 81 percent in 2013 to 67 percent in 2016 (see Figure 6).

In 2016, the MTA attributed nearly 40 percent of the delays to overcrowding and more than 28 percent to track and signal issues. Since 2013, the number of delays attributed to overcrowding has increased by 200,000, a threefold increase in three years.

The number of weekday subway delays continued to increase in 2017. Weekday delays were 19 percent higher during the first eight months of 2017 compared with the same period last year, and on-time performance slipped to 63 percent.

FIGURE 4
Subway Mean Distance Between Failures

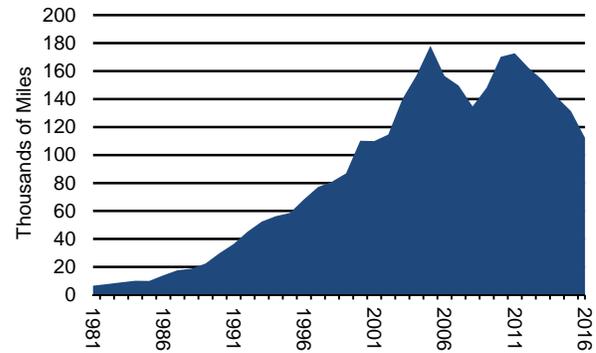


FIGURE 5
Weekday Subway Delays

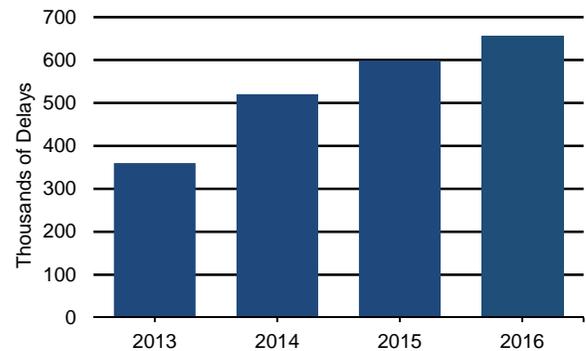
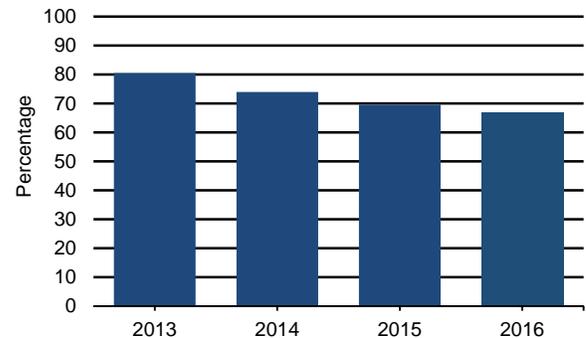


FIGURE 6
Weekday Subway On-Time Performance



Sources: Metropolitan Transportation Authority; OSC analysis

Long Island Rail Road

The LIRR's on-time performance, which peaked at 95.2 percent in 2009, has slipped in recent years. On-time performance fell sharply during the first half of 2017 and was on pace for the worst year in 17 years, largely as a result of increased delays related to Amtrak-owned tracks, signals and switches in Pennsylvania Station and the East River tunnels.

In the first half of 2017, a total of 12,177 LIRR trains were late, canceled at the terminal before departure or terminated en route, an increase of 57 percent compared with the same period last year. Amtrak was responsible for 45 percent of the increase, but there was also a marked increase in the number of delays attributed to the LIRR (see Figure 7).

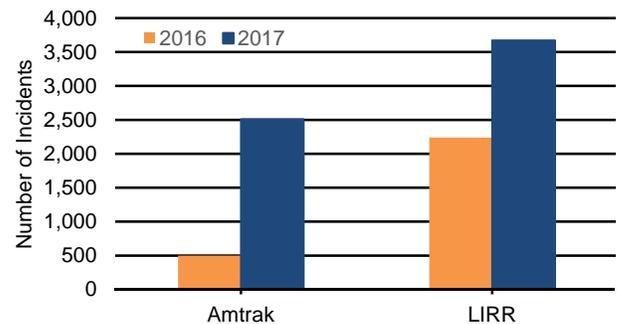
On-time performance during peak travel times to and from Penn Station showed a marked deterioration. The on-time performance of trains traveling to Penn Station during the morning peak was 87.6 percent, down from 93.6 percent during the first half of 2016 (see Figure 8).

Trains traveling east from Penn Station during the evening peak fared even worse. Only 79.5 percent of these trains were on time, compared with 90.4 percent during the first half of 2016 (see Figure 9). This means one in five trains were canceled, delayed or terminated. On-time performance fell to 72.7 percent in April.

In response to these conditions, Amtrak performed emergency repairs in July and August, focusing on tracks and switches utilized mostly by Amtrak and New Jersey Transit. The LIRR had to reduce service to Penn Station during these months, but on-time performance improved markedly. On-time performance improved further to 92.6 percent in September, slightly less than one year earlier.

The number of trains delayed because of problems in the Amtrak-owned East River tunnels more than doubled during the first half of 2017, increasing to 329 from 148 in 2016. Two of the four East River tunnel tubes were severely damaged in 2012 during Superstorm Sandy and have not been repaired.

FIGURE 7
LIRR Delays Related to Amtrak and the LIRR First Half of the Year



Note: Delays include trains that are late, canceled or terminated.

FIGURE 8
Penn Station: LIRR Morning Peak On-Time Performance

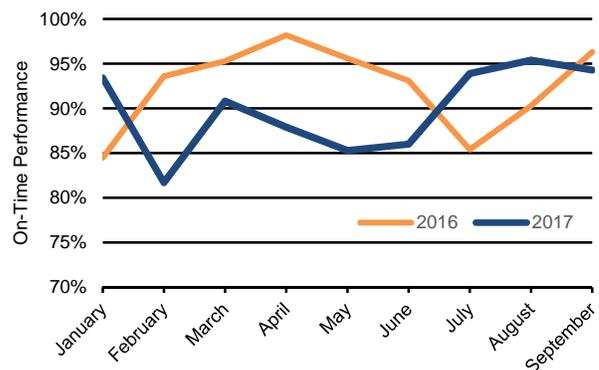
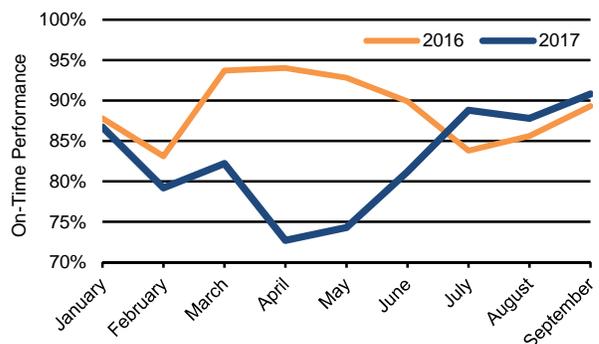


FIGURE 9
Penn Station: LIRR Evening Peak On-Time Performance



Sources: Long Island Rail Road; OSC analysis

The Operating Budget

In February 2017, the MTA projected small positive cash balances through 2019, and a deficit of \$372 million in 2020. In the July Plan, the MTA has reduced the size of the 2020 budget gap despite downward revisions to its forecasts of real-estate-related tax collections and farebox revenues, which are expected to result in a cumulative revenue loss of \$924 million by 2021.

The revenue loss was partly offset by a number of favorable developments totaling \$755 million through 2021. For example, the projected cost of energy, borrowing for the capital program and employee health benefits was revised downward (\$440 million). The MTA also benefited from an upward revision in its forecast for collections from the payroll mobility tax (\$138 million) and an unexpected State appropriation for the capital program (\$65 million). The latter development allowed the MTA to redirect an equal amount in operating funds that it had earmarked for the capital program.

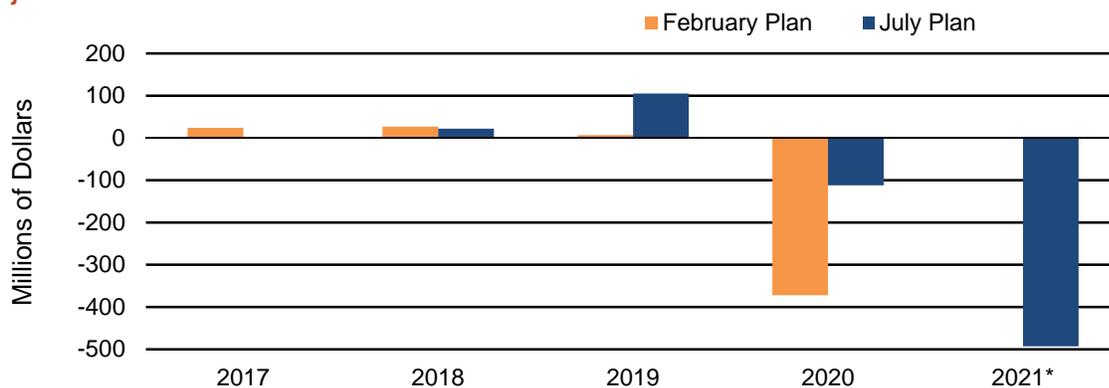
The MTA also allocated additional resources (\$484 million) for maintenance, operations and customer experience enhancements. More than half of these funds were allocated to New York City Transit for pilot programs to reduce subway track and signal delays, improve emergency response times, reduce subway and station overcrowding, and improve subway car maintenance. The LIRR and Metro-North will also make investments to improve equipment reliability.

Additional funding for safety and security (\$90 million) will be used for employee sleep apnea testing, bus safety initiatives (including onboard cameras) and new MTA police radios. The MTA also dedicated an additional \$100 million in operating funds to the capital program.

After taking these changes into account, the July Plan still forecasts balanced budgets through 2019, and the budget gap for 2020 has been reduced from \$372 million to \$112 million (see Figure 10). By 2021, however, the MTA now projects an operating budget gap of \$493 million.

The July Plan is based on a number of assumptions that may or may not materialize. For example, it assumes that New York State will continue to appropriate funding to offset a revenue loss to the MTA from a change in the payroll mobility tax that reduced the burden on small businesses (\$65 million annually beginning in 2018 or a total of \$260 million over four years). Although the MTA will seek reimbursement from Amtrak for the cost of providing alternative service and fare discounts while emergency repairs were performed in Penn Station during July and August (estimated at \$58 million), these funds were not included in the July Plan and are unlikely to be received.

FIGURE 10
Projected Year-End Cash Balances



Sources: Metropolitan Transportation Authority; OSC analysis

The July Plan anticipates fare and toll increases of 4 percent in 2019 and 2021, which are subject to board approval. The MTA is also counting on \$1.4 billion in savings during the financial plan period from new efficiencies. While the MTA has been successful in recent years in obtaining such savings, it remains to be seen whether these targets can be met.

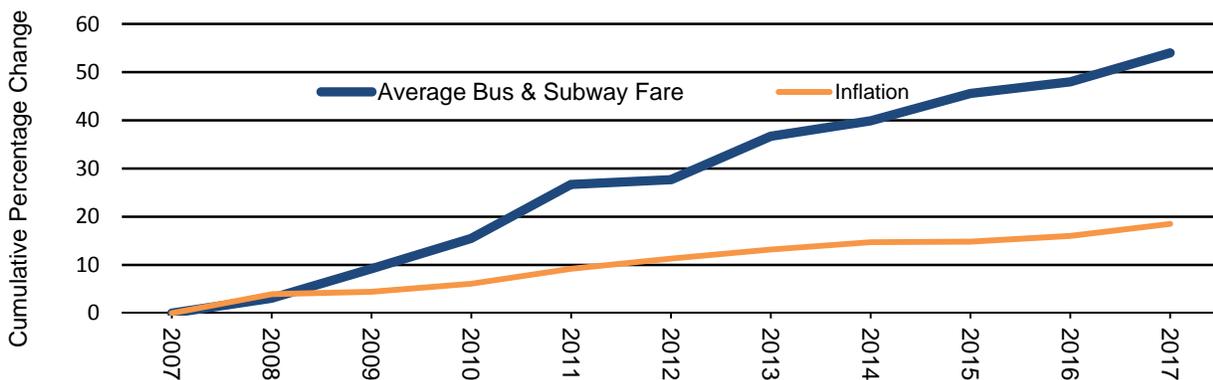
The MTA's revenues are sensitive to changes in economic conditions as demonstrated by the recent recession. While the July Plan assumes uninterrupted economic growth during the financial plan period, the job expansion in New York City has already become the largest on record and will also be the longest on record by the end of 2017. Changes in business cycles are inevitable, and the likelihood of an economic setback increases with each passing year.

Revenue Trends

Total revenues are projected to total \$15.7 billion in 2018. More than half of that amount (\$8.3 billion or 53 percent) is expected to come from fare and toll revenue. Dedicated taxes enacted by the State (including taxes on payrolls, real estate transactions, petroleum businesses and the sale of certain goods and services) are expected to generate \$5.5 billion, or 35 percent of total revenue. State and local subsidies will contribute another \$1.2 billion (8 percent). Other operating revenues, including advertising income, will generate the remaining \$707 million.

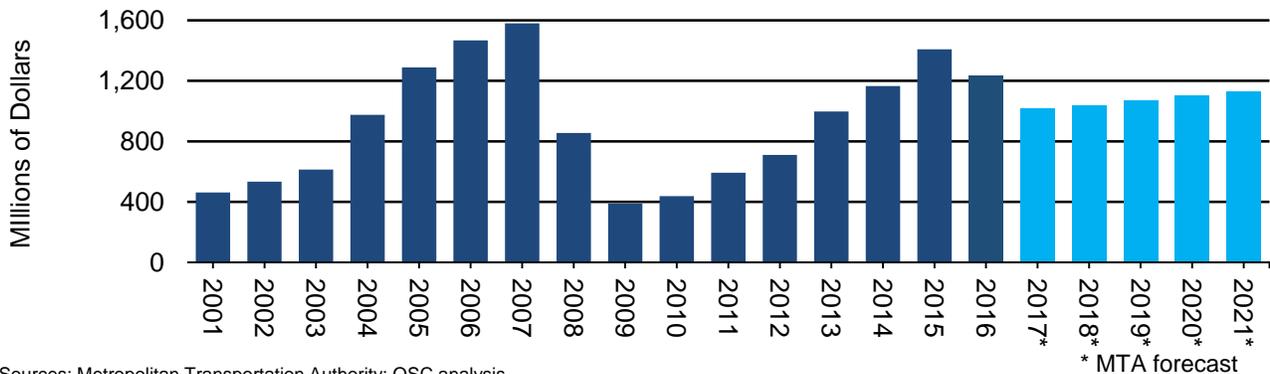
The MTA raised fares and tolls by less than the inflation rate between 1996 and 2007, but since then fares and tolls have risen at a faster pace (see Figure 11). For example, the average subway and bus fare rose by 54 percent between 2007 and 2017, nearly three times faster than the inflation rate for the metropolitan region (18.5 percent). These increases occurred when riders were least able to afford them, as the recession took a heavy toll on family finances. The July Plan assumes biennial fare and toll increases of 4 percent in 2019 and 2021, less than the projected inflation rate of 9 percent over the four-year period.

FIGURE 11
Fares Have Grown Nearly Three Times Faster than Inflation



Sources: Metropolitan Transportation Authority; U.S. Bureau of Labor Statistics; OSC analysis

FIGURE 12
Real Estate-Related Tax Collections



Sources: Metropolitan Transportation Authority; OSC analysis

In 2009, the State enacted the payroll mobility tax (PMT) to provide a new revenue source for the MTA to help close projected budget gaps and to help fund the capital program. The MTA expects the PMT to generate nearly \$1.7 billion in 2017 (including replacement funds). The July Plan assumes collections will grow by 4.1 percent annually during the financial plan period to reach \$2 billion by 2021 (on the assumption that job and wage growth will continue uninterrupted during the financial plan period).

Revenue from taxes on commercial and residential real estate transactions in the MTA’s 12-county region peaked at \$1.6 billion in 2007, but fell below \$400 million in 2009 as the real estate market collapsed. Collections increased steadily between 2009 and 2015, reflecting Manhattan’s strong commercial market, and peaked at \$1.4 billion in 2015. In 2016, collections declined by 13 percent (\$177 million), the first decline in eight years (see Figure 12). The July Plan assumes collections will fall by 17 percent in 2017 (\$214 million) before growth resumes in 2018. The MTA expects collections to grow slowly and to reach \$1.1 billion by 2021.

State and local subsidies account for less than 8 percent of operating revenues. State operating assistance is appropriated by the State Legislature on an annual basis. Since 1995, the State has funded about 95 percent of these payments from dedicated transit taxes rather than from the State’s general fund. The City and each of the seven suburban counties are required by law to match the State’s contribution. The July Plan does not anticipate an increase in these subsidies during the financial plan period. The City and the suburban counties also contribute to the cost of maintaining the commuter railroad stations within their jurisdictions. These payments are adjusted for inflation.

Expenditure Trends

The July Plan projects total spending of \$16.2 billion in 2018. Of this amount, more than 60 percent (\$9.8 billion) is devoted to labor costs, including salaries, overtime and fringe benefits. Nonlabor costs (including maintenance contracts, materials and supplies, and professional service and paratransit contracts) are projected to total \$3.5 billion (22 percent). Debt service is projected to total \$2.7 billion in 2018, representing 17 percent of total revenues.

Spending is projected to reach \$18.2 billion by 2021 (an increase of nearly 22 percent from 2016), driven by an increase in nondiscretionary costs, including debt service and fringe benefits. Nondiscretionary costs have been consuming an increasing share of the operating budget and will

account for 55 percent of total revenue by 2021. These estimates assume that the labor unions with outstanding contracts reach agreements that conform to the pattern set by the Transport Workers Union (the MTA's largest union). Spending could be lower if the MTA achieves cumulative savings of nearly \$1.4 billion as planned during the financial plan period.

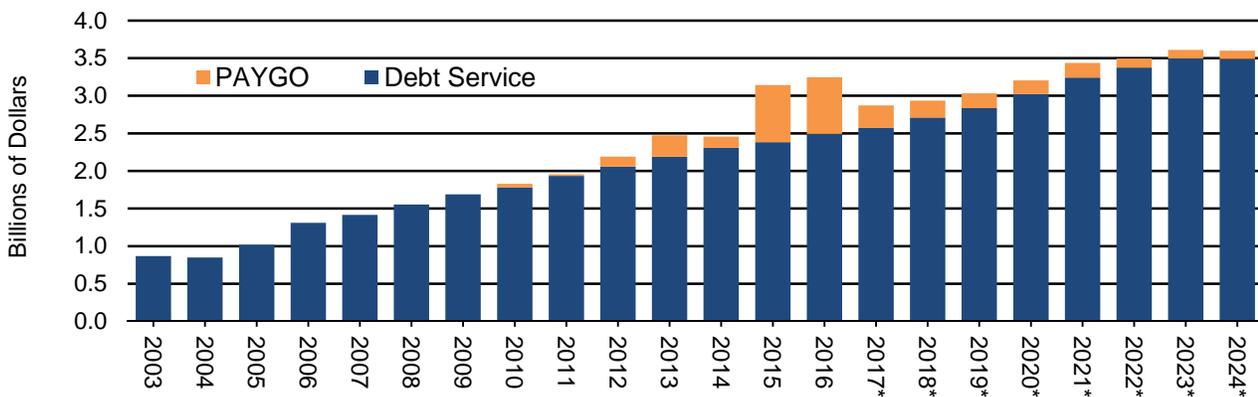
Health insurance and other fringe benefits for active employees continue to grow faster than revenues. These costs are projected to grow at an average annual rate of 5.5 percent during the financial plan period (twice as fast as revenues) to reach \$2.6 billion by 2021.

Pension contributions are projected to remain stable during the financial plan period, averaging less than \$1.4 billion. Many MTA employees are members of the New York City Employees' Retirement System (NYCERS). Last year, NYCERS earned almost 13 percent on its investments, significantly higher than the actuarial assumed rate of return of 7 percent. As a result, future pension contributions could be slightly lower than projected in the July Plan.

The cost of other post-employment benefits (OPEBs) for retirees are projected to increase by 44 percent between 2016 and 2021 (from \$562 million to \$810 million). The accrued actuarial OPEB liability totaled \$18.5 billion as of January 2014 (the most recent valuation). To help fund these liabilities, the MTA voluntarily established the MTA Retiree Welfare Benefits Trust (OPEB Trust) in June 2008. As of December 31, 2016, the OPEB Trust had a balance of \$323 million. The MTA had planned to set aside an additional \$101 million through 2021 for future OPEB liabilities, but it no longer plans to do so.

Debt service is expected to total nearly \$2.6 billion in 2017, nearly a threefold increase since 2003, and is projected to increase by nearly one-third (31 percent) to reach \$3.4 billion by 2022 (see Figure 13). In addition to debt service on borrowing, the MTA has allocated other operating budget resources to fund the capital program. Between 2010 and 2016, the MTA allocated more than \$2.1 billion to help finance the capital program on a pay-as-you-go basis (PAYGO), and it plans to allocate another \$1.4 billion by 2024. Debt service and other operating resources that support the capital program are projected to consume, on average, nearly one-fifth (19 percent) of all MTA revenues during the current financial plan period.

FIGURE 13
Debt Service and Other Operating Resources in Support of the Capital Program



Sources: Metropolitan Transportation Authority; OSC analysis *MTA forecast

Reserves

The MTA maintains a number of different operating budget reserves. The general reserve totaled \$155 million at the beginning of 2017, but the MTA plans to reduce the reserve to \$20 million to fund the cost of alternative service and fare discounts while Amtrak performed emergency construction work in Penn Station and to offset the impact of lower-than-planned real estate transaction tax collections. The general reserve totals \$160 million in 2018 and increases to \$180 million by 2021.

The GASB Fund Reserve has a balance of nearly \$149 million. These resources are intended for the OPEB Trust, but have not yet been transferred and could be used for other purposes if needed. The MTA has not indicated when, if ever, it plans to transfer the funds to the OPEB Trust.

The Bridge and Tunnel Necessary Reconstruction Reserve is intended to help fund the capital program and is available as a backstop should open road cashless tolling result in a material reduction in toll revenue.¹ The MTA plans to suspend contributions to this reserve from 2018 through 2021, leaving a balance of \$321 million.

¹ Open road cashless tolling uses an electronic toll collection system to collect road and bridge tolls without the use of tollbooths. This recently completed capital project had an estimated cost of \$500 million.

Subway Action Plan

Shortly before the release of the July Plan, the MTA chairman announced a two-phase Subway Action Plan to address the deterioration of the subway system. Phase 1, with an estimated cost of \$836 million, focuses on stabilizing and improving the system. Phase 2, with an estimated cost of \$8 billion, focuses on modernizing the entire system.

Phase 1 is intended to address the key drivers of 79 percent of the major incidents that cause delays in the system, including signal malfunctions, track issues, car breakdowns, failing power infrastructure, water-related damage and corrosion, and track fires. The cost to the MTA's operating budget was estimated at \$456 million over three years, and the capital cost was estimated at \$380 million.

Phase 1 includes the following major elements.

- Creating dedicated teams to eliminate the backlog of 1,300 signal work orders. About 40 percent of the subway's signals are more than 50 years old, and 30 percent of all major incidents are caused by signal problems.
- Tripling the number of MTA Combined Action Teams to reduce the response time from 45 minutes to 15 minutes for a range of track, power and signal repairs.
- More than doubling the number of stations with dedicated emergency medical teams to respond to sick passengers (from 5 to 12) in an effort to reduce wait times. In 2016, sick passengers were responsible for more than 36,000 delays.
- Expanding the overhaul capacity from 950 subway cars to 1,100 cars per year and prioritizing the inspection and repair of subway car doors, which cause 40 percent of subway car breakdowns. Almost one-third of the 6,400-car fleet is more than 30 years old, and 16 percent of the fleet is more than 40 years old.
- Adding additional subway cars to trains on the C line and increasing subway car capacity on the Times Square Shuttle and the L line by removing seats from certain cars.
- Cleaning the entire subway system to remove debris and reduce fire hazards. There were 957 fires in 2016, an average of 2.6 fires per day. The MTA's recent efforts to reduce the number of fires in the system have begun to show results. Nonetheless, subway delays caused by fires are 24 percent higher than last year as of August 2017.
- Tripling the installation rate of continuous welded rail and increasing track welding capacity by 30 percent. About half of the system already has new rail, including two-thirds of the underground system. In addition, 50,000 new friction pads will be installed to increase rail resiliency.
- Dispatching 31 specialized teams to expedite track repairs in the subway system at targeted locations with the highest rate of incidents, and pre-positioning 20 Emergency Subway Car Response teams at 12 locations with five mobile repair trucks for faster on-location repairs.
- Increasing the frequency of heavy-duty station cleaning by 30 percent, from every six weeks to every four weeks. A program to deep-clean, repaint, repair tile, and service elevators and escalators will be launched at priority stations across the system.

The cost of Phase 1 has not yet been reflected in the MTA's operating budget or its capital program. The MTA chairman has suggested that the State and the City split the cost of Phase 1 (\$836 million), but an agreement has not yet been reached. In the absence of a funding agreement, the MTA has been drawing on reserves to begin Phase 1.

In October 2017, NYC Transit suggested that Phase 1 could be accelerated and completed by the end of 2018. Although the total cost of the program would remain the same, the impact on the operating budget would increase to \$508 million and the capital cost would be lowered to \$328 million. NYC Transit reported that it has already hired 760 workers and that it plans to add another 1,600 by the end of 2018.

The MTA has not yet explained how the cost of increased subway maintenance will be funded after State and City funds are exhausted. The recurring cost of these efforts could exceed \$300 million annually, the equivalent of an unscheduled fare and toll increase of about 4 percent. The MTA is expected to release a revised four-year financial plan in November 2017, which may include the impact of Phase 1.

Phase 2 will focus on modernizing the system and is expected to cost \$8 billion. Phase 2 will be part of the 2020-2024 capital plan, but the MTA has not indicated how the cost will be funded.

The MTA has established an advisory board to support the Subway Action Plan and to advise the MTA on its implementation. Members include David N. Dinkins, former Mayor, New York City; Kathryn S. Wylde, President and CEO, Partnership for New York City; Daniel L. Doctoroff, CEO, Sidewalk Labs; Peter Kalikow, President, Kalikow & Company; John Samuelsen, President, Transport Workers Union (TWU) International and TWU Local 100; Dennis Rivera, Senior Advisor to the President, Service Employees International Union (SEIU) and Founder and Former Chair of SEIU Healthcare; Hector Figueroa, President, 32BJ SEIU; Sarah Feinberg, former Administrator, Federal Railroad Administration; and Gene Russianoff, the Straphangers Campaign.

Unfunded Capital Needs

The MTA has invested more than \$120 billion in capital improvements since the first MTA capital program in 1982. However, the pace of investment has not always kept up with the need. As a result, many of the transit system's assets, particularly in the subway system, have yet to be restored to a state of good repair.

To illustrate this point, the Office of the State Comptroller (OSC) compared the amount identified in the MTA's capital needs assessment with the amount funded in each capital program. For example, the MTA's assessment identified a need of \$14.9 billion for repair and modernization for the 2000-2004 capital program.² In total, the MTA's operating agencies received 95 percent of their estimated needs, although NYC Transit received 88 percent of its estimated need for that time period (see Figure 14).

All of the MTA's operating agencies fared poorly during the 2005-2009 and the 2010-2014 capital programs. In the aggregate, they received 75 percent and 55 percent, respectively, of their estimated needs. The agencies fared much better during the 2015-2019 capital program (receiving 96 percent of the estimated need), but the share of capital needs funded varied by agency.

FIGURE 14
Share of Capital Needs Funded by Capital Program

	2000-2004	2005-2009	2010-2014	2015-2019
NYC Transit	88%	81%	51%	100%
LIRR	112%	65%	67%	85%
Metro-North	139%	59%	73%	70%
Bridges & Tunnels	NA	65%	61%	122%
Total	95%	75%	55%	96%

Note: Estimates for the 2010-2014 capital program exclude funding related to Superstorm Sandy, since most of the funding was devoted to projects that were not contemplated in the capital program (e.g., mitigation projects and restoration of the Rockaway subway line and the South Ferry subway station).

Sources: Metropolitan Transportation Authority; OSC analysis

Figure 15 shows the percentage of funding received by NYC Transit for each investment category during the four most recent capital programs. Some categories fared better than others, but some were significantly underfunded. Track and switches were fully funded during all four capital programs, but line equipment, power, signals, repair shops and train yards were frequently underfunded. Subway cars were fully funded during the first two capital programs, but received only half of the estimated need during the two most recent programs. In addition to financial constraints, the MTA also had to contend with operational constraints and the ability of its agencies and external contractors to complete projects.

Line equipment was the least well-funded of the investment categories, receiving only 40 percent of the estimated need during the 20-year period. For example, NYC Transit estimated that it needed \$882 million for line equipment during the 2015-2019 period, but it received only \$285 million. Line equipment includes mechanical ventilation plants in the subway tunnels that blow heat, smoke and harmful gases away from passengers in the event of fires or other emergencies.

² Bridges and Tunnels was not included in the needs assessment released by the MTA in May 2000.

FIGURE 15
New York City Transit
Percentage of Capital Needs Funded by Capital Program Category

	2000-2004	2005-2009	2010-2014	2015-2019
Subway Cars	103%	117%	34%	64%
Buses	142%	109%	55%	106%
Passenger Stations	85%	73%	62%	177%
Track and Switches	108%	127%	116%	127%
Line Equipment	52%	53%	27%	32%
Line Structures	112%	71%	48%	125%
Signals and Communications	85%	100%	55%	68%
Power	23%	77%	23%	130%
Shops and Yards	48%	26%	15%	94%
Depots	172%	55%	48%	89%
Service Vehicles and Staten Island Railway	67%	97%	42%	140%
Other	155%	65%	66%	126%
Total	88%	81%	51%	100%

Sources: Metropolitan Transportation Authority; OSC analysis

Ventilation plants are an important part of the MTA's strategy to ensure the safety of riders and its employees, which includes reducing the likelihood of a fire by removing trash from the tracks. In 1990, the failure of ventilation plants contributed to the deaths of two people in a fire in a subway tunnel near Clark Street in Brooklyn. In response, NYC Transit hired a consultant to develop a tunnel emergency ventilation strategy.

In 1994, the consultant conducted a risk assessment of the underground tunnel segments, which is still used today to prioritize capital projects. The consultant estimated that it would cost between \$3 billion and \$5 billion (\$5 billion to \$8 billion in 2017 dollars) to bring the ventilation system up to modern fire safety standards.

The subway system has 321 underground tunnel segments, including five that were recently opened on the No. 7 subway line extension and the first phase of the Second Avenue Subway. The new subway tunnels are protected by modern ventilation plants, but that is not the case for most of the system. Although not required under current guidelines, the MTA has installed modern equipment in certain high-priority tunnel segments.³

A total of 183 of the underground subway tunnel segments (57 percent) do not have emergency ventilation plants (see Figure 16). As a result, NYC Transit lacks the ability to mechanically vent smoke or fumes from these tunnel segments in the event of an emergency. Almost two-thirds of these segments (118) were built with chambers for ventilation equipment, but equipment was not installed during construction and 126 chambers remain empty.

³ In 1983, the National Fire Protection Association (NFPA) developed a new standard for fixed guideway transit systems. The standard, known as NFPA 130, requires emergency ventilation plants to operate in either supply or exhaust mode, and to provide passengers with at least one hour to safely evacuate an underground tunnel. It does not require subway systems built before 1983 to install ventilation equipment that meets modern fire safety standards, with the exception of extensions built after that date and modifications to existing ventilation equipment. NYC Transit has stated that it is in full compliance with NFPA 130.

A total of 83 tunnel segments (26 percent) have equipment that provides some ventilation, but these segments do not meet the modern fire safety standards. NYC Transit claims that fans in these segments may still be capable of handling low-intensity fires that are typically associated with the system.

Only 55 underground tunnel segments (17 percent) are protected by ventilation plants that meet modern fire safety standards. These segments include all 14 of the subway system's underwater tunnels, as well as some other high-risk areas.

More than 200 plants have been installed over the decades, and there are currently 201 ventilation plants. According to NYC Transit, 70 of the 201 ventilation plants (35 percent) are more than 50 years old and have never been rehabilitated, including five that are more than 100 years old.

One-third (67) of the ventilation plants are rated by NYC Transit as Condition 4 (on a scale of 1 to 4, with 4 being the worst condition). These plants break down frequently, have obsolete parts and require major capital investments. An average of 12 ventilation plants were out of service each week between January 1, 2015 and December 31, 2016, and another two operated with diminished capacity.

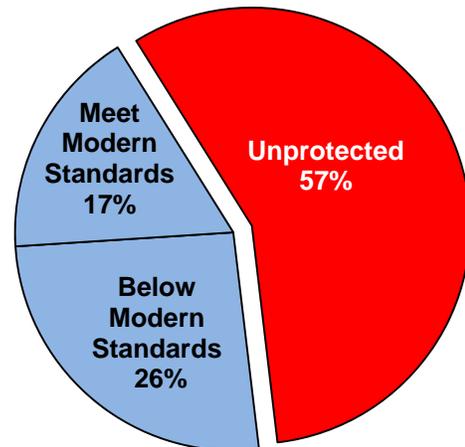
In 2000, NYC Transit predicted that all of the ventilation plants would be restored to a state of good repair by 2022 if its funding requests were fulfilled over the following 20 years. Four years later, it pushed back the anticipated completion date to 2028 because of a lack of funding. NYC Transit no longer anticipates restoring all of the ventilation plants to a state of good repair.

In 2008, the MTA switched its focus to high-priority tunnel segments. It planned to upgrade 50 additional segments to meet modern fire safety standards by 2029. Five years later, it reduced its goal to 26 segments by 2034 because funding had not been made available. Of the 100 most vulnerable underground tunnel segments in the subway system as defined by a 1994 consultant study, 57 are currently protected by ventilation plants. Of these, just 21 meet modern fire safety standards.

A total of 118 ventilation plants were added or rehabilitated between 1980 and 2008. Since then, only two new plants have been built for the original subway system and none have been rehabilitated. (Ten plants were built for the No. 7 line extension and the first phase of the Second Avenue Subway.) One new plant is scheduled to be completed in 2018 as part of the 2010-2014 capital program, and another will be replaced as part of the 2015-2019 program. Each new ventilation plant costs up to \$100 million.

With limited funding for new ventilation plants in the 2015-2019 capital program, NYC Transit is replacing plant components that are at high risk of failing. To mitigate the risks posed to riders and its employees, the MTA is taking other actions, such as those intended to reduce the likelihood of fires. While this may be an effective strategy to stretch limited resources, it leaves large sections of the subway system unprotected, while other sections are protected by outdated equipment.

FIGURE 16
Status of Tunnel Segments



Sources: Metropolitan Transportation Authority; OSC analysis

2015-2019 Capital Program

The MTA first proposed the 2015-2019 capital program in September 2014, but that program (which had a value of \$32 billion) had a funding gap of \$15.2 billion. Shortly thereafter, the Governor stated that the capital program was “bloated.”⁴ After 17 months of delays because the MTA and its funding partners could not agree on a formula to close the funding gap, the State Capital Program Review Board (CPRB) approved a new five-year capital program in May 2016.

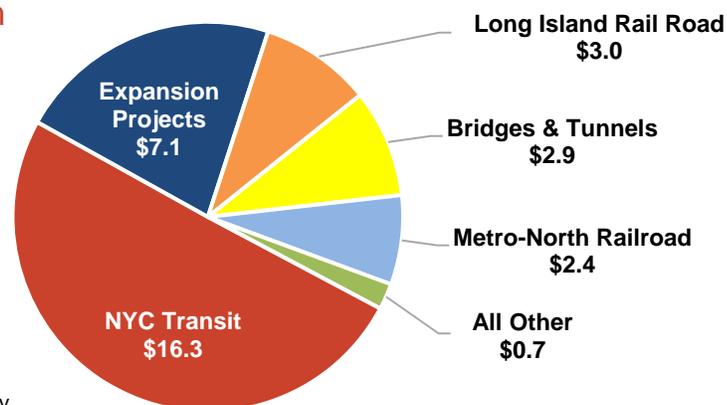
The approved 2015-2019 capital program had a total value of \$29.6 billion, including the portion devoted to bridges and tunnels, which is not subject to CPRB approval. The \$15.2 billion funding gap was closed by reducing the size of the program by \$2.6 billion (with the expectation that the cut would be offset by efficiencies) and by increasing the contributions from the MTA (by \$2.5 billion), New York State (by \$8.3 billion) and New York City (by \$1.8 billion).

In July 2017, the CPRB approved an amendment to the 2015-2019 program. The amendment increased the size of the capital program by \$2.9 billion to \$32.5 billion. Of this amount, \$25.3 billion was allocated to maintenance and modernization, and \$7.1 billion to expansion projects. The amendment added \$2 billion to build a third LIRR track between Floral Park and Hicksville, and eliminate seven grade crossings along that route. Funding for Phase 2 of the Second Avenue Subway was increased by \$700 million.

Figure 17 shows the allocation of capital resources in the 2015-2019 capital program. Half of the program’s total value (\$16.3 billion) has been allocated to NYC Transit for capital maintenance and modernization. Of this amount, one-quarter (slightly more than \$4 billion) will be used for subway station renovations and to install new fare payment technology.

Another \$2.7 billion will be used to upgrade subway signals and communications. The MTA will begin installing communications-based train control on the E, F, M, and R subway lines in Queens, the F line in Brooklyn and the A, C and E lines in Manhattan during the 2015-2019 capital program. This modernized signal system (which is in place on the L line and under construction on the 7 line) will allow the MTA to operate more subway trains during periods of peak demand.

FIGURE 17
Allocation of Capital Resources
2015-2019 Capital Program
(in billions)



Source: Metropolitan Transportation Authority

Note: 2015-2019 capital program as amended in May 2017.

⁴ Dan Rivoli, “Cuomo Calls \$32 Billion Transit Plan ‘Bloated’ as MTA Chief Sells It,” AM New York, October 7, 2014.

The LIRR has been allocated \$3 billion, with one-quarter devoted to continuing track improvements and completion of the Double Track project between Farmingdale and Ronkonkoma. The LIRR will also purchase new rolling stock (\$350 million) to complete the replacement of the older M-3 fleet and upgrade stations, including Penn Station (\$767 million).

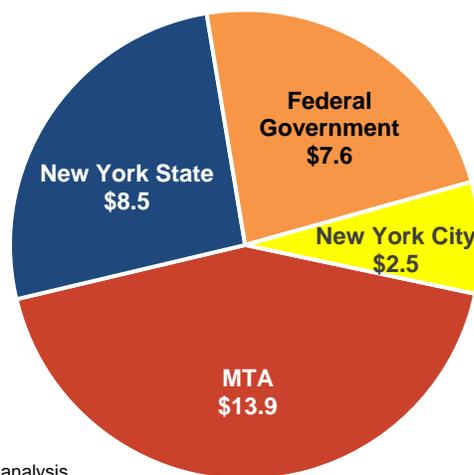
Metro-North has been allocated \$2.4 billion, with the largest amounts devoted to rolling stock (\$532 million); shops and yards (\$472 million); stations (including Grand Central Terminal) and parking lots (\$434 million); communication and signal work (\$267 million); and track, switch and structures on the East of Hudson lines (\$374 million). Both the LIRR and Metro-North intend to complete installation of positive train control by the end of the capital program, which will improve safety.

Bridges and Tunnels has been allocated \$2.9 billion, with the largest amounts devoted to the Robert F. Kennedy Bridge (\$675 million), the Throgs Neck Bridge (\$621 million) and the Verrazano-Narrows Bridge (\$594 million) for open road cashless tolling and capital maintenance, including deck replacement.

Expansion projects have been allocated \$7.1 billion, with the largest amounts devoted to the LIRR’s Third Track (\$2.0 billion) and East Side Access (\$2.4 billion) projects. East Side Access, with an estimated cost of \$10.7 billion (including rail cars) and a projected completion date of 2022, will bring the LIRR directly to Grand Central Terminal.⁵ The MTA also allocated \$1.7 billion to Phase 2 of the Second Avenue Subway. When completed by 2029 at an estimated cost of \$6 billion, it will extend the subway line in Manhattan from 96th Street to 125th Street along Second Avenue.

As shown in Figure 18, the largest share of the capital program will be funded by the MTA itself (43 percent). The MTA’s contribution of \$13.9 billion is the largest the MTA has ever made to its capital program. Of this amount, \$9.9 billion will come from borrowing; \$2.8 billion from fare revenue and other operating resources (i.e., PAYGO financing); \$600 million from asset sales and leases; and \$575 million from other sources, including savings anticipated from issuing PMT-backed bonds.

FIGURE 18
Sources of Capital Funding
2015-2019 Capital Program
(in billions)



Sources: Metropolitan Transportation Authority; OSC analysis
Note: As amended in May 2017.

⁵ East Side Access had an initial cost estimate of \$4.3 billion and an initial completion date of 2009.

The MTA is counting on the federal government to fund 23 percent of its capital program (\$7.6 billion), but there is uncertainty regarding a portion of the expected federal commitment. Despite the President's calls for a federal infrastructure initiative, he has proposed eliminating the New Starts program, which the MTA hopes will fund one-third (\$2 billion) of the estimated cost of Phase 2 of the Second Avenue Subway. The 2015-2019 capital program anticipates the receipt of \$500 million in federal funds for Phase 2 of the Second Avenue Subway.

The State has agreed to contribute \$8.5 billion (26 percent) to the MTA's capital program. So far, the State has appropriated \$5.5 billion and has identified sources of funding for \$1.1 billion of its commitment. The City has agreed to contribute \$2.5 billion (8 percent) and has included \$655 million in its ten-year capital strategy for this purpose. The State and the City have not yet identified the sources of their remaining contributions (\$7.3 billion in State funding and \$1.8 billion in City funding).⁶

Under current State law, the State and the City will provide the MTA with the remaining \$9.2 billion after the MTA has effectively exhausted all other existing MTA-supported sources of capital funding, but no later than State fiscal year 2025-2026, or by the completion of the 2015-2019 capital program.⁷ Thus, the debate over how the State meets its commitment to the 2015-2019 capital program could overlap with the debate over how to fund the following capital program for 2020-2024.

While the State could provide direct capital grants to the MTA's 2015-2019 capital program, the MTA could issue its own bonds backed by an existing or new State revenue source. The State has already increased the MTA's bond cap by \$13.6 billion, which permits the MTA to move forward with the capital program until State and City funds become available, and to cover, if needed, the State's remaining share of \$7.3 billion.

⁶ On June 29, 2017, the Governor announced the State's intention to contribute an additional \$1 billion to the MTA's 2015-2019 capital program, which would raise the State's contribution to \$9.5 billion if approved by the State Legislature. The Governor has not identified the potential sources of these funds.

⁷ The City has indicated that it will provide proportional matches concurrently with additional State funds in accordance with the funding needs of the MTA's capital program.

2020-2024 Capital Program

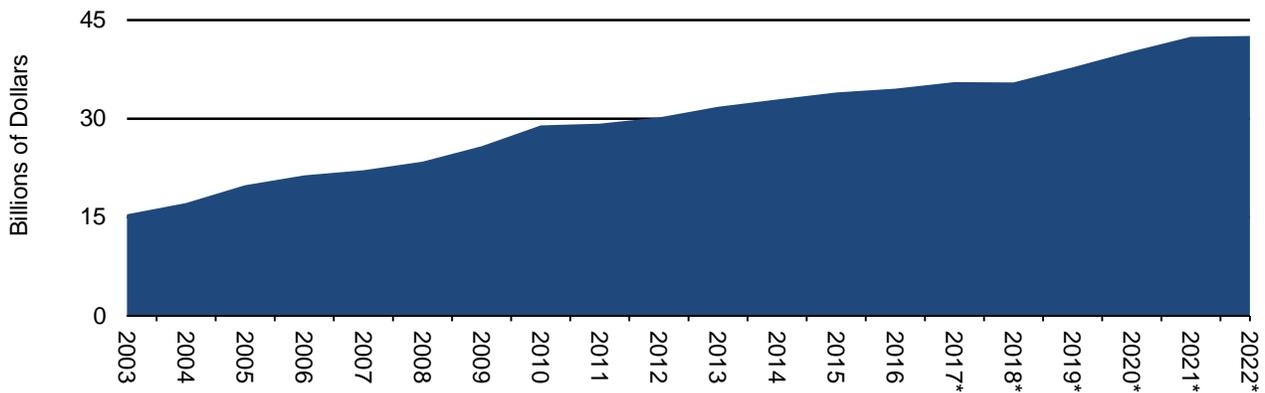
The MTA is scheduled to propose its 2020-2024 capital program in the fall of 2019. While it has not yet determined the size of the program, it has indicated that it will require an additional investment of \$8 billion in the City’s subways. The 2015-2019 capital program had a funding gap of \$15 billion when it was first proposed, and the 2020-2024 capital program could have an even larger funding gap.

It took 17 months for the State, the City and the MTA to reach an agreement on a funding formula to close the gap in the 2015-2019 capital program. A number of important projects were delayed as a result. To avoid such delays in the future, the State and the City should reach agreement on a long-term funding formula for the nonfederal share of the MTA’s capital program. The MTA should also consider accelerating its planning process and releasing the 2020-2024 capital program early, in conjunction with the 20-year needs assessment. This would allow the State and the City (and other stakeholders) to consider the adequacy of the MTA’s proposal and its priorities.

The cumulative impact of the 2015-2019 program and prior capital programs has placed a heavy burden on the MTA’s operating budget, and on those who use the transit system in the form of ever-increasing fares and tolls. Even before taking into consideration the 2020-2024 capital program, debt outstanding will increase by \$7 billion between 2017 and 2022 to reach \$42.6 billion (see Figure 19), an increase of 20 percent in just five years.

Without additional assistance from its traditional funding partners, the MTA will have to raise fares and tolls faster than already planned to maintain, modernize and expand the system. The Governor and the Mayor have expressed support for developing new revenue sources for the MTA, rather than funding the MTA’s capital program from existing State and City resources.

FIGURE 19
Debt Outstanding
Cumulative Impact of the 2015-2019 and Prior Capital Programs



Sources: Metropolitan Transportation Authority; OSC analysis

* MTA forecast

The Governor recently announced the creation of an advisory panel to develop proposals to address traffic congestion in New York City, while at the same time producing a dedicated funding stream for the MTA. The panel is composed of transportation experts, representatives from the MTA region, local leaders and stakeholders, but does not include any New York City government representatives. The panel is expected to report its findings and proposals by the end of 2017 for consideration in next year's State legislative session. OSC will review any cost savings or cost-generating options and how they could impact the State's budget.

MoveNY, a transportation advocacy group, has proposed placing tolls on the East River bridges and below 60th Street in Manhattan to ease traffic congestion and to raise an estimated \$1.5 billion annually for transit. Some of the proposed revenue would be used to maintain the East River bridges and to lower tolls on the MTA's bridges that do not serve the central business district, but most of the revenue would be devoted to the MTA's capital program.

The Mayor has proposed raising the personal income tax on individuals with incomes over \$500,000 and on couples with incomes over \$1 million (which together represents less than 1 percent of all City taxpayers). According to the City, the proposed tax would raise \$700 million in 2018 and higher amounts in subsequent years. Under this proposal, the first \$500 million could be leveraged to raise \$8 billion to modernize New York City subways, buses and the Staten Island Railway. Another \$250 million would be used to finance half-price MetroCards for 800,000 New Yorkers who have incomes at or below the poverty level.



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