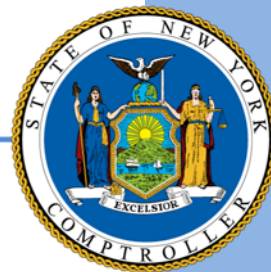


Financial Outlook for the Metropolitan Transportation Authority

Report 8-2019

OFFICE OF THE NEW YORK STATE COMPTROLLER

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Contents

Executive Summary	1
Utilization Trends	3
Selected Performance Measures	4
Agency Action Plans.....	6
The Operating Budget.....	9
The Capital Program	13
Appendix A: Mean Distance Between Subway Car Failures	18
Appendix B: Subway Maintenance Staffing Levels.....	19
Appendix C: MTA Staffing Levels	20
Appendix D: Revenue and Expenditure Trends	21



Executive Summary

The Metropolitan Transportation Authority (MTA), which operates the regional transportation system in the New York City metropolitan area, is facing its greatest challenge in decades. Subway, bus and commuter rail service has deteriorated, and riders are abandoning the system for other transportation alternatives.

In New York City, the MTA operates the subway and bus systems as well as nine vehicular bridges and tunnels. It also operates the nation's two largest commuter railroads, which provide rail service between the City's suburbs and the central business district. More than 8 million people each day rely on the MTA to get to work and home again, on time and safely.

Weekday subway on-time performance fell from 87.7 percent in 2010 to 63.4 percent in 2017, the lowest in decades. Ridership has declined for the past two years despite the largest job expansion in the City's history, and the MTA expects ridership to fall by another 2.1 percent in 2018. The MTA attributes the decline to fare evasion, service disruptions from planned maintenance and repair, poor service and competition from for-hire vehicles, such as Uber and Lyft.

The deterioration in service has not been limited to the subways. In 2017, the Long Island Rail Road (LIRR) had its worst on-time performance in 18 years, and on-time performance has also fallen on the Metro-North Railroad. On-time performance has fallen on both railroads in 2018.

The deterioration in LIRR service in 2017 can be traced to an increase in delays attributed to Amtrak, which owns and operates Pennsylvania Station in Manhattan and the four rail tunnels under the East River. While there has been a sharp decline in delays attributed to Amtrak in 2018, those caused by the LIRR have grown.

In June 2017, the Governor declared a transportation emergency. One month later, the MTA launched its Subway Action Plan (SAP) to stabilize and improve the system while laying a foundation for modernization.

The SAP has an estimated cost of \$856 million over an 18-month period ending in December 2018, and a recurring cost of more than \$300 million annually. Pursuant to State law, the initial cost will be shared by New York State and the City, and the recurring cost will be funded from a new surcharge on for-hire vehicles.

When the SAP was proposed in July 2017, the MTA had planned to add 2,800 subway maintenance workers by the end of 2019, but it now plans to add 1,249. The number of workers is projected to decline from 18,976 in 2018 to 18,053 in 2022, only 742 more than before the SAP. As of September 30, 2018, the MTA had committed only 58 percent of SAP capital funds.

New York City Transit (NYCT) has also proposed a large capital investment plan, known as Fast Forward, which would modernize the subway system by introducing long-term, system-wide improvements, including new subway cars, a new signaling system and station improvements.

Fast Forward could cost about \$40 billion over 10 years. The MTA has indicated that final estimates will be completed in connection with the development of the 2020-2024 capital program. Implementation is contingent upon funding from the State and the City, as well as the support of the public, which will experience significant service disruptions.

The 2015-2019 capital program had a funding gap of \$15 billion when it was first proposed, and the 2020-2024 program could have an even larger gap. The 2015-2019 program was delayed 17 months because the State and the City could not agree on a road map to close the gap. As a result, a number of projects were delayed, an outcome the MTA cannot afford to repeat.

The MTA is also seeking new resources to fund its operating budget. Despite planned fare and toll increases of 4 percent in 2019 and in 2021, and another round of budget reductions, the MTA projects residual budget gaps that grow from \$262 million in 2020 to \$634 million in 2022.

The gaps are largely driven by the rising cost of health insurance for MTA employees and retirees, increased borrowing for the capital program, and the decline in subway and bus ridership. Subway and bus ridership in 2019 is projected to be 236 million rides lower than projected by the MTA three years ago, resulting in a cumulative revenue loss of \$822 million during calendar years 2016 through 2019 (and about \$250 million annually thereafter).

The cumulative impact of the 2015-2019 and prior capital programs has placed a heavy burden on the MTA's operating budget. Debt service is projected to reach \$3.3 billion by 2022, an increase of 26 percent in just four years.

By 2022, debt service is projected to consume 18.6 percent of total revenue and 36.5 percent of fare and toll revenue. These estimates assume biennial fare and toll increases of 4 percent in 2019 and 2021, but do not factor in the potential impact of the 2020-2024 capital program.

The largest risk to the operating budget may be the assumption that the current economic expansion will continue uninterrupted. As evidenced by the sharp drop during the Great Recession, the MTA's revenues are sensitive to economic fluctuations. Changes in business cycles are inevitable, and the likelihood of an economic setback grows with each passing year.

Another key assumption is that subway ridership will resume growing in 2019. While subway service has improved marginally in 2018, it remains far below riders' expectations, and the improvement may not be enough to persuade riders to return in the face of higher fares.

The MTA is also counting on \$540 million in savings from cost reductions, including \$300 million annually from still-unspecified actions. Another uncertainty involves the cost of the next round of collective bargaining. The contract with the Transport Workers' Union, the MTA's largest union, expires in May 2019.

At the same time the MTA is seeking new resources to balance its operating budget, it is seeking large contributions from the State and City to fund the 2020-2024 capital program. These discussions could overlap with those about how the State will meet its outstanding commitment to the 2015-2019 capital program (\$7.3 billion), further complicating negotiations.

The MTA also assumes that the federal government will maintain its commitment to the capital program. The growing federal deficit, which could reach nearly \$1 trillion in 2019, may increase calls to cut discretionary spending. The President has already proposed eliminating the New Starts program, which the MTA is counting on to provide one-third of the funding for the next phase of the Second Avenue Subway.

Whether the MTA can successfully manage a capital program of the size under consideration for 2020-2024 remains to be seen. In each of the past three five-year capital programs, the MTA committed less than 80 percent of the resources in five years. Moreover, the 2005-2009 capital program is only 83 percent complete 13 years after its start date. The MTA will have to do better if it hopes to turn the system around.

Since 2007, the average subway and bus fare has grown by 53 percent, almost three times faster than the inflation rate for the metropolitan region. The MTA intends to raise fares and tolls by 4 percent in 2019 and 2021, in line with the projected inflation rate. Before asking riders to pay more, the MTA will need to demonstrate sustained service improvements.

The transportation system is the lifeblood of New York City and the regional economy, and must be properly maintained. The MTA is seeking additional financial support, but it must do its part, demonstrating a commitment to improved service while eliminating waste and inefficiencies. Without support from its funding partners, fares and tolls could rise faster than planned or the system will further deteriorate.

Utilization Trends

Annual subway ridership declined slightly in 2016 and fell by 1.7 percent in 2017. The MTA expects ridership to fall by another 2.1 percent in 2018 to 1.7 billion (see Figure 1). However, ridership has fallen at a faster pace (2.8 percent through July) even though job growth in the City remains strong.

According to the MTA, fare evasion, service disruptions from planned maintenance and repairs, poor service and the expansion of ride-hailing services are responsible for the decline in ridership. The MTA assumes subway ridership will resume growing slowly in 2019, but that could depend on the MTA's ability to improve service.

Last year, weekday ridership fell for the first time since 2009, and the MTA expects it to decline again in 2018, the first two-year decline since 1992. Weekend ridership has fallen for three consecutive years, and is expected to decline further in 2018.

LIRR ridership reached 89.4 million rides in 2016 (see Figure 2), the highest level since 1949. In 2017, ridership declined slightly as the railroad experienced its worst on-time performance in 18 years.¹ Ridership has slowly increased in 2018 and is expected to continue to grow in 2019. Figure 2 also shows ridership trends for Metro-North. Ridership grew by 51.5 percent between 1991 and 2017, reaching a record of 86.5 million. The MTA expects Metro-North ridership to continue growing.

After decreasing sharply during the recession, bridge and tunnel crossings increased by 9.6 percent between 2012 and 2017 to a record of 310 million (see Figure 3), in response to robust economic growth and lower gas prices. As of July 2018, crossings were up 4.3 percent despite higher gas prices, and the MTA expects crossings to continue to grow in later years.

Ridership on the MTA's buses fell by 16.5 percent between 2008 and 2017 to 725 million, and the MTA assumes ridership will decline by another 4.4 percent in 2018 before growth resumes in 2019. According to the MTA, riders are abandoning slow bus routes for other modes of transportation, and fare evasion has increased.

FIGURE 1
Annual Subway Ridership

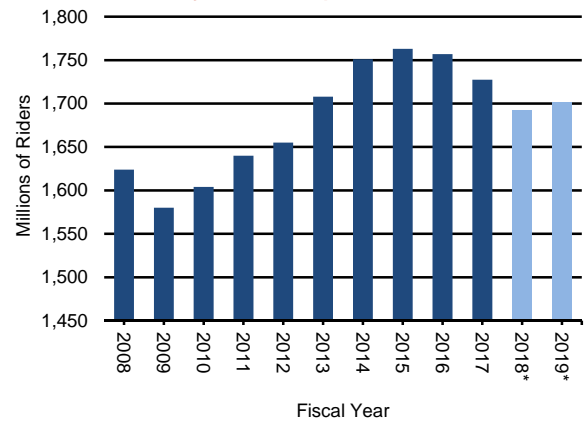


FIGURE 2
Commuter Rail Ridership

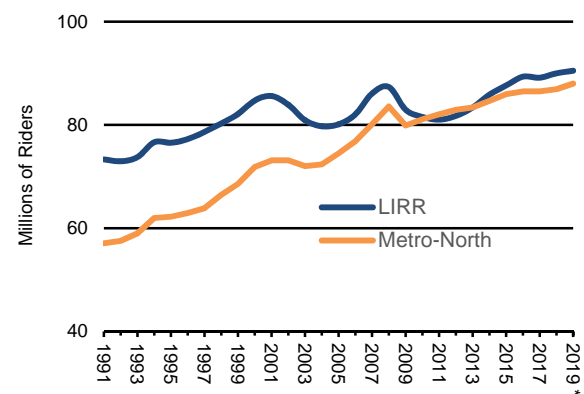
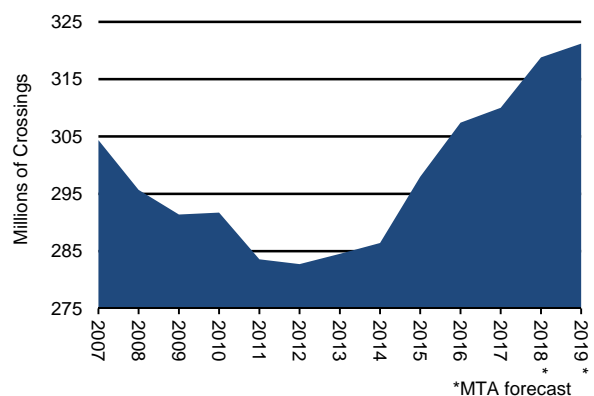


FIGURE 3
Bridge and Tunnel Crossings



Source: Metropolitan Transportation Authority

*MTA forecast

Selected Performance Measures

New York City Subway

At the depth of the transit crisis in 1981, the mean distance between failures (MDBF) for subway cars fell to 6,600 miles.² As new rolling stock was purchased and trains were better maintained, the MDBF reached a record of 178,000 miles in 2005. The MDBF fell 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.

However, the MDBF declined for five years between 2011 and 2016 (see Figure 4) as subway car purchases were delayed and maintenance cycles were extended.³ This was the longest and largest 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. In 2017, the MDBF rose to 121,000 miles, a level that has been maintained through August 2018 (an average of 121,849 miles).

Almost one-third of the subway cars are more than 30 years old. These cars are at the end of their useful lives and break down more frequently than newer cars (for more, see Appendix A). In August 2018, the MDBF ranged from 31,000 miles for subway cars that are more than 50 years old on the C, J and Z lines to more than 400,000 miles for cars introduced in 2013 on the No. 7 subway line.

Subway delays have grown significantly in recent years. Weekday on-time performance fell from 87.7 percent in 2010 to 63.4 percent in 2017 (see Figure 5), the lowest level since at least 1991.⁴ As a result of the SAP, the weekday average improved slightly during the first eight months of 2018 to 65.3 percent. However, the weekend average continued to decline because of repair work.

The number of subway delays rose from a monthly average of 23,000 in 2012 to more than 60,000 in 2017. The number of major subway incidents (defined as incidents that delay 50 or more trains) rose from a monthly average of 67 during 2015 through 2017, to 75 during the first eight months of 2018 (see Figure 6). The MTA attributes the increase to weather, signal integration on the No. 7 subway line and incidents at high-impact locations.

FIGURE 4
Subway Mean Distance Between Failures

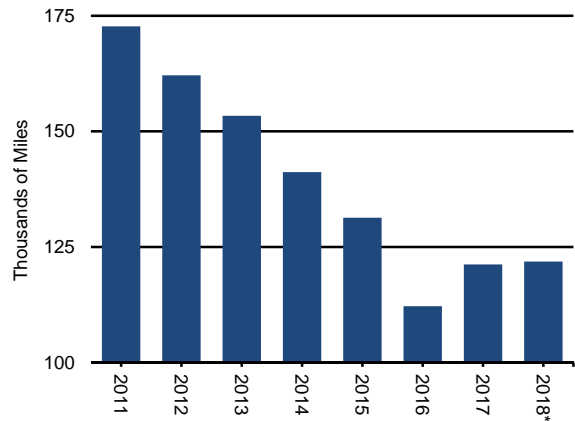


FIGURE 5
Weekday On-Time Performance

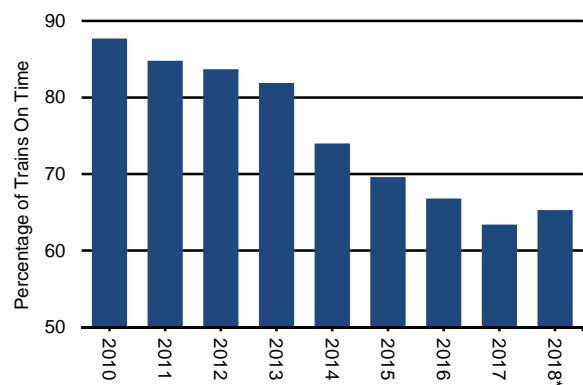
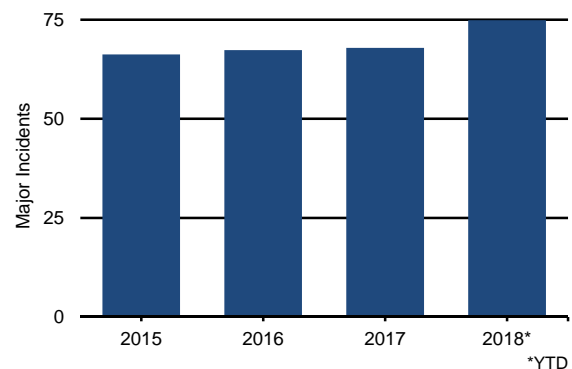


FIGURE 6
Major Subway Incidents
(Monthly Average)



Sources: Metropolitan Transportation Authority; OSC analysis

Commuter Railroads

The on-time performance of the commuter railroads has also declined in recent years (see Figure 7). The LIRR's on-time performance, which peaked at 95.2 percent in 2009, slipped to 91.4 percent in 2017, its worst level in 18 years. In 2018, on-time performance has further deteriorated, averaging 89.9 percent through August. While preliminary data for September 2018 shows improvement, on-time performance was still lower than one year earlier.

Metro-North's on-time performance has generally been better than the LIRR's, but it too has declined. Metro-North's on-time performance fell from 97.8 percent in 2009 to 93.4 percent in 2017. In 2018, on-time performance averaged 90.9 percent through August, lower than last year (94.2 percent).

The number of canceled LIRR trains has increased in recent years. Last year, the number of trains canceled each month averaged 115 (see Figure 8), the highest monthly average in at least 10 years. In 2018, the number of cancellations each month has grown, averaging 141 through August.

Train delays are caused by a number of factors, including weather, slow passenger boarding, the presence of unauthorized people on the tracks, equipment failure, track work, police investigations, and issues arising from Amtrak, which owns Pennsylvania Station and the underwater rail tunnels that connect Manhattan to Long Island.

Last year, there was a sharp increase in the number of delays caused by Amtrak and the LIRR (see Figure 9). While the average number of trains delayed each month because of Amtrak declined by 51 percent through August 2018, the average number of delays attributed to the LIRR has grown.

The number of trains delayed each month because of the LIRR has averaged 690 through August 2018, which was 22 percent higher than last year during the same period (567). In the absence of substantial improvement in the last four months of the year, the number of train delays attributed to the LIRR will exceed last year's level.

FIGURE 7
Commuter Railroads
On-Time Performance

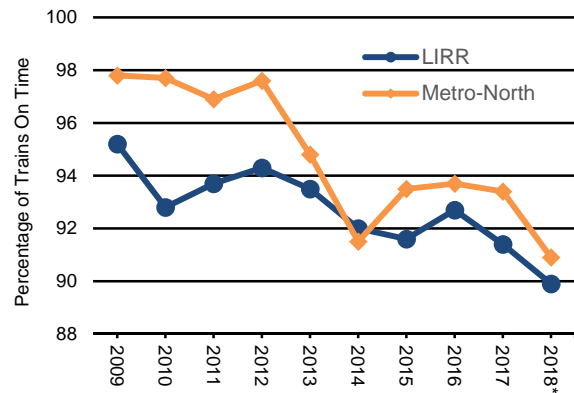


FIGURE 8
LIRR Canceled Trains (Monthly Average)

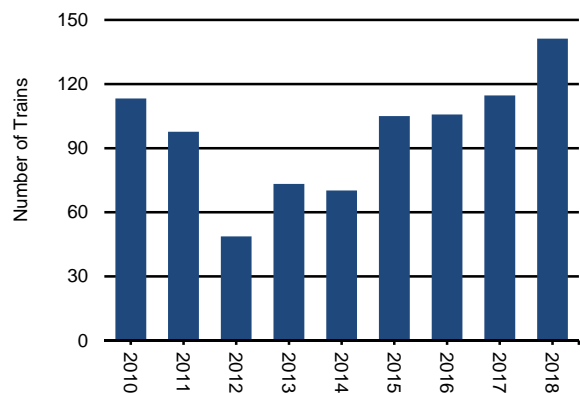
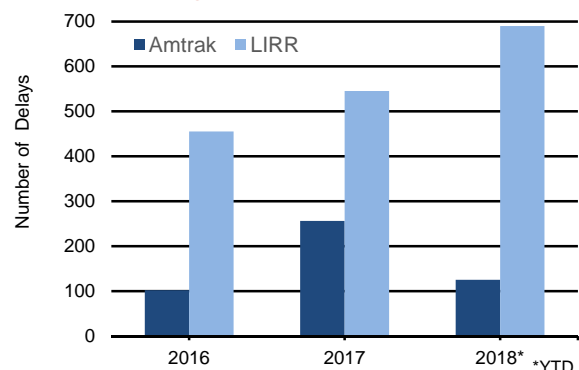


FIGURE 9
Delays Attributed to the LIRR and Amtrak
(Monthly Average)



Sources: Metropolitan Transportation Authority; OSC analysis

Agency Action Plans

In response to the deterioration in subway and LIRR service, the Governor declared a transportation emergency in June 2017. The MTA has begun a number of action plans to improve safety, reliability and service on the subways, buses and commuter railroads. While these efforts have not yet resulted in significant improvements in service, the MTA hopes riders will see the benefits in coming months.

Subway Action Plan

In July 2017, the MTA announced a Subway Action Plan (SAP) to stabilize and improve subway service, and to lay the foundation for modernizing the system. State law requires the State and the City to each contribute \$418 million toward the cost of the SAP, for a total of \$836 million through 2018.⁵

The State also enacted a surcharge of \$2.50 on taxi trips and \$2.75 on for-hire vehicle trips, effective on January 1, 2019, on all trips that originate in or enter Manhattan south of 96th Street. A surcharge of \$0.75 per passenger will be added to all pooled for-hire trips as well.

State law requires that the revenue generated from the surcharges will be deposited into the Transportation Assistance Fund, which will have three separate accounts. The revenue can only be used to supplement existing funds and may not be used to supplant any federal, State or local funds expended by the MTA. The first \$362 million in 2019 (\$301 million in 2020 and \$300 million annually thereafter) will be dedicated to the recurring cost of the SAP.

The next \$50 million will be dedicated to MTA projects in the outer boroughs to improve connectivity to Manhattan or fund a toll-reduction program at MTA crossings. Any revenue collected above those amounts can be used by the MTA for general purposes.

The SAP is intended to address the key drivers of 79 percent of the major incidents that cause delays in the system, including track issues,

signal malfunctions, car breakdowns, failing power infrastructure, water-related damage, and track fires. The operating budget cost is estimated at \$507.5 million through 2018, and the capital cost is estimated at \$348.5 million (a total of \$856 million including \$20 million from the new surcharge on for-hire vehicles).

When the SAP was first proposed in July 2017, the MTA had planned to add 2,800 subway maintenance workers by the end of 2019 (see Figure 10). Currently, the MTA plans to add 1,480 workers by the end of 2018 and retain about 1,200 during the financial plan period. A comparison of the July 2017 estimate to the current forecast shows that the MTA plans to hire about 1,500 fewer maintenance workers.

FIGURE 10
Change in Subway Action Plan Staffing

	2017	2018	2019	2020
July 2017	884	2,628	2,800	2,805
July 2018	519	1,480	1,249	1,229
Variance	(365)	(1,148)	(1,551)	(1,576)

Sources: Metropolitan Transportation Authority; OSC analysis

The revised estimate for 2019 calls for adding 482 fewer track and infrastructure workers, 432 fewer car equipment workers, 372 fewer station maintenance workers and 133 fewer signal maintenance workers. The MTA has indicated that staffing levels beyond 2018 are still being evaluated and may be revised as part of the November 2018 financial plan.

Besides the SAP, there are other initiatives planned that could affect staffing levels, including budget reduction initiatives. Overall, the number of subway maintenance workers is projected to grow from 17,311 in June 2017 to 18,976 by the end of 2018, a net increase of 1,665 employees. MTA expects the number of subway maintenance workers to decline to 18,053 by the end of 2022, only 742 higher than before the SAP (see Appendix B). As of July

2018, the number of subway maintenance workers had increased by 927 employees.

The SAP got off to a slow start because State and City funding was not authorized until April 2018. As a result, about 40 percent of the \$113 million spent in 2017 was allocated to overtime (see Figure 11), and more than one-quarter was allocated to outside contractors (28 percent). Only 12 percent of the funds were used to hire staff in 2017.

The MTA's operating budget for 2018 includes \$394 million in SAP funding, with most allocated to labor costs (\$241 million), including overtime (\$120 million). The balance was allocated to outside contractors (\$88 million) and for materials and supplies.

FIGURE 11
Subway Action Plan
Allocation of Operating Budget Resources
 (in millions)

	Actual 2017	Plan 2018
Payroll	\$ 13	\$ 91
Overtime	46	120
Health and Welfare	15	23
Pensions	---	9
Other Fringe Benefits	---	11
Reimbursable Overhead	---	(13)
Subtotal Labor Costs	74	241
Maintenance and Other Contracts	22	76
Professional Service Contracts	9	12
Materials & Supplies	8	65
Total	\$ 113	\$ 394

Sources: Metropolitan Transportation Authority; OSC analysis

The operating budget includes \$342 million in SAP funding in 2019, but \$143 million is still unallocated. With three months remaining, the MTA had committed a little more than half (58 percent) of the \$348.5 million in SAP capital funds. The MTA had yet to commit \$117 million for signal upgrades and \$28 million for continuous welded rail.

The MTA is required by State law to develop a reporting program that provides a detailed accounting of the amount spent on enhanced

subway activities that comes from supplemental revenues, including State and City appropriations, and revenues from the surcharge on ride-hailing services.⁶ The information must be updated quarterly and prominently posted on the MTA's website.

Fast Forward

On May 23, 2018, NYCT presented Fast Forward, a plan to restructure and modernize subway and bus operations. The plan proposes to accomplish in 10 years what was previously scheduled to take more than 40 years. NYCT has acknowledged that current conditions reflect years of inadequate investment, and bureaucratic and restrictive practices.⁷

While the plan does not yet have an official price tag, preliminary estimates at the time of its release put the cost of Fast Forward at about \$37 billion, including \$19 billion during the first five years.⁸ More recently, the president of NYCT stated that Fast Forward could cost about \$40 billion over 10 years, or about \$4 billion per year.⁹ In response to a draft of this report, the MTA stated that the cost estimate for Fast Forward is still under development.

Implementation of Fast Forward is contingent upon funding from the State and the City, as well as the support of the public, which will experience significant service disruptions. Fast Forward would accelerate the installation of Communications-Based Train Control (CBTC) from 40 years to 10 years by closing subway lines on nights and weekends for as long as 30 months.¹⁰ If ultra-wideband wireless technology proves viable, the timeline could be shorter.

Under Fast Forward, the NYCT would:

- Install CBTC signals on 11 more subway lines, including five in the first five years. Currently, CBTC signals only operate on the L line. Work on the No. 7 line, which has fallen years behind schedule, is expected to be completed by the end of 2018.

- Purchase 3,650 new subway cars, including 650 in the first five years.
- Repair certain components at 300 subway stations, including 150 in the first five years.
- Make an additional 180 subway stations accessible to disabled passengers, including 50 in the first five years.
- Purchase 2,800 buses in the first five years and another 2,100 in the next five years.
- Install a new fare payment system in 2020.

Other Action Plans

The MTA has put in place other agency action plans (with an operating cost of \$240 million through 2022) to address agency-specific concerns in a comprehensive manner. These include the following.

- The LIRR “Forward” Plan (\$132 million during the financial plan period) will upgrade switches and track circuits; install high-visibility safety delineators at grade crossings; clear overgrown vegetation along rights of way; install snow switches, third-rail heaters, and countdown clocks; replace key M-7 door components; and increase station and car cleaning.
- The Metro-North “Way Ahead” plan (\$56 million during the financial plan period) will make improvements to power systems and transmission lines; increase security cameras and countdown clocks; and replace seats and floors in train cars.
- NYCT and MTA Bus will redesign the bus network and maps; pilot an increase in off-peak-service frequency; increase bus lanes and enforcement cameras; upgrade security and technology; and evaluate the feasibility of transitioning to a zero-emissions fleet. The bus plan has an estimated cost of \$68 million during the financial plan period.

Positive Train Control

Following a fatal train collision in Los Angeles, the federal government passed the Rail Safety Improvement Act of 2008. The act mandated the implementation of positive train control (PTC) safety systems by 2015 on certain freight, intercity passenger and commuter railroads.

PTC is a communication/processor-based train control technology system designed to prevent collisions, derailments, incursions into work zone limits, and the movement of trains through switches left in the wrong position. The LIRR and Metro-North are installing PTC at a cost of more than \$1 billion.

In 2015, Congress passed the Positive Train Control Enforcement and Implementation Act, which granted railroads an extension until December 31, 2018. The extension was needed because a majority of the 40 railroads in the nation subject to the mandate (including the LIRR and Metro-North) were unable to meet the 2015 deadline. Railroads may receive a maximum two-year extension to December 31, 2020, if they meet certain statutory criteria.

As of August 31, 2018, the LIRR had installed 90 percent of the PTC hardware and trained 82 percent of its employees. Metro-North had installed 92 percent of the hardware and trained 95 percent of its employees.

While both railroads have made substantial progress, neither one expects to have PTC operating system-wide by the end of 2018. Instead, the railroads expect to qualify for an extension until December 31, 2020 for full implementation. The railroads are expected to begin passenger service on three rail segments before the end of 2018.

The Operating Budget

On July 25, 2018, the MTA released its preliminary budget for 2019 and the associated financial plan (the “July Plan”). The operating budget is projected to total nearly \$16.7 billion in 2019, including debt service on bonds issued to finance the capital program.

As shown in Figure 12, more than half of the MTA’s revenues in 2019 are expected to come from fare and toll revenue (39 percent and 12 percent, respectively). Dedicated taxes enacted by the State will account for more than one-third of total revenue (36 percent), and State and local subsidies will contribute another 8 percent. Other operating revenues, such as advertising income, will make up 5 percent.

Nearly two-thirds of the 2019 operating budget is devoted to personnel costs (see Appendix C for staffing levels), including fringe benefits (see Figure 13). Debt service represents 16 percent of the budget, while other non-labor costs, such as maintenance contracts, materials and supplies, as well as energy costs, make up 22 percent of the budget.

Baseline spending is projected to increase at an annual rate of 3.8 percent between 2017 and 2022, nearly twice the projected inflation rate and faster than the projected growth in baseline revenues (2.2 percent). Appendix D shows revenue and expenditure trends by category during the financial plan period.

To help narrow the gap between projected revenues and expenditures, the July Plan assumes biennial fare and toll hikes of 4 percent starting in 2019, and annual savings of more than \$300 million starting in 2019 from as-yet-unspecified budget reduction initiatives.

Despite these actions, the MTA still projects budget gaps that grow from \$262 million in 2020 to \$634 million by 2022 (see Figure 14). With large gaps remaining even after raising fares and tolls in 2019 and 2021, the MTA is asking the State to authorize new sources of revenue to help balance the operating budget and address its structural imbalance.

FIGURE 12
Sources of Revenue (2019)

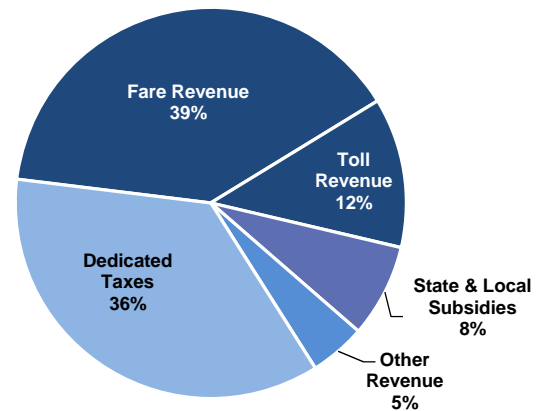


FIGURE 13
Planned Spending (2019)

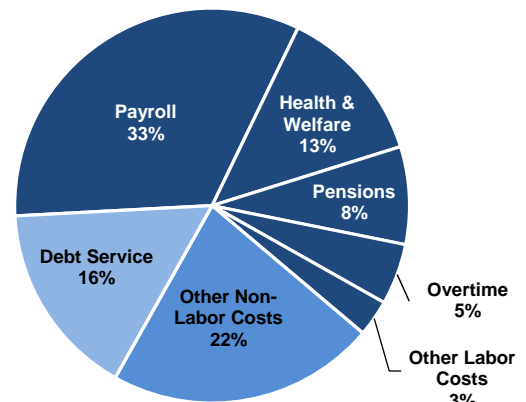
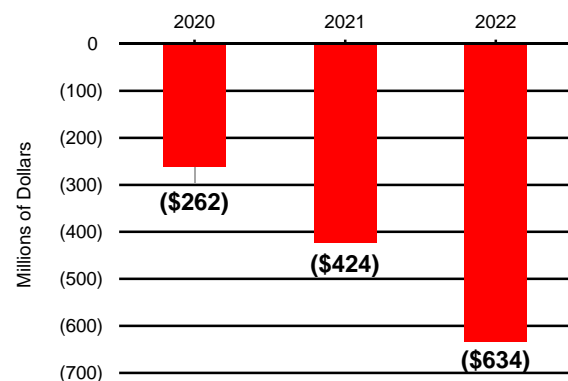


FIGURE 14
Projected Budget Gaps



Sources: Metropolitan Transportation Authority; OSC analysis

A number of factors contribute to the structural imbalance. Health and welfare costs for MTA employees and retirees are projected to increase at an average annual rate of 8.1 percent between 2017 and 2022, four times faster than the projected inflation rate. Debt service, which has grown slowly in recent years due to low interest rates, is projected to increase by 26 percent over the next four years as borrowing for the capital program increases.

Another factor behind the projected budget gaps is the relatively slow rate of revenue growth. While dedicated taxes are projected to grow faster than spending, fare revenue is projected to increase at an annual rate of only 0.3 percent (excluding fare hikes).

While the growth in weekday subway ridership kept pace with job growth in New York City during the first five years after the recession (see Figure 15), ridership growth began to slip beginning in 2015. In fact, weekday ridership declined by 1.3 percent in 2017 even though employment grew by nearly 2 percent. In 2018, the decline in weekday ridership has accelerated despite continued job growth.

In July 2015, the MTA projected that subway and bus ridership would continue to increase along with job growth in New York City. However, deteriorating service, the expansion of ride-hailing services, and fare evasion have resulted in a loss in reported ridership.

The Office of the State Comptroller (OSC) estimates that the MTA could experience a cumulative revenue loss of \$822 million during calendar years 2016 through 2019 (and about \$250 million annually thereafter) by comparing the MTA's current forecast for subway and bus fare collections with those made three years ago (see Figure 16). The MTA currently estimates that subway and bus ridership will be 236 million rides (9.4 percent) lower in 2019 than projected in July 2015.

The July Plan also reflects the operating budget impact of East Side Access, which is expected to begin service on December 13, 2022. The MTA estimates that more than 1,200 employees will be added over the next four years to staff the new service. The operating cost is estimated at \$652 million through 2022, without any offsetting revenue during this period. The cost in 2022 (\$246 million) accounts for more than one-third (39 percent) of the MTA's budget gap in that year.

FIGURE 15
Annual Change in NYC Employment and Weekday Subway Ridership

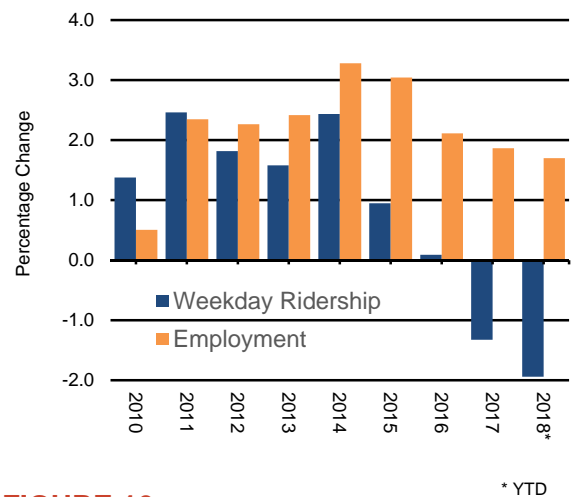
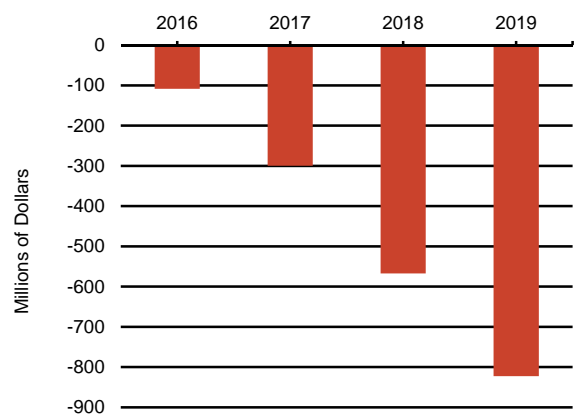


FIGURE 16
Cumulative Loss of Subway & Bus Revenue



Sources: Metropolitan Transportation Authority; OSC analysis

Although the MTA raised fares and tolls by less than the inflation rate between 1996 and 2007, since then they have risen at a faster pace (see Figure 17). The average subway and bus fare rose by 53 percent between 2007 and 2017, almost three times faster than the inflation rate for the metropolitan region (18 percent). The July Plan assumes biennial fare and toll increases of 4 percent in 2019 and 2021, in line with the projected inflation rate during the four-year period.

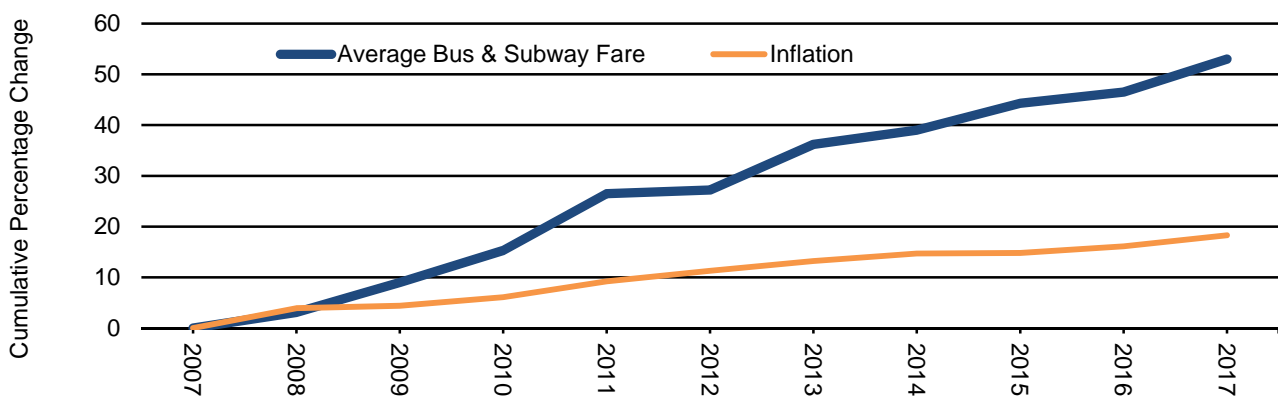
The July Plan also includes budget reduction initiatives valued at \$539 million in 2019 and similar amounts in subsequent years. So far, the MTA has identified actions that will generate recurring savings of about \$210 million annually beginning in 2019, but it has not yet identified the actions needed to achieve the remaining savings (\$329 million in 2019 and similar amounts in subsequent years).

In 2019, 37 percent of the identified savings will come from reductions in administrative and support functions, 33 percent will come from reductions in maintenance and 27 percent will come from actions affecting service or customer convenience.

NYCT has identified initiatives that will eliminate 468 positions and save \$123 million in 2019 (and similar amounts in subsequent years). Some of these initiatives could have adverse impacts, as discussed below.

- Reduce subway car cleaning (such as mopping and trash removal) at the second terminal on subway lines and reduce night staffing at select locations at the first terminal (eliminate 91 positions for savings of \$8.4 million annually).
- Close eight full-time and four part-time auxiliary subway booths and reduce coverage at seven auxiliary booths while maintaining at least one full-time booth in each station and/or station complex (eliminate 75 positions for savings of \$7.1 million annually).
- Extend shop maintenance cycles for certain buses by implementing a mid-life bus overhaul (eliminate 27 positions for savings of \$5.9 million annually).
- Reduce manual subway track inspections from twice to once per week on approximately one-third of the subway system as part of a pilot program to increase video track inspections (eliminate 53 positions for savings of \$5.7 million annually).

FIGURE 17
Growth in Average Subway/Bus Fare Compared to Inflation, 2007-2017



Sources: Metropolitan Transportation Authority; OSC analysis

annually). The MTA believes the installation of continuous welded rail and the utilization of track geometry cars to perform automated inspections will reduce the need for manual inspections.

- Defer the implementation of new select bus service routes until 2021 while the MTA re-evaluates its bus network (savings of \$3.8 million in 2019, \$9.8 million in 2020 and 2021, and \$3.8 million in 2022).
- Eliminate elevator operators at the Washington Heights subway station, the deepest in the City (26 positions for savings of \$2.2 million annually). The elevators do not require operators and the MTA has indicated that reliability has been improved from dedicated vendor maintenance.
- Reduce bus service to the Staten Island Ferry during overnight hours to one bus per hour (eliminate nine positions for savings of \$1.1 million annually).

The largest risk to the MTA's operating budget may be the assumption that the current economic expansion will continue uninterrupted through 2022. As evidenced by the sharp drop in revenues during the Great Recession, the MTA's revenues are sensitive to changes in the economy.

Another key assumption is that recent declines in subway and bus ridership will reverse. While some signs suggest that subway service is no longer in decline, the MTA must make further improvements to persuade riders to return in the face of higher fares.

In December 2018, the MTA Board will decide whether to raise fares and tolls in 2019. It remains to be seen whether the board will approve a 4 percent fare hike, effective March 2019, as assumed in the budget.

The July Plan also counts on the successful implementation of the MTA's budget reduction program, including unspecified actions valued at more than \$300 million annually.

Another uncertainty is whether the cost of the next round of collective bargaining will conform to the MTA's budget assumptions. The July Plan assumes that wages will increase at 2 percent annually during the next round of collective bargaining. The actual cost will be determined through negotiation or arbitration and could be higher (or lower) than assumed in the July Plan. The contract with the Transport Workers' Union, the MTA's largest union, expires in May 2019.

The MTA is seeking new sources of revenue to help close the remaining gaps in the operating budget. It is also counting on the State and the City to make large contributions to its 2020-2024 five-year capital program, and assumes that the federal government will maintain its commitment to the capital program. In the absence of adequate support from its funding partners, fares and tolls could rise faster than planned.

In April 2018, the State established the Metropolitan Transportation Sustainability Advisory Workgroup. The workgroup is expected to review and make recommendations regarding the adequacy of public transportation provided by the MTA; sustainable funding for public transportation; motor vehicle congestion in New York City; transportation strategies to further environmental goals; tolling of intra-borough bridges in New York City; taxicab and for-hire vehicles; and the feasibility of a reduced fare program for college students located in New York City. The workgroup is expected to issue a final report and recommendations by December 31, 2018.

The Capital Program

The 2015-2019 capital program totals \$33.3 billion, \$3.8 billion more than when it was first approved in May 2016. Three-quarters of the program's value is devoted to maintenance and modernization (\$25.6 billion), with the balance devoted to expansion projects (\$7.7 billion).

Half of the program has been dedicated to maintaining and modernizing NYCT (\$16.7 billion; see Figure 18). Of this amount, the largest shares will be used for subway station renovations (including compliance with the Americans with Disabilities Act) and to install new fare-payment technology (28 percent or \$4.6 billion); to upgrade subway signals and communications (18 percent or \$3.1 billion); and to replace aging subway cars and buses (\$2.7 billion) as well as tracks and switches (\$1.9 billion).

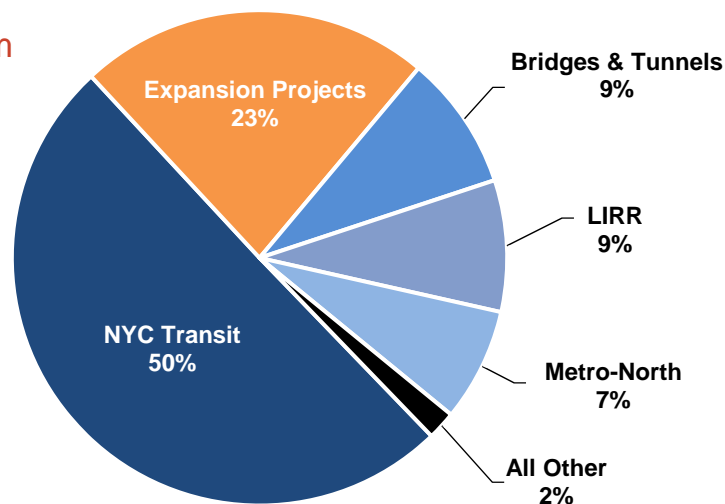
During the 2015-2019 capital program, the MTA will begin installing CBTC on the E, F, M and R subway lines in Queens, the F line in Brooklyn, and the A, C and E lines in Manhattan. A modernized signal system will allow the MTA to operate more subway trains during periods of peak demand. In the meantime, the SAP will focus on improving the reliability of the existing signal system.

The LIRR has been allocated \$2.9 billion for maintenance and modernization, with more than one-quarter devoted to continuing track improvements and completion of the Double Track project between Farmingdale and Ronkonkoma.¹¹ The LIRR will also upgrade stations, including Penn Station (\$679 million), and purchase new rolling stock (\$369 million) to complete the replacement of the older M-3 fleet.

Metro-North has been allocated \$2.5 billion, with the largest amounts devoted to stations (including Grand Central Terminal) and parking lots (\$537 million), shops and yards (\$470 million), tracks and structures (\$437 million), rolling stock (\$394 million) and communications and signal work (\$310 million). Both the LIRR and Metro-North are expected to complete the implementation of positive train control by December 31, 2020.

Bridges and Tunnels has been allocated \$2.9 billion, with the largest amounts devoted to the Throgs Neck Bridge (\$681 million), the Robert F. Kennedy Bridge (\$613 million) and the Verrazano-Narrows Bridge (\$553 million) for the installation of open-road cashless tolling and capital maintenance, including deck replacement.

FIGURE 18
2015-2019 Capital Program
Allocation of Resources
(Total: \$33.3 Billion)



Sources: Metropolitan Transportation Authority; OSC analysis

Expansion projects have been allocated nearly one-quarter of the program's total funding (\$7.7 billion), with the largest amounts devoted to the LIRR's East Side Access (\$2.7 billion) and Third Track (\$2.1 billion) projects.¹² East Side Access, which will bring the LIRR directly to Grand Central Terminal, is expected to cost \$11.6 billion (including rail cars) and begin passenger service in December 2022.¹³

The MTA has also allocated \$1.7 billion to Phase 2 of the Second Avenue Subway. The project, with an estimated completion date of 2029 at an estimated cost of \$6 billion, will extend the subway line in Manhattan from 96th Street to 125th Street along Second Avenue.

As shown in Figure 19, the largest share of the 2015-2019 capital program (44 percent) will be funded by the MTA itself. The MTA's contribution of \$14.7 billion is the largest in its history. Of this amount, \$10.4 billion will come from borrowing.

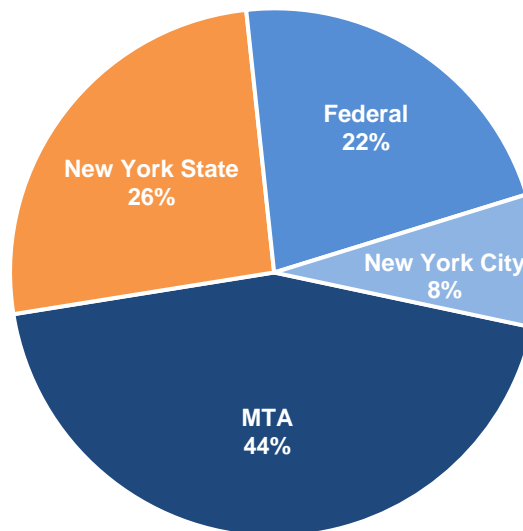
The State has agreed to contribute \$8.6 billion (26 percent of the program's total cost) and the City has agreed to contribute \$2.7 billion (8 percent). The State has not yet identified the sources of \$7.3 billion of its funding commitment,

and the City has not identified the sources of \$1.8 billion of its commitment.

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. In addition to capital grants, the State's fulfillment of its commitment could include authorizing the MTA to issue its own bonds backed by an existing or new State revenue source.

The MTA is counting on the federal government to fund 22 percent of the 2015-2019 capital program (\$7.3 billion), but there is uncertainty regarding its commitment. Despite the President's earlier calls for a federal infrastructure initiative, he has proposed eliminating the New Starts program, which the MTA expects will fund one-third (\$2 billion) of the estimated cost of Phase 2 of the Second Avenue Subway.

FIGURE 19
2015-2019 Capital Program
Sources of Funding
 (Total: \$33.3 Billion)



Sources: Metropolitan Transportation Authority; OSC analysis

The cumulative impact of the 2015-2019 program and prior capital programs has placed a heavy burden on the MTA's operating budget, as well as 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 \$41.9 billion (see Figure 20), an increase of 20 percent in just five years.

Citing the MTA's low debt service coverage in the near term and its challenging funding issues, Standard & Poor's recently downgraded the MTA's credit rating, which could lead to higher borrowing costs.¹⁴ Debt service is already projected to increase by 26 percent over the next four years, reaching nearly \$3.3 billion by 2022 (see Figure 21). Debt service has been growing rapidly since the early 2000s because the MTA has been required to fund a larger share of its capital program.

The debt burden has also been rising. After averaging about 16 percent of total revenue for 10 years, the burden is projected to gradually rise, reaching 18.6 percent by 2022 (see Figure 22). This forecast assumes biennial fare and toll increases of 4 percent in 2019 and 2021, but does not factor in the impact of the 2020-2024 capital program.

Debt service as a share of fare and toll revenue is much higher than the burden on total revenue, and it is projected to grow much faster. The debt burden on fare and toll revenue increased slowly over 10 years between 2007 and 2017, rising four percentage points to 31 percent. However, the July Plan assumes the burden will increase sharply during the current financial plan period, reaching 36.5 percent by 2022. This forecast also assumes biennial fare and toll hikes.

The MTA is scheduled to propose its 2020-2024 capital program in September 2019. While the MTA has not yet determined the size of the program, it may include the first five years of the Fast Forward program.

FIGURE 20
Debt Outstanding

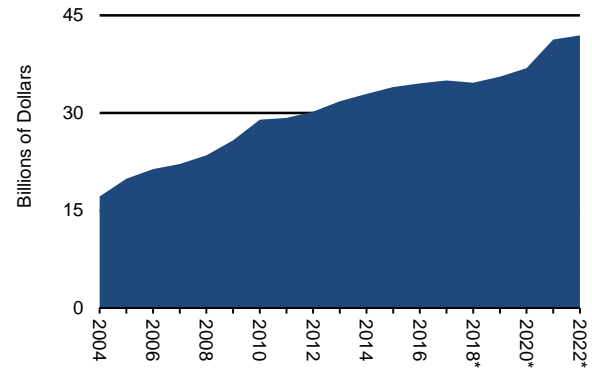


FIGURE 21
MTA Debt Service

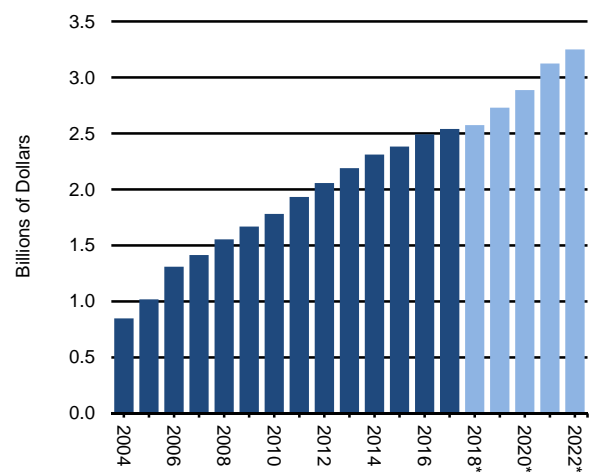
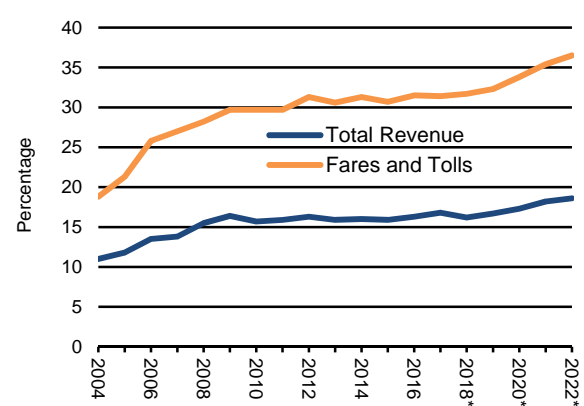


FIGURE 22
MTA Debt Burden



* MTA forecast
Sources: Metropolitan Transportation Authority; OSC analysis

The 2015-2019 capital program had a funding gap of \$15 billion when it was first proposed in September 2014, and the 2020-2024 capital program could have an even larger funding gap. Moreover, the debate over how to fund the 2020-2024 program could overlap with discussions about how the State meets its outstanding obligations to the 2015-2019 capital program (\$7.3 billion).

The start of the 2015-2019 program was delayed 17 months because the State and the City could not agree on a funding formula to close the funding gap. 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.

Whether the MTA can successfully manage a five-year capital program of the size under consideration for 2020-2024 remains to be seen. As shown in Figure 23, during the past three capital programs, the MTA committed less than

80 percent of the allocated resources in each five-year period.¹⁵

Of the resources allocated to the 2000-2004 capital program, the MTA committed 78 percent in five years; for the 2005-2009 program, it committed 79 percent. It took 10 years to commit 98 percent of the 2000-2004 program and 96 percent of the 2005-2009 program.

The 2010-2014 program was complicated by Superstorm Sandy. On October 29, 2012, toward the end of the third year of the program, Superstorm Sandy struck New York City and caused extensive damage to transit assets. In the aftermath of the storm, the MTA added \$7.6 billion (mostly federal funds) to the capital program to repair damaged transit assets and make them more resilient to future storms.

At the end of five years, only 57 percent of the 2010-2014 program’s resources had been committed (75 percent excluding storm-related projects). That share had grown to 82 percent as of December 2017.

FIGURE 23
Pace of Capital Commitments
 (Cumulative Share of Total Commitments by Capital Program)

Years Since the Start of the Capital Program	Capital Program			
	2000-2004	2005-2009	2010-2014	2015-2019
1	14.1%	9.9%	7.3%	0.6%
2	33.5%	24.2%	20.8%	15.5%
3	61.2%	48.8%	31.7%	38.0%
4	68.8%	61.2%	41.6%	
5	77.6%	79.2%	57.1%	
6	84.0%	87.3%	67.5%	
7	90.2%	92.6%	72.0%	
8	94.4%	94.9%	82.2%	
9	96.7%	95.8%		
10	97.9%	96.1%		
11	98.7%	97.3%		
12	98.6%	98.0%		
13	99.1%	98.6%		
14	99.2%			
15	99.5%			
16	100.0%			

Sources: Metropolitan Transportation Authority; OSC analysis

The 2015-2019 program was not approved by the Capital Program Review Board until May 2016 because of delays in obtaining agreement on State and City funding.¹⁶ In the first year of the program, the MTA committed only \$186 million of the \$3.2 billion planned for that year.

After three years, the MTA had committed 38 percent of the \$33.3 billion planned for the 2015-2019 capital program. It committed another \$2.9 billion during the first quarter of 2018,

raising total commitments to \$15.2 billion (47 percent of the program's value).

The MTA also reports on the completion status of its capital programs. Ten years after the start date, only two-thirds of the 2005-2009 capital program was completed. The completion rate rose to 83 percent by 13 years after the start date (see Figure 24). The 2010-2014 capital program was only 37 percent complete as of December 31, 2017. The completion rate rises to 44 percent when Sandy-related projects are excluded.

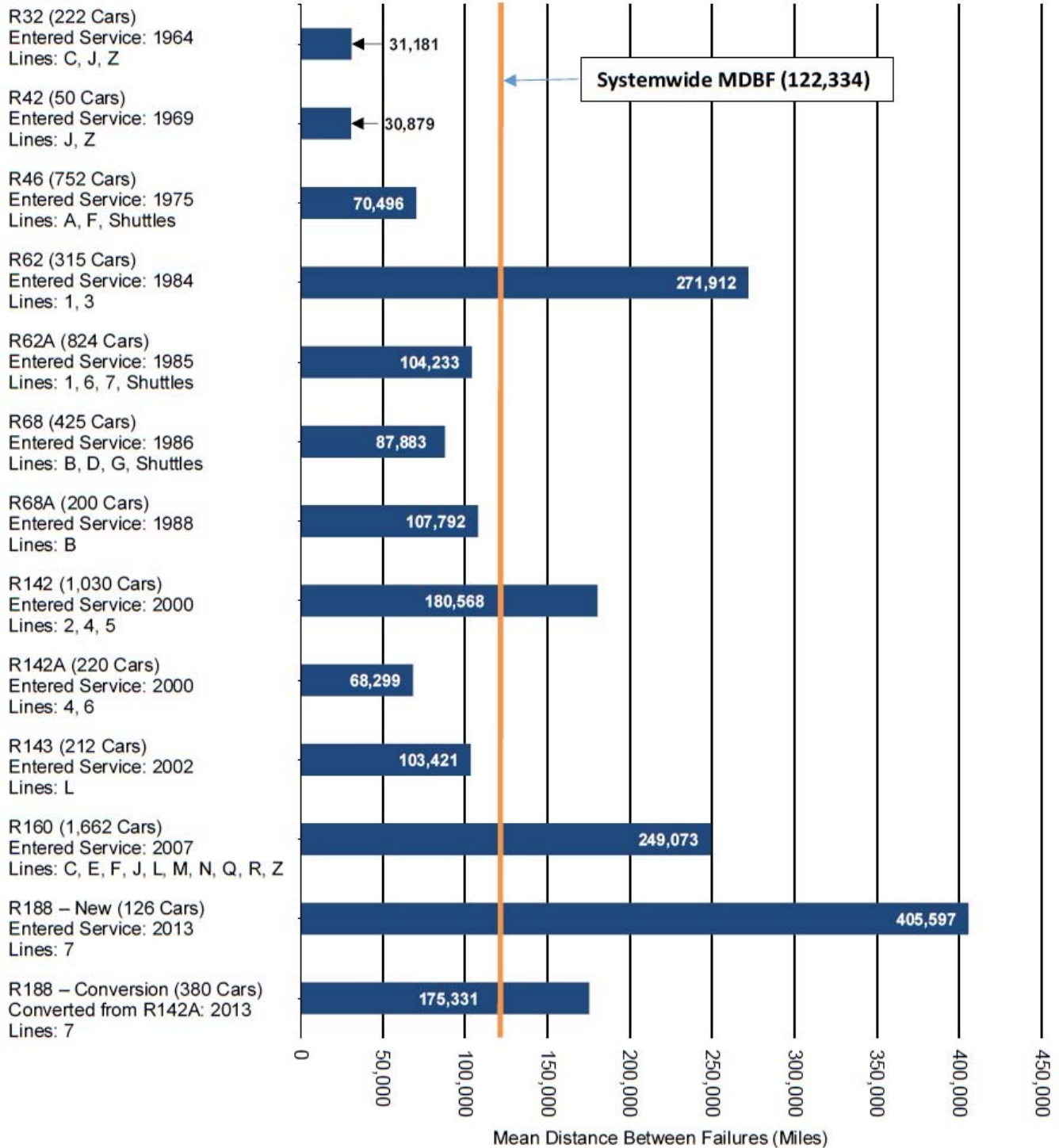
FIGURE 24
Capital Program Status as of December 31, 2017
 (in millions)

Capital Program	Program Value	Amount Completed	Percent Completed
2005-2009			
New York City Transit	\$ 11,525	\$ 10,692	92.8 %
Metro-North and LIRR	3,716	2,988	80.4
Capital Construction	7,701	5,446	70.7
MTA Bus	152	93	61.2
Bridges and Tunnels	1,127	1,061	94.1
Interagency Program	168	48	28.6
Total	\$ 24,389	\$ 20,328	83.3 %
2010-2014			
New York City Transit	\$ 11,369	\$ 5,867	51.6 %
Metro-North and LIRR	3,876	1,006	26.0
Capital Construction	6,329	2,174	34.3
MTA Bus	297	179	60.3
Bridges and Tunnels	2,022	1,195	59.1
MTA Security Program	337	97	28.8
Superstorm Sandy Program	7,565	1,181	15.6
Interagency Program	223	154	69.1
Total	\$ 32,018	\$ 11,853	37.0 %
2015-2019			
New York City Transit	\$ 16,664	\$ 814	4.9 %
Metro-North and LIRR	5,318	65	1.2
Capital Construction	7,235	---	0.0
MTA Bus	376	---	0.0
Bridges and Tunnels	2,936	284	9.7
Interagency Program	321	---	0.0
Total	\$ 32,850	\$ 1,163	3.5 %

Note: MTA Bridges and Tunnels amounts are as of April 25, 2018.
 Sources: Metropolitan Transportation Authority; OSC analysis

APPENDIX A

Mean Distance Between Subway Car Failures by Car Type 12-Month Rolling Average as of August 2018



Sources: Metropolitan Transportation Authority; OSC analysis

APPENDIX B

Subway Maintenance Staffing Levels Full-Time and Full-Time Equivalents

	Actual	Projected for the End of the Calendar Year				
	July 2018	2018	2019	2020	2021	2022
Operation Support/Admin	159	188	174	168	167	167
Engineering	349	398	363	314	306	305
Car Equipment	5,205	5,165	5,092	5,168	5,041	5,018
Infrastructure	1,738	1,842	1,908	1,822	1,748	1,748
Elevators & Escalators	425	482	462	459	488	488
Stations	3,272	3,454	3,446	3,452	3,457	3,457
Track	3,210	3,348	3,161	3,046	3,028	3,028
Power	683	723	711	679	650	650
Signals	1,619	1,652	1,638	1,579	1,579	1,579
Electronics Maintenance	1,578	1,724	1,715	1,613	1,613	1,613
Total	18,238	18,976	18,670	18,300	18,077	18,053

Source: Metropolitan Transportation Authority; OSC analysis

APPENDIX C

MTA Staffing Levels (Full-Time and Full-Time Equivalents)

	Actual	Projected for the End of the Calendar Year				
	2017	2018	2019	2020	2021	2022
Administration	4,559	5,098	5,118	5,094	5,060	5,062
NYC Transit	1,413	1,401	1,388	1,351	1,343	1,342
Long Island Rail Road	462	525	529	537	549	547
Metro-North Railroad	515	608	609	609	609	609
Bridges & Tunnels	82	96	99	99	99	99
Headquarters	1,933	2,267	2,270	2,270	2,264	2,264
Staten Island Railway	29	28	28	28	28	28
Capital Construction Company	15	21	21	21	21	21
Bus Company	110	152	174	179	147	152
Operations	31,273	31,520	32,097	31,298	31,437	31,417
NYC Transit	23,940	24,157	24,676	23,762	23,758	23,738
Long Island Rail Road	2,514	2,660	2,717	2,832	2,975	2,975
Metro-North Railroad	1,993	1,938	1,938	1,938	1,938	1,938
Bridges & Tunnels	90	98	101	101	101	101
Headquarters	---	---	---	---	---	---
Staten Island Railway	109	111	111	111	111	111
Capital Construction Company	---	---	---	---	---	---
Bus Company	2,627	2,556	2,554	2,554	2,554	2,554
Maintenance	32,336	33,801	33,695	33,180	33,224	33,379
NYC Transit	22,532	23,241	23,066	22,651	22,379	22,384
Long Island Rail Road	4,174	4,437	4,533	4,448	4,744	4,835
Metro-North Railroad	3,899	4,336	4,347	4,349	4,349	4,349
Bridges & Tunnels	379	387	391	391	391	391
Headquarters	---	---	---	---	---	---
Staten Island Railway	184	189	169	169	169	169
Capital Construction Company	---	---	---	---	---	---
Bus Company	1,168	1,211	1,189	1,172	1,192	1,251
Engineering/Capital	2,062	2,252	2,241	2,166	2,093	2,092
NYC Transit	1,420	1,438	1,428	1,353	1,283	1,283
Long Island Rail Road	181	214	211	205	202	201
Metro-North Railroad	112	136	136	136	136	136
Bridges & Tunnels	203	253	255	261	261	261
Headquarters	---	---	---	---	---	---
Staten Island Railway	9	14	14	14	14	14
Capital Construction Company	110	160	160	160	160	160
Bus Company	27	37	37	37	37	37
Public Safety	2,118	2,207	2,261	2,271	2,287	2,287
NYC Transit	646	644	688	644	644	644
Long Island Rail Road	---	---	---	---	---	---
Metro-North Railroad	---	---	---	---	---	---
Bridges & Tunnels	653	663	653	653	653	653
Headquarters	799	882	902	956	972	972
Staten Island Railway	---	---	---	---	---	---
Capital Construction Company	---	---	---	---	---	---
Bus Company	20	18	18	18	18	18
Baseline Total Positions	72,348	74,878	75,412	74,009	74,101	74,237

Source: Metropolitan Transportation Authority

APPENDIX D

Revenue and Expenditure Trends (in millions)

	Actual	←	Forecast			→	Average Five-Year Growth Rate
	2017	2018	2019	2020	2021	2022	
Revenues							
Farebox Revenue							
New York City Transit	4,487	4,459	4,487	4,517	4,510	4,517	0.1%
Metro-North Railroad	733	751	761	769	771	779	1.2%
Long Island Rail Road	728	742	746	748	749	750	0.6%
MTA Bus Company	217	217	218	218	218	218	0.1%
Staten Island Railway	7	7	7	7	7	7	0.7%
Subtotal – Farebox Revenue	6,172	6,176	6,218	6,260	6,255	6,272	0.3%
Toll Revenue	1,912	1,955	1,969	1,981	1,992	1,994	0.8%
Dedicated Taxes							
Payroll Mobility Tax	1,695	1,771	1,846	1,918	1,996	2,078	4.2%
Metro. Mass Trans. Operating Asst.	1,668	1,687	1,778	1,840	1,918	1,999	3.7%
Petroleum Business Tax	606	625	634	633	633	633	0.9%
Urban Tax	539	529	548	565	587	612	2.6%
Mortgage Recording Tax (net)	443	462	481	497	515	533	3.7%
NYC Transportation Assist. Fund	---	---	365	385	385	385	NA
Other	293	304	309	309	310	311	1.2%
Subtotal – Dedicated Taxes	5,245	5,378	5,961	6,148	6,344	6,551	4.5%
State and Local Subsidies	1,171	1,769	1,261	1,246	1,287	1,328	2.5%
Other Revenue	653	657	665	705	735	724	2.1%
Total Revenues (Baseline)	\$ 15,152	\$ 15,935	\$ 16,074	\$ 16,339	\$ 16,613	\$ 16,869	2.2%
Fare and Toll Increases	---	---	261	312	585	637	NA
Adjusted Revenues	\$ 15,152	\$ 15,935	\$ 16,335	\$ 16,651	\$ 17,198	\$ 17,506	2.9%
Expenditures							
Payroll	\$ 5,021	\$ 5,266	\$ 5,458	\$ 5,599	5,715	\$ 5,844	3.1%
Debt Service	2,525	2,575	2,731	2,888	3,124	3,270	5.3%
Health and Welfare	1,773	1,945	2,139	2,284	2,443	2,622	8.1%
Pensions	1,345	1,327	1,352	1,326	1,313	1,263	-1.3%
Overtime	934	945	813	822	853	872	-1.4%
Other Fringe Benefits	792	911	916	959	1,004	1,028	5.4%
Maintenance and Other Contracts	695	843	900	863	903	893	5.1%
Professional Service Contracts	507	599	516	482	478	488	0.8%
Energy (Fuel and Electric)	581	679	658	664	705	735	4.8%
Claims	526	343	345	356	360	364	-7.1%
Paratransit Service Contracts	393	412	409	419	453	488	4.4%
Other	803	964	927	940	951	965	3.8%
Reimbursable Overhead	(492)	(452)	(461)	(424)	(403)	(395)	NA
General Reserve	---	160	165	170	175	180	NA
Other Adjustments	49	143	154	78	36	23	NA
Total Expenditures (Baseline)	\$ 15,452	\$ 16,660	\$ 17,020	\$ 17,425	\$ 18,110	\$ 18,640	3.8%
Unspecified Expenditure Savings	---	(75)	(329)	(305)	(337)	(331)	NA
Other	---	(80)	(13)	(19)	(29)	(37)	NA
Adjusted Expenditures	\$ 15,452	\$ 16,505	\$ 16,678	\$ 17,101	\$ 17,774	\$ 18,272	3.4%
Net Surplus (Deficit)	(300)	(570)	(343)	(450)	(546)	(766)	NA
Conversion to Cash Basis	173	459	337	185	123	132	NA
Cash Balance	(125)	(112)	(6)	(265)	(423)	(634)	NA
Prior-Year Carryover	248	121	9	4	---	---	NA
Net Cash Surplus (Deficit)	121	9	4	(262)	(424)	(634)	NA

Sources: Metropolitan Transportation Authority; OSC analysis

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- ¹ A commuter train is considered on time by the MTA if it arrives at its final destination within 5 minutes and 59 seconds of its scheduled arrival time.
 - ² The mean distance between subway car failures is calculated by dividing the number of miles cars travel while in service by the number of incidents that result from car-related problems.
 - ³ The MTA expects to receive 300 new R-179 subway cars by January 2019, two years later than originally scheduled. A contract for 535 R-211 subway cars was awarded in January 2018, but final delivery is not expected until 2023.
 - ⁴ Unlike the Long Island Rail Road and Metro-North Railroad, New York City Transit does not track subway on-time performance for the morning and evening peak periods.
 - ⁵ Part VV of Chapter 59 of the Laws of 2018.
 - ⁶ Part NNN of Chapter 59 of the Laws of 2018.
 - ⁷ New York City Transit, *Fast Forward: The Plan to Modernize New York City Transit*, May 2018, pages 4-5.
 - ⁸ A number of newspaper articles cited unnamed MTA sources for the preliminary estimate of Fast Forward, including the *Bond Buyer* and the *New York Times*.
 - ⁹ Andy Byford, NYCT President, “Fast Forward,” <https://www.youtube.com/watch?v=hbXF9qmbnsw&feature=youtube>
 - ¹⁰ CBTC is a signaling system that communicates between the train and track equipment for improved traffic management. The exact position of a train is known more accurately with CBTC than with traditional signaling systems, which permits shorter headways between trains and improves safety.
 - ¹¹ The Double Track project was completed in September 2018.
 - ¹² The Third Track project entails constructing a third track along the mainline corridor from Floral Park to Hicksville, and removing seven street-level crossings.
 - ¹³ According to the MTA, East Side Access (ESA) completion will lag the beginning of revenue service, possibly by several years. A number of regional investments, budgeted separately from ESA, have been deferred to the 2020-2024 capital program, including the Eastbound Re-route and the Westbound Bypass. These investments, while not required to meet ESA project objectives, are necessary to meet operational flexibility.
 - ¹⁴ In August 2018, Standard and Poor’s (S&P) lowered the MTA’s issuer credit rating from “A+” to “A” with a negative outlook, while also downgrading its long-term credit rating and underlying rating to “A” on the MTA’s outstanding transportation revenue bonds. S&P cited the MTA’s low debt service coverage in the near term and challenging funding issues as the reasons for the downgrade.
 - ¹⁵ Generally, capital commitments are made when a contract for work or service is entered into.
 - ¹⁶ The MTA Capital Program Review Board (CPRB) consists of four voting members that are appointed by the Governor, three of which are recommended by the Speaker of the Assembly, the Temporary President of the Senate, and the Mayor of New York City. The CPRB does not approve the Bridges and Tunnels portion of the capital program and the Mayor’s representative votes only on New York City Transit projects.