City of New York

OFFICE OF THE COMPTROLLER

Scott M. Stringer
COMPTROLLER

MANAGEMENT AUDIT

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Deputy Comptroller for Audit

Audit Report on the Metropolitan Transportation Authority's Monitoring of Its Express Bus Services

June 30, 2021

To the Residents of the City of New York:

My office has audited the Metropolitan Transportation Authority (MTA) to determine whether it adequately monitors its express bus service performance. We perform audits such as this to help agencies improve their operations and in the best interest of the public.

While the audit found that the MTA has established a framework for monitoring express bus performance through various means, the audit identified significant issues with that framework and the MTA's efforts during our review period to improve express bus performance. Although the MTA has identified nine indicators by which it measures express bus performance, the audit found that the MTA not establishing goals for six of them. Additionally, although the MTA can identify those express bus routes that are low-performing, no recommendations for schedule or route modifications were put forth by Road Operations—the unit tasked to make such recommendations—during our review period. Finally, the audit found that the MTA did not have an adequate process for providing customers with real-time information regarding delays affecting particular buses along a bus route.

The audit makes six recommendations, including that the MTA: establish goals for all publicly reported performance indicators; ensure that Road Operations identifies and recommends possible route and schedule modifications for express buses that do not meet performance goals; and provide customers with real-time notifications of service delays impacting individual bus trips.

The results of the audit have been discussed with MTA officials, and their comments have been considered in preparing this report. Their complete written response is attached to this report.

If you have any questions concerning this report, please e-mail my Audit Bureau at audit@comptroller.nyc.gov.

Sincerely,

Scott M. Stringer

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MJ20-055A

EXECUTIVE SUMMARY

The objective of this audit was to determine whether the Metropolitan Transportation Authority (MTA) adequately monitors its express bus service performance.

The MTA is the largest public transportation agency in North America, serving a population of 15.3 million people in the 5,000-square-mile area fanning out from New York City (City) through Long Island, southeastern New York State and Connecticut. The MTA comprises six agencies (plus various departments and boards). Two of the six agencies provide local and express bus service within the City: MTA New York City Transit (NYC Transit) and MTA Bus Company (MTA Bus). Express buses transport commuters between Manhattan and the outer boroughs, typically from a series of pick-up locations in one borough and drop-off locations in the other, connected by an express segment, generally over highways where they do not stop. At the end of 2019, the MTA Bus and NYC Transit bus systems in total operated 73 express bus routes throughout the five boroughs.

NYC Transit and MTA Bus manage service delivery through the MTA Department of Buses' Road Operations unit, which oversees and tracks bus service relative to the MTA's goals and responds to real-time needs as issues arise. Road Operations' staff in its BusTrek room monitor all express bus routes, Citywide, and can instruct bus operators to adjust routes to help bring service back on schedule. Road Operations can also recommend schedule and route modifications to improve service when a bus route is not meeting its performance goals over time.

Our office's prior audit, *Audit Report on the Performance of New York City Express Buses Operated by the Metropolitan Transportation Authority* (Audit #MH13-118A, issued April 22, 2015), found that although the MTA had established criteria for measuring buses' timeliness, it had not set targets for the percentages of buses that it expected to operate on time. That audit found that 31 percent of sampled express buses were not on time based on the MTA's criteria. That audit further found that the MTA did not publicly report the extent to which express buses met their targets for reliable service. Instead, the agency combined the performance results for express buses with those of the much larger population of local buses.

Based on MTA data, MTA Bus and NYC Transit collectively operated a fleet of 1,523 express buses, with an annual ridership of 18.5 million, during Calendar Year 2019.

Audit Findings and Conclusion

Overall, the audit found that MTA has established a framework for monitoring express bus performance through field observations, the use of GPS technology, and data analysis, and can identify the routes with the lowest levels of on-time performance and service delivery. However, we have significant concerns about that framework and the MTA's efforts to improve express bus performance during our review period.

Specifically, in connection with its performance monitoring structure, the MTA has identified nine performance indicators, including (but not limited to) on-time performance and travel time, by which it measures express bus performance. However, the way the MTA has implemented these performance indicators appears to reduce their utility:

- For six of the nine performance indicators, the MTA has not set goals for measuring its express buses' actual performance. Without such goals, it is unclear how the MTA can use those performance indicators to assess its performance.

- For two of the three indicators for which goals *have* been set, the indicators appear to be of limited value for assessing express bus performance.

- For on-time performance, the MTA has set a very modest goal of just under 60 percent. From that target, it appears that the agency expects that a significant percentage of its buses will not operate on time in accordance with its own schedules.

Additionally, although the MTA can identify those express bus routes that are low-performing, such as on-time performance as low as 23 percent, the agency stated during the audit that it had not received any recommendations from its Road Operations unit for schedule or route modifications for any express bus routes during our review period. At the exit conference—after fieldwork for this audit had been completed—officials contradicted their earlier written statements and claimed that Road Operations *did* recommend modifications during the review period. Officials subsequently submitted a document listing purported adjustments the agency claims it made in 2018 and 2019. However, since the MTA did not provide this document until our audit testing had ended, we did not verify the information it contains and offer no opinion regarding its reliability.

Finally, the MTA does not have an adequate process for providing customers with real-time information regarding delays affecting particular buses along a bus route. The agency generally notifies customers of system-wide service disruptions and delays. However, when a delay impacts a particular scheduled bus, the MTA generally notifies customers only if the resulting service gap is (1) twice the scheduled interval between buses or (2) more than an hour. A policy of leaving customers uninformed of delays of up to one hour, and potentially stranding them at bus stops, creates a significant risk of seriously inconveniencing customers who rely on and pay a premium for express bus service.

Audit Recommendations

Based on the audit, we make six recommendations, including the following:

- The MTA should establish goals for all publicly reported performance indicators so that Road Operations personnel gain a clear understanding of management's expectations.

- For its on-time performance target, the MTA should consider increasing the percentage of express buses that it expects to operate on schedule.

- The MTA should ensure that Road Operations: (a) identifies possible route and schedule modifications for express buses that do not meet performance goals; and (b) recommends appropriate modifications to the MTA's Operations Planning department.

- The MTA should provide customers with real-time notifications of service delays impacting individual bus trips and measure its performance in doing so.

Agency Response

In its response, the MTA generally agreed with five of the audit's six recommendations. The MTA disagreed with the recommendation (#4) to consider increasing its on-time performance target for the percentage of express buses that it expects should be on time.

AUDIT REPORT

Background

The MTA is the largest public transportation agency in North America, serving a population of 15.3 million people in the 5,000-square-mile area fanning out from the City through Long Island, southeastern New York State and Connecticut. The MTA comprises six agencies (in addition to various departments and boards). Two of the six agencies provide local and express bus service within the City: NYC Transit and MTA Bus. At the end of 2019, the MTA Bus and NYC Transit bus systems in total operated 234 local and limited bus service routes, 20 Select Bus Service routes and 73 express bus routes throughout the five boroughs.[1]

NYC Transit and MTA Bus manage service delivery through the MTA Department of Buses' Road Operations unit, which is responsible for overseeing local and express bus services. Supervisors and dispatchers in the BusTrek room, a unit within Road Operations, are responsible for using BusTrek data to monitor all express bus routes on a Citywide scale. Road Operations is authorized to instruct bus operators to make adjustments (e.g., re-route bus, skip stops) as needed to help bring service back on schedule. In addition, to sustain on-time service, Road Operations can recommend schedule and route modifications when a bus does not meet its performance goals over time. The MTA further informed us that its Operations Planning department may recommend changes in express bus service based on its staff's field observations, discussions with Road Operations, and investigations of complaints.

A prior audit our office conducted, *Audit Report on the Performance of New York City Express Buses Operated by the Metropolitan Transportation Authority* (Audit #MH13-118A, issued April 22, 2015), found that although the MTA had certain criteria by which it measured timeliness for a scheduled pick-up, it did not have targets for the percentages of buses that it expected to operate on time. That audit found that, based on the MTA's criteria for timeliness, 31 percent of sampled express buses observed by the auditors were not on time. In addition, the audit found that the MTA did not publicly report progress toward meeting its targets for reliable express bus service.[2] Instead, when reporting bus performance, the agency combined the results for express buses with those of the much larger population of local buses.

Based on MTA data, MTA Bus and NYC Transit collectively operated a fleet of 1,523 express buses, with an annual ridership of 18.5 million, during Calendar Year 2019.

Objective

To determine whether the MTA adequately monitors its express bus service performance.

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[1] The four categories of bus service consist of: (1) local bus service, which serves all stops along a route; (2) limited bus service, which operates on the same routes served by local bus service, but serves fewer stops to travel the route more quickly; (3) Select Bus Service, which provides a complementary service to the subway system by connecting neighborhoods to subway stations and major destinations; and (4) express bus service, which focuses on transporting commuters between Manhattan and the outer boroughs, and typically has a series of pick-up locations in one borough and a series of drop-off locations in the other, connected by an express segment that generally traverses a highway, where the express buses do not stop.
[2] The prior audit found that MTA developed two bus performance indicators to measure how well it was attaining its goal of service reliability: (1) percent of bus trips completed, and (2) mean distance between failures.

Scope and Methodology Statement

We conducted this performance audit in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objective. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objective. This audit was conducted in accordance with the audit responsibilities of the City Comptroller as set forth in Chapter 5, §93, of the New York City Charter.

The audit scope was January 1, 2018 to October 26, 2020. Please refer to the Detailed Scope and Methodology at the end of this report for the specific procedures and tests that were conducted.

Discussion of Audit Results with the MTA

The matters covered in this report were discussed with MTA officials during and at the conclusion of this audit. A preliminary draft report was sent to the MTA and discussed at an exit conference held on May 25, 2021. On June 10, 2021 we submitted a draft report to the MTA with a request for written comments. We received a written response from the MTA on June 24, 2021.

In its response, the MTA generally agreed with five of the audit's six recommendations. The MTA disagreed with the recommendation (#4) to consider increasing its on-time performance target for the percentage of express buses that it expects should be on time. After carefully considering the MTA's arguments, we find no basis to modify the audit recommendation.

The full text of the MTA response is included as an addendum to this report.

FINDINGS AND RECOMMENDATIONS

Overall, the MTA has established a framework for monitoring express bus performance and is able to identify the lowest performing routes in certain categories, such as on-time performance and service delivery. However, we have significant concerns about that framework and the MTA's efforts to improve performance in those categories during our review period.

Specifically, through field observations, the use of GPS technology, and data analysis, the MTA has established a structure for monitoring express bus performance and modifying routes and schedules when bus routes do not achieve desired performance goals. In connection with this structure, the MTA has identified nine performance indicators, including (but not limited to) on-time performance and travel time, by which it measures express bus performance. However, we have significant concerns about the way the MTA utilizes these performance indicators:

- For six of the nine performance indicators, the MTA has not set goals by which to measure actual performance. In the absence of such benchmarks, it is unclear how the MTA can use these indicators for their intended purpose of assessing its performance.

- For two of the three indicators for which goals *have* been set, the indicators appear to be of limited value with regard to assessing express bus performance.

- For on-time performance, the MTA has set a very modest goal of just under 60 percent. From that target, it appears that the agency expects that a significant percentage of its buses will not operate in accordance with the time schedules the agency itself established.

Additionally, although the MTA is able to identify those express bus routes that are low-performing, such as on-time performance as low as 23 percent, the agency stated during the audit that "there were no recommendations brought forth" with respect to any schedule or route modifications for any express bus routes during our review period. At the exit conference—after fieldwork for this audit had been completed—officials contradicted their earlier written statements and claimed that Road Operations did recommend modifications during the period. Officials subsequently submitted a document listing purported adjustments made by the agency in 2018 and 2019. However, since we were not provided with this document until our audit testing had ended, we did not verify the information contained therein and offer no opinion regarding the document's reliability.

Finally, the MTA does not have an adequate process for providing customers with real-time information regarding service delays affecting specific bus trips along a bus route.[3] The agency generally notifies customers only if the delay results in a service gap that is (1) twice the scheduled interval between buses or (2) more than an hour. A policy of leaving customers uninformed of delays of up to one hour, and potentially stranding them at bus stops, creates a significant risk of seriously inconveniencing customers who rely on and pay a premium for express bus service.

These issues are discussed in the following sections of this report.

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[3] For audit report purposes, we are defining a "bus trip" to be one particular scheduled bus that travels along a bus route in a given day according to the publicly published bus schedule. As an example, a bus scheduled to arrive and depart at 8:00 am at the first bus stop on a bus route and thereafter complete the route would be considered a specific bus trip.

Overview of the MTA's Monitoring Efforts

Organizational Structure for Monitoring Express Bus Performance

According to Comptroller's Directive #1, *Principles of Internal Control,* and the U.S. Government Accountability Office's (GAO's) *Internal Control Management and Evaluation Tool*, internal control activities are the policies, procedures, techniques, and mechanisms that help ensure that management's directives are carried out. One such activity is to establish and monitor performance measures and indicators.

The MTA has established the following structure and mechanisms for monitoring express bus performance.

- Road Operations' supervisors operate in the field to observe road conditions (e.g., traffic conditions and road repairs), and are responsible for ensuring that bus routes run according to their schedules.

- Road Operations' BusTrek room personnel use BusTrek, a GPS service management program, to monitor express bus service throughout the City in real-time. As stated previously, both Road Operations' dispatchers and supervisors in the BusTrek room are authorized to make certain route modifications (e.g., re-routing a bus or having a bus skip stops along a route) to try to keep service on schedule.

- Road Operations also utilizes Operations Research and Computational Analysis (ORCA) performance reports to identify schedule deficiencies and service trends over time.[4] For bus routes that are not achieving the desired performance goals, Road Operations can make recommendations to MTA's Operations Planning for schedule and route modifications. According to officials, trends are analyzed and actions are implemented on a weekly basis.

A key resource utilized by Road Operations is the Bus Performance Indicator Summary (BPIS) report, an internal report that provides performance indicator data for all bus routes (local, limited, Select, and express). The indicators the MTA established and included in the BPIS report are listed in Table I below.

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[4] ORCA is a reporting server system that generates reports from MTA's Oracle databases, which store raw data from various internal data sources (e.g., BusTime).

Table I

Performance Indicators Listed in
BPIS Report

Indicator	Description
On-Time Performance (OTP)	Reports the percentage of buses that were considered to be on time.
Wait Assessment*	Measures how evenly buses are spaced; it looks at the regularity of service between buses and reports the percentage of buses that have maintained the assigned interval.
Bunching	Measures how often buses sharing the same route arrive within 90 seconds of each other at select time-points. (Time points are certain stops along a bus route that are tracked and displayed on a bus route's timetable with scheduled departure times.)
Service Delivered*	Measures the percentage of scheduled buses that are actually provided during peak hours.
Bus Speeds*	Measures how quickly buses travel along their routes, which is calculated as a bus's average end-to-end speed along a route.
Additional Bus Stop Time (ABST)*	The average time that customers spend waiting at a stop beyond their scheduled wait time. The measure assumes customers arrive at the bus stop uniformly, except for routes with longer headways, where customers arrive more closely aligned to the schedule.[5]
Additional Travel Time (ATT)*	The average time customers spend onboard a bus beyond their scheduled travel time.
Customer Journey Time Performance (CJTP)*	The percentage of customers whose journeys are completed within five minutes of the scheduled time.
Customer Speed	Measures the average speed of customers on the bus, based on their origin and destination.

*The performance indicator is publicly reported on the MTA's website.

Additionally, with regard to the above-noted indicators:

- For OTP, a bus is considered on time if it departs no more than one minute before or five minutes after its scheduled departure time from select designated stops (i.e., time points) along a route.

- Wait Assessment (WA) is defined as the percentage of actual intervals between buses along a route that is no more than three minutes over the scheduled interval during morning (7am to 9am) and afternoon (4pm to 7pm) peak hours, and no more than five minutes over the scheduled interval during non-peak hours.

- ABST, ATT and CJTP are considered new indicators for the MTA, which it began using in March 2018. They are measured using data obtained from customers' MetroCard swipes on buses and GPS tracking data from BusTime.[6]

- The Bunching, Customer Speed and OTP indicators are not reported on the MTA's website.

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[5] Headway is defined as the scheduled intervals between two consecutive buses.
[6] BusTime is a software application utilizing a GPS system that reports the position of a bus every 30 seconds; it was created for and allows customers to see the position of a bus in real time. This information is also used internally by MTA/NYC Transit to assess OTP. BusTime went into effect as a pilot program in 2012, and was officially rolled out Citywide in 2014.

As part of our review of these indicators and how the MTA utilizes them, we noted a number of concerns. These concerns are discussed in the following sections of this report.

Performance Indicator Concerns

In reviewing the MTA's utilization of its performance indicators for express bus service, we noted the following concerns: The MTA has not stated a goal for six of the nine indicators, hindering management's ability to ascertain whether its performance expectations are being met. Further, two of the three indicators for which goals *have* been set—WA and Bunching—appear to be of limited value with regard to assessing express bus performance. Finally, the MTA has set a very modest OTP target of just under 60 percent for express buses, an indication that management's expectation is that a significant percentage of express bus routes will not run according to schedule.

These issues are discussed below.

MTA Has Not Set Target Goals for Six of the Nine Express Bus Performance Indicators

According to GAO's *Internal Control Management and Evaluation Tool*, entities should continually compare actual performance data against expected/planned goals and analyze key differences. Such an analysis is useful in helping to identify areas for improvement.

However, the MTA has not set goals for six of the nine express bus performance indicators mentioned above, specifically: Service Delivered, Bus Speeds, Additional Bus Stop Time, Additional Travel Time, Customer Journey Time Performance, and Customer Speeds. The only indicators for which the MTA has set goals are On-Time Performance, Wait Assessment, and Bunching.

Goals are operational targets that should represent management's expectation of satisfactory performance. In the absence of goals, the usefulness of the MTA's performance indicators is questionable at best, in that the agency lacks the benchmarks it needs to help identify where performance meets and does not meet management's expectations. Management is also hindered in determining whether its expectations are realistic or need to be modified.

Wait Assessment and Bunching Performance Indicators Are of Limited Value in Assessing Express Bus Performance

According to GAO's *Internal Control Management and Evaluation Tool*, entities should periodically review and validate the propriety (i.e., appropriateness or suitability) of their performance measures and indicators.

However, we question the utility of the WA and Bunching indicators since they do not appear to provide particularly useful information about express bus service. According to MTA officials, express buses have relatively long scheduled intervals between consecutive buses and are not as sensitive to WA and Bunching as local buses, which generally have shorter scheduled intervals. Furthermore, WA is not a true measurement of the time customers spend waiting at stops because it is not weighted based on how many customers are waiting for buses at different stops; nor does it distinguish between relatively minor gaps in service and major delays. An MTA official claimed that agency decision makers are discouraged from using WA to evaluate service as long as customer metrics (Bus Speeds, Service Delivered, ATT, ABST, and CJTP) are

available. As previously stated, however, the MTA has not set express bus performance targets for these indicators, so the agency is hindered in relying on them to evaluate whether service is meeting expectations.

OTP Performance Target Is Less Than 60 Percent

As stated previously, the OTP indicator is not publicly reported. Nonetheless, we found that the MTA set the target for OTP for express buses at a modest 59.9 percent for Calendar Year 2019. MTA officials further informed us that no OTP goal was established for Calendar Year 2017. We requested but did not receive evidence that the MTA set an OTP goal for Calendar Year 2018. Consequently, we do not know whether the MTA expected OTP to improve, decline, or remain at the same level throughout the three-year period (2017 – 2019) for which we requested MTA's OTP targets for express bus service.

According to MTA officials, targets are based largely on historical data, including performance, financial, and operational data based on established metrics. From the OTP goal of 59.9 percent, it appears that management expected that approximately 40 percent of its express buses would not run according to their schedules.

However, the MTA determines those time schedules. Consequently, if historical data show that a significant percentage of buses do not run according to the schedules the MTA established, that variance raises the question of whether those schedules sufficiently account for current traffic and other relevant conditions. If they do not, the schedules are of limited benefit to customers who would rely on them.

By setting such a low bar (<60 percent of buses on time) for satisfactory on-time performance, the MTA may be unintentionally signaling that management has a limited expectation that buses will generally operate according to their stated schedules. Under such circumstances, it is likely that any current customer dissatisfaction with the on-time performance for express bus service will remain.

Recommendations

1. The MTA should establish goals for all publicly reported performance indicators so that Road Operations personnel have a clear understanding of management's expectations.

   MTA Response: "Management agrees to consider these audit recommendations and comments to determine the practicality and potential benefits of assigning goals for specific indicators in 2022, in the context of a post-pandemic environment. The MTA does not set specific goals for all publicly reported performance indicators, but rather strives to show measured performance improvements month upon month and year upon year. To this end, we utilize several internal measurement tools to compare time periods and use trend analysis to gauge performance. This is a focused approach to track actual progress in a way that can be acted on by our operations staff and allows our customers to measure improvements for their specific commutes.

   Note, an important measure of the effectiveness of the bus system is a function of buses ability to move amidst congested NYC streets. To this end, we closely partner with NYC DOT and NYPD, and are working closely to achieve the Mayor's goal to improve bus speeds by 25%."

Auditor Comment: We are pleased that MTA agrees to consider this recommendation. While we agree that it is important for the MTA to review and to show performance improvements on a month-by-month and year-by-year basis, without goals being set for each performance indicator, we believe MTA is hindered in its performance assessment. Through goal setting, MTA would be able to better assess bus performance and to address any performance issues.

2. The MTA should consider using and publicly reporting a more relevant performance indicator, other than Wait Assessment and Bunching, that more appropriately reflects the dynamics of express bus service, accurately reflects the reliability and timeliness of each express bus route, and enables customers to find out whether and to what extent their express buses are running according to their published schedules.

   MTA Response: "Agreed. The MTA's public facing and transparent online dashboard currently has a total of eight metrics that can be viewed by borough, service type (local/limited, Select Bus Service, Express), time period (peak and off-peak), and route, and has historical data going back several years. Based on the audit recommendation, the MTA will explore additional express bus performance indicators that can be publicly reported, and which better reflect the dynamics of express bus service. This will include a current review of the most relevant transit industry best practice indicators."

3. The MTA should consider modifying its express bus schedules if they do not realistically reflect the times by which management expects express buses will complete their routes.

   MTA Response: "Agreed. The process of monitoring and updating schedules is ongoing. We are currently analyzing express bus routes on Staten Island and will update the Fall 2021 schedule."

   Auditor Comment: We are pleased that the MTA agrees with this recommendation and encourage the agency, in that regard, to analyze and update the schedules, as needed, for the express bus routes operating in the other boroughs, as it is currently doing for the Staten Island express bus routes.

4. The MTA should consider increasing its on-time performance target for the percentages of express buses that it expects should be on time.

   MTA Response: "Disagree. Buses operate in a dynamic environment and are subject to factors outside Buses' operational control such as weather, events, traffic, road construction, labor rules, etc. – all of which impact on-time performance. Therefore, when setting goals, the MTA looks at year-over-year and 5-year average performance and factors in all known variables. The intent is always to set challenging yet realistic goals that encourage improvement. Additionally, while on-time performance is an important goal, Wait Assessment better reflects the customer experience during peak travel times. Specifically, providing buses at more even frequencies during peak hours is more desirable for the customers. By contrast, On Time Performance becomes more important for customers in the evening and overnight hours, when there is less service, and customers need to rely on us adhering to accurate schedules to get them to their desired destination."

   Auditor Comment: In this report we note that the MTA's own Operations Planning officials informed us that WA is not a good indicator for on-time performance for

express buses. For express bus customers, on-time performance is important not only during non-peak hours but also during peak hours, allowing riders to use the scheduled times to plan their commutes and reach their destination on time. While the MTA states that the agency's intent is to set "challenging yet realistic goals that encourage improvement," we note that the MTA's OTP goal for Calendar Year 2019 was a very modest 59.9 percent. As we state in the report, if historical data show that a significant percentage of buses do not run according to the MTA's own established time schedules, the MTA should determine whether those schedules do or do not sufficiently account for current traffic and other relevant conditions. If the schedules do not sufficiently account for actual conditions, they should be modified, as we recommend in the preceding recommendation, and the MTA would then be in a better position to elevate its on-time performance target above the current modest level. We therefore urge the MTA to implement this recommendation—in conjunction with recommendation #3 above—and set OTP targets that encourage improved, timely service for express bus riders.

Road Operations Did Not Recommend Any Schedule or Route Modifications for Low-Performing Routes

According to Comptroller's Directive #1, management should be comparing actual performance data to target, analyzing significant variances, and introducing corrective action as appropriate. As stated previously, on a weekly basis, Road Operations is responsible for evaluating trends and making recommendations to Operations Planning for schedule and route modifications.

Our review found that the MTA has established a process that enables it to track performance and review trends for its express bus service. Road Operations' officials stated that they use the performance indicators to assess the overall performance of a particular route or borough. The BPIS reports highlight routes with an OTP percentage under 50 percent and a Bunching percentage greater than 5 percent. Our review of the 2019 BPIS reports revealed that the following express bus routes had the lowest monthly OTP percentages within their respective boroughs:

- BXM11 – ranging from 46% to 67% on-time performance;
- BM2 – ranging from 43% to 49% on-time performance;
- QM17 – ranging from 37% to 53% on-time performance; and
- SIM8X – ranging from 23% to 57% on-time performance.[7]

However, when we asked MTA officials whether any recommendations for schedule or route modifications were made to Operations Planning in Calendar Year 2019 and, if so, what those recommendations were, MTA officials responded via email in October 2020 that "there were no recommendations brought forth for any MTA Bus routes." (During Calendar Year 2020, operational modifications were primarily enacted in response to the COVID-19 pandemic.)

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[7] These four express bus routes (BXM11, BM2, QM17, and SIM8X) had the lowest monthly OTP percentages in more months during Calendar Year 2019 than the other express bus routes in their respective boroughs.

Bus Network Redesign Initiative

MTA officials stated that a major bus network redesign initiative is underway for each outer borough. The Bronx, Brooklyn, and Queens redesigns cover all bus routes (local and express), while the Staten Island redesign covers only the express bus routes. The Staten Island Express Bus Network redesign was completed and implemented in August 2018. The Bronx, Brooklyn, and Queens redesigns are in progress at different stages as of the date of this report.[8]

Our review of the materials found on the MTA's website pertaining to these redesigns revealed that they are intended to help provide more reliable and faster service with better connections and easier rides for customers that use bus services provided by the MTA. The literature discusses express bus service at length and the expected service impact of the redesigns. Due to the COVID-19 pandemic, however, revenues have decreased substantially, and the implementation of these redesigns is currently on hold. The MTA did not indicate when it would commence.

Unlike the large-scale service modifications that are planned as part of the MTA's redesign initiatives, the route and schedule modifications that would be implemented based on Road Operations' recommendations are targeted more toward specific bus routes and would be expected to yield more immediate results. Consequently, when (or if) the redesigns for Brooklyn, Queens, and the Bronx are implemented, it is likely that performance shortfalls will continue to affect specific routes, and that individual routes will continue to require the kind of adjustments that rely on recommendations from Road Operations, such as necessary schedule and route modifications. Accordingly, Road Operations should more actively monitor OTP and recommend route and schedule adjustments where warranted.

Failure to act on documented performance deficiencies and to implement appropriate modifications and remedial measures increases the risk that underperforming routes will continue to underperform and that the riders who patronize those routes will continue to experience subpar service.

At the exit conference—after fieldwork for this audit had been completed—MTA officials stated that Road Operations *did* recommend schedule modifications to Operations Planning during 2019, directly contradicting the agency's written statements during the audit that Road Operations made no such recommendations.

Following the exit conference, on June 1, 2021, MTA officials provided us with a document that, according to officials, listed schedule adjustments made in Calendar Years 2018 and 2019, along with the OTP and WA percentages before and after these changes were implemented. According to this document, the MTA made 54 adjustments to express bus routes during Calendar Year 2019, including 5 that were based on requests made by Road Operations. MTA officials provided no explanation for why they did not share this information with us during the audit. Further, the officials did not explain why they were now providing information that contradicts their earlier written statement that no recommendations were made for any route or schedule modifications during Calendar Year 2019. Since we were not provided with this document until our fieldwork was completed, we did not have an opportunity to review any supporting documentation for the express bus routes associated with these listed changes to validate the accuracy of the information and figures contained therein or to determine whether any of the supposed recommended changes were a result of Road Operations' bus performance monitoring and its trend analyses. Consequently, we offer no opinion with regard to the relevance or reliability of this document.

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[8] The redesigns for the Bronx, Brooklyn, and Queens are currently on pause due to the COVID-19 pandemic.

Recommendation

5. The MTA should ensure that Road Operations: (a) identifies possible route and schedule modifications for bus routes that are not meeting performance goals; and (b) makes recommendations to Operations Planning to implement those modifications.

   MTA Response: "Agreed. Road Operations works closely with our Operations Planning department to continuously review and implement route and schedule changes. With over 300 routes and 53,000+ daily revenue trips to manage, Road Operations routinely reviews routes and makes recommendations for schedule improvements on the lowest performing routes. This includes close coordination with NYC DOT, joint traffic enforcement with NYPD, proposed bus stop moves, and traffic studies, as is necessary.

   Please also note that the MTA's ability to implement route and schedule changes is limited by financial constraints, particularly in areas where additional running time is required to improve route performance."

   Auditor Comment: Our recommendation was based on the MTA's written assertion that there were no schedule or route modifications made to Operations Planning in Calendar Year 2019, even though MTA's own data identified low performing express bus routes. Although the MTA now claims that Road Operations *does* recommend schedule improvements, no evidence was provided during the audit suggesting any such recommendations were made to Operations Planning in Calendar Year 2019.

The MTA Needs to Improve Its Communications with Customers

According to GAO's *Internal Control Management and Evaluation Tool*, information and communications comprise one of the five standards for internal control. In accordance with that standard, management should establish open and effective channels of communications with customers.

However, we found that the MTA has not established effective communication channels with customers to notify them in real time about service delays relating to individual scheduled bus trips. The MTA's Digital Communication Unit's (DCU's) policy is to send notifications of service disruptions and delays to the public within five minutes of receiving such a notification from other MTA divisions. DCU posts notifications on the MTA website and Twitter and sends them as text messages or emails to customers who signed up to receive such notifications. However, the notifications that DCU sends are primarily related to system-wide service disruptions and delays. DCU generally does not provide real-time notifications for service delays impacting individual bus trips.

We judgmentally selected October 2019 and analyzed the express bus service notifications that DCU released to the public. During that month, DCU posted 207 service notifications regarding express bus services. Our review revealed that only 13 (6 percent) of them concerned events (e.g., re-routing, bus out of service) relating to specific bus trips—the remaining 194 (94 percent) concerned system-wide service disruptions or delays (e.g., road construction, heavy traffic) relating to entire routes.

During that same month, the MTA also recorded 201 road calls from express bus operators to report service issues, including accidents, buses not starting or moving, stalling buses, flat tires, and transmission problems. At least 39 of these road calls involved service disruptions (e.g., flat tires and accidents) that would have caused delays. Nevertheless, none of the MTA's notifications addressed delays related to these or any of the other road calls made by operators that month.

DCU officials stated that their general guideline is to send out delay notifications specific to a particular bus trip if the delay results in a time gap that is (1) twice the scheduled interval between buses for that route or (2) more than an hour. However, we question the helpfulness of that policy. Under those criteria, if a route calls for a bus to arrive every 30 minutes, DCU will post a notification only if the bus route is delayed by at least 60 minutes (i.e., by twice the scheduled interval of 30 minutes).

Express bus routes generally run with less frequency than local bus routes, so a delay or service disruption generally has a greater impact on express bus service than on local bus service. Were the MTA to notify customers of delays in a more timely manner (e.g., shortly after receiving a road call from a bus operator), customers would be better able to make an informed decision as to whether to (continue to) wait for the bus or make other arrangements.

A policy of leaving customers uninformed of delays of up to one hour, and potentially stranding them at bus stops, creates a significant risk of seriously inconveniencing customers who rely on express bus service. Express bus riders pay a premium for this benefit—as of June 2021, one-way fares for express bus rides were $6.75, as opposed $2.75 for local bus rides—and would therefore likely expect commensurate service as well. The policy also conflicts with the MTA's stated goal of meeting its customers' expectation for "service that is safe, on-time, reliable, and that provides good value for their money."[9] Consequently, it is important for the MTA to make reasonable efforts to inform riders of such service disruptions and to do so in a timely manner.

Recommendation

6. The MTA should reconsider its current notification timeline and develop a more customer-oriented policy to provide customers with real-time notifications of service delays impacting individual scheduled bus trips and establish performance indicators with measurable goals for doing so.

   MTA Response: "Agreed. The MTA has made great strides to provide more helpful real-time bus service communications. In 2020, the MTA began translating detour details to convey specific customer impact, including stops not being served during detours, and providing specific alternate locations where customers can board detoured buses. Our Digital Communication Unit also creates detour maps in real-time. These updates help ensure clear, accurate and timely messaging.

   Alerts of cancelled scheduled express bus trips started in March 2021 as a pilot in the Bronx and has expanded to express routes throughout the city. Given how resource-intensive this process is, the MTA is currently working on an update to our BusTime algorithm that will allow us to provide the same level of precision in our service alerts much more efficiently. Longer term, we hope to apply similar logic to the bus arrival prediction display in our customer applications so that cancelled trips do not appear.

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[9] MTA 2019 Mission Statement, Measurements, and Performance Indicators, p. 2, http://web.mta.info/mta/compliance/pdf/2019/2019%20Mission%20Statement%20and%20Performance%20Indicators%20Report.pdf (accessed May 16, 2021).

Auditor Comment: While we commend the MTA's new initiatives of providing information on bus detours and cancelled express bus trips to customers, our recommendation was directed toward real-time communication to customers when a scheduled express bus is delayed in making scheduled stops. Consequently, we are pleased that the MTA has started providing more notifications of cancelled scheduled express bus trips to its customers and urge the MTA to continue its efforts to update its BusTime algorithm.

DETAILED SCOPE AND METHODOLOGY

We conducted this performance audit in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objective. This audit was conducted in accordance with the audit responsibilities of the City Comptroller as set forth in Chapter 5, §93, of the New York City Charter.

The audit scope was January 1, 2018 to October 26, 2020.

We reviewed the following documents to obtain an understanding of the general procedures, policies, and regulations with which the MTA and its Express Bus services are expected to comply and used as criteria:

- MTA Transit Service Guidelines Manual;

- MTA Permanent Directive on Complaints and Commendations;

- U.S. Government Accountability Office's *Internal Control Management and Evaluation Tool*;

- Office of the New York City Comptroller's Directive #1, *Principles of Internal Control*;

- Article 19-A of the New York State Vehicle and Traffic Law; and

- MTA's definitions of key performance indicators.

We reviewed the New York City Comptroller's audit, *Audit Report on the Performance of New York City Express Buses Operated by the Metropolitan Transportation Authority* (Audit # MH13-118A, issued April 22, 2015) to obtain an understanding of the deficiencies identified during that audit regarding the performance of express bus services.

To obtain an understanding of the MTA's organizational structure as it related to express bus services, we reviewed the MTA organization chart to identify the reporting structures of the units and the personnel involved. We also reviewed the MTA roles, functions, and responsibilities of the related personnel.

To obtain a general understanding of the MTA's express bus services, of its scheduling and maintenance, and of the various roles and responsibilities of the responsible MTA personnel, we interviewed the following officials from MTA Bus Company and NYC Transit Buses:

- Chief Officer, MTA Bus Company;

- Assistant Chief Officer Schedules, MTA Bus Company;

- Director of Schedules, MTA Bus Company;

- Assistant Chief Officer, MTA Bus Company;

- Acting Deputy Chief, Bus Planning, NYC Transit Buses;

- Acting Deputy Director, Brooklyn/Queens/Staten Island Bus Schedules, NYC Transit Buses; and

- Chief Officer of Central Maintenance Facilities, NYC Transit Buses.

We obtained and reviewed documents pertaining to maintenance such as Maintenance Policy Plan, List of Maintenance Directives, inspection sheets, and the Operator Vehicle Condition

Report (OVCR) Card used by bus operators in order for us to obtain an understanding of the bus maintenance process.

To obtain an understanding of how the MTA provides and monitors express bus services, as well as to assess existing internal controls over the monitoring process, we conducted walkthroughs and interviewed various officials from Road Operations.

Additionally, we conducted a walkthrough of the BusTrek Room to observe how supervisors monitor and regulate bus services in real time. We also conducted a walkthrough of the Bus Command Center, which is responsible for regulating and monitoring bus services from 2 a.m. to 6 a.m. only (BusTrek room handles these responsibilities for the rest of the day) and for managing incidents and emergencies related to all bus services.

To obtain an understanding of the MTA's performance metrics and goals for express bus services, we interviewed various officials from the Operations Planning and the Business Intelligence units.

We conducted a walkthrough of the MTA's Customer Relationship Management (CRM) system, its complaint management system, to obtain an understanding of CRM's functions and available data fields, and interviewed other officials to obtain an understanding of how the MTA monitors customer satisfaction and incorporates customer feedback into the monitoring of the performance of its express bus service. We also interviewed various officials from the Department of Strategy and Customer Experience.

To obtain an understanding of how the MTA communicates issues such as accidents, delays, and other service interruptions to customers, we interviewed the Senior Director of the MTA's Digital Communications Unit, which is a part of the Department of Strategy and Customer Experience.

To obtain an understanding of the MTA's monitoring and publicly reporting of customer satisfaction, we reviewed the following documentation presented on the MTA website:

- MTA press releases on surveys of customers regarding their satisfaction with MTA service as a whole;
- Staten Island Bus Study, 2017; and
- New York City Travel Survey, 2019.

We also reviewed the information posted on the MTA website on MTA Bus Redesign projects for Staten Island, the Bronx, Brooklyn and Queens.

MTA's website presents several performance indicators on its Bus Performance Dashboard page. To determine the accuracy and consistency of the indicators reported publicly on the MTA's website, we compared the Dashboard data for the following five indicators identified by MTA officials to be key indicators—WA, SD, ABST, ATT and CJTP—for the month of October 2019 and compared them to the Bus Performance Indicator Summary reports we received from the MTA's Operations Improvement and Analysis group for the same period. We selected the month of October because it would generally not be impacted by low ridership (school is in session) or extreme weather conditions (e.g., snow storms).

To determine the adequacy and timeliness of MTA's communications to customers on express bus service related issues, we obtained a list of 120 communications sent to the customers by the MTA's DCU unit in October 2019, and tested whether DCU posted all the communications they received from various MTA divisions through MTA's internal communication SLACK within the assigned timeframe. The communications are provided to customers via several media

platforms: MTA's website, MTA's BusTime app, Twitter, text messages, and e-mails. In addition, to determine whether MTA posted real-time delays of individual buses, we reviewed a list of all 207 communications (including the 120 SLACK communications) sent by DCU to customers in October 2019 via the various media platforms.

We obtained a list of all the road calls the Command Center received during October 2019 and identified 421 road calls related to express bus service. From these 421 road calls, we identified 201 road calls that reported issues severe enough that the buses would not have been able to continue their journey (e.g., accidents, transmission problem, and flat tire). We reviewed all 201 road calls and compared the location of the buses where the issues occurred to the buses' schedule and identified 39 express buses that were in the midst of their route when the bus broke down. We compared these 39 incidents to MTA's communications to customers during October 2019 to ascertain whether the delays caused by these incidents were communicated to the customers.

To test the reliability of the road call list generated from the MTA's Department of Bus Information Center (DOBIC) system, we compared all the express bus service related road calls recorded in 219 handwritten road call sheets from October 2019 that we obtained from the Command Center and ascertained whether those calls were included in the list generated from DOBIC.[10]

To determine the lowest performing express bus routes, we reviewed the monthly Bus Performance Indicator Summary report for Calendar Year 2019. We identified the three lowest performing routes from the Bronx, Brooklyn, Queens and Staten Island by identifying those routes with the lowest OTP and WA, and the highest Bunching for each month. We then determined whether the MTA made any recommendations or changes to the schedules or routes for any of the lowest performing express bus routes.

The results of our tests, while not projectable to their respective populations, along with other analyses performed, provided a reasonable basis for us to assess the adequacy of the MTA's monitoring of the service performance of its express buses.

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[10] Bus operators requiring assistance while operating an express bus (e.g., passenger-related issues, mechanical breakdown, accident, and vandalism) will contact MTA's Bus Command Center personnel who will document these contacts and related information in handwritten road call sheets that are later electronically recorded into the Road Call program within the MTA's DOBIC system.

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Patrick J. Foye
Chairman and Chief Executive Officer

Metropolitan Transportation Authority

State of New York

July 24, 2021

Mr. Naheed Amin
Audit Supervisor
Office of New York City Comptroller Scott M. Stringer
1 Centre Street, 11ᵗʰ Floor N.
New York, NY 10007

Re: MJ20-055A Audit Report on the Metropolitan Transportation Authority's Monitoring of Its Express Bus Services

Dear Mr. Amin:

On June 10, 2021, the Office of the City Comptroller issued the above referenced audit report. I have attached for your information the response from Sarah Feinberg, Interim President, NYCT Transit, which addresses the recommendations contained in the report.

Additionally, I will be working with staff to ensure that management is following up on and enforcing the audit's recommendations, where appropriate, and requesting regular, interim reports to that effect.

A copy of the final audit report is attached for your convenience.

Sincerely,

Patrick J. Foye
Chairman and Chief Executive Officer

c: Anni Zhu, Chief of Staff to the MTA Chairman and Chief Executive Officer
    Michele Woods, Auditor General, MTA Audit Services

Attachment

The agencies of the MTA

MTA New York City Transit   MTA Metro-North Railroad   MTA Construction & Development
MTA Long Island Rail Road   MTA Bridges and Tunnels   MTA Bus Company

Memorandum

MTA New York City Transit

Date June 17, 2021

To Patrick J. Foye, Chairman and CEO

From Sarah E. Feinberg, Interim President
Craig Cipriano, President, MTA Bus Company / SVP, NYCT Department of Buses

Re Agency Response to Express Bus Service Final Audit Report MJ20-055A 653

This is in response to the findings and statements contained in the draft audit report on The Metropolitan Transportation Authority's (MTA's) monitoring of its express bus services (Audit # MJ20-055A). The following are our responses to the recommendations in the report:

Recommendation 1: The MTA should establish goals for all publicly reported performance indicators so that Road Operations personnel have a clear understanding of management's expectations.

Response: Management agrees to consider these audit recommendations and comments to determine the practicality and potential benefits of assigning goals for specific indicators in 2022, in the context of a post-pandemic environment. The MTA does not set specific goals for all publicly reported performance indicators, but rather strives to show measured performance improvements month upon month and year upon year. To this end, we utilize several internal measurement tools to compare time periods and use trend analysis to gauge performance. This is a focused approach to track actual progress in a way that can be acted on by our operations staff and allows our customers to measure improvements for their specific commutes.

Note, an important measure of the effectiveness of the bus system is a function of buses ability to move amidst congested NYC streets. To this end, we closely partner with NYC DOT and NYPD, and are working closely to achieve the Mayor's goal to improve bus speeds by 25%.

Recommendation 2: The MTA should consider using and publicly reporting a more relevant performance indicator, other than Wait Assessment and Bunching, that more appropriately reflects the dynamics of express bus service, accurately reflects the reliability and timeliness of each express bus route, and enables customers to find out whether and to what extent their express buses are running according to their published schedules.

Response: Agreed. The MTA's public facing and transparent online dashboard currently has a total of eight metrics that can be viewed by borough, service type (local/limited, Select Bus Service, Express), time period (peak and off-peak), and route, and has historical data going back several years. Based on the audit recommendation, the MTA will explore additional express bus

performance indicators that can be publicly reported, and which better reflect the dynamics of express bus service. This will include a current review of the most relevant transit industry best practice indicators.

Recommendation 3: The MTA should consider modifying its express bus schedules if they do not realistically reflect the times by which management expects express buses will complete their routes.

Response: Agreed. The process of monitoring and updating schedules is ongoing. We are currently analyzing express bus routes on Staten Island and will update the Fall 2021 schedule.

Recommendation 4: The MTA should consider increasing its on-time performance target for the percentages of express buses that it expects should be on time.

Response: Disagree. Buses operate in a dynamic environment and are subject to factors outside Buses' operational control such as weather, events, traffic, road construction, labor rules, etc. – all of which impact on-time performance. Therefore, when setting goals, the MTA looks at year-over-year and 5-year average performance and factors in all known variables. The intent is always to set challenging yet realistic goals that encourage improvement. Additionally, while on-time performance is an important goal, Wait Assessment better reflects the customer experience during peak travel times. Specifically, providing buses at more even frequencies during peak hours is more desirable for the customers. By contrast, On Time Performance becomes more important for customers in the evening and overnight hours, when there is less service, and customers need to rely on us adhering to accurate schedules to get them to their desired destination.

Recommendation 5: The MTA should ensure that Road Operations: (a) identifies possible route and schedule modifications for bus routes that are not meeting performance goals; and (b) makes recommendations to Operations Planning to implement those modifications.

Response: Agreed. Road Operations works closely with our Operations Planning department to continuously review and implement route and schedule changes. With over 300 routes and 53,000+ daily revenue trips to manage, Road Operations routinely reviews routes and makes recommendations for schedule improvements on the lowest performing routes. This includes close coordination with NYC DOT, joint traffic enforcement with NYPD, proposed bus stop moves, and traffic studies, as is necessary.

Please also note that the MTA's ability to implement route and schedule changes is limited by financial constraints, particularly in areas where additional running time is required to improve route performance.

Recommendation 6: The MTA should reconsider its current notification timeline and develop a more customer-oriented policy to provide customers with real-time notifications of service delays impacting individual bus runs and establish performance indicators with measurable goals for doing so.

Response: Agreed. The MTA has made great strides to provide more helpful real-time bus service communications.   In 2020, the MTA began translating detour details to convey specific customer impact, including stops not being served during detours, and providing specific alternate locations where customers can board detoured buses. Our Digital Communication Unit also creates detour maps in real-time. These updates help ensure clear, accurate and timely messaging.

Alerts of cancelled scheduled express bus trips started in March 2021 as a pilot in the Bronx and has expanded to express routes throughout the city. Given how resource-intensive this process is, the MTA is currently working on an update to our BusTime algorithm that will allow us to provide the same level of precision in our service alerts much more efficiently. Longer term, we hope to apply similar logic to the bus arrival prediction display in our customer applications so that cancelled trips do not appear.

Finally, in reference to footnote #3 on page 6 of the report ("[3] *A 'bus run' refers to one particular scheduled bus that travels along a bus route in a given day. As an example, a bus scheduled to arrive and depart at 8:00 am at the first bus stop on a bus route and thereafter complete the route would be considered a specific bus run"*), we are recommending a revision to the note to reflect that "A 'bus run' refers to one particular piece of work for an operator on a given day. A bus run consists of multiple trips and can operate on more than one route."

We look forward to discussing the responses provided and to reiterate the fact that we always use audit findings and discussions as tools to improve our operations.