Metropolitan Transportation Authority

Selected Performance Measures

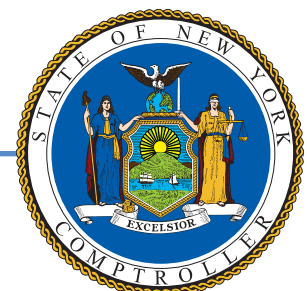# Audit Highlights

Objectives

To determine whether the Metropolitan Transportation Authority (MTA) constituent agencies' performance measurements are accurate and consistent. In addition, we sought to determine whether the MTA uses relevant metrics to measure its performance. The audit covers the period between January 1, 2015 and August 22, 2018.

About the Program

The MTA is a public benefit corporation chartered by the New York State Legislature in 1965. There are six constituent agencies of the MTA: MTA Bridges and Tunnels, MTA Capital Construction, Metro-North Railroad (Metro-North), Long Island Rail Road (LIRR), New York City Transit (Transit [consisting of Transit Subways and Transit Bus]), and MTA Bus Company (MTA Bus). (The latter four are the focus of this report and are herein collectively referred to as Agencies.)

The MTA is required under the Public Authorities Law to report annually on its performance. Each Agency identifies specific performance measures related to its mission, such as ridership and mean distance between failures (MDBF). In addition to the annual report, performance and other measures are reported to specific committees of the MTA Board on a monthly basis. Certain measures are also reported on the Performance Metrics Dashboards and other areas of the MTA website.

In addition, the MTA is required by the Federal Transit Administration (FTA) to report certain performance measures to the National Transit Database (NTD). The FTA uses this information as the basis for allocation of federal funding. In some instances, the FTA defines a performance measure differently than the MTA. For example, the MTA generally considers ridership to be the sum of all fare-paying customers, whereas the FTA defines ridership as the number of times passengers board public transportation vehicles (including transfers).

Key Findings

Given the millions of people who rely on MTA transportation, it is incumbent on its Agencies to accurately report on their performance. As reported to the MTA Board and committees – and further disseminated to the public by the MTA on its website and elsewhere – these performance data are critical to evaluating actual service and conditions.

For two key performance measures – MDBF and ridership – we identified deficiencies and inconsistencies in Agencies' methodology and calculations that may result in misleading or inaccurate results. Examples of the issues are as follows:

- Transit Subways and LIRR calculate the miles component of MDBF using the miles per train car rather than the actual distance traveled by the whole train, which generally results in a significantly higher (approximately eight to ten times, based on the number of train cars) – and misleading – MDBF.

- Our review of how MDBF was calculated by LIRR found that the agency did not include all mechanical failures in its calculation. For the month reviewed, 24 incidents were included in MDBF. However, another 14 incidents that were mechanical in nature or where the train had a failure on more than one car and resulted in delays or lost trips were not included in its MDBF calculation. Had they been included, the number of failures would have been 58 percent higher, and the MDBF would have been 156,493 as opposed to 247,780.

- LIRR and Metro-North use a model based on a 36-year-old survey of passenger travel patterns to estimate the number of trips to include in ridership for weekly and monthly commutation ticket holders. Commutation tickets were about 60 percent of ridership in February 2018.

- MTA Bus does not include non-paying passengers when reporting ridership to the NTD. Although the need to include non-revenue riders is not explicitly stated in the NTD Manual, those numbers are used to allocate federal funding.

Key Recommendations

- Evaluate Transit Subways and LIRR MDBF to determine if it is an easily understood, accurate representation of car fleet reliability and service reliability and determine whether changes need to be made regarding how the metrics are calculated and presented.

- Update the survey used to calculate commuter railroads' ridership statistics, including, but not limited to, consideration of ticket use patterns; changes in the composition and travel habits of customers; and changes in ticket, pass, and refund policies.

- Adjust the MTA Bus ridership methodology for FTA reporting to properly identify non-revenue riders.
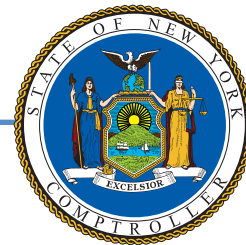
Office of the State Comptroller
Division of State Government Accountability

January 6, 2020

Mr. Patrick J. Foye
Chairman and Chief Executive Officer
Metropolitan Transportation Authority
2 Broadway
New York, NY 10004

Dear Mr. Foye:

The Office of the State Comptroller is committed to helping State agencies, public authorities, and local government agencies manage their resources efficiently and effectively. By doing so, it provides accountability for tax dollars spent to support government operations. The Comptroller oversees the fiscal affairs of State agencies, public authorities, and local government agencies, as well as their compliance with relevant statutes and their observance of good business practices. This fiscal oversight is accomplished, in part, through our audits, which identify opportunities for improving operations. Audits can also identify strategies for reducing costs and strengthening controls that are intended to safeguard assets.

Following is a report of the MTA entitled *Selected Performance Measures*. The audit was performed pursuant to the State Comptroller's authority as set forth in Article X, Section 5 of the State Constitution and Section 2803 of the Public Authorities Law.

This audit's results and recommendations are resources for you to use in effectively managing your operations and in meeting the expectations of taxpayers. If you have any questions about this report, please feel free to contact us.

Respectfully submitted,

Division of State Government Accountability

Contents

Glossary of Terms

Term	Description	Identifier
Agencies	Collective reference to four of the MTA's constituent agencies: Metro-North, LIRR, Transit, and MTA Bus	*Key Term*
FTA	Federal Transit Administration	*Key Term*
LIRR	Long Island Rail Road	*Constituent Agency*
MDBF	Mean distance between failures	*Key Term*
Metro-North	Metro-North Railroad	*Constituent Agency*
MTA	Metropolitan Transportation Authority	*Auditee*
MTA Bus	MTA Bus Company	*Constituent Agency*
NTD	National Transit Database	*Key Term*
RMS	Railcar Management System	*Key Term*
Transit	New York City Transit, which consists of Transit Subways and Transit Bus	*Constituent Agency*
UPTs	Unlinked passenger trips	*Key Term*

Background

The Metropolitan Transportation Authority (MTA) is a public benefit corporation chartered by the New York State Legislature in 1965. There are six constituent agencies of the MTA: MTA Bridges and Tunnels, MTA Capital Construction, Metro-North Railroad (Metro-North), Long Island Rail Road (LIRR), New York City Transit (Transit [consisting of Transit Subways and Transit Bus]), and MTA Bus Company (MTA Bus). (The latter four are the focus of this report and are herein collectively referred to as Agencies.)

The MTA is required under the Public Authorities Law to report annually on its performance, including specific performance measures for each Agency, such as ridership and mean distance between failures (MDBF). Performance and other measures are also reported to specific committees of the MTA Board monthly. Certain measures are also reported on the Performance Metrics Dashboards or other areas of the MTA website.

In addition, the MTA is required by the Federal Transit Administration (FTA) to report certain performance measures to the National Transit Database (NTD), established by Congress as the primary source for information and statistics on the transit systems of the United States. The FTA uses this information to allocate federal funding to urban and rural areas in the United States.

Audit Findings and Recommendations

Given the millions of people who rely on MTA transportation, it is incumbent on Agencies to accurately report on their performance. As reported to the MTA Board and committees – and further disseminated to the public by the MTA on its website and elsewhere – these performance data are critical to evaluating actual service or conditions.

For two key performance measures – MDBF and ridership – we identified deficiencies and inconsistencies in Agencies' methodology and calculations that may result in misleading or inaccurate results.

Mean Distance Between Failures

MDBF is used by LIRR, Transit's Subways and Buses, and MTA Bus as a measure of on-time and reliable service. The MTA reports MDBF in its annual performance report in addition to reporting it monthly at meetings of committees of the MTA Board.

Generally, MDBF is calculated by dividing the number of miles traveled by the number of mechanical failures. The higher the MDBF, the more reliable the equipment and the service. However, each agency uses a slightly different methodology for determining which mileage and failures to factor into its calculation. For example (and as outlined in Table 1):

- For mileage, the calculation may include revenue service (i.e., passenger transport) miles or non-revenue service (i.e., non-passenger transport) miles, or both, and may count miles per train car or per train.

- For mechanical failures, the calculation may include only those incidents that impact revenue service transit or may include non-revenue service transit incidents as well. Further, some calculations exclude failures depending on the length of the resulting delay.

As explained later, each variable impacts the reliability of the performance measure data.

Table 1 – MDBF Methodology Variables, by Agency

Agency	Mileage Variables			Failure Variables		
	Revenue Miles	Non-Revenue Miles	Basis of Mileage	Revenue Service	Non-Revenue Service	Minimum Delay Requirement
LIRR	Yes	Yes	Per train car	Yes	Yes	Yes – 6 minutes
Transit Subways	Yes	No	Per train car	Yes	No	Yes – 5 minutes
Transit Bus	Yes	Yes	Per trip	Yes	Yes	Not applicable
MTA Bus	Yes	Yes	Per trip	Yes	Yes	Not applicable

Transit Subways

Mileage Accuracy

Transit uses actual trips taken to determine mileage, based on monitoring data recorded in the Railcar Management System (RMS), such as mileage between origin and destination stations, number of subway cars used, and number of trips taken. The mileage is calculated by referencing a station-to-station mileage dataset.

We tested the accuracy of this dataset by judgmentally selecting ten station-to-station pairs and verifying that the mileage listed was reasonable based on actual miles. In some instances, however, RMS cannot automatically determine the mileage between two stations because trains may have provided service on multiple subway lines (e.g., a train diverted from its normal route). In these instances, Transit must manually review these trips and calculate the mileage. For instance, Transit reported 28,220,096 total miles for April 2018 based on planned route, and an additional 612,183 miles (2 percent) when actual route was considered. While Transit maintains the documents to calculate the total miles, it does not log adjustments and cannot support its manual changes to the mileage. As a result, there is less assurance that miles manually accounted for are accurate.

Use of Train Car Mileage

Transit uses MDBF as a measure of car fleet reliability for in-service vehicles and, for this purpose, its calculation includes only revenue service miles. Transit does not include non-revenue miles (such as when train cars travel between or within yards without passengers). For instance, in February 2018, Transit reported approximately 1.05 million non-revenue/idle miles that were excluded from the MDBF calculation.

Further, Transit determines mileage by train car, not by train trip. As an example, for a ten-car train that traveled between 137th Street to South Ferry Terminal:

- Calculated by trip: 1 train × 9.12 miles = 9.12 miles

- Calculated by train car: 10 cars × 9.12 miles = 91.20 miles

This methodology, while useful for assessing individual car reliability, can be misleading.

We recalculated Transit's total MDBF for April 2018 using revenue service train trip, rather than train car miles. As shown in the following graph, the revenue service train trip methodology derived an MDBF of 14,761 miles compared with 137,297 miles using the individual revenue car methodology – a difference of 122,536 miles, which results in a significantly lower MDBF.

Graph 1 – MDBF Calculation Comparison for Subways, April 2018
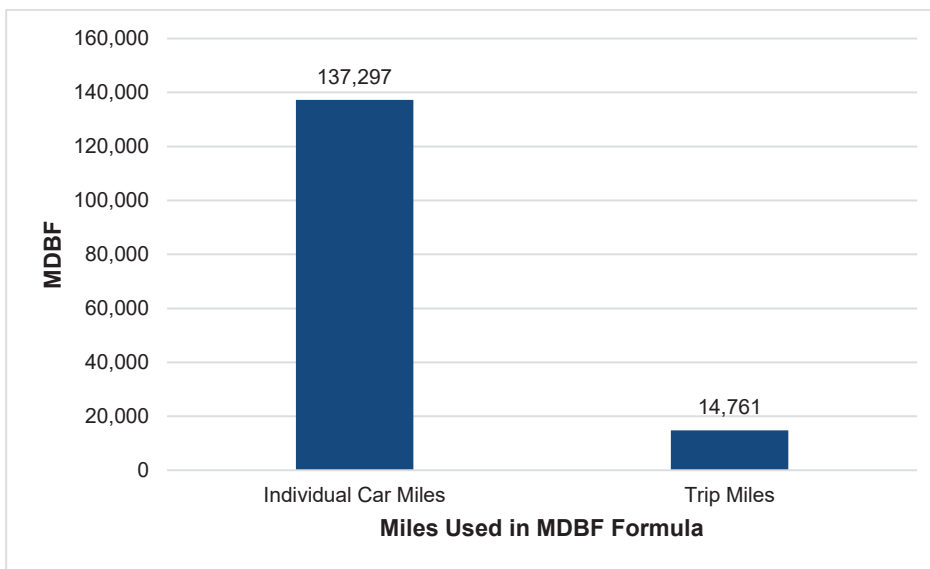
Transit needs to evaluate whether its MDBF, as publicly reported, alters the perception of how many miles a train can travel before service is impaired by a mechanical failure. Transit's methodology for calculating MDBF should be consistent with its goal to meet customers' expectation of on-time and reliable services.

Failures

As pointed out in Table 1, Transit's methodology for MDBF only accounts for failures during revenue service and failures that meet a minimum delay requirement of five minutes. In excluding non-revenue service failures

and failures that cause short delays, Transit's MDBF does not represent a complete picture of fleet reliability.

Furthermore, in tandem with the use of the individual train car methodology, Transit's reported MDBF can be misleading. As a result, the MTA Board and the public may not correctly understand what MDBF actually represents.

Long Island Rail Road

Use of Train Car Mileage

Similar to Transit, LIRR calculates miles for MDBF by factoring the mileage for each individual train car within the train.

As an example, for a ten-car train that traveled between New York Penn Station and Port Washington:

- Calculated by trip: 1 train × 20 miles = 20 miles

- Calculated by train car: 10 cars × 20 miles = 200 miles

As the majority of scheduled trains on the Port Washington branch contain 8, 10, or 12 cars, actual MDBF could be approximately 8 to 12 times less than is currently reported. As a result, LIRR's per train car metric may not be relevant for measuring the reliability of service.

To determine whether LIRR accurately calculated MDBF, we reviewed the February 2018 MDBF as reported to the MTA Board. LIRR calculates failures for MDBF by including only mechanical failures that result in a delay of six minutes or greater (including canceled or partially canceled trains) and excludes failures considered not preventable or not indicative of maintenance, such as those due to vandalism and debris strikes. In this month, 202 total failures were reported (see Graph 2). Of these, 127 were automatically excluded for not meeting the internal delay criteria. Of the remaining 75 failures, only 24 met all MDBF criteria. However, some appear to have been improperly excluded. Five cars were part of four canceled trains, but were nonetheless excluded. The repair notes for these trains indicate that the failures appear to be mechanical in nature (such as adjustments made to wheels) and thus they should have been included in MDBF calculations. Furthermore, nine failures were not properly evaluated. These failures occurred in sets of cars where multiple failures were reported throughout the train. LIRR officials explained it is their practice to only count a single failure for the train set and not a failure for each car in the train set.

Graph 2 – LIRR Train Failures in February 2018
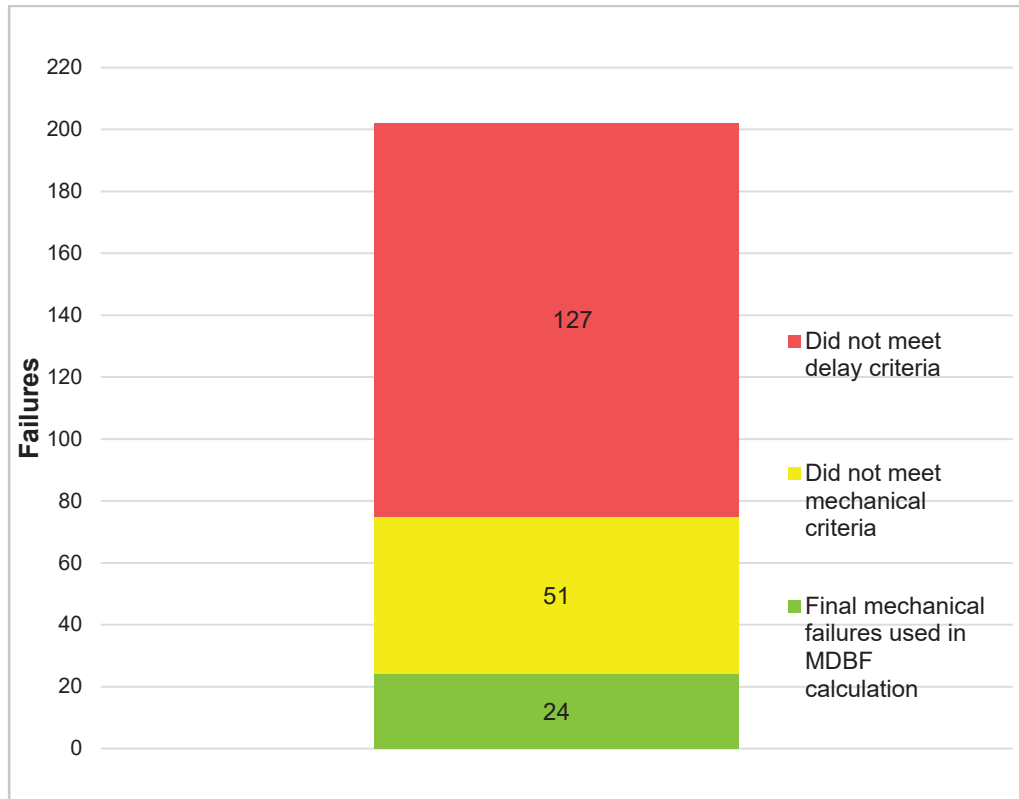
Additionally, of the 127 reported failures that did not meet delay criteria, 113 were eliminated because the delay was less than six minutes. This does not seem to accurately reflect reliability, especially because many of these failures required mechanical repairs. For example, two train failures that were excluded required replacement of brake switches and propulsion control units. For the month, 14 incidents that were mechanical in nature or where the train had a failure in more than one car and resulted in delays or lost trips were not included in the MDBF calculation. Had these failures been included, the number of failures would have been 58 percent higher, and the MDBF would have been 156,493 as opposed to 247,780.

According to LIRR officials, the purpose of MDBF is to monitor train car reliability. Reliability is defined as the extent to which an experiment, test, or measuring procedure yields the same results on repeated trials. By including train car miles rather than train trip miles and excluding certain relevant failures, the reported MDBF does not appear to reflect the actual service being delivered.

Recommendations

1. Evaluate Transit Subways and LIRR MDBF to ensure it is an easily understood, accurate representation of car fleet reliability and service reliability and determine whether changes need to be made regarding how the metrics are calculated and presented.

2. Ensure that all failures for canceled trains are evaluated for inclusion in the MDBF calculation. Ensure that each train car with a failure is included in the count of failures.

Ridership

The MTA uses ridership as a performance indicator to measure whether it is "maximizing system usage." The results are reported publicly, to the MTA Board and elsewhere, as required by the Public Authorities Law. In addition, the MTA reports its Agencies' ridership statistics to the NTD, as required by the FTA.

While ridership is generally defined as the number of people who rode on a train, bus, or subway, the actual methodology for developing the statistic varies widely. For example, both LIRR and Metro-North base ridership on ticket sales, not physical counts of passengers, and ridership is reflective of revenue. Transit, by contrast, does not report subway ridership when MetroCards are sold. Instead, ridership is reported each time the card is used to pay a fare or transfer from a bus to the subway. Both Transit Bus and MTA Bus count a rider each time the MetroCard is swiped to pay a fare or transfer. They also count cash, single-ride tickets, and transfer tickets (bus to bus). By contrast, the FTA counts ridership in terms of unlinked passenger trips (UPTs): each time a passenger boards a transit vehicle, including transfers, is counted as a ride.

LIRR and Metro-North Methodology

Ridership Calculated Based on Ticket Sales

The Metro-North and LIRR ridership statistic, as reported to the MTA Board and in the MTA's annual report, is based on ticket sales, not trips or actual passenger counts, and, as such, does not accurately reflect actual ridership. For example:

- Multi-trip ticket purchases (round-trip or ten-trip tickets) are counted on the day of sale, not when the ticket is actually used.

- LIRR's methodology doesn't account for tickets that were included in a ridership count but that were later refunded.

- Unused tickets or non-fare-paying passengers (e.g., employees, fare evaders) also are not accounted for.

In reporting ridership, while Metro-North discloses its number is based on ticket sales, LIRR does not, which invites misperception. In response to our preliminary findings, LIRR agreed to disclose in future documents the source of ridership.

The value of a ticket sales basis aside, with the exception of electronic ticket purchases, neither commuter railroad has a way to account for actual rides by weekly and monthly ticket holders. Instead, Metro-North and LIRR use a formula to estimate their ridership (see the Exhibit at the end of this report). The railroads also apply this formula to mobile device ticket sales – an option that became available in 2016 and that actually allows a ridership count. Notably, the estimation formula used by both railroads was developed from a 1983 survey of Metro-North customers. As it is based on demographics and commuting patterns from 36 years ago, the formula is of questionable value in producing reliable estimates today.

In February 2018, about 60 percent of LIRR's and Metro-North's ridership was calculated using this formula:

- Metro-North's reported ridership of 6,120,024 included 3,641,899 in estimated riders.

- LIRR's reported ridership of 6,476,251 included 3,844,285 in estimated riders.

Officials from both agencies explained that, by design, the railroads are an open system and monthly and weekly tickets are not counted. However, both agencies see weekly and monthly mobile tickets that must be activated each time they are used. This information can be used to help provide a more accurate ridership number. We also note that automated passenger counting equipment has been developed, which may provide a more accurate picture.

In response to our preliminary findings, LIRR officials stated that they are working with Metro-North to explore new methods to count passengers. They added that their future fleet of M9 and M9A train cars will be equipped with electronic passenger counting systems that will provide an advanced methodology for calculating LIRR ridership.

Ridership Calculated for FTA Reporting

According to LIRR officials, to calculate ridership for FTA reporting purposes (i.e., measured as UPTs), they use a sampling methodology focused on physically counting all passengers for a sample of trains. Metro-North, by contrast, does not physically count passengers but rather adds 3,126 Metro-North employee passes to the count of monthly tickets sold to create the FTA ridership amount. This number, however, was established based on an employee count from the 1990s and has not been adjusted to reflect current numbers. Also, Metro-North does not adjust ridership to account for any other non-paying passengers (e.g., employees with other transit agencies with Metro-North commuting passes, fare evaders) or to account for passengers who must transfer to a second train to reach their destination.

MTA Bus and Transit Bus Ridership

Transit adjusts its local bus ridership totals when reporting to the FTA's NTD to include all UPTs. A monthly correction factor (totaling 34.33 percent as of October 2017) is used to increase the number of rides. It consists of three components: fare evaders (based on sample observations), cash/single-ride ticket adjustment, and an adjustment called fare box data transmission errors.

Transit officials explained that the fare box data transmission error factor is intended to measure the number of riders estimated from MetroCard swipes that were not properly accounted for by the fare box. However, they could not provide support for the calculation used to come up with the fare box data transmission error adjustment, which was 5.44 percent of riders, or 2.4 million riders in the month of October 2017 alone.

Ridership Calculation Excludes Non-Fare-Paying Riders

While both MTA Bus and Transit Bus measure ridership in terms of number of passengers, MTA Bus – unlike Transit Bus – does not include non-paying riders (e.g., employees, fare evaders), which may result in underreporting. A comparison of ridership data from MTA Bus and Transit Bus bears this out (see Table 2). Consequently, MTA Bus ridership as reported to the NTD – and reported by the MTA elsewhere – may not represent actual conditions.

Furthermore, its underreported ridership may impact its federal funding allocation. MTA Bus officials advised us that they will begin reporting non-paying ridership starting in 2019.

Table 2 – Annual Ridership, 2015–2017

Source	2015	2016	2017
Transit Bus			
MTA Annual Report	650,652,440	638,413,113	602,620,356
MTA annual mission statement and goals	650,652,440	638,413,113	602,620,356
MTA Committee monthly report*	650,652,440	638,383,514	602,595,909
MTA website	650,681,784	638,413,113	602,620,356
Reported to NTD (based on UPTs)	776,481,616	785,144,309	735,316,390
MTA Bus			
MTA Annual Report	125,399,522	125,617,157	122,213,569
MTA annual mission statement and goals	125,399,522	125,617,157	122,213,569
MTA Committee monthly report†	125,400,000	125,617,000	122,214,000‡
MTA website	125,399,522	125,617,157	122,213,569
Reported to NTD (based on UPTs)	125,399,521	125,617,038	122,214,328

*Provided by Transit.
†Provided by MTA Bus.
‡Ridership reported as rounded amount.

Recommendations

3. Update the survey used to calculate commuter railroads' ridership statistics, including, but not limited to, consideration of ticket use patterns; changes in the composition and travel habits of customers; and changes in ticket, pass, and refund policies.

4. Examine methods used by other commuter railroads to develop ridership counts and technology changes to improve counting methodologies.

5. Enhance transparency in disclosure of the ridership metric by explaining the means by which the statistic is developed.

6. Both commuter railroads should evaluate the use of electronic ticket activation data as part of their ridership calculation and document the results.

7. Adjust the MTA Bus ridership methodology for FTA reporting to properly identify non-revenue riders.

Audit Scope, Objectives, and Methodology

Our audit examined whether the MTA's constituent Agencies' performance measurements are accurate and consistent. In addition, it examined whether the MTA uses relevant metrics to measure its performance. The audit covers the period between January 1, 2015 and August 22, 2018.

To accomplish our objectives and evaluate related internal controls, we performed tests to determine the accuracy of LIRR, Metro-North, MTA Bus, and Transit ridership statistics. We also tested the accuracy of LIRR, MTA Bus, and Transit MDBF. Metro-North MDBF was not included in our audit scope. We interviewed management and staff from Transit, MTA Bus, LIRR, and Metro-North and reviewed records provided to support the performance measures. We observed fare boxes being probed/downloaded and recorded mileage readings from hubometers (which measure distance traveled). We reviewed applicable sections of federal and State laws and regulations and MTA Board and committee meeting minutes and materials, and examined MTA procedures related to the selected performance measures. We sampled all failures forwarded to the LIRR Maintenance of Equipment Department in February 2018.

For February 2018, MTA reported approximately 12 million miles logged with 1,753 chargeable failures for its 27 bus depots, which resulted in an MDBF of 6,807. Based on our review of three of the bus depots in February 2018, we found that miles and failures were supported and appropriately recorded.

To determine whether Transit's subway ridership was accurately calculated, we selected February 2018 for review because it was the most recently reported month at the time of testing. A comparison of the Automated Fare Collection data (i.e., MetroCard) data against the total reported to the MTA Board committee revealed a difference of 90,738 riders. According to Transit officials, the differences may occur when uploads of MetroCard swipe data are delayed because of communication failures between the stations where the data is collected and the central Automated Fare Collection database. They added the monthly committee reports are considered "preliminary actual" numbers, but the methodology is not explicitly detailed to the MTA Board. Moreover, Transit does not track the number of late swipes from month to month. To create the annual report, Transit's Office of Management and Budget reruns internal reports, which would then include any late swipes. None of our samples were designed to be projected to the population as a whole.

Statutory Requirements

Authority

This audit was performed pursuant to the State Comptroller's authority as set forth in Article X, Section 5 of the State Constitution and Section 2803 of the Public Authorities Law.

We conducted our 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 objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

In addition to being the State Auditor, the Comptroller performs certain other constitutionally and statutorily mandated duties as the chief fiscal officer of New York State. These include operating the State's accounting system; preparing the State's financial statements; and approving State contracts, refunds, and other payments. In addition, the Comptroller appoints members to certain boards, commissions, and public authorities, some of whom have minority voting rights. These duties may be considered management functions for purposes of evaluating organizational independence under generally accepted government auditing standards. In our opinion, these functions do not affect our ability to conduct independent audits of program performance.

Reporting Requirements

We provided a draft copy of this report to MTA officials for their review and formal comment. Those comments were considered in preparing this final report and are attached in their entirety at the end of the report.

In response to our draft report, Transit officials disagreed with our recommendations, while MTA Bus Company, Metro North, and LIRR officials generally agreed or stated that they already complied with our recommendations. Our responses to certain comments are embedded within MTA's response.

Within 180 days after the final release of this report, as required by Section 170 of the Executive Law, the Chairman of the Metropolitan Transportation Authority shall report to the Governor, the State Comptroller, and the leaders of the Legislature and fiscal committees advising what steps were taken to implement the recommendations contained herein, and where the recommendations were not implemented, the reasons why.

Exhibit

The formula used by the commuter railroads is based on a 1983 Metro-North Railroad Fare Survey. The survey documented the number of trips taken by a sample of monthly and weekly ticket holders. A multiplier was created, which took into consideration the number of days in the month and the number of working days, weekend days, and holidays.

As an example, in February 2018, there were 19 non-holiday weekdays (1.8 × 19 = 34.2) and 8 weekend days and one holiday (9 × 0.2 = 1.8), resulting in a factor of 36, meaning each monthly ticket sold was counted as 36 trips (even if the ticket was sold after the first of the month). The weekly factor (10 × 19/20) or 9.5 trips was counted for each ticket sold.

LIRR provided us with its February 2018 transaction level ticket sales data, which gives a summary of all ticket types sold for a given period. When applying the multipliers and following the LIRR process, the calculations arrive at the ridership statistic reported by LIRR for February 2018.

Sample Railroad Ridership – February 2018

Ticket Type	Tickets Sold	Ridership Multiplier	Ridership	Percent of Total Ridership
Commutation Tickets				
Monthly tickets	103,386	36 trips*	3,721,896	57.5%
Weekly tickets	12,883	9.5 trips[†]	122,389	1.9%
Non-Commutation Tickets				
One-way tickets	2,222,279	1[‡]	2,222,986	34.3%
Ten-trip tickets	40,898	10	408,980	6.3%
Totals	**2,379,446**		**6,476,251**	**100%**

*Monthly Ridership = Number of Monthly Tickets Sold. That is:
  (1.8 × Number of Monthly Workdays) + (0.2 × Number of Monthly Non-Workdays)
[†]Weekly Ridership = Number of Weekly Tickets Sold. That is:
  10 × (Number of Monthly Workdays/Number of Monthly Workdays and Holidays)
[‡]Includes leisure and group package tickets. (This may account for the 707-trip difference between tickets sold and the ridership for this category of ticket).

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Patrick J. Foye
Chairman and Chief Executive Officer

MTA **Metropolitan Transportation Authority**

State of New York

November 8, 2019

Ms. Carmen Maldonado
Audit Director
The Office of the State Comptroller
Division of State Government Accountability
59 Maiden Lane, 21st Floor
New York, NY 10038

Re: Draft Report #2018-S-18 (MTA – Selected Performance Measures)

Dear Ms. Maldonado:

This is in reply to your letter requesting a response to the above-referenced draft report.

I have attached for your information the comments of each agency President (NYC Transit, MTA Bus, LIRR and Metro-North) which address this 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.

Sincerely,

Patrick J. Foye
Chairman and Chief Executive Officer

c: Helene Fromm, MTA Chief of Staff
     Michele Woods, Acting Auditor General, MTA Audit Services

The agencies of the MTA
MTA New York City Transit
MTA Long Island Rail Road

MTA Metro-North Railroad
MTA Bridges and Tunnels

MTA Capital Construction
MTA Bus Company

Memorandum

MTA New York City Transit

Date   November 7, 2019

To   Pat Foye, Chairman, MTA

From   Andy Byford, President, New York City Transit

Re   New York State Comptroller Report #2018-S-18 – MTA Selected Performance
        Measures: 30 Day Response

This information is being provided in response to the Subways section of the State Comptroller's draft audit report on MTA Selected Performance Measures (2018-S-18), which covers the period from January 1, 2015 through August 22, 2018. The stated purpose of the audit was to determine whether the MTA constituent agencies' performance measures are accurate and consistent, and to determine whether the MTA uses relevant metrics to measure its performance.

Response to Audit Findings

1. *...In some instances, however, RMS (Railcar Management System) cannot automatically determine the mileage between two stations because trains may have provided service on multiple subway lines (e.g., a train diverted from its normal route). In these instances, Transit must manually review these trips and calculate the mileage. For instance, Transit reported 28,220,096 total miles for April 2018 based on planned route, and an additional 612,183 miles (2 percent) when actual route was considered. While Transit maintains the documents to calculate the total miles, it does not log adjustments and cannot support its manual changes to the mileage. As a result, there is less assurance that miles manually accounted for are accurate.*

NYCT Response: A dedicated mileage unit researches and reconciles discrepancies within the legacy system to ensure that the information reported is as accurate as possible. While source documents from this reconciliation are retained for audit purposes, there has been no separate log of all adjustments as it would be disproportionately resource intensive relative to the context of the scope it covers which is only two percent of total miles. This issue will be fully addressed with the rollout of the new mileage reporting system which will automatically log the adjustments. We are in the process of migrating from the current RMS system to the new mileage reporting system, with expected roll out by the first quarter of 2020.

State Comptroller's Comment 1 - As mentioned in the report, Transit makes significant manual adjustments to mileage; however, if recorded contemporaneously, the amount of time to keep a log of the adjustments would not require "disproportionately resource intensive activity."

2. *...Transit determines mileage by train car, not by train trip....This methodology, while useful for assessing individual car reliability, can be misleading. We recalculated Transit's total MDBF for April 2018 using revenue service train trip, rather than car miles...The revenue service train trip methodology derived an MDBF of 14,761 miles compared with 137,297 miles using the individual revenue car methodology – a difference of 122,356 miles, which results in a significantly lower MDBF. Transit needs to evaluate whether its MDBF, as publicly reported, alters the perception of how many miles a train can travel before service is impaired by a mechanical failure.*

New York State Comptroller Report #2018-S-19
MTA Selected Performance Measures: 30 Day Response
November 7, 2019

NYCT Response: The purpose of the MDBF metric is to provide a common benchmark to compare disparate systems and car classes to determine the relative reliability of these systems and car classes. NYCT has publicly reported on MDBF in a manner consistent with standards used by 32 urban railways in 30 world cities for almost 50 years. Since NYCT trains vary in length from two to eleven cars, and the number of components that must be kept in working order increases as the number of cars increases, a measure based on car mileage is a more accurate measure of the reliability of the fleet than using a train-based measure. Our monthly reports to the MTA Board and the public dashboard on the MTA website make clear that MDBF is calculated as revenue car miles divided by the number of delay incidents attributed to car-related issues. As stated earlier, the purpose of MDBF is to compare performance across different car types and over time, so consistency in reporting is the most important factor.

State Comptroller's Comment 2 - Transit's reply to our report indicates that the only measure of MDBF is one based on revenue car miles divided by delays, which it has calculated the same way for almost 50 years. Transit needs to be more receptive to reporting additional information on service reliability on a train-trip basis. Transit may use the current MDBF for internal purposes; however, the public rides trains, not individual cars, and therefore the better measure for the public would be one of train-trip reliability.

3. *...Transit's methodology for MDBF only accounts for failures during revenue service and failures that meet a minimum delay requirement of five minutes. In excluding non-revenue service failures and failures that cause short delays, Transit's MDBF does not represent a complete picture of fleet reliability.*

NYCT Response: Due to the complexity of mileage reporting, NYCT has never captured actual non-revenue miles but, instead, uses an informed estimate calculated at less than one percent of total miles. Reporting on actual non-revenue miles would result in significant time expended with no added value to the metric. MDBF is calculated throughout the railcar industry using a delay measurement threshold. While the number of minutes varies somewhat by agency, NYCT has used the same five-minute threshold since 1970.

State Comptroller's Comment 3 - We did not comment on how non-revenue mileage is calculated. We identified that Transit does not include non-revenue failures and non-revenue miles in its calculation of MDBF. In addition, Transit excludes any failure that does not meet a minimum delay of six minutes. Without attributing all failures and mileage to their equipment, Transit does not have a complete picture of reliability to better inform decisions to maintain or replace equipment.

<u>Response to Recommendations</u>

Comptroller Recommendation #1: Evaluate Transit Subways and LIRR MDBF to assure it is an easily understood, accurate representation of car fleet reliability and service reliability and determine whether changes need to be made regarding how the metrics are calculated and presented.

NYCT Response: We have again reviewed our methodology and, for reasons noted above, have determined not to deviate from the current industry-wide definition of MDBF in use since 1970.

Comptroller Recommendation #2: Report actual car class mileage instead of an allocation of miles in the calculation of MDBF to improve accuracy. Ensure that all failures for canceled trains are evaluated for inclusion in the MDBF calculation. Ensure that each train car with a failure is included in the count of failures.

New York State Comptroller Report #2018-S-19
MTA Selected Performance Measures: 30 Day Response
November 7, 2019

NYCT Response: NYCT disagrees with this recommendation for the reasons noted in the response to Finding #3 above. The MDBF calculations include any incidents that result in at least one delay (i.e., a train that arrives at its terminal more than 5 minutes late, skips any planned stops, or is cancelled). Non-revenue miles are a very small portion of total mileage of the fleet, and excluding them from the calculation (both in miles travelled and any failures) has very little impact on the overall MDBF figure.

2 Broadway   Craig Cipriano
New York, NY 10004   Acting President

MTA Bus Company

Date: November 7, 2019

To: Patrick J. Foye, Chairman, Metropolitan Transportation Authority

From: Craig Cipriano, Acting President, MTA Bus Company

Subject: **New York State Comptroller Draft Report - MTA Selected Performance Metrics (2018-S-18) / MTA Bus Company**

This is in response to the above subject NYS Comptroller's Draft report recommendation, specific to the MTA Bus Company.

Response to Recommendation

Comptroller Recommendation #7: Adjust the MTA Bus ridership methodology for FTA reporting to properly identify non-revenue riders.

MTA Bus Response: National Transit Database (NTD) reporting guidelines do not explicitly state that "non-revenue" riders should be included in reported ridership numbers and consequently, MTA Bus NTD reporting has consistently excluded such data. Two other factors influenced this decision;

1. The high percentage of express routes that historically do not have high incidents of fare evasion, usually under 2%.
2. There was no data to support the estimation of a fare evasion factor for the remaining local routes.

After discussions with an NTD validation analyst with acknowledgement of the ambiguity of the guidelines on this subject matter, it was suggested that non-revenue riders be included in future NTD ridership data. Beginning with the 2019 reporting cycle, MTA Bus is working with NYCT OMB to determine the best methodology to calculate non-revenue ridership in all the related categories. Please note, however, that NYCT Bus provides substantially more service than MTA Bus, and this will continue to be reflected in future comparisons of ridership data between MTA Bus and NYCT Bus even after the adjustment for non-paying riders is made.

State Comptroller's Comment 4 - Although the response indicates that it will begin to report information regarding non-revenue riders in the 2019 reporting cycle, this information has been available from the MTA Bus Company's Operations Planning Unit from its semi-annual fare evasion surveys conducted since 2012. However, it was not reported to the NTD.

The recommendation is accepted and is being implemented.

MTA Bus Company is an agency of the Metropolitan Transportation Authority State of New York

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MTA Long Island Rail Road

November 7, 2019

Mr. Patrick Foye
Chairman and Chief Executive Officer
Metropolitan Transportation Authority
2 Broadway
New York, NY 10004

> **RE: Metropolitan Transportation Authority**
> **Selected Performance Measures**
> **Report 2018-S-18**

Dear Chairman Foye:

As required by Section 170 of the Executive Law, detailed below are the updated actions that have or will soon be taken to address the recommendations contained in the State Comptroller's (OSC) Draft Audit of Selected Performance Measures as relates to the Long Island Rail Road (LIRR).

Mean Distance Between Failure (MDBF)

Before addressing the specific findings of the report, it is important to note that MDBF is a standard metric developed by the railroad industry to assist equipment departments in assessing the mechanical reliability of their train fleets.

State Comptroller's Comment 5 - LIRR's response is similar to Transit's; see State Comptroller's Comment 2.

The purpose of MDBF is to measure the performance of each individual fleet, so that maintenance and repair cycles can be scheduled appropriately. Each car in a consist accumulates mileage and additional wear and tear as it travels through the system and must be assessed individually, whether it is part of a six-car consist or a ten-car consist. Consequently, the LIRR calculates MDBF as number of primary failures, defined as a mechanical failure that causes a delay, when compared to the total miles traveled of all cars in its fleet, not just when compared to the total miles traveled of all consists in the fleet. While train car failure rates affect service, measuring service reliability for customers is not the primary purpose of MDBF. The railroad industry uses other metrics to assess that, most notably via On-Time Performance.

State Comptroller's Comment 6 - Although the LIRR replied that the MDBF statistic it is reporting is a measure of "fleet reliability" and not primarily for the purpose of advising customers of "service reliability," MTA's website page on "Transparency, Performance Metrics, LIRR" shows the metric under the heading of "service reliability." Therefore, LIRR needs to reconsider how it reports this statistic to the public.

Below please find detailed responses to the specific findings and recommendations. In addition, we wish to clarify a statement discussed in the report.

Recommendation No. 1

- Evaluate Transit Subways and LIRR MDBF to assure it is an easily understood, accurate representation of car fleet reliability and service reliability and determine whether changes need to be made regarding how the metrics are calculated and presented.

LIRR Response:

The LIRR already complies with this recommendation. The purpose of the LIRR's MDBF is to measure the reliability of its train car equipment. More specifically, it is the average number of the total scheduled miles in passenger service and deadhead service that cars travel before a mechanical failure contributes to a train being six or more minutes late. While MDBF partially gauges the impact that mechanical failures of railcars have on the LIRR's on-time performance, it is not a direct measure of service reliability. Since service reliability may be impacted by other than mechanical failures (e.g., debris strikes, infrastructure problems, police activity etc.), the LIRR uses its On-Time Performance (OTP) as a measure of service reliability. As such, the LIRR maintains its methodology as relayed to the auditors in detail and supported by extensive and automated recordkeeping results in calculating MDBF as an accurate measure of car fleet reliability which is consistent with the rail industry.

State Comptroller's Comment 7 - Our point is that many equipment failures are eliminated from the calculation because they did not delay the train by six minutes. By eliminating these failures, LIRR does not have a complete picture of reliability for its equipment.

It should be noted that MTA Audit Services validated the LIRR's MDBF calculation methodology in 2010, (MTA-09-215) and in 2015 the MTA Office of the Inspector General (OIG) confirmed that LIRR had an effective process in place to identify, review, and assign primary delay causes to the Maintenance of Equipment Department. While MTA/OIG did not issue a written report, they did consider the audit closed.

State Comptroller's Comment 8 - Notwithstanding, if, as stated, the LIRR is focused on fleet reliability, all failures and the resultant delays should be included.

Recommendation No. 2

- Report actual car class mileage instead of an allocation of miles in the calculation of MDBF to improve accuracy. Ensure that all failures for canceled trains are evaluated for inclusion in the MDBF calculation. Ensure that each train car with a failure is included in the count of failures.

LIRR Response:

The LIRR partially rejects and partially complies with this recommendation. The LIRR's Service Planning Department provides monthly reports of scheduled service miles by fleet type (i.e. electric vs diesel). These miles are not provided by fleet (i.e., M3, M7) since the specific fleet types generating these miles is not known beforehand and is part of LIRR's daily dynamic process of manipulating equipment as available. For purposes of calculating MDBF, the LIRR's Maintenance of Equipment Department (MofE) allocates the scheduled mileage provided by Service Planning based on the percentage of trips serviced by car class that are used in daily service. The allocation process is based on a manual count of daily train consist sheets. The LIRR does not utilize automated data to determine car miles per car class. While MofE does not report on mileage per car class based on actual mileage travelled, it should be noted

that scheduled miles can be considered a reliable proxy since the trains adhere to and travel according to pre-determined schedules.

As noted in Items #2 and 5 in the "Other Clarifications" section of this response, the LIRR already includes all relevant primary failures in the calculation of MDBF.

Ridership

Recommendation No. 3

- Update the survey used to calculate commuter railroads' ridership statistics, including, but not limited to, consideration of ticket use patterns; changes in the composition and travel habits of customers; and changes in ticket, pass, and refund policies.

LIRR Response:

Absent the existence of fare gates, the LIRR must make assumptions about how often, and precisely when, customers who purchase tickets travel. The calculation used by the LIRR is as follows:

- Monthly Ridership = Number of Monthly Tickets Sold * (1.8 * Number of Monthly Work Days) + (0.2 * Number of Monthly Non-Workdays)
- Weekly Ridership = Number of Weekly Tickets Sold * (10) * (Number of Monthly Workdays)/ (Number of Monthly Workdays and Holidays)

The assumptions and factors employed in the above formulas were last formally reassessed in 2013, and staff concluded that they acceptably reflect current travel patterns. The LIRR agrees with the auditors that demographics, population shifts and employment trends can impact ridership. For that reason LIRR staff revisits its methodology each year to determine whether a formal reassessment is necessary, so the LIRR is effectively in compliance with this recommendation. It is worth noting that many of the potential trend shifts pointed out by the auditors are already reflected in the ticket sales data used by the LIRR to calculate ridership. For example, individuals who frequently telecommute would be more likely to purchase a ten-trip or weekly ticket than stick with a monthly ticket.

State Comptroller's Comment 9 - LIRR replied that the factors and assumptions used in the ridership calculation were "last formally assessed in 2013, and staff concluded that they acceptably reflect current travel patterns." However, we requested a copy of the formal assessment and were told that documentation was not available.

Nevertheless, the LIRR will continue to regularly reassess its ridership calculation methodology in order to make sure it employs the most updated information available. In addition, it is expected that the MTA's implementation of a multi-agency New Fare Payment System (NFPS) will strengthen the LIRR's ability to track, monitor and analyze ridership data. We expect the implementation of NFPS will present another opportunity to revisit the methodology. Also, it should be noted that LIRR's future fleet of M9's and M9A's will be equipped with electronic passenger counting systems that will provide for an advanced methodology for calculating LIRR ridership.

Recommendation No. 4

- Examine methods used by other commuter railroads to develop ridership counts and technology changes to improve counting methodologies.

LIRR Response:

The LIRR agrees with this recommendation and will research and reach out to other commuter railroads and evaluate their methodologies. The LIRR's Controller has already conferred with and established a reciprocal relationship with Chicago Rail for sharing ideas relative to ridership. Also, see references to the NFPS to be implemented concurrently with Metro-North and updated technology pending on the M9's and M9A's referred to in our response to Recommendation No. 3.

It is important to reiterate the distinction between train counts performed by Service Planning and ridership calculations as performed by the Controller's Office. The former is conducted only several times per year to evaluate the adequacy of service levels and to assess train capacity. The latter utilizes actual daily ticket sales data to estimate overall ridership and revenue.

Recommendation No. 5
- Enhance transparency in disclosure of the ridership metric by explaining the means by which the statistic is developed.

LIRR Response:

The LIRR agrees with this recommendation and starting with the October 2019 results will issue a footnote on LIRR official documents citing the ridership metric used (e.g., ticket sales or passenger counts).

Recommendation No. 6
- Both commuter railroads should evaluate the use of electronic ticket activation data as part of their ridership calculation and document the results.

LIRR Response:

The LIRR agrees with this recommendation. By 2021 the MTA expects to launch a new fare payment system across its agencies which will provide new sales technology resulting in a more enhanced method to improve ridership calculations.

Other Clarifications
1. On page 1, the first bullet on the bottom of the page is listed as an example of how the performance methodologies are misleading or inaccurate; however, it is neither. The practice of using the mileage of each train car for rail agencies is well known, consistent throughout the MTA and consistent throughout the industry.
2. On Page 2, the report states: *"Our review of how MDBF was calculated by the LIRR found that the agency did not include all mechanical failures in its calculation."* It should be noted that "mechanical failures" is more accurately described as failures caused by primary on-board equipment failures that cause a delay. The remainder of the same paragraph contains several pieces of erroneous information. Considering every reported symptom or condition a "failure" would change the purpose and therefore the usefulness of the MDBF metric. Not every reported condition is the result of a mechanical failure. Additionally, not every work order entered on a car or train is the result of mechanical failures. See previously submitted documents and meeting content for previous specifics.

State Comptroller's Comment 10 - We maintain our position that the LIRR excluded failures such as doors that did not function properly. These failures reflect on fleet reliability, which LIRR officials claim is the purpose of MDBF.

3. On Page 7, the report states: *"MDBF is used by LIRR, Transit's Subways and Buses, and MTA Bus as a measure of on-time and reliable service"*.

   On Page 10 the report states: *"As the majority of scheduled trains on the Port Washington branch contain 8, 10, or 12 cars, actual MDBF could be approximately 8 to 12 times less than is currently reported. As a result, LIRR's per train car metric may not be relevant for measuring the reliability of service."*

   These statements are not accurate. MDBF is a measure of fleet performance reliability, not service delivery.

4. MDBF is a measure of <u>fleet performance</u> reliability, not service reliability. On page 7, the description of the MDBF calculation is incomplete. A more accurate statement would be, *"Generally, MDBF is calculated by dividing the number of miles traveled by the number of mechanical failures that cause a delay."*

5. On Page 10, the report states: *"Five trains were canceled but were nonetheless excluded. The repair notes for these trains indicate that the failures appear to be mechanical in nature (such as adjustments made to wheels) and thus they should have been included in MDBF calculations."* The first sentence should have read *"Five cars were part of four cancelled trains but were nonetheless excluded."*

State Comptroller's Comment 11 - The report was revised to reflect the information in the response.

Please note that the OSC's preliminary report referenced six failures, all of which the LIRR advised were properly accounted for as follows:

   a. The same train was counted three times, as such the number of suggested failures sited by the OSC should have been four and not six.

   b. Three of the four were not maintenance delays (not caused by an on-board equipment failure). More specifically, two were related to low adhesion conditions that caused wheel damage and one was related to a partially gapped train (a train stopped where there wasn't sufficient 3rd rail coverage).

   c. The fourth incident was correctly counted as a mechanical failure but it was counted on the previous day from the date listed – it caused a ripple cancellation on the next day.

6. On Page 10 the report states: *"Furthermore, nine failures were not properly evaluated. These failures occurred in sets of cars where multiple failures were reported throughout the train. LIRR officials explained it is their practice to only count a single failure for the train set and not a failure for each car in the train set."*

   On Page 11 the report states: *"Additionally, other failures excluded occurred on trains where failures were reported on multiple cars. LIRR's practice is to only consider a single failure rather than each car's failure within the train despite the fact that LIRR calculates failures per car mileage as opposed to the entire train."*

   All nine trains had one or less (zero) equipment failures. Three were NDF (No Defects Found) per MTA criteria. The rest were failures on one car, not multiple cars. A single issue on one car can affect the trainline; for instance, a door zone switch left in the wrong position on one car will prevent the doors from opening or closing on the remainder of the cars in the consist. In this case, the crew would report the doors not opening/closing on the cars and work orders would be opened on the reported cars affected for proper investigating, troubleshooting and tracking purposes. The fact the work orders exist on those cars does not represent a mechanical failure, but the

report of a condition that was the result of a crew error. The LIRR include all Maintenance of Equipment assigned cancelled and partially cancelled trains with a confirmed equipment failure as an assignable MDBF cause.

7. On Page 11 the report states: *"Additionally, included in the 127 that did not meet delay criteria, 113 of the reported failures were eliminated because the delay was less than six minutes. This does not seem to accurately reflect reliability, especially because many of these failures required mechanical repairs. For example, two train failures that were excluded required replacement of brake switches and propulsion control units."*

   a. LRR is unsure if the report is alluding to fleet performance reliability or service reliability. If the latter, the auditors should refer to Other Clarifications # 2.

State Comptroller's Comment 12 - Our point is that many equipment failures are eliminated from the calculation because they did not delay the train by six minutes. By eliminating these failures, LIRR does not have a complete picture of reliability for its equipment.

   b. In adherence with MTA criteria, delays of less than six minutes caused by equipment failures are not material for the purposes of calculating MDBF which is consistent with the LIRR's agency-wide accepted policy of not categorizing trains delayed by the same timeframe as "late".

   c. The 113 instances are reported conditions, NOT reported failures. Additionally, none of the 113 work orders were regarding conditions that delayed a train. The report makes a reference to brake switches as an example. However, the brake switch work order didn't affect the operation of the train – the LIRR was able to replace the brake switch before the intermittent condition became a permanent/hard failure. In this case, proactive train crew reporting and mechanical response ensured the reliability was unaffected. Additionally, with regard to the second example, the propulsion control unit failure did not delay the train because alternate equipment was available and the train was swapped.

State Comptroller's Comment 13 - LIRR disagreed with our conclusion that the unreported failures should have been included in the calculation of MDBF because they did not meet the criteria (six minutes) to be reported as a delay. However, in these two incidents, the brake switch had to be replaced by the train crew and the train was swapped. While no delay was reported because staff found solutions to avoid a delay, the equipment was still not reliable.

8. On Page 11 the report states: *"For the month, 14 incidents that were mechanical in nature and resulted in delays or lost trips were not included in the MDBF calculation. Had these failures been included, the number of failures would have been 58 percent higher, and the MDBF would have been 156,493 as opposed to 247,780."* The LIRR disagrees; please refer to "Other Clarifications" items #3 and#4.

9. On Page11 the report states: *"By including train car miles rather than train trip miles and excluding certain relevant failures, the reported MDBF does not appear to reflect the actual service being delivered."* See Page 1 of the response.

Please contact me should you require additional information.

Sincerely,

Phillip Eng
President

cc: M. Young
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MTA **Metro-North Railroad**

November 7, 2019

Mr. Patrick Foye
Chairman and Chief Executive Officer
Metropolitan Transportation Authority
2 Broadway, 20th Floor
New York, NY 10017

Re: Response to Draft OSC Report 2018-S-18 Selected Performance Measures

Dear Chairman Foye:

The Office of the New York State Comptroller recently issued a Draft Report on Selected Performance Measures at the MTA. With respect to Metro-North, the auditors focused on our process and practices used when determining and reporting ridership statistics (Recommendations 3, 4, 5 & 6). We will use these findings and recommendations to try to find ways to improve and strengthen our ridership statistical analysis and reporting.

This letter serves as our formal response and approach to addressing the Draft Report's findings and recommendations.

Recommendation 3:
Update the survey being used to calculate commuter railroads' ridership statistics, including, but not limited to, consideration of ticket use patterns; changes in the composition and travel habits of customers; and changes in ticket, pass, and refund policies.

MNR Response to Recommendation 3:
In Progress. We agree that the ridership and demographic data used to calculate ridership statistics should be brought up to date. MNR is engaged in an MTA wide initiative to implement a new fare payment system (NFPS). It is expected that the NFPS will provide the ability to track, monitor and analyze ridership data across the MTA, including Metro-North Railroad. In our opinion, the cost benefit of updating the ridership methodology would be more appropriate after the NFPS implementation. Any efforts to change the methodology currently being used

would not be cost-effective, as better data will be available from the NFPS soon after completion of any revision to the current methodology.

Recommendation 4:
Examine methods used by other commuter railroads to develop ridership counts and technology changes to improve counting methodologies.

MNR Response to Recommendation 4:
In Progress. MNR is currently investigating innovations in people counting technologies, and is performing a demonstration project to determine the accuracy and effectiveness of the current state of the art in counting commuter rail riders. As part of the lead-in to this pilot, MNR has communicated and/or met with other commuter railroads including MBTA (Boston) and NJ TRANSIT. In addition, the next generation of rail cars for Metro-North Railroad will include passenger counting technology built into the rail cars, similar to that installed in the LIRR's new M9/M9A fleet, currently being delivered. MNR is constantly looking to find new and better methodologies to count riders and will continue to communicate with peers and vendors to make use of new techniques and technology as they become available.

To be clear, however, MNR's ridership counts are developed through a process performed at different points throughout the year, as a service planning tool. These counts are used to determine seating capacity assignments to individual trains; ensure compliance with service guidelines; and identify areas where service changes would be beneficial to customers. Ridership counts do not purport to document total system ridership, but instead offer a snapshot of average daily ridership on individual trains, which is used for the purposes outlined here. These ridership counts are not used in any way to develop or inform the official ridership reporting that was reviewed for this audit.

Recommendation 5:
Enhance transparency in disclosure of the ridership metric by explaining the means by which the statistic is developed.

MNR Response to Recommendation 5:
Implemented. MNR already complies with this recommendation. MNR is fully committed to consistency and transparency in reporting our performance indicators, including ridership reporting. As indicated on page 13 of the draft report, "[i]n reporting ridership...MNR discloses its number is based on ticket sales[.]" MNR will continue to include this explanation in its ridership reports and when/if there are any changes to the reporting methodology, MNR will disclose such changes proactively.

Recommendation 6:

Both commuter railroads should evaluate the use of electronic ticket activation data as part of their ridership calculation and document the results.

MNR Response to Recommendation 6:

In Progress. As indicated above, the New Fare Payments System could provide benefits including ridership data for all ticket types, including multi-ride and single-ride tickets, electronic and paper-based. As this data becomes available to MNR we will update our ridership reporting methodology to include this data, and we will document the change in methodology for all stakeholders.

To be clear, however, electronic weekly and monthly commutation passes do not require validation for each trip. Instead, these passes are validated by the customer on the first use, and remain validated for the remaining validity time period of the ticket. In addition, electronic weekly and monthly passes are not scanned by the train crews except on the periodic "punch days," which are generally scheduled one or two times per month. As such, use of electronic validation data will not obviate the need to calculate the number of trips taken on weekly and monthly commutation passes, but the data from electronic validation may be used to update the survey data on which those calculations are based.

Sincerely,

Catherine Rinaldi

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