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**OFFICE OF THE COMPTROLLER**  
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AUDIT

BUREAU OF AUDIT

June 28, 2018

**By Electronic Mail**

Joseph J. Lhota  
Chairman  
Metropolitan Transportation Authority  
2 Broadway  
New York, NY 10004

**Re: Letter Audit Report on the Telecommunication Services on the Metropolitan  
Transportation Authority Brooklyn Buses Phase I (Audit Number SZ18-117AL)**

Dear Chairman Lhota:

This Letter Report presents the results of our audit of the installation of Wi-Fi service and Universal Serial Bus (USB) charging ports in the New York City bus system in Brooklyn, New York. The objective of this audit was to determine whether the telecommunication services in the New York City's Metropolitan Transportation Authority (MTA) buses in Brooklyn enable Wi-Fi and USB charging capabilities and are operating effectively.<sup>1</sup> This is the third in a series of audits of the ongoing installation of Wi-Fi service and USB charging ports in the New York City bus system.

**Background**

In December 2015, the MTA entered into a contract with Cellco Partnership, doing business as Verizon Wireless, in which the MTA granted Verizon Wireless the right to supply and deliver wireless voice and data services for a period of five years throughout the MTA bus system.<sup>2</sup> The contract stipulates that Verizon Wireless will provide services, certain hardware, software and other components and data plans in connection with the MTA's project to purchase, install and integrate an onboard public Wi-Fi system.<sup>3</sup> According to the contract's "Wi-Fi Terms of Service" provision, "the service is provided as a free amenity to New York City Transit Authority (NYCTA)

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<sup>1</sup> The term "MTA buses" refers to the fleets owned and operated by both New York City Transit Authority's Department of Buses (DOB) and MTA Bus Company. Wi-Fi is a wireless networking technology that allows computers and other devices to communicate over a wireless signal. USB, short for Universal Serial Bus, is an industry standard that was developed to define cables, connectors and protocols for connection, communication, and power supply between personal computers and their peripheral devices.

<sup>2</sup> Cellco Partnership, Inc., doing business as Verizon Wireless Inc., provides wireless, residential, and business telecommunications products and services.

<sup>3</sup> New York City Transit (NYCTA), a subsidiary of the MTA, owns, operates, and repairs the buses. The MTA purchased the new-look buses and has the contract with Verizon Wireless.

customers for entertainment and educational purposes and it's not intended to be a designated public forum." The terms of service provision further states that the service is not supposed to be used for multi-media streaming, continuous data transmission or broadcasts, automatic data feeds, automated machine to machine connections or peer to peer file sharing, voice over internet protocol, or any application that is not made available to customer-users by NYCTA and that uses excessive network capacity. Further, the service is not intended to be used as a substitute or a back-up for private lines or a dedicated data connection.

In March 2016, Governor Andrew Cuomo announced that the MTA would add 2,042 new buses to its transportation fleet over a five-year period. The new buses, which have a distinctive blue-and-yellow color scheme (new look buses), represent a \$1.3 billion investment of capital program resources and will replace almost 40 percent of the pre-existing fleet. It is intended that the new buses will include free Wi-Fi hotspots and 35-55 USB charging ports located throughout each bus.<sup>4</sup> The Governor later stated that the "new state-of-the-art buses will better connect passengers who are on-the-go, [and] create a stronger mass-transit system to bring New York into the future."<sup>5</sup>

In May 2016, the MTA began putting the first 75 new-look buses, equipped with Wi-Fi service and USB charging ports into service.<sup>6</sup> The service began in Queens along four routes; one additional bus was later added, and the 76 buses were in service in Queens by December 2017. In April 2017, the MTA began putting 86 new-look buses equipped with Wi-Fi and USB charging ports along the B4, B8, B9, B11, B16, B35, B37, B43, B61, B63, B67, B68, B69 and B70 routes in Brooklyn. (See Table I below for the timetable for new-look regular and new-look SBS buses in Phase I.<sup>7</sup>)

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<sup>4</sup> The number of USB ports will range from 35 to 55 depending on the make and model of the new-look buses.

<sup>5</sup> *Governor Cuomo Announces Roll Out of New Buses with Wifi and USB Charging Ports in the Bronx*, March 21, 2017 press release.

<sup>6</sup> During our previous testing in Queens, one additional new-look bus began operating for a total of 76 new-look buses.

<sup>7</sup> Select Bus Service (SBS) is New York City Transit's bus service designed to reduce travel time and increase the level of comfort for customers.



**TABLE I**

**Installation of New- Look and SBS Buses on Various Routes throughout the City**

<b>Borough</b>	<b>Date Service Began</b>	<b>Service Completed</b>	<b>Number of Buses</b>	<b>Type of Bus</b>	<b>Routes</b>	<b>Depot(s)</b>
Queens	May 2016	December 2017	76	New-Look	Q10, Q111, Q113 & Q114	JFK and Baisley Park
Queens	March 2017	March 2017	43	New -Look- SBS	Q44-SBS	Casey Stengel
Bronx	March 2017	December 2017	83	New- Look	Bx1, Bx2, Bx9, Bx15, Bx6, Bx8, Bx11, Bx17, Bx21, Bx27, Bx31, Bx32, Bx33, Bx35 and Bx46	Kingsbridge and West Farms
Brooklyn	April 2017	November 2017	86	New-Look	B4, B8, B9, B11, B16, B35, B37, B43, B61, B63, B67, B68, B69 and B70	Grand Avenue and Jackie Gleason
Manhattan	April 2017	December 2017	79	New-Look	M14, M15, M101, M102 and M103	Tuskegee Airmen
<b>TOTAL</b>			<b>367 buses</b>		<b>39 routes</b>	

The remaining 1,675 new-look buses will be assigned to various routes throughout the five boroughs from 2018 to 2020.

In addition, in 2016, the MTA began the process of upgrading its pre-existing buses to include Wi-Fi and USB charging ports. As of January 2018, the MTA had 1,019 express buses in operation throughout the five boroughs; by mid-October 2017, according to the MTA, all had been retrofitted with the USB charging ports, and 910 had been retrofitted with Wi-Fi. The MTA also informed us that all express buses were expected to be retrofitted with Wi-Fi by the end of 2017 and that the 149 express buses in Brooklyn were retrofitted with both Wi-Fi and USB charging ports as of December 2017.<sup>8</sup>

<sup>8</sup> The MTA often transfers bus assignments between depots, therefore depot/borough assignments are subject to change.

## **Audit Findings**

We found that, overall, the telecommunication services provided by Verizon Wireless are generally operating as intended in the MTA's buses in Brooklyn. We tested 82 buses in Brooklyn with Wi-Fi and/or USB capability, which consisted of 29 new-look buses and 53 express buses. Our tests showed that the MTA Wi-Fi network operated effectively on 81 out of the 82 buses that were equipped with Wi-Fi (99 percent). On those buses, we were able to connect to the wireless network and browse various websites such as news, entertainment, and social media. We also found that the MTA's Wi-Fi network appropriately restricted access to multi-media video streaming websites such as YouTube, Netflix, Hulu and VuDu. We tested the USB ports on 29 new-look buses and sampled 53 of the 149 Brooklyn express buses for a total of 4,089 ports.<sup>9</sup> We found that 4,078 of the 4,089 USB charging ports on both the new-look and express buses we tested (99 percent) were working as intended; in those instances, we were able to connect and charge phones utilizing the tested buses' USB ports.

We confirmed that all 29 new-look buses that we tested in Brooklyn were equipped with both Wi-Fi and USB charging ports.<sup>10</sup> We found that the MTA's Wi-Fi network operated effectively on 28 of 29 the new-look buses (97 percent) we tested on two Brooklyn routes, allowing us to establish a connection and browse various websites on the MTA's Wi-Fi network. However, as shown in Table II below, we also found that the Wi-Fi network did not operate effectively on 1 of the 29 new-look buses (3 percent).

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<sup>9</sup> The new-look buses tested in Brooklyn were the New Flyer XN40 CNG model, which average 35 ports per bus, (29 X 35=1,015), while the express buses average 58 USB ports each (53 X 58=3,074), for a total of 4,089 USB ports tested.

<sup>10</sup> Brooklyn had 69 of the planned 86 new-look buses in mid-October during the time of our testing. On several occasions, we also attempted to test additional new-look buses on other Brooklyn routes, but after spending multiple hours on the routes, we didn't observe any of the aforementioned buses. Therefore, we were only able to test 29 new-look buses.



**Table II**  
**Testing of the Wi-Fi on the MTA’s New- Look Buses in Brooklyn**

<b>Route</b>	<b>Type of Bus</b>	<b>Number of Buses</b>	<b>Number of Buses With Working Wi-Fi</b>	<b>Percentage of Buses With Working Wi-Fi</b>	<b>Number of Buses Without Working Wi-Fi</b>	<b>Percentage of Buses Without Working Wi-Fi</b>
B35	New-look	28	27	96%	1	4%
B67 <sup>11</sup>	New-look	1	1	100%	0	0%
<b>TOTAL</b>		<b>29</b>	<b>28</b>	<b>97%</b>	<b>1</b>	<b>3%</b>

Our USB port testing described earlier included 1,015 ports tested on 29 new-look buses. We found that all 1,015 (100%) of those USB charging ports were operating as intended, in that we were able to connect and charge our phones utilizing the buses’ USB ports.

Further, we found that all 53 express buses we tested were equipped with both Wi-Fi and USB charging ports. We tested the 53 Wi-Fi capable express buses and found that the Wi-Fi network operated effectively on all 53 (100 percent). On those 53 buses we were able to establish a connection and browse various websites including news, entertainment and social media on the Wi-Fi network. (See Table III below.)

**Table III**  
**Testing of the Wi-Fi on the Brooklyn Express Buses**

<b>Route</b>	<b>Type of Bus</b>	<b>Number of Buses</b>	<b>Number of Buses With Working Wi-Fi</b>	<b>Percentage of Buses With Working Wi-Fi</b>	<b>Number of Buses Without Working Wi-Fi</b>	<b>Percentage of Buses Without Working Wi-Fi</b>
Garaged/Parked at the Spring Creek Depot (BM1, BM2, BM3, BM4 and BM5)	Express	53	53	100%	0	0%
<b>TOTAL</b>		<b>53</b>	<b>53</b>	<b>100%</b>	<b>0</b>	<b>0%</b>

In addition, we tested the USB charging ports on the 53 express buses. We found that 3,063 of the 3,074 (99.6 percent) operated as intended and that 11 (.4 percent) of the ports, on a total of 9 express buses, did not.

<sup>11</sup> We tested two new-look buses on the B67 route, one of which was previously tested on the B35 route.

During the course of the audit, we notified MTA officials of any Wi-Fi connectivity or USB charging capability malfunction that we found during our field testing. The MTA initiated repair orders, and we observed ongoing repair work. To ensure that the malfunctioning Wi-Fi connectivity and USB charging capabilities were properly repaired and operating, we re-boarded the 10 buses in which we previously found issues and retested either the Wi-Fi connectivity and or the USB charging capability. In all 10 buses, the retesting showed that the issues were resolved.

## **Recommendation**

We recommend that the MTA and the NYCTA periodically perform tests to ensure that their wireless network and USB charging capabilities, once installed, are functioning properly.

## **Scope and Methodology**

We conducted this performance audit in accordance with generally accepted government auditing standards (GAGAS). 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. 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 covered the period of June 1, 2017, through March 2, 2018. Our audit tested buses in Brooklyn with Wi-Fi and/or USB charging ports that were reportedly operational.

To determine which buses garaged in the depots had Wi-Fi service and/or USB charging ports, we reviewed the requested spreadsheet submitted by the MTA that included the bus numbers, bus models and bus depots in Brooklyn with fully operating Wi-Fi connectivity and/or USB charging ports. To determine the reliability of the list provided we tested 82 buses in Brooklyn (29 of the 86 new-look buses and 53 of the 149 express buses) that were listed as having Wi-Fi and/or 4,089 USB charging ports .

To achieve our audit objective, we used cellular phones and USB cables to assist us in testing the Wi-Fi and/or USB charging ports in the buses in Brooklyn along the B35 and B67 bus routes, and buses garaged at the Spring Creek Bus Depot that were listed by MTA as having Wi-Fi connectivity and/or USB charging ports. We attempted to test new-look buses on the other routes; however during a 5 hour span no new-look buses were observed on route. Our testing was conducted between September 18, 2017 and March 2, 2018. During our testing, we established a Wi-Fi connection and connected the phones to various USB charging ports on the bus to ensure functionality. On each bus, we took screenshots displaying Wi-Fi connectivity on the phone and a connection to the USB charging port.



To determine access to Wi-Fi hotspots on the bus, the auditors signed into the MTA's Wi-Fi network along bus routes and on buses garaged at the Spring Creek bus depot. The auditors then logged onto MTA.info and attempted to access news/information, updates to MTA's service status, as well as the MTA's Bus Time and Trip Planner features.

To determine the accessibility of social media websites, the auditors downloaded Yahoo, Google, Facebook, Twitter and Snapchat to cellular devices and attempted to read e-mail and send messages on the tested MTA buses. The auditors also attempted to access multi-media video streaming websites such as Netflix, Pandora, Hulu, Vudu and YouTube to determine if it was possible to watch movies, play music and stream videos on the tested MTA buses.

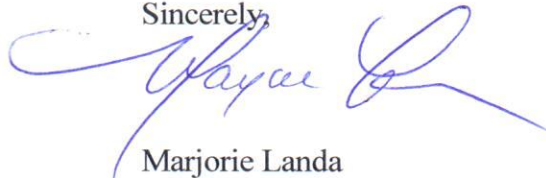
Testing was performed Monday through Sunday at various times during a full day, 24-hour cycle, to ensure that the Wi-Fi network was available and USB charging ports were operational at all times. In addition, the auditors tested service in inclement weather to determine the effect on Wi-Fi and cellular service.

MTA and NYCTA officials were notified during the audit of any issues we found with Wi-Fi connectivity or USB charging capability and initiated repair orders and conducted repairs as we were continuing the audit.

The matters covered in this letter report were discussed with MTA and NYCTA officials during and at the conclusion of the audit, and they agreed that an exit conference was not necessary. On May 30, 2018, we submitted a draft letter report and provided the MTA and NYCTA with the opportunity to formally respond. The MTA's and NYCTA's responses were received on June 25, 2018. In their written responses, the MTA and NYCTA agreed with the report's one recommendation and NYCTA stated that, "[b]uses management agrees with the audit recommendation to 'periodically perform tests to ensure that their wireless network and USB charging capabilities, once installed, are functioning properly'."

The full text of the MTA's and NYCTA's comments are included as addenda to this report.

Sincerely,



Marjorie Landa

c: Patrick Foye, President, Office of the Chairman, MTA  
Andy Byford, President, NYC Transit Authority  
Veronique Hakim, Managing Director, Office of the Chairman, MTA  
Darryl Irick, Senior Vice President, Department of Buses, President MTA Buses  
Craig Cipriano, Executive Vice President, Business Strategies and Operations Support  
Michael Ribosh, Vice President, Chief of Operations

Chairman Lhota

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Michael Ecker, Deputy General Manager  
Zafira Lateef, Chief Officer, Business Strategies  
Sunir Nair, Chief Officer, Customer Information Systems  
David Perez-ACMO Customer Service  
Roy Grey-Stewart, Controller, MTA Bus Company  
Michael J. Fucilli, Auditor General, MTA  
Darren Jurgens, Audit Manager, MTA  
Emily Newman, Director, Mayor's Office of Operations  
George Davis III, Deputy Director, Mayor's Office of Operations





## Metropolitan Transportation Authority

State of New York

June 25, 2018

Ms. Marjorie Landa  
Deputy Comptroller for Audit  
NYC Office of the Comptroller  
One Centre Street, Room 1100N  
New York, NY 10007

**Re: Draft Letter Audit Report #SZ18-117A (Telecommunication Services on the MTA's Brooklyn Buses Phase 1)**

Dear Ms. Landa:

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

I have attached for your information the comments of Andy Byford, President, NYC Transit, which address this report.

Sincerely,

A handwritten signature in blue ink that reads "Joseph J. Lhota".

Joseph J. Lhota

c: Veronique Hakim, MTA Managing Director  
Michael J. Fucilli, Auditor General, MTA Audit Services

Attachment

# Memorandum



**Date** June 12, 2018

**To** Joseph Lhota, Chairman, MTA

**From** Andy Byford, President, NYC Transit

**Re** **Response To New York City Comptroller Letter Report #SZ18-117A**

Buses management agrees with the audit recommendation to *“periodically perform tests to ensure that their wireless network and USB charging capabilities, once installed, are functioning properly”*.

cc: D. Irick  
M. Ribosh  
S. Nair  
J. Higgins  
R. Grey-Stewart