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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 Queens Buses Phase I (Audit Number SZ17-134AL)**

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 Queens, New York. The objective of this audit was to determine whether the telecommunication services that have been installed in the Metropolitan Transportation Authority (MTA) buses in Queens enable Wi-Fi and USB charging capabilities and are operating effectively.¹ This is the first 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 on the MTA bus system.² 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

¹ The term "MTA buses" refers to the fleets owned and operated by both the New York City Transit Authority's Department of Buses (DOB) and the 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.

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

integrate an onboard public Wi-Fi system.³ 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) 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 the NYCTA and 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. The MTA intends that the new buses will include free Wi-Fi hotspots and 35-55 USB charging ports located throughout each bus.⁴ 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."⁵

In May 2016, the MTA began putting the first 75 new-look buses, equipped with Wi-Fi service and USB charging ports, into service.⁶ The service began in Queens along the Q10 bus route between the JFK Depot and the Baisley Park Depot, and along the Q111, Q113 and Q114 bus routes; all 75 buses were in service on those routes by December 2017. In the interim, in March 2017, the first of 43 new-look Select Bus Service (SBS) buses arrived at the Casey Stengel Depot in Queens and went into service along the Q44 bus route.⁷ Table I below shows the timetable for the deployment of 367 new-look regular and new-look SBS buses in Phase I.

³ The NYCTA is a subsidiary of the MTA that owns, operates, and repairs the buses. The MTA purchased the new-look buses and has the contract with Verizon Wireless.

⁴ The number of USB ports will range from 35 to 55 depending on the make and model of the buses.

⁵ *Governor Cuomo Announces Roll Out of New Buses with Wifi and USB Charging Ports in the Bronx*, March 21, 2017 press release (updated announcement for Bronx Wi-Fi Buses).

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

⁷ Select Bus Service 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

Borough	Date Service Began	Service Completed	Number of Buses	Type of Bus	Routes	Depot(s)
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	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
TOTAL			367 buses		39 routes	

The remaining 1,675 new-look buses will be assigned to various routes throughout the five boroughs from 2018 through 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 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 209 express buses in Queens were retrofitted with both Wi-Fi and USB charging ports as of December 2017.

Audit Findings

We found that, overall, the telecommunication services provided by Verizon Wireless are generally operating as intended in the MTA’s Queens buses. We tested 144 MTA buses in Queens with Wi-Fi and/or USB capability, which consisted of all 76 new-look buses and 68 express buses.

Our tests showed that the MTA Wi-Fi network operated effectively on 122 of the 139 buses that were equipped with Wi-Fi (88 percent).⁸ On those buses, we were able to connect to the wireless network and browse various news, entertainment and social media websites. 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 in all 76 new-look buses in Queens and sampled 68 of the 209 Queens express buses for a total of 8,124 ports.⁹ We found that 8,018 of the 8,124 USB charging ports 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 76 new-look buses in Queens were equipped with both Wi-Fi and USB charging ports. We found that the MTA's Wi-Fi network operated effectively on 65 of 76 of the new-look buses (86 percent), 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 11 of 76 of the new look buses (14 percent).

Table II

Testing of the WI-FI on the MTA's New-Look Buses in Queens

Route	Type of Bus	Number of Buses	Number of Buses With Working Wi-Fi	Percentage of Buses With Working Wi-Fi	Number of Buses Without Working Wi-Fi	Percentage of Buses Without Working Wi-Fi
Q10	New-Look	15	9	60%	6	40%
Q44	New-Look	15	13	87%	2	13%
Q111	New-Look	11	10	90%	1	10%
Q113	New-Look	6	5	83%	1	17%
Q114	New-Look	7	6	86%	1	14%
Garaged/Parked at the Baisley Park Depot	New-Look	22	22	100%	0	0%
TOTAL		76	65	86%	11	14%

⁸ Of the 68 express buses we tested, 63 express were equipped with both Wi-Fi and USB ports during the time of our inspection; the other 5 express buses were equipped with USB ports only.

⁹ The new-look buses average 55 USB ports each (76 x55), while the express buses average 58 USB ports each (68 x58), for a total of 8,124 USB ports tested.

Our USB port testing described earlier included 4,180 USB ports tested on the new-look buses. We found that 4,110 (98 percent) of those 4,180 USB charging ports were operating as intended, in that we were able to connect and charge our phones utilizing the buses' USB ports. We also found that 70 of the 4,180 USB ports (2 percent) were not operational.

Further, we found that 63 of the 68 express buses were equipped with both Wi-Fi and USB charging ports, and 5 had only USB charging ports at the time of inspection. We tested the 63 Wi-Fi capable express buses and found that the Wi-Fi network operated effectively on 57 of them (90 percent). On those 57 buses we were able to establish a connection and browse various websites including news, entertainment, and social media on the Wi-Fi network. However, we found that the Wi-Fi network did not operate on 6 (10 percent) of the 63 express buses we tested. (See Table III below.)

TABLE III

Testing of the WI-FI on the Queens Express Buses

Route	Type of Bus	Number of Buses	Number of Buses With Working Wi-Fi	Percentage of Express Buses With Working Wi-Fi	Number of Buses Without Working Wi-Fi	Percentage of Express Buses Without Working Wi-Fi
Garaged/Parked at the Baisley Park Depot (QM4 and QM21)	Express	12	6	50%	6	50%
Garaged/Parked at the College Point Depot (BxM9, QM1, QM2, QM3, QM5, QM6, QM7, QM8, QM10, QM11, QM12, and QM20)	Express	51	51	100	0	0
TOTAL		63	57	90%	6	10%

In addition, we tested the USB charging ports on 68 express buses that were so equipped. We found that 3,908 of the 3,944 USB ports (99 percent) operated as intended and that 36 (1 percent) of the ports did not.

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 34 buses in which we previously found issues and retested the Wi-Fi connectivity and USB charging capability. In all 34 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 Queens 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 spreadsheets submitted by MTA that included the bus numbers, bus models, and bus depots in Queens with fully operational Wi-Fi connectivity and/or USB charging ports. To determine the reliability of the list provided we tested 144 buses in Queens (all of the 76 Queens new-look buses and 68 of the 209 express buses) that were listed as having Wi-Fi and/or 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 Queens along the Q10, Q44, Q111, Q113, and Q114 bus routes and buses garaged at the Baisley Park and College Point bus depots that were listed by MTA as having Wi-Fi connectivity and/or USB charging ports. Our testing was conducted between June 22, 2017 and March 2, 2018. During our testing, we established a Wi-Fi connection and connected the phones to various USB charging ports on each 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 being tested, the auditors signed into the MTA's Wi-Fi network along bus routes and on buses garaged at the bus depots. The auditors 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 whether 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 the USB charging ports were operational at all times. In addition, the auditors tested service in inclement weather to determine its effect on Wi-Fi and cellular service.

The matters covered in this letter report were discussed with MTA and NYCTA officials during and at the conclusion of the audit. A preliminary draft letter report was sent to the MTA and NYCTA and discussed at an exit conference on May 11, 2018. On May 30, 2018, we submitted a draft letter report and provided the MTA and the NYCTA with the opportunity to formally respond. The MTA's and the NYCTA's written responses were received on June 25, 2018. In their written responses, the MTA and the NYCTA agreed with the report's one recommendation, and the 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 the 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, NYCTA
- 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
- 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, Acting 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 #SZ17-134A (Telecommunication Services on the MTA's Queens 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 Lhota".

Joseph J. Lhota

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

Attachment

Memorandum



New York City Transit

Date June 12, 2018

To Joseph Lhota, Chairman, MTA

From Andy Byford, President, NYC Transit

Re **Response To New York City Comptroller Letter Report #SZ18-134A**

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