



CITY OF NEW YORK
OFFICE OF THE COMPTROLLER
SCOTT M. STRINGER

MARJORIE LANDA
DEPUTY COMPTROLLER FOR
AUDIT

BUREAU OF AUDIT

October 27, 2017

By Electronic Mail

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

Re: Final Letter Audit Report on Phases V and VI of the Wireless Voice and Data Service in New York City's Subway System as Provided by Transit Wireless (Audit Number SZ18-063A)

Dear Chairman Lhota:

This Final Letter Report contains the findings of our audit of the Wireless Voice and Data Service in New York City's subway system as provided by Transit Wireless ("TW"). The audit's objective was to determine whether the wireless voice and data communications system installed by TW within certain New York City subway stations (including platforms, mezzanines, and various points within public access passageways) operates effectively. This audit is the fifth in a series of audits of the ongoing installation of cellular and wireless services in the New York City subway system.

Through our audit, we found that the wireless voice and data communications system installed in the 37 Phase V and in the 45 Phase VI underground Manhattan and Bronx subway stations was operating as intended. In addition, we also examined *Subway Reads*, a partnership between the Metropolitan Transportation Authority ("MTA") New York City Transit ("NYCT"), TW and Penguin Random House, that brings free electronic books through free wireless internet services to the underground subway system, and found that it also works as planned. Accordingly, based on this audit and our earlier audits of Phases I through IV of TW's installation of wireless voice and data communications, we found that, as of September 19, 2017, all 227 stations in Phases I through VI were operating as intended.

Background

In 2007, following a request for proposals, the MTA's Board entered into an agreement with TW that granted it an exclusive license to provide commercial cellular/PCS and Wi-Fi service in 277 underground subway stations. Under the agreement, TW acts as a neutral host, constructing the distributed antenna system within the stations (excluding the tunnels between stations) and sub-licenses rights to use that system to cellular carriers, Wi-Fi providers, and other network users.

TW installs equipment and antennas at each underground station to provide cellular and Wi-Fi coverage throughout public areas. The in-station equipment and antennas are linked by fiber optic cables to TW trunk fiber optic cables, which run through the streets and connect back to a base station hotel (hub) that houses the head-end equipment for TW, the cellular carriers, Wi-Fi providers, and NYCT.

In addition, in August 2016, the MTA, NYCT and TW partnered with Penguin Random House to begin *Subway Reads*, a service that allows subway riders free access to five full-length e-short stories and excerpts from a total of 175 full-length books in categories such as fiction, non-fiction, sci-fi and fantasy, and young adults and children. Subway riders can access this material for periods of 10, 20, or 30 minutes each, and they also have the ability to purchase an e-book in its entirety through this service.

TW installed the wireless network in 47 underground subway stations in Manhattan as part of Phase I (previous Audit Number SZ15-062AL), including major station complexes such as Times Square and Grand Central; 29 stations in Queens as part of Phase II (previous Audit Number SZ16-086AL); 38 additional stations in Manhattan, including the Fulton Street Terminal Center, as part of Phase III (previous Audit Number SZ17-095AL); 36 additional Manhattan and Bronx stations as part of Phase IV; and more recently in 35 additional Manhattan and Brooklyn stations as part of Phase V, as well as 42 additional Brooklyn and Manhattan stations as part of Phase VI (the subjects of this audit). Phase VII is underway and includes stations in lower Manhattan and Brooklyn. TW is contractually required to have all 277 underground stations in New York City in service by the end of 2017. However, in its responses to our earlier audits of Phase III and Phase IV, the MTA stated that all 277 underground subway stations would have the wireless network installed by December 31, 2016, almost one year ahead of schedule. Therefore, we will continue to audit the wireless voice and data communications system installed by TW in the remaining stations scheduled to be completed in Phase VII.

Conclusion

We found that the wireless voice and data communications system currently installed by TW within the 35 Phase V and 42 Phase VI subway stations between March 29, 2017 and September 10, 2017 (including platforms, mezzanines, and various points within public access passageways) is operating as intended. In addition, during the same time, we revisited the 47 stations previously tested in Phase I, the 29 stations previously tested in Phase II, the 38 stations previously tested in Phase III and the 36 stations previously tested in Phase IV. We found the wireless network still operational and were able to establish an immediate Wi-Fi connection. Further, we were able to download *Subway Reads* e-books from the Penguin Random House site at the appropriate stations. As of September 19, 2017, all 227 stations in Phases I through VI were operating as intended. We recommend that the MTA, NYCT and TW continue their current plan to provide voice and data service to the remaining 50 underground New York City subway stations.

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 scope period of this audit was March 20, 2017, through September 19, 2017. Our audit reviewed all 227 stations from Phases I to VI that were reportedly operational in our scope period.

To meet our objective, auditors equipped with laptops and cellular phones visited the 227 stations that were listed on NYCT and TW websites as having Wi-Fi service, established a Wi-Fi connection, and completed cellular calls (911 service was not tested). At each station location, auditors took screenshots showing Wi-Fi connectivity on the laptop and emailed them to Comptroller email addresses. Initial visits to the 35 stations in Phase V and 42 stations in Phase VI took place between March 29, 2017 and May 16, 2017. Subsequent visits to stations were completed as of September 19, 2017.

- To determine whether the voice (cellular) service was active, the auditors made phone calls to the Comptroller’s office and either spoke to other employees or left voice messages.
- To determine whether the text messaging features were available, the auditors sent text messages to other cellular devices while in the train stations and on the train (if the next station was listed as being equipped with service).
- To determine the accessibility of social media websites, the auditors downloaded Yahoo, Google, Facebook, Twitter and Snapchat to cellular devices and attempted to read mail and send messages. The auditors also accessed Netflix, Pandora, Hulu, Tunein, Crackle, Vudu and YouTube to determine if it was possible to watch movies, play music and stream videos. The auditors also used laptops to test social media applications and video streaming while in the subway stations and on platforms.
- To determine whether the *Subway Reads* service was working, the auditors downloaded excerpts from fiction, non-fiction, sci-fi and fantasy, young adult and children’s books within the various time allotments of 30 minutes, 20 minutes, and 10 minutes.

- In order to determine which stations had been chosen to have wireless service during our scope period, we reviewed the MTA Board Action Items and station listings, as well as the MTA's and TW's websites. In addition, we received from the MTA a listing of stations by phases.

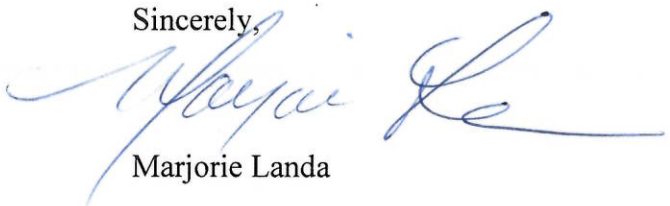
Testing was performed Monday through Sunday at various times from 6 a.m. to 12 a.m., to ensure that Wi-Fi and cellular service were available. In addition, the auditors tested service in inclement weather to determine the effect on Wi-Fi and cellular service. (See Appendices I, II, III, IV, V and VI for a listing of stations and services available.)

Based on our positive conclusion, we recommend that the MTA, NYCT and TW continue their current plan to provide voice and data service to the remaining 50 underground New York City subway stations.

On October 3, 2017, we submitted a draft letter report providing MTA and NYCT officials with the opportunity to formally respond. The MTA's and NYCT's responses were received on October 19, 2017 for Phase V and Phase VI Transit Wireless audits. In their written responses, the MTA and NYCT agreed with the report. NYCT stated, "In response to the Office of the Comptroller's audit of Phases V and VI of the wireless voice and data service, we are in agreement with the findings. Further, we are pleased that the auditors have found the system to be as functional and as easy to use as intended. MTA New York City Transit welcomes this opportunity to extend this desirable service to its customers."

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

Sincerely,



Marjorie Landa

c: Patrick Foye, President, Office of the Chairman, MTA
Veronique Hakim, Managing Director, Office of the Chairman, MTA
Tim Mulligan, Acting President, NYC Transit Authority
Donna M. Evans, MTA, Chief of Staff
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

October 19, 2017

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 #SZ18-063A (Phases V and VI of the Wireless Voice and Data Service in New York City's Subway System as Provided by Transit Wireless)

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 Tim Mulligan, Acting President, NYC Transit, which address this report.

Sincerely,

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

Joseph J. Lhota

c: Donna M. Evans, MTA Chief of Staff
Michael J. Fucilli, Auditor General, MTA Audit Services

Attachment

2 Broadway
New York, NY 10004-2207
646 252-5800 Tel
646 252-5815 Fax

Tim Mulligan
Acting President

ADDENDUM
page 2 of 2



New York City Transit

October 11, 2017

Mr. Joseph J. Lhota
Chairman
Metropolitan Transportation Authority
2 Broadway, 20th Floor
New York, New York 10004

Re: Draft Letter Audit Report on Phases V and VI of the Wireless Voice and Data Service in New York City's Subway System as Provided by Transit Wireless (Audit Number SZ18-063A)

Dear Chairman Lhota:

In response to the Office of the Comptroller's audit of Phases V and VI of the wireless voice and data service, we are in agreement with the findings. Further, we are pleased that the auditors have found the system to be as functional and as easy to use as intended. MTA New York City Transit welcomes this opportunity to extend this desirable service to its customers.

Sincerely,

A handwritten signature in black ink, appearing to read "Tim Mulligan", with a long, wavy horizontal line extending to the right.

Tim Mulligan
Acting President

cc: Veronique Hakim
Michael Fucilli

Listing of Stations and Dates Tested

Phase V 35 Stations Tested as of September 19, 2017

	Station Name	Line Tested	Dates Tested	Cellular Voice*	Cellular Voice	Social Media	Wi-Fi	Music/Video Streaming
1	8th st	R	4/20/2017, 8/9/17, 08/30/2017, 09/12/2017	YES	YES	YES	YES	YES
2	Canal St (UL)	N Q R	4/20/2017, 8/9/17, 09/12/2017, 09/14/2017	YES	YES	YES	YES	YES
**	Canal St (LL)	N Q R	4/20/2017, 8/9/17, 08/30/2017, 09/12/2017	YES	YES	YES	YES	YES
3	City Hall	R	4/20/2017, 8/9/17, 08/30/2017, 09/12/2017	YES	YES	YES	YES	YES
4	Rector St	R	4/20/2017, 8/9/17, 08/30/2017, 09/12/2017	YES	YES	YES	YES	YES
5	Bowery	J M Z	4/5/2017, 8/9/17, 08/18/2017	YES	YES	YES	YES	YES
6	Canal St	J M Z	4/5/2017, 8/9/17, 08/18/2017, 08/27/2017	YES	YES	YES	YES	YES
7	Chambers St	J M Z	4/5/2017, 8/9/17, 08/18/2017, 08/21/2017	YES	YES	YES	YES	YES
8	Broad St	J Z	4/5/2017, 8/9/17, 08/20/2017	YES	YES	YES	YES	YES
9	3rd Ave	L	3/30/2017, 8/11/17, 09/05/2017, 09/06/2017	YES	YES	YES	YES	YES
10	1st Ave	L	3/30/2017, 8/11/17, 09/05/2017, 09/06/2017	YES	YES	YES	YES	YES
11	Bedford Ave	L	3/30/2017, 8/11/17, 09/05/2017, 09/06/2017	YES	YES	YES	YES	YES
12	Lorimer St	L	3/30/2017, 8/11/17, 09/05/2017, 09/06/2017	YES	YES	YES	YES	YES
13	Graham Ave	L	3/30/2017, 8/11/17, 09/05/2017, 09/06/2017	YES	YES	YES	YES	YES
14	W. 4th St	A B C D E F	3/31/2017, 07/22/2017, 8/9/17, 09/16/2017	YES	YES	YES	YES	YES
15	Spring St.	C E	3/31/2017, 07/22/2017, 8/10/17, 09/16/2017	YES	YES	YES	YES	YES
16	Canal St	A C E	3/31/2017, 07/22/2017, 8/9/17, 09/13/2017	YES	YES	YES	YES	YES
17	Chambers St	A C E	3/31/2017, 07/22/2017, 8/10/17, 09/16/2017	YES	YES	YES	YES	YES
**	World Trade Center	E	3/31/2017, 07/22/2017, 8/10/17, 09/06/2017, 09/13/2017	YES	YES	YES	YES	YES
18	Broadway-Lafayette	F	4/18/2017, 07/23/2017, 07/31/2017, 8/17/17	YES	YES	YES	YES	YES

PHASE V

19	Grand St.	B D	4/18/2017,07/22/2017, 8/18/17, 09/16/2017	YES	YES	YES	YES	YES
20	Greenpoint Ave	G	5/16/2017,08/13/2017, 8/17/17, 08/24/2017	YES	YES	YES	YES	YES
21	Nassau Ave	G	5/16/2017,08/13/2017, 8/17/17, 08/24/2017	YES	YES	YES	YES	YES
22	Metropolitan Ave	G	5/16/2017,08/13/2017, 8/17/17, 08/24/2017	YES	YES	YES	YES	YES
23	Canal St	1	3/29/2017, 8/8/17, 08/10/2017, 09/09/2017	YES	YES	YES	YES	YES
24	Franklin St	1	3/29/2017, 8/8/17, , 08/10/2017, 09/09/2017	YES	YES	YES	YES	YES
25	Chambers St	1 2 3	3/29/2017, 8/8/17, 08/10/2017, 08/28/2017	YES	YES	YES	YES	YES
26	Rector St	1	3/29/2017, 8/8/17, 08/10/2017, 09/09/2017	YES	YES	YES	YES	YES
27	Park Place	2 3	4/10/2017, 8/8/17, 08/21/2017, 08/31/2017	YES	YES	YES	YES	YES
28	Wall St	2 3	4/10/2017, 8/8/17, 08/21/2017, 08/31/2017	YES	YES	YES	YES	YES
29	Astor Place	6	4/7/2017, 07/26/2017, 8/9/17, 08/24/2017	YES	YES	YES	YES	YES
30	Bleecker St	6	4/7/2017, 07/22/2017, 8/9/17	YES	YES	YES	YES	YES
31	Spring St	6	4/7/2017, 07/22/2017, 8/9/17	YES	YES	YES	YES	YES
32	Canal St	6	4/7/2017, 07/22/2017, 8/9/17	YES	YES	YES	YES	YES
33	Brooklyn Bridge/Chambers ST	4 5 6	4/7/2017, 07/24/2017, 8/9/17, 08/28/2017	YES	YES	YES	YES	YES
34	Wall St	4 5	4/11/2017, 8/9/17, 08/27/2017, 08/28/2017					
35	Bowling Green	4 5	4/11/2017, 07/24/2017, 8/9/17, 08/28/2017	YES	YES	YES	YES	YES
<p>*This listing includes stations that have AT&T, T-Mobile Verizon Wireless, and Sprint service. ** Entrance at the same station.</p>								

Listing of Stations and Dates Tested

Phase VI 42 Stations Tested as of September 19, 2017

	Station Name	Line Tested	Dates Tested	Cellular Voice*	Cellular Voice	Social Media	Wi-Fi	Music/Video Streaming
1	Court St.	M R	4/18/2017, 07/29/2017, 8/9/17	YES	YES	YES	YES	YES
2	Lawrence St	M R	8/9/2017, 08/30/2017, 09/11/2017	YES	YES	YES	YES	YES
3	Dekalb Ave	B Q M R	4/18/2017, 07/22/2017, 8/9/17, 09/13/2017, 09/16/2017	YES	YES	YES	YES	YES
4	Grand St	L	3/30/2017, 8/11/17, 09/05/2017, 09/06/2017	YES	YES	YES	YES	YES
5	Montrose Ave	L	3/30/2017, 8/11/17, 09/05/2017, 09/06/2017	YES	YES	YES	YES	YES
6	Morgan Ave	L	3/30/2017, 8/11/17, 09/05/2017, 09/06/2017	YES	YES	YES	YES	YES
7	Jefferson St	L	3/30/2017, 8/11/17, 09/05/2017, 09/06/2017	YES	YES	YES	YES	YES
8	Dekalb Ave	L	3/30/2017, 8/11/17, 09/05/2017, 09/06/2017	YES	YES	YES	YES	YES
9	Myrtle Ave	L	3/30/2017, 8/11/17, 09/05/2017, 09/06/2017	YES	YES	YES	YES	YES
10	Halsey St	L	3/30/2017, 8/11/17, 09/05/2017, 09/06/2017	YES	YES	YES	YES	YES
11	Wilson Ave	L	3/30/2017, 8/11/17, 09/05/2017, 09/06/2017	YES	YES	YES	YES	YES
12	Bushwick Ave	L	3/30/2017, 8/11/17, 09/05/2017, 09/06/2017	YES	YES	YES	YES	YES
13	34th St	A C E	3/31/2017, 07/22/2017, 8/10/17, 09/16/2017	YES	YES	YES	YES	YES
14	High St	A C	4/5/2017, 07/22/2017, 09/16/2017	YES	YES	YES	YES	YES
15	Jay St-Boro Hall / PBX2	A C F	4/5/2017, 07/22/2017, 09/16/2017	YES	YES	YES	YES	YES
16	Hoyt-Schermerhorn	A C G	4/5/2017, 07/22/2017, 09/16/2017	YES	YES	YES	YES	YES
17	Lafayette Ave	A C	4/5/2017, 07/22/2017, 09/16/2017	YES	YES	YES	YES	YES
18	Clinton &. Washindton	A C	4/5/2017, 07/22/2017, 09/16/2017	YES	YES	YES	YES	YES
19	Franklin Ave	A C	4/5/2017, 07/22/2017, 09/16/2017	YES	YES	YES	YES	YES
20	Nostrand Ave	A C	4/5/2017, 07/22/2017, 09/16/2017	YES	YES	YES	YES	YES

PHASE VI

21	Kingston-Throop	A C	4/5/2017, 07/22/2017, 09/16/2017	YES	YES	YES	YES	YES
22	Utica Ave	A C	4/5/2017, 07/22/2017, 09/16/2017	YES	YES	YES	YES	YES
23	Ralph Ave	A C	4/5/2017, 07/22/2017, 09/16/2017	YES	YES	YES	YES	YES
24	Rockaway Ave	A C	4/5/2017, 07/22/2017, 09/16/2017	YES	YES	YES	YES	YES
25	Broadway-ENY	A C	4/5/2017, 07/22/2017, 09/16/2017	YES	YES	YES	YES	YES
26	Liberty Ave	A C	4/5/2017, 07/22/2017, 09/16/2017	YES	YES	YES	YES	YES
27	Van Siclen Ave	A C	4/5/2017, 07/22/2017, 09/16/2017	YES	YES	YES	YES	YES
28	Shepherd Ave	A C	4/5/2017, 07/22/2017, 09/16/2017	YES	YES	YES	YES	YES
29	Euclid Ave	A C	4/5/2017, 07/22/2017, 09/16/2017	YES	YES	YES	YES	YES
30	Grant Ave	A	4/5/2017, 07/22/2017, 09/16/2017	YES	YES	YES	YES	YES
31	York St	F	4/20/2017, 07/23/2017, 07/31/2017, 8/17/17	YES	YES	YES	YES	YES
32	Bergen St	F G	5/16/2017, 07/23/2017, 07/31/2017, 8/17/17	YES	YES	YES	YES	YES
33	Carroll St	F G	5/16/2017, 07/23/2017, 07/31/2017, 8/17/17	YES	YES	YES	YES	YES
34	Broadway	G	5/16/2017, 08/13/2017, 8/17/17, 08/24/2017	YES	YES	YES	YES	YES
35	Flushing Ave	G	5/16/2017, 08/13/2017, 8/17/17, 08/24/2017	YES	YES	YES	YES	YES
36	Myrtle-Willoughby	G	5/16/2017, 08/13/2017, 8/17/17, 08/24/2017	YES	YES	YES	YES	YES
37	Bedford/Nostrand	G	5/16/2017, 08/13/2017, 8/17/17, 08/24/2017	YES	YES	YES	YES	YES
38	Classon Ave	G	5/16/2017, 08/13/2017, 8/17/17, 08/24/2017	YES	YES	YES	YES	YES
39	Clinton-Washington	G	5/16/2017, 08/13/2017, 8/17/17, 08/24/2017	YES	YES	YES	YES	YES
40	Fulton St	G	5/16/2017, 08/13/2017, 8/17/17, 08/24/2017	YES	YES	YES	YES	YES
**	34th St	1 2 3	3/29/2017, 8/8/17, 08/10/2017, 08/28/2017	YES	YES	YES	YES	YES
41	Clark St	2 3	4/10/2017, 8/8/17, 08/21/2017, 08/31/2017	YES	YES	YES	YES	YES
**	Borough Hall	4 5	5/18/2017, 07/24/2017, 8/8/17, 08/28/2017	YES	YES	YES	YES	YES
42	Hoyt St	2 3	4/10/2017, 8/8/17, 08/21/2017, 08/31/2017	YES	YES	YES	YES	YES

PHASE VI

**	Borough Hall	2 3	4/10/2017, 8/8/17, 08/21/2017, 08/31/2017	YES	YES	YES	YES	YES
<p>*This listing includes stations that have AT&T, T-Mobile Verizon Wireless, and Sprint service. ** Entrance at the same station.</p>								

Listing of Stations and Dates Tested

Phase I 47 Stations Retested as of September 19, 2017

	Station Name	Line Tested	Dates Tested	Cellular Voice*	Cellular Voice	Social Media	Wi-Fi	Music/Video Streaming
1	8th Av	L	3/30/2017, 8/11/2017	YES	YES	YES	YES	YES
2	6th Av	1 2 3 L F M	3/30/2017, 8/11/2017	YES	YES	YES	YES	YES
3	23rd St	C E	3/31/2017, 8/10/2017	YES	YES	YES	YES	YES
4	14th St	A C E	3/31/2017, 8/10/2017	YES	YES	YES	YES	YES
5	14th St	F M	04/18/17	YES	YES	YES	YES	YES
6	14th St	1 2 3	3/29/2017, 8/8/2017	YES	YES	YES	YES	YES
7	5th Ave	N R	4/20/2017, 8/18/17	YES	YES	YES	YES	YES
8	57th St	N Q R	4/20/2017, 8/18/17	YES	YES	YES	YES	YES
9	49th St	N R	4/20/2017, 8/18/17	YES	YES	YES	YES	YES
10	Times Square	N Q R	4/20/2017, 8/18/17	YES	YES	YES	YES	YES
11	28th St	R	4/20/2017, 8/18/17	YES	YES	YES	YES	YES
12	23rd St	R	4/20/2017, 8/18/17	YES	YES	YES	YES	YES
13	96th St	B C	4/4/2017, 8/18/17	YES	YES	YES	YES	YES
14	86th St	B C	4/4/2017, 8/18/17	YES	YES	YES	YES	YES
15	81st St	B C	4/4/2017, 8/18/17	YES	YES	YES	YES	YES
16	72nd St	B C	4/4/2017, 8/18/17	YES	YES	YES	YES	YES
17	59th St	A B C	4/4/2017, 8/18/17	YES	YES	YES	YES	YES
18	50th St	C E	3/31/2017, 8/18/17	YES	YES	YES	YES	YES
19	42nd St	A C E	3/31/2017, 8/18/17	YES	YES	YES	YES	YES
20	57th St	F	4/18/2017, 8/18/17	YES	YES	YES	YES	YES

21	47-50 St Rock Ctr	B D F M	4/17/2017, 8/17/17	YES	YES	YES	YES	YES
22	5th Ave	E	3/31/2017, 8/10/17	YES	YES	YES	YES	YES
23	7th Ave	B D E	3/31/2017, 8/10/17	YES	YES	YES	YES	YES
24	96th St	1 2 3	3/29/2017, 8/8/17	YES	YES	YES	YES	YES
25	86th St	1	3/29/2017, 8/8/17	YES	YES	YES	YES	YES
26	79th St	1	3/29/2017, 8/8/17	YES	YES	YES	YES	YES
27	72nd St	1 2 3	3/29/2017, 8/8/17	YES	YES	YES	YES	YES
28	66th St	1	3/29/2017, 8/8/17	YES	YES	YES	YES	YES
29	59th St	1	3/29/2017, 8/8/17	YES	YES	YES	YES	YES
30	50th St	1	3/29/2017, 8/8/17	YES	YES	YES	YES	YES
31	Times Square	1 2 3	3/29/2017, 8/8/17	YES	YES	YES	YES	YES
32	28th St	1	5/18/2017, 8/8/17	YES	YES	YES	YES	YES
33	23rd St	1	5/18/2017, 8/8/17	YES	YES	YES	YES	YES
34	18th St	1	5/18/2017, 8/8/17	YES	YES	YES	YES	YES
35	Times Square	7	4/11/2017, 8/8/17	YES	YES	YES	YES	YES
36	Times Square	S	4/20/2017, 8/17/17	YES	YES	YES	YES	YES
37	34th St	N Q R	4/20/2017, 8/18/17	YES	YES	YES	YES	YES
38	42nd St	B D F M	4/18/2017, 08/17/17	YES	YES	YES	YES	YES
39	34th St	B D F M	4/18/2017, 08/17/17	YES	YES	YES	YES	YES
40	23rd St	F M	4/18/2017, 08/17/17	YES	YES	YES	YES	YES
41	Grand Central	4 5 6	4/7/2017, 08/09/17	YES	YES	YES	YES	YES
42	33rd St	6	4/7/2017, 08/09/17	YES	YES	YES	YES	YES
43	28th St	6	4/7/2017, 08/09/17	YES	YES	YES	YES	YES
44	23rd St	6	4/7/2017, 08/09/17	YES	YES	YES	YES	YES

PHASE I

45	Grand Central	7	4/11/2017, 08/08/17	YES	YES	YES	YES	YES
46	5th Ave	7	4/11/2017, 08/08/17	YES	YES	YES	YES	YES
47	Grand Central	S	4/20/2017, 08/17/17	YES	YES	YES	YES	YES
*This listing includes stations that have AT&T, Verizon Wireless, and Sprint service.								

Listing of Stations and Dates Tested

Phase II 29 Stations Retested as of September 19 , 2017

	Station Name	Line Tested	Dates Tested	Cellular Voice*	Cellular Voice	Social Media	Wi-Fi	Music/Video Streaming
1	21st St	F	4/20/2017, 08/11/17	YES	YES	YES	YES	YES
2	179th St	F	4/20/2017, 08/11/17	YES	YES	YES	YES	YES
3	169th St	F	4/20/2017, 08/11/17	YES	YES	YES	YES	YES
4	Parsons Blvd	F	4/20/2017, 08/11/17	YES	YES	YES	YES	YES
5	Sutphin Blvd	F	4/20/2017, 08/11/17	YES	YES	YES	YES	YES
6	Van Wyck Blvd	E F	4/20/2017, 08/11/17	YES	YES	YES	YES	YES
7	Union Turnpike	E F	3/31/2017, 08/09/17	YES	YES	YES	YES	YES
8	75th Ave	E F	4/20/2017, 08/11/17	YES	YES	YES	YES	YES
9	71st Ave	E F M R	3/31/2017, 08/09/17	YES	YES	YES	YES	YES
10	67th Ave	M R	3/31/2017, 08/09/17	YES	YES	YES	YES	YES
11	63rd Drive	M R	3/31/2017, 08/09/17	YES	YES	YES	YES	YES
12	Woodhaven Blvd	M R	3/31/2017, 08/09/17	YES	YES	YES	YES	YES
13	Grand Ave	M R	3/31/2017, 08/09/17	YES	YES	YES	YES	YES
14	Elmhurst Ave	M R	3/31/2017, 08/09/17	YES	YES	YES	YES	YES
15	Roosevelt Ave	E F M R	3/31/2017, 5/16/17	YES	YES	YES	YES	YES
16	65th St	M R	3/31/2017, 08/09/17	YES	YES	YES	YES	YES
17	Northern Blvd	M R	3/31/2017, 08/09/17	YES	YES	YES	YES	YES
18	46th St	M R	3/31/2017, 08/09/17	YES	YES	YES	YES	YES
19	Steinway St	M R	3/31/2017, 08/09/17	YES	YES	YES	YES	YES
20	36th St	M R	3/31/2017, 08/09/17	YES	YES	YES	YES	YES

21	Queens Plaza	E M R	3/31/2017, 08/09/17	YES	YES	YES	YES	YES
22	Ely Ave-23rd	E M	3/31/2017, 08/10/17	YES	YES	YES	YES	YES
23	Parsons Blvd	E J Z	3/31/2017, 8/9/17	YES	YES	YES	YES	YES
24	Sutphin Blvd	E J Z	3/31/2017, 08/09/17	YES	YES	YES	YES	YES
25	Jamaica-Van Wyck	E	3/31/2017, 08/09/17	YES	YES	YES	YES	YES
26	Court Square	G	5/16/2017, 08/17/17	YES	YES	YES	YES	YES
27	21st St/Van Alst Ave	G	5/16/2017, 08/17/17	YES	YES	YES	YES	YES
28	Hunters Point	7	4/11/2017, 08/08/17	YES	YES	YES	YES	YES
29	Vernon-Jackson	7	4/11/2017, 08/08/17	YES	YES	YES	YES	YES
*This listing includes stations that have AT&T, T-Mobile Verizon Wireless, and Sprint service.								

Listing of Stations and Dates Tested

Phase III 38 Stations Retested as of September 19, 2017

	Station Name	Line Tested	Dates Tested	Cellular Voice*	Cellular Voice	Social Media	Wi-Fi	Music/Video Streaming
1	Cortland St	R	04/20/17	YES	YES	YES	YES	YES
2	Essex St	J M Z	4/5/2017, 8/9/17	YES	YES	YES	YES	YES
3	Fulton St	J M Z	4/5/2017, 8/9/17	YES	YES	YES	YES	YES
4	207th St	A	04/04/17	YES	YES	YES	YES	YES
5	Dyckman St	A	04/04/17	YES	YES	YES	YES	YES
6	190th St	A C	04/04/17	YES	YES	YES	YES	YES
7	181st St.	A	04/04/17	YES	YES	YES	YES	YES
8	175th St	A	04/04/17	YES	YES	YES	YES	YES
9	163rd St	C	4/4/2017, 8/17/17	YES	YES	YES	YES	YES
10	155th St	C	4/4/2017, 8/17/17	YES	YES	YES	YES	YES
11	145th St mezzanine	A B C D	4/4/2017, 8/18/17	YES	YES	YES	YES	YES
12	135th St	B C	4/4/2017, 8/18/17	YES	YES	YES	YES	YES
13	125th St	A B C D	4/4/2017, 8/18/17	YES	YES	YES	YES	YES
14	116th St	B C	4/4/2017, 8/17/17	YES	YES	YES	YES	YES
15	110th St	B C	4/4/2017, 8/17/17	YES	YES	YES	YES	YES
16	103rd St	B C	4/4/2017, 8/17/17	YES	YES	YES	YES	YES
17	Broadway-Nassau	A C	04/04/17	YES	YES	YES	YES	YES
18	155th St	B D	4/17/2017, *8/8/17, 8/17/17	YES	YES	YES	YES	YES
19	2nd Ave	F	4/20/2017, 8/17/17	YES	YES	YES	YES	YES
20	Delancey St	F	4/20/2017, 8/18/17	YES	YES	YES	YES	YES

21	East Broadway	F	4/20/2017, 8/17/17	YES	YES	YES	YES	YES
22	191st St	1	3/29/2017, 8/8/17	YES	YES	YES	YES	YES
23	157th St	1	3/29/2017, 8/8/17	YES	YES	YES	YES	YES
24	145th St	1	3/29/2017, 8/8/17	YES	YES	YES	YES	YES
25	137th St	1	3/29/2017, 8/8/17	YES	YES	YES	YES	YES
26	116th St	1	3/29/2017, 8/8/17	YES	YES	YES	YES	YES
27	110th St	1 1	3/29/2017, 8/8/17	YES	YES	YES	YES	YES
28	103rd St		3/29/2017, 8/8/17	YES	YES	YES	YES	YES
29	Fulton St	2 3	4/10/2017, 8/8/17	YES	YES	YES	YES	YES
30	Fulton St	4 5	4/11/2017, 8/9/17	YES	YES	YES	YES	YES
31	148th St	3	4/11/2017, 8/8/17	YES	YES	YES	YES	YES
32	145th St	2 3	4/11/2017, 8/8/17	YES	YES	YES	YES	YES
33	135th St	2 3	4/10/2017, 8/8/17	YES	YES	YES	YES	YES
34	125th St	2 3	4/10/2017, 8/8/17	YES	YES	YES	YES	YES
35	116th St	2 3	4/10/2017, 8/8/17	YES	YES	YES	YES	YES
36	110th St/Central Park N	2 3	4/10/2017, 8/8/17	YES	YES	YES	YES	YES
37	Main St.	7	4/11/2017, 8/8/17	YES	YES	YES	YES	YES
38	Fulton St Trn. Ctr.	A C J M Z 2 3 4 5	**4/4/2017, 4/10/2017, 4/11/2017, 8/8/17, 8/9/17	YES	YES	YES	YES	YES

*This listing includes stations that have AT&T, T-Mobile Verizon Wireless, and Sprint service.

Listing of Stations and Dates Tested

Phase IV 36 Stations Retested as of September 19, 2017

	Station Name	Line Tested	Dates Tested	Cellular Voice*	Cellular Voice	Social Media	Wi-Fi	Music/Video Streaming
1	Lexington Ave	N R	4/20/2017, 8/18/17	YES	YES	YES	YES	YES
2	Prince St	R	4/20/2017, 8/9/17	YES	YES	YES	YES	YES
3	205th St	D	4/17/2017, 8/17/17	YES	YES	YES	YES	YES
4	Bedford Park Blvd	B D	4/17/2017, 8/17/17	YES	YES	YES	YES	YES
5	Kingbridge Rd	B D	4/17/2017, 8/17/17	YES	YES	YES	YES	YES
6	Fordham Rd	B D	4/17/2017, 8/17/17	YES	YES	YES	YES	YES
7	182nd-183rd St	B D	4/17/2017, 8/9/17	YES	YES	YES	YES	YES
8	Tremont Ave	B D	4/17/2017, 8/9/17	YES	YES	YES	YES	YES
9	174th St	B D	4/17/2017, 8/9/17	YES	YES	YES	YES	YES
10	170th St	B D	4/17/2017, 8/9/17	YES	YES	YES	YES	YES
11	167th St	B D	4/17/2017, 8/9/17	YES	YES	YES	YES	YES
12	161st St	B D	4/17/2017, 8/9/17	YES	YES	YES	YES	YES
13	Lexington Ave	E	3/31/2017, 8/10/17	YES	YES	YES	YES	YES
14	Christopher St	1	3/29/2017, 5/18/17	YES	YES	YES	YES	YES
15	Houston St	1	3/29/2017, 5/18/17	YES	YES	YES	YES	YES
16	Hunts Point Avenue	6	4/7/2017, 8/9/17	YES	YES	YES	YES	YES
17	Longwood Avenue	6	4/7/2017, 8/9/17	YES	YES	YES	YES	YES
18	East 149th St	6	4/7/2017, 8/9/17	YES	YES	YES	YES	YES
19	East 143rd St	6	4/7/2017, 8/9/17	YES	YES	YES	YES	YES
20	Cypress Avenue	6	4/7/2017, 8/9/17	YES	YES	YES	YES	YES

21	Brook Avenue	6	4/7/2017, 8/9/17	YES	YES	YES	YES	YES
22	138th St-3rd Ave	6	4/7/2017, 8/9/17	YES	YES	YES	YES	YES
23	149th St	4	4/10/2017, 8/9/17	YES	YES	YES	YES	YES
24	138th St	4	4/10/2017, 8/9/17	YES	YES	YES	YES	YES
25	125th St	6	4/7/2017, 8/9/17	YES	YES	YES	YES	YES
26	116th St	6	4/7/2017, 8/9/17	YES	YES	YES	YES	YES
27	110th St	6	4/7/2017, 8/9/17	YES	YES	YES	YES	YES
28	103rd St	6	4/7/2017, 8/9/17	YES	YES	YES	YES	YES
29	96th St	6	4/7/2017, 8/9/17	YES	YES	YES	YES	YES
30	86th St	4 5 6	4/7/2017, 8/9/17	YES	YES	YES	YES	YES
31	77th St	6	4/7/2017, 8/9/17	YES	YES	YES	YES	YES
32	68th St	6	4/7/2017, 8/9/17	YES	YES	YES	YES	YES
33	59th St	4 5 6	4/7/2017, 8/9/17	YES	YES	YES	YES	YES
34	51st St	6	4/7/2017, 8/9/17	YES	YES	YES	YES	YES
35	149th St-3rd Ave	2 5	4/10/2017, 8/17/17	YES	YES	YES	YES	YES
36	149th S. Grand Concourse (LL)	2 5	4/10/2017, 8/17/17	YES	YES	YES	YES	YES
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