Countdown to Success: an Evaluation of Real-Time Arrival Information on the MTA’s Lettered Lines
Executive Summary: Lettered Line Countdown Clocks Are an MTA Success

In August 2016, Governor Cuomo announced a pilot program to install countdown clocks on certain platforms serving lettered “B Division” subway lines, with a goal of evaluating the technology and possibly expanding it systemwide.\(^1\) In November, the MTA noted a proposed timeline of extending the project to all lettered train lines by the first quarter of 2018, pending execution of a vendor contract.\(^2\)

Because the “A division” (numbered lines) and “B division” (lettered lines) use different signal and train control systems, the MTA is piloting different technology for its lettered line countdown clock program from what is currently in use on numbered lines. Specifically, the MTA is installing a “beacon” system in which trains are equipped with transponders that wirelessly identify the train location to readers located in stations. Because this technology is new and not integrated into the train control system, some concern existed that the clocks would be insufficiently accurate or insufficiently useful to riders.

Prior to this report, no independent entity has delivered an evaluation of the accuracy and functionality of the MTA's 2016 lettered line countdown clock program. Responding to interest from Riders Alliance members, many of whom have long voiced support for accelerating installation of countdown clocks on lettered lines, the Riders Alliance observed the pilot program countdown clocks in operation. We observed eight platforms in four stations, evaluating the clocks for accuracy, utility and best practices that can guide an expansion of the program. To do an apples-to-apples comparison, we then used the same methods to evaluate four comparable numbered line stations, to judge the new pilot system against the existing popular countdown clock system installed through the numbered “A Division” subway lines. This report is based on those observations.

In sum, the MTA's lettered line countdown clock pilot program is an unmitigated MTA success. Our observers found the clocks to be largely accurate, with 59% of clocks correctly predicting the eventual train arrival time to within one minute of accuracy and 81% predicting the time to within two minutes of accuracy.

In this report, we provide background material for our conclusion that the experimental lettered line countdown clocks are accurate and successful. We also make recommendations for how the MTA can build on that success and expand countdown clocks quickly to all lettered line subway stations. Those recommendations include:

---

2 http://www.amny.com/transit/mta-to-install-subway-countdown-clocks-on-all-lettered-lines-1.12619143
• The MTA should follow through with its proposal to expand the countdown clock program to every station on the lettered lines by the first quarter of 2018.

• On the same time frame, the MTA should introduce web functionality: riders should be able to access real-time train information from their smartphones and on the internet.

• Real-time train arrival information should also be made available to app developers, so independent companies and individuals can incorporate the information into transit apps and design new ones for riders to use.

• The real-time data should be integrated into existing “On the Go” kiosks and other displays in stations, which continue to display misleading schedule information instead of accurate train location data.

• Stations with transfers should display countdown information—not just about the trains that stop on that platform but about every connecting train in the same station, so riders can make educated choices about which train to ride.

• The MTA should add real-time bus and other data to in-station displays so riders can make quick and smart decisions about transferring from subways to buses and other modes.

The MTA did well to experiment with different technologies and move forward with the “beacon” plan to bring real-time information to the lettered lines. In the coming year, the agency should double down on that success and roll out the popular measure more broadly.

Background: The Long Countdown to Countdown Clocks

Following a signal upgrade for numbered line trains, the MTA was able to install countdown clocks in stations for those lines in 2006. The program quickly became popular, and the MTA stated a goal of expanding it to the lettered lines.³

To date, the only lettered line that has countdown clocks is the L train. In that case, clocks were made possibly by a signal upgrade to Communications-Based Train Control (CBTC). Watchdog groups led by Regional Plan Association have recommended installing CBTC across the entire MTA subway system, not only because it facilitates real-time information

but also because it allows more trains to run safely and efficiently, expanding system capacity.  

In response to questions about installing countdown clocks on the lettered lines, the MTA had previously held a policy that the agency would install countdown clocks only as part of a broader transition to a new train control system—in essence, that the clocks would be a side benefit to a system upgrade that would also allow greater capacity and more efficient operations. That planned system, referred to by its acronym ISIM-B, is in development and is not expected to be available until 2019 at the earliest.

The Riders Alliance, Straphangers Campaign and other transit advocacy organizations pushed the MTA to consider a stopgap measure, arguing that the real-time arrival information was so valuable to riders that it should be considered an end in itself rather than an ancillary benefit.

Prompted by Governor Cuomo, the MTA began an experimental countdown clock program in August of 2016, referred to often as “beacons.” The beacons are transponders installed on trains that use Bluetooth technology to connect with location readers in stations, so that train locations can be noted whenever a train passes a transponder, entering and exiting stations.

Because the beacons only ping location information when they pass a reader, which happens when trains enter and exit stations, they are not as accurate as the numbered line countdown clocks, which give more frequent updates about precise train location.

In its pilot program, the MTA has installed countdown clocks at eight midtown subway stations that serve the N, Q, R and now W trains. The times are currently displayed on LED screens placed either outside of the turnstiles or in the middle of the platform, and they update their information as a train enters and leaves a station.

The Riders Alliance set out to evaluate this program.

---

4 “Moving Forward: Accelerating the Transition to Communications Based Train Control For New York City's Subways”, The Regional Planning Association, May 2014.
Methodology

A Riders Alliance staff member visited 16 platforms over the course of a week in September 2016: the uptown and downtown platforms at each of four lettered line stations and nearby numbered line stations. Specifically, we observed data at the 23rd St, 28th St, 34th St and 42nd St stations on the N, Q and R trains (the W was not yet back in operation) and on the 1/2/3 line as well.

In each station, our staff member recorded the initial time that a train was announced on the countdown clock, then recorded the amount of time that elapsed before the train arrived and compared the two data points. We also noted any discrepancies, such as when trains arrived without having been announced on the clocks or when trains became delayed.

All observations were made on weekdays in the hours between morning and evening rush hours (data was recorded in all cases between 9:30 am and 3:30 pm).

Findings: The Lettered Line Countdown Clocks Meet Riders’ Needs

Our goal was to evaluate the countdown clock pilot program for accuracy, and to make an apples-to-apples comparison with the broadly popular numbered line countdown clock program, in order to make an assessment about whether subway riders would be satisfied with the degree of accuracy in the new lettered line clocks.

In sum, though the numbered line clocks were consistently more accurate and precise than the experimental lettered line clocks, we found that the lettered line clocks were accurate enough to provide riders with almost all of the benefits riders currently derive from the numbered line clocks.

Additionally, through direct observation, we were able to form recommendations that can help guide a broader rollout of the program, observing strictly from a rider experience perspective. We do not have the expertise to evaluate whether the program is useful to the MTA's internal operations.
The lettered line clocks were accurate most of the time: 59% of the time, they were able to predict the next two train arrivals within a minute of the trains’ actual arrival time, and 81% of the time, the clocks were accurate within two minutes.

In contrast, countdown clocks on the numbered lines accurately predicted the upcoming train arrival times within one minute 85% of the time, and within two minutes the clocks were accurate 97.5% of the time.

In addition to being marginally less accurate than their numbered line counterparts, the experimental lettered line clocks also, during the period of observation, occasionally failed to “read” a train—such that a train would arrive at the station without having been predicted by the clock. This error occurred only during an unusual circumstance—specifically, at a time when service had changed unexpectedly because of a broken train.

Substantively, though the pilot clocks on the lettered lines are less accurate at this stage than the existing clocks on the numbered lines, they fulfill the same core functionality: they provide riders with generally accurate real-time information about wait times for subway trains.

**Recommendations: Expand the Program – and Put the Data Online**

Given the success of the pilot program to provide lettered line countdown clocks, the Riders Alliance makes the following recommendations for scaling the program and making it as effective as possible:

1. **Expand the countdown clock program to every lettered line station.** Because of the benefits to riders of generally accurate and reliable real-time data, the MTA should move expeditiously on its planned citywide expansion. The program should be rolled out largely in 2017, with completion in the first quarter of 2018.

2. **Put the data online right away.** In addition to installing countdown clocks in every station, the MTA should make the data available to the public online, both through a web portal in which members of the public can see where the trains are and also through an API feed that will allow web and app developers to incorporate the data
into popular transit apps and design new ones for riders to use.

3. **Integrate the data into existing “On the Go” kiosks and other displays in stations.** Currently, many displays in stations—even those in numbered line stations—display misleading schedule information instead of accurate train location data. These screens should be reprogrammed to receive live feed from beacons on the trains, so that they will provide accurate information to riders.

4. **Display information about every train in a station, not just the ones on a specific platform.** For example, on the Union Square N/Q/R/W platform, the display should also show arrival information about the L, 4, 5 and 6 trains that also stop at Union Square, so that riders can make educated choices about which train to wait for. Similar logic should apply at Times Square, Herald Square and every other station that serves multiple train lines.

5. **Add real-time data about buses and other connections.** In addition to connecting trains, the countdown clocks should also display information about bus, commuter rail and other connections, recognizing that subway travel is often only one part of a journey for many riders.

Taken together, these recommendations can turn a successful pilot program into a citywide amenity that improves the lives of millions of subway riders every day.

**Acknowledgments**

This report was written by Riders Alliance Executive Director John Raskin and Organizing Fellow Joe Loonam, using data collected in the field by Joe Loonam. Special thanks to Deputy Director Nick Sifuentes for additional assistance.