

SPOTLIGHT

MAX CAPACITY: CAN TECHNOLOGY HELP NEW YORK CITY'S SUBWAYS HANDLE INCREASING RIDERSHIP?

BY LOUIS CHE

Given New York City's reputation as a magnet for the world's top innovators, its subway system can seem woefully behind the times. At gates in London, riders brush a contactless smart card against a yellow pad that can communicate directly with their debit or credit card. In New York, flimsy magnetic strips are sometimes swiped multiple times without even unlocking the turnstile. In Paris and Washington, D.C., ubiquitous countdown clocks on platforms announce the arrival times of incoming trains. At most stations in New York, straphangers are often left to guess how long their waits will be. Wireless and Wi-Fi service, while available in a little over 15 percent of the five borough's 278 underground stations, is nothing to boast about compared with its availability in Boston or Buenos Aires.



And in an age when young people expect the latest technology to be available to them, they are also increasingly ditching cars for mass transit. In part, as a result the Metropolitan Transportation Authority is experiencing historically high ridership, meaning the pressure on an already burdened system is only becoming greater. In 2013 ridership reached a 65-year high with 1.7 billion passengers, a 3.2 percent increase from the previous year.

"We're seeing a shift in how people commute, partially based on smartphones ... on demographics ... [and] on preference," said Richard Barone, director of transportation research at the nonprofit Regional Plan Association, which is involved in forecasting the mass transit needs of New York City's 22-plus millionperson metropolitan region. "The younger generation is not gravitating toward driving as much, and there are a number of reasons why."

Smartphone applications have simplified mass transit navigation. An app like HopStop, which gives step-by-step directions from origin to destination in most major U.S. cities, and in 10 other countries as well, has long been indispensable to riders. The MTA has also developed its fair share of apps, featuring real-time schedules for bus, subway and commuter rail, as well as one billed as "a pocket reference for discovering commissioned artworks within the subway system."

But Robert Paaswell, a professor of civil engineering at the City College of New York, believes smartphones have the potential to revolutionize the entire system.

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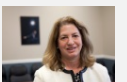
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“We’re moving into a big shift in how we use and supply transportation,” Paaswell said. “To an information-based culture in which both the user and the provider have an incredible array of real-time information ... the provider can make operational choices which they were never able to do before: They can locate their whole fleet, and they can integrate for hired vehicles with transit, with on-call cars and other things.”

If we can better plan our journeys, can the MTA up its efficiency as well?

The technology is already available: so-called communication-based train control, commonly referred to as CBTC. CBTC uses telecommunications between train cars and track equipment to map train positions more accurately than traditional signaling equipment can. This additional information provides for the possibility of greater efficiency and safety—dispatchers can safely pack trains closer together, and automated braking systems ensure against human error. If the Metro- North commuter train that derailed near the Spuyten Duyvil station last December had been subject to CBTC control, for instance, it would have automatically slowed well before the curve that caused the deadly accident.

In its most advanced form, CBTC eliminates the need for in-train operators altogether. In Paris, the trains running along the city’s oldest subway line—Métro Line 1—are now completely driverless.

But while the MTA has installed CBTC along its L line, the trains still have a conductor and an operator— one to drive the train and one to operate the doors.

“One-person train operation has to be collectively bargained,” said MTA spokesman Kevin Ortiz in an email. “It is currently in place on shuttles and the G line during certain off-peak periods ... On the L, roles for the conductor and train operator have not changed. Both are charged with the safe operation of their train.”

According to Barone, when CBTC was first installed on the L train back in the early to mid aughts, the idea was to rid the trains of their conductors and only keep a driver to operate the doors. (Manually operated trains carry both a driver and a conductor.) But labor unions have been opposed to the possibilities afforded by one-man train operation. With innovations such as CBTC and other technological advances making travel more convenient, one might expect the need for some of the New York City Transit Authority’s 40,000-plus workers to decline. But is this really the case?

“The MTA lost the arbitration, and they were forced to have a conductor and an operator,” Barone said. “But the thing is, when you do that, it’s not like you fire these folks ... What you do is you use them in the stations instead.”

Barone points out that in Paris an expanding métro system has led the city to shift drivers to other lines rather than doing away with them and train some drivers to monitor the system in new operations centers precipitated by the CBTC technology.

Bill Conis, director of business development at Siemens, a company that works with the New York City Transit Authority to pick the most cost-effective technologies for the subway system, also thinks the new technology will bring about the shifting of workers to other jobs rather than layoffs.

“In the end, I think the number of people that the system is employing is right,” Conis said. “I don’t think the technology is going to drive it up or down significantly.”

From an infrastructure perspective, Conis thinks CBTC is the most critical technology available. “The current technology ... is 150 years old,” he said. “It’s as old as railroads themselves, and this is the first real effort to improve on that technology.”

However, because of the immensity of the subway system and the intricacies of the MTA’s structure, upgrading to CBTC is sure to be a long and costly process.

“The MTA was created to be one integrated organization, but that’s not really how it is,” Barone said. “From New York City Transit to both the railroads, even within New York

Barone said. From New York City Transit to both the railroads, even within New York City Transit there are a bunch of systems— buses, subways—and that’s the issue. It never truly integrated. And when you have to make the decision on something complex, you have multiple parties that get involved, and they can counter each other. It can slow everything down and make everything complex.”

Barone says procurement is one area that needs reforming.

“Yes, there are cost issues and procurement reform should probably be part of overall reforms,” Barone said, “just based upon what we’re paying compared to what everyone else in the country is paying to build things. You could always say that there is a premium in this city that is over the top, but it seems to be too much of a premium. Especially when you compare us to somewhere global.”

But with the New York City subway nearing capacity—only the 1, G, J/M/Z and L lines are not maxed out at rush hour—the MTA’s plan is to expand CBTC. The next line to benefit from the technology will be the Flushing Line—commonly known as the 7 Train—which currently cannot handle any more trains at rush hour. By 2027, the city hopes most lines will run on the technology.

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