



ZEBRA

ZEBRA'S WLAN TECHNOLOGY

SERVES 1.7 BILLION NEW YORK CITY SUBWAY RIDERS WITH ROBUST WI-FI SERVICES — EVEN UNDERGROUND

Zebra AP 7161 OUTDOOR ACCESS POINT and NX 9500 CONTROLLER



New York City Transit (NYCT) wanted to provide its riders with free wireless and Wi-Fi services in underground stations for numerous reasons. First, riders were clamoring for the service, especially since their cellular service typically wasn't available in the underground stations and tunnels, shutting them off from family and friends during travel time. In addition, Mayor Bloomberg introduced the Digital Leadership program, an initiative focused on making New York City the nation's number one digital city — and providing free Wi-Fi in public spaces, such as the underground stations in the subway, was a key part of that initiative. NYCT chose partner Transit Wireless to bring their wireless and Wi-Fi vision to fruition, where the company faced the daunting task of deploying a massive wireless LAN in what is most likely the most challenging of all underground subway systems.

CUSTOMER PROFILE

Agency

New York City Transit

Industry

Travel and Transportation

Solution

Wi-Fi service in the subway stations

Benefits

- Increased passenger safety
- Increased passenger satisfaction
- Minimal maintenance and management time and cost for a stronger return on investment
- Investment protection through endless scalability

SUCCESS STORY

NEW YORK CITY TRANSIT



THE BUSINESS CHALLENGE:

PROVIDING SEAMLESS AND DEPENDABLE HIGH-PERFORMANCE WI-FI SERVICES TO RIDERS OF ONE OF THE WORLD'S LARGEST SUBWAY SYSTEMS

When Transit Wireless was hired to provide Wi-Fi service to NYCT subway passengers, they were faced with creating a WLAN to serve 277 challenging underground subway stations. Issues include:

- **Physical size.** The NYC Transit subway system is physically vast, with over 840 miles of track — laid end-to-end, the tracks would run from New York City past Chicago¹. It is also one of the largest subway systems measured by the number of stations: With a total of 468 stations (above and underground), the NYCT subway system is just 60 stations shy of the combined total of all of the subway systems in the United States.²
- **Number of passengers.** With over 1.7 billion annual riders, this subway system is also one of the largest measured by the number of passengers, with sheer volume of passengers a major challenge.
- **A harsh and challenging environment.** The network requirements for this subway environment are about as complicated as it gets. The stations are over 100 years old, and every station is unique, with unique networking requirements, making it impossible to replicate a network plan across multiple stations. In addition, the city has gone to great expense to restore the intricate artwork in the stations — the WLAN infrastructure has to be placed so that it does not destroy station aesthetics. There is a lot of brake dust always present, so WLAN infrastructure must be dust tight. In addition to wide temperature swings, the moisture content of the air is always high. And since the stations are regularly sprayed down with a fire hose, the WLAN equipment would have to survive jetting water.
- **Connectivity challenges.** Radio densities are constantly changing as crowds move in, through and out of the subway system. And riders are always on the move, alternately sitting in a station waiting for a train, walking to the train and then sitting on a fast moving train.

- **Extremely high performance expectations.** Riders expect the same high quality and consistent Wi-Fi connections they experience above ground in their offices, their homes and in private and public hot spots.
- **Deployment and maintenance challenges.** Since the city's citizens count on the subway system 24 hours a day, shutting down a tunnel for installation, regular maintenance or repair is not an option. And due to the vastness of the physical environment, sending technicians to stations to provision or troubleshoot equipment is also not feasible — the cost would be astronomical.

THE SOLUTION:

THE AP 7161 OUTDOOR ACCESS POINT AND NX 9500 INTEGRATED SERVICES PLATFORM CONTROLLER

Armed with this formidable list of challenges, Transit Wireless began their search for the right WLAN equipment provider. They needed infrastructure that could handle the harsh underground environment, deliver fast and highly dependable connections, with best-in-class remote management capabilities. They found it in the Zebra AP 7161 outdoor rugged access point and NX 9500 controller. Says William Bayne, Jr., CEO of Transit Wireless, "We chose Zebra WLAN equipment for its very robust rugged design, which is crucial to sustaining high quality, long-term Wi-Fi services in this very tough environment. It also met our requirements for scalability and easy updating, ensuring our ability to create a WLAN that can accommodate exploding demands for Wi-Fi service and technology evolutions." In addition, not only did Zebra have the infrastructure that was perfect for the job, they also offered the vast experience and true partnership Transit Wireless needed to ensure maximum success of this project.

The AP 7161 access points are installed in the subway system where they provide riders with high-speed Wi-Fi access. The access points are remotely controlled by the NX 9500 controller that is located in a Transit Wireless data center, which controls a grouping of stations. Since the AP 7161 supports cellular data offloading, in the future, the Zebra Wi-Fi network can be utilized to provide passengers with a seamless connection to their cellular services, even if they are deep in subway tunnels.

PARTNER PROFILE



COMPANY

Transit Wireless
New York City, New York

INDUSTRIES

Travel & Transportation: municipal transit agencies

ABOUT THE COMPANY

Transit Wireless is an industry leader in advanced technology solutions for wireless, Wi-Fi and fiber business solutions. Currently, Transit Wireless is building, financing and operating an open-access, multi-application Neutral DAS network for all 277 underground stations in the New York City subway system. Services provisioned include cellular service provided by AT&T, T-Mobile USA, Sprint and Verizon Wireless, as well as Wi-Fi for public, private and business applications provided by Boingo Wireless. Transit Wireless has implemented a high quality, highly resilient network that enables secure private networks and public Wi-Fi. This is a broadband network operating at all primary licensed cellular bands, as well as 2.4GHz, 5.xGHz (public unlicensed bands) and 4.9GHz (public safety band). This broadband network can be used by multiple resources for varying communication needs and applications - consumer, business, transit and public safety.

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¹ MTA Website:
<http://www.mta.info/nyct/facts/ffsubway.htm>

² Ibid

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The ideal outdoor access point:

The Zebra AP 7161

The AP 7161 is the ideal access point for this solution, purpose built to deliver enterprise-class wireless networking in the harshest of environments. Key features that make the AP 7161 the right choice in the stations include:

- A unique routing engine, MeshConnex™, and Opportunistic Radio Link Adaption (ORLA) ensure the highest possible data rates at all times, regardless of how many passengers are in the station, or whether they are sitting, walking or riding on a train.
- Support for 3x3 MIMO provides a blazing 300 Mbps data rate to deliver high performance connections and better transmission quality.
- NEMA 4X housing and IP67 sealing combine to make the AP 7161 dust and water tight, able to handle the jetting water during station hose downs as well as the constant presence of brake dust.
- With a wide temperature range, from -40° F to 158° F/-40° C to 70° C, plus a 150 mph wind rating, the AP 7161 is built to survive the cold and heat of New York City winters and summers — as well as hurricane force gales.

The ideal controller:

The Zebra NX 9500 Integrated Services Platform

The NX 9500 is the perfect controller, allowing Transit Wireless to control all AP 7161s from a single remote point of control, while its advanced WiNG 5 operating system

provides the AP 7161s with the intelligence required to achieve superior performance, quality of service, security, and management simplicity. Key features that make the NX 9500 the right choice include:

- The ability to control, monitor and troubleshoot over 10,000 access points from a single pane of glass allows Transit Wireless to heavily automate management. True hierarchical management provides whatever network view is required to get the job done — the entire network, a specific subway station or a specific AP 7161 anywhere in the network. And with easy scripting, it's easy to automate group functions — for example, hundreds of AP 7161 access points can be automatically discovered and provisioned with the press of a button.
- WiNG 5 provides the advanced brainpower required to create a “fully network aware” WLAN, allowing all AP 7161 access points to work together to route every transmission as efficiently as possible.
- Leading WLAN security solution AirDefense Services Platform is integrated into the NX 9500, providing maximum security.



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BENEFITS

The Zebra WLAN provides a win-win for all — Transit Wireless has exceeded the expectations of its customer, the NYCT subway system; and NYCT has exceeded the expectations of its riders. Benefits include:

- Increased rider satisfaction. A highly dependable high-speed Wi-Fi network keeps riders connected to their world as they travel through the subway system — even when they are underground.
- Increased rider safety. The availability of cellular connections ensures that riders can call 911 from their own cell phones at any time.
- Minimal management and maintenance costs. Robust remote control over the entire network eliminates the need to send technicians to the station for staging or troubleshooting.
- Endless scalability for superior future-proofing. As ridership continues to grow and riders utilize more bandwidth-heavy applications, such as video, scaling the network is as easy as adding more AP 7161s to meet capacity requirements. And while plans currently call for approximately 5,000 access points, well below the 10,000 access point limit of a single NX 9500, if the upper limit is ever reached, Transit Wireless can maintain centralized control of all access points by simply adding another NX 9500 controller.

FOR MORE INFORMATION ON HOW YOU CAN PROVIDE YOUR PUBLIC TRANSIT PASSENGERS WITH COST-EFFECTIVE, ROBUST WI-FI SERVICES, PLEASE VISIT US ON THE WEB AT ZEBRA.COM/WLAN.

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