



Powerwave Coverage Solutions

São Paulo Metro

São Paulo Metro Rail System Undergoes a “Wireless Makeover”

Business moves at the speed of light; to keep up, workers must maximize their time for improved productivity. To this end, many turn to their cell phones, BlackBerry® smartphones and other personal communications devices during daily commutes to catch up in real-time on work assignments or correspondence.

Recent advances in the development of coverage and capacity solutions have made it possible to bring wireless connectivity to even the most difficult to reach locations including the airports, train stations and subway systems used daily by millions of commuters around the globe. São Paulo Metro, Brazil’s first rapid transit system, is the latest metropolitan subway to undergo a “wireless makeover.”

Thanks to a wireless coverage and capacity solution designed and implemented by Powerwave Technologies, many of the more than 3.6 million passengers – 66 percent of whom São Paulo Metro officials say use the rapid transit systems exclusively for travel to and from work – now experience uninterrupted access to wireless voice and data services while using the rapid transit system.

Referred to by locals as simply the “Metro,” the São Paulo Metro began operating in 1974, and is the first such rapid rail system to be installed in Brazil. With 58 stations dotting the 65.9-kilometer (41.2 mile) system, the Metro is currently comprised of five rail lines, while plans call for significant extensions to existing lines through 2025.

Moving Toward a Vision of Success

In 2008, São Paulo Metro was in the process of expanding its rapid rail system and upgrading many of its aging train stations, when customers and the wireless operators serving the city began pressuring the agency to provide wireless voice and data services within its railway facilities. As a result, the Metro embarked on yet another subway modernization project – the deployment of a wireless coverage system.

The city’s four main wireless operators came together at the request of the São Paulo Metro to negotiate a contract to benefit both the Metro and the operators. In the end, it was decided that the operators would rent space from the Metro to house the wireless coverage infrastructure system, and that each carrier would purchase and operate 25 percent of the total system. Following contract ratification, Powerwave Technologies was hired to design and implement the wireless coverage system.

“We chose to partner with Powerwave Technologies in the deployment of our indoor

wireless coverage system for several reasons, including the company's local sales, management and engineering technical support, its proven ability to support multiple carriers and frequencies, and an inherent modularity that will enable us to expand the system to accommodate future growth," said Mr. Aldo Clementi, VP Executive Operation, Vivo SA and leader of the four-operator committee for the São Paulo Metro Project.

"We were also impressed by the outstanding performance offered by Powerwave RF equipment in environments that are prone to dirt, dust and temperature fluctuations," said Mr. Eduardo Curiati, Chief of System Implementation Department, on behalf of Companhia do Metropolitano de São Paulo, "Metro" for the São Paulo Metro Project.

Getting on Track

Powerwave Technologies began the deployment of the wireless coverage solution for São Paulo Metro in late 2007, and phase one of the project went into operation on the Metro's Green Line in June 2008.

"The distributed antenna system (DAS) deployment for the São Paulo Metro, is a ground-breaking project for Powerwave that not only leverages our state-of-the-art wireless infrastructure solutions, but also our capabilities as a provider of network management, monitoring, and maintenance services for wireless voice and data networks," said David N. Bacino, vice president, Global Services & Support, Powerwave Technologies, Inc. "Powerwave has deployed DAS systems in hundreds of large and complex environments, including many metropolitan rail systems throughout North America, Europe and Asia. By leveraging our extensive technology expertise in this area, we are able to ensure that the São Paulo Metro installation not only meets the customers' unique requirements, but provides optimum service levels for both operator and end-users."

Destination: Access

Powerwave's wireless coverage system supports customers using São Paulo Metro's Green, Red, Blue and Purple Lines on commercial wireless frequency bands, including GSM (850 MHz, 1800 MHz and 1900 MHz); UMTS (850 MHz and 2100 MHz); CDMA (850 MHz) and iDEN (800 MHz). Consisting of a series of indoor antennas and repeaters with hubs discretely located throughout the rapid rail system's communications closets to reduce visual impact and maintain aesthetics, Powerwave's wireless coverage system also leverages additional components residing outside of public view, including a fiber optic conversion module located within the centralized base station hotel.

Working to install the system across stations and particular tunnels within three-hour working windows, the team utilized a common fiber-optic and coaxial backbone among operators, resulting in a highly efficient system that provides substantial cost savings over other competing solutions due to fewer initial infrastructure requirements and maintenance routines, shorter installation times, and more streamlined technology upgrades.

In addition, the system's efficient design allows frequencies from all four operators to be combined and delivered through a single distributed antenna system, while its modular design offers a migration path for future technologies, services and carriers. In fact, that modularity is currently allowing the Powerwave team to easily and seamlessly incorporate a fifth operator to the activated system.

In addition to the São Paulo Metro, Powerwave has expertise in creating DAS systems for transportation venues such as the Chicago Transit Authority (CTA), the Canadian Pacific Railway and Rio Metro, and has cast state-of-the-art wireless networks across some of the world's most challenging and well-known venues including the Olympic Athletic Center of Athens, the Berlin Subway, the King Abdul Aziz Endowment in Mecca, and the 55-story high-rise Torre Mayor in Mexico City.

About Powerwave Technologies

A global leader in end-to-end wireless coverage and capacity solutions, Powerwave Technologies, Inc. offers cutting edge wireless infrastructure to address the demands of enterprise and commercial customers. Powerwave offers a comprehensive suite of solutions, including Antennas, Base Station Solutions and Coverage Solutions. Powerwave's product line supports all wireless network protocols and frequencies including Next Generation Networks in 4G technology such as WiMAX™ and LTE®. Powerwave solutions, products and services also help wireless operators and OEMs reduce capital and operating expenses, speed rollout of services, improve coverage and capacity, and reduce environmental impact. For more information, visit us at www.powerwave.com.



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