Powerwave | Case Study

Greater Toronto Airports Authority (GTAA)

COVERAGE SYSTEMS

New Distributed Antenna System Delivers Private Mobile Radio Services to Law Enforcement, Public Safety, and GTAA Personnel

Reduce Initial Investment & Lifetime Costs | Simple to Complex Indoor & Outdoor Environments | Speedy Implementation

Challenge
To extend public safety, airline and GTAA wireless coverage at TPIA and effectively meet requirements for 95 percent RF coverage and a minimum of 99.9 percent system availability in Terminal 1, parking garage and additional facilities, which comprise a total coverage area of nearly 9 million square feet.

Solution
An indoor distributed antenna system (DAS) consisting of fiber optic and coaxial cables, splitters, Powerwave's patented tap-ins™, broadband antennas and LinkNet satellite units, provides seamless, reliable wireless communications coverage.

Result
A scalable, robust coverage system design that supports future private and commercial wireless services, offers high system availability for Terminal 1 and additional TPIA facilities, and provides a common DAS for 800 MHz to PCS services.

Toronto's Pearson International Airport is the 17th busiest airport in North America, and the 27th busiest airport in the world. More than 65 airlines operate out of TPIA, which serves more than 28 million passengers each year. The GTAA is responsible for the management, operation, and maintenance of TPIA, and currently develops and maintains some of the most advanced airport facilities and systems in the world.

In 2002, building upon its long-standing history of working with the GTAA, Powerwave Technologies began development and implementation of an indoor distributed antenna system (DAS) for Terminal 1 and corresponding parking garage at TPIA.

Comprised of a flexible, multi-service wireless infrastructure system, the indoor DAS now delivers private mobile radio services to law enforcement and public safety personnel throughout the newly constructed Terminal 1 and corresponding parking garage, Terminal 3, Infield Terminal and Infield Tunnel. The system also offers expansion capabilities to support future services including cellular PCS and 3G, with minimal impact to the existing infrastructure.

Among the key objectives in establishing an indoor DAS at TPIA were to:

- Create a common, non-discriminatory, comprehensive communications access system that leverages state-of-the-art technology to provide law enforcement and public safety personnel with seamless wireless communications throughout TPIA facilities
- Avoid costly upgrades with a system that is capable of supporting commercial, private and public safety wireless services within a single platform
- Develop a flexible and scalable platform that is "future-proofed" to accommodate existing public safety and private network frequencies, as well as new and emerging frequencies and technologies
- Provide a minimum of 99.9 percent system availability
- Offer a 95 percent RF coverage guarantee

Powerwave Aims High With a Robust and Flexible Design
Powerwave faced several challenges during the design, development and implementation of the TPIA DAS. First, and foremost, was the extensive coordination with several architects and engineers at the GTAA to develop a system that would meet strict architectural and construction codes, as well as aesthetic guidelines. In addition, the new system would have to be installed during the construction phase of Terminal 1 and its parking structure, requiring Powerwave to collaborate with multiple parties, including construction personnel, to ensure current "live" coverage in existing facilities would not be compromised.

Leveraging its broad-based experience in designing systems to accommodate wireless communications for law enforcement and public safety agencies, Powerwave developed a highly reliable, flexible, cost-effective turnkey solution for distributing multiple RF signals throughout the TPIA.

Powerwave also designed the indoor DAS with a coverage enhancement solution using predominantly passive components to provide TPIA with a more reliable wireless connection, ensuring greater system availability and overall system integrity throughout the facility.

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Powerwave's Coverage System Innovations Team is a team of RF- and system engineers within Powerwave who manage, or assist you in, your projects for cellular coverage worldwide.

Increasing complexity of wireless systems today combines with regulatory restrictions and a variety of practical considerations to demand comprehensive experience and know-how for cost-efficient cellular coverage solutions. Based on Powerwave's outstanding track record of customer projects completed, and on our extensive experience and know-how in quality wireless communications, Powerwave offers novel solutions that are carefully tailored to your specific needs.

Airport

Easy to Install and Maintain

By using a broadband antenna in conjunction with coaxial cable, only one type of antenna must be installed to accommodate all in-building frequencies within Terminal 1. Because there is no need for separate antennas for each service with Powerwave's indoor DAS, fewer parts need to be maintained once the system has been installed. To enable rapid maintenance and ensure minimal loss of service, all modules deployed throughout the system are hot-swappable -- designed to be quickly added or removed while the system is live, without disconnecting any RF connections.

In addition, all active components of the system reside in secure, non-public areas of the TPIA, so airport travelers are not inconvenienced during system maintenance and repair. The system also provides a substantial cost savings over other competing solutions due to fewer initial infrastructure requirements and ease of maintenance routines, shorter installation times and smoother technology upgrades.

Scalability – Now and in the Future

The inherent flexibility and scalability of Powerwave's indoor DAS at TPIA not only provides a cost-effective platform to support current technological and capacity requirements for additional airport facilities, but enables TPIA to accommodate future private and commercial wireless services with minimal effort and expense. New modules, servicing new and subsequent public safety and emergency services frequencies may easily be added as new technology is required, or to accommodate user demand, as well as provide coverage extension for these bands.

24/7 Comprehensive, Remote Network Monitoring and Management

To provide support and maintenance of the RF coverage system and ensure 99.9 percent uptime availability, the indoor DAS also includes Powerwave's InView™ Management System. This state-of-the-art network alarm monitoring and control system allows Powerwave to provide control of all active equipment installed throughout all five TPIA facilities 24 hours a day, 7 days a week, 365 days a year. Airport network administrators are notified immediately by Powerwave via its Network Operations Center (NOC) if a system fault occurs. In the event of a critical fault, Powerwave service personnel can be dispatched immediately, or can resolve the problem via the Internet. This feature dramatically reduces maintenance costs by avoiding the need to send service personnel on site to correct minor system issues.

"Our multi-technology platform is specifically designed to be the most reliable and cost-effective method for providing access to wireless communications services in an indoor environment," said David Quinn, managing director, Coverage System Innovations, Powerwave Technologies. "With the design and implementation phase of the indoor distributed antenna system at TPIA now complete, public safety personnel can now experience seamless connectivity anytime and anywhere throughout the covered terminals."

Corporate Headquarters
Powerwave Technologies, Inc.
1801 East St. Andrew Place
Santa Ana, CA 92705 USA
Tel: 714-466-1000
Fax: 714-466-5800
www.powerwave.com

Dallas Office
1421 S. Beltline Road
Suite 100
Coppell, TX 75019
Tel: 817-684-4500
Fax: 817-684-3500

Main European Office
Antennvägen 6
SE-187 80 Täby
Sweden
Tel: +46 8 540 822 00
Fax: +46 8 540 823 40

Main Asia-Pacific Office
23 F Tai Yau Building
181 Johnston Road
Wanchai, Hong Kong
Tel: +852 2512 6123
Fax: +852 2575 4860

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