Powerwave Case Study

King Street Center

COVERAGE SYSTEMS

Powerwave increased employee productivity and the publics safety in downtown Seattle Government Building

Distributed Antenna System	Frequency Range: 800 MHz Coverage Reliability: 97%	Coverage Area: 700,000 sq. ft. Venue Type: Government Building

Challenge
Extend coverage of 4 separate wireless services to keep government employees and first responders connected anywhere on the premises.

Solution
Powerwave's In-Hancer Series line of bi-directional amplifiers, which includes models designed to maximize service offerings across the 800 MHz frequency band.

Result
Employee productivity and security have greatly increased as a result of the installed Powerwave coverage system.

In-Hancer™

The Customer Seattle, Washington is just a stone's throw away from Redmond, home base for Microsoft and consequently, the high tech capital of the Pacific Northwest. One of the largest office complexes in downtown Seattle is King Street Center, a 700,000 square foot municipal government facility that houses the King County Department of Natural Resources and its various divisions and commissions including the Solid Waste Division, the Commission for Marketing Recyclable Materials, the Water & Land Resources Division and the Wastewater Treatment Division.

The Challenge A large percent of the government employees who work at King Street Center rely on a variety of wireless devices to perform their jobs each day. Also, because Seattle is located along a major fault line and has a long history of seismic activity, many locals also view their wireless devices as potential lifelines in the event of an earthquake. When traditional lifelines such as utilities, communications networks and transportation systems are damaged, wireless devices can serve to connect people with desperately needed help and information in emergency situations. Unfortunately, a number of physical obstacles were impeding the successful transmission of clear, strong, reliable wireless signals within King Street Center. These included the concrete, steel and brick materials used to construct the building itself as well as certain architectural details; all of which can be extremely hostile to RF signals. Nearby high-rise buildings were also contributing to the problem by effectively blocking signal transmissions altogether.

To satisfy both productivity and public safety issues, it became evident to the building management that their in-building wireless coverage needed to be dramatically improved. In order to achieve this, a signal of – 85dBm was required throughout 97%+ of the building.

The Wireless Service Provider While the top priority was to cost-effectively achieve in-building wireless coverage throughout, King Street Center also wanted to ensure that their employees would be able to continue to use the wireless service providers and services of their choice. These included Nextel *i*DEN® services, Verizon cellular services, AT&T Wireless services and Motorola's SmartNet™ 800 MHz trunking services for public safety. In essence, what they were seeking was a multi-service wireless network that would allow them to extend all four wireless services throughout the facility. Only Powerwave Technologies had the capability to satisfy this requirement and at the same time, manage all of the complex technical demands and business relationships with the various wireless service providers.

The Solution Based upon Powerwave's proven expertise, King Street Center was confident that the company would be able to deliver an affordable and dependable solution. The first phase of the process involved a a thorough on-site survey by Powerwave's highly experienced team of engineers in order to assess the building layout and pinpoint all of the obstacles that needed to be outsmarted.

THE POWER IN WIRELESS®

Powerwave technologies

King Street Center

Powerwave Technology

The In-Hancer Series suite of bi-directional amplifiers are made to maximize the extension of wireless services in the 400 MHz, 800 MHz and 900 MHz frequency bands. No matter the wireless service offering, passband, gain or application need, the In-Hancer Series product suite is an ideal solution for extending voice and data communications into buildings, tunnels, and other challenging RF shielded structures.

Key Advantages

- **Unprecedented precision in both uplink and downlink paths** with advanced Digital Gain Control, which allows installers or technicians to set DGC levels in 1dB increments
- **Simplified maintenance and repair** because all major components, such as uplink and downlink amplifiers, power supply and Microprocessor Controller are designed for 'plug-and-play' to facilitate quick module replacement
- **Suitable for all types of environments** because units are housed in a painted steel cabinet for indoor environments, but are also available in a stainless steel option for more demanding environments
- **High System Availability** through the Powerwave Microprocessor Controller option – a device that enables installers or technicians to quickly and easily set, store and change all relevant parameters on site, including Automatic Gain Control, Digital Gain Control, module fault monitoring and battery back-up control
- **Negligible signal loss over large distances** when equipped with Powewave's Fiber-Optic upgrade

During the second phase of the process, the Powerwave engineering team set about designing the optimum solution for extending wireless coverage to those "impeded" spaces inside the building where it typically failed. What they ultimately recommended was the installation of four In-Hancer™ Bi-directional Amplifiers, each one dedicated to extend one of the four public carrier signals. Then, to ensure that the signals were evenly distributed throughout the building, a complete distributed antenna system was recommended using fiber optic and coaxial cables, RF to optic converters, and Powerwave's own patented Tap-In™ signal taps. Upon approval, the third and final phase of the process took place, which involved the rapid implementation of the recommended solution with minimal disruption to workplace activities.

The Results Because Powerwave was able to provide a turn-key solution for extending coverage of all wireless service providers throughout King Street Center and handled all aspects of its execution – including design, manufacture and installation – the job was completed efficiently and cost-effectively. Even more important, employee productivity and their sense of security have greatly increased. Employees no longer lose 92 minutes per day answering voicemail. Callers have immediate access to mobile employees.

For more about King St. Center, visit <http://dnr.metrokc.gov/kscmap.htm>.

The average employee is away from their desk 40% of every business day and spends an average of 92 minutes per day answering voicemail.

Cahners In-Stat Group

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

THE POWER IN WIRELESS®

Powerwave technologies

©Copyright April 2005, Powerwave Technologies, Inc. All Rights reserved. Powerwave, Powerwave Technologies, The Power in Wireless and the Powerwave logo are registered trademarks of Powerwave Technologies, Inc. LinkNet, In-Hancer, Tap-In and InView are all trademarks of Powerwave Technologies, Inc.