RFI leads with an Australian-first distributed antenna system, to provide enhanced in-building wireless coverage in Westfield’s flagship Sydney shopping centre.

THE CHALLENGE

The Westfield Group is one of the largest retail property groups in the world and one of the largest companies listed on the Australian Securities Exchange. Westfield Sydney is their $1.2 billion landmark office and shopping complex in the heart of Sydney’s retail precinct.

The development includes the Westfield Sydney retail centre, which integrates the former Centrepoint, Imperial Arcade and Skygarden sites. The 40,000m2 site accommodates approximately 250 retailers and thousands of shoppers every day. Westfield required comprehensive, unified and reliable wireless coverage inside the retail centre. This ubiquitous coverage had to be multi-carrier and multi-service to meet the needs of both shoppers and cleaning, maintenance and emergency service personnel.

Providing wireless coverage inside shopping centres can be challenging due to different materials, such as steel, reinforced concrete and tinted glass that weaken radio frequency signals. This results in poor signal strength and black spots, leading to unreliable or even complete loss of mobile phone and other radio communications coverage.

THE SOLUTION

Westfield appointed Optus as their lead carrier for the development to ensure the communications solution for Westfield Sydney retail centre met the mobile carriers’ requirements. In turn, Optus engaged RFI to deliver a distributed antenna system (DAS) to ensure ubiquitous in-building wireless coverage.
Technical details

Westfield required a wideband DAS that would support mobile phones and the two-way radio communications used by their cleaning, maintenance and security personnel. The system had to be flexible enough to support any wireless technologies that may emerge in the future without disruption of building tenants and shoppers. It was also important that the DAS meet the mobile carriers’ stringent compliance requirements.

Westfield requested the Zinwave 3000 Distributed Antenna System because it’s the only true wideband active DAS currently on the market and a product that RFI is exclusively partnered with Zinwave on.

The Zinwave 3000 covers all frequencies and wireless services between 150 MHz and 2700 MHz. It’s a flexible and advanced in-building DAS for mobile phone and multiple wireless services. It provides a platform for the addition of new services within its wideband spectrum, without the need for costly upgrades or extra hardware.

RFI was appointed to design, install and commission the system. Their first task was to conduct RF surveys to measure the existing level of coverage and identify any exclusion zones where there were levels of interference outside the mobile carriers’ specifications. Then, working in close consultation with Optus and Westfield, RFI designed and documented the system.

The DAS comprises four primary hubs feeding into 43 secondary hubs that connect to 160 remote amplifier units distributed throughout the retail centre. The mobile carrier’s base station equipment was housed in the main distribution frame (MDF) room in the Westfield Data Centre located in the basement of the building.

An RF cable linked the MDF room and the Data Centre. From the Data Centre, fibre optic cabling was distributed throughout the retail centre as part of Westfield’s fibre optic network.

The remote amplifier units feed separately banded antennas by way of cross-band couplers. There are separate antennas for UHF and mobile phone services. To maintain the design integrity of the shopping areas the larger UHF antennas were concealed in the ceiling cavity, whilst the cellular antennas were positioned unobtrusively in the shop front facades.

The DAS also featured an uninterruptible power supply to ensure communications would be maintained in the event of a power blackout.
Project Management

In this project time was of the essence. To expedite the installation of the DAS, RFI had weekly progress meetings with the lead electrical and communications contractor. They also liaised with the head site foreman on a daily basis to coordinate their work, ensuring mitigation of potential delays in the programme.

By taking a flexible approach and working closely with the team of electricians, RFI were able to maintain the project delivery on a very tight schedule.

THE RESULT

This project was the first time a Zinwave 3000 DAS had been deployed in Australia. RFI had to deliver the project within a tight timeframe, with just eight weeks to design, install and commission the DAS. An additional challenge was liaising with multiple stakeholders and coordinating multiple contractors.

Despite these challenges, RFI had the system commissioned well before Westfield Sydney’s opening day. Westfield estimates the retail centre will attract around 26 million domestic and international visitors each year. And they’ll all be able to use their mobile phones inside the centre, thanks to RFI’s expertise.