Sydney's Cross City Tunnel is a 2.1 kilometre motorway running beneath Sydney's Central Business District. CommTel's communications backbone supports the tunnel's traffic and operations systems to manage forecasted traffic levels of 90,000 vehicles per day.

The Cross City Tunnel is one of the most technically challenging road tunnel projects ever undertaken in Australia. It was excavated with minimal disruption to the heart of Sydney, and was officially opened on the 28th August 2005.

The $680 million project consists of 8.5 kilometres of tunneling, and links Sydney's Eastern and Western suburbs. In addition to allowing motorists to bypass Sydney's Central Business district, it is the first motorway in Sydney to feature full electronic tolling. This removes the need for tollbooths and avoids the traffic congestion that they create.

The Tunnel will link Darling Harbour to Rushcutters Bay through separate east and westbound tunnels. From the west, you'll be able to access the Eastern Distributor directly to the Airport. Coming from the east, you'll be able to avoid city traffic and access the harbour crossings. Fewer cars will use city streets every day.

**The Constraints**
As a vital piece of Sydney's motorway network, the Cross City Tunnel is equipped with the latest in electronic control and monitoring technology. In developing a network to support these mission-critical applications, a number of design constraints were in place:

- Full equipment redundancy was required at each node
- Operation over a fibre-optic ring, supporting a ring switchover time of less than 50 msec in case of fibre failure
- Maximum operating temperature of 65 degrees Celsius
- Support of both switched-Ethernet and telephony
- Small form-factor, due to limited available space
- SNMP managed equipment

CommTel's Approach
CommTel was responsible for the design, supply, integration and installation of the communications backbone, supporting the traffic management and tunnel operations systems.

CommTel's solution is based on the Optical Access Point (OAP), developed by Avara Technologies. These were arranged in a dual-redundant ring architecture, with no single point of failure. Due to their compact form-factor, it was possible to mount the units on the wall of the equipment cabinet, thereby not consuming any additional rack space.

Due to the harsh environment, it was not appropriate to use VoIP telephones in the tunnel. The OAP's support standard POTS handsets, suited to the rugged conditions. In the event of a fibre failure, even active telephone calls are protected by the ring architecture.

A key benefit of the OAP is the ability to configure hotline circuits. During the tunnel construction phase, a key benefit of the OAP is the ability to configure hotline circuits. During the tunnel construction phase,
it was possible to initiate telephone calls between sites in the tunnel, where radio coverage was not yet in place. The ability to easily communicate between sites had a substantial positive impact on the overall construction and testing phase of the project.

CommTel met and exceeded all the project requirements within a single integrated unit. This homogenous approach resulted in a low capital cost and a low cost of operation for the system. It has become a solution of choice for future projects.

About CommTel
CommTel Network Solutions is an Australian owned company providing turnkey communications networks, both within Australia and internationally.

As a leading international provider of communications design, supply, integration and support in the dedicated and industrial networks sector, we have unsurpassed experience and knowledge that our customers rely on.

Network Overview

Legend
- Optical Fibre Ring A
- Optical Fibre Ring B
- Ethernet
- POTS