

endless .... seamless .... wireless ....

# CASE STUDY



**Optical Master Unit II** 

## GOING UNDERGROUND IN Gauteng

### The Challenge

The Gautrain is a rail network that serves the cities of Johannesburg and Pretoria, including O.R. Tambo International Airport and was opened in June 2010.

GAUTRAIN

FOR PEOPLE ON THE MOVE

The Gautrain comprises of 80km of track, serving 10 stations, of the 80km, 18km are

underground.

Axell Wireless in collaboration with Radio Network Solutions designed, supplied and implemented a safety radio network System into the complete tunnel and underground station Network.

In underground locations like this one, heavily used by the public, robust wireless communication networks are crucial for the provision of continuous communications during emergencies. However, with new standards and regulations changing the public safety network landscape, the technology that is chosen has to continuously evolve to keep pace.

#### The Solution

To meet the high reliability requirements of the Gautrain tunnel and station network, RNS deployed a Radiating cable (Leaky Feeder) system. Using this method, the Gautrain system required 2 fibre-optic master sites (using Axell's latest Optical Master Unit, or OMU II) and 22 remote units. Each remote unit is placed at an underground station and emergency Shafts, connected through optical fibres.

Leaky feeder cables then run from the remote units providing coverage inside the tunnel itself.

The use of these repeaters allows base station coverage to be boosted and extended over great distances to remote locations; removing the issues associated with continuous communications underground.

A reliable public safety system must continue performing despite any failures to the system itself. This problem is solved by providing a fully redundant design underground. Each base station is configured to feed several repeaters, and overlapping coverage exists between two adjacent repeaters. If a repeater fails, the repeater sited next to it will provide ongoing coverage.



Additionally the system has a dual fibre feed to each remote location. This means, that if one master site location fails, or if the fibre-optic cable becomes damaged, the remote repeater will switch its feed to the other master site. As a result, the system has both overlapping and dual fibre-optic feed redundancy. The requirement for critical resilience, ensuring that there are no coverage black spots for the emergency services which is of vital importance.

### The Benefit

**Fully redundant network** - As a fully redundant system if any part fails the system will continue to run through overlapping coverage between stations. This comprehensive wireless system meets stringent safety standards, as the network is underpinned by an automatic single level control, which is integrated in the system, so in the event of any failures the signal will still be carried.

**Easy to extend** – Providing radio frequency over fibre makes the network flexible to upgrade and offers the ability to add to the network when expansion is needed.

**Future-proof solution** – Axell's technology is flexible and adaptable, providing public safety operators with the flexibility to specify and change sub-band allocation providing an easier path to new standards in the future.

