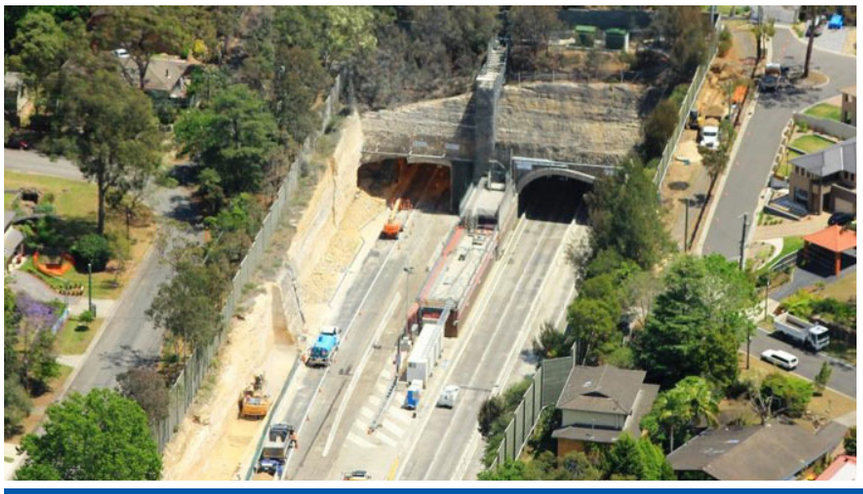
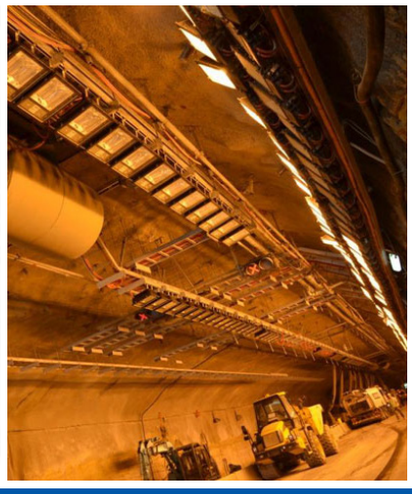
Case Study





M2 tunnel case study

RFI provided a communications solution to deliver Break-In Emergency Services radio coverage and AM/FM rebroadcast (RRB) system as part of the $550 million Sydney Hills M2 tunnel upgrade.

An audio break-in capability allows pre-recorded or live audio announcements to be inserted into the AM and FM rebroadcasts so drivers can hear them on their car radios.

To reduce traffic congestion and improve travel time, Transurban undertook a significant upgrade of Sydney's M2 Motorway, which included widening the 360m roadway tunnel from two to three lanes in both directions. During this process, Transurban recognised the need to upgrade the public address system and audio break-in of the AM/FM Radio Rebroadcast System (RRB) via the Intelligent Transport System (ITS).

Transurban required RFI to fully manage the project and provide a full turnkey solution of Break-in radio rebroadcast including design, installation, commission, training and documentation.

RFdesigned the system which comprised:

12 Channels of AM and 12 Channels of FM Off-Air Channelised Uni-Directional Amplifiers

UHF O&M Two-Way Radio Rebroadcast

UHF/Police/RMS Rebroadcast

Future compatibility for inclusion of DAB+ Rebroadcast

Coaxial and Radiating Cable AM/FM RF distribution system

Audio Break-In Interface to the AM/FM

Rebroadcast System

Fully Integrated DYNAC OMCS Radio

Rebroadcast interface

Audio Server / Logger/ Replayer

PMCS System Alarm Monitoring interface

…And associated combining, antennas and related equipment

Specific requirements for the project included:

Tyco selected RFI to design and install the rebroadcast system, based on RFI's experience and expertise with this technology. RFI delivered a flexible and feature-rich rebroadcast system, utilising a comprehensive suite of their products and services, including:

- The retransmission of the AM and FM radio station broadcasts to maintain the quality equivalent to that outside of the tunnel
- The Retransmission of existing Hills M2 operations and maintenance UHF radio system needed to improve hand-held radio reception
- The system needed to interface to existing PA system
- The RRB needed to provide an interface to both the primary and secondary OMCS system servers Of particular challenge was the extensive software development RFI had to undertake to enable the interface from radio rebroadcast public address (RRBPA) Audio Server, to communicate with the existing Transurban OMCS system via the Ripple protocol.
- Also challenging was signal reception and rebroadcast of the clients preferred AM/FM commercial radio stations, this was due to the geographical location and various output power of targeted AM/FM commercial broadcasters. RFI exercised thorough site surveys for optimal antenna placement to ensure strong signal reception and quality tunnel rebroadcasting to resolve these issues.
- RFI supplied all RRB hardware, software, cabinets, cables and antennas for both East and West Bound Tunnels, the MTP (Main Toll Plaza) and the EPCR (East Portal Control Room).
- The DSPbR and AM/FM repeater equipment is manufactured at our high spec Adelaide facility. RFI also supplied AM/FM antennas and RFI UHF yagi antennas, lightning protection, and in-tunnel off-air monitoring system.