

SUCCESS STORY: *Wireless Video Surveillance for Moving Rail Vehicles*

Metropolitan transportation departments around the world have a pressing need to bring applications familiar in fixed networks to moving vehicles, such as metros, trains and buses. One example is video camera (CCTV) for surveillance, which is an essential factor for today's public transit security. Traditional wireless data communications systems do not provide the reliability and performance to support applications such as full motion video in moving vehicles. The importance of these applications is growing rapidly, and the WiBorne solutions are vital ingredients for today's ground transportation, urban rapid transit, metro, subway, and bus systems.

Toll Rail (www.tollrail.co.nz) is New Zealand's leading transport operator and multimodal freight transport and distribution company. The company provides a cost-efficient linehaul service for the movement of bulk commodities or containerized freight. They also offer an integrated national network of rail, road, and sea freight transportation, along with world class distribution and logistics management services, and inter-island and urban passenger services.



Toll Rail in conjunction with Infortek (www.infortek.co.nz) and WiBorne (www.wiborne.com), is the first rail line in the country to successfully complete a "proof of concept" for wireless broadband access technology that provides continuous high-speed Intranet access along a rail line at high travel speeds. Other rail lines have provided wireless Internet access based on slower communication technologies.



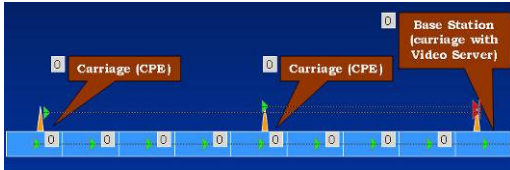
Railway lines are often isolated from infrastructure, such as when traveling through long tunnels, by using different technologies, we can use each system to hold on to the signal as long as possible and deliver the best possible connection. Toll Rail has installed WiFi hotspots in each carriage and antenna on each train roof, with a local area network running along the length of the train. The service will be tested on the North-South Mainline route. Such remote management and surveillance includes a number of functions, making it possible to monitor the operation of the service on its fleet.

Wireless Train Network - The Infortek-WiBorne developed **Wireless Train Network (WTN)** / **Wireless Vehicle Network (WVN)** systems that support multiple applications such as video camera for security, VoIP, telemetry, automation & remote control of vehicles and data communications for monitoring and updating of information throughout the transport network. For example, full transmission of live video and security surveillance information from the moving train to a central server can be easily accomplished via the Infortek-WiBorne system. Our WTN/WVN is the backbone of intranet on train, hooking up all vehicles together; in each vehicle, WiFi access points (AP) are deployed to cover the whole area, allowing end users to access this WLAN via mobile devices, such as portable computer, PDA, mobile IP phone, etc.



Each carriage has 4 cameras and one DVR that expect high throughput of streaming data and 10 more carriages aim to one carriage that acts as base station. Once train approaches to railway station it then start to sending video to **Railway Information System (RIS)** by using wireless AP along railroad with **Train-Ground Internetworking (TGI)** and **Broadband Railway Digital Network (BRDN)**. All carriages are interchangeable along with any base carriage as part of infrastructure of **BRDN** along the railway track. Thus whole system must be designed to be very flexible with rapid mobility to support interconnection scheme

between vehicles of a train. Programmable **SNMP** MIBS is implemented to support such flexible **WTN**.



Our **WTN / WVN** infrastructure technologies show very promising technology that offer internet on moving vehicles and trains. It can serve internet quickly either from 3G (UMTS, GPRS), Satellite, WiFi, and WiMAX stations.

Travelers aboard with Toll Rail New Zealand will now have more than scenery and solitaire to keep them occupied as Canada's national passenger rail service has introduced WiFi access aboard its trains. All that is needed to access the network is a WiFi enabled device such as a laptop or PDA.

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