

Case Study

Guangzhou Expressway



Infinova provides fiber optic transmission for Xiaotang to Maoshan section of Guangzhou City-circular Highway.



Solution: Infinova fiber optic networks and transmission

Guangzhou West 2nd Ring Expressway Transmission System

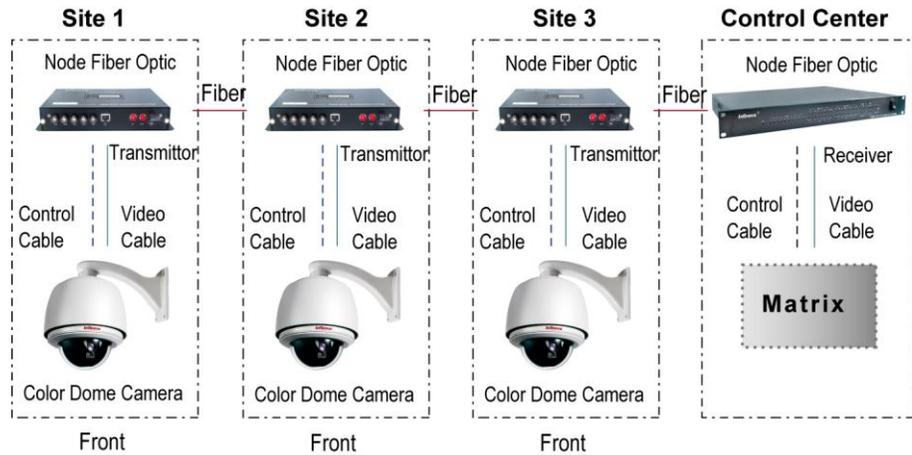
The Guangzhou West 2nd Ring Expressway, also known as the Xiaotang to Maoshan section of Guangzhou City-circular Highway of the National Main Trunk Line, connects six expressways of approximately 42 kilometers. With it, travelers driving from Foshan to the new Guangzhou Airport now have a direct link.

The surveillance system used on the expressway differs from a traditional CCTV system. The highway systems has decentralized edge sites, distributed along the expressways, all of which need to stand up to weather extremes, temperature fluctuations and the other rigors of an outdoor environment. Due to the long distances, transmission quality is a challenge and fiber is was the best choice for this intelligent highway system (ITS). To assure reliability within the Guangzhou expressway surveillance system, two different types of transmission modes are deployed, node fiber optic modems and video encoders/decoders.

Traditionally, peer-to-peer digital fiber optic modems have been used in such systems. Although they are priced very competitively, they can create problems. Since a peer-to-peer set-up requires fiber to be run from each of the edge sites to the monitoring site, the amount of fiber needed for a highway surveillance system can be quite high. This not only increases the overall investment in materials but also impacts the cost of installation.

Infinova[®]
The Integrator's Manufacturer

Because the Guangzhou must transmit of many types of signals – video, audio, alarm closure, etc. – the most logical choice was to create a centralized transmission distribution mode. Video signals collected at each toll gate, as well as those transmitted from cameras along traffic lanes, are input to the closest communications station. Here, they are compressed and encoded by network video encoders working with the on-site digital video storage server, and, ultimately, transmitted to the monitoring and management center via the fiber ring network. As a result, authorization levels can be created that allow the center to call up, control and store video from the edge sites remotely. Video also can be called up and transmitted manually, by schedule, or triggered by events. In addition, distributed management is used at all toll stations, with images determined by their levels of priority. Using its own matrix switcher, every toll station can remotely call up videos from monitoring sites. Likewise, the matrix switcher itself is managed remotely.



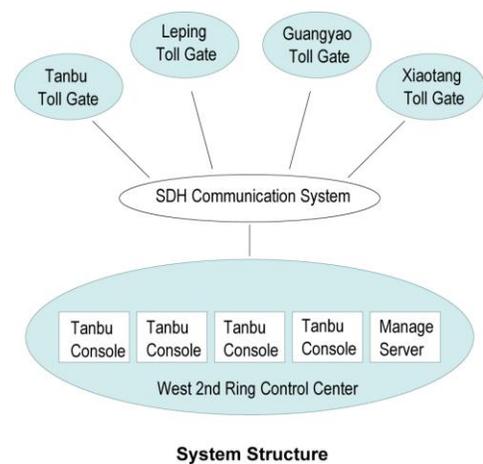
To more fully leverage the fiber wiring, the Resilient Packet Ring (RPR) channel is dynamically distributed. This guarantees real-time surveillance of emergencies and provides a faster response to incidences, including anti-terrorist activities. It unifies the highway surveillance solution and toll booth CCTV systems into a single platform.

Node Fiber Optic Modem Advantages for Guangzhou

The use of a node fiber optic modem greatly reduced the engineering costs of the Guangzhou expressway surveillance system. Also called a bus digital fiber optic modem or link type digital fiber optic modem, the video transmission system is networked through one or two fibers. Deploying a standard Time Division Multiplex (TDM) and an Add/Drop Multiplex (ADM) approach, the node fiber optic modems save Guangzhou fiber resources and extend transmission distances.

Since a link fiber optic modem using ADM technology is restricted by its transmission capacity, both TDM and ADM technologies are used in the Guangzhou system. If the system begins to run low on redundant fiber resources, the Guangzhou system would increasingly use the TDM technology. In this way, different kinds of optical signals can be transmitted via one-core of fiber while isolating the physical layer.

In this system, Infinova’s N3793 series 10-node fiber optic modem integrates with a traditional video matrix switching system, creating an innovative, intelligent optical transmission device that is especially designed for applications like the Guangzhou expressway system. One link can achieve real-time transmission of up to ten channels of video with eight channels of bi-directional audio and data (or 16 channels bi-directional data), two channels of reverse data and one channel of Ethernet. Each node can input up to five channels of video with four channels of bi-directional data or audio, two channels of reverse data and a 10/100M Ethernet signal.

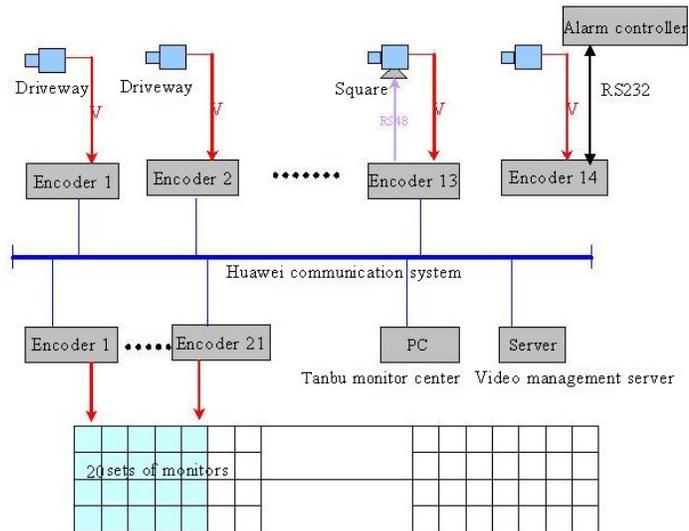


The thinking behind the Guangzhou expressway system

At the beginning of the project, the designers wanted to assure that they developed a comprehensive digital video surveillance solution, one that integrated real-time video transmission, online storage, archive search and playback, and multiple levels of remote control. This was to ensure that the system would improve security responses, faster handling of emergencies, timely and reliable video information for traffic management and allow supervisors to call up and collect evidence.

To assure multiple levels of network video surveillance, the network video encoder/decoders leverage a powerful MPC860 core, which supports uni-casting, multipoint uni-casting and multicasting. Besides Infinova components, the encoders/decoders integrate with the network transmission devices of other manufacturers, including as CISCO, Huawei, ZTE, UT and Harbour.

To ensure a stable system operation, the main operating system uses a telecom industry level OSE real time operating system. As a result, the unique internal 31-level priority assignment of the network video encoder/decoder becomes a perfect solution for distributed multi-level priority management. Since it doesn't rely on server authorization control, the system is more stable.



In the Guangzhou expressway application, which interfaces with the Anyshow network video surveillance system software, the software can assign priority for different levels of management stations, such as the overall control center, expressway monitoring center, area sub-center, and the surveillance and management station. Users of different levels can be assigned different control priorities to video images ranging from viewing to control, storage and reviewing archives. Department leaders can view live video via an Internet Explorer (IE) browser.

To help with troubleshooting, the solution provides self-checks and online checks for the encoder/decoder, DVR and their communication lines. With its rack encoder/decoder, the system saves installation space at the local sites and the control center while ensuring easy maintenance for future system expansion.

Taking into consideration the different requirements of the expressway management and the needs of the traffic police departments, this project is a leading example of a comprehensive intelligent traffic management platform which meets both departments' needs. It features long distance monitoring, limited fiber resources, centralized toll stations and many types of transmission signals. The signals collected from the expressway are transmitted by node fiber optic modems, saving time and money and making management of the expressway system more flexible and easier to maintain. Signals collected from the toll stations are transmitted by digital encoders/decoders, leveraging the distributed management system of the toll stations. The combination of the two transmission methods makes the video surveillance system an intelligent traffic system, providing real-time distributed management with no delay and no distortion.



By helping channel partners provide their customers with complete, affordable, best-in-class, large and small video surveillance solutions, Infinova helps integrators generate more business more profitably. Leveraging a

manufacturing process certified to ISO 9001:2000 standards and over 250 engineers with a list of video industry firms, Infinova channel partners provide their end-users with industry-acknowledged product reliability and technical leadership.

So that Infinova channel partners can create complete solutions, Infinova provides IP surveillance cameras and components, CCTV analog cameras, DVRs and components, camera accessories, monitors, power supplies and fiber optics communications devices. Infinova also has the technical ability and manufacturing flexibility to let integrators propose customized solutions. In addition, Infinova will partner with other manufacturers making other surveillance equipment and software to help its channel partners create turnkey solutions. Contrary to most other companies, Infinova will back-up their partners' products as well as its own to assure both the integrator and its customers that one call – to Infinova only – takes care of everything.

Infinova works diligently to assure its channel partners can provide cost-conscious solutions. With Infinova's hybrid systems, channel partners can propose systems that protect a customer's investment in its already-installed analog surveillance system but that also put them on a dynamic migration pathway to IP systems.

Infinova is lauded for its exceptional maintenance programs. A major highlight is the company's 24-hour advanced replacement policy in which a substitute product is shipped immediately upon notice of a problem.

With such customer focus, Infinova is often referred to as "the integrators' manufacturer."

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