

Case Study

Shenzhen Intelligent Transport System



China's Shenzhen transportation surveillance system exhibits how installations can leverage their analog cameras while creating a state-of-the-art intelligent transportation system.

Solution: InfinoVA cameras, matrix switchers, fiber optics and DVRs



Analog and Digital Come Together in Shenzhen's Leading Intelligent Transport System

In China, an Intelligent Transport System (ITS) is considered extremely important for building a nationwide national traffic system. Local city traffic surveillance, including traffic monitoring and traffic control, along with traffic information management are considered the first steps to creating a nationwide system. Cities, such as Beijing and Shanghai, are already planning for it.

From the Chinese perspective, such systems go beyond simple monitoring. They understand that the implementation of a municipal traffic system in a major city, including traditional bus transportation, rapid bus transit (BRT), railway transportation, sea shipping, and city light rail system, produces a profound influence on a city's economic development while bringing a national traffic and transportation system one step closer. That's important but the vision doesn't stop there. One system leads to another. While a local city street surveillance system, comprised of that city's traffic control, traffic monitoring, traffic information management, traffic police response system and comprehensive information transmission, produces the desired effects on a local level, it also can feed into a traffic bureau, which itself can ultimately become the national department for centralized traffic and transportation management, as well as a driver for ITS installation throughout the country.

How Shenzhen Created an ITS System

In Shenzhen, a migrant-rich city of 10 million rich with a strong economy, the city's traffic has been a major challenge. During a Municipal Party Committee meeting of Shenzhen, a program of "Five Changes" was created for developing a new Shenzhen traffic system.

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The Integrator's Manufacturer

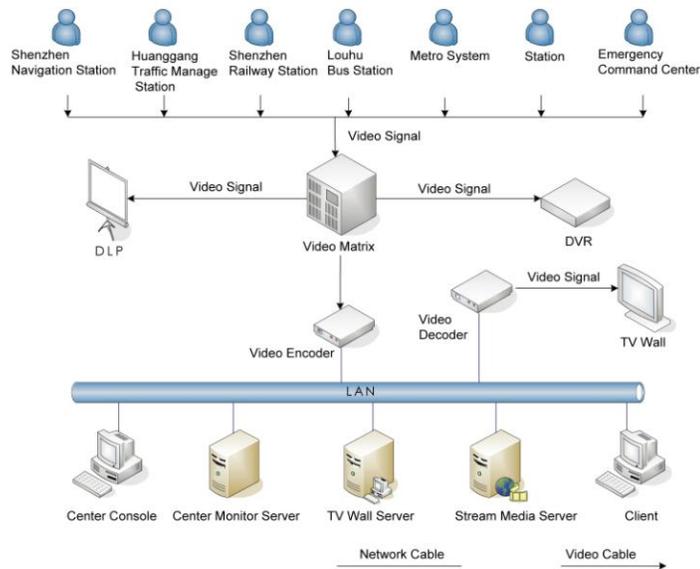
One of the major changes was to switch traditional management of the city’s transportation system to one of intelligent management. To do so, the Shenzhen Traffic Bureau, the primary driver of the city’s ITS implementation, was given uniform control over the city’s affiliate bus stations, railway stations, wharfs and metro system.

Video surveillance was no stranger to the city’s bus stations, railway stations, ports, wharfs or metro stations. In fact, most of the surveillance systems in these departments had been in operation for years. Most of the equipment serving these departments was analog. They included a mix of analog matrix-based, PC video recorder-based and network video encoder/decoder-based camera systems. However, with the new vision, these analog systems needed to be upgraded from being strictly local to part of a fully integrated ITS system.

Here is one example. Shenzhen’s ports, which lead the nation in container throughput, play a key role in the city’s economy. To ensure they operated safely, they needed to be monitored. As a result, the Shenzhen Port Hazardous Cargo and Transportation Surveillance System implementation was defined as one aspect of the system. Phase One of this locale’s implementation included not only monitoring the Shenzhen navigation station, where videos from all Shenzhen ports are converged, but having video surveillance over all routes and stops into the station. These would include the Huanggang Traffic management station, Louhu Bus Station, Shenzhen Metro system Line One and the Shenzhen Emergency Command Center. The next phase was to integrate this system into the larger ITS system.

Centralizing Monitoring and Control

Although, it was considered very important to integrate all the video systems of the above mentioned departments, designers also had to assure that each group’s original functions were kept intact. For instance, the Port needed to be able to monitor itself as always. To assure this goal was met, the Shenzhen Traffic Bureau determined that the equipment in the control center would be able to view, switch and control videos of these various departments and assigned relevant priorities to each to avoid conflicts. Therefore, while Port continues to monitor itself, if something taking higher priority happens elsewhere, the control room will focus in on that.



Although the present video systems were analog based, the Traffic Bureau wanted to establish a network-based digital system and then connect it to a dedicated government WAN. This would let the Traffic Bureau remotely view and record videos of each department from anywhere they were connected to the dedicated government WAN.

Instead of tearing out the old cameras and system, it was decided to leverage the analog system yet start the migration to an ultimate fully digital system by creating a hybrid digital system to work with the older analog cameras. Encoders were added to the original analog cameras along with a management server and a streamed media transmission server. To maximize network bandwidth when connected to the dedicated government WAN, the Bureau selected digital products manufactured by the same manufacturer, Infinova, of the analog products. This increased compatibility between the old and new equipment. Nonetheless, there were still problems to overcome.

Problems with the analog system included:

1. The legacy surveillance systems in each department had been installed a long time ago and were comprised of products from several different manufacturers. Installers knew there would be problems. For instance, incompatible protocols and different networking platforms (RS232, RS485, and Ethernet) would raise havoc once the control center attempted to use its new matrix switcher to control the various brands of legacy matrix switchers within the affiliate departments.
2. It was probable that the matrix system in the control center would generate a different code for the front-end devices. Therefore, it may not be able to control the pan/tilt system of the dome cameras at affiliate departments.
3. Some affiliate departments had no matrix system. A new system had to be installed.
4. On the positive side, another affiliate department did have several Infinova matrix systems and they could be networked.

How the System Works

The videos and control priorities of the original surveillance system are now redistributed and the normal operation of the original system has been fully ensured. Importantly, the City Traffic Bureau’s operation has no negative effect on the normal operation of the surveillance systems of the affiliate departments.

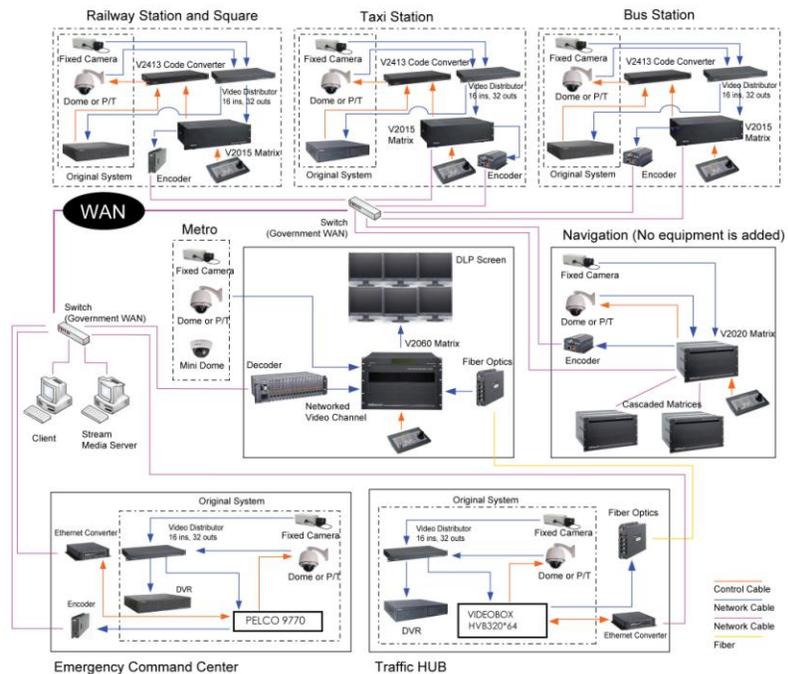
Today, the control center uses an Infinova matrix switcher as the control device and the affiliate departments are basing their systems on it. An Infinova V2015 matrix switcher, video distributor and multi-protocol converter are used for the affiliate departments which had no matrix switching

systems. The V2015 series provides these departments with automated electronic surveillance or allows a single user to control an entire CCTV system of up to 80 video inputs by 16 video outputs. The newly added Infinova matrix switcher is connected to the City Traffic Bureau’s government WAN. Network video encoders and decoders are used for single-way video channel connection so that the matrix switching system at the Traffic Bureau can view and control all individual site videos.

For the affiliate department that had a matrix switching system, an Infinova Ethernet Converter is used for control and network video encoders/decoders are deployed for the matrix video channel connection. Both are connected to government WAN.

For the affiliate department that had several matrix switching systems, installers connected the original Infinova matrix switching systems to the government WAN. A multi-level networking procedure is used. Network video encoders/decoders are used for matrix video channel connection which lets the matrix system at the control center view and control matrix switchers at this department.

As a result of this design, the Control Center has full control ability over the surveillance systems of the affiliate departments. It can view and control all videos of all local surveillance systems, eliminating blind areas.



Using a dedicated network provides enough bandwidth for transmission of the matrix networking control data and video data with very little delay. Since the Infinova matrix switching system performs the networking control, video transmission from the affiliate departments to the City Traffic Bureau does not need any additional fiber or fiber optic components, saving both installation labor and hardware costs.

A Foreshadowing of Many Systems

One of the most challenging dilemmas that security managers face is when and how to take the leap from an analog to an IP/digital video system. They want to jump to IP surveillance but in a cost-managed way that extends the life of existing equipment. For most sites, this migration will take place gradually and, during the process, analog and IP solutions will have to coexist, in some cases, for many years to come. As security technologies continue to mature, an analog plus digital structure, as exhibited in this system, will be integral to surveillance system installations.

Infinova[®]

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 firsts, 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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