Wireless Video Raises Public Safety in Major Municipality

Cook County, Illinois, fights crime and improves response with wireless video in police cars and high-crime areas.

<table>
<tr><td colspan="1">EXECUTIVE SUMMARY</td></tr>
</table>

EXECUTIVE SUMMARY

COOK COUNTY
- State and Local Government
- Cook County (Chicago), Illinois

BUSINESS CHALLENGE
- Improve emergency incidence response among police officers in 129 municipalities
- Enable mobile video communication alongside data communication in sheriff's vehicles
- Provide video monitoring in high-crime areas across the county

NETWORK SOLUTION
- Mobile networked video capture and sharing solution based on wireless routers in sheriff's vehicles
- Wireless mesh access points installed on buildings and towers
- Fixed wireless infrastructure enabling monitoring cameras

BUSINESS RESULTS
- Police officers are more efficient and safer with real-time tactical video information
- Real-time video and data feeds improve collaboration among municipalities
- Standards-based modular architecture allows for less-expensive integration of future technologies

Business Challenge

Cook County, Illinois, includes the city of Chicago and two major airports as well as 128 other cities, towns, townships, and villages. Cook County's judicial and law enforcement services department is vast and busy. Several years ago, the county launched Project Shield, which aimed to improve the public safety and emergency response of the county's municipalities with a wireless network.

Project Shield had three major IT challenges. First, it called for the county's police vehicles to be equipped with video cameras, digital video recorders, and laptop computers that would let first responders communicate wirelessly over a common network.

"There had been a trend in the United States for police cars to be equipped with cameras and VCRs, but the video recording stayed in the car, only to be used later for evidentiary purposes," says Hugo Vliegen, a senior market development manager at Cisco. "Cook County had a vision that the videos should be completely networked and put to use during an incident."

Experience shows that first responders can be more effective if they have always-on mobile access to information such as outstanding arrest warrants, police records, maps of dangerous territory, license plate information, or simple driving directions. In addition, live video feeds from police vehicles can keep fellow officers informed of each other's activities.

Second, at the time the county had no standard countywide network. Cook County wanted a common system for its municipalities to communicate with each other wirelessly, especially during emergencies.

Third, Project Shield called for a video monitoring system in which temporary wireless cameras, also part of the countywide network, would record activity in high-crime areas.

In 2004 the county received a $20 million federal grant for Project Shield, then issued a nationwide request for proposal to equipment vendors and service providers.

Network Solution

After its evaluation process, Cook County chose wireless networking equipment from Cisco, which was already the county's provider of Ethernet hardware and services.

In the initial phase of Project Shield, 80 police cars were equipped with Cisco® 3200 Series wireless routers and third-party cellular modems, turning the vehicles into mobile networks. The cars communicate with the home office and each other over both Wi-Fi and cellular networks, moving transparently between the two. This dual-mode connectivity is important as the county owns a limited number of buildings for Wi-Fi access rights, so it requires a blend of cellular and Wi-Fi.

"In those days putting a router in a car was revolutionary," Vliegen says. "The county already had a huge Cisco network and was happy to see that we would be able to meet their wireless needs with Cisco equipment."

Wi-Fi hotspots were placed on buildings and towers throughout the county, with a focus on Chicago. Each of the 80 hotspots uses three Cisco Aironet® 350 Series Access Points, running at 2.4 GHz. (Future hotspots will use Cisco Aironet 1300 Series Access Points, which are optimized for outdoor use.)

The router uses standards-based Mobile IP to deliver constant network connectivity as vehicles move around the county. The Mobile Networks feature of Cisco IOS® Software allows multiple devices—cameras, recorders, GPS systems, and laptop computers—to stay connected to the network through the router.

And all devices can maintain a high level of network security to protect confidential data. The Cisco IOS Software provides integrated network security features including authorization and authentication, stateful firewall, intrusion detection, and data encryption for VPNs.

Furthermore, the Cisco solution allows remote management of the in-vehicle equipment, so software can be updated while the car is on the road.

The initial deployment was a success, except for one problem: the digital video recorders from a third-party vendor were so large that they took up the majority of the trunk space. Cisco solved this problem in the second phase of Project Shield, working with several business partners to create a single enclosure housing the wireless router and a networked video recorder, video server, hard drive, storage, and video management software. The improved solution saved space and a great deal of battery power.

Cisco and its business partners ensured that the intelligent video capabilities of the system could take full advantage of the network foundation provided by the Cisco routers. Now, the county accesses the recorded video and video cameras through a browser interface. Whether an officer is issuing a routine speeding ticket or responding to a violent crime incident, the system continuously captures the video streams and makes them accessible from anywhere on the network.

And now that there is a single-box solution, based on industry standards, the county can deploy to its multiple municipalities as funding and time allow.

Phase 2 of the project included upgrading the wireless network to support radio communication in the 4.9 GHz range, which is reserved for public safety and faces fewer interference issues than the 2.4 GHz range.

Today, nearly 200 vehicles are equipped with mobile networking equipment.

Business Results

PRODUCT LIST
• Mobile networked video solution based on Cisco 3200 Series Wireless and Mobile Routers
• Cisco Aironet 350 Series Access Points
• Cisco 1300 Series Access Points

Project Shield was deployed to prepare the county for a collaborative response in case of a terrorist attack, major natural disaster, or other widespread emergency. So far, the in-vehicle wireless network system has helped police officers do their jobs both more efficiently and more safely. First responders have access to live video feeds from other vehicles. And precinct offices can update field officers in real time with information such as new cases, news about outstanding warrants, and changes to legal policies and procedures. This should prove invaluable in the case of a major disaster.

"Now they have a standards-based network that lets officers collaborate," Vliegen says. Furthermore, because the network is based on industry-standard technology, it can be upgraded to support new wireless technologies, such as Worldwide Interoperability for Microwave Access (WiMax), should the county decide to do so.

And the cutting-edge technology is an incentive for new police officers to join the forces of Cook County. "I met a sergeant who said they see major hiring problems if they don't extend the IP network into the vehicles," Vliegen says.

Meanwhile, the fixed network video monitoring systems are popular with the residents of the neighborhoods in which they are installed. The county was initially concerned that the residents might resent the monitoring, but in fact, after an initial pilot phase, neighborhood organizations insisted that the cameras stay.

"From the moment they installed the cameras, the people in the neighborhood wanted to keep them," Vliegen says. "If you have a high-crime area, people feel more relaxed if they believe someone is watching over them." The wireless solution allows for a great deal of flexibility to place and move cameras based on the nature and location of the crime. It has proved to be an effective tool to reduce crime.

Next Steps

Now that Cisco has created an all-in-one network package for vehicles, "they can put the package on a state price list, so procurement becomes easier," Vliegen says.

While the bulk of the police vehicles equipped with wireless routers are in the city of Chicago, the county and Cisco have created a solution that can be purchased by the other 128 communities. "Cook County is a model for other counties," Vliegen says.

Cisco has more than 200 offices worldwide. Addresses, phone numbers, and fax numbers are listed on the Cisco Website at **www.cisco.com/go/offices.**

Printed in USA

C36-399563-00   3/07