

Wireless Watch

Marquette University extends video surveillance beyond campus borders with a wireless system, and crime rates drop.

With campus safety and security a nationwide concern following incidents at several universities, the Department of Public Safety at Marquette University in late 2006 decided to fortify security beyond campus boundaries. While officers routinely patrolled off-campus neighborhoods in the areas adjacent to the university's location near downtown Milwaukee, the DPS electronic surveillance system did not extend off-campus. Thus, instead of a costly and inefficient strategy of deploying more officers, DPS turned to a wireless video surveillance system to extend security coverage to neighboring streets.

"Public Safety came up with the idea for the wireless surveillance system beyond campus. They were looking

for a force multiplier," says Dan Smith, Marquette's senior director of IT services. "Putting feet on the street is very expensive, and they were looking for a more cost-effective way to provide the same, or better, level of service."

Much of the infrastructure was already in place. Marquette started offering wireless network access in academic buildings and common areas to its 11,000 students and 2,500 faculty and staff in 2001. And since 2007, students in the dorms have had wireless access over a Cisco Unified Wireless Network. The university has also used surveillance cameras running over the wired network for many years, with hundreds installed to monitor both interior and exterior spaces on campus. But to extend the reach of DPS into the community, the university needed two things: a wireless mesh network

and its neighbors' cooperation.

With the Unified Wireless Network already in place, the IT department decided to add a Cisco mesh network solution, but only after the due diligence of comparing it with the offering of another manufacturer, says Mary Simmons, director of security and networks.

"We investigated another solution, but it was very proprietary, and we shied away from it because of that," she says.

Smith says that he and others involved in the decision also selected Cisco because they thought the vendor's technology would offer better end-to-end control over quality of service and more easily let them give video priority across the network.

Community Cooperation

It was relatively easy to persuade Marquette's neighbors to let the university set up cameras on their property as part of a system that beefs up security in the community, says Smith.

"In most cases, the community is pleased to do it, and they're actually providing the power for [the cameras]," he says. "They now have security cameras up outside their property that Public Safety is watching for them."

At present, the outdoor wireless grid supports 12 surveillance cameras mounted on commercial and residential buildings at important locations near the university, Smith says. Fifteen Cisco Aironet 1520 Series lightweight outdoor mesh access points, along with Cisco Catalyst

PHOTOGRAPHY BY JOHN SIBILSKI

5 REASONS FOR OUTDOOR SURVEILLANCE

1. A well-publicized surveillance program deters crime.
2. A real-time wireless surveillance system helps public-safety staff stop crimes in progress, and surveillance videos can be used to identify and apprehend perpetrators after the fact.
3. The program improves relationships with neighbors, who reap the benefits of increased safety in the community.
4. Outdoor surveillance technology leads to more effective allocation of the public safety department's financial and human resources.
5. The system offers safety assurances to current and prospective students, as well as their parents.

6500 wireless service modules that enable centralized control, were installed on the periphery of the Marquette campus. They provide the wireless connectivity needed to transmit operating instructions to and video data from the cameras.

According to Simmons, the only glitch in the implementation occurred when older model access points originally purchased for the outdoor wireless system proved unsuitable to Marquette's needs.

"The first outdoor access points that we used were really not made for the environment that we had," Simmons says. "But we replaced them with the newer outdoor access points, and they seem to be working just fine. Both CDW•G and Cisco were willing and ready to jump in and work on all problems that we encountered."

Public Safety staff monitor the real-time video from the outdoor wireless installations, along with the data from more than 400 other campus surveillance cameras, on a video wall at the department's Command Information Center, says Lt. Brian Joschko, DPS support



LT. BRIAN JOSCHKO says the goal of the wireless surveillance system is to catch people before they break into apartments, stores or cars.

services coordinator. Video from the cameras is stored for about 30 days on a network digital-video recorder, unless it records a crime or otherwise represents evidence, in which case the data is shared with local law enforcement officials and burned to permanent storage media.

While signals between the mesh access points and cameras travel over the 2.4-gigahertz network, video from the access points is backhauled over a 5GHz link to root access points connected to Ethernet ports inside campus buildings. The result is that video from the off-campus surveillance cameras is available over Marquette's Cisco Unified Wireless Network.

One important piece of the wireless initiative was extremely low-tech. To maximize deterrence, the university posted signs in the area around the campus that read: "You are under video surveillance." The signs are part of a focus on preventing crime or stopping it in progress, rather than catching criminals after the fact, Joschko says.

"Absolutely, our goal is to use these [cameras] as proactive tools — to catch people looking into car

windows before they actually break into them, and catch people who are hanging out on street corners with their hoods up," Joschko says. "Once we identify those people, we send officers out to get involved before a criminal act occurs."

Promising Results

With more cameras planned for installation in the future, results from the outdoor wireless surveillance program are promising, says Joschko. Total incidents were down 17 percent in the first quarter of 2009, compared with the first quarter of 2008. In the same period, robberies dropped from 10 in 2008 to just three this year, and personal crimes (robberies, sexual assaults and battery) were down from 17 last year to seven this year.

Marquette is in the vanguard of a growing number of mostly urban colleges that are pushing their surveillance capabilities out to the communities around their campuses, says security consultant and analyst Jim Webster, president of Security Design Services in Estell Manor, N.J. The trend began with programs to beef up

MARY SIMMONS and DAN SMITH say crime rates are down on the Marquette campus in Milwaukee thanks to the school's outdoor wireless surveillance system.



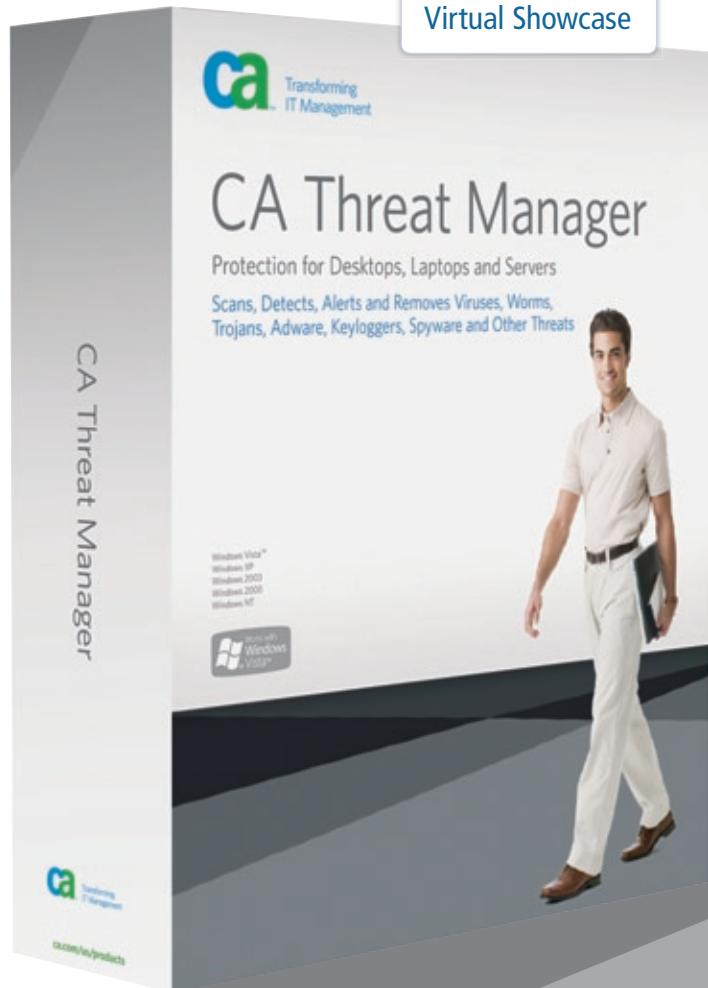
Los Angeles police reported a **40%** drop in crime the year after the installation of a well-publicized wireless video surveillance system at Jordan Downs public housing project.

SOURCE: Los Angeles Police Department



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Marquette's Wireless Surveillance Network

Wireless video cameras mounted on near off-campus commercial and residential buildings receive and transmit data from Cisco Aironet 1520 lightweight outdoor mesh access points.

The access points transmit instructions to the cameras and data from the cameras to the DPS Command Information Center and to root access points that connect the outdoor network to Ethernet ports and the Cisco Unified Wireless Network.

In the Command Information Center, using the Cisco Wireless Control System and a video wall, officers monitor and control the outdoor network cameras in real time, along with all other surveillance cameras at the university. Data from the cameras is stored in network video recorders in the CIC.

Officers within Wi-Fi range of university buildings, especially those in squad cars, can log into video from the outdoor network and pan or zoom cameras for real-time crime control.

security in off-campus housing and administration buildings. It has been supported by a parallel trend toward increased cooperation between municipal and campus police. Advances in technology have also helped, says Webster.

“With the old CDMA [code division multiple access] wireless systems, there wasn’t enough infrastructure to do useful electronic video surveillance,” Webster says. “With mesh networks,

there’s enough bandwidth to get good images and deploy cameras in critical locations. It just makes security better.”

According to Smith and Joschko, there have been almost no complaints about the surveillance program from students or citizens concerned about privacy. They chalk up acceptance of the program to it being well-publicized and to the cameras being deployed very openly.

“In successful surveillance programs,

campuses sell it as an asset to students before they install it,” Webster says. “A campus is already a very public place, and when they think about it, people are willing to give up a little privacy for security.”

At Marquette, security is better now that it includes the surrounding neighborhood. “There’s no doubt in anyone’s mind that these cameras and the signs we put up played a role in deterring crime,” Joschko says. **ET**