Giving the green light to safer streets with Axis.

City of Dubuque steers the future of traffic safety towards IP technology.

Organization:
City of Dubuque

Location:
Dubuque, Iowa, USA

Industry segment:
City surveillance

Application:
Traffic monitoring

Axis partners:
RACOM Corp., Milestone, HP

Mission

The City of Dubuque, Iowa, is a regional hub of 60,000 people on the border of Illinois and Wisconsin. In the early 2000s, the traffic department began linking traffic signals and intersections together in a fiber optic network. Initially, they installed network cameras to detect vehicles at the intersections for signal changes, but they later switched over to microwave-based detectors. Unfortunately, with the change, they lost the ability to view and record video at the intersections.

Solution

To reestablish visual support, the traffic department selected a mix of Axis network cameras provided by systems integrator and Axis partner RACOM Corp. They first installed fixed HDTV AXIS Q1755 Network Cameras, as well as HDTV 1080p AXIS Q6035 pan/tilt/zoom (PTZ) for targeted examination. Then, when Axis released the fixed AXIS Q1604 Network Camera with Wide Dynamic Range-Dynamic Capture, the city saw how well wide dynamic range could combat the effects of direct sunlight, reflections off passing vehicles and glare from nearby lights.

AXIS Q1604 cameras soon became the standard for future installations. Milestone XProtect® Video Management Software provides critical support for viewing and extracting video at city hall.

Result

The IP cameras have become an integral component of the city's Intelligent Transportation System. Video analysis helps traffic engineers improve roadways without incurring the high costs of new construction. They are able to update signage and roadway markings to improve traffic safety. Police use footage to get an accurate account of accidents and other incidents. Local citizens also use the video to settle disputes over accidents without the need to go to court.

AXIS® COMMUNICATIONS

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"The system gives me a really good heartbeat on the city. We can go back through the footage to see what led up to accidents and get a good feel for what might help [in the future]."

David Ness, professional engineer for the City of Dubuque.

From riverboats to fiber optics

As one of the oldest settlements in the state of Iowa, the City of Dubuque has benefited from more than 200 years of transportation innovations: from steamboats floating in on the Mississippi River to cable cars chugging up and down its bluffs. Continuing this tradition, Dubuque traffic engineers launched a project in the early 2000s to connect all of its traffic signals and intersections to a central monitoring location via Ethernet and fiber optics. As the project evolved, the city began installing Axis network cameras alongside other IP-addressable technology as part of its Intelligent Transportation Systems (ITS) initiative.

"ITS improvements are being utilized a lot more often, because you are able to can get more efficiency out of your existing infrastructure if you improve your communications," said city engineer David Ness.

In total, 260 cameras have been installed at 80 intersections around town. The design of the Axis cameras made installation simple and efficient. "Getting it out of the box and up on the pole is very easy," said Ken Fleege, manager of Dubuque, Iowa operations for systems integrator RACOM. The health assessment features of AXIS Camera Management software helps reduce the number of trips needed to maintain the cameras in high traffic areas.

Every detail from all the angles

The city initially installed fixed HDTV-quality AXIS Q1755. These were paired with AXIS Q6035 PTZ Dome Network Cameras, which allowed them to zoom in close and examine specific areas of a scene if needed. After testing the fixed AXIS Q1604 Network Camera when it was released, the city embraced the possibilities offered by the camera's Wide Dynamic Range- Dynamic Capture features. The wide dynamic range feature provides clear, detailed images free of glare from oncoming headlights, traffic signals, emergency vehicles and the sun. "Even when the lights are shining right on the camera, you can see the sidewalk in the dark behind it," Ness said.

The city customizes many of its AXIS Q1604 cameras with 15-50mm telephoto lenses to get a comprehensive view of several blocks at once. They also employ the default 2.8-8mm wide angle lens to get an overhead shot of all approaches at an intersection.

The cameras record 24 hours a day at ten frames per second. Video is managed with Milestone XProtect® software on HP Z620 workstations. The footage is stored on direct attached drives for 30 days with HP DL380E Generation 8 Servers, which also use high speed drives for the live video databases. The Milestone software allows the traffic department to follow cars seamlessly from one camera to another, and the mapping feature lets them target specific cameras with ease. Wireless technology helps connect cameras on hard-to-reach bridges spanning the Mississippi River.

Safer roads, fewer costs

The IP technology offers unprecedented analytical oversight of traffic safety. "The system gives me a really good heartbeat on the city," Ness said. "We can go back through the footage and see what led up to accidents and get a good feel for what might help." In one instance, they installed new signage after observing drivers repeatedly getting confused by a road's lane transition. Elsewhere, they are able to make critical adjustments without the high cost of physically altering roadways. "It's probably a tenth of the cost of adding another lane," Ness said. They are also able to respond to sudden detours and other incidents remotely with the Milestone smartphone app.

The footage also helps police and local citizens make sense of the often chaotic scenes following car accidents. "The police find it extremely useful," he said. From the scene, they can request the traffic department review video to help produce an accurate report. The traffic department can also review footage afterwards. Following one accident, the video helped reverse the person alleged to be at fault after Ness noticed the footage did not match up with the witness statements. Other times, it has helped people settle disputes and avoid court battles. "I think it really helps citizens put closure on accidents," Ness said.