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Metropolis Report

Eye in the Sky: A New Way to Combat Crime



By Editor on February 22, 2010 7:51 AM | [0 Comments](#)

By **Brian James Kirk**

When it comes to fighting crime, Philadelphia is undergoing a video revolution. Within a few short years, the city is likely to be blanketed by a network of more than a thousand state-of-the-art, high resolution cameras, scanning high-crime areas, critical structures such as the Benjamin Franklin Bridge, SEPTA stops and inner city streets.

The sweeping program had a modest beginning. In 2007, Mayor John Street and the Philadelphia Police Department announced a \$10 million initiative to install 250 surveillance cameras around the city. These are high resolution Unisys digital video cameras that, if perched on a street light, can pan, tilt and zoom into details, such as a person's face or a license plate number, from a full city block away.

Today, 117 of the planned 250 cameras are in operation, perched above streets with their tell-tale blue lights blinking. Another 76 are covered by plastic bags awaiting network configuration. They are expected to be operational soon.

But this is only the beginning. The number of cameras on the network is expected to

expand exponentially in the near future. City officials are working on ways to link their Police Department operation with surveillance cameras used by such parties as SEPTA, local universities and private businesses to create a super-network of public space surveillance that can feed images back to the video monitoring room at Police Headquarters at Eighth and Race Sts.

These are not your old-fashioned, crude convenience-store cameras that offered up grainy, black-and-white images. The images produced by the new police cameras are high resolution, in full color and can be streamed to the computer screens at the monitoring unit in near real-time.

A shooting recorded

To demonstrate the efficacy of the cameras, police showed me their video of a June 2008 shooting incident on the first block of South Salford St. in West Philadelphia as captured by a police camera.

The video shows a black minivan pull up outside a rowhouse on South Salford. Police said the aim of the three men inside the van was to rob the home of a local narcotics dealer named Terrell Green.

The tape shows the men stepping out of the rented van. When they see Green standing outside his house, they open fire. Green, 20, is hit in the chest and the mouth. The video shows a puff of dust as a bullet ricochets off the brown stucco façade of the house.

The video shows Green running back into the house and returning moments later carrying a handgun. It shows him firing at the men as they pile back into their van. Though located at intersections more than one block away, the cameras captured details, such as the revolver's flash and the bullet's ricochet, with cinematic clarity.

The video of the shooting eventually led to the identification and arrest of six suspects. Police say video surveillance footage resulted in a guilty plea for attempted murder in the case.

The incident was an early success for the surveillance program, which has seen delays because the existing technological infrastructure failed to produce images that police officials deemed suitable.

Since then, the technological glitches have been worked out. There are plans to deploy new cameras and to utilize existing cameras in partnership with local and state organizations. There is also the potential that the city will receive federal Homeland Security grants and that will mean even more cameras. In short, the city's camera network is poised to become a significant tool for law enforcement.

I got a sense of what the future will look like with a visit to the department's video monitoring room, at the Police Administration building on Eight and Race Sts., where a handful of limited- and restricted-duty officers lean forward, staring into dual-monitor Dell workstations, using joysticks to control and view the city's cameras around the clock.

A 14-foot wide screen in the front of the room displays multiple camera locations at high-crime intersections, such as Kensington and Allegheny Avenues and Broad St. and Erie Ave., adjacent to video feeds from other city departments, SEPTA and PennDOT.

Impact on crime

With plans in place to dramatically expand camera coverage, an important question remains: Do they impact crime?

"Going into it, we knew that the cameras were a tool. But when they stop a homicide, how do you put a price on how much that is worth?" said Deputy Police Commissioner Jack Gattens, who oversees the camera unit.

So, far, the cameras have been proven to reduce what police call disorder crime -- drug sales, assaults and vandalism -- by 13 percent. But they have not effected violent crime rates, according to a 2006 study completed by Temple University, which examined 18 pilot cameras installed in the city.

While civil libertarians express doubt about the cameras on privacy issues, the public supports them - as evidenced by a 75 percent "Yes" supporting police surveillance in referendum that was on the city ballot in 2006. The expectation is that the widespread presence of cameras will reduce crime significantly.

That may not be the case, said Temple criminal justice professor Dr. Jerry Ratcliffe, a police intelligence expert who authored the 2006 study.

"If we had been asked prior to the referendum: 'Are cameras effective at reducing violent crime?'" he says, "We'd have said that the evidence suggests not."

But, the research is not done. A two-year study of the expanded camera program in Philadelphia is now underway. And similar studies done in Baltimore and Chicago, both of which have extensive surveillance networks, offer some promising conclusions.

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Eye in the Sky II: How Other Cities Make It Work



By Editor on February 21, 2010 6:27 AM | [2 Comments](#)

By **Brian James Kirk**

If you wonder about the impact of public video surveillance on crime look to Baltimore and Chicago. Law enforcement officials in these cities, which have mature and widespread surveillance operations, said that their camera units reduce crime and aide in policing, investigation and prosecution.

It was in 2005 that Mayor John Street and Police Commissioner Sylvester Johnson visited Baltimore to see its year-old police surveillance network in action. Since then, Baltimore's CitiWatch video program, as its called, has expanded to include 500 police-controlled

cameras.

Overall, areas in Baltimore where a camera is mounted show a 10 percent reduction in crime, according to Sheryl Goldstein, who oversees Baltimore's Mayor's Office of Criminal Justice. Goldstein said that in 2009 cameras assisted in 1,725 arrests, half of those drug-related, and that they aided in the investigation of 38 shootings and homicides. Chicago's Operation Virtual Shield program has helped solve 6,000 crimes since 2006, officials there said. Chicago's network of "thousands" of cameras -- officials do not disclose how many, though estimates point to more than 3,000 -- includes sister agencies such as Chicago Public Schools, Chicago Housing Authority and 14 private sector partners.

Nancy LaVigne, a senior research associate specializing in crime at The Urban Institute, a nonpartisan policy research firm, has been involved with an independent study of video surveillance networks in Baltimore and Chicago.

"Our preliminary analysis shows that we're seeing an impact on crime that is cost beneficial where [cities] are really using them well and integrating them into their law enforcement practices," LaVigne said.

Expanding the network

In Philadelphia, police report that since 2006, the city's 117 operational cameras have directly resulted in 214 arrests and 1,300 "contacts," incidents where cameras have been used to assist patrol officers and investigators. A handful of convictions are the direct result of camera footage, like a 2008 West Philadelphia shooting caught on tape that led to a plea for attempted murder.

Those figures could be improved by increased camera coverage, which is likely in Philadelphia as the city expands its network of cameras..

Over the years, Chicago's \$30 million surveillance network -- comprised of 1,000 miles of fiber-optic and copper cable -- has been funded largely by federal grants from the Department of Homeland Security because Chicago's designation as a Tier 1 Urban Area gives it a chance to get more federal funding for public safety.

In December, Homeland Security elevated Philadelphia to a Tier 1 Urban Area and city departments and institutions are scrambling to take advantage of the new designation. More cameras are expected in Philadelphia because the city procured a \$2 million grant from the Southeast Pennsylvania Regional Counter Terrorism Task Force, which works closely with the Department of Homeland Security, for the installation of a more than 500 additional cameras around critical infrastructure in the city, according to Deputy Mayor Everett Gillison.

Baltimore is planning to expand its program by partnering with other city departments and private organizations, such as Johns Hopkins University, which operates a network of 140 cameras.

"There's a less expensive way to multiply what you're able to do by looking at universities, hospitals and private institutions that have installed video technology," Goldstein says. Philadelphia, too, is looking to expand its camera network through strategic partnerships. The city is hoping to bring in video feeds from entities like the Delaware River Port Authority, the National Park Service, the sports stadiums and others. It is in talks, too, with Foxwoods and Sugarhouse casino officials about interfacing their cameras with police operations.

Learning from others

"We learn from our sister cities and that gives us an opportunity to get more cameras in areas that we need it," Deputy Mayor Everett Gillison says.

Partnerships, like Chicago's alliance with its school district, could be significantly beneficial in Philadelphia. After 26 Asian students were attacked in December at South Philadelphia High School, school administrators had 150 cameras installed to keep an eye on the situation. But police are barred from viewing the cameras, a stipulation of a federal technology grant provided to the district, something that Gillison says he's lobbied against. "It's that kind of operational interconnectivity that will allow us to help a situation, rather than be outside of things," he says.

The Philadelphia Police Department works in close contact with partners like SEPTA and Temple University. Camera unit officers can radio or call to SEPTA's monitoring unit to pan and zoom any of the 500 cameras on its network. Though the unit is unable to view Temple's 600 fixed-position cameras, the departments communicate closely, sharing crime tips and video evidence. "I don't know any other urban institution that operates with the police department as closely as Temple," Temple Police Executive Director Carl Bittenbender says.

Solid communication protocols have been critical to Baltimore's successful surveillance program, according to Goldstein, who took over the city's camera project in 2007. "I think that collaboration and cooperation between agencies has made it effective," she says. "That communication is the biggest thing."

There are also advancements in video surveillance technology coming that could help streamline those communications, making cameras an even more useful policing tool.

Tomorrow: The new technology behind video cameras.

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Eye in the Sky III: How Technology Makes It Happen

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By Editor on February 20, 2010 7:39 AM | [0 Comments](#)
By **Brian James Kirk**

Citywide video surveillance is a relatively new field that is changing rapidly due to recent technological advances. The first closed-circuit television system was deployed in New York in 1968. It wasn't until 1996 that the first Internet Protocol-based video cameras were introduced, allowing video to stream over the net and laying the foundation for advanced surveillance networks like in Philadelphia. Since the first basic networks, monitoring technology, image quality and bandwidth capability have rapidly advanced.

Camera monitoring is key to a successful surveillance program, say officials and experts, such as The Urban Institute's Nancy LaVigne, who chose to study Baltimore and Chicago's surveillance programs for their active monitoring units.

"The true power of cameras is to send the message to would-be criminals that there are more sets of eyes and you need monitoring to make that happen," she says. In Philadelphia, police video monitoring staffing is contingent on the number of light- and restricted-duty officers who are available and not working with other divisions in the department. On one Thursday morning in early February, four officers watched the city's 117 cameras, eyeing areas that were selected using crime data.

They day is coming when video analytics technology might be able to assist camera units like Philadelphia's that don't have the manpower to constantly watch all the cameras. Municipalities are deploying technology that can monitor virtual perimeters, alert officers when graffiti appears on a wall and track loiterers. Facial recognition, an expensive and cutting-edge feature, can cross-check video images with database records of mugshots. These algorithms can be easily added to existing cameras through simple firmware upgrades, vendors tell Metropolis.

Philadelphia is already taking advantage of new tools to empower its surveillance unit.

Parking Authority camera

Cameras attached to Philadelphia Parking Authority vehicles record license plates and compare them against vehicle investigation records, a technology that police are considering implementing on the wider camera network. When the city flipped the switch on the Parking Authority's license plate recognition system, it began spotting suspects almost immediately.

"I think they had 15 hits in the first half-hour that it ran. Stolen cars, people under investigation," says Chief Information Officer of Communications Joe James, who oversees camera technology in the city's Division of Technology.

Last June, the Police Department began testing Shot Spotter sound monitoring technology that triangulates gun fire and can automatically focus a camera where shots ring out. Video feeds can be transmitted to the police video monitoring unit from the city's new Homeland Security-funded mobile command post and from its helicopters. The Police Department hopes to someday stream video feeds from the surveillance network to patrol cars and handheld devices.

Then, there's simply image quality improvements.

"There's an increasing number of megapixels appearing in consumer products at the moment. That technology trickles down into the professional camera space," says Cisco Director of Product Marketing Steve Collen, who works with municipalities on public safety surveillance networks.

But as those megapixels increase -- Philadelphia's network of cameras utilizes 2.0

megapixels image sensors -- so do bandwidth needs, a lesson that the city learned early in the implementation of its surveillance network.

Since 2006, police officials have extended project deadlines because of bandwidth issues. The high-quality video images would respond slowly when panned or zoomed and streams would black out, a result of reliance on wireless-only data transmission.

Earthlink network

To address these issues, the Division of Technology developed a hybrid mesh network that allows wireless cameras to transmit images to nearby fiberoptic base stations, larger pipes for sending and receiving data.

The city's planned \$2 million acquisition of the wireless network once owned by Earthlink will further improve connectivity, allowing it to reach neighborhoods where fiber isn't available.

"When I got here, before I had even signed the papers, [Deputy Mayor of Public Safety] Everett Gillison's neck was bulging with frustration," says Chief Technology Officer Allan Frank, who heads the Division of Technology. "We made that [network] change, now we're in execution mode."

The build-out of base network infrastructure has been vital to the consistency and expansion Chicago's surveillance program, says the city's Office of Emergency Management and Communications spokesperson Jennifer Martinez.

"Spending the time and money to set up a solid infrastructure allowed us to expand at minimal cost to taxpayers," she says. "Technology is constantly changing. We want to be able to grow and expand as the years go on."

Last year, Chicago unveiled a major upgrade to its computer-aided dispatch system, paid for by a Homeland Security grant, which included technology that enabled 911 operators to instantly view cameras within proximity of emergency calls. Call-takers can see what's happening in the field and can verify, to the extent that a camera's line-of-sight allows, how imperative a call might be.

Of emerging technologies, video integration with its computer dispatch system is considered by Deputy Police Commissioner John Gattens to be critical to improving Philadelphia's surveillance unit. But even Gattens -- who has been with Philadelphia's camera unit since it was set up -- says that rapidly-advancing technologies that aide crime-fighting are not a replacement for officers.

"We would certainly like to see more [cameras]," he says, pausing for emphasis. "But understand, if I have the choice between 100 more cameras or 100 more cops, we're going to have more uniforms out there."

Brian James Kirk is a Philadelphia journalist and co-founder of [Technically Philly](#).