



Visualization Technology Takes a Bite Out of Crime

DC-area transit authority joins efforts with police to build a security command center

It's getting tougher and tougher to be a criminal these days, at least on Washington, DC public transportation.

"If you're a criminal, you're going to pass by one of our cameras," says Shawn Doody, Digital Video Evidence Manager for the Metro Transit Police Department and manager of the agency's new Security Operations Command Center (SOCC). "We're going to find you."

Video from thousands of cameras is digitally stored and accessible from the agency's security network, giving operators at SOCC the ability to call it up quickly for an investigation or a trial. Based on the video, they can give officers detailed descriptions of perpetrators and send them screen captures to aid in making an arrest.

At the heart of the new Command Center is a 27' wide, 11' high Mitsubishi Electric display wall, which enables operators and dispatchers to see multiple live and recorded video feeds at remarkably high resolution.

Its use at SOCC is the culmination of more than 15 years of close coordination and experimentation by the Metro Transit Police and the Washington Metropolitan Area Transit Authority (WMATA).

Planning the Command Center

WMATA is the nation's second largest transit system, serving more than five million people in the greater Washington metropolitan area. It provides almost one million rides each day. The Metro Transit Police, with 490 sworn officers, is the nation's only police agency with authority in three different jurisdictions: Maryland, Virginia and the District of Columbia.

The transit agency first began installing security cameras back in the 1970s, but they did not have any recording capability and were used only for real time monitoring.



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*- Eric Choucroun
Washington Professional Systems*

In 2001, Doody and William Taylor, a Communications Design Engineer for WMATA, added a centralized recording system and set up remote viewing capability at several Metro Transit Police locations. Investigators used it to pull up recorded video as they sorted out the details of a crime or a civil liability case.

In 2008, the pair began experimenting with a centralized viewing center, which became the predecessor to SOCC. "Bill put together a test to see how it would work," Doody recalls. "We had four workstations, each with four local monitors plus three 52-inch monitors that the operators could share."

Originally the viewing center was used only for recovering videos from the recording system, but soon Doody and Taylor began using it to monitor certain events live, including Fourth of July celebrations on the National Mall. "I remember using it for President Obama's first inauguration," Taylor says. "To make that possible, we had to integrate cameras from Pelco, First View and VidSys...It gave us the opportunity to learn how a command center should work, and what it would take to integrate all of the components."

They also applied for a federal grant to design and build a true security command center, for which Metro Transit Police purchased a 10 acre plot in Maryland. Design began in earnest in 2011 and construction in 2013.

The Command Center in Action

SOCC, which opened in the fall of 2015, consists of two main areas in a tiered, stadium-type arrangement.

In the lower section in front are ten computer workstations for video operators, who are employees of WMATA. Above and behind them are five more workstations for Metro Transit Police dispatchers. Video from the surveillance cameras is shared on the Mitsubishi display wall, which consists of ten VS-72WEF78S 1920 x 1200 LED projection cubes, arranged in a 2-high by 5-wide configuration. In addition, there are six 65-inch LCD flat-panel displays mounted on the side walls.

The dispatchers take calls from the Metro emergency number 2121, forwarded calls from 911, and radio communications from officers in the field. "Our video operators are listening to the calls and to the radio, searching for whatever is being dispatched," Doody explains. "Because the operators are constantly bringing up relevant video, our dispatchers can see what's going on. There's no need to ask officers in the field a lot of questions over the radio. They can see it and start dispatching backup units immediately.

"Yesterday, for example, we worked a robbery snatch, where three ladies stole this gentleman's iPad as a train pulled into a station. They ran out of the train and he started chasing them, and we started getting calls. We were quickly able to locate them, and the first officer on the scene stopped the girls."

Doody says that his people, like police officers everywhere, are having to adjust to constantly being on camera, but in cases like this they are happy someone is watching. "Most of our officers work alone. It's great to know someone has your back."

Because officers in the field carry tablet computers, operators can send screen captures or video clips to them as they arrive on a crime scene. "A picture does speak a thousand words," Doody explains. "If a witness says the person was wearing blue and brown, we can send an image showing that it was brown pants and a blue shirt, we know the shade of blue, and we can probably see his face as well."

In addition to supporting their own officers, Metro Transit Police assist local police departments, since criminals very often take public transportation to and from their crimes.

"We had a case recently where a gentleman from Arlington, Virginia robbed a bank next to a Metro station," Doody recalls. "The FBI sent us a photo, and it didn't take long to find him in our video. The next day, he came back into the subway system, and we alerted the Arlington County Police. They stopped him at the front door of another bank, ready to do another robbery."

Choosing the Technology

Taylor says that, in choosing the technology for SOCC, he took into account WMATA's experience with other control rooms, including one with a front-projector based video wall. "The projectors give us a bigger surface area, but in 24/7 operations, we go through lamps every six weeks – and that's a lot of lamps and it costs a ton of money." The Mitsubishi cubes can be relied to go up to 11 years with no lamps to change and little to no maintenance, dramatically lowering operating costs.

"The other major advantage with the Mitsubishi LED cubes is that we have a much sharper, much more defined image, so we can put a number of cameras on the wall at once and see them at maximum sharpness."

In addition to the video wall, integrator Washington Professional Systems installed a Jupiter video wall processor, Crestron DigitalMedia™ technology with a 32x32 switcher, and a Crestron control system. CNL IPSecurityCenter™ software runs on each of the video operators' workstations.

Jerry Rayadi, Electrical Construction Engineer for WMATA, says that the digital camera feeds come into SOCC over a secure network, and operators use the CNL software to choose the feeds they want to look at.

"You need to understand that the video wall is one giant surface with an aggregate resolution of over 23 million pixels [9600 pixels wide by 2400 pixels high], which we can divide up in many different ways," Rayadi explains. Each operator gets one section of the video wall, although how large that section may be depends on the layout chosen for the wall. "The CNL software allows you to drag camera images and drop them onto one of the monitors at your workstation—you have a choice of showing one, four, nine or 16 images. Then the Crestron system sends that layout to the wall."

In addition, the Crestron controller, triggered by Crestron XPanel software installed on each operator computer, tells the Jupiter system which video wall layout the operators choose, and it handles the switching from the various workstations to the Jupiter as well.

"It's a really simple interface that allows the WMATA operators to put things up on the wall very quickly," adds Eric Choucroun, Senior Account Executive for Washington Professional Systems.

In addition to the cameras, operators can display a dynamic rail map that shows the location of every train and the direction it's headed in real time, cable news feeds, and images from a Cisco video conferencing system that allows dispatchers or managers to communicate with their counterparts in other locations. "Still, 99% of what we display is from our cameras," Rayadi says.

"We've been working with WMATA for more than 10 years, and we've completed a number of control rooms for them," Choucroun adds. "They have tried every technology over the years, but the new Mitsubishi LED cubes give them the highest image quality together with extremely low maintenance, which of course will save them money in the long run. I was delighted to be able to set them up with the front serviceable Mitsubishi LED cubes, the product that best fit the application."

Taylor says his experience working on other projects with Washington Professional Systems taught him the value of using the best possible technology. "We learned that using high quality, state-of-the-art equipment allowed [an earlier] Command Center, with its original equipment, to remain operational as a critical asset long after other lower-cost systems had to be replaced or retired. In the long run this investment saved us money. During our engineering assessments, we anticipated the cube wall and AV system at the SOCC will follow that track and provide many years of reliable service."

"The video wall, switching and control make up a very powerful system," Choucroun says.

"It's been easy to learn and to work with, and it gives us a wonderful picture of our operations," Doody says. "Most important, it's helping our officers keep the people who use our system safe."