

Chicago Police Department

CHICAGO, IL

CASE STUDY | GOVERNMENT

➔ Challenge

Simplify operations for a third-generation crime prevention center able to monitor thousands of sources of video, audio and computer information.

➔ Solution

Base all signal processing on Crestron DigitalMedia™ technology.



Real-Time Crime Prevention

Chicago's Crime Prevention & Information Center relies on Crestron technology

Although few Americans realize it, our nation has seen a remarkable drop in violent crime over the last 20 years.

Bureau of Justice statistics confirm that the rate of violent crime has dropped by 49% since 1991 and property crime by 44%. If that seems counterintuitive, it may be because local news outlets bombard us daily with reports of murders, robberies, and assaults. This is evident in a Pew Research report from last year which found that a majority of Americans believe crime rates have gone up over the last two decades, even though the opposite is the case.

Experts agree that better, smarter police work accounts for a large part of the drop in crime rates. The Chicago Police Department (CPD), for example, has moved to a high-tech approach that enables officers to arrive at a crime scene faster and with more accurate information about the incident.

A centerpiece of their efforts is the Crime Prevention & Information Center (CPIC) at the Chicago Police headquarters, recently redesigned and rebuilt to take advantage of the latest technology.

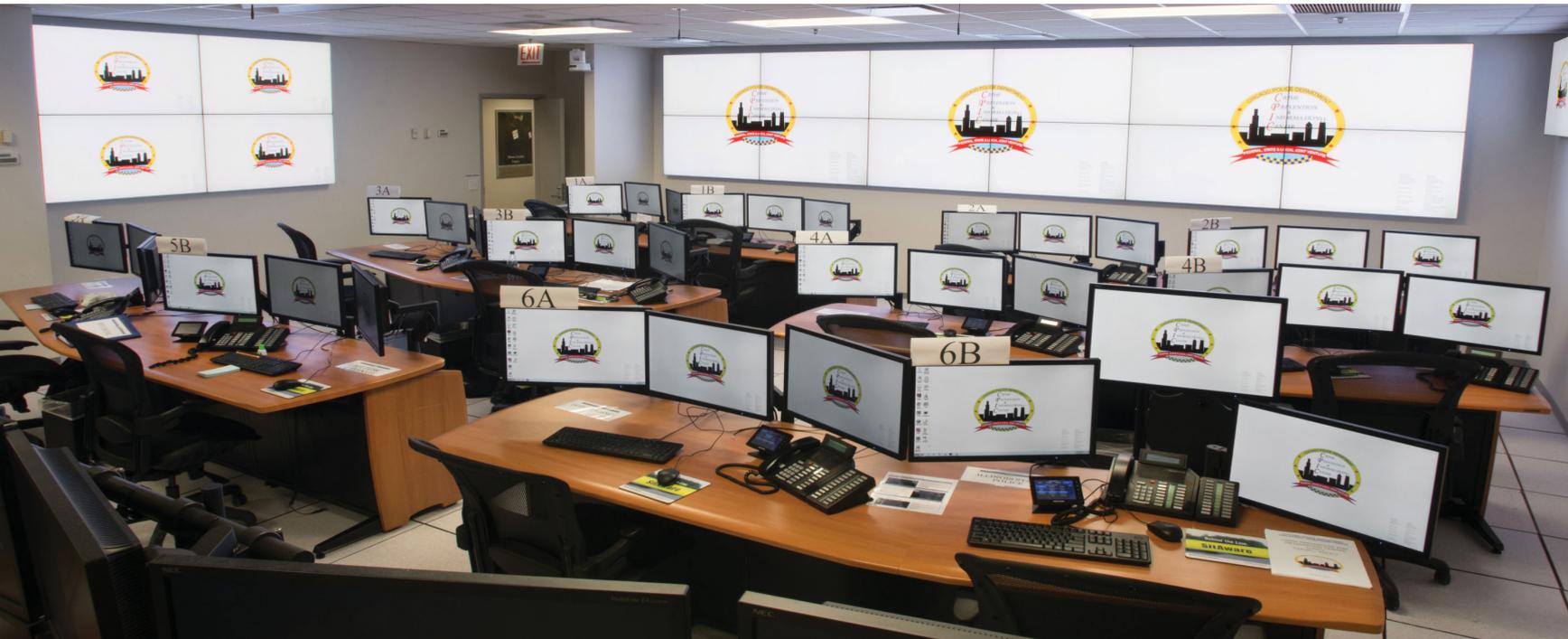
At the heart of this extensive upgrade are Crestron control and Crestron DigitalMedia™ systems.

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— **Jon Chuchla**

Audio Visual Systems



Solving crimes quickly

CPIC, according to its technology designer, Jon Chuchla of Chicago-based Audio Visual Systems (AVS), provides real-time information to support police officers in the field as they investigate a crime or intercede with a situation in progress.

“Let’s say there is a shooting outside a school,” Chuchla explains. “CPIC personnel will be alerted by the 911 Center, who have already identified nearby officers and dispatched them to the crime scene. CPIC personnel will retrieve information relevant to the crime from a variety of sources. They may look up data on the suspect’s criminal record and any criminal affiliations he/she might have. They can make screen captures from photos or video and send it with relevant data to the officers in the field. And they’re doing all this in real-time, so that when the officers are at the scene, they may already have the information they need to make an arrest or start a pursuit.”

One key to the system’s effectiveness is the fact that CPIC personnel are trained to think like investigators, rather than dispatchers. “They know what information to look for, how to find it, and how to feed it to the officers on the street,” Chuchla says. Studies have shown that the more rapidly officers can arrive at a crime scene and the better informed they are, the more likely they are to make an arrest that will lead to a conviction. “CPD

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Crestron was a great choice and they are a great partner. I expect to rely on them for many years to come, with many more upgrades of this constantly-changing facility.”

— Jon Chuchla

Audio Visual Systems

came to us with the goal of arming officers at the scene with the best information available within minutes of the report of the crime,” Chuchla adds.

Another key is the system’s ability to take information from a very large number of sources, ranging from analog security cameras to informational databases, and even a ‘gunshot detection system’ set up across the city, and then place it into a highly visual, simple-to-understand form for CPIC personnel to work with.



This is possible largely due to the fact that CPIC is now in its third iteration. It has been completely redesigned based on almost 20 years of experience with similar rooms in Chicago, and at other police “Fusion Centers” across the nation.

“The first version in Chicago, which we helped design, was built in the 1990s,” Chuchla recalls. “It was really an emergency operations center, designed to give CPD a place to monitor and direct resources when there was some kind of unusual event. It might be manned during a major storm, a championship ball game, or a visit by the president.”

By 2003 the department realized that a command center like this could be very useful in day-to-day operations. “They named it CPIC at that point and staffed it 24 hours a day,” Chuchla says.

This second iteration included workstations for ten operators plus a video wall, and it had inputs from the 911 call center, a small number of surveillance cameras and various crime and gang-related databases. “It was high-tech for its time,” Chuchla says, “but there has been a great deal of improvement in computer and video systems since it was built.”

The newest iteration, designed and installed this year by Chuchla and AVS, includes 16 operator workstations for 16 operators, a new 18-screen video wall, and extensive audio and video systems based on Crestron technology.

A challenging design

One of the most challenging issues for Chuchla and his design team has been the fact that many of the information systems used in CPIC cannot, for legal and policy reasons, be connected.

“For example, the city’s dispatch system includes information from 911 calls, a GPS mapping application showing resource locations, and the operators’ notes.” In addition, CPD has developed its own databases, and there is video from the city’s network of outdoor security cameras. “It would not make sense to put any of that on a computer with a public Internet connection or with email,” Chuchla says, “nor would agency policies allow direct, inter-organizational connections. The information is simply too sensitive and too closely regulated.”

For that reason, AVS set up a bank of computers in the equipment rooms, each with appropriate access to relevant networks, data and security systems. Each CPD operator has simultaneous access to at least three of them at any given time, and they can access a Crestron 3-Series® control processor to toggle back and forth from source to source as needed. Data and video relevant to the group as a whole can be shared via the DigitalMedia network and the video wall.

Some of the work is done in response to incoming calls, but operators work proactively as well. “There’s no way CPIC can watch the entire city at once,” Chuchla says, “but if there’s a large public event or a gang dispute going on, operators will monitor the relevant information and share it with officers on the street as needed.”



Handling the flow of audio, video and data

One of the most important requirements for this complex data and media routing system was the need to keep its operation simple. Staff already had enough on their plates without having to worry about how to use the technology.

AVS, therefore, equipped each operator with a five-inch Crestron touch screen at his or her workstation. It displays a three-column list of relevant sources, switches the operator's keyboard and mouse to a selected source, and allows him or her to choose the local display to send it to. At the supervisor's station, AVS included a 15-inch touch screen with these same local controls, plus the ability to route any source to the video wall, dial and receive video conferencing calls, and control and route news media from six cable TV boxes.

One programming challenge to overcome was the fact that the sources are constantly changing, and as they change the labels must appear on the touch screens. Another was the complexity of the audio system, which has hundreds of potential sources routed to operators' headsets through a QSys audio processor.

"We gave the operators six simple audio choices on their Crestron touch screens," Chuchla explains. "There's the phone, the police radio, what's on each local monitor, and what's on the room speakers."

The video wall consists of 12 Planar® 55" Clarity™



Matrix displays mounted on the front wall at CPIC, four more on the left wall and two more on the right. To help keep the system simple and affordable, AVS used the processing built into the Planar displays and did not include a separate video wall controller.

AVS has used Crestron control in CPIC since the 1990s, but Chuchla felt the best way to handle the large number of video and computer sources now available was through an extensive DigitalMedia network. "Our main switcher is the DM-MD128X128, the biggest one they make and a brand-new product when we installed it at CPD," Chuchla explains. "To my knowledge it was the first of that size that was installed anywhere... Normally I would be hesitant to specify a new product in a mission-critical project like this, but I felt I could trust Crestron to make it work."

"We also used five smaller DM-MD32X32 switchers, really to act as media converters, taking all of the analog video sources and routing them in digital form into the CPD networks."



CPIC consists of several rooms: the main command and control room, a primary equipment room, and two distant equipment rooms each containing half of the source equipment. “All of the connections from room to room use multimode fiber, so it was very helpful that the Crestron switchers could connect to both HDMI® and fiber cables. Given that we have 72 strands of fiber from each satellite room to the main room, we needed a very high-density conversion and switching system, which DM® provides.”

Chuchla also specified Middle Atlantic Viewpoint™ operators’ workstations – a significant upgrade from the tables CPD had chosen for the 2003 remodel – as well as Middle Atlantic equipment racks.

Making a major upgrade to a 24/7 facility is not an easy process. Chuchla says installation began by converting a lunchroom in another part of the building into a temporary CPIC and transferring operations there. Then came the physical demolition and reconstruction of the existing space, the construction of a new equipment room, major backup power upgrades, and finally, the installation of all of the new furniture and equipment. After the equipment was in place and working, the lengthy process of configuring and debugging all of the networking and software began.

Another challenge AVS faced was that CPIC is always a work in progress. Although this is only the third major rebuild of the space, Chuchla says it has been upgraded almost constantly since day one, as new computer, audio, and video systems become available, both in the facility and out in the field. “Another reason I chose Crestron was that I know they are always very good at working with upcoming technologies. Their support is great, too. I don’t need it very often, but if something fails or if I have to interface to something new and quirky, I know I can count on our local Crestron engineering team.”

In the end, everything worked perfectly, Chuchla says. “Crestron was a great choice and they are a great partner. I expect to rely on them for many years to come, with many more upgrades to this constantly-changing facility.”



The main switching matrix, combining a 128x128 and a 32x32 DigitalMedia switcher

Integrator
Audio Visual Systems
www.audiovisualsystems.com/