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Up Close From a Distance

Investigators have only one chance to protect and secure a crime scene, collect evidence, and document images for future review. But crime scenes by their nature are often chaotic. Vital evidence can be inadvertently overlooked, contaminated, or even destroyed by the best-intentioned investigators. The use of teleforensics technology under evaluation by the El Paso, Texas, Police Department may reduce crime scene problems as it aids investigations.

Teleforensics allows investigators at a remote location to view a crime scene as evidence is being gathered. A technician at the crime scene uses a camcorder (handheld or helmet cam) that is outfitted with a wireless transmitter. The camcorder transmits images via radio frequency to a monitor for detectives to view in real time. Concurrently, the recorder makes a videotape for investigators to view before questioning witnesses or to recreate the crime scene.

Teleforensics helps protect potential evidence by limiting the number of people allowed inside the crime scene. It gives police a record of the crime scene before it is altered. It can help identify valuable evidence, speed up the investigation, and develop leads. Teleforensics provides outside investigators with the same information as those at the crime scene, which improves their analysis of the scene.

The El Paso teleforensics project began in 1999 when the Border Research and Technology Center (BRTC), a program of the National Institute of Justice, provided equipment to the department. This initial equipment, dubbed the investigator's toolkit, consisted of little more than a microphone and a camera in a briefcase. Using low-cost, commercial-off-the-shelf technology, BRTC's technology partner Sandia National Laboratories (SNL) in Albuquerque, New Mexico, created a prototype for the department to evaluate during covert operations.

BRTC's mission, says its director, Chris Aldridge, is to work with law enforcement agencies and other entities to strengthen technology capabilities along the Nation's borders. Aldridge says the El Paso Police Department was chosen for the project not only because El Paso is a border city, but also because its officers are "technology champions." El Paso Homicide Commander Michael Czerwinsky has become a teleforensics expert. Czerwinsky gives presentations on the technology at conferences all over the country. He first used the toolkit when he was a lieutenant in the department's Intelligence and Vice Unit.

In the project's first phase, Czerwinsky and two other members of the unit—Sgt. Darwin Armitage and Sgt. Arthur McDaniel—used a briefcase version of the toolkit in undercover surveillance to obtain audio and video evidence. The number of pleas increased because of "the high quality of the evidence that was presented to the [District Attorney's] office" from the toolkit, Czerwinsky says.

When he was promoted to commander of the Homicide Division, Czerwinsky realized the toolkit could be adapted for use in crime scene investigations, and he asked Armitage and McDaniel to modify it. They took the toolkit apart and pieced together a new version using existing and donated equipment. They then tested the components at a dummy crime scene set up for the Homicide Division. Armitage notes they initially used a small camera worn around the neck, hooked it up to a transmitter, and sent the video to a receiver in the toolkit. The video was disappointing. But once they plugged a wireless transmitter into a standard handheld camcorder, the quality of the transmission improved significantly.

"This is a big improvement over typical homicide investigations, where detectives would go into the scene, take a couple of shots, and then come out and try to explain what they saw based on the photographs," Armitage says. "Photos don't even compare to you seeing it live."

Czerwinsky says the teleforensics project entered its second phase when investigators tested the toolkit during four homicide investigations. In the first case, a female stabbing victim was found dead in her home. Using the toolkit, investigators viewed not only the victim and her injuries, but also crime scene evidence. As a technician recorded the scene, investigators at the command post watching the live feed noticed a piece of mail in the house with an inmate number. Investigators determined

that the letter came from a relative of the victim who was serving time on drug charges. "That provided a possible motive or connection," Czerwinsky says. "Discovering such evidence so early in the investigation is invaluable."

In the second case in which the toolkit was used, another woman was found murdered in her home. Investigators viewing the live feed of the scene quickly determined that the case required expert forensic analysis of blood-spatter patterns and latent fingerprints. In the past, Czerwinsky says, investigations could be slowed down because investigators had to wait for the walkthrough to determine how the scene should be analyzed, then they had to wait for the experts to arrive.

Using the toolkit, investigators can determine which experts are needed even before a walkthrough is completed. The toolkit also helps investigators determine whether additional equipment should be sent to the scene. Furthermore, it helps investigators and technicians make decisions faster. In a multiple homicide investigation, Armitage says, the medical examiner viewing the crime scene on a monitor at the command post was able to formulate a preliminary approach to the autopsies. "She knew well in advance what she would need."

While these investigations proved that teleforensics aids crime scene analysis, they also revealed flaws in the system. The signal from the transmitter was weak, which sometimes caused the video feed to break up and radio transmissions to fade out. Police also were concerned about possible media interception of the live feed, since the transmissions were not encrypted. Moreover, there were concerns about the legality of presenting evidence from the toolkit in court. To address these concerns, Czerwinsky gave the District Attorney's office an overview of the project. "They gave us their blessing," he says.

After proving the concept of teleforensics at four crime scenes, the project moved into its third phase—using helmet cameras equipped with the technology at critical incidents such as protests, riots, or hostage situations, that require the intervention of SWAT teams.

Czerwinsky notes the use of teleforensic technology in critical incidents means the incident commander no longer has to make critical decisions based only on oral briefings from on-scene personnel, radio transmissions by officers, and cell phone traffic. Without seeing what is happening for themselves, he says, commanders can have a hard time getting the information they need. "There are a lot of officers on radios, and there is a lot of screaming, and it can get chaotic. But with helmet cams, a live video feed is streamed to the command post, which gives the commander more information to make a better decision."

In addition, Czerwinsky says that video from the scene of a critical incident helps investigators re-create the incident. Traditionally, investigators interview witnesses to a critical incident and piece together what happened. "When the SWAT team goes in, their job is to save lives and eliminate any threat. They're going to destroy the crime scene. They'll be stepping on blood, removing victims, altering evidence. But that's their mission. The crime scene is secondary. The helmet camera allows investigators to see the crime scene before it was altered." Adds Czerwinsky, "I'm not saying [the tape] will have everything on it, but it will eliminate a lot of confusion."

Investigators tested the helmet cameras at two mock school-shooting scenarios. At the first mock shooting, an investigator followed SWAT team members with a camcorder as the team entered the school. The transmission from inside the incident was sent to a 25-inch monitor located with incident commanders. The result: "Although we were able to get some good video," Armitage says, "the quality was not as good as transmissions from the crime scene investigations. But it worked. . . . They were watching what the SWAT team was doing."

Based on the feedback from SWAT team members, Armitage and Richard Sparks, a specialist at SNL, developed a prototype helmet cam using surplus Army helmets that had been donated to the El Paso Police Department. These prototypes were tested by SWAT team members at a second mock school shooting. As contact team members entered the school wearing the helmet cam, recovery team members watched the action on a pocket-sized monitor. The only problem encountered was electromagnetic and radio interference. "The transmitters are really low powered, not real high quality, and they just don't send video through the building very well," Armitage says. He notes that the test was "a good learning experience. We are working to resolve this problem."

According to Armitage, most investigators have been receptive to teleforensics technology. He says veteran investigators take time to warm up to the idea, but once they see what the technology can do, they like it. SWAT team members especially liked the helmet cam because the recovery team could see what the contact team was doing inside the school, a clear advantage over radio communications. "When the contact team goes in [with the helmet cam], the recovery team can see where a victim is and know exactly how to get there," Armitage says. SWAT team members also approved of the pole cameras that were created for the mock shooting, which enabled them to see around corners and above and below stairwells.

The appeal of this technology, Czerwinsky says, is that it is affordable and user friendly and can be easily modified to fit a department's needs. It is well suited to smaller agencies that do not have the budgets to buy state-of-the-art equipment from a vendor. Moreover, he says, when buying from a vendor, "you're stuck with what the vendor gives you."

The intention for the investigator's toolkit is to develop a plug-and-play system that works with simple, off-the-shelf technology. "The goal of this project is to show departments that there is equipment out there that they can put together without having to spend thousands and thousands of dollars," Armitage says. Before receiving the investigator's toolkit, the El Paso department bought an expensive video-only system, he says, that "really wasn't functional. The video was just awful. You couldn't see anything."

Czerwinsky and his team strongly believe the toolkit could become an industry standard. Although other departments may be using similar technology, he says, "no one is using it in the same way."

The next step is sending the video feed over the Internet so commanders can view a crime scene or critical incident on laptops or PCs at their desks. At one of the mock school shootings, El Paso investigators used a modem to transmit video to police headquarters about 20 miles away. "The video was fluttered and had a 30-second delay because the technology being used was low end," Czerwinsky says. "But we were just trying to prove that it would work."

In the meantime, further refinements are being made to the toolkit. SNL is working on a newer version that will have infrared lighting for night vision capabilities, longer battery life, and improved range of transmission.

El Paso Chief of Police Carlos Leon says he is honored that his department was chosen for this initiative and is excited about the possibilities both for his department and for departments across the country. He believes the investigator's teleforensics toolkit will save lives.

For general information on the teleforensics toolkit for investigators, call Commander Michael Czerwinsky, 915–585–6115 or e-mail, MichaelC@ci.el-paso.tx.us. For technical questions call Sgt. Darwin Armitage, 915–759–2000 or e-mail, eppdradar@msn.com; or call Sgt. Arthur McDaniel, 915–544–7633, or e-mail, ArthurM@ci.el-paso.tx.us.

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