As rush hour nears on a March evening, a call comes in to an emergency dispatch center: vehicle and brush fire on a four-lane highway. When a fire engine arrives, the crew finds a fully involved minivan on the side of the road, but a state trooper on the scene has not slowed or diverted traffic, and both northbound lanes remain open. The engine parks upwind of the burning vehicle, but a wind shift causes smoke to obscure visibility. An oncoming car strikes a working firefighter, killing him instantly.*

The U.S. Fire Administration (USFA) and the U.S. Department of Transportation’s (DOT) Federal Highway Administration, working in partnership with the International Fire Service Training Association (IFSTA) and with funding support from the Office of Justice Programs’ National Institute of Justice, recently produced a report that provides technical guidance and training programs in traffic incident management for emergency service providers. The April 2008 report, Traffic Incident Management Systems (TIMS), focuses on guidance for local-level fire departments on compliance with DOT’s Manual of Uniform Traffic Control Devices and the National Fire Service Incident Management System (IMS) Consortium’s Model Procedures Guide for Highway Incidents, both of which additionally emphasize the importance of cooperation between fire and law enforcement departments in preplanning for and managing traffic-related incidents.

A consistently high annual percentage of fatalities related to fire department response and roadway scene operations prompted USFA to examine ways to improve responder safety, as injuries and deaths occurring at road scenes have increased steadily in recent years. USFA has made a commitment to reduce on-duty firefighter fatalities by 25 percent within five years and by 50 percent within 10 years, and the research detailed in the report supports that goal.

“Too many firefighters and other emergency responders have been killed on duty from being struck by vehicles,” says U.S. Fire Administrator Greg Cade. “Implementing an effective traffic incident management system could reduce this number. The USFA was pleased to work with the DOT and IFSTA to enhance first responders’ safety while working on the roadways.”

A majority of the report focuses on secondary collisions as an area lacking in studies and data, pointing out that law enforcement personnel are keenly aware of the likelihood and potential severity of secondary collisions. Often, this translates into friction between law enforcement officers and other emergency (See Study of Traffic Incident, page 3)

The man sits at his computer, answering his e-mail, checking the new music downloads available at his favorite sites. In the back of his mind, the temptation is to do a bit of browsing on forbidden topics. But he also remembers the program his community supervision officer ran on the computer during the last visit. The program that quickly delivered information on all his Internet use. The program called Field Search.

The National Institute of Justice’s (NIJ) Office of Science and Technology funded the development of Field Search through the National Law Enforcement and Corrections Technology Center (NLECTC)-Rocky Mountain in 2005. Field Search helps community corrections officers deal with the readily access to the Internet available to sex offenders.

Since development of the Field Search tool in 2005, NLECTC-Rocky Mountain has updated it and continues to provide services to the corrections community as a partner with NIJ’s Weapons and Protective Systems Technologies Center of Excellence. (See Field Search, page 2)
Field Search, currently in its third iteration, is designed specifically to help nontechnical probation and parole officers quickly and efficiently search an offender’s computer and create a detailed report of their findings. Not a forensic software application, Field Search is instead designed as a last and user-friendly investigation and management tool for field agents not trained in computer forensics. The software is provided free of charge to community corrections agencies, and NLECTC-Rocky Mountain offers training opportunities (via CD-ROM) to go along with it. This update was funded by NIJ through the Rocky Mountain Center and the Weapons and Protective Systems Technology Center of Excellence.

The management and monitoring of sex offenders’ computer use is important for many reasons, says Joe Russo, assistant director for corrections at the Rocky Mountain Center. First, it can alert authorities to a new crime such as possession of child pornography. Second, it can help provide proper supervision by reinforcing treatment prohibitions against access to sexual material. Lastly, monitoring computer use is essential in helping treatment agencies better understand offenders.”

NLECTC Rocky Mountain released version 3.0 for Windows (FS Windows) in May 2008, which works with the latest versions of Windows and adds the ability to view the most recently used files. This capability allows officers to quickly see what a subject has been looking at recently, perhaps since the last visit. Russo explains, and is quicker than doing a full scan. The new version also can scan specific folders as opposed to scanning the entire hard drive, again delivering quick searches by purchasing Mac computers.

In January 2008, NLECTC-Rocky Mountain surveyed the criminal justice community about the use of Field Search software. Between training classes (since discontinued) and downloads from the Internet, more than 2,600 copies of Field Search have been distributed. Due to sharing of the software, the actual number of copies in the field is estimated at approximately 7,500.

Survey results showed the following:

• Respondents report that Field Search is superior to other field-based preview tools due to its cost effectiveness, functionality and ease of use.

• More than half of the 269 respondents use Field Search primarily for probation/parole operations, while more than one-quarter use it primarily for law enforcement operations.

• Respondents overwhelmingly expressed their satisfaction with Field Search, primarily as a tool that can generate information used by treatment providers and provide a means of determining compliance with conditions of supervision.

• Respondents overwhelmingly reported that their agency/jurisdiction has supported their use of Field Search.

• The only concerns expressed by users were in regard to Field Search’s leaving a “footprint” on the target computer. Field Search was originally designed as a probation and parole tool. The footprint is small and known and did not present problems in technical violation/revocation hearings. The original intent notwithstanding, the experience in the field is that when used with proper investigative procedures, Field Search poses no problem for forensic laboratories in the event evidence of a new crime is discovered. Survey results report that more than 70 percent of respondents have successfully used evidence captured by Field Search in a court proceeding, and 17 percent reported the evidence was used to successfully prosecute new criminal charges.

“The management and monitoring of sex offenders’ computer use is important for many reasons.”

- Image search, finding all logical .jpg, .bmp, .png and .gif files, even if zipped, in a galery view.
- Media search, which will locate and play video files.
- Built-in report function of all items selected for inclusion. Each item’s associated path and date/time stamps are included.
- Text search, allowing officers to search for specific words and phrases in any logi cal file, including zipped files (if they are not password protected).
- Export function, using data to populate standard Microsoft® Excel® spreadsheets for further analysis. All records are exported, regardless of whether records were selected for inclusion in a report. All date/time stamps associated with history records and text search hits are exported along with the data.

Although Field Search and its functions were designed with the corrections community in mind, Russo says that law enforcement officers have also found value in the tool, using it in basic criminal investigations and to scan law enforcement agency computers for evidence of abuse. Correctional facilities often use it to monitor computers that inmates can access.

“It’s really nice to see that crosses over,” Russo adds. “The best thing is it’s a nice free tool that the nontechnical officer can use. The payoff for us is it is being used in the field, and used successfully, and bad guys are being caught and being held account able.”

To learn more about the program and/or download a copy of Field Search, visit http://www.justnet.org/Pages/fieldsearch.aspx.
Law enforcement officers, pressured to clear the scene as soon as possible to help minimize traffic delays and reduce the possibility of secondary collisions, may view bringing more apparatus and people to the scene as increasing the potential danger for secondary collisions and increasing the time needed to clear the scene. Preincident planning and interagency cooperation to balance the needs of both types of agencies are crucial, as trying to “iron these issues out while standing in the roadway at an incident is rarely successful,” according to the report.

Key issues in causing secondary collisions include the following:

- Lack of training specific to the associated hazards.
- Lack of situational awareness (i.e., of the dangers associated with a particular situation). This often stems from insufficient training or lack of experience.
- Failure to establish a proper temporary traffic control zone. Common causes include lack of sufficient training, equipment or standard operating procedures.
- Failure to position apparatus so as to protect the work area, or unnecessarily positioning it in the roadway.
- Inappropriate use of vehicle headlights, warning lights or flood lights, thus confusing or blinding approaching motorists.
- Failure to wear appropriate protective and retroreflective garments.
- Failure to use all available traffic control devices.
- Curiously distracted, careless, inattentive or impaired drivers; reduced visibility or other poor driving conditions; and driver confusion caused by traffic control measures, all of which are beyond emergency services professionals’ ability to control.

The report examines such technologies and practices as effective distance for placement of roadway warning signs; efficient emergency vehicle warning lighting; and training, placement and protective equipment for flaggers. It also includes recommendations, case studies, highway scene safety survival basics, incident command, examples of effective TIMS programs and information on the American National Standards Institute/International Safety Equipment Association (ANSI/ISEA) standard 207, High Visibility Public Safety Vests.


* Adapted from Traffic Incident Management Systems, chapter 2, p. 13.
In 2005, digital evidence from a floppy disk led investigators to the BTK serial killer, a criminal who had eluded police capture since 1974 and claimed at least 10 victims. Digital evidence from a mobile phone led international police to the terrorists responsible for the Madrid train bombings, which resulted in the deaths of at least 190 people in 2004. Digital evidence collected from computer networks at universities and military sites in the 1980s led to the discovery of international espionage supported by a foreign government hostile to the United States.

In today’s world, law enforcement officers attempting to extract digital evidence face growing challenges from more types of devices with greater data storage capacity. Digital media that could be seized in relation to an offense include computers, laptops, flash drives, external storage devices, digital cameras, game units and cellular phones. Investigators, prosecutors and forensic examiners must deal with vastly more data than they did just a few years ago.

Data contained on these digital devices can assist law enforcement in a criminal investigation or prosecution of crime in a variety of ways, described below:

• Digital evidence may be found on a computer or other electronic device directly related to the offense committed. For example, law enforcement officers may be investigating a child molestation complaint. When they analyze a suspect’s computer, they find multiple pictures that appear to show the suspect molesting a number of children. In another example, a small flash card from a digital camera found in the possession of a suspected car thief may contain images of stolen cars.

• Digital evidence can be used to show intent existed to commit a crime (in legal terms, mens rea) or premeditation of an act. Many digital devices efficiently track user activity; it is also possible to recover deleted files, both of which may affect a criminal investigation. Physical evidence may already point to a suspect’s guilt, and digital evidence can indicate that the crime was planned in advance. For example, a man suspected of killing his wife because he had discovered she was having an affair claimed that he killed her accidentally during an argument that became violent. When a computer forensic examiner analyzed his laptop, however, she found deleted Internet history files showing searches for perfect murder, getting away with murder, and quick ways to kill someone that occurred weeks and days prior to the crime. Based on this evidence of premeditation, the defendant could be charged with murder instead of manslaughter.

• Another possible use for digital evidence is in supporting or refuting witness, victim, or suspect statements in cases of questionable credibility. For example, a suspect in a homicide case denied knowledge about the firearm used to commit the crime. An examination of his cellular phone, however, showed deleted images that implicated the suspect.

• Another useful application is to expand an investigation by revealing new crimes or suspects. For example, an identity theft investigation revealed that the suspect was part of a network that was sharing, selling and buying identity data. This resulted in an expansion of the investigation to other jurisdictions and led to additional arrests.

• An often overlooked use of digital evidence is data mining. By exporting information from multiple digital devices (such as call logs from multiple cellular phones or e-mails from computers) and importing that data into an analytical software package, investigators can diagram and visualize a criminal enterprise or a timeline of events. This graphical representation can make it easier for investigators to understand the complex relationships in a criminal enterprise or for a jury to understand criminal activity in a courtroom presentation, and could reveal possible connections between offenders.

In order to capitalize on the potential value of digital evidence, law enforcement agencies might want to develop resources for processing digital evidence, either independently or in conjunction with other agencies, under a task force model to share resources. In cases where an agency cannot support independent digital evidence recovery, federal, state and regional laboratories may be able to help.

Related reading:
• Investigations Involving the Internet and Computer Networks (http://www.ojp.usdoj.gov/nij/pubs-sum/216716.htm)
The South Carolina experience is in keeping with the findings of a study of the effectiveness of DNA forensics in the investigation of property crimes. That study, The DNA Field Experiment Cost Effectiveness Analysis of the Use of DNA in the Investigation of High Volume Crimes, found that cases with DNA evidence yielded twice as many suspects identified and arrested. (For a summary story on the study, see “Burglars Go Bust: The DNA Field Experiment” in JustTech, Summer 2008, http://www.justtvt.org/Pages/TechBeatIssue.aspx?Issue-Summer-2008.)

As part of an effort to improve accessibility of DNA testing for local law enforcement agencies, officials proposed the creation of a regional DNA laboratory to serve law enforcement agencies in the South Carolina Low Country. To help determine the workload of the proposed laboratory, the Office of Justice Programs’ National Institute of Justice (NIJ) and its National Law Enforcement and Corrections Technology Center (NLECTC-Southeast) established a program to collect and test DNA samples from property crimes. Investigators routinely collect biological fluids from crime scenes of violence. This project is designed to determine if resources should be devoted to the collection and analysis of biological fluids from property crimes as well.

NLECTC-Southeast is coordinating the project, which involves the Charleston County Sheriff’s Office, the Charleston Police Department, the North Charleston Police Department, the Mount Pleasant Police Department, the South Carolina Law Enforcement Division (SLED) and the Marshall University Forensic Science Center (MUSFC) in West Virginia. NIJ is providing funds for processing the DNA samples at MUSFC. MUSFC is affiliated with the Forensic Technologies Center of Excellence (CoE), which is part of the NLECTC system. The CoE provides specialized technology assistance programs and other services with regard to tools and technologies intended for use by law enforcement, crime laboratories and other criminal justice agencies.

Like many other regions in the United States, South Carolina’s law enforcement agencies, which are supported by SLED, have a backlog of DNA laboratory test requests. The backlog is generally due to the number of samples submitted compared to the funds available. Ideally, sufficient funding would always be available to process all samples within a reasonable amount of time, but striking a balance between funding and the number of samples submitted can be challenging.

“If you have a pressing issue, SLED will work the case immediately, but they are overwhelmed and have to set priorities on cases,” says Judith Gordon of the Charleston Police Department Forensic Services Division. “In a recent high-profile case, SLED provided DNA test results to the Charleston Police Department within 48 hours, leading to an arrest of a sexual assault suspect.”

“Almost every state has backlogs,” adds Bill Deck, program manager at NLECTC-Southeast. “It’s fairly easy to do a sample, which is estimated at $1,200 start to finish to process a crime scene, including collecting, testing, shipping, evaluation and entry into CODIS [Combined DNA Index System]. States can’t afford to do DNA testing without justification for the expenses. We are lucky that Marshall agreed to do it and NIJ agreed to fund it.

In general, most states only have certain capability for DNA testing, so property crimes really don’t come to the forefront because they’re busy dealing with the violent crime cases. Those violent crimes alone can max out the lab capability. Marshall, because of its uniqueness, has the capacity to pick up this extra workload to determine the benefit of testing samples from property crimes and develop best evidence policies, which will minimize the over-submission of samples by prioritization of samples based on expected success rate.”

As part of the project, DNA samples from property crimes such as burglary, motor vehicle break-ins and motor vehicle theft are collected and sent to MUSFC for processing. The results are returned to the participating agencies and submitted by SLED to CODIS, the central nationwide database of DNA profiles. CODIS uses two indexes to generate investigative leads from biological evidence recovered from crime scenes. The convicted offender index contains DNA profiles of individuals convicted of certain crimes, and the forensic index contains DNA profiles from crime scene evidence. CODIS computer software searches across these indexes for a potential match (Visit http://www.dna.gov/uses/database/codis for more information).

Sources of DNA include blood and saliva. Burglars and car thieves may cut themselves on glass when breaking a door or a window, drop cigarette butts or shed a stray hair on a kitchen floor or in a stolen car.

“Touch” DNA refers to the DNA left behind from skin cells or sweat when a person touches or comes into contact with an object, such as a steering wheel. The DNA Field Experiment study, which was funded by NIJ, found that blood and saliva samples are significantly more likely to yield usable profiles when compared with samples consisting of cells from items that were touched or handled.

For example, the perpetrator uses a crowbar to break in, to a house,” says Gordon. “We swab the crowbar to get a DNA profile. We have set up a number of samples of touch evidence and Marshall has been successful in recovering DNA from touch samples.

“In perspiration there are cells that shed off from your skin,” explains Terry Fenger, director of MUSFC. “There are very low levels of DNA in these samples. Previous technology couldn’t do much with it, but with the newer technologies, we have a better chance of developing a profile. Full profiles give us all the possible testing results.”

The Low Country project began in October 2007 and was initially slated to last just a year, but has been extended to October 2009 to allow for the collection of additional data. Initial results have been promising.

“The real success of this project thus far is the number of people that have been identified in CODIS,” says Gordon. “In the first shipment we had 15 people identified. All those CODIS hits came on blood evidence. Some of the 15 came up for more than one crime.

“One of the cases matched across jurisdictions. Two cases were from one agency but linked two crime scenes together. There were no CODIS hits from touch evidence. But the fact that we have done this through property crime evidence is notable.”

Jason Chute, a Marshall forensic DNA analyst, adds: “Just because a touch sample doesn’t result in a CODIS match immediately doesn’t mean it won’t match down the road. There is always the possibility to match the evidence to the CODIS database.” That is, as the contents of the CODIS database expand, the probability of obtaining a match increases.

A board composed of representatives from the four police and sheriffs’ departments participating in the project decides which samples to submit based on case background and the likelihood of developing a DNA profile. Officials can submit up to 66 samples at a time to Marshall for DNA testing, and MUSFC developed full or partial genetic profiles on 78 percent of the 65 samples initially submitted. Full profiles were developed on every blood and saliva sample and partial profiles were developed on 22 percent of the touch samples. There has been only one full profile developed from touch evidence. Every time a genetic profile is developed, it builds the forensic index in CODIS.

Genetic profiles from evidence sent to Marshall in March 2008 resulted in 12 more CODIS hits, with one suspect identified in 10 cases. All CODIS matches were made on blood evidence, according to Gordon.

“The personnel in the field, when they realize their samples they collect will be tested, it adds another layer of importance and value to their work,” says Fenger. “In the past the highest priority has been given to violent crime. That is still the case, but property crimes are becoming a higher importance and can lead to a DNA profile and legal action.”

The Charleston Police Department Forensic Laboratory functions as a regional lab but does not have DNA capability. The lab is not funded or managed regionally.

“In crime scene work we have always collected cigarette butts, blood,” Gordon says. “What has changed is now there is a concentration on touch evidence. We didn’t do that before because we didn’t have a lab that could do it routinely. It did not require additional training, but the capacity to test for touch DNA has created a different mindset and perspective — investigators swab different surfaces. It caused them to look at things in a different way.”

So far, participants are pleased with the program’s progress.

“Things are progressing very nicely,” says Fenger. “We have good interaction with NLECTC-Southeast and Charleston and the law enforcement side. It seems like we are on autopilot as far as returning the profiles.”

As for the Charleston Police Department, Gordon says, “We’re thrilled. We see it as a gift to us we didn’t have before. Fifteen cases were solved initially, which was beyond our wildest expectations. Marshall extending the work for another year is fantastic for us.

“We are really grateful to the Southeast Center for setting this all up. They brought the players together and laid the foundation. We are very grateful for their efforts to facilitate this.”

For more information, contact Bill Deck, NLECTC-Southeast, at (843) 760-6272 or bdeck@NLECTCSE.org; Terry Fenger, Marshall University Forensic Science Center, at (304) 396-4253 or fenger@marshall.edu; or Judith Gordon, Charleston Police Department, at (843) 536-7270 or GORDONJl@charlestonsc.us.
Across the country, many drug investigations, a number of them straightforward possession cases, are not prosecuted or are dismissed because crime labs have too many drug samples to analyze, which causes large backlogs and significant delays. The Field Investigation Officer (FIDO) program can help.

“We used to have backlogs depending on how busy we were or how busy the officers and detectives were,” says Jay Henry, laboratory director for BFS. “We used to have turnaround times from three weeks to three months. Three months is unacceptable. Now we are down to routinely having turn-around times of less than two weeks, sometimes kept less than one week. High cases we can get done sometimes the same day. We can get the results to people who really need it.”

The FIDO program trains certified officers to identify in the field the most commonly encountered drugs of abuse: marijuana, cocaine, methamphetamine and heroin. These preliminary, or presumptive, tests can be used to close a case through a plea agreement. Cases that go to trial are sent to the laboratory for follow-up confirmation analysis. This reduces the number of samples submitted to the crime lab for analysis, thereby reducing the backlog.

The FIDO program was developed by the National Forensic Science Technology Center (NFSTC) in Largo, Fla., with funding from the Office of Justice Programs’ National Institute of Justice. Based on a program operated by the Phoenix Police Department, FIDO provides training materials to agencies, who can then tailor the training to suit their specific needs. Utah BFS served as a pilot site for the program.

In addition to FIDO, BFS has a separate program called the Marijuana Leaf Identification Technician Course. As a result of the two programs, Henry estimates a projected 56 percent reduction in cases and a 44 percent reduction in submitted samples between 2003 and 2008.

“The FIDO program structure includes lesson plans, class outlines, class lecture and presentation content, practical exercises, written exams and references. Topics for class outlines include safety considerations, evidence control, legal considerations, substance overview, field testing procedure, report writing and courtroom testimony.”

BFS took basics of the program and modified it to what was best for BFS and the agencies around it. The Utah FIDO program tests for methamphetamine, cocaine and heroin. Henry explained that BFS opted not to include marijuana in its FIDO program because the agency already had the Marijuana Leaf Identification Technician Course in place.

Also, BFS developed its own drug test kit rather than use a commercially available one. (NFSTC conducted a validation study of four commercially available test kits.) The BFS kit includes a metal spatula, disposable spot plates, methanol for cleaning and rinsing drug paraphernalia and a CD containing all training content. The kit has the capacity to test approximately 100 times more drug submission samples than commercial test kits.

“The FIDO program has dramatically reduced the drug testing backlog when it found out what was best for BFS and the agencies around it,” Henry says. “We kept the same program pattern as the national FIDO program but developed our own test kit because we wanted officers to be very familiar with the tests they are running and also because of economy of scale.”

David Sylvester, program/operations administration director for NFSTC, explained the flexibility of the FIDO program.

“We built the program so that it could be adapted to meet the specific needs of an agency,” Sylvester says. “For example, some areas of the country have problems with methamphetamine use, but that might not be a significant problem in another region. Different areas may just want to test marijuana. The program is compartmentalized with modular training so agencies can pick and choose what to train on.”

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“We kept the same program pattern as the national FIDO program but developed our own test kit because we wanted officers to be very familiar with the tests they are running and also because of economy of scale,” Henry says. “We could do it cheaper then actually buying the commercially available kits.”

BFS had been searching for a novel way to reduce the drug testing backlog when it found out about the FIDO program.
“We liked that it is a nationwide program and that it involved Arizona,” Henry says. “That was important because we would not be doing it by ourselves. Also, police departments can already get commercial kits to test, but an officer may not get training on how to use them. In small police departments it’s often hit or miss for training on the use of the kits. What was different about the FIDO program is the training. There is some information and capability out there [in police departments] but not much training or experience to go along with it. There is a lack of training and procedures, no way to take notes or write reports — all things the court system requires.

“FIDO provides training, procedures — all of that plus quality assurance. The program is flexible enough to do things on your own. Some departments choose to buy the kits. We looked at it and we decided to make our own kits.”

As of August 2008, Utah had trained about 150 officers in the FIDO program, which comprises approximately eight hours of classroom and practical training. Recertification classes are administered every year. The tests are of high quality and reliable, given proper training of officers and correct conduction of the tests, according to Henry.

“Participants are brought back each year for refresher training and tested again to ensure officers know how to do the testing,” Henry says. “If there is a problem with the procedure there is a quality assurance program to help fix it.”

For information on the FIDO program and the pilot project in Utah, contact David Sylvester of the National Forensic Science Technology Center, at (727) 545-6067, ext. 188, email david.sylvester@nfstc.org; or Jay Henry of the Utah Bureau of Forensics Services, at (801) 965-4093, email jhenry@utah.gov.
Sounds like a standard test message, possibly broadcast as part of routine maintenance at the nation’s largest stadium. Except that this test used the THOR-8L, a new long-range directed acoustic device developed at Penn State University. And it was heard, clearly and distinctly, in a restroom located three-quarters of a mile away.

THOR was developed by the university’s Applied Research Laboratory, the host entity for the Weapons and Protective Systems Technologies Center of Excellence (CoE). The CoE is a program of the Office of Justice Programs’ National Institute of Justice (NIJ) and part of NIJ’s National Law Enforcement and Corrections Technology Center system. THOR is designed to improve on currently available commercial off-the-shelf acoustic hailing devices and allow enforcement of the U.S. Navy’s 500-yard vessel protection zone. However, the CoE also has been quick to promote THOR’s possible law enforcement and public safety uses.

“One of our focus areas is school safety,” says Andrew Barnard, a research associate in Penn State’s Structural Acoustics Department. “We’re exploring developing technology for safer campuses, and in this case, the CoE is promoting the leveraging of an existing technology for school safety purposes.”

In fact, the enthusiasm of campus and other public safety uses. THOR is designed to improve on currently available commercial off-the-shelf acoustic hailing devices and allow enforcement of the U.S. Navy’s 500-yard vessel protection zone. However, the CoE also has been quick to promote THOR’s possible law enforcement and public safety uses.

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In fact, the enthusiasm of campus and other local law enforcement for potential campus safety applications for the device, particularly in the wake of the April 2007 Virginia Tech shootings, led to the successful test demonstration described above on July 25, 2007.

“We had performed a demonstration for the Navy, and some of the Penn State administrators who saw THOR in action became its biggest advocate,” says Dr. Timothy A. Brungart, senior research associate and associate professor of acoustics at Penn State. “Penn State police were extremely interested in its capability to notify the campus in the event of an emergency, both at Beaver Stadium and campuswide.”

The system, designed for intelligibility over long distances, overcomes even loud levels of background noise, yet doesn’t overpower listeners standing right next to the device. And the obvious major difference, compared with using warning sirens, is that listeners can receive instructions on what they should do.

“It can be used for emergency warning purposes [such as in the event of a shooting], for communications when there’s been a natural disaster like a flood, an earthquake or a fire, or any other time you might need to notify or warn extensive numbers of people,” Brungart adds.

Penn State, for example, experienced its own campus shooting incident on Sept. 17, 1996, when one person was killed and another wounded. Also, chemical spills, fires and other accidents are all-too-common hazards on college campuses. With that in mind, the research team designed the 2007 exercise, in which volunteers positioned in 21 locations around Beaver Stadium confirmed THOR’s voice command intelligibility. Also, the end of the test message included an e-mail address and asked individuals elsewhere on campus who heard the message to respond, generating the following:

- “I thought that you should know that in Thomas Building your testing could be heard in the restrooms.” (The Thomas Building is three-quarters of a mile away; the restroom window was open).
- “My sister-in-law heard the message in her car as she was passing from the hospital to the campus.”
- “The telephone repair guy told me this morning that he was inside the Jordan Center working and he heard it loud. He said he knew it wasn’t the speakers on the scoreboard at the stadium because this was much louder than [they are].”
- “My observations of the test were that it was outstanding,” Clifford Lutz, assistant director of the campus police department, told the organizers. “The uniform quality of the voice at all distances was amazing. Even at the [Bryce Jordan Center] where there was an echo, the clarity was maintained. The test clearly shows the value THOR would be as an emergency alert system.”

The research team continues to incorporate refinements into THOR, and commercialization, at an undetermined cost, is still a couple of years away. Brungart believes it is possible that larger universities would purchase their own systems for use as a campus security tool.

“If it saves one life in the wake of a campus incident,” Brungart says, “how much is that worth in both humanitarian terms and in terms of potential litigation?”

Brungart also thinks that states may possibly purchase systems and keep them in a central location for emergency deployment after hurricanes, floods and other natural disasters.

For more information, contact Dr. Timothy A. Brungart at (814) 865-3034, e-mail tab7@psu.edu, or Andrew Barnard at (814) 865-0819, e-mail arb279@psu.edu.
TECHshorts is a sampling of the technology projects, programs and initiatives being conducted by the Office of Justice Programs’ National Institute of Justice (NIJ) and the centers, specialty offices and criminal justice technology Centers of Excellence that constitute its National Law Enforcement and Corrections Technology Center (NLECTC) system. If you would like additional information concerning any of the following TECHshorts, please refer to the specific point-of-contact information that is included at the end of each entry.

In addition to TECHshorts, an online, biweekly technology news summary containing articles relating to technology developments in public safety that have appeared in newspapers, newsmagazines and trade and professional journals is available through the NLECTC system’s Web site, JUNET, at www.junet.org. This service, the Law Enforcement and Corrections Technology News Summary, also is available through an electronic e-mail list, JUNETNews. Every other week, subscribers to JUNETNews receive the news summary directly via e-mail. To subscribe to JUNETNews, e-mail your request to asknleetc@nlectc.org or call (800) 248-2742.

Note: The mentioning of specific manufacturers or products in TECHshorts does not constitute the endorsement of the U.S. Department of Justice, NIJ, or the NLECTC system.

Robot Assists Alaska State Troopers in Barricade Situation NLECTC-Northwest

In late spring 2008, the Alaska State Troopers SWAT team successfully used a Vanguard™ MK-II robot on loan from the Northwest Center in an operational deployment against a barricaded homicide suspect. The Wasilla, Alaska, man had shot a neighbor and retreated into his residence; when troopers arrived on the scene at about 5:30 p.m. on May 31, the victim’s body lay near the suspect’s home and neighbors gave the officers reason to believe that the suspect had access to multiple weapons. The troopers first used the robot to pursue the suspect, who had ventured outside his home, with the intention of the robot’s placing chemical munitions that would disorient the suspect. However, he was able to retreat into the house and avoid the robot. The troopers next deployed the robot near the door the suspect had used to exit the home; on several occasions, the suspect looked out the door, saw the robot remained nearby, and remained inside the house. (Unknown to the suspect, the robot’s battery had died and it remained inoperative while it positioned near the door.)

At the end of a nearly 24-hour standoff, the suspect exited his home and that the house was not booby trapped. Troopers in Washington State had barricaded himself in a completely darkened rear bedroom. Officers forced an opening wide enough to insert a pole-mounted camera with infrared illumination, helping them locate the suspect, but attempts to flush him out using several less-lethal means proved ineffective. Officers next broke an exterior window and located the suspect hiding behind a door, armed with a large knife. Because the camera let them know the suspect was armed, officers attempting to make an entry at the door dropped back and once again resorted to less-lethal measures, eventually resulting in the suspect’s surrender.

The department’s SWAT team first responded to a home where a suspect had barricaded himself in a completely darkened rear bedroom. Officers forced an opening wide enough to insert a pole-mounted camera with infrared illumination, helping them locate the suspect, but attempts to flush him out using several less-lethal means proved ineffective. Officers next broke an exterior window and located the suspect hiding behind a door, armed with a large knife. Because the camera let them know the suspect was armed, officers attempting to make an entry at the door dropped back and once again resorted to less-lethal measures, eventually resulting in the suspect’s surrender.

The following day, the SWAT team responded to another bedroom barricade situation, where the suspect was known to be armed with a 9mm handgun and was threatening to shoot through the door. Officers entered the residence with a ballistic blanket and a pole-mounted camera, confirming the suspect’s location. The subject attempted to draw officers’ fire during negotiations, but the camera allowed them to observe that his hands were empty. The subject’s handgun was later found lying on the bed. In both cases, without use of the camera system, it is possible that officials and volunteers. Three years ago, a young girl was swept away in a similar incident: that search and rescue effort lasted for 11 days in heat above 120 degrees Fahrenheit before her body was found. The searchers suffered numerous heat injuries and broken bones, and overtime and personnel costs reached between $100,000 and $150,000.

For more information on the NIJ Aviation Technology Program, contact Mike O’Shea, NIJ program manager, (202) 305-7954, michael.oshea@usdoj.gov; Joe Peters, Director, BRTC-Austin, (512) 445-2316, Joe@txsheriffs.org; or Tim Adelman, project manager, BRTC-Austin, (410) 224-3000, Tim@txsheriffs.org.

“Eyeballing” Ways To Save Lives Sensors, Surveillance and Biometric Technologies CoE

Thanks to an evaluation program administered by the Sensors, Surveillance and Biometric Technologies Center of Excellence, the Cobb County Police Department in Georgia used the Remington Eye Ball R-1™ tactical camera system and possibly saved multiple lives in a 24-hour period in summer 2008. The camera was developed and funded under the auspices of the Technical Support Working Group (TSWG), which provided the technology to the CoE for evaluation. NIJ is a member of TSWG.

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The Eye Ball R-1 is a 360-degree tactical wireless surveillance system that provides live audio and video and is equipped with IR. The baseball-sized wireless camera can be thrown, rolled, tossed, or dropped or lowered into any hazardous location, thus providing eyes and ears to improve situational awareness. The CoE has provided this technology to numerous law enforcement and correctional agencies for evaluation in the field. Feedback from participants has been positive.

For more information, contact the CoE’s Jerry Cook at jcook@biometricgroup.com.

Powered Parachute Helps Recover Victims, Saves Time and Money BRTC-Austin

Early in 2008, the Tohono O’odham Nation Police Department (Sells, Ariz.) began evaluating a powered parachute as part of the NIJ Aviation Technology Program (see “Under Your Own Power…Parachute,” TechBeat Summer 2006). The craft has been put into action several times, most notably following events on August 3, when a vehicle crossing a roadway became trapped by a flash flood. Several occupants escaped, but two were swept away downstream. The next morning, Officer Richard Pullum launched the powered parachute as part of a search and rescue mission, flying to the last known location of the victims. Only 17 minutes later, Pullum successfully determined the location of the first victim. After he returned to the airport, Officer Darren Manns continued the search further down the creek bed and found the other victim 12 to 15 miles from the location of the incident just 34 minutes later. A ground crew recovered the bodies of both victims, and told Pullum and Manns that given the location of the victims, they might not have ever been found by searching from the ground.

Search and rescue missions are nothing new to the Tohono O’odham Nation. Every year the department launches searches for lost tribal members, hikers, undocumented aliens and flash-flood victims. Due to the vastness of the Nation’s territory, these searches often require much time and effort from both officials and volunteers. Three years ago, a young girl was swept away in a similar incident: that search and rescue effort lasted for 11 days in heat above 120 degrees Fahrenheit before her body was found. The searchers suffered numerous heat injuries and broken bones, and overtime and personnel costs reached between $100,000 and $150,000.
In addition to funding the National Law Enforcement and Corrections Technology Center, the National Institute of Justice (NIJ) and other Federal agencies support the National Criminal Justice Reference Service (NCJRS), assisting a global community of policymakers, practitioners, researchers and the general public with justice-related research, policies and programs.

NCJRS offers reference and referral services, publications, online and offline conference support and other technical assistance. The easiest way to access NCJRS is online.

Start at http://www.ncjrs.gov

The NCJRS website showcases the latest criminal and juvenile justice and drug policy information. Take advantage of:

- Topic-specific resources.
- Online registration and ordering.
- Searchable abstracts, calendar of events, and questions-and-answers databases.

Stay Informed

Register at http://www.ncjrs.gov/subreg.html to receive:

- JUSTINFO. A biweekly electronic newsletter that includes links to full-text versions of printed publications.
- E-mail notifications. Periodic messages about new publications and resources that match your specific interests.

NCJRS Contact Information

at-a-Glance

Web: http://www.ncjrs.gov
Phone: (800) 851-3420 (Monday – Friday, 10 a.m. to 6 p.m. e.s.t.)
Fax: (301) 519-5121
Mail: NCJRS, P.O. Box 6000, Rockville, MD 20849-6000

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The National Institute of Justice is a component of the Office of Justice Programs, which also includes the Bureau of Justice Assistance; the Bureau of Justice Statistics; the Community Capacity Development Office; the Office for Victims of Crime; the Office of Juvenile Justice and Delinquency Prevention; and the Office of Sex Offender Sentencing, Monitoring, Apprehending, Registering, and Tracking (SMART).

Your Technology Resource...

TechBeat is the award-winning newsmagazine of the National Law Enforcement and Corrections Technology Center (NLECTC) system. Our goal is to keep you up to date with current and developing technologies for the public safety community, as well as other research and development efforts with in the federal government and private industry. TechBeat is published four times a year.

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Staff: Interim Managing Editor, Lance Miller; Editor, Michele Coppola; Lead Writer, Becky Lewis; Graphic Designers, Tina Kramer and John Graziano.

2009 NJI Technology Institute for Law Enforcement

March 15 – 20, 2009, Annapolis, MD

Agenda: The National Institute of Justice (NIJ) is sponsoring its annual Technology Institute for Law Enforcement. Participants will learn about and discuss technology initiatives and issues affecting the law enforcement community. Attendance is limited to 25 full-time, mid-grade, career, state and local law enforcement officers who are actively involved in technology-related issues within their agencies.

Registration: To obtain an application, visit http://www.justnet.org or contact Bruce Blair at (800) 248-2742 or bblair@nlectc.org. An agency may submit one application for consideration. Alumni from previous Institutes will not be considered. The application must be completely filled out in order to be considered. All travel, lodging and meal expenses are paid by NIJ.


www.justnet.org

Online News Summary: Online News Summary includes article abstracts on law enforcement, corrections and forensics technologies that have appeared in major newspapers, magazines and periodicals and on national and international wire services and Web sites. Online News Summary includes all articles from NIJ and NLECTC that you can view or download to your system, including printer-friendly versions of TechBeat articles and features.

Testing Results: Up-to-date listing of public-safety equipment evaluated through NIJ’s testing program. Includes ballistic- and stab-resistant armor, patrol vehicles and tires, protection gloves, handcuffs and more.

Publications: Publications from NIJ and NLECTC that you can view or download to your system, including printer-friendly versions of TechBeat articles and features.

Calendar of Events: Calendar of Events lists upcoming meetings, seminars and training opportunities.

Links: Links takes you to other important law enforcement and corrections Web sites.

For help establishing an Internet connection, linking to JUSTNET or finding needed technology and product information, call the NLECTC Information Hotline at (800) 248-2742.
Offering cost-effective assistance to law enforcement and corrections agencies and crime laboratories — large or small, rural or urban — in the implementation of current and emerging technologies, the National Law Enforcement and Corrections Technology Center (NLECTC) system is an integrated network of centers, specialty offices and criminal justice technology Centers of Excellence located across the country.

Established in 1994 by the Office of Justice Programs’ National Institute of Justice (NIJ) as part of its research, development, testing and evaluation initiatives, the NLECTC system serves as an “honest broker” resource for technology information and assistance and helps introduce technologies into the criminal justice community.

The NLECTC system seamlessly delivers its expertise to the Nation’s 19,000-plus police agencies; 50 State correctional systems; thousands of prisons, jails, and probation and parole departments; and crime laboratories in a number of technology areas. These technology areas are supported by technology partners who provide the leveraging of unique science and engineering expertise. In addition, technology working groups and a national advisory council provide guidance relating to the technology needs and operational requirements of the public safety community for NIJ’s various technology focus areas and ensure a focus on the real-world needs of public safety agencies.

Contact NLECTC for:

Technology Identification
The NLECTC system provides information and assistance to help agencies determine the most appropriate and cost-effective technology to solve an administrative or operational problem. We deliver information relating to technology availability, performance, durability, reliability, safety, ease of use, customization capabilities and interoperability.

Technology Assistance
Our staff serves as proxy scientists and engineers. Areas of assistance include unique evidence analysis (e.g., audio, video, computer, trace and explosives), systems engineering, and communications and information systems support (e.g., interoperability, education and training programs). Our technology partners provide technical support to information technology and operations specialists.

Technology Implementation
We develop technology guides, best practices and other information resources that are frequently leveraged from hands-on assistance projects and made available to other agencies.

Property Acquisition
We help departments take advantage of surplus property programs that make Federal excess and surplus property available to law enforcement and corrections personnel at little or no cost.

Equipment Standards and Testing
We oversee the development of performance standards and a standards-based testing program in which equipment such as ballistic- and stab-resistant body armor, double-locking metallic handcuffs and semiautomatic pistols is tested. NLECTC also conducts comparative evaluations (testing equipment under field conditions) on patrol vehicles; patrol vehicle tires and replacement brake pads; and cut-, puncture- and pathogen-resistant gloves.

Technology Demonstrations and Capacity Building
We introduce and demonstrate new and emerging technologies through special events, conferences and practical demonstrations such as the Mock Prison Riot and an annual public safety technology conference. We also provide hands-on training assistance for the latest technologies through workshops and software programs dealing with crime mapping, community corrections and critical incident management. In addition, on a limited basis, NLECTC facilitates deployment of new technologies to agencies for operational testing and evaluation.

Technology Information
NLECTC disseminates information to the criminal justice community at no cost through educational bulletins, equipment performance reports, guides, consumer product lists, product information databases, news summaries, meeting/conference reports, videotapes and CD-ROMs. Most publications are available in electronic form through the Justice Technology Information Network (JUSTNET) at www.justnet.org. Hard copies of all publications can be ordered through NLECTC’s toll-free number, (800) 248-2742, or via e-mail at asknlectc@nlectc.org.

Technology Product Network
The Technology Product Network (TPN) provides one-stop access to information on currently available products for law enforcement and corrections. Vendors and technologists who register with the TPN can upload information about their products, while registered practitioners can participate in discussion forums about the products found in the database. Registered users also receive e-mail notifications of new products that match their specified interests. Visit the TPN Web site at www.techproductnetwork.com.

In September 2007, the U.S. Department of Justice, Office of Justice Programs, created four Technology Centers of Excellence (CoEs) as part of the NLECTC system.

Establishment of these CoEs within the existing NLECTC system will further the mission of NIJ by better aligning the NLECTC system with NIJ’s research, development, testing and evaluation activities, enhancing the cost-effective delivery of technology information and assistance services required by state and local public safety practitioners.

The existing NLECTC sites will continue to serve as the initial point of entry for technology information and generalized technology assistance. The new CoEs will serve as an authoritative resource within their respective technology focus areas, providing specialized technology assistance to public safety personnel as well as working with technology developers and users to test and evaluate equipment in operational environments.
The Mock Prison Riot, held in May each year, serves as a venue for technologists that want to showcase new or improved law enforcement and corrections-specific products and seek valuable feedback from end users.

“Since the MPR and the suggestions made on the spot upon exit from the basement scenario, we have already made the following improvements: placed a cross-hair center for better target acquisition such as reaching for a door handle, [and placed] field-of-view rings at the 90- and 180-degree angle for greater orientation and situational awareness,” says Barry Bloomfield of InterScience, Inc., producer of the C-View Night Vision Goggle. “We have begun designing a lens cap. All of the above product advances are a result of our experience at the MPR.”

The Office of Justice Programs’ National Institute of Justice (NIJ) and the West Virginia High Technology Consortium (WVHTC) Foundation host the annual event, using the buildings and grounds of the decommissioned penitentiary to evaluate the effectiveness of emerging and existing law enforcement and corrections technologies. Core components of the MPR include a technology showcase, tactical training scenarios, numerous free workshops (many of which result in certifications), a skills competition and virtually unlimited opportunities for networking and camaraderie. All areas of the prison and grounds are used for demonstrations, and end user participation and feedback are welcomed and encouraged.

“End users can take a technology from a table in the showcase area, walk a hundred yards and give it to an individual or a team to deploy in an actual cell block, Chow hall or rec yard,” says Brad DeRoos, former vice president and chief technology officer of the WVHTC Foundation. “There’s no other event in the law enforcement and corrections arena that combines the technologies with optimum conditions for deployment at the same location.”

Law enforcement and corrections practitioners from sheriffs’ departments, police departments, prisons, jails, border patrols and the military come from all over the world to view new technologies, then design and execute training scenarios using them. Often, the technology developers stand nearby to watch their products in action.

“Our exhibitors and technologists tell us that the candid, immediate and direct feedback that they receive from the end users is critical to the development process,” DeRoos says. “By partnering and working together for just a few short days each year, the folks who come here are shaping the future of their industry on a global scale. It’s tremendously exciting and rewarding to be a part of that.”

Although technologists say they benefit most from the unlimited, candid and informal feedback and networking they receive, formal operational assessments also take place. Requests for formal technology assessments must be made in advance, preferably at the time of registration, as opportunities are limited.

New products introduced during the 2008 MPR included the following:

- Taser®’s XREP, a self-contained, wireless projectile fired from a standard 12-gauge shotgun that is said to deliver the same neuromuscular incapacitation as the handheld Taser® X26, but from a distance of up to 100 feet, and SHOCKWAVE, the first generation of the new Taser Remote Area Denial (TRAD) technology, which integrates neuromuscular incapacitation into an anti personnel area-target system capable of incapacitating individuals with reversible effects.

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