National Law Enforcement and Corrections Technology Center

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Putting the Fire Out in Utica

At times it looked like the city of Utica, New York, was going up in smoke. Its arson rate was twice that of the national average and three times that of the State average. Its closure rate was not good; its conviction rate even worse.

Utica's arson problems could be traced to several sources. The city had lost more than 30 percent of its population due to the closing of Griffiss Air Force Base and a number of defense-related businesses. With the local economy spiraling downward and home sales plummeting, some property owners started burning their homes for the insurance money. Others just boarded them up and walked away. In turn, these areas became prey to drug dealers who set up drug fiefdoms and often burned the property of their competitors in drug deals gone bad or in an effort to take over additional turf. At the same time, New York City cracked down on criminal activities, significantly lowering its crime rate but sending many of its resident criminals scurrying for new and more lucrative areas. In addition, profiteers appeared on the scene who bought abandoned houses at fire-sale prices, insured them for $100,000, and torched them.

At its worst, Utica firefighters battled two to three fires a night. The city's arson rate was twice that of the national average, with 45 percent of all structure fires ruled arson. The national average for arson case closures was 15 percent, but Utica only closed 2 percent of its cases. Structure fires numbered more than 250 in 1997—far too high for this town of 65,000 people living in 9 square miles.

Although many Utica neighborhoods remained strong during the city's economic downturn, its inner city bore the brunt of the arson-related crimes. But it was here, right in the middle of what looked like a war zone, that hope was born. With $10,000 in funding from the Federal Emergency Management Agency (FEMA), the city of Utica, several surrounding local agencies, and a number of Federal agencies formed the Utica Arson Strike Force in April 1997. From each participating agency, the strike force tapped experts in all facets of arson investigation and housed them in an abandoned firehouse in the heart of the most fire-ravaged section of the city.

Although in existence a relatively short time, the strike force has turned around what had become a serious and dangerous trend. Since its inception, arson has dropped by 50 percent, closure rates now stand at 52 percent, and the conviction rate is 100 percent, according to Utica Police Department Capt. Claude DeMetri, who heads the strike force. Not only did the strike force investigate current fires, DeMetri says, it opened more than 120 old cases dating back to 1991. Nineteen of those have since been closed by arrest.

(See Utica Fires, page 2)

Taking the Fight Out in Lakewood

The Lakewood Police Department is proving that when it comes to domestic violence, technology not only saves lives, it also simplifies and speeds the handling of cases. This Colorado agency used computer technology to take a closer look at how it handles domestic violence calls. By implementing a program that uses "process mapping," it has dramatically changed the structure of its domestic violence response system—so much so that it became one of the reasons Good Housekeeping *magazine named the Lakewood Police Department one of the top eight law enforcement agencies in the country.*

Lakewood's program started in 1995 as a spinoff of a project that involved the city of Chicago and Motorola, Inc. Motorola had used a process mapping program to improve its overall performance, and offered the program to the Chicago Police Department for the same purpose. The project paired the Performance Learning Corporation, which had expertise in process mapping, with the Police Executive Research Forum. With sponsorship from Motorola, the project expanded to include six other U.S. cities: Lakewood, Colorado; Phoenix, Arizona; Charlotte-Mecklenburg, North Carolina; West Palm Beach, Florida; Arlington, Texas; and Naperville, Illinois, as well as the Thames Valley Constabulary in the United Kingdom.

Process mapping is an alternative to traditional,

(See Domestic Violence, page 7)

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(Utica Fires. . . cont. from page 1)

DeMetri believes this success lies in the cooperation that exists among the participating agencies. The strike force, he says, consists of a commander, a deputy commander, a technical resource coordinator, an operations officer, three fire marshals, an arson detection K-9 and handler, a forensic technician, a special agent from the Bureau of Alcohol, Tobacco and Firearms (ATF), an assistant district attorney on call 24 hours a day, and six investigators. Participating agencies include the Utica Police Department, Oneida County Sheriff's Department, Utica Fire Department, New York State Office of Fire Prevention and Control, and New York State Police. Part-time members come from the U.S. Marshals Service, the New York State Insurance Fraud Bureau, and the National Institute of Justices's (NIJ's) National Law Enforcement and Corrections Technology Center (NLECTC)–Northeast.

NLECTC–Northeast got involved in the strike force at the request of FEMA, which was responding to an appeal by U.S. Representative Sherwood Boehlert (R-NY), for help with the growing problem of arson. Utica was designated as the fourth pilot city in FEMA's National Arson Prevention Initiative. FEMA asked NLECTC–Northeast, located in Rome, New York, to assess and provide for the team's technology requirements.

"They needed a digital camera, a color scanner, printers, and funding to build a custom database, which we provided," says John Ritz, director of NLECTC–Northeast. "They also needed a local area network, which we designed, built, and implemented. This network gives them the capability to send and receive information over the Internet and to share information with other agencies."

Through the U.S. Air Force's Law Enforcement Analysis Facility, also located in Rome, NLECTC–Northeast also cleaned up audiotapes taken from body wires and enhanced the quality of surveillance audio and videotapes.

"The actual number of dollars invested has not been that much," Ritz says. "The task force had substantial manpower and expertise in every area of arson investigation. We provided the technology that supports what they do. With the digital camera, they can develop high-quality investigative documents, which increases their conviction rate. It also lets them e-mail suspect photos to other agencies, which has helped them arrest arsonists in New York City, North Carolina, Nevada, and Florida."

In addition to accessing state-of-the-art technologies and expertise, the arson strike force changed the basic structure of the typical arson investigation. Instead of waiting for the fire marshal to investigate and rule on a particular blaze, the strike force assumed every fire was arson and treated the area as a crime scene. Investigators and fire marshals rolled alongside the fire department at the moment the fire alarm sounded. They watched how the structure burned, canvassed the crowd for suspects and witnesses, conducted on-scene interviews, and took photographs of the crowd and fire scene. If the fire marshal decided it was arson after the fire was out, the strike force simply continued their investigation.

The strike force also took advantage of cooperation, donations, and funding from the community: A local communications company provided intercoms for the strike force offices; a cell phone company supplied cell phones to investigators free for 6 months; local businesses, agencies, and colleges donated office furniture, computers, and supplies; area insurance companies donated money and camera equipment; the Utica Fire Department donated pagers with group paging capabilities; ATF provided a radio base station, portable radios, surveillance equipment, and a van; the sheriff's department provided two computers and three vehicles seized from drug investigations, while its offender work program supplied manpower for construction, remodeling, and cleanup of the strike force offices; and the U.S. Marshals Service provided prisoner transport services.

The strike force has been such a success that it is expanding to cover the entire county and is being used as a model for an area drug task force. And, even more important to the city's economic welfare is that downtown business owners are starting to rebuild, remodel, and restore their properties. Utica is truly rising from the ashes.

For more information about the Utica Arson Strike Force and its operations, contact John Ritz or Dave Hallett at NLECTC–Northeast, 888–338–0584; or Capt. Claude DeMetri, 315–732–7260. You can also access the strike force's World Wide Web site at www.borg.com/~uticapba/arson.

New Position on Positional Asphyxia

The practice of applying restraining devices to individuals once they are subdued is common throughout the country. However, with extraordinarily violent or delirious individuals, the procedure of connecting the handcuffs to secured ankles—frequently referred to as "hogtying"—may be the only way to physically immobilize them so they are no longer a threat.

But due to the potential risk of an "in-custody sudden death" and its association with a contributing factor that has come to be known as "positional asphyxia," the option of applying a maximum or Total Appendage Restraint Procedure (TARP) has been eliminated by many law enforcement and corrections agencies. So the issue police and corrections agencies need to confront and resolve when formulating policies and procedures for restraining violent persons is, "Will this procedure be considered excessive or unreasonable force because it is considered by some as potentially lethal?" It will come as a surprise to learn that the experts are not unanimous.

A correlation between an "in-custody sudden death" and "positional asphyxia" was hypothesized by Dr. Donald T. Reay, the Chief Medical Examiner for King County, Washington, in 1988 based on a study he conducted to determine the oxygen recovery rate of the body when influenced by extreme exertion. After exercise (such as a violent struggle with law enforcement or corrections officers), does the blood oxygen level decrease? More significantly, what effect might body position, specifically weight on the chest and stomach, have on one's ability to recover to a normal heart rate and blood oxygen level? Furthermore, could the physical restraint and the position of the body impair the mechanical respiratory process of inhaling and exhaling?

Contemporary policies and procedures adopted by law enforcement and corrections agencies across the country have been based on these findings. In fact, most court-recognized experts refer to Reay's study as the acknowledged standard. However, Reay's methodology and logic were never critically examined by scientists until they were challenged in a recent San Diego, California, case.

The U.S. District Court case *Price* v. *County of San Diego* subjected these issues to a careful examination in response to a plaintiff's claim that an unlawful death occurred after a subject's confrontation with deputies and was the result of positional asphyxiation associated with the hogtie restraint. The argument in this case was that hogtying caused positional asphyxia, which is equivalent to deadly force and therefore excessive under the circumstances. During the trial, Reay testified about his previous findings.

The defense questioned the validity of Reay's original work and his testimony, in particular the overall methodology of his study and the relationship of body position to heart recovery rate and blood oxygen level. At the request of the defense counsel, a new study was conducted at the University of California, San Diego (UCSD) by Dr. Thomas Neuman to "determine whether the 'hobble' or 'hogtie' restraint position results in clinically relevant respiratory dysfunction."

Neuman identified several weaknesses in the methodology of Reay's study and concluded that the results were invalid. The UCSD study refuted Reay's underlying premise—that blood oxygen levels decrease after exercise—as well as his ultimate conclusion: that the hogtie restraint prevents the lungs from replenishing the blood's oxygen supply. The UCSD study determined that the blood needs no replenishment after exercise because it already has adequate oxygen. It should be noted that the studies conducted to date were completed using reasonably healthy individuals who were not under conditions of stress.

When presented with this new information, Reay reversed himself and testified that he concurred with the findings and agreed that the UCSD methodology was valid. He further agreed that his study appeared to be flawed. As a result of this information, the U.S. District Court, Southern District of California, ruled that the "hogtie restraint was not considered deadly force" under the circumstances present in this particular case.

Additionally, there have been at least three other recent cases to date that have challenged the use of a full body restraint procedure as excessive force by peace officers in response to violently aggressive individuals. Highlights of some of these decisions follow.

The first is that the "hogtie" or prone restraint is not considered deadly force. "Restraining a person in a prone position is not, in and of itself, excessive force when the person restrained is resisting arrest" *(Phillips* v. *Milwaukee)*. And even though the prone method of restraint has the potential to cause death under certain circumstances, "There is no evidence that the probability of death is so high as to be considered 'likely' when such restraint is used."

The second affects the standard by which the actions of the officers involved in these cases are judged. "All claims that law enforcement officers have used excessive force—deadly or not—in the course of an arrest, investigative stop, or other 'seizure' of a free citizen should be analyzed under the Fourth Amendment and its 'reasonableness' standard, rather than under a 'substantive due process' approach" *(Graham* v. *Conner)*.

What impact will these recent cases have on the law enforcement and corrections community's options to safely and effectively control and restrain these violent and threatening offenders? It is an opportune time for agencies to review their policies and procedures in light of these developments.

A point to remember is that control refers to the force necessary to "stop the fight" (as in gain control), as opposed to restraint, which is the method by which the individual is immobilized using some type of device, such as handcuffs and/or hobbles. Stopping the threat should be the first concern, then the method or device used for restraining the individual and preventing the need for more vigorous control can be considered. Once the person is "adequately" restrained, the physical condition of the person should be carefully monitored and any medical concerns immediately addressed. Departments should consider all factors (including alternatives if any exist) when determining revisions for methods of effectively restraining violent individuals.

The National Institute of Justice reported in the Winter 1998 edition of* TechBeat *that an informational videotape would soon be released to address this critical issue for law enforcement and corrections. It has since been delayed in order to accurately include the latest information about positional asphyxia. The videotape is being revised and edited and will be released in the near future. For more information, please contact the National Law Enforcement and Corrections Technology Center–National at 800–248–2742, or visit the center's World Wide Web site, JUSTNET, at www.nlectc.org for updated information.

This article was written by Michael Grossman, Director, Technology Assistance Division, Office of Science and Technology, National Institute of Justice, and Sgt. Gilbert Aguilar, Los Angeles County Sheriff's Department.

NIJ NATIONAL INSTITUTE OF JUSTICE

From the Director

Law enforcement, courts, and corrections officials and officers working in the field know how crucial technology is to their day-to-day operations. In some circumstances, having the right tool can even mean the difference between life and death.

The technological revolution that has swept society as a whole in recent years has also affected the criminal justice system. Some technologies that not long ago seemed advanced—vests that can stop bullets and electronic monitoring of probationers—today seem commonplace. But the revolution continues apace, with ever more spectacular advances now being made, or in the testing stages, or on the drawing board.

As the research arm of the U.S. Department of Justice, the National Institute of Justice (NIJ) has, since its founding 30 years ago, been in the forefront in sponsoring the development, testing, and demonstration of technology to improve the justice system. The development of DNA testing standards, soft body armor, and improved fingerprint evidence are some of the many areas in which NIJ has played a leading role.

More recently, with strong support from the Administration and the Congress, NIJ has accelerated the pace of its efforts. Less-than-lethal technologies to minimize the use of force, computerized mapping to pinpoint and analyze crime patterns, concealed weapons detection to prevent violence, methods of stopping fleeing vehicles to apprehend suspects, and improvements in DNA laboratories to aid in evidence testing—all these capabilities, and others, are now being explored by NIJ. Their application can mean even greater transformations in law enforcement operations.

TechBeat *plays an important role as an essential link communicating the latest information about these developing technologies from the National Law Enforcement and Corrections Technology Center. By keeping law enforcement, courts, and corrections personnel current about the tools they can use, the newsletter makes a difference in controlling crime and ensuring justice.*

Jeremy Travis
Director
National Institute of Justice

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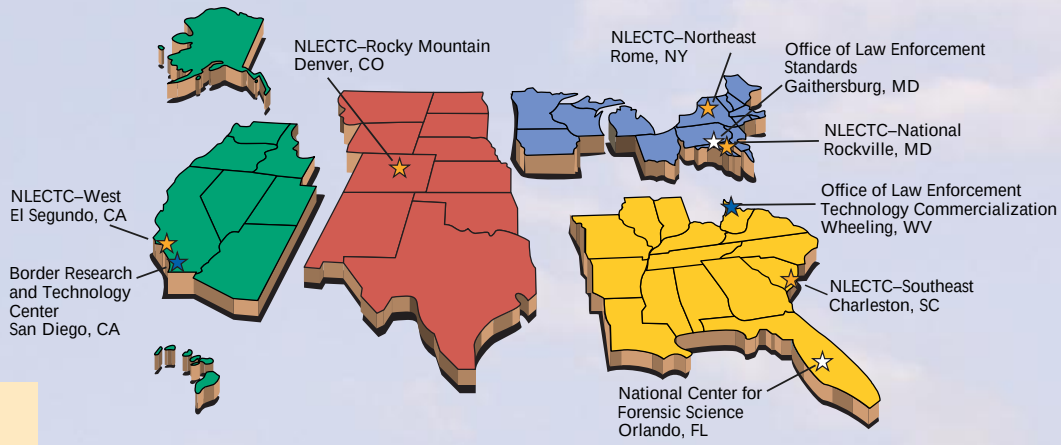
The National Institute of Justice is a component of the Office of Justice Programs, which also includes the Bureau of Justice Assistance, Bureau of Justice Statistics, Office of Juvenile Justice and Delinquency Prevention, and Office for Victims of Crime.

We Got You Covered

The National Institute of Justice (NIJ), responding to recommendations by the law enforcement and corrections community, converted its Technology Assessment Program Information Center (TAPIC) into the National Law Enforcement and Corrections Technology Center (NLECTC) system. Created in 1994 as a component of NIJ's Office of Science and Technology, NLECTC's goal, like that of NIJ, is to offer support, research findings, and technological expertise to help State and local law enforcement and corrections personnel safely and more efficiently do their jobs.

NIJ's NLECTC system consists of facilities located across the country that are colocated with an organization or agency that specializes in one or more specific areas of research and development. Although each of the NLECTC facilities has a different technology focus, they work together to form a seamless web of support, technology development, and information to help the law enforcement and corrections communities do their jobs more safely and efficiently.



NLECTC–National

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The National Center, located just 30 minutes north of Washington, D.C., is the hub of the NLECTC system. It provides information and referral services to anyone with a question about law enforcement and corrections equipment or technology. Its staff manages the voluntary equipment standards and testing program that tests and verifies the performance of body armor, metallic handcuffs, shotguns, and police vehicles and tires. This office produces consumer product lists of equipment meeting a specific set of performance standards and also operates JUSTNET (Justice Technology Information Network), an Internet World Wide Web site that provides links to the entire NLECTC system and other appropriate sites, as well as assistance to those seeking information about equipment, technology, or research findings.

NLECTC–Northeast

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NLECTC–Northeast is located at the Air Force Research Laboratory, Rome Research Site (formerly Rome Laboratory), on the grounds of the Griffiss Business and Technology Park. The center sponsors research and development efforts into technologies that address command, control, communications, computers, and intelligence. This center draws on the expertise of Air Force scientists and engineers in its development of technologies that can be used to detect concealed weapons on individuals, an effort that is expected to yield stationary equipment for use in buildings and handheld devices for field and patrol officers. Other areas of research and development include through-the-wall sensors, audio processing, image processing, timeline analysis, computer forensics, secure communications, and command/control.

NLECTC–Southeast

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Two of the focus areas of NLECTC–Southeast are corrections technologies and surplus property acquisition and distribution for law enforcement and corrections. The center facilitates the acquisition and redistribution of Federal surplus/excess property to State and local law enforcement and corrections agencies. The equipment must be used for law enforcement purposes only. Utilizing the JUSTNET Web site, the center educates law enforcement and corrections professionals about Federal surplus and purchasing programs. The efforts of NLECTC–Southeast have resulted in agencies receiving equipment they would not ordinarily have access to or might not have been able to afford due to budgetary constraints. This facility also studies the needs of corrections agencies. It is guided in this mission by a committee of criminal justice, law enforcement, and corrections practitioners that identifies requirements and sets priorities for research and development. NLECTC–Southeast is allied with the South Carolina Research Authority (SCRA) and the Naval Command, Control and Ocean Surveillance Center In-Service Engineering, East Coast Division (NISE East). NLECTC–Southeast's other areas of focus include information management and technologies, simulation training, and designated special projects.

NLECTC–Rocky Mountain

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Located at the University of Denver, NLECTC–Rocky Mountain focuses on communications interoperability and the difficulties that often occur when different agencies and jurisdictions try to communicate with one another. This facility works with law enforcement agencies, private industry, and national organizations to implement projects that will identify and field test new technologies to help solve the problem of interoperability. NLECTC–Rocky Mountain also houses the newly created Crime Mapping Technology Center, the training and practical application arm of NIJ's Crime Mapping Research Center, which is staffed by NIJ social scientists and scholars who utilize crime analysis research to improve police field operations and develop crime-mapping software for small, medium, and large departments. The Rocky Mountain facility also conducts research into ballistics and weapons technology, as well as information systems. Sandia National Laboratory has been designated as a satellite of NLECTC–Rocky Mountain. The laboratory works in partnership with NLECTC–Rocky Mountain and focuses on technology for detecting and neutralizing explosive devices (Operation Albuquerque).

NLECTC–West

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NLECTC–West is housed on the grounds of The Aerospace Corporation, a nonprofit corporation that provides technical oversight and engineering expertise to the Air Force and the U.S. Government on space technology and space security systems. NLECTC–West draws on The Aerospace Corporation's depth of knowledge and scientific expertise to offer law enforcement and corrections the ability to analyze and enhance audio, video, and photographic evidence. In cooperation with The Aerospace Corporation, this NLECTC facility also has available an extensive array of analytic instrumentation to aid in criminal investigations, such as a scanning electron microscope, an x-ray microscope, and a mass spectrometer, all of which are used to process trace evidence. Its other areas of expertise include computer architecture, data processing, communications systems, and a recent effort to identify technologies to stop fleeing vehicles.

Border Research and Technology Center (BRTC)

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The Border Research and Technology Center works with the Immigration and Naturalization Service, the U.S. Border Patrol, the U.S. Customs Service, the Office of National Drug Control Policy, and the U.S. Attorney for the Southern District of California to develop strategies and technologies that will facilitate control of the Southwest border. One of its most recognized accomplishments has been the implementation of SENTRI (Secured Electronic Network for Travelers' Rapid Inspection). BRTC also works on joint ventures to identify technologies that will stop fleeing vehicles and is currently participating in a project to detect the heartbeats of people concealed in vehicles or other containers.

Office of Law Enforcement Standards (OLES)

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Supported by NIJ, the Office of Law Enforcement Standards applies science and technology to the needs of the criminal justice community. While its major objective is to develop minimum performance standards for equipment and technology, which NIJ promulgates as voluntary national standards, OLES also undertakes studies leading to the publication of technical reports and user guides. Its areas of research include clothing, communications systems, emergency equipment, investigative aids, protective equipment, security systems, vehicles, and weapons. It also develops measurement methods for analytical techniques and standard reference materials for forensic scientists and crime labs. Since the program began in 1971, OLES has coordinated the development of nearly 200 standards, user guides, and advisory reports. Housed at the National Institute of Standards and Technology, OLES works closely with NLECTC–National to conduct tests and to guarantee the performance and quality of equipment used by police and corrections.

Office of Law Enforcement Technology Commercialization (OLETC)

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Housed at Wheeling Jesuit University, the Office of Law Enforcement Technology Commercialization provides one of the NLECTC system's most important services, that of bringing research and private industry together to put new technologies into the hands of law enforcement and corrections. OLETC actively solicits manufacturers to commercialize technologies based on requirements identified by law enforcement and corrections practitioners. For example, it is currently seeking companies interested in commercializing technologies already developed by the U.S. Department of Energy's Los Alamos National Laboratory, such as a device that lets police officers detect crack houses from a distance, microwave and acoustic sensors that detect the motion of people behind walls or doors, and a nondetectable, nonscannable transmitter for use in undercover situations. OLETC works with private industry to support its efforts and help companies streamline the commercialization process.

National Center for Forensic Science

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The newest addition to the NLECTC system, this facility is housed in the University of Central Florida and initially will focus on arson and explosives research. Its mission is to conduct fundamental research into the basic nature of fire and explosion reactions, provide the support for developing standard protocols for analyzing arson and explosion debris, promote the use of electronic media to access and exchange information about the forensic sciences, and provide education opportunities to practicing professionals and full-time students. This new facility will draw on the experience and expertise of the university, which houses a forensic science program with an active research program, as well as the Institute of Simulation and Training, which is currently exploring ways to simulate explosive reactions to study various chemical processes.

From the Street. . . to the Street

The National Institute of Justice (NIJ) has long believed that one of the most vital aspects of its program is the solicitation of ideas and suggestions of criminal justice practitioners. It is this information that helps form the framework of NIJ's work. NIJ's Office of Science and Technology and its National Law Enforcement and Corrections Technology Center (NLECTC) system get this information through conferences, regional workshops, and most especially through a series of advisory groups. These groups are composed of representatives from all areas of law enforcement, corrections, and the forensic sciences, and focus on everything from operational technological needs to liability issues and public acceptance of these new technologies.

One such group, the Law Enforcement and Corrections Technology Advisory Council (LECTAC), is a group of law enforcement, corrections, and forensics practitioners who serve as advisers to the NLECTC system and recommend program priorities. Because LECTAC's members are also the end users of new technologies, they keep the NLECTC system in touch with the realities of the street by bringing the immediate needs of police and corrections officers to the attention of staff, who then pass them on to researchers, scientists, and engineers.

LECTAC's current research priorities include the development of technologies in the areas of concealed weapons and contraband detection, vehicle stopping, enhanced DNA testing, officer protection, less-than-lethal tools, information management, counterterrorism, location and tracking, secure communications, and noninvasive drug detection. Following are updates on several sample projects that fall under these headings, many having both law enforcement and corrections applications.

- ***National Guidelines for Death Investigation.*** The purpose of this project was to identify, delineate, and assemble a set of investigative tasks that should and could be performed at every death scene. These guidelines are designed to provide those responsible for death investigations with the steps and tools to identify, collect, preserve, and present evidence crucial to death scene investigation. In addition, the guidelines are designed to offer the courts a way to assess whether or not evidence in question was collected and preserved in a thorough and systematic fashion to maintain the chain of custody and prevent contamination. The *National Guidelines for Death Investigation* were developed and approved by the National Medicolegal Review Panel, a multidisciplinary group of nationally recognized experts from the medical, forensic, law enforcement, and legal communities. The 144-member Technical Working Group for Death Investigation also contributed to the project by providing a national perspective in its review of the report. Copies can be obtained through the National Criminal Justice Reference Service's World Wide Web site at www.ncjrs.org or by calling 800–851–3420.

- **Rapid DNA Identification Using Microchip-Based Genetic Detectors.** This project is expected to result in a field-ready, laptop analysis unit capable of receiving and analyzing a biological sample at the crime scene. DNA profiles can be displayed onsite or electronically transferred to a database. The technology comes from the diagnostic field where microchips are used to help identify certain genetic diseases. Modified for forensic use, the chips will contain an array of microelectrodes that are individually electronically controlled to transport, concentrate, and hybridize DNA through manipulation of electric fields. Separation of the DNA molecule to reveal individually discriminating markers is controlled by a programmable power supply. This system is so sensitive that it can identify several genetic markers at once, resolving each of them to their most basic units by fluorescent signal. Present efforts include increasing the number of genetic markers to include all DNA sites identified for inclusion in the Combined DNA Index System (CODIS) and further development of a field-ready portable unit.

- **Electric Stun Projectile.** The electric stun projectile is a wireless less-than-lethal weapon that uses stun gun technology to temporarily incapacitate a person at a standoff range of 30 feet. It is fired from compressed gas or powder launchers. It sticks to the target with a glue-like substance or with short, clothing-attachment barbs. On impact, the device will impart a short burst of high-voltage pulses capable of penetrating several layers of clothing. It will instantly and temporarily disable individuals or cause extreme discomfort. The projectile can be used in any stand-off encounter where an individual needs to be temporarily incapacitated without exposing law enforcement or corrections officers to unnecessary risk. A prototype has been developed and demonstrated; the next step is to complete a safety certification and a limited bioeffects study.

- **Pepper Spray Projectile / Disperser.** This project will yield an improved, less-than-lethal projectile capable of dispersing oleoresin capsicum (pepper spray) launched from a stand-off position. It can be used in hostage, barricade, and tactical assault situations. The projectile specifications include a 100-foot minimum launch range with delivery through a plate glass or household window having a screen or blind in place. It will deliver a fine, atomized spray of OC (oleoresin capsicum) sufficient to fill a room at least 10 feet by 10 feet by 9 feet within 1 second of penetrating the glass targets, or on striking an internal wall or ceiling if entry is achieved through an open door or window. The end product for this project will be a preproduction device, detailed drawings and specifications, and a final report describing the in-house testing results and field evaluation trials. A proof-of-concept device for carrying the pepper spray has been developed.

- **Weapons Team Engagement Trainer.** The Weapons Team Engagement Trainer (WTET) is an interactive team trainer that simulates hostage rescue, use of force, and room-clearing scenarios. Scenarios are played on large screens with trainees providing realistic aggressor response, branching, and shootback. The WTET simulation was originally developed by the military for use by special forces teams. Through its Technology Transfer Division, the Naval Air Warfare Center Training Systems Division saw that this technology could also apply to law enforcement. NIJ is participating in the commercialization of the WTET by supporting the prototype installation and evaluation at the Naval Training Center in Orlando, Florida. NIJ is also supporting the installation and testing of the first production version of the system at the Los Angeles County Sheriff's Department Laser Village training site.

- **General Revision of *Ballistic Resistance of Police Body Armor, NIJ Standard–0101.03.*** NIJ is currently revising its 0101.03 body armor standard. As part of this effort, the agency is undertaking tests to determine if newer combinations of ammunition and weapons present threat levels outside the range of values currently used in its *Ballistic Resistance of Police Body Armor, NIJ Standard–0101.03.* NIJ also will assess the existing and candidate ammunition for its effect on armor; perform validation and comparison tests; develop a formal test procedure, including a performance-assurance program; survey armor manufacturers on the subject of service life; evaluate a modified form of V_{50} testing as a means of determining the service life of soft body armor; and survey agencies to determine what threat levels are commonly used and how the users would respond to a simplified level designation system. The projected date of completion for this project is late 1998.

- **Development of a Standard for Stab- and Puncture-Resistant Body Armor.** While the most common type of threat faced by a police officer is a ballistic threat, the most common threat faced by correctional officers is from sharp-edged and pointed weapons. In response to the needs of the corrections community, NIJ is working to develop a test standard for stab- and puncture-resistant body armor. NIJ, through the Office of Law Enforcement Standards (OLES), has partnered with the U.S. Secret Service and the Police Scientific Development Branch (PSDB) in the United Kingdom to conduct research that will ultimately lead to the development of an NIJ standard. The research being conducted by PSDB is anticipated to be completed in early 1999 and the new NIJ standard completed by the fall of 1999.

- **Development of a Testing Program for Protective Gloves.** In response to a LECTAC request to assist the law enforcement and corrections community in acquiring better pathogen-, cut-, and puncture-resistant protective gloves, NIJ is currently developing a comparative evaluation test protocol and a testing program for protective gloves. After reviewing input from police and correctional officers and consulting with leading companies in the protective garment materials industry, it was determined that pathogenic protection, cut and puncture resistance, tactility, dexterity, and affordability were the primary criteria for evaluation and comparison. Through this new testing program, protective gloves will be evaluated and data will be provided for each of the priority requirements in a comparative report that will enable law enforcement and corrections professionals to make better choices for the best combination of characteristics versus price for all gloves tested. It is currently anticipated that the final report will be available by July 1999.

Clearing the DNA Logjam

It's ironic that a computer search—so simple it can be accomplished by the average second grader—could almost instantly solve some of the Nation's most heinous crimes. Yet this computer search, which involves the analysis and matching of DNA (deoxyribonucleic acid) samples, is rarely used in those cases having no suspects. Why? Because currently waiting to be tested are an estimated 500,000 blood samples that have been drawn from prisoners, probationers, and parolees, as well as samples taken in cases where there are no suspects. Add to that another 500,000 samples that need to be drawn. Ironically, if all these million samples were analyzed and entered into a database, police could take DNA evidence from a crime in which there is no suspect, run it through the database, and stand a good chance of coming up with a match.

"DNA analysis is the most efficient way to narrow down the list of suspects," says Chris Asplen, Executive Director of the National Institute of Justice's (NIJ's) National Commission on the Future of DNA Evidence. "Imagine—if you get a hit, your investigative search is significantly narrowed."

But as popular and as widely accepted as the use of DNA analysis is for cases where there is a suspect, Asplen says, it is not typically used in cases in which there is no suspect (nonsuspect cases). One reason is because the Nation's crime laboratories are already overwhelmed with the task of analyzing evidence in cases having suspects. To engage in the lengthy and expensive process of analyzing samples from felons, convicts, and jail inmates, just to build a database for future reference, is beyond current capabilities of most jurisdictions. And although some States have started sending database samples to outside labs, it becomes an expensive proposition and one whose importance is often eclipsed by current cases, especially those that involve violent crime.

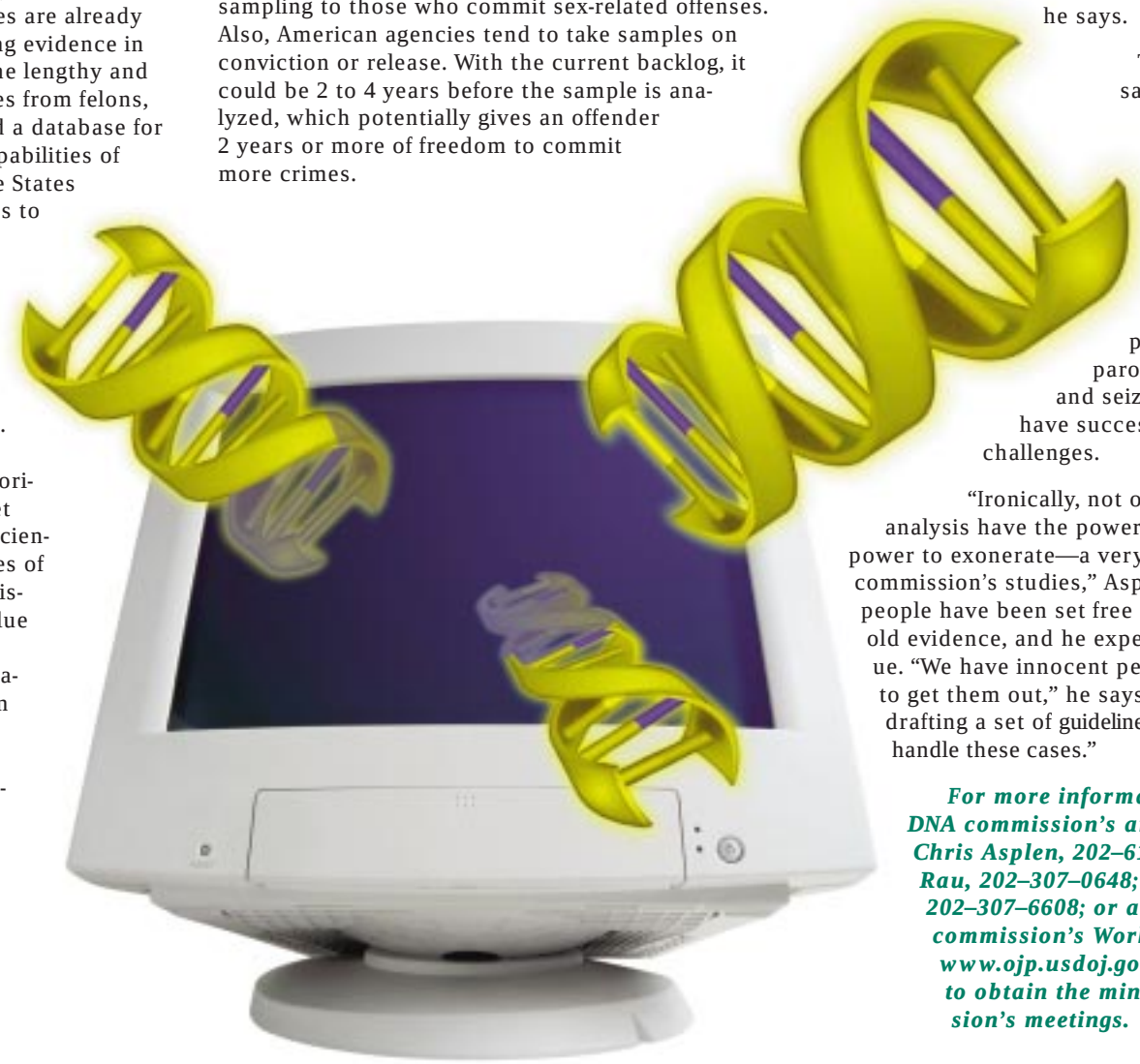
The DNA commission, however, sees it differently, according to Asplen. The commission has made addressing the DNA backlog one of its highest priorities. Created by Attorney General Janet Reno in August 1997 and made up of scientists, policymakers, and representatives of the criminal justice system, the commission looks at ways to maximize the value of DNA evidence. Its five committees focus on postconviction release, laboratory funding, crime scene investigation and evidence collection, legal issues, and science and technology. To help alleviate the DNA backlog, the committee examining laboratory funding has proposed that the U.S. Department of Justice set up a grant program that would provide funding to help States send DNA database samples to private laboratories. That proposal is now under consideration by the full commission.

"This backlog is a crisis, especially when you consider the fact that we're drawing blood primarily for sex-related crimes, which are highly recidivistic in nature," Asplen says. "If we arrest a serial rapist after crime number four, we can probably look back and see we have a sample from a previous attack that was never tested. If that DNA profile had been put in the system, we would have caught him after the earlier offense and prevented the subsequent rapes."

Police in the United States will certainly look to the British as an example of law enforcement taking an aggressive stance on DNA analysis, Asplen notes. In the United Kingdom, police take samples on arrest and for a wide range of offenses, including nonviolent crimes. The United Kingdom's database includes almost 200,000 samples; authorities say they expect to add 5 million more in the next few years.

According to Asplen, the British have switched to a fully automated analysis system—short tandem repeats, or STR—which is faster and a more discriminatory identifier. The British also have a different attitude toward DNA analysis, treating it as a primary investigative tool and using it to do mass screening in specific geographic areas or among certain groups of suspects.

In comparison, Asplen says, American police agencies are bound by State laws, many of which limit sampling to those who commit sex-related offenses. Also, American agencies tend to take samples on conviction or release. With the current backlog, it could be 2 to 4 years before the sample is analyzed, which potentially gives an offender 2 years or more of freedom to commit more crimes.



The difference between the two countries is evidenced by the number of "cold hits" for each system. A cold hit is one in which a sample in a case with no suspect is run through the system and produces a match. U.S. authorities have scored a little more than 200 cold hits on the FBI's CODIS (Combined DNA Index System) database since it came online. In the United Kingdom, cold hits number into the thousands.

Although the numbers for the United States are comparatively low, some individual States fare much better. States having extensive databases average about 1 hit to every 250 to 500 attempts. Virginia, for example, has one of the country's largest databases. Although it is still behind on its testing—gathering 160,000 samples but having tested only about 10,000—more than half of Virginia's cold hits on violent crimes have come from its DNA database. Paul Ferrara, of the Virginia Division of Forensic Science, makes the point that those hits frequently identified people previously convicted of nonviolent crimes, such as burglary or breaking and entering.

Asplen estimates that with Federal funding and outsourcing of DNA samples, it will take 2 years to unclog the system, instead of the currently estimated 6 years. "That's a lot of people who may be victimized unnecessarily. In my mind there is no more important issue in criminal justice right now," he says.

The DNA commission, he says, is also addressing the legal issues that are integral to DNA database sampling, including questions about privacy, civil liberties, and allegations that taking blood samples from prison inmates, probationers, and/or parolees is an illegal search and seizure. Most States to date have successfully dealt with such challenges.

"Ironically, not only does DNA testing and analysis have the power to convict, it has the power to exonerate—a very important aspect of the commission's studies," Asplen says. More than 50 people have been set free as a result of analyzing old evidence, and he expects that trend to continue. "We have innocent people in jail and we need to get them out," he says. "The commission is drafting a set of guidelines that will help prosecutors handle these cases."

For more information about any of the DNA commission's areas of study, contact Chris Asplen, 202–616–8123; Dr. Richard Rau, 202–307–0648; Dr. Lisa Forman, 202–307–6608; or access the DNA commission's World Wide Web site at www.ojp.usdoj.gov/nij/dna/welcome.html to obtain the minutes of the commission's meetings.

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(Domestic Violence. . . cont. from page 1)

top-down methods of analysis. It takes a more horizontal view of the system and involves personnel at all levels. Process mapping visually depicts how information and materials flow in an organization and how work is handed off from one unit to another. In addition, it identifies breakdowns and barriers in the process. The end product is a series of flowcharts, or maps. The first map is an "as is" map that shows the current process. The second map is a "should be" map that shows the process if interim changes were made to reduce waste and error. The third map is the "could be" map that depicts the process if it were permanently and significantly altered.

Interestingly, process mapping can be used with almost any police investigation function, from burglary to homicide. The Lakewood department decided to employ process mapping in its domestic violence cases to better understand them and to streamline their handling, from the initial call to final disposition. According to Lakewood Police Department Capt. Al Youngs, it was the perfect way to separate fact from fiction.

"It examines what is really happening," Youngs says, "not what everyone thinks is happening. We mapped the process from the time the 911 call came in, all the way to the end, which is at the municipal or county court level. From the detective to the D.A., we found out how we respond to domestic violence calls."

Lakewood looked at the 12 components of a typical domestic violence case—suspect, victim, citizen, communication, patrol, victim advocates, investigations, criminalistics, records, property, prosecution, and courts—and then mapped the route of each through the criminal justice system. The mapping project involved everyone who had any connection with handling a domestic violence call.

"It forced all of the components of the system to sit down together and examine, criticize, critique, and hypothesize how the system could be made better," Youngs says. "We were then asked to go beyond that, with the idea that if we had all kinds of technology, money, and all kinds of people power, what would we do and how would we do it?"

Although Colorado has some of the toughest domestic violence laws in the country, it does not mean there are not weaknesses in the systems of its police agencies, Youngs says. Lakewood identified several of its weaknesses and changed the system to better accommodate the needs of victims and families, as well as the department. Youngs adds that as part of this new system, the department now has a "fast track" program, which means judicial proceedings occur more swiftly. Unless the incident occurs on a weekend, when there is no provision for bond, batterers generally appear before a judge within 24 hours, he says. Such rapid processing often means a guilty plea the next day.

In addition, more information than ever before is now fed into the department's database, which in turn provides a thorough history via laptop computer to the patrol officer at the scene. Officers now know the history of the location, how many calls have been made from there and why, who made the call, and the disposition of previous cases.

The Lakewood domestic violence program includes a cadre of victim/witness advocates who provide support to the officer at the scene. Five full-time civilian employees and a group of trained volunteers respond to each domestic violence call. After the officer stabilizes the scene, they step in, providing immediate crisis intervention and freeing the officer to return to the street. Victim/witness advocates use a mobile unit that is available for calls around the clock. It provides a safe place to interview victims and witnesses, and can be used to transport victims to safe locations.

The Lakewood Police Department advocates provide continuing support as the case proceeds through the judicial system. They follow up with children who have witnessed violence to ensure that the children's needs are met. They are also the conduit through which the family can take advantage of the State's victim compensation program, which pays for mental health counseling, medical expenses, and the repair of property damaged during a violent incident. If long-term protection for the victim is necessary, the advocates can arrange for assistance through the State's victim protection program.

"Our process mapping program identified areas where we could improve our delivery of services. We've also hired another victim advocate, which gives us increased coverage on the street. Also, citizen satisfaction is rising, based on the feedback we've received," Youngs says.

Through the program, the police department has benefited almost as much as have victims of domestic violence. Handling cases is more efficient and the process clearly defined. Even better, though, is that the program has resulted in a cooperative effort between sworn officers and civilian employees, who have successfully completed the project through teamwork.

Lakewood has used the same mapping process on sex offender registration, burglary, and its county juvenile assessment center. The department also has been asked to share its experience with other departments. It was one of the cities highlighted in a 2-hour training telecourse on community policing and domestic violence produced by the California and Arizona P.O.S.T. (Police Officer Standards and Training). The film is currently being beamed via satellite to officers in both States.

For additional information about the Lakewood Police Department's program for domestic violence, contact Capt. Al Youngs, 303–987–7201.

New Publications/Videos

The following publications/videos are available from the National Law Enforcement and Corrections Technology Center–National:

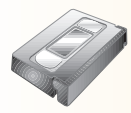
TechBeat, Summer 1998. This issue of *TechBeat* examines communications interoperability among law enforcement and other public safety agencies, smart card technology being used in corrections facilities, and vehicle-stopping technology.

TechBeat, Spring 1998. This issue of *TechBeat* features the use of telemedicine in corrections facilities, facial recognition technology, and thermal-imaging night vision devices.

Selection and Application Guide to Police Body Armor. While body armor is a household word in the law enforcement community, questions about its selection and use are frequently asked. This guide responds to commonly expressed concerns and provides information to help determine the level of protection required by officers. Excellent companion publication to *Police Body Armor Consumer Product List Update Fall 1997.*

Pursuit Management Task Force Report. In August 1996, the National Institute of Justice's Office of Science and Technology created the Pursuit Management Task Force (PMTF) to conduct a multidisciplinary effort to define police practices and the role of technology in high-speed police pursuits. This report assesses current technologies and techniques related to pursuits and provides recommendations on technology development and commercialization, an overview of legal issues related to pursuits and related technologies, and information obtained from surveys completed by agencies, line officers, and the public related to pursuits and technology.

Michigan State Police Tests 1999 Patrol Vehicles. Every year, the Michigan State Police tests new patrol vehicles as part of their procurement policy. This bulletin summarizes test results of the 1999 patrol vehicles.

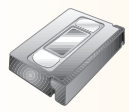


"Why Can't We Talk?" When Lives Are at Stake. This videotape examines the issues and problems surrounding interoperability and public safety radio communications. Learn why planning, designing, and funding public safety wireless communications systems are critical activities for ensuring the public welfare.

The following publications/videos will be available soon:

Survey of Commercially Available Explosives Detection Technologies and Equipment. This document provides a comprehensive overview of currently available explosives detection methods and technologies. It is intended to inform law enforcement agencies about relevant aspects of explosives detection and provide them with a basis for making procurement decisions.

Federal Property and Equipment Manual. In a time of tight budgets, State and local law enforcement agencies are sometimes hard pressed to outfit their personnel with the equipment they need to do their jobs safely and effectively. This manual describes Federal sources of personal property for law enforcement. Through these programs, agencies can obtain high-quality, high-value, excess property at little or no cost.



Positional Asphyxia Videotape. This informational videotape, targeted to the many smaller county and municipal jail facilities throughout the United States, details actions to prevent in-custody deaths related to positional asphyxia. The video highlights the correct procedures to use when restraining a violent prisoner and safety precautions to follow to help jail personnel prevent medical problems.

To obtain any of the above publications or videotapes or to receive additional copies of the* TechBeat *newsletter, write NLECTC, P.O. Box 1160, Rockville, MD 20849–1160; telephone 800–248–2742. Publications can also be downloaded from JUSTNET at http://www.nlectc.org.

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