
RESPONSIVE TECHNOLOGY ASSISTANCE

The current system of NIJ crime technology centers is intended, in part, to provide state and local law enforcement agencies with *Consumer Reports*-type testing, evaluation, and technology assistance.

The existing centers were established as a relatively modest effort. Because of demand for these services, the system is overextended and cannot provide the “quick response” assistance that is needed nationwide. The four regionally based centers in the network serve 10–15 states each—too much territory to cover with existing resources.

What is proposed is to establish 10 additional NIJ crime technology centers to meet the technology assistance needs of law enforcement. These centers will be supported by a consortium of federal laboratories to ensure that the best technology and science information and the best forensic technologies are available to law enforcement officers. This consortium will in no way duplicate the work of the existing state and local crime lab system. It is intended that the consortium will provide forensic support in coordination with local crime labs only when the local labs do not have the equipment or technical skills to do the job.

CURRENT SYSTEM

The National Law Enforcement and Corrections Technology Centers are part of the National Institute of Justice Office of Science and

Technology (OS&T).¹ NLECTCs provide criminal justice (law enforcement, corrections, and court) professionals with information on technology, guidelines and standards for these technologies, objective testing data, and technical assistance to implement these technologies.

The current system of NLECTCs was designed to leverage limited federal dollars to partner with and augment existing infrastructure. The center network is intended to provide a quick-response capability to agencies that need specialized technical help. In 1997 alone, the NLECTCs responded to 10,000 local requests for assistance.

The NLECTC system includes the national center in Rockville, MD, and four regional centers operating in North Charleston, SC (Southeastern region); Denver, CO (Rocky Mountain region); El Segundo, CA (Western region); and Rome, NY (Northeastern region). Also included in the system are four special offices: the Office of Law Enforcement Standards (OLES), the Office of Law Enforcement Technology Commercialization (OLETC), the Border Research and Technology Center (BRTC), and the National Center for Forensic Sciences (NCFS).² Table 2 gives an overview of the present system.

Technology assistance can be thought of as being one of three types: general, specialized, and referral.

- *General assistance* available through a state or local agency's regional NLECTC. This may deal with specific law enforcement or corrections problems, as illustrated by most of the examples cited in this report. Its success depends in part of the regional centers' being well connected with and responsive to the state and local agencies they serve. Expansion of the present system would reduce the regional focus of each regional center from the present 10–15 states to a more manageable and responsive 3–5

¹Descriptions of the centers are taken from the NLECTC web site (<http://www.nlectc.org>).

²The President's Budget for Fiscal Year 2000 has listed the technology centers to be funded under the Community Oriented Policing Services (COPS) Initiative, rather than under the Bureau of Justice Assistance (BJA), but they would continue to be administered by the Office of Justice Programs (OJP).

Table 2**National Law Enforcement and Corrections Technology Centers**

| Center | Budget | Focus |
|--|---------------|--|
| NLECTC-National, Rockville, MD | \$2.5 million | Serves as an information clearinghouse, testing products, maintaining product lists, and answering questions about technology from law enforcement agencies. Publishes newsletters and papers describing latest advances. |
| NLECTC-Northeast, Rome, NY | \$1.3 million | Specializes in computer, communications, and intelligence-gathering technologies. Areas of research and development include weapons detection, automatic booking system, automatic firearms identification, and computerized language translation systems. |
| NLECTC-Southeast, North Charleston, SC | \$2.2 million | Develops technology for prisons, including information management systems and simulation technologies for training. Identifies and distributes surplus federal equipment to prisons. |
| NLECTC-Rocky Mountain, Denver, CO | \$1.8 million | Specializes in communications, weapons research, and mapping technology to help analyze crime patterns and deploy officers. Works with Sandia National Laboratories to develop technology for detecting and defusing explosive devices. |
| NLECTC-West, El Segundo, CA | \$1.5 million | Develops microscopes and other sensitive instruments for examining barely detectable evidence. Develops technology to analyze and enhance audio, video, and photographic evidence. |
| BRTC, San Diego, CA | \$875,000 | Specializes in strategies and technologies to control illegal immigration. |
| OLET, Wheeling, WV | \$2.8 million | Solicits and encourages manufacturers to commercially produce new technologies for law enforcement. |
| NCFS, Orlando, FL | \$1.4 million | Focuses on arson and explosives research to improve methods of analyzing debris from fires and explosions. |

SOURCE: Rob Gavin, "Technology Helps Catch Criminals," *The Post-Standard*, Syracuse, NY, date unknown.

state average. This can be expected to further encourage utilization by local agencies of “their” NLECTC.

- *Specialized assistance* available through one of the special offices or possibly through a regional center having the desired specialized equipment or expertise. This meets the need for high technology centers possessing specialized equipment and personnel to provide services not normally available in state or local agencies or laboratories because of their cost, the extremely specialized nature of the work, or infrequent use.³ Specialized assistance needs to keep pace with the current state of the art and should, in fact, serve to advance it.
- *Referral assistance* for uncommon expertise available through the NLECTC and other centers and offices. In this role, the centers would act as clearinghouses to help state and local agencies find the expertise they need. Success depends on the centers’ information being current, comprehensive, and readily available.

National Center

The national center of the NLECTC is located at Aspen Systems Corporation, an employee-owned, information management company.

The national center coordinates the technical information collection and dissemination program for the entire NLECTC system. In this capacity, the national center

- produces detailed test reports, user guides, and bulletins on public safety equipment, metallic handcuffs, pepper spray, and DNA profiling
- operates an equipment, technology, and research information hotline

³One example of such specialized equipment is a synchrotron light source providing an X-ray beam that can be coupled with a microscope on the beam line; such equipment would be used infrequently by any individual lab but would get sufficient use at the national level. (J. Ballantyne correspondence, March 12, 1999.)

- publishes a quarterly newsletter, *TechBeat*, and maintains the NLECTC system World Wide Web site, JUSTNET, at <http://www.nlectc.org/>
- maintains current information on the manufacturers of commercially available equipment and developers of law enforcement and corrections products and services, provides referrals to users of these products, and assists in locating experts in a particular field
- helps identify equipment and technology requirements of local, state, and federal criminal justice practitioners by coordinating conference and advisory group activities, including those of the Law Enforcement and Corrections Technology Advisory Council.

Regional Centers

Southeast Center. The South Carolina Research Authority (SCRA) serves as the host of NLECTC-Southeast. Along with SCRA and other technical partners, the center offers access to an extensive, multidiscipline technology infrastructure. Highly responsive to the needs of its regional criminal justice community, which includes federal, state, and local law enforcement and corrections agencies in a 15-state area, the center also serves agencies nationwide. The center's primary focus is the exchange of information with the criminal justice community on current and emerging technologies. In this capacity, the center

- applies analytical tools and information engineering concepts to assist in developing strategic plans to meet information technology needs
- investigates distance learning technology and simulation and training technology tools for their potential application to training requirements
- plans and coordinates corrections technology demonstration projects that assess the utility of selected technologies
- assesses the application of transportation security technologies

- conducts vulnerability assessments of regional schools and reviews lessons learned by state and local law enforcement in order to develop and assess candidate school security technologies
- develops and assesses smart-card technology needed for controlled access, personnel and equipment accountability, and recording of health care services
- helps state and local law enforcement and corrections agencies acquire excess and surplus federal property, a nontechnical area of involvement.

Rocky Mountain Center. The NLECTC-Rocky Mountain office is located on the campus of the University of Denver and is affiliated with the Denver Research Institute.

NLECTC-Rocky Mountain focuses on communications interoperability and facilitating communications among different agencies and jurisdictions.

This facility works with law enforcement agencies, private industry, and national organizations to implement projects to identify and field test new technologies to help solve interoperability problems and conducts research on ballistics, weapons technology, and information systems.

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.

Sandia National Laboratories has been designated as a satellite of NLECTC-Rocky Mountain. In partnership with NLECTC-Rocky Mountain, the laboratory focuses on technology for detecting and neutralizing explosive devices (Operation Albuquerque).

Western Center. NLECTC-West is housed on the grounds of The Aerospace Corporation, a nonprofit corporation that provides technical oversight and engineering expertise to the U.S. 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 agencies the ability to analyze and enhance audio, video, and photographic evidence.

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.

Other areas of expertise at NLECTC-West include

- computer architecture
- data processing
- communications systems
- technologies to stop fleeing vehicles.

Northeast Center. NLECTC-Northeast is located at the United States Air Force Research Laboratory, Information Directorate, at the Rome Research Site (formerly Rome Laboratory) on the grounds of the Griffiss Business and Technology Park.

NLECTC-Northeast 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 people—an effort that is expected to yield a stationary device for use in buildings and handheld devices for patrol officers. Other areas of research and development at NLECTC-Northeast include

- through-the-wall sensors
- audio and image processing
- timeline analysis
- computer forensics

- secure communications
- command/control.

Special Offices

Office of Law Enforcement Standards. OLES was established as a matrix management organization in 1971 through a Memorandum of Understanding between the U.S. Departments of Justice and Commerce and was based upon the recommendations of the President's Commission on Crime. The OLES mission is to apply science and technology to the needs of the criminal justice community, including law enforcement, corrections, forensic science, and the fire service. Although its major objective is to develop minimum performance standards, OLES also undertakes studies leading to the publication of technical reports and guides.

OLES assists law enforcement and criminal justice agencies in acquiring, on a cost-effective basis, the high-quality resources they need to do their jobs. To accomplish this, OLES

- develops methods for testing equipment performance and examining evidentiary materials
- develops standards for equipment and operating procedures
- develops standard reference materials
- performs other scientific and engineering research as required.

Since its inception, OLES has coordinated the development of nearly 200 standards, user guides, and advisor reports. Topics include handguns, soft body-armor testing, pathogen and slash-resistant gloves, and analytical procedures for developing DNA profiles.

The application of technology to enhance the efficiency and effectiveness of the criminal justice community continues to increase. The proper adoption of the products resulting from emerging technologies and the assessment of performance of equipment, systems, methodologies, etc. used by criminal justice practitioners constitute critical issues having safety and legal ramifications. The consequences of inadequate equipment performance or inadequate test methods can range from inconvenient to catastrophic. In addition,

these deficiencies can adversely affect the general population when they increase public safety costs, preclude arrest, or result in evidence found to be inadmissible in court.

Office of Law Enforcement Technology Commercialization. OLETC is a program of the National Institute of Justice and is located in the National Technology Transfer Center at Wheeling Jesuit University, Wheeling, WV.

OLETC is dedicated to developing and refining new strategies to accelerate the commercialization of innovative law enforcement and corrections products. It is committed to bringing high-value, well-tested products to market in a quick and affordable manner.

OLETC's staff include experienced project and commercialization managers, engineers, technical specialists, and law enforcement professionals who are able to assist developers and manufacturers in bringing new products to market. Their services include

- matching new technologies and product concepts to specific needs
- identifying technologies to develop new or improved products
- assisting with market assessments and business plans
- locating complementary technologies, expertise, and test resources as well as identifying product standards and test protocols
- identifying investment capital financing and grant opportunities
- locating manufacturing and distribution partners
- assisting with questions on liability, intellectual property, and licensing fees
- developing innovative product acquisition strategies
- developing creative funding initiatives
- providing informational and educational videos.

Border Research and Technology Center. The BRTC executive office is located in the same building that houses the Southwest Border High Intensity Drug Trafficking Area (HIDTA) and is adjacent to the

California Border Alliance Group (CBAG)—the California/Mexico border HIDTA partnership.

The BRTC works with the Immigration and Naturalization Service, the U.S. Border Patrol, the U.S. Customs Service, the Department of Defense Counterdrug Development Program, the U.S. Coast Guard R&D program, the White House Office of National Drug Control Policy/Counterdrug Technology Assessment Center, and the U.S. Attorney for Southern California, as well as with state and local law enforcement agencies and organizations operating along the U.S. borders.

BRTC is working with these agencies and their organizations in the development and implementation of SENTRI (Secured Electronic Network for Travelers' Rapid Inspection) technology as well as human presence detection, seismic sensor upgrade demonstrations, evaluation of night vision and thermal imaging technologies, vehicle immobilization, and communications interoperability.

National Center for Forensic Science. This center is a joint project of the University of Central Florida and the National Institute of Justice. The goal of the NCFS is to create a unique laboratory facility staffed and equipped to service the forensic and law enforcement communities in the areas of fire and explosion debris. The NCFS is chartered to

- conduct fundamental research investigations to gain insights into the basic nature of fire and explosion reactions
- provide the support needed for the development of standard protocols for arson and explosion debris
- promote the use of electronic media to access and exchange forensic information
- make educational opportunities available to practicing professionals and full-time students
- partner with the forensic, law enforcement, and business communities.

EXAMPLES OF TECHNOLOGY ASSISTANCE

The assistance needed by state and local law enforcement agencies can range from narrow, engineering sorts of expert advice to broad, integrative assistance.

The centers have received many letters of appreciation from law enforcement agencies they have helped—e.g., by improving the quality of audio and video tape to facilitate suspect identification and/or conviction. Typical assistance of this type includes reducing background noise in audio recordings and extracting high-quality still photographs from videotapes. Below are examples of these and other types of assistance presently in use or needed at law enforcement and other public agencies.

Utica Arson Strike Force

The Utica, New York, Arson Strike Force was assembled in April 1997 to help combat arson.⁴ Because of the severity of the problem, Utica is the only northern city to be included in the National Arson Initiative, which included the southern church fire states in 1996. The strike force consists of federal, state, and local law enforcement agencies along with state and local fire agencies, which are organized into teams to perform cause and origin investigation and analysis, and technical support. NLECTC-Northeast has provided a local area network and technical support to establish a model investigative strike force as a demonstration site for the rest of the country. Prior to April 1997, the Utica arson closure rate was 2 percent (the national average is 15 percent); it is now approaching 60 percent with a 100-percent conviction rate.

NLECTC-Northeast is continuing to monitor computer network use by the arson strike force in order to utilize it as a model for other investigative strike forces. The arson strike force currently uses a computer network for preparation of court documents, e-mail communication, and Internet access—which enhance the performance of the investigators and increase the closure rate of arson cases. The initial success of the arson strike force was so overwhelming that old cases

⁴This project description is taken from the NLECTC web site, <http://www.nlectc.org/>.

were reopened and have been closed by arrest. The need for lead-tracking and case-management software has been identified; it is currently being developed through the Oneida County District Attorney's office. Utica has also identified a drug problem in the city and, with assistance from NLECTC-Northeast, is modeling a drug task force after the arson strike force. In addition, one of the lessons learned from the arson strike force is that there is a need for an information-sharing infrastructure among law enforcement agencies. Because of this, a shared database concept is being developed including the necessary computer-aided-dispatch/records-management system infrastructure called the Central New York-Law Enforcement Network, which will facilitate sharing and analysis of information among agencies in four counties in central New York. It is hoped that this infrastructure will be applicable throughout the country.

The Utica Police Department has observed that

the unanticipated outcomes of this project now equal the planned outcomes in terms of benefits. The partnership with NLECTC-NE has proven to be of equal value as the project itself. The staff of the center have devoted their time, technical expertise, experience, energies and patience to assisting us in achieving our goals. They have provided insight, information, and direction. They have acted as advocates, researchers, technical advisors and facilitators (Office of the Chief of Police, City of Utica, letter, February 27, 1998).

Technology Assistance to a Fire Department

The Los Angeles Fire Department identified the following areas where it believed NLECTC technology assistance could be of assistance (Los Angeles Fire Department, letter, December 10, 1998):

- Enhance audio and videotape recordings that are related to arson and/or fire cause determination.
- Analyze fire scene debris to identify the presence of accelerants in trace amounts to help in fire-cause determination.
- Perform the analysis and set benchmark testing criteria to substantiate the accuracy of the Arson Investigation Section Accelerant Detection Canine Team.

- Conduct computer modeling of radio systems for analysis of operational variables.
- Analyze Global Positioning System data for dispatch priority and tracking of personnel in hazardous environments.
- Perform computer modeling for emergency incident planning.
- Design information network and architecture for computer system development.

Audio Enhancement Processing Helps Build Murder Case

During the investigation of the kidnapping, rape, and strangulation murder of a young woman, investigators identified two suspects believed to be responsible for the crimes. These two suspects were placed together in an interview room and their conversation was recorded.

Because of their whispering and the background noise present, investigators could not hear a large portion of the conversation. The only portions of the recording that were understandable were self-serving statements made by the suspects, probably intended to be overheard by investigators.

NLECTC processed the tapes to lower the background noise and enhance the whispering to understandable levels. After reviewing the enhanced recordings provided by NLECTC, investigators were able to understand enough of the suspects' conversation to determine they were discussing several different versions of their alibi. With the addition of this new information, investigators were able to obtain criminal complaints charging the suspects with the murder and special circumstances enhancements, making the subjects eligible for the death penalty (Sheriff-Coroner Department, County of Orange, California, letter, July 2, 1998).

Still Photo from Videotape Prompts Confession

When the suspect in a robbery/kidnapping case was shown a photo of himself, enhanced by NLECTC from a 7-Eleven store videotape, he confessed to three robberies and the kidnapping (Los Angeles Police Department, letter, March 17, 1998).

Computer File Analysis Identifies Victims

NLECTC assisted an 11-month investigation into a mail theft and counterfeit check ring, which was operating in California and Nevada. NLECTC provided information, documents, and computer technology needed to access computer programs seized during the arrest of the suspects. These computer files identified hundreds of victims. As a result, 250 members of the ring were identified and/or arrested. Several of the suspects were involved in other serious crimes, including rape, arson, use of explosives, drug sales, and burglary. Over 8,000 items of property were booked and over 25 search warrants served. Without the center's help, investigators may not have achieved this outcome (Los Angeles Police Department, letter, September 22, 1998).

E-Mail Analysis Nabs Child Molester

The Charleston, SC, Police Department requested assistance from NLECTC-Southeast in an investigation involving a missing 13-year-old boy who was very active on the Internet and e-mail services. Working with technology partner South Carolina Research Authority, NLECTC staff were able to access e-mail messages between the missing boy and a known child molester. This led to the successful recovery of the missing boy from the Myrtle Beach area and a subsequent FBI fugitive investigation leading to the arrest of the child molester in Virginia and his return to South Carolina for prosecution.

NLECTC Metallurgy Expertise Discredits Murder Alibi

An Oregon case involved a man suspected of killing his wife and burning their house to the ground. The defense in the case put forward several theories regarding the fire cause; these were stumbling blocks to the prosecution because of the lack of expertise available, either from the State of Oregon Crime Lab or the FBI Lab. NLECTC technical expertise in the fields of metallurgy and fire cause provided technical and scientific information and examinations of evidence that enabled the prosecution to conclusively eliminate several of the defense's theories. This was credited as a significant contribution toward the successful prosecution of the defendant (Washington County, Oregon, Sheriff's Office, letter, May 15, 1997).

Videotape Enhancement Clears Suspect

Technology assistance has also helped clear suspects who were innocent, as happened when NLECTC enhancement of videotape from a hospital proved that a suspect was visiting a hospitalized relative at the time of the carjacking/kidnapping under investigation (Los Angeles County Public Defender, letter, November 19, 1998).

Technology in Strategic Planning

The following illustrates the range of factors involved in addressing technology issues in strategic planning for a typical mid-sized, progressive police department:

- A police department has begun to install computers in all its squad cars, and it needs to know how to anticipate the use of all the data/records it will create in the future to enhance the value of their use for the department and the community.
- It is interested in validating and reexamining the measures that have traditionally been used to assess the effectiveness of policing.
- It wishes to explore ways to incorporate and integrate technology into its communications and interactions with the general community.
- It is anxious to develop a “generic blueprint” for the next 5 to 10 years to guide integration of technology into the department and to identify and anticipate the changes that will be engendered by the use of technology in every aspect of its operations: patrol effects, investigation, administration, and management; it is interested in measuring the effects on such projects as Community Oriented Policing and Alcohol Interdiction.
- It wants to anticipate the future organization of its department based on the application of technology and availability of real-time information to the community and police operations.
- It wants to prepare for the future selection, hiring, and training of officers and department personnel needed to apply technology and data access in the future.

Crime Mapping and Database Challenges

Even matters that may appear to be purely technical, such as crime mapping and database maintenance, can involve much “softer” factors, as John O’Connell has observed:

Local analysis that goes beyond crime counting is recognized and embraced wherever it happens.

The most striking example of this is computer-aided mapping of crime in communities. This single advancement of knowledge about crime in a community is causing a paradigm shift in how police recognize, deal with, and plan for crime.

Getting States and local communities to do this level of crime analysis requires a change in how criminal justice analysis and planning are viewed at the State and local levels. First, a research unit needs to have the authority to work with single or multiple jurisdictions across the State.

Lack of money and leadership to encourage development of State and local community crime and policy analysis are the greatest limitations to better understanding crime in our communities.

DOJ’s Safe Streets initiative . . . is expanding community crime analysis to include employment status, child abuse, and educational success as crucial variables to better understand crime in our communities.

[C]ombining the traditional criminal justice study topics with the points of view of other disciplines, while potentially fruitful, will mean at least two technical changes. First, as we find the need to integrate criminal justice and social services databases, we will need to work through confidentiality requirements. Second, optimal analysis would allow us to commingle an individual’s data from various disciplines. This will be problematic because all data systems have difficulty in positively identifying and tracking individuals. The problems of individual identification will increase significantly as we try to join databases (O’Connell, 1998, p. 95).

PROSPECTS FOR IMPROVED TECHNOLOGY ASSISTANCE

Prospects are quite good. As mentioned, each of the present NLECTCs leverages federal dollars by partnering with existing infrastructure—NLECTC-West with The Aerospace Corporation, NLECTC-Rocky Mountain with Sandia National Laboratories, and so forth. The NIJ is confident that similar infrastructure partnerships can readily be developed for the 10 additional technology centers being proposed.