



**NIJ**

2002

2003

2004

2005

2006

**2007**

2008

NIJ ANNUAL REPORT

**U.S. Department of Justice  
Office of Justice Programs**

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NCJ 223597

## To the President, the Attorney General and the Congress:

It is my honor to transmit the National Institute of Justice's annual report on research, development and evaluation for fiscal year 2007, pursuant to Title I of the Omnibus Crime Control and Safe Streets Act of 1968 and Title II of the Homeland Security Act of 2002.

Respectfully submitted,

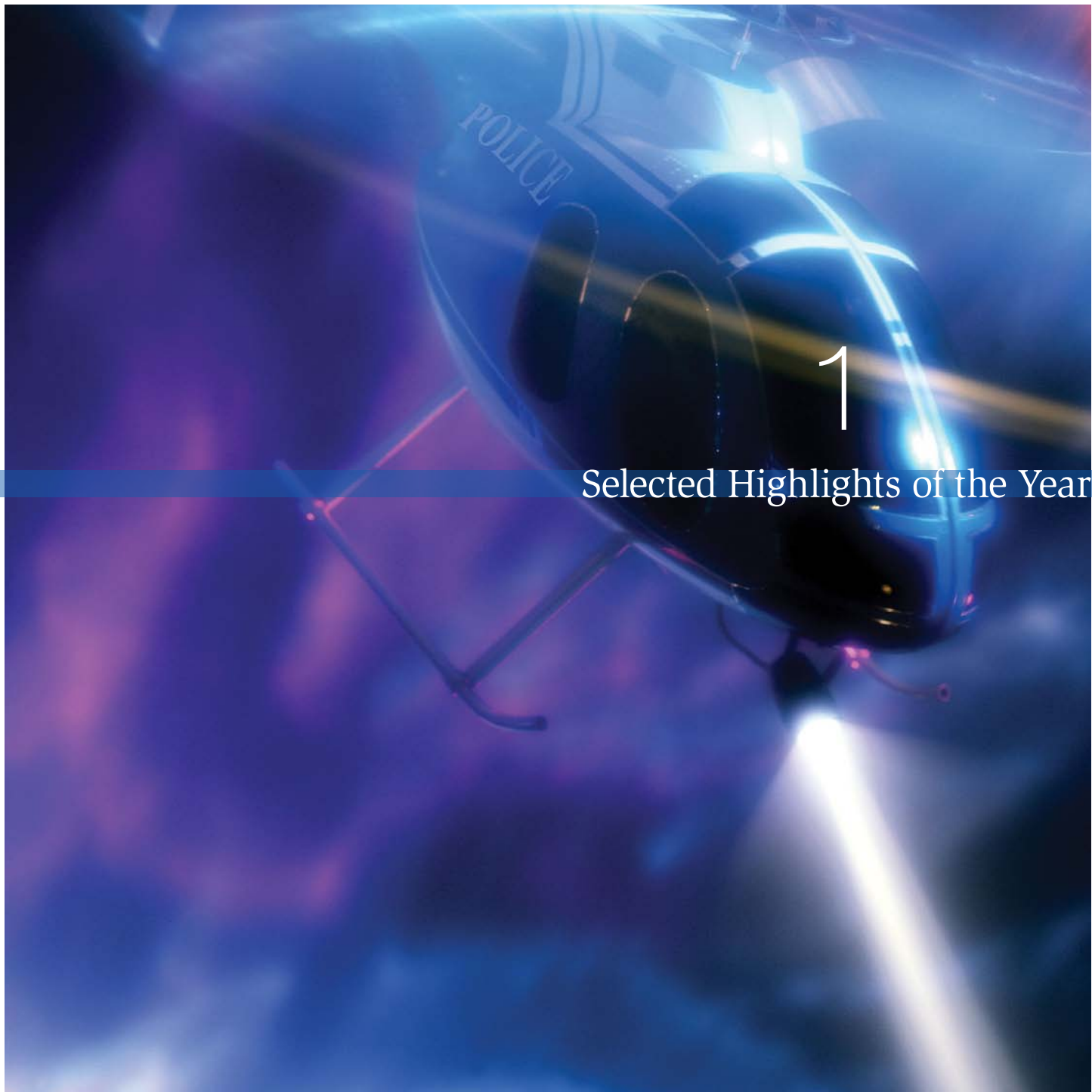
A handwritten signature in black ink, appearing to read "David W. Hagy". The signature is written in a cursive style with a large initial "D" and "H".

David W. Hagy

Director, National Institute of Justice

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Selected Highlights of the Year



As the research arm of the U.S. Department of Justice, the National Institute of Justice (NIJ) helps people who work in the criminal justice field do their jobs better. Researchers harness the power of the physical, biological and social sciences in

their efforts to make the American justice system more effective and equitable. Projects range from developing better safety equipment for police officers to providing funds that enable courts to free wrongfully convicted prisoners using modern DNA testing. The Institute works closely with law enforcement organizations, corrections officials, courts, crime laboratories, sheriffs, victim advocates, and managers of juvenile programs and drug treatment programs.

## Officers Use DNA to Catch Burglars

Using DNA evidence to catch career burglars can have a major impact on solving cases and reducing crime rates. Commonly used to investigate rapes and homicides, DNA evidence can be a major asset in property crime cases, too.



An NIJ-funded field experiment is examining whether the use of DNA evidence in property crime cases is effective and cost-efficient.<sup>1</sup> NIJ provided funds for the 18-month experiment to Denver;

Los Angeles; Orange County, Calif.; Phoenix; and Topeka, Kan. When officers find DNA evidence at a property crime scene, they send it for analysis so it can be matched with evidence from other scenes and with DNA profiles of known criminals.

The final report will be published in 2008; preliminary results are promising. District Attorney Mitch Morrissey of Denver said one area's burglary rate fell 31 percent when DNA evidence was used to capture two prolific burglars, one of whom confessed to looting 54 homes.<sup>2</sup>

According to an NIJ analysis, many burglars have several prior arrests and convictions for felonies, and sample analysis costs about \$4,500 for every suspect identified.

Los Angeles Police Department Commander Harlan Ward plans to use the study to petition his city council for the funds to make DNA use in property crimes a regular event. "My goal is to approach our city council and advocate for permanent funding for this program," he said. "The preliminary results have shown that it is prudent to expand DNA evidence collection beyond homicides and sexual assaults to property crimes."



**"We get tremendous bang for our buck if we can use DNA to identify even one suspect from a burglary. Murderers often only murder once, rapists may be involved in two or three rapes — and these are horrible crimes that must be solved. But if you take a burglar off the street, that's 10, 20, 30 crimes in a month that won't be committed. We need to take these criminals off the street."**

— Jim Dawson, Assistant Officer in Charge  
Investigative Analysis Unit  
Los Angeles Police Department

## NamUs Helps Families Find Missing Relatives

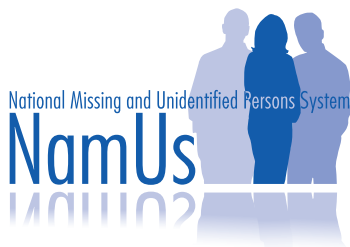
*On August 29, 1996, Carrie Culberson disappeared. She had last been seen the evening before, returning from a volleyball game. In the morning, her bed was empty. No one had slept in it. Her car was missing from the driveway. Evidence eventually suggested that her abusive boyfriend, Vincent Doan, had murdered Carrie and destroyed evidence of her car and body. Doan was found guilty of murder in 1997, but authorities never found Carrie's body or car. Her family continues to search for her remains.<sup>3</sup>*

On July 2, 2007, NIJ launched the National Missing and Unidentified Persons System (NamUs), which gives families such as Carrie's a way to search for the remains of those they have lost.<sup>4</sup> NamUs will eventually allow anyone to search records of missing persons and unidentified human remains simultaneously.

NamUs combines a national database of unidentified decedents, which launched in 2007, with a national missing persons database that will launch in 2008. In 2009, both databases will be linked at <http://www.namus.gov>.

The NamUs initiative lets Carrie's mother, Debbie Culberson, access reports from medical examiners and coroners across the nation in her search for her daughter's remains. Although her daughter is still missing, she has hope for the future.

"I know that my daughter is not alive, but I need to know where she is," Culberson said. "It was her physical body that I held in my arms for all those years. NamUs has given me the hope that I might find my daughter Carrie's remains — hope that I did not have until this time. NIJ hasn't just talked about the issue, they have moved forward in making this happen."



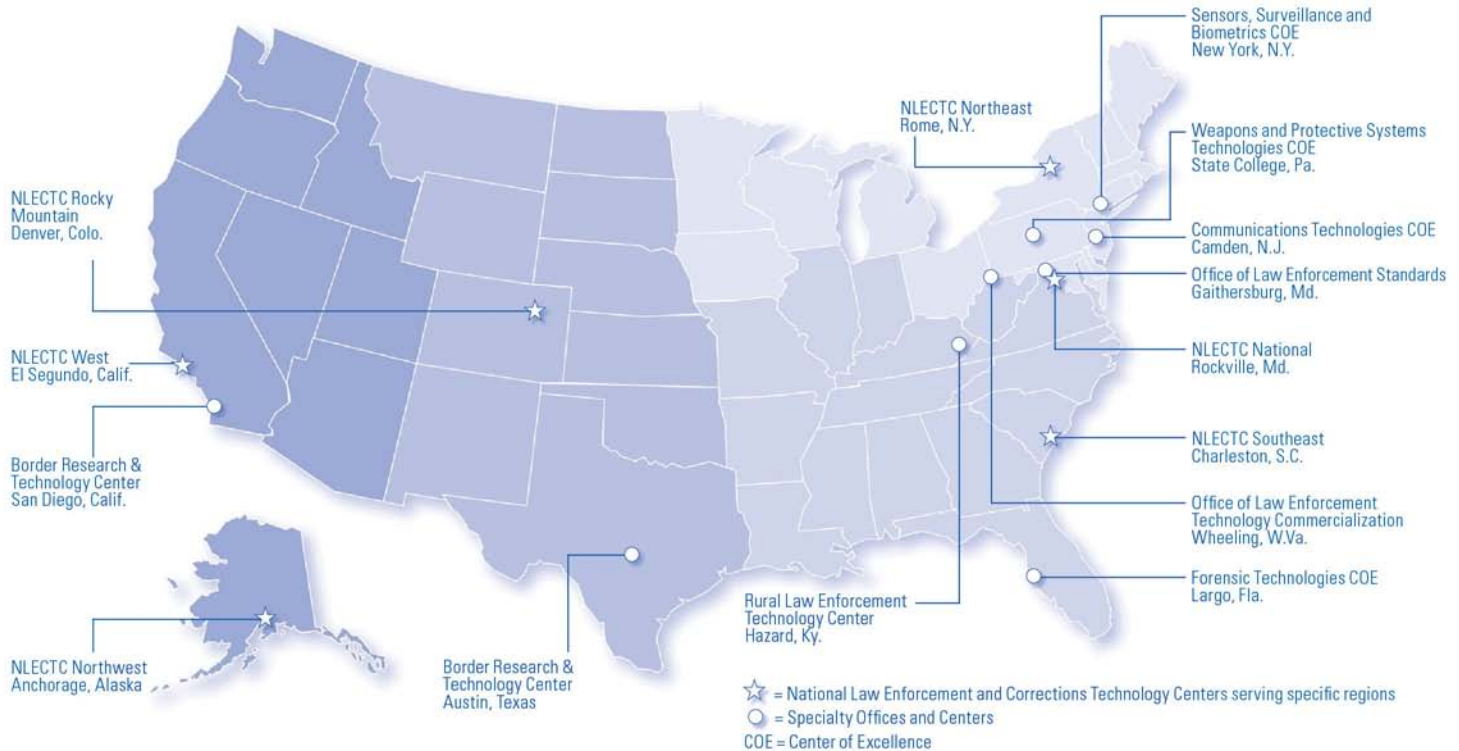


## NIJ Sets Up National Centers of Excellence

NIJ's National Law Enforcement and Corrections Technology Center (NLECTC) system provides technical help to police departments and corrections personnel. The regional centers help develop and disseminate guidelines and standards as well as provide information and support to the criminal

justice community.<sup>5</sup> In 2007, NIJ expanded and reorganized the centers, creating four Centers of Excellence on forensics; communications; weapons and equipment; and sensors, surveillance and biometrics. The specialized centers focus on testing and evaluating emerging technologies.

### NATIONAL LAW ENFORCEMENT AND CORRECTIONS TECHNOLOGY CENTER SYSTEM



## The Harvard Executive Session on Policing and Public Safety

In 1985, NIJ sponsored a series of discussions at the John F. Kennedy School of Government at Harvard University. The series, called an Executive Session on Policing,<sup>6</sup> brought top police executives and academic professionals together to explore issues in policing and crime control. Participants wrote a series of papers that shaped



“We take a talent-rich group of police executives and academics and ask them to leave their desks, to take two days to step back from daily concerns over budgets, crime rates and staffing. We ask them to start talking about the bigger and broader concepts of policing in society and thinking about the needs of the field and business. I see this process as an opportunity for key thinkers in the field to discuss and change police management frameworks and strategy. It is vital for advancing policing in the 21st century.”

— Christine Cole, Executive Director  
Program in Criminal Justice Policy and Management  
Harvard University  
[discussing the Harvard Executive Session  
on Policing and Public Safety]

the community policing initiative,<sup>7</sup> a problem-solving approach that asked officers to leave their patrol cars and build rapport with members of their communities. Community policing has since been widely adopted, uniting communities and law enforcement agencies in the fight against crime and social disorder.

Crime has changed since the sessions ended in 1991 — the Internet, wireless technology and global terrorism have produced new kinds of crimes. To reexamine policing in a post-Sept. 11 era, NIJ launched a new Executive Session on Policing and Public Safety. The sessions will occur every six months for three years. At each session, participants will discuss policing policies, research evidence and new directions that can help the law enforcement community over the next decade.

## NIJ Undergoes a Rigorous Evaluation

In 2007, NIJ asked the National Academy of Sciences (NAS)<sup>8</sup> to perform a 27-month evaluation of the Institute and its research methods. NAS will convene a panel of scientific experts to evaluate:

- How NIJ develops priorities and reports research findings.
- How to strengthen the impact of NIJ's programs.
- Whether NIJ's organizational structure advances the Institute's goals.
- How well NIJ meets its goals and fulfills its unique role.
- Which initiatives should be a high priority in the future.

NIJ officials hope the assessment will allow the Institute to set better research and development priorities and become more efficient.

Another NAS committee is assessing the needs of the forensic science community.

### ■ ■ ■ VIRTUAL GUIDE PROVIDES FORENSIC TRAINING

In 2007, NIJ launched more virtual training courses on the Web site of the President's DNA Initiative, <http://www.dna.gov>. These courses include *DNA — A Prosecutor's Practice Notebook*, *Crime Scene and DNA Basics*, and *Laboratory Orientation and Testing of Body Fluids and Tissues*. The site now features more than a dozen courses for police officers, crime laboratory technicians and court officials. To take a course, see <http://www.dna.gov/training/#coursecatalog>.

## Notes

1. See Zedlewski, E., and M.B. Murphy, "DNA Analysis for 'Minor' Crimes: A Major Benefit for Law Enforcement," *NIJ Journal* 253 (January 2006): 2-5, available at [http://www.ojp.usdoj.gov/nij/journals/253/dna\\_analysis.html](http://www.ojp.usdoj.gov/nij/journals/253/dna_analysis.html).
2. Kilzer, L., "Genetic Fingerprints Proving Downfall for Denver Burglars," *Rocky Mountain News*, February 24, 2007, available at <http://www.rockymountainnews.com/news/2007/feb/24/genetic-fingerprints-proving-downfall-for-denver>.
3. For more information on the Culberson case, see <http://www.findcarrieculberson.com>.
4. NIJ partners with the National Association of Medical Examiners, National Center for Forensic Science and National Forensic Science Technology Center to develop the missing persons database in NamUs. For more information, see <http://www.ojp.usdoj.gov/newsroom/pressreleases/2007/NIJ07054.htm>.
5. For more information on NLECTC, see <http://www.justnet.org>.
6. For more information on the Executive Session on Policing and Public Safety, see [http://www.hks.harvard.edu/criminaljustice/executive\\_sessions/policing.htm](http://www.hks.harvard.edu/criminaljustice/executive_sessions/policing.htm).
7. For more information on community policing or to see the papers produced in the last executive session on policing, see [http://www.hks.harvard.edu/criminaljustice/research/community\\_policing.htm](http://www.hks.harvard.edu/criminaljustice/research/community_policing.htm).
8. See <http://www.nationalacademies.org> for more information on NAS.

A stylized eye is the central focus, rendered in shades of blue and green. The eye's iris and pupil are visible, with a bright white highlight on the pupil. The background is a dense field of binary code (0s and 1s) in various colors, creating a digital, data-driven atmosphere. Light streaks and a glowing horizontal line intersect the eye, suggesting a digital interface or data flow.

# 2

Advancing Crime Research and Law Enforcement Technology





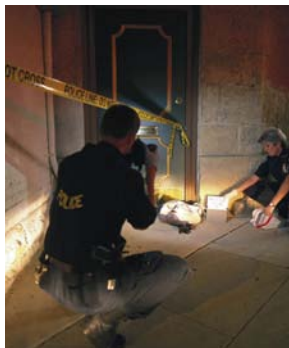
“Working officers in the field are the driving force behind NIJ’s technology development work. They tell us what they need, and we fund the research to make it happen.”

— Joseph Heaps, Deputy Chief  
Information and Sensor Technologies Division  
Office of Science and Technology, NIJ

NIJ evaluates methods that law enforcement agencies and courts routinely use, finding new ways to approach common crime, public safety and judicial problems. In 2007, NIJ began



a field experiment to help police evaluate better ways to conduct lineups and provided better guidance for bomb squads responding to vehicle explosives.



## Examining Models for Police Lineups in Eyewitness Identification

*After spending more than 26 years in prison for rape, Charles Chatman was released when a DNA sample did not match the profile of a vaginal swab taken from the rape victim in 1981. Chatman was convicted by a jury after the victim's eyewitness testimony wrongly identified him as her rapist.<sup>9</sup>*

Eyewitness identification can play a key role in a court case. A witness who correctly identifies a defendant can help a prosecutor secure a conviction. A 1992 study suggested that jurors found defendants guilty 72 percent of the time when presented with eyewitness identification, compared to 18 percent of the time without it.<sup>10</sup>

However, eyewitnesses can sometimes be wrong. How can police and prosecutors ensure that eyewitnesses identify subjects accurately? They must examine how law enforcement agencies conduct lineups. Police use two types of lineups — simultaneous lineups, in which an eyewitness sees all candidates at once, and sequential lineups, in which an eyewitness views one candidate at a time and must make a

separate decision about each one. Lineups can be administered by officers who know the suspect's identity ("nonblind") or by those who do not know the identity ("blind").

Past research on the best lineup procedures has produced mixed results.<sup>11</sup> In 2007, NIJ funded two studies on police lineups, both of which aim to identify the most accurate lineup model. The first study, at Augsburg College in Minneapolis, will simulate blind and nonblind sequential lineups in an academic setting. The second will test how reliable blind versus nonblind and simultaneous versus sequential lineups are in the field. Police departments in Dallas and Washington, D.C., will participate. The Urban Institute won the competitive award to evaluate the field experiment.



## Technical Experts Help American Bomb Squads

U.S. bomb squads are trained to deal with suicide bombers who strap explosives to their bodies. These bombs are small, and squads have the technology to disable them. Increasing terrorist activity and international mobility mean bomb squads must look into new types of bombs and diverse techniques to stop explosions and keep bystanders out of harm's way.

For example, vehicle bombs are often larger and more difficult to disable than small backpack or briefcase bombs. Robots that can disable smaller bombs cannot always handle larger explosives, and squads cannot stop car-driving terrorists

with the same methods they use to stop terrorists on foot. To guide American law enforcement in preparing for vehicle bombs, the National Bomb Squad Commanders Advisory Board (NBSCAB),<sup>12</sup> which NIJ uses as a Technology Working Group (TWG) on explosives, started the Vehicle-Borne Improvised Explosive Device Intensification Project. The program requires bomb squads to develop tools and train squad members to handle vehicle bombs.<sup>13</sup>

TWGs are groups of experts from federal, state and local law enforcement agencies who work together to help guide NIJ's activities. They develop guidelines for vendors and law enforcement agencies and recommend new training programs. TWGs also increase cooperation among law enforcement agencies, help avoid duplication of efforts and suggest how technology created for one purpose may be leveraged for another.



“One of the biggest accomplishments any Technology Working Group can achieve is to help align the various federal resources that serve that discipline. The National Bomb Squad Commanders Advisory Board has worked hard on aligning federal resources for the past several years and is now seeing unprecedented levels of cooperation to go after some extremely serious problems.”

— David Heaven  
Technology Working Group Liaison  
National Bomb Squad Commanders Advisory Board



## Studies Assess Taser Safety

Police officers often use conducted-energy devices (CEDs), such as Tasers, to arrest hostile or violent suspects. These devices provide a less-lethal alternative to firearms. CEDs used by law enforcement officers typically generate 50,000 volts of electricity, which stuns and incapacitates suspects, making them easier to arrest. NIJ researchers are looking more closely at these less-lethal devices, particularly their relationship to fatalities.

To assess CED safety, NIJ funded a nationwide study at Wake Forest University called the Less-Lethal Monitoring System. Researchers and medical personnel escorted victims who received CED shocks to the hospital, examining medical data for each case. An interim review of about 1,000 incidents in six locations found that CED application caused no injuries or minor injuries (for example, scrapes or bruises) in 99.7 percent

of the cases. Three suspects had injuries that required hospital admission. Two of the three subsequently died.<sup>14</sup>

Researchers have documented the deaths of more than 300 people in the U.S. and Canada who have died after contact with a CED. NIJ has assembled a blue-ribbon panel of medical professionals to examine these incidents. Experienced law enforcement investigators will compile a report of the chain of events that preceded a suspect's death. A medical panel will then perform a mortality review that includes an autopsy and toxicological analysis, a review of the care the person received following CED application, and findings from the scene investigation. The panel will also review the current state of relevant human and animal studies that examine the effects of CED application. Interim findings will be released in summer 2008.

## Exchanging Information and Improving Police Communications

Police officers need equipment that allows them to communicate directly with one another during joint missions or when dealing with criminals who cross county or state lines. NIJ works to ensure that police departments can get the kind of technology they need through its information-led policing portfolio, which helps law enforcement personnel take full advantage of a variety of emerging communications technology systems.

**Adapting military radios.** Police on joint missions that span county or state lines must be able to talk to one another directly. However, they typically receive instructions through dispatchers for each department, and bottlenecks can occur if an officer must relay messages through multiple dispatchers. An NIJ pilot project in Orangetown, N.Y., is testing the effectiveness of military radios that let officers from different jurisdictions communicate directly. The radios have multiple channels, giving officers several communication lines. NIJ worked with the Federal Communications Commission to get a special waiver that allows police to use the additional channels offered by the military radios.



In 2007, military multiband radios continued to be adapted for use by public safety agencies.

**Advancing information sharing.** NIJ is sponsoring research to allow different jurisdictions to exchange critical information needed for crime analysis and investigations. For example, the Automated Regional Justice Information System<sup>15</sup> helped different jurisdictions throughout California identify 56 alien street gang members involved in violence, illegal weapons and narcotics trafficking. The system allowed San Diego police officers to use their wireless personal digital assistants to identify the suspects quickly by searching a dozen historically disparate databases with a single query.

**Exchanging driver's license photos.** Criminals regularly cross state lines and use false names. Normally, police departments in these states share text data, not photos. To help officers accurately identify individuals, NIJ sponsored a pilot program through which police departments in Virginia, North Carolina and South Carolina exchange driver's license photos. The pilot program uses technology that makes it much more difficult for criminals to mislead police officers.

## Notes

9. Blumenthal, R., "15th Dallas County Inmate Since '01 Is Freed by DNA," *New York Times*, January 4, 2008, available at <http://www.nytimes.com/2008/01/04/us/04dna.html>.

10. Loftus, E., and J. Doyle, *Eyewitness Testimony: Civil and Criminal*, Charlottesville: Michie Co., 1992.

11. For more information on police lineups, see Schuster, B., "Police Lineups: Making Eyewitness Identification More Reliable," *NIJ Journal* 258 (October 2007): 2-9, available at <http://www.ojp.usdoj.gov/nij/journals/258/police-lineups.html>.

12. For more information on NBSCAB, see <http://www.nbscab.org>.

13. For more information about these explosives, see [http://www.nationalhomelandsecurityknowledgebase.com/Research/International\\_Articles/VBIED\\_Terrorist\\_Weapon\\_of\\_Choice.html](http://www.nationalhomelandsecurityknowledgebase.com/Research/International_Articles/VBIED_Terrorist_Weapon_of_Choice.html).

14. For more information, see NIJ's CED Web page at <http://www.ojp.usdoj.gov/nij/topics/technology/less-lethal/conducted-energy-devices.htm>.

15. For more information on the Automated Regional Justice Information System, see <http://www.arjis.org>.







3

Courts and Corrections



NIJ's work in 2007 influenced state and local policies about prisons, jails and probation programs across the nation. Studies have helped officials improve parole policies, place inmates in suitable mental health programs and keep victims safe.

NIJ also hosted two major corrections events in 2007 — an Innovative Technologies for Community Corrections Conference, which introduced new technologies to the field, and a Mock Prison Riot, which trained corrections officers to respond to a riot using the latest equipment.<sup>16</sup>



“NIJ’s corrections research has improved the way state-level institutional and community corrections agencies are conducting business. We are excited that our work has had a positive impact.”

— Andrew Goldberg, Social Science Analyst  
Justice Systems Research Division  
Office of Research and Evaluation, NIJ



## States Adopt NIJ Mental Health Screening Tool

Minnesota, North Carolina and Wyoming have passed legislation requiring the use in jails of a new mental health screening assessment that was developed through NIJ research. The assessment, called the Correctional Mental Health Screen, allows corrections intake personnel to detect which inmates are mentally ill and decide whether to refer them to a trained professional.<sup>17</sup>



Most intake screening surveys take up to two hours to complete and must be conducted by a mental health professional. The new assessment takes only a few minutes, and any corrections staff member can conduct it.<sup>18</sup> The tool, developed by the University of Connecticut Health Center, gives corrections facilities an inexpensive, effective and user-friendly way to detect mental illness.

## Court Tactics Keep Assailants Away From Domestic Violence Victims

Domestic violence victims may face further abuse from unsupervised suspects who have been released from jail while awaiting trial.<sup>19</sup>

**Judicial oversight.** To reduce pretrial violence, NIJ funded a field experiment to keep victims safe and reduce recidivism. NIJ also funded an evaluation of the Judicial Oversight Demonstration Initiative model in Dorchester, Mass.; Milwaukee; and Washtenaw County, Mich.<sup>20</sup> Court officials asked judges to take a central and aggressive role in managing domestic violence cases before they came to trial, for example, by ensuring the same judge oversees all hearings in a case. Courts were also asked to speed up victim protection hearings,

intensify probation supervision and expand victim service programs.

Results varied by site, but certain parts of the new model — such as careful monitoring of offenders, quick responses to violations of “no contact” stipulations and a greater emphasis on protecting victims — helped protect women from further abuse.<sup>21</sup>

**Electronic monitoring.** Following a conviction and sentence of probation or parole, old electronic monitoring technology (in the form of ankle bracelets) emitted radio-frequency signals to monitor when offenders left and returned home and whether they obeyed curfews. These bracelets also set off an alarm in the victim’s home and alerted a monitoring center if the offender came too close. However, they did not monitor movements all day or provide warning to victims if the offender tried to approach them away from their homes.





Newer technology in the form of GPS-enabled electronic monitoring uses satellite signals to track a person with exceptional accuracy and can help keep offenders away from victims at home and at work. NIJ is funding several studies involving GPS technology for corrections:

- An examination of how well GPS devices protect victims from alleged assailants during the pretrial period and up to a year after supervision ends.<sup>22</sup>
- Two comprehensive evaluations that examine how well GPS technology reduces recidivism and technical violations for:
  - More than 300 medium- and high-risk offenders in Florida.<sup>23</sup>
  - About 800 high-risk sex offenders in California.
- An examination of problems with existing systems that will produce guidance for future development.



## NIJ Study Points to Problems With California Parole Policy

When California parolees violate their parole, officers impose penalties or send them back to prison, depending on the severity of the offense and what risk the person poses to public safety.

Researchers at the University of California, Davis, are analyzing parole violations and revocations to find out which parolees are sent back to prison and why.<sup>24</sup> According to the study's lead researcher, Ryken Grattet, people who have their

parole revoked are frequently sent to temporary holding centers within prisons. "These centers are not productive," Grattet said. "They turn into a revolving door with offenders going in and out and in and out." Grattet's study has direct implications for using a matrix of violations that helps corrections officials decide under which circumstances parolees should have their parole revoked. A final report will be completed in 2008.

## Notes

16. For more information about the Innovative Technologies for Community Corrections Conference and the Mock Prison Riot, see <http://nlectc.org/training/commcorr.html> and <http://mockprisonriot.org/mpr/index.aspx>.

17. The Correctional Mental Health Screens for Men and for Women are free and available to the public at <http://www.asca.net/publications-archive.html>.

18. For more information on mental health screens, see Goldberg, A.L., and B.R. Higgins, "Brief Mental Health Screening for Corrections Intake," *Corrections Today* (August 2006): 82-84, available at <http://www.ncjrs.gov/pdffiles1/nij/215592.pdf>.

19. For more information, see Tjaden, P., and N. Thoennes, *Prevalence, Incidence, and Consequences of Violence Against Women: Findings From the National Violence Against Women Survey*, Research in Brief, Washington, DC: U.S. Department of Justice, National Institute of Justice, and Centers for Disease Control and Prevention, November 1998, available at <http://www.ojp.usdoj.gov/nij/pubs-sum/172837.htm>.

20. See NIJ's Domestic Violence Courts Web page at <http://www.ojp.usdoj.gov/nij/topics/courts/domestic-violence-courts/welcome.htm> for more information about the Judicial Oversight Demonstration Initiative.

21. For more information, see NIJ's Domestic Violence Courts Web page. Also see Visher, C.A., A.V. Harrell, and L.C. Newmark, *Pretrial Innovations for Domestic Violence Offenders and Victims: Lessons From the Judicial Oversight Demonstration Initiative*, Research for Practice, Washington, DC: U.S. Department of Justice, National Institute of Justice, August 2007, NCJ 216041; and Visher, C.A., L.C. Newmark, and A.V. Harrell, *The Evaluation of the Judicial Oversight Demonstration: Findings and Lessons on Implementation*, Research for Practice, Washington, DC: U.S. Department of Justice, National Institute of Justice, June 2008, NCJ 219077.

22. To find out more about the background for this electronic monitoring study, see Erez, E., P.R. Ibarra, and N.A. Lurie, "Electronic Monitoring of Domestic Violence Cases — A Study of Two Bilateral Programs," *Federal Probation* 68 (1) (June 2004), available at [http://www.uscourts.gov/fedprob/June\\_2004/monitoring.html](http://www.uscourts.gov/fedprob/June_2004/monitoring.html).

23. For more information on the Florida electronic monitoring study, see <http://www.criminologycenter.fsu.edu/p/electronic-monitoring.php>.

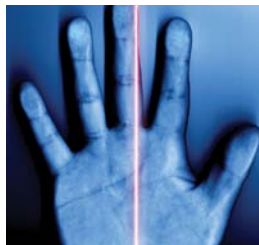
24. For more information about the California parole policy study, see Grattet, R., and J. Petersilia, *The Causes and Consequences of Parole Violations in California: A Multilevel and Policy-Focused Analysis*, available at <http://ucicorrections.seweb.uci.edu/node/19>.





4

DNA and General Forensics



**F**orensic evidence plays an increasingly important role in investigations and prosecutions. Fingerprinting, toxicology, blood splatter patterns, bomb site reconstruction and forensic engineering can all help attorneys convict or clear a defendant. With recent advances that allow scientists to ana-

lyze extremely small or damaged DNA samples, DNA identification has become a mainstay for courtroom prosecution. Detectives can use DNA to solve cold cases and property crimes when they might otherwise give up on a case.



In 2007, NIJ continued to help crime laboratories improve their capacity and reduce DNA backlogs. The Institute also developed methods to detect elder abuse and funded researchers who are improving DNA methods and the full range of forensic sciences.



“Through our support for research and development, capacity enhancement, training and technical assistance, I believe NIJ is having a profound effect on improving the forensic sciences in the U.S.”

— Michael G. Sheppo, Chief  
Investigative and Forensic Sciences Division  
Office of Science and Technology, NIJ

## NIJ Helps Reduce Crime Laboratory Backlogs

Many crime laboratories do not have the capacity to handle the large volumes of DNA samples that need analysis. Congress asked NIJ to step in to help.

The President's DNA Initiative is a program to improve the use of DNA in the criminal justice system.<sup>25</sup> The initiative's continuing efforts have funded DNA analysis for about 100,000 crime cases and processed the DNA of about 2.5 million convicted criminals. NIJ provided an additional \$44.2 million for backlog reduction and laboratory capacity improvement in 2007.<sup>26</sup>

The new funds can affect laboratories dramatically. Craig Price, director of the South Dakota State Forensic Laboratory, reported that NIJ funds and advice helped him reduce his laboratory backlog from 420 to 100 cases. Price hopes the

changes will reduce processing time from as long as 150 days to fewer than 60. In addition, George Herrin of the Georgia Bureau of Investigation in Decatur reported that funding used in 2007 alone was enough to cut the laboratory's DNA backlog by 10 to 12 percent.

### NIJ OFFICIAL WINS 2007 SERVICE TO AMERICA MEDAL

John Morgan, NIJ's deputy director for science and technology, won the 2007 Service to America Medal for Justice and Law Enforcement for the work he and his team did to make the President's DNA Initiative a success. This program has helped crime laboratories reduce backlogs, expand capacity and uncover evidence that will help to solve thousands of cases. Learn more about the Service to America Medals awards program at <http://servicetoamericamedals.org>.

## NIJ Funds Help Solve Two 22-Year-Old Cold Cases

In 1985, 5-year-old Kizzy Brooms was raped and murdered. Although DNA evidence from a cigarette linked a suspect to the murder, the case was unsolved because of evidence contamination. However, in 2007, funds from NIJ allowed analysts to test DNA from three hairs found on Brooms' sweatshirt and chest, and investigators finally solved the 22-year-old case. Tests showed the original suspect had committed the crime.<sup>27</sup>

Police solved a second case by analyzing DNA evidence from the nude body of Jody Lynn Wolfe, a 14-year-old girl from Fresno, Calif., who was murdered in 1985. A Fresno cold case<sup>28</sup> team used grant money from NIJ to analyze the DNA sample obtained from Wolfe's body and linked it to a career criminal named Eddie Ricky Nealy. Police subsequently charged Nealy with the crime.<sup>29</sup>

NIJ awards grants to law enforcement agencies to identify, review and investigate cold cases.<sup>30</sup> The program awarded more than \$8 million to 21 police departments in 2007. These funds allow agencies to start cold case units, hire and train personnel, or buy equipment and supplies. NIJ also provides training on cold cases; in 2007, NIJ funding helped train 347 investigators. NIJ's work makes it possible to solve cases like Brooms' and Wolfe's, bringing resolution to families across the nation and putting criminals in prison.

### THE NATIONAL DNA INDEX SYSTEM

The National DNA Index System (NDIS) provides a place for criminal justice agencies to store DNA records. These records can subsequently be used in criminal or missing persons investigations across the country. NIJ contributes to NDIS by funding the analysis of forensic casework and paying to test stored DNA samples from convicted criminals and suspects. In 2007, NIJ funded the analysis of 9,278 forensic cases and 441,019 DNA samples from convicted criminals and suspects.



## NIJ Forensic Projects Help Prevent and Prosecute Elder Abuse

*Sixty-eight-year-old Blossom Deering was found in early 2000, stuck to the floor by a glue that had formed when her waste fused with cloth and newspaper. She was covered in sores and severely infected. A 51-year-old man, her “caretaker,” had been living in her house and gambling her money away, while she lay helpless on the floor. Deering died three days after she was discovered.<sup>31</sup>*

Elder abuse can be difficult to detect and prosecute. Elderly people are often reluctant to report abuse, and their testimonies are complicated by medical conditions such as dementia. The U.S.

has few forensic elder abuse experts, and little scientific research exists on the issue.

To address this knowledge gap, NIJ is examining elder abuse and prevention strategies. In 2007, NIJ funded a study that will survey elders to find out how often they experience any of the four major kinds of elder abuse — financial abuse, psychological abuse, physical abuse and neglect. A second study will address whether elderly people with mild or moderate dementia can reliably report emotional events, including personal abuse.<sup>32</sup>

### MOBILE PHONE FORENSIC TECHNOLOGIES AID CRIME INVESTIGATIONS

Two mobile phone forensic technologies give crime analysts access to deleted phone files, providing evidence that can help solve cases. The first, called the Cell Phone Analyzer, interprets the flash files (i.e., memory) of a cell phone — including deleted data and images — and turns them into readable text. A related technology, the SIM (subscriber identity module) Card Analyzer, scans information on the SIM card and finds deleted messages. An advanced version of the SIM Analyzer can copy a SIM card and create an “evidence” file for officers to examine in the future. NIJ funded the development of these technologies and provides financial help to train analysts to use them in crime investigations.



## General Forensics Projects Identify Body Fluids and Assess Skull Fractures

### **Advanced camera identifies biological fluids.**

NIJ funding is helping scientists at the University of South Carolina develop a portable camera to quickly find and distinguish biological fluids, such as semen or blood, from nonbiological fluids, such as oil. The camera prototype uses infrared spectroscopy to visualize the substance under a beam of infrared light. Because biological fluids contain enzymes with ionic charges, they produce different wavelengths of infrared light than

nonbiological material. The camera identifies the specific wavelengths of light and creates a visual image that researchers can use to determine whether the sample contains biological material and, if so, what kind.

**Understanding infant head trauma.** Falling off a tall slide on a playground can crack an infant's skull, but if authorities suspect foul play, forensic examiners may be called in to decide whether the injury or death was an accident. Currently, no standards exist to help examiners make these kinds of decisions, mostly because infant cadavers are rarely donated for research.

A team of anthropologists and biomechanical engineers at Michigan State University is working around the lack of physical evidence by studying fractures in animal models. Using pig skulls,

University of South Carolina graduate students (pictured left to right) Megan Baranowski, Heather Brooke, Anthony Trimboli and Jessica McCutcheon work with the prototype imaging camera for blood stain detection. (Courtesy of Stephen L. Morgan, University of South Carolina.)



which have similar tissue construction to human skulls, researchers hope to set up a guiding model for forensic examiners who investigate infant skull trauma, which will allow examiners to decide whether fractures are consistent with accidental or intentional death.<sup>33</sup>

Todd Fenton, a forensic anthropologist involved in the trials, is excited about the potential impact the study may have for forensic scientists. “This might be the most important work that I ever do in my career,” Fenton said. “We are working to fill such a critical gap in our knowledge.”

### THE PAUL COVERDELL FORENSIC SCIENCE PROGRAM

The Utah Bureau of Forensic Services receives hundreds of requests a year for analysis of fingerprints and other impression evidence (e.g., footprints). However, its ability to process requests was limited because it did not have the funds to buy expensive cameras and imaging equipment. The Bureau needed zooming digital cameras to record evidence at crime scenes and advanced video and imaging software to analyze and process evidence. NIJ’s Paul Coverdell program provided funds to the Bureau, allowing it to buy the forensic equipment it needed and give staff related training seminars.

The Paul Coverdell program awards grants to improve state and local forensic science and medical examiner services. Funding reached \$16.1 million in 2007. Funds may be used to eliminate forensic backlogs, improve the timeliness of forensic science and medical examiner services, and train and employ personnel.<sup>34</sup>

#### Coverdell Funding and Awards, FY 2003-FY 2007

	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007
Funds	\$4.9 million	\$9.6 million	\$13.6 million	\$14.8 million	\$16.1 million
Number of Grant Awards	54	77	92	87	88

## Notes

25. For more information about the President's DNA Initiative, see <http://www.dna.gov>.

26. For more information on funding for NIJ's Forensic DNA Backlog Reduction Program and DNA Capacity Enhancement Program, see <http://www.dna.gov/funding>.

27. Daley, C.K., presentation at the Regional Basic Cold Case Training, Clearwater Beach, Fla., June 19, 2007, available at [http://www.ojp.usdoj.gov/newsroom/speeches/2007/07\\_0619daley.htm](http://www.ojp.usdoj.gov/newsroom/speeches/2007/07_0619daley.htm).

28. A cold case is any case for which investigative leads have been exhausted.

29. Lopez, P., "22-Year-Old Fresno Murder Solved: Cold-Case Unit Matches DNA to Career Criminal," *Fresno Bee*, May 30, 2007.

30. For more information on cold cases, see [http://www.dna.gov/uses/solving-crimes/cold\\_cases](http://www.dna.gov/uses/solving-crimes/cold_cases).

31. Testimony of Honorable Christopher D. Chiles, Prosecuting Attorney, Cabell County, West Virginia, and Vice President, National District Attorneys Association, before a hearing of the Crime, Corrections and Victims' Rights Subcommittee on Elder Abuse, Neglect and Financial Exploitation, Sept. 24, 2003, available at [http://judiciary.senate.gov/hearings/testimony.cfm?id=935&wit\\_id=2649](http://judiciary.senate.gov/hearings/testimony.cfm?id=935&wit_id=2649); and Connolly, M.T., "A Hidden Crime," *Washington Post*, January 27, 2008, B01.

32. For more information, see the NIJ Elder Abuse Web page at <http://www.ojp.usdoj.gov/nij/topics/crime/elder-abuse/welcome.htm>.

33. Pigs in preliminary trials died of natural causes before being used for experimentation.

34. For more information on the Paul Coverdell Forensic Science Improvement Grants program and a description of eligibility requirements, see <http://www.ojp.usdoj.gov/nij/topics/forensics/nfsia>.





5

## Setting Standards for Equipment and Training



Law enforcement officers need to know the equipment they use will both protect them and not harm suspects or bystanders unnecessarily. NIJ's research and evaluation programs ensure that officers' equipment is well made, safe and effective.



“NIJ remains committed to ensuring the safe operation of law enforcement equipment.”

— Marc Caplan, Chief  
Operational Technologies Division  
Office of Science and Technology, NIJ



## Keeping Police Safe From Chemical, Biological, Radiological and Nuclear Hazards

In daily duties, police often face chemical threats — such as toxic chemical spills and gas emissions from illegal drug manufacturing — which can cause burns, respiratory disorders and even death. With the proper safety equipment, officers could avoid these chemical dangers. However, performance standards do not exist for personal protective gear that protects police officers from chemical, biological, radiological and nuclear (CBRN) hazards.

Currently, police use CBRN standards developed for firefighters — public servants who do not usually deal with the same threats that police face, such as bullet fire. The CBRN safety equipment police use today often does not fit properly with the other equipment an officer must wear in a raid, such as body armor, a fireproof suit, a breathing apparatus, a helmet, a microphone and a radio. In addition, the layers of protective gear might keep an officer from hearing commands properly through a radio headset or shouting for help into a microphone. Officers may be forced to choose what hazards are most significant, abandon some of their protective equipment and hope for the best.

In 2007, NIJ answered officers' calls for help and began developing a standard for a protective CBRN ensemble for law enforcement. The standard will be completed in 2008. To people like Heather McArthur, an industrial hygienist with the Phoenix Police Department, the standard is critical. "Our hope is that the standard will advance the garments out there and make manufacturers understand what a suit needs to do," she said. "Officers don't want to kneel down and worry the suit will rip, they don't want to worry about chemical exposure leading to cancer risk and they want to be able to hear the suspects they're trying to apprehend. But they are exposed to so much without the proper protective equipment. We can't wait any longer for this standard."



**“NIJ’s work writing the CBRN ensemble standard for law enforcement will finally ensure that police have a garment specific to our missions. I cannot think of one law enforcement project in recent history that will have a greater impact on police officers’ safety.”**

— Ed Bailor, Inspector (retired)  
U.S. Capitol Police

## NIJ Develops a “How To” Guide for Responding to Bomb Threats

When police realize a suspect in a crowd may be carrying a bomb, how do they respond? Do they handcuff the suspect? What if a suspect resists? What if they realize a truck contains a bomb?

To answer such questions, the National Bomb Squad Commanders Advisory Board<sup>35</sup> created the *First Responder Guide to Person Borne and*

*Vehicle Borne Improvised Explosive Devices*. The guide ensures that first responders know how to assess a crisis, select a path of action and alter their actions if conditions change. The guide ensures that police chiefs can train officers, make policies and choose safe equipment to support first responders who face bomb threats.

### NIJ TESTS AVIATION TECHNOLOGIES FOR LOCAL LAW ENFORCEMENT

Aviation equipment can help rural law enforcement officers, who may use small airplanes in such time-critical situations as missing persons searches. In 2007, NIJ launched an aviation technology program for state and local police. The projects are assessing the value of small aircraft and airborne cameras in law enforcement agencies.





## NIJ Updates the Body Armor Standard

More than 3,000 police officers' lives have been saved since the 1970s, when NIJ published its first standard for body armor, commonly (but inaccurately) known as bulletproof vests.<sup>36</sup> Body armor must weather changes in temperature and humidity, and the fibers that make up the material may decay over time. NIJ creates reliable standards and guidelines that police departments use to decide which brands of body armor they should purchase. The Institute then tests armor to ensure that it meets the new standards.

In 2007, NIJ worked to update its body armor standard, holding numerous meetings with law enforcement officials, body armor manufacturers and other interested parties. The comprehensive revision of the standard focuses on the continuing performance of armor as it is subjected to heat and humidity, ensuring that the armor will continue to provide protection as it ages. The standard also introduces a voluntary laboratory accreditation program run by the National Institute of Standards and Technology.<sup>37</sup> The new standard will be published in 2008.



“Creating the revised body armor standard is probably the most important undertaking for law enforcement officers’ lives that has ever been done — not only for the officers but for their families.”

— Nick Roberts, Rangemaster and Firearms Director  
Salt Lake County Sheriff’s Office, Utah

## Notes

35. For more information on the National Bomb Squad Commanders Advisory Board, see <http://www.nbscab.org>.

36. For more information about body armor, see <http://www.ojp.usdoj.gov/nij/topics/technology/body-armor>.

37. For more information about the accreditation program, see <http://www.nist.gov/nvlap>. To search NIJ's database of compliant models, see [http://www.justnet.org/Pages/Topic.aspx?opentopic=10&topic\\_=10](http://www.justnet.org/Pages/Topic.aspx?opentopic=10&topic_=10).

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APPENDIX

Financial Data and Web Activity





Exhibit 1: NIJ's Research and Development Portfolio, Awards Made FY 1997-2007

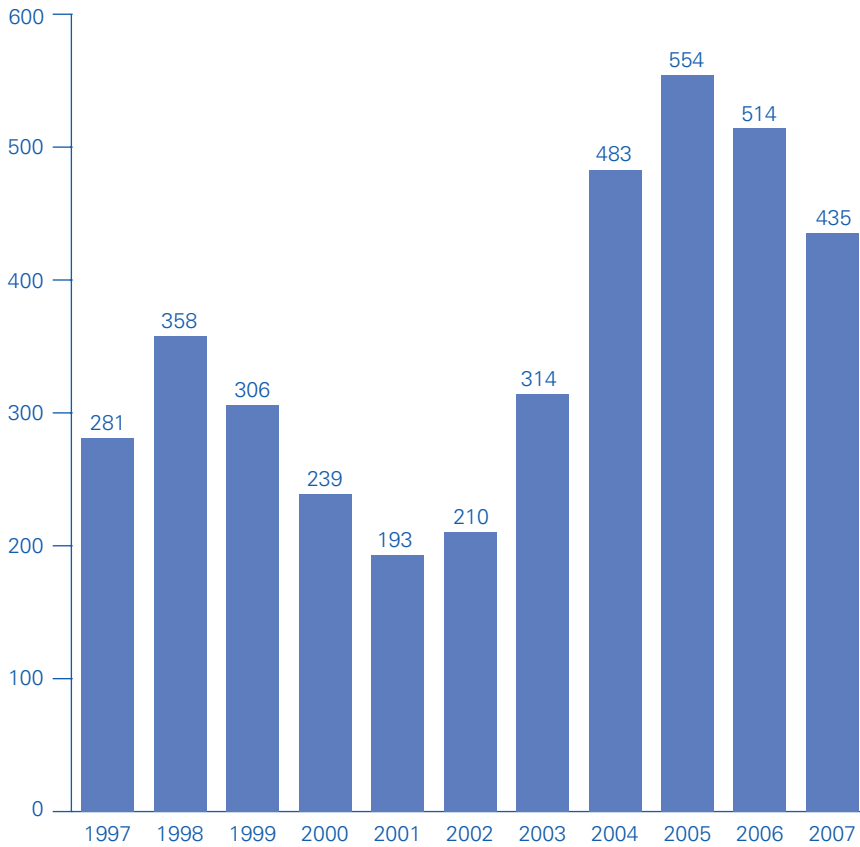


Exhibit 2: Value of Active Awards, in Millions, FY 1997-2007

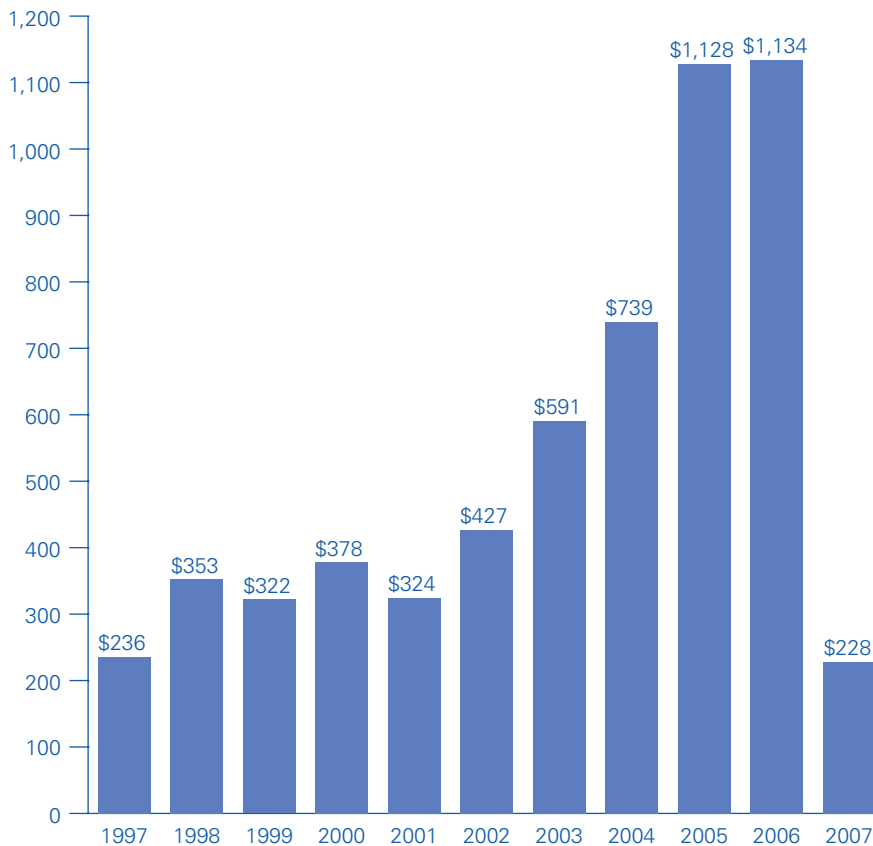


Exhibit 3: Sources of NIJ Funds, in Millions, FY 1997-2007

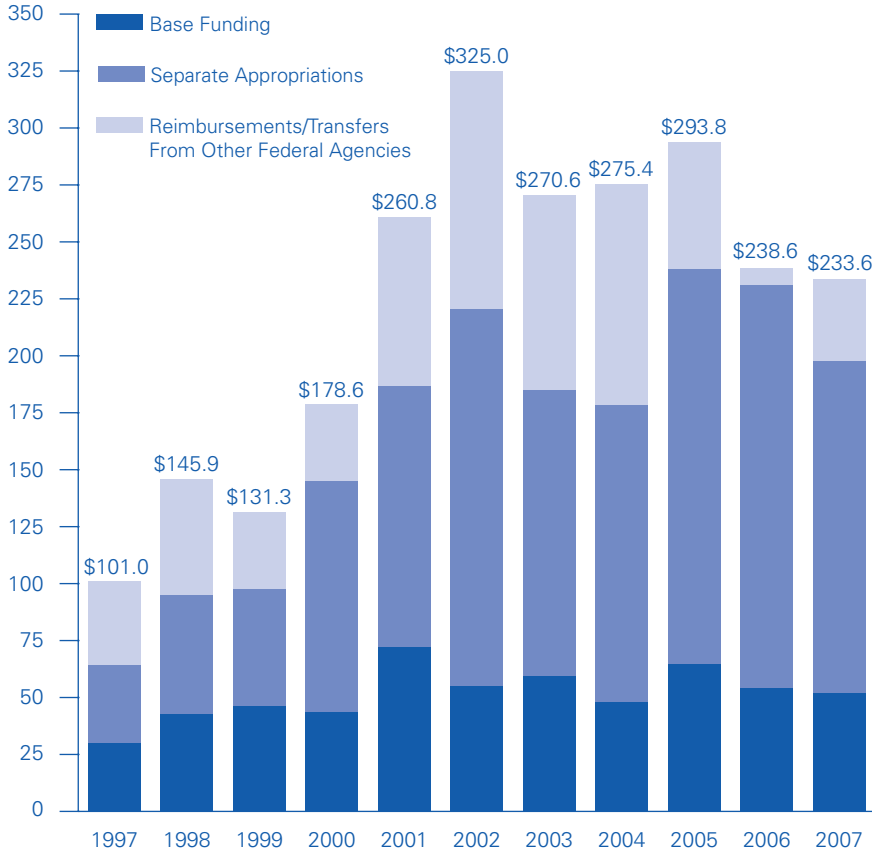




Exhibit 4: Allocation of NIJ Funds as a Percentage of Total Funding,\* FY 2007

<b>Social Science</b>	Research	10%
	Evaluation	8%
<b>Science and Technology</b>	Capacity Enhancement <sup>†</sup>	35%
	Research and Development	23%
	Technology Assistance	16%
	Standards	1%
<b>Program Support</b>		3%
<b>Dissemination</b>		2%
<b>Other</b>		2%

\*Total funding of \$233.6 million includes NIJ base appropriation of \$52.1 million plus separate appropriations and funds transfers.

<sup>†</sup> Grants to improve and enhance crime laboratories.

## Exhibit 5: DNA Funding, FY 2007

The funding request under the President's DNA Initiative\* was \$112.1 million. Actual funding breakdowns for each purpose area are shown below.

DNA Capacity Enhancement	\$ 0
DNA Casework Backlog Reduction	0
Convicted Offender DNA Backlog Reduction	12,529,049
Training for the Criminal Justice Community	8,805,539
Identifying Missing Persons	3,301,202
Research and Development	21,956,310
Earmarks	N/A
Forensic DNA Backlog Reduction	48,256,597
Cold Case	9,564,355
Post-Conviction Testing	4,260,942
National Institute of Standards and Technology (NIST)	3,471,006
Post-Rescission Total	\$112,145,000

\*Cost in each DNA Initiative category includes cost associated with grants and program support as well as peer review, consulting services and dissemination costs associated with each activity area.

Exhibit 6: NIJ Web Site Visits, FY 2003-2007

	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007
	904,969	1,017,169	1,181,936	1,423,712	1,776,149



The National Institute of Justice is the research, development and evaluation agency of the U.S. Department of Justice. NIJ's mission is to advance scientific research, development and evaluation to enhance the administration of justice and public safety.

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).

<http://www.ojp.usdoj.gov/nij>

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