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# NATIONAL INSTITUTE OF JUSTICE

Research in Brief

March 1993

## NIJ Initiative on Less-Than-Lethal Weapons

by David W. Hayeslip, Ph.D., and Alan Preszler, Ph.D.

The Sacramento County (California) Sheriff's Department Special Enforcement Detail (SED) responded on April 4, 1991, to what initially appeared to be a robbery attempt. As it turned out, the situation was the worst nightmare for law enforcement—the taking of innocent hostages by dangerous criminals. Four armed men had been cornered by the police in a retail electronics store, and approximately 50 customers and store employees had been taken hostage. Members of the department's Critical Incident Negotiating Team were able to establish communication with the suspects, and negotiations continued for some 8 hours.

The situation quickly deteriorated, however, when the suspects shot a male hostage. Although wounded in the leg, this hostage was allowed to drag himself out of the store to safety. Shortly thereafter another hostage was shot and wounded in a similar manner. The suspects then announced their intention to execute the remaining hostages, and the police could see that the assailants had placed guns to the hostages' heads.

The Sheriff's Department ultimately decided that a tactical assault on the location was necessary, given the immediate threat to the hostages. When SED teams rushed the suspects, the

suspects opened fire on the hostages, and the assault ended with three of the suspects dead and a fourth seriously wounded. During the confrontation the suspects killed 3 of the hostages and seriously wounded 11 others.<sup>1</sup>

In the aftermath of such events, questions are often raised about police weapons and tactics. It is clear that local officials did the very best they could within the limits of current weapons technology.

But this is an extraordinary event. What of the almost daily dilemma faced by police when they order a fleeing suspect

As the research and development agency of the U.S. Department of Justice, the National Institute of Justice (NIJ) pursues a wide range of programs to prevent crime and improve the criminal justice system.

Over the years, NIJ has sponsored numerous special projects and research and development programs, evaluated the effectiveness of new and promising crime control programs, and developed new technologies to fight crime and improve criminal justice.

Among NIJ's accomplishments are the research and development that resulted in lightweight police body armor, scientific advances such as the development of

DNA analysis to identify suspects or eliminate suspicion from the innocent, and a research and testing program for dogs that resulted in establishment of K-9 units that are employed to detect drugs and explosives at airports and in major cities.

NIJ has also pioneered research and development efforts to produce less-than-lethal devices that police can use in situations where lethal force is not justified or risks injury or death to innocent victims or bystanders. For example, hostage and terrorist situations demand that law enforcement personnel stop offenders without risking harm to innocent persons in their custody.

To this end, NIJ is exploring the potential of several technologies: electrical, chemical, impact, and light. And, as this report details, progress is being made.

Sophisticated technology is increasingly essential to criminal justice. Research into the development of less-than-lethal weaponry continues to be a priority in NIJ's ongoing effort to put the most useful tools available into the hands of law enforcement professionals.

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to halt? Since 1985, police officers have been restricted by a decision of the Supreme Court (see box) that deadly force should not be used unless absolutely necessary.

The first example is a dramatic and unique confrontation. The second, that of a fleeing felon, is an everyday, routine event. What both situations have in common is the need for new technology—weapons that will incapacitate suspects quickly and safely—weapons that are nonlethal or less-than-lethal.<sup>2</sup>

Wouldn't the outcome of hostage situations be different if the police had the technology to safely incapacitate suspects without harming hostages?

Questions such as this are now being asked by the National Institute of Justice (NIJ) as part of its research into the development of weapons that are effective law enforcement tools but minimize the risk to life.

Of particular interest to NIJ has been research that can answer the following questions:

- Can an officer stop a fleeing felon without use of deadly force?

- Are there devices and substances that would rapidly subdue assailants before they could open fire or otherwise harm their hostages?

- Can technology provide devices to incapacitate assailants without also harming nearby innocent hostages and bystanders?

### The need for alternatives to lethal force

In July 1991 and March 1992, NIJ brought together criminal justice professionals, representatives from major law enforcement agencies, public interest groups, and criminal justice researchers and scholars for major conferences in Washington, D.C., on the development of less-than-lethal devices. These conferences were only the latest expression of NIJ's considerable research into the development of less-than-lethal technology.

On the agendas were discussions of various situations in which the use of less-than-lethal force would be desired, including domestic disturbances, barricade situations, fleeing felons, terrorist incidents, hostage taking, and prison or jail disturbances.

While law enforcement officials have long recognized the necessity for less-than-lethal weapons, interest in research and development of new minimum-force alternatives for State and local law enforcement personnel is relatively recent in origin.<sup>3</sup>

### New types of less-than-lethal devices

NIJ had begun in 1987 to examine operational requirements for future innovative less-than-lethal devices and examined several new technologies that might be developed for use in law enforcement. Of interest were electrical and electromagnetic technologies, alternative impact devices, drug-delivering dart guns, and knockout gases. There was substantial interest in the potential for developing a chemical dart gun.<sup>4</sup>

NIJ had conducted an analysis of the feasibility of developing less-than-lethal chemical technology for law enforcement. This feasibility assessment focused on potential knockout gases and chemical darts. With positive results from the initial assessment, NIJ in 1989 began to develop a prototype chemical device for State and local law enforcement use. This effort has been guided by an advisory Medical Operations Committee.

Additional research needs to be completed on the potency and safety of the chemical compound before development of actual delivery systems can begin.

### Current NIJ efforts

NIJ convened the 1991 and 1992 meetings of law enforcement professionals and experts to review and assess NIJ's progress with the development of the chemical technology and to consider other methods that could meet law enforcement's expanding need for minimum-force alternatives.

Participants in NIJ workshops represented law enforcement at Federal, State, and local levels, as well as correctional institutions. Included from State, county, and local agencies were police chiefs, SWAT commanders, narcotics detectives, deputy sheriffs, and line

## Deadly Force and Fleeing Felons

In March 1985, the U.S. Supreme Court ruled by a 6 to 3 vote that more than half the States' laws and many law enforcement agencies' regulations on police use of deadly force were unconstitutionally permissive. In *Tennessee v. Garner*,\* an apparently unarmed 15-year-old was fatally wounded by police as he fled the scene of a burglary. Through this decision, the Supreme Court imposed a national minimum standard of force for the first time.

The decision invalidated laws in nearly half the States that allowed using "deadly force" to prevent the escape of someone suspected of a felony. However, the Court limited its ruling by providing that if a suspect is armed and poses "a significant threat of death or physical injury to the officer or others," police use of deadly force is *not* prohibited.

The Court held that ". . . the use of deadly force to apprehend an apparently unarmed, non-violent fleeing felon is an unreasonable seizure under the fourth amendment." *Tennessee v. Garner* sharply limited situations in which lethal force could be used by police and added significantly to the interest in developing less-than-lethal devices, particularly for use against fleeing felons.

\* *Tennessee v. Garner*, 471 U.S. 1, 105 S.Ct. 1694, 85 L.Ed.2d 1 (1985).

## NIJ 1992/1993 Plan

### Policy Assessments (Current)

- Case studies, surveys, interviews, onsite observations are being carried out on policy issues regarding technology.

### Field Evaluations (Current)

- Less-than-lethal technology will be tested in applications by law enforcement and corrections agencies.

### Technology Transfers (Short Term)

- Short-term research will be completed to adapt military technologies to use by domestic law enforcement.

### Laboratory Research (Ongoing)

- Scientific studies will be conducted to identify which technologies may be developed for use by law enforcement and corrections, including laser, microwave, and electromagnetic.

patrol officers. Federal law enforcement was represented by agents from the Federal Bureau of Investigation and the U.S. Secret Service.

The past 5 years have witnessed significant changes in situations and circumstances of police encounters where the likelihood of violence is much higher than in the past. Therefore, the participants were divided into six focus groups to examine the utility and needs for less-than-lethal weapons.

NIJ is planning for multiple situations:

- **Fleeing felon/patrol applications.**
- **Domestic disturbances.**
- **Barricade/tactical assault.**
- **Search warrant/raid.**
- **Prison/jail disturbance.**

These scenarios were chosen as situations in which less-than-lethal force would most likely be used advantageously by reducing the probability of injury or death to a suspect, innocent bystander, or law officer.

The types of technologies considered by the focus groups also reflected their perceptions that violent confrontations faced by the police varied significantly within each of the scenarios discussed. For patrol applications, an improved chemical mace was considered ideal in many situations. Lasers were favored in "less volatile" hostage situations and

barricade encounters, while microwave devices may show promise for major hostage situations, such as airplane hijackings.

NIJ is reviewing specific law enforcement needs concerning weapon effectiveness, weapon characteristics, and operational and deployment characteristics.

Several preliminary findings have been established:

- While there might be typical situations where one technology could be useful, in reality the confrontations facing the police vary greatly.
- Differences in situational factors could have a direct effect on the usefulness of any less-than-lethal weapon that might be developed.
- Situations could change very rapidly and escalate into something very different. For example, a domestic disturbance could develop into a hostage situation in moments.

Because of the variables in potential violent confrontations where the police might employ less-than-lethal force and the changing nature of these situations, the workshop participants concluded that NIJ must develop more than one less-than-lethal device since no single device currently conceived would be useful in all situations where the police would need to use force.

### NIJ's approach

The Institute is currently conducting a national survey of the use of less-than-lethal devices by law enforcement. This research is examining the kinds of devices being used, the policies and procedures that departments have developed for the use of such force, and the relative effectiveness of the types of less-than-lethal devices being deployed by State and local law enforcement agencies. The survey is designed to provide information on the extent of less-than-lethal device use and to serve as a foundation for the development of a long-term research agenda for NIJ.

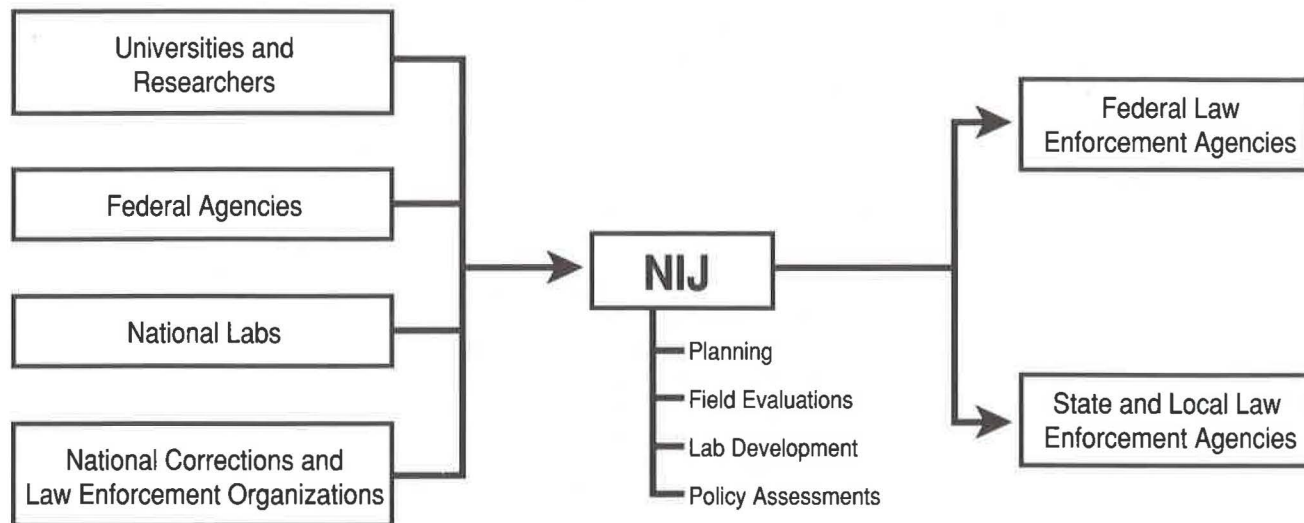
NIJ is also examining all less-than-lethal technologies currently under development by Federal agencies. The review is considering the development status of the technology, applicability to situations faced by criminal justice professionals, potential for quick transfer to State and local agencies, and the ability to incapacitate without inflicting enduring harm.

Already available, for example, are capture nets, dazzle lights, and lasers.

### Next steps

A major research priority of the National Institute of Justice in the 1990's will be to continue the development and testing of less-than-lethal devices for use in the criminal justice system.

## NIJ Is Managing Development of Less-Than-Lethal Devices



## Participants in NIJ Planning

### National Law Enforcement and Corrections Organizations:

International Association of Chiefs of Police  
 National Sheriffs' Association  
 Police Foundation  
 Police Executive Research Forum  
 National Organization of Black Law Enforcement Executives  
 American Jail Association  
 American Correctional Association

### Technology:

#### U.S. Army

Chemical Research, Development and Engineering Center

#### U.S. Department of Energy

Oak Ridge National Laboratory  
 Idaho National Engineering Laboratory  
 Lawrence Livermore National Laboratory  
 Los Alamos National Laboratory  
 Sandia National Laboratories

*As these charts show, NIJ's effort involves a coordinated and comprehensive approach, involving users, criminal justice professionals, and scientific technological researchers to give practical solutions to control life-threatening situations.*

Continued evolution of this research program will be based on an ongoing assessment of the needs of law enforcement in light of emerging technological advances.

At present, NIJ is moving forward with research, development, and evaluation of devices for use by line patrol officers under a wide variety of circumstances. NIJ's goal is to give line officers effective and safe alternatives to lethal force.

There will be further development of the chemical compound research that NIJ began in 1989. However, NIJ will focus not only on dart technology, but will also examine gaseous and liquid delivery systems. This effort will be based on the recognition that such chemical devices will serve important but specialized law enforcement needs.

## A long-range effort

The success of these research initiatives could mean that law enforcement agencies will have the technological capability in the future to swiftly bring violent confrontations to a conclusion safely and without serious injuries. NIJ is working with law enforcement organizations and Federal agencies to match needs with national technical resources. In this way, NIJ hopes to get this Nation's most advanced technology into the hands of those who need it most—America's law enforcement officers.

## Notes

1. John Robert Marlow, "Sacramento Showdown," *Police* (July 1991): 31-73.

2. The terms "nonlethal" and "less-than-lethal" are often used interchangeably. The author's definition of a nonlethal weapon is one that cannot cause death regardless of how it is used. Alternatively, a less-than-lethal weapon is one designed to have a minimal probability of causing death, but that can result in death if used inappropriately or under unusual circumstances.

3. See, for example, D.O. Egner and D. Campbell, *Testing and Evaluation of Chemical Weapons*, Aberdeen Proving Ground, Maryland, U.S. Department of the Army, 1975; B.K. Thein, E.B. Shank, and M.J. Wargovich, *Analysis of a Bean-Bag-Type Projectile as a Less Lethal Weapon*, Aberdeen Proving Ground, Maryland, U.S. Department of the Army, 1974.

4. Sherri Sweetman, *Report on the Attorney General's Conference on Less-Than-Lethal Weapons*, Washington, D.C., National Institute of Justice, March 1987: 18-19.

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