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# National Institute of Justice

## S o l i c i t a t i o n

*June 2001*

## NIJ “Smart Gun” Solicitation

**APPLICATION DEADLINE:**  
July 26, 2001

**U.S. Department of Justice**  
**Office of Justice Programs**  
810 Seventh Street N.W.  
Washington, DC 20531

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For grant and funding information, contact:  
**Department of Justice Response Center**  
800-421-6770

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**Office of Justice Programs**  
**World Wide Web Site:**  
<http://www.ojp.usdoj.gov>

**National Institute of Justice**  
**World Wide Web Site:**  
<http://www.ojp.usdoj.gov/nij>

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## I. Introduction

The National Institute of Justice (NIJ) is the research and development arm of the U.S. Department of Justice. Created by Congress in 1968, the Institute is charged with investing public funds to develop knowledge that will reduce crime, enhance public safety, and improve the administration of justice. Under its enabling legislation, NIJ is authorized to assist State and local justice systems in the following ways:

- By conducting and sponsoring basic and applied research into the causes, prevention, and detection of crime.
- By sponsoring evaluations of major Federal initiatives concerning crime and justice.
- By supporting research, demonstrations, and validations to develop new approaches, techniques, systems, and equipment to improve law enforcement and the administration of justice.
- By developing, validating, and evaluating new technologies to deter crime and enhance criminal justice operations.
- By making recommendations to Federal, State, and local governments.
- By conducting conferences and workshops for criminal justice policymakers and professionals.
- By collecting and disseminating both domestic and international criminal justice information obtained by the Institute or other Federal agencies.

NIJ's portfolio covers a diverse and dynamic array of research and development topics. Over the course of each year, the Institute's research program evolves as a result of consultations with researchers; technologists and practitioners; Federal, State and local policymakers; and partnerships with other public and private organizations. The NIJ Research Portfolio, which lists ongoing NIJ research and

development, with project descriptions, is available online. The Institute encourages prospective applicants to consult the portfolio as well as *Building Knowledge About Crime and Justice: The 2000 Research Prospectus of the National Institute of Justice*, as guides to NIJ's approach to criminal justice research and development. (See section V of this solicitation for instructions on obtaining these and related documents.)

## II. Background

NIJ has been working since 1994 to develop, test, and replicate "smart gun" technologies that will reduce deaths and injuries resulting from the use of weapons taken from law enforcement officers.

A review conducted in 1994 of the FBI's *Law Enforcement Officers Killed and Assaulted Uniform Crime Report* (<http://www.fbi.gov/ucr/ucr.htm>) showed that of the police officers killed in the line of duty during a 10 year period, one in six were killed with their own firearm after being disarmed by a suspect. An additional 113 firearms were stolen from police officers in that same period of time. To address the growing concern for the safety of our Nation's police officers, NIJ funded Sandia National Laboratories to study the problem of police firearm take-aways, identify the extent to which officers are assaulted and killed with their own firearms, and identify the requirements officers would want in a "smart gun." Sandia was also charged with identifying existing technologies that could be used to disable a weapon so that it would only fire for a recognized user.

Based on the requirements identified by police, Sandia assessed the technical and practical feasibility of 14 technology concepts ranging from simple mechanical devices to sophisticated electromagnetic concepts incorporating biometric technology. At that time radio frequency technology was determined to be the best suited and most readily available. A copy of that report is available on the Internet at:

[http://infoserve.sandia.gov/sand\\_doc/1996/961131.pdf](http://infoserve.sandia.gov/sand_doc/1996/961131.pdf).

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In 1996 NIJ funded Colt's Manufacturing to further develop its radio frequency "smart gun." Colt's "smart gun" research initiative was based on a wrist watch-like transponder that had to be within an "enabling zone" to allow the weapon to operate. Notwithstanding several mechanical and technical challenges, the development demonstrated, in particular, that commercial off-the-shelf technology to support the "smart gun" was difficult to locate and difficult to incorporate once found.

Since that time, NIJ has funded two different and promising "smart gun" initiatives with Smith & Wesson and FN Manufacturing. One project uses an ultrasonics-based transponder with embedded microelectronics technology while the other is a pin code activated electronic handgun with growth into incorporation of a biometrics user authentication device. In addition to the design and optimization of the "smart gun" components, these programs are performing finite element stress analyses; failure mode & effects analyses; design for manufacturing & assembly; and design of tooling & assembly fixtures to evaluate the entire prototype system concepts.

NIJ's long-term goal for the "smart gun" program is a handgun that operates in a normal manner for authorized law enforcement users, but disables itself when in the possession of an unauthorized user. The imbedded technology, which recognizes whether a user is authorized or not, would be seamless and transparent to the authorized user, or group of users. It would be simple, affordable, and would not adversely impact the reliability of the weapon in all current environments and operating conditions which law enforcement officers may find themselves.

Although these are idealistic goals, there have been a number of technologies demonstrated to date that already meet a subset of them. NIJ anticipates that the "smart gun" program will develop and demonstrate technologies meeting more, and ultimately all, of these goals while further defining and developing standards and test methods to measure them. Proposers are encouraged to clearly state their role in defining, measuring, and/or developing and demonstrating technologies meeting these goals. If technologies are proposed that do not meet all of

them, then a path of development to achieve that end should be shown.

Each proposal should include a breakdown of tasks and resource expenditures for each task for the project. The breakdown should, as a minimum, include major tasks, accomplishment of program goals, and timing of deliverables. This will enable the reviewers and NIJ managers to better understand how the proposer plans to accomplish the work.

Proposers should keep in mind that cost considerations of resulting "smart gun" technology development products are a major concern. Most law enforcement and corrections agencies have limited financial resources to apply to the evaluation, development, implementation, or purchase of technology. This is especially true for State and local agencies. These and related factors all influence the timeliness and the degree to which new technologies are accepted by administrators.

Please consider the questions below when determining the usefulness of your proposal. In your proposal, you should incorporate information that addresses the general themes posed by these questions.

- How important is the new technology to law enforcement and corrections officers?
- What will be its impact on policing or correctional organizational structure and personnel requirements?
- How will the "smart gun" technology impact existing weapons?
- What are the hidden costs? For example, what costs are required for equipment to program the "smart gun" technology or batteries to operate it?
- What, if any, are the net savings in labor or other costs?
- How much training is required to use and maintain the technology?

- How will the courts view the technology—in terms of liability or interference with personal freedom? What constitutional or other legal issues may arise from utilization of the technology?
- How will the “smart gun” technology be successfully transitioned from research to production?
- How will the development, implementation, or evaluation of this technology integrate with existing technology or work with existing technical infrastructure?
- What technical standards are or will be employed in the development, implementation, and evaluation of this technology?

### III. Areas of Research Required

Within the following research areas, there are specific topics that could meet critical law enforcement and corrections needs for “smart gun” technology. These topics are not considered to be exclusive; you may submit proposals in other areas related to “smart gun” technology. NIJ anticipates making multiple awards covering the technical areas of this solicitation.

**A. “Smart Gun” System Concepts.** NIJ is interested in bringing “smart gun” technology to the law enforcement community as rapidly as possible, but in a manner that develops confidence in the technology through a clearly defined development, evaluation and demonstration process. It is understood that the development of a “smart gun” system will require a broad array of technical disciplines and capabilities to bring a concept to market. Teaming arrangements are encouraged that bring together the strengths of multiple organizations to develop an entire “smart gun” product; a product that meets the law enforcement needs but also benefits from coordination with military and civilian applications of “smart gun” technology.

If proposed, teaming arrangements need to have clearly defined technical milestones, leadership plans, business strategies, intellectual property sharing

agreements, and participant cost sharing plans. A coordination plan should also be developed identifying “smart gun” users, training institutions, government test facilities and laboratories, legal and legislative bodies, and others that should be part of bringing a successful “smart gun” program to market.

Proposers of teaming arrangements should not overlook or underestimate the technology component of the project. NIJ believes that there is still significant technology development that must take place to meet the law enforcement goals.

Proposers of entire system concepts should plan to deliver a sufficient quantity of prototype “smart guns” to allow NIJ to perform independent laboratory assessments and user evaluations.

For example, NIJ released an *Autoloading Pistols Standard - 0112.03 Rev A* in 1999 that established performance requirements and test methods for today’s law enforcement pistols. NIJ’s National Law Enforcement and Corrections Technology Center (NLECTC) sponsored two independent test laboratories to perform tests of 27 pistols from eight manufacturers against the new pistol standard. The results of that test are produced in the *Equipment Performance Report: 1999 Autoloading Pistols*. The standard and performance report is available on the Internet at: <http://www.nlectc.org/pubs>. Products of the “smart gun” program will be evaluated against this standard, plus any additional tests developed to specifically address the “smart gun” components (i.e., user identification rate, false identification rate, false rejection rate, electromagnetic incompatibilities or interference, etc.).

**B. Component Development.** NIJ is not aware of any known single solution (mechanical, electromagnetic, or biometric) meeting the law enforcement requirements of the “smart gun.” Proposals are sought that develop or implement a user authentication technology that is seamless and transparent for the authorized “smart gun” user, but disables the gun for an unauthorized user. As noted previously, the ideal solution would be:

- imbedded entirely in the structure of the gun
- simple to operate

- reliable in differentiating between authorized and unauthorized users
- affordable
- reliable in all environments and operating conditions that law enforcement officers may find themselves

Proposals that do not initially meet all of these goals are encouraged to show a clear development path to that end. All proposals must demonstrate novelty in their technological developments that will result in innovative solutions for the “smart gun” program.

Proposers of component devices should plan to deliver a sufficient quantity of engineering demonstration models to allow NIJ to perform an independent assessment or user evaluation of the component technology.

Universities and other academic institutions are particularly encouraged to submit proposals for innovative solutions to the “smart gun” program. NIJ anticipates making a number of awards for innovative University proposals for component development efforts up to \$100,000 each.

**C. Simulation and Training.** Proposals are encouraged that take advantage of simulation and training technologies to analyze or evaluate the application of “smart gun” technologies in specific law enforcement or corrections applications or scenarios.

Although NIJ does not intend to fund the development or purchase of simulation devices as part of this effort, devices to interface with “smart guns,” devices to equip prototype “smart guns” with feedback mechanisms, or development of specific “smart gun” test/training scenarios for the simulation or training system could be proposed.

**D. Other Areas.** NIJ encourages the submission of any research, development, and application proposals that will result in creative, innovative technologies to benefit “smart gun” applications for law enforcement and corrections personnel. All proposals in technology application, assessment, or practice areas of the “smart gun” program not addressed in the previous

focus areas will be considered. You must explain the benefit derived from your proposal that will assist “smart gun” applications for law enforcement and corrections.

## IV. Selection Criteria

NIJ is firmly committed to the competitive process for funding proposed efforts. All proposals are subjected to an independent, peer-review panel evaluation. The peer-review panel consists of members with academic, practitioner, technical, and operational expertise in the subject areas of the solicitation. Selection criteria used to evaluate proposals are as follows:

### 1. Quality and Technical Merit

- Soundness of methodology, analytic, or technical approach.
- Innovation and creativity.
- Feasibility of proposed project; awareness of pitfalls.
- Awareness of existing research and developmental work currently underway or completed, and related applications.

### 2. Impact of the Project

- Understanding the importance of the problem.
- Potential for significant advance in crime prevention, law enforcement, courts, corrections, or other practice or policy areas.
- Potential for advancement of scientific understanding of the problem area.
- Relevance to practice, including development and demonstration in application domains (if applicable).
- Affordability of proposed end products by law enforcement or corrections users (if applicable), including maintenance and training.

### 3. Capabilities, Demonstrated Productivity, and Experience of Applicants

- Qualifications and experience of personnel as related to proposed project.
- Responsiveness to the goals of the solicitation.
- Demonstrated ability to manage proposed effort.
- Adequacy of proposed project management plan including, where appropriate, a task breakdown listing expenditure of resources for each task.
- Adequacy of proposed resources to perform effort.

### 4. Budget Considerations

- Total cost relative to perceived benefit.
- Use of existing resources to conserve costs.
- Cost-effectiveness of program or product for application in the criminal justice system (if applicable).

After peer-review panelists' consideration, Institute staff make recommendations to NIJ's Director based on the results of the independent reviews. Final decisions are made by the NIJ Director following consultation with Institute staff.

## V. How to Apply

Persons interested in submitting research proposals under this solicitation must submit the required application materials. (See below for instructions on obtaining application forms and guidelines.) Applications must include the following information or completed forms to qualify for funding:

- Standard Form (SF) 424—application for Federal assistance
- **Geographic Areas Affected Worksheet—NEW FORM**
- Assurances

- Certifications Regarding Lobbying, Debarment, Suspension, and Other Responsibility Matters; and Drug-Free Workplace Requirements (one form)
- Disclosure of Lobbying Activities
- Budget Detail Worksheet
- Budget Narrative
- Negotiated indirect rate agreement (if appropriate)
- Names and affiliations of all key persons from applicant and subcontractor(s), advisors, consultants, and advisory board members. Include name of principal investigator, title, organizational affiliation (if any), department (if institution of higher education), address, phone, and fax
- Proposal abstract
- Table of contents
- Program narrative or technical proposal
- **Privacy certificate—REVISED**
- **Form 310 (Protection of Human Subjects Assurance Identification/Certification/Declaration)—NEW FORM**
- **Environmental Assessment (if required)—NEW**
- References
- Letters of cooperation from organizations collaborating in the research project
- Résumés
- Appendices, if any (e.g., list of previous NIJ awards, their status, and products [in NIJ or other publications])

**Confidentiality of information and human subjects protection.** NIJ has adopted new policies and procedures regarding the confidentiality of information and human subjects protection. Please see the *Guidelines for Submitting Proposals for National Institute of Justice-Sponsored Research* for details on the new requirements.

The Office of Justice Programs encourages integration and interoperability of information technology (IT) systems between all justice agencies and across Federal, State, and local jurisdictional boundaries. IT systems include automated information systems used by each of the justice system components (law enforcement, courts, prosecution, defense, corrections, probation and parole) in their

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internal day-to-day business and in communicating with each other. To support State and local justice integration and interoperability of these systems, OJP asked the Governor to designate a "point of contact" to provide information on IT plans and coordination in your. State and local recipients of awards that will be used in whole or in part for information systems may be required by the awarding OJP Bureau to communicate with this point of contact about their information technology plans. By increasing local communication when planning and implementing information technology, OJP funds may be used to support interoperable, rather than isolated, information systems.

The name and address of your State Information Technology Point of Contact can be obtained by calling our customer service line at 1-800-458-0786, or on the OJP web page at <http://www.ojp.usdoj.gov/ec/states.htm>.

**Page limit.** The number of pages in the "Program Narrative" part of the proposal must not exceed 30 (double-spaced pages), no matter the amount of funding requested.

**Due date.** Completed proposals **must be received** at the National Institute of Justice by 4:00 P.M. (EDT) on **July 26, 2001**. Extensions of this deadline will not be permitted.

**Award period.** In general, NIJ limits its grants and cooperative agreements to a maximum period of 12 or 24 months. However, longer budget periods may be considered.

**Applying.** Two packets need to be obtained: (1) application forms (including a sample budget worksheet) and (2) guidelines for submitting proposals (including requirements for proposal writers and requirements for grant recipients). To receive them, applicants can:

- Access NIJ's Funding Opportunities Page on the World Wide Web: (<http://www.ojp.usdoj.gov/nij/funding.htm>). NIJ application policies and forms are available as

electronic files that may be downloaded to a personal computer.

- Access the Justice Information Center on the Web: <http://www.ncjrs.org/fedgrant.htm#nij>  
This Web site offers the NIJ application forms and guidelines as electronic files that may be downloaded to a personal computer.
- Request hard copies of the forms and guidelines by mail from the National Criminal Justice Reference Service at 800-851-3420 or from the Department of Justice Response Center at 800-421-6770 (in the Washington, D.C., area, at 202-307-1480).
- Request copies by fax. Call 800-851-3420 and select option 1, then option 1 again for NIJ. Code is 1023.
- For additional information or to request mail delivery contact the National Criminal Justice Reference Service at 800-851-3420.

For further information on NIJ research, see:

- *NIJ Awards in Fiscal Year 1999* (NCJ 179016).
- *Building Knowledge About Crime and Justice: The 2000 Research Prospectus of the National Institute of Justice* (NCJ 178903).
- *National Institute of Justice Year in Review 1999* (NCJ 182948).
- *NIJ Online Research Portfolio*: <http://nij.ncjrs.org/portfolio>.

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## Notes

1. You should choose a title in block 10 of SF 424 Application for Federal Assistance for your proposal that is descriptive of your project and succinct.



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2. When estimating budget requests, investigators should note that NIJ policy prohibits the use of grant funds for operational, training, or other nonresearch costs of the project.

3. The proposal abstract, when read separately from the rest of the application, is meant to serve as a succinct and accurate description of the proposed work. Applicants must concisely describe the research goals and objectives, research design, and methods for achieving the goals and objectives. Summaries of past accomplishments are to be avoided, and proprietary/confidential information is not to be included. Length is not to exceed 400 words. Use the following two headers: (1) Project Goals and Objectives and (2) Proposed Research Design and Methodology.

**Guidance and information.** Applicants who wish to receive additional guidance and information may contact the U.S. Department of Justice Response Center at 800-421-6770. Center staff can provide assistance or refer applicants to an appropriate NIJ professional. Applicants may, for example, wish to discuss their prospective research topics with the NIJ professional staff. However, applicants are expected to obtain and carefully read application forms and proposal guidelines in advance.

**Send completed forms to:** Ten (10) copies of fully executed proposals must be received by NIJ by 4:00 P.M. (EDT) on **July 26, 2001**. Proposals must be sent to the following address:

NIJ Smart Gun Solicitation  
c/o Wendy Howe, Program Manager  
National Institute of Justice  
810 Seventh Street N.W.  
Washington, DC 20531  
[overnight courier ZIP code 20001]

For more information on the National Institute of Justice, please contact:

**National Criminal Justice Reference Service**  
Box 6000  
Rockville, MD 20849-6000  
800-851-3420

e-mail: askncjrs@ncjrs.org

You can view or obtain an electronic version of this document from the NCJRS Justice Information Center web site (<http://www.ncjrs.org>) or the NIJ web site (<http://www.ojp.usdoj.gov/nij>).

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