



NOV. 04

**NIJ**

Solicitation for Concept Papers

**Communications Technologies**

**Notice:**

You *must* submit your application using the Office of Justice Programs' automated Grants Management System. Paper applications will not be accepted. We suggest you begin the process as soon as possible. To start the process, go to <http://www.ojp.usdoj.gov/fundopps.htm>.

**Deadline:**

**Concept Papers:  
December 13, 2004**

**8 p.m. eastern time**

SL 000687

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

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Partnerships for Safer Communities  
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# Communications Technologies

## I. Introduction

The National Institute of Justice (NIJ) is the research, development, and evaluation agency of the U.S. Department of Justice and a component of the Office of Justice Programs. NIJ provides objective, independent, evidence-based knowledge and tools to enhance the administration of justice and public safety. NIJ seeks research to inform its search for the knowledge and tools to guide policy and practice.

With this solicitation, NIJ is seeking concept papers for research, development, and demonstration of emerging technology solutions for interoperable voice communications for use by public safety agencies. Solutions to inadequate and unreliable wireless communications are of particular importance to improve the safety and effectiveness of law enforcement. NIJ is interested in technical research and development to support functionality or coverage of existing communications infrastructure. Of particular interest are technologies that help increase coverage, bandwidth, and functionality by extending current technology or by developing new technology. These include systems operating at 4.9 GHz, mesh networks, fast deployable PANs, and technology to enhance land mobile radio systems.

Specific areas of interest include:

- Voice over Internet Protocol.
- Standards-based radios/systems.
- Cognitive radio.
- Software-defined radio.
- Wireless broadband data communications.

**Due date:** The due date for this concept paper is listed on the cover of this announcement and on the NIJ Web site at <http://www.ojp.usdoj.gov/nij/funding.htm>. Invited full proposals are likely to be due by March 16, 2005. Extensions to the deadlines are generally not granted.

**Page limit:** The program narrative section of your concept paper must not exceed 7 double-spaced pages in 12-point font with 1-inch margins. Abstract, table of contents, charts, figures, appendixes, and government forms do not count toward the 7-page limit for the narrative section, but should not increase the total past 10 pages. (Full proposals, for applicants who will be invited to submit them, are usually limited to 25 to 30 pages.)

**Reasons for rejection:** NIJ may reject applications that are incomplete, do not respond to the scope of the solicitation, do not comply with format requirements, or are submitted after the additions to the original submission are allowed.

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**How to submit applications to NIJ:** Funding applications instructions are in “Guidelines: How to Submit Applications,” available on the NIJ Web site at <http://www.ojp.usdoj.gov/nij/funding.htm>.

## II. Concept Paper Topics

- A. Topics to be considered:** Concept papers should focus on one or more of the technologies listed below. Novel technologies that clearly address the interoperability needs of public safety will also be accepted. NIJ is seeking concept papers that fall into one of the following five categories:
- 1. Voice over Internet Protocol:** Voice over Internet Protocol (VoIP) technology involves digitizing voice transmissions and sending packets of data through a communications network using Internet protocol. The focus of this topic is VoIP applications to radio communications (not telephony applications). Radio applications of VoIP can be used to extend coverage, provide interoperability among incompatible systems or different types of systems (e.g., SatComm and land mobile radio), optimize network utilization, and provide redundant backup capabilities. Critical issues in bringing VoIP technology to public safety include standardization of packet structure, feature support, network quality of service, and vocoders; security, particularly across multiple systems; and robust, bandwidth-sensitive vocoding capabilities.
  - 2. Standards-based radios/systems, including P25-compliant capabilities and/or technology that further the completion of the P25 suite of standards:** Developing standards is critical to solving the interoperability challenge. This topic focuses on research, development, and demonstration that can accelerate the adoption of the standards in the P25 suite. Another critical standards issue involves leveraging existing standards to ensure that new products for public safety take the greatest advantage of broader markets. For example, equipment developed in the 4.9 GHz frequency band could leverage commercial chip sets developed to standards such as 802.11 to create a lower cost product for public safety. Concept papers might propose research, development, and/or demonstrations that show how public safety agencies can leverage existing/evolving commercial standards or standards for other domains (such as transportation).
  - 3. Cognitive radio:** Cognitive radios can sense their environment and adapt performance accordingly. Cognitive radio technology has the potential to provide equipment and systems that can continually adjust to changing conditions to enhance voice

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communication quality, reliability, and efficiency. Critical issues include the ability to sense the RF environment, algorithms to determine how to adjust performance and interpret feedback to enhance performance, how to adjust performance parameters, security, how to ensure predictable behavior, and how to test cognitive radio capabilities.

**4. Software-defined radio:** Software-defined radios are radios in which the operating parameters, including frequency range, modulation type, and output power limitations, can be set or altered by software. It is a key technology to the implementation of multiband, multimode radios that could operate with a variety of radio systems, providing ubiquitous interoperability, simplifying logistical support and maintenance, and ultimately reducing costs of ownership. This technology is rapidly evolving, but there are a number of issues that remain to be addressed. These issues include security, particularly of over-the-air downloads, minimization of processor requirements (e.g., memory, power consumption) for portable units, and standard interfaces, particularly between waveforms and the underlying hardware/software configuration of the radio.

**5. Wireless broadband data communications:** Wireless communications systems are moving beyond handling just voice and low-rate data queries and responses to transmission of images and real-time video that require broadband data connectivity. Research, development, and demonstrations are requested in this area to include ad hoc networks, use of products in unlicensed frequency bands for non-mission-critical applications (e.g., WiFi, WiMax), use of commercial services, and so on. Key issues include security, coverage, ability to transmit and receive while moving, efficient bandwidth utilization, and standards.

**B. Research and development concept papers:** According to the NIJ-sponsored National Task Force on Interoperability (“When They Can’t Talk, Lives Are Lost,” February 2003, [http://www.agileprogram.org/ntfi/ntfi\\_brochure.pdf](http://www.agileprogram.org/ntfi/ntfi_brochure.pdf)), the public safety community has identified the following key problems that hamper public safety wireless communications today:

- Incompatible and aging communications equipment.
- Limited and fragmented budget cycles and funding.
- Limited and fragmented planning and coordination.
- Limited and fragmented radio spectrum.
- Limited equipment standards.

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In many cases, agencies cannot perform certain mission-critical duties. These agencies are unable to share critical voice or data information via radio with other jurisdictions in day-to-day operations and in emergency responses, including responses to acts of terrorism and natural disasters.

Because of the sheer number of State and local public safety agencies in this country, the bulk of first-responder equipment and personnel is at the local level. Given the diversity of agencies, geography, equipment, and demographics, there will be no “one-size-fits-all” solution. Instead, future solutions will need to accommodate a system-of-systems approach. Thus, this solicitation seeks concept papers proposing to develop and demonstrate public safety communications technology that will help achieve the long-term goal of creating a “system of systems” by which public safety across disciplines and jurisdictions will be fully interoperable when necessary.

NIJ is interested in projects that will promote the development of affordable public safety communications technologies that will interconnect existing systems and allow for the future development of new technologies and functionalities. These solutions would be based on mainstream technology, make use of standards, and accommodate a wide variety of local operational and technical requirements.

Applicants must describe a systems approach that is scalable. Public safety can benefit from routine interoperable communications on a daily basis. Systems must be designed to accommodate large-scale events but must also accommodate routine use to ensure that maintenance and training are up to date. Thus, future interoperability systems need to support both day-to-day activities and large-scale events.

Future systems need to be able to address the physical and proprietary barriers to interoperability. This means that they need to be able to accommodate all spectrum bands and operate with systems from all manufacturers.

Emerging public safety communications technologies should leverage mainstream technology. Public safety will benefit by sharing the cost of innovation with the much larger commercial sector. A mainstream choice will also foster innovation, competition, and open architecture, while incorporating existing systems with other technology.

NIJ seeks concept papers in the following categories:

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- Research and development of emerging technologies required for future interoperable communications solutions. This activity is meant to accelerate the development of future technology of open systems-based interoperability architectures and approaches.
  - Proof-of-concept pilot projects that demonstrate the use of open systems-based interoperable communications.
  - Test beds that demonstrate the use of new interoperability technologies in an operational environment.
  - Standards development that promotes the uniform adoption of open systems-based interoperable communications.

### III. General Requirements and Guidance

NIJ is asking you to submit a concept paper that captures the essence of a full proposal. The main difference between a concept paper and a proposal is that concept papers are much shorter and do not contain detailed budgets.

Your concept paper should state the problem under investigation (including goals and objectives of the proposed project) and the relevance of the project to public policy, practice, or theory. The narrative program section should state the research question and objectives and explain how the work will contribute to knowledge and practice. It should describe in sufficient detail the research methods and analytic strategy.

While the concept paper should not include a detailed budget or management plan, it should include a staffing plan and an estimate of the funding required, summarized by task, and a general timeframe for completion of those tasks and the project as a whole.

The format for your concept paper is as follows:

1. Abstract of no more than 400 words.
2. Program narrative.
  - a. Research question or problem.
  - b. Research goals and objectives.
  - c. Research design and methods.
  - d. Implications for knowledge and practice.
  - e. Dissemination plan for project deliverables.
  - f. Description of estimated costs.
  - g. Staffing plan.
  - h. Timeline.
3. Tables, figures, charts, and appendixes (if applicable).

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Peer reviewers will evaluate each concept paper and based on their recommendations, NIJ will invite authors of selected concept papers to submit full applications.

Instructions for submitting concept papers can be found in “Guidelines: How to Submit Applications,” (available at <http://www.ojp.usdoj.gov/nij/funding.htm>) and the Office of Justice Programs Grants Management System Handbook (available at <http://www.ojp.usdoj.gov/fundopps.htm>).

- A. Submit applications online:** Paper applications are not accepted. Applications must be submitted through the Office of Justice Programs’ online Grants Management System. NIJ suggests you begin the process early, especially if this is the first time you have used the system. To begin, go to <http://www.ojp.usdoj.gov/fundopps.htm>. There are three types of documents that can be uploaded to an application package: PDFs, Word documents, and text documents. The Grants Management System does not consider an application complete until three files are uploaded: (1) “Program Narrative.” (2) “Budget Detail Worksheet and Narrative,” and (3) “Other Program Attachments.” Upload your concept paper into the “Program Narrative” box. Concept papers do not have “Budget Detail Worksheets and Narratives” and do not have “Other Program Attachments.” Therefore, you should upload blank files into those boxes in the Grants Management System.
- B. Relevance of the project for policy and practice:** Higher quality concept papers clearly explain the practical implications of the project. They connect technical expertise with policy and practice. To ensure that the project has strong relevance for policy and practice, some researchers and technologists collaborate with practitioners and policymakers. You may include letters showing support from practitioners, but they carry less weight than clear evidence that you understand why policymakers and practitioners would benefit from your work and how they would use it. While a partnership may affect State or local activities, it should also have broader implications for others across the country.
- C. Equal opportunity for all applicants:** It is OJP’s policy that faith-based and community organizations that statutorily qualify as eligible applicants under OJP programs are invited and encouraged to apply for awards. Faith-based and community organizations will be considered for an award on the same basis as any other eligible applicants and, if they receive an award, will be treated on an equal basis with non-faith-based and community organization grantees in the administration of such awards. No eligible applicant or grantee will be discriminated against on the basis of its religious character or affiliation, religious name, or the religious composition of its board of directors or persons working in the organization.
- D. Cofunding:** A grant made by NIJ under this solicitation may account for up to 100 percent of the total cost of the project. You must indicate whether you believe it is feasible for you to



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contribute cash, facilities, or services as non-Federal support for the project. Your concept paper should identify generally any such contributions that you propose to make. If you are asked to submit a full proposal, your proposed budget should indicate in detail which items, if any, will be supported with non-Federal contributions.

- E. Number of grants to be awarded:** NIJ's grant award process is highly competitive. The number of awards to be made is subject to the availability of funds and the number and quality of applications received.
- F. When awards will be made:** All applicants, whether they are accepted or rejected, will be notified. The review and approval process for concept papers takes about 8 weeks. The review and approval process for full proposals takes about 6 months. You should not propose to begin work until at least 8 months after the concept paper deadline on the cover of this solicitation. Also, you should not expect to receive notification of a decision for at least 8 months after that date. Lists of awards are updated regularly on NIJ's Web site at <http://www.ojp.usdoj.gov/nij/funding.htm>.
- G. Financial audits are required:** If your organization spends \$500,000 or more of Federal funds during the fiscal year, you may be asked to submit an organization-wide financial and compliance audit report before any award is made. The audit must be performed in accordance with the U.S. Government Accountability Office Government Accounting Standards and must conform to Chapter 19 ("Audit Requirements") of the Office of Justice Programs' Financial Guide (available at <http://www.ojp.usdoj.gov/FinGuide>). You may include the costs of complying with these audits in the proposed budget submitted as part of your application. Detailed information regarding the independent audit is available in Office of Management and Budget Circular A-133 (available at <http://www.whitehouse.gov/omb/circulars>).
- H. An environmental assessment may be required:** All award recipients must comply with the National Environmental Policy Act (NEPA). To ensure NEPA compliance, NIJ may require some award recipients to submit additional information.
- I. Protection of confidentiality:** Federal regulations require applicants for NIJ funding to outline specific procedures for protecting private information about individuals as part of the Privacy Certificate submitted with the application package. For additional information, see "Guidelines: How to Submit Applications," <http://www.ojp.usdoj.gov/nij/funding.htm>.
- J. A DUNS number is required:** The Office of Management and Budget requires that all businesses and nonprofit applicants for Federal funds include a DUNS (Data Universal Numeric System) number in their application for a new award or renewal of an award. Applications without a DUNS number are incomplete. A DUNS number is a unique nine-digit

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sequence recognized as the universal standard for identifying and keeping track of entities receiving Federal funds. The identifier is used for tracking purposes and to validate address and point of contact information. NIJ will use the DUNS number throughout the grant life cycle. Obtaining a DUNS number is a free, one-time activity. Obtain one by calling 1-866-705-5711 or by applying online at <http://www.dunandbradstreet.com>. Individuals are exempt from this requirement.

- K. Funds cannot be used to lobby:** Under the Anti-Lobbying Act (18 U.S.C. § 1913), grantees generally may not use funds to support the enactment, repeal, or modification of any law, regulation, or policy at any level of government. For additional information on rules and regulations, see “Guidelines: How to Submit Applications” at <http://www.ojp.usdoj.gov/nij/funding.htm> and OJP’s Financial Guide at <http://www.ojp.usdoj.gov/FinGuide>.
- L. What will *not* be funded:** Typically, NIJ *does not* fund the following:
1. Provision of training or direct service.
  2. Proposals primarily to purchase equipment, materials, or supplies. (Your budget may include these items if they are necessary to conduct applied research, development, demonstration, evaluation, or analysis, but NIJ does not fund proposals that are primarily to purchase equipment.)
  3. Work that will be funded under another specific solicitation.
  4. Basic or pure research.
  5. Projects that do not involve a suitable treatment of a technology, such as the conduct of applied research, development, analysis, evaluation, or the demonstration of one or more technologies.
- M. Cost of proposed work:** If you propose a project that exceeds \$500,000, we recommend that you divide the project into phases, stages, or tasks so that NIJ can consider making an award for a specific portion of the work. NIJ cannot guarantee that subsequent phases, stages, or tasks will be funded. Such additional funding depends on NIJ’s resources and your satisfactory completion of each phase, stage, or task. Note: Deliverables (e.g., a final report) will be required at the end of each phase, stage, or task.
- N. Call for assistance:**
1. For technical guidance about using the Grants Management System, call the hotline at 1-888-549-9901.
  2. For questions about this solicitation, the research being solicited, or other NIJ funding opportunities, contact NIJ at 202-307-2942.

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## IV. Selection Criteria

NIJ is firmly committed to the competitive process in awarding grants. All concept papers and proposals are subjected to an independent peer-review panel evaluation. External peer-review panelists consider both technical and programmatic merits. Panelists are selected based on their expertise in subject areas pertinent to the proposals.

Peer-review panelists will evaluate concept papers and full proposals using the criteria listed below. Following this assessment, NIJ will then invite selected applicants to submit full proposals. Full proposals will also be peer reviewed. NIJ staff then make recommendations to the NIJ Director. The Director makes final award decisions.

Successful applicants must demonstrate the following:

**A. Understanding of the problem and its importance.**

**B. Quality and technical merit.**

1. Awareness of the state of current research or technology.
2. Soundness of methodology and analytic and technical approach.
3. Feasibility of proposed project and awareness of pitfalls.
4. Innovation and creativity (when appropriate).

**C. Impact of the proposed project.**

1. Potential for significant advances in scientific or technical understanding of the problem.
2. Potential for significant advances in the field.
3. Relevance for improving the policy and practice of criminal justice and related agencies and improving public safety, security, and quality of life.
4. Affordability and cost-effectiveness of proposed end products, when applicable (e.g., purchase price and maintenance costs for a new technology or cost of training to use the technology).
5. Perceived potential for commercialization and/or implementation of a new technology (when applicable).

**D. Capabilities, demonstrated productivity, and experience of applicants.**

1. Qualifications and experience of proposed staff.
2. Demonstrated ability of proposed staff and organization to manage the effort.
3. Adequacy of the plan to manage the project, including how various tasks are subdivided and resources are used.
4. Successful past performance on NIJ grants and contracts (when applicable).

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**E. Budget.**

1. Total cost of the project relative to the perceived benefit.
2. Appropriateness of the budget relative to the level of effort.
3. Use of existing resources to conserve costs.

**F. Dissemination strategy.**

1. Well-defined plan for the grant recipient to disseminate results to appropriate audiences, including researchers, practitioners, and policymakers.
2. Suggestions for print and electronic products NIJ might develop for practitioners and policymakers.

## V. Requirements for Successful Applicants

If you are invited to submit a proposal and your proposal is funded, you will be required to submit several reports and other materials as follows:

- A. Final report:** The final report should be a comprehensive overview of the project and should include a detailed description of the project design, data, and methods; a full presentation of scientific findings; and a thorough discussion of the implications of the project findings for criminal justice practice and policy. It must contain an abstract of no more than 400 words and an executive summary of no more than 2,500 words.

A draft of the final report, abstract, and executive summary must be submitted 90 days before the end date of the grant. The draft final report will be peer reviewed upon submission. The reviews will be forwarded to the author with suggestions for revisions. The author must then submit the revised final report, abstract, and executive summary by the end date of the grant. The abstract, executive summary, and final report must be submitted in both paper and electronic formats.

For evaluation studies, the final report should include a section on measuring program performance. This section should outline the measures used to evaluate program effectiveness, modifications made to those measures as a result of the evaluation, and recommendations regarding these and other potential performance measures for similar programs. (This information will be particularly valuable to NIJ and other Federal program agencies in implementing performance measures for federally funded criminal justice programs.)

- B. Interim reports:** Grantees must submit quarterly financial reports, semi-annual progress reports, and a final progress report. Future awards and fund drawdowns may be withheld if reports are delinquent. Post-award reporting requirements are described in "Guidelines: How to Submit Applications," available at <http://www.ojp.usdoj.gov/nij/funding.htm>.

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**C. Materials concerning protection of confidential information and human subjects:**

Recipients of NIJ research funds must comply with Federal regulations concerning the protection of private information about individuals. Recipients also must comply with Federal regulations concerning protection of human subjects. In general, all research involving human subjects that is conducted or supported by NIJ funds must be reviewed and approved by an Institutional Review Board before Federal funds are expended for that research. NIJ may also ask grant recipients for additional information related to privacy and human subjects testing.

Additional general information regarding NIJ's requirements for privacy and protection of human subjects appears in "Guidelines: How to Submit Applications," available at <http://www.ojp.usdoj.gov/nij/funding.htm>. Complete information about NIJ's requirements can be found at <http://www.ojp.usdoj.gov/nij/humansubjects>.

- D. Electronic data:** Some grant recipients will be required to submit electronic data and supporting documentation, such as a codebook or dictionary, capable of being re-analyzed and used by other researchers. The materials must be submitted by the end date of the grant. Grant applicants should ensure that the proposed timeline and budget accommodate these requirements.
- E. Performance guidelines:** As part of government-wide efforts to measure the performance of Federal funding, in May 2002, the White House issued guidance on how to evaluate the performance of Federal research programs. Research should be: (1) relevant—that is, important and appropriate for meeting the needs of the field, (2) of high quality, and (3) well-managed by grantees and well-monitored by the Federal agency. Therefore, in addition to the reporting requirements discussed above, a grantee's performance on an award made under this solicitation will be evaluated on whether the final research report was (1) relevant to the needs of the field as measured by whether the grantee's substantive scope did not deviate from the funded proposal or any subsequent agency modifications to the scope; (2) of high quality as assessed by peer reviewers; and (3) well-managed as measured by whether significant interim project milestones were achieved, final deadlines were met, and costs remained within approved limits. For more information see "Guidelines: How to Submit Applications," available at <http://www.ojp.usdoj.gov/nij/funding.htm>.

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### **Tips for Submitting Your Application**

1. Begin the application process early—especially if you have never used the online Grants Management System before. NIJ will not accept applications received after the closing date and time listed on the cover. To start the process, go to <http://www.ojp.usdoj.gov/fundopps.htm>.
2. Review “Guidelines: How to Submit Applications” for complete instructions, available at <http://www.ojp.usdoj.gov/nij/funding.htm>.
3. Although your proposal may budget for the purchase of equipment if the equipment is necessary to conduct the project, NIJ will not fund applications that are primarily to purchase equipment, materials, or supplies.
4. Call for help:
  - For technical guidance about the Grants Management System, call the hotline at 1–888–549–9901.
  - For questions about this solicitation, the research being solicited, or other NIJ funding opportunities, contact NIJ at 301–307–2942.

View or print a copy of this document from the NIJ Web site

(<http://www.ojp.usdoj.gov/nij/funding.htm>) or request one by calling NCJRS at 1–800–851–3420 or e-mailing [askncjrs@ncjrs.org](mailto:askncjrs@ncjrs.org).

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NIJ provides objective, independent, evidence-based knowledge and tools to enhance the administration of justice and public safety.

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