



**U. S. Department of Transportation  
Office of the Secretary  
of Transportation**

## **PROGRAM SOLICITATION**

### **Small Business Innovation Research Program**

**Issue Date: February 28, 2005**

**Closing Date: May 16, 2005**

**DOT SBIR Program Office, DTS-22  
U.S. DOT/RITA/VNTSC  
55 Broadway  
Cambridge, MA 02142-1093**

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# DOT PROGRAM SOLICITATION FOR SMALL BUSINESS INNOVATION RESEARCH

## I. PROGRAM DESCRIPTION

### A. Introduction

This solicitation for research proposals is issued by the United States Department of Transportation (DOT) pursuant to the Small Business Innovation Development Act of 1982, P.L. 97-219, as amended (15 U.S.C. A. 638). The SBIR program encourages small business concerns to engage in research or research and development (R/R&D) that has potential for commercialization to meet Federal research or research and development objectives.

The purposes of the SBIR program are:

- (1) To stimulate technological innovation;
- (2) To use small business to meet Federal research and research and development (R/R&D) needs;
- (3) To increase private sector commercialization of innovations derived from Federal R/R&D; and
- (4) To foster and encourage participation by minority and disadvantaged persons in technological innovation.

In consonance with the statutory obligations of the Act, the DOT has established a Small Business Innovation Research Program - hereinafter referred to as the DOT SBIR Program.

The purpose of this solicitation is to invite small businesses with their valuable resources and creative capabilities to submit innovative research proposals that address high priority requirements of the DOT.

### B. Three-Phase Program

The DOT SBIR Program is a three-phase process. **THIS SOLICITATION IS FOR PHASE I PROPOSALS ONLY.**

**Phase I.** Phase I provides support for the conduct of feasibility-related experimental or theoretical research or R/R&D efforts on research topics as described herein. The dollar value of the proposal may be up to \$100,000 unless otherwise noted and the period of performance is generally six months. The basis for

award will be the scientific and technical merit of the proposal and its relevance to DOT requirements and priorities. **Only awardees in Phase I are eligible to participate in Phase II which is by invitation only.**

**Phase II.** Phase II is the principal research or R&D effort having a period of performance of approximately two years with a dollar value of up to \$750,000 unless otherwise noted. DOT will accept Phase II proposals under the DOT SBIR Program only from firms, which have previously received a DOT Phase I award. Phase II proposals must be prepared in accordance with guidelines provided by DOT to Phase I awardees receiving an invitation to submit a Phase II proposal. Phase II awards will be based on results of Phase I efforts, technical merit, agency priority and commercial applications, and the availability of appropriated funds to support the Phase II effort. Special consideration may be given to proposals that have obtained commitments for follow-on funding from non-Federal sources for Phase III.

**Phase III.** Phase III is to be conducted by the small business with either:

- non-Federal funds to pursue commercial applications of research or R&D funded in Phases I and II
- or non-SBIR government funded contracts for continued research or products or processes intended for use by the United States Government.

### C. Eligibility

Each concern submitting a proposal must qualify as a small business at the time of award of Phase I and Phase II contracts. In addition, **the primary employment of the principal investigator must be with the small business firm at the time of contract award and during the conduct of the proposed research** unless otherwise approved by the Contracting Officer. Primary employment means that more than one-half of the principal investigator's time is spent with the small business. Also for both Phase I and Phase II, the research or R&D work must be performed in the United States. "United States" means the 50 states, the Territories and possessions of

the United States, the Commonwealth of Puerto Rico, the Commonwealth of the Northern Mariana Islands, the Trust Territory of the Pacific Islands, and the District of Columbia.

All types of small business organizations may submit proposals, including high technology, R&D, manufacturing and service firms. Companies with outstanding scientific or engineering competence in highly specialized product, process or service areas may wish to apply their expertise to the research topics in this solicitation through a laboratory prototype. Ideally, the research should make a significant contribution to the solution of an important transportation problem and provide the small business concern with the basis for new products, processes, or services.

#### **D. General Information**

This is a solicitation for Phase I research or R&D proposals on advanced, innovative concepts from small business firms having strong capabilities in applied science or engineering.

The Phase I research or R&D proposals shall demonstrate a sound approach to the investigation of an important transportation-related scientific or engineering problem categorized under one of the topics listed in Section VIII.

A proposal may respond to any of the research topics listed in Section VIII, but must be limited to one topic. The same proposal may not be submitted under more than one topic. An organization may, however, submit separate proposals on different topics, or different proposals on the same topic, under this solicitation. Where similar research is discussed under more than one topic, the proposer shall choose that topic which appears to be most relevant to the proposer's technical concept.

The proposed research must have relevance to the improvement of some aspect of the national transportation system or to the enhancement of the ability of an operating element of the DOT to perform its mission.

Proposals shall be confined principally to scientific or engineering research, which may be carried out through construction and evaluation. Proposals must be for research or R&D, particularly on advanced or innovative concepts, and shall not be for incremental or scaled-up versions of existing equipment or the development of technically proven ideas. Proposals for the development of already proven concepts toward commercialization, or which offer approaches already developed to an advanced prototype stage or for market research shall not be submitted. Commercialization is the objective of Phase III, in which private capital or non-SBIR funds are to be used to continue the innovative research supported by DOT under Phase I and Phase II.

The proposal shall be self-contained and checked carefully by the proposer to ensure that all preparation instructions have been followed.  
(See proposal checklist, Appendix D).

Requests for additional information or questions relating to the DOT SBIR Program may be addressed to:

Joseph Henebury  
DOT SBIR Program Director, DTS-22  
U.S. DOT/RITA/VNTSC  
55 Broadway  
Cambridge, MA 02142-1093

Telephone: (617) 494-2051  
Fax: (617) 494-2370  
E-Mail Address: henebury@volpe.dot.gov  
Volpe Center Web Site:  
<http://www.volpe.dot.gov/SBIR>

## II. DEFINITIONS

### A. Research or Research and Development

Research or research and development (R/R&D) means any activity which is:

- (1) A systematic, intensive study directed toward greater knowledge or understanding of the subject studied;
- (2) A systematic study directed specifically toward applying new knowledge to meet a recognized need; or
- (3) A systematic application of knowledge toward the production of useful materials, devices, and systems or methods, including design, development, and improvement of prototypes and new processes to meet specific requirements.

### B. Small Business Concern

A small business concern is one that at the time of award of Phase I and Phase II contracts meets all of the following criteria:

- (1) Is independently owned and operated, is not dominant in the field of operation in which it is proposing, and has a place of business in the United States and operates primarily within the United States or makes a significant contribution to the US economy, and is organized for profit.
- (2) Is (a) at least 51% owned and controlled by one or more individuals who are citizens of, or permanent resident aliens in, the United States or (b) it must be a for-profit business concern that is at least 51% owned and controlled by another for-profit business concern that is at least 51% owned and controlled by one or more individuals who are citizens of, or permanent resident aliens in, the United States.
- (3) Has, including its affiliates, an average number of employees for the preceding 12 months less than 500, and meets the other regulatory requirements found in 13 CFR Part 121. Business concerns are generally considered to be affiliates of one another

when either directly or indirectly, (a) one concern controls or has the power to control the other; or (b) a third party/parties controls or has the power to control both.

Control can be exercised through common ownership, common management, and contractual relationships. The term "affiliates" is defined in greater detail in 13 CFR 121.103. The term "number of employees" is defined in 13 CFR 121.106.

A business concern may be in the form of an individual proprietorship, partnership, limited liability company, corporation, joint venture, association, trust, or cooperative. Further information may be obtained at <http://www.sba.gov/size>, or by contacting the Small Business Administration's Government Contracting Area Office or Office of Size Standards.

### C. Socially and Economically Disadvantaged Small Business Concern

A socially and economically disadvantaged small business concern is one that is at least 51% owned and controlled by one or more socially and economically disadvantaged individuals, or an Indian tribe, including Alaska Native Corporations (ANCs), a Native Hawaiian Organization (NHO), or a Community Development Corporation (CDC). Control includes both strategic planning (as that exercised by boards of directors) and the day-to-day management and administration of business operations. See 13 CFR 124.109, 124.110, and 124.111 for special rules pertaining to concerns owned by Indian Tribes (including ANCs), NHOs, or CDCs, respectively.

### D. Women-Owned Small Business Concern

A small business concern is one that is at least 51% owned and controlled by a woman or women. Control includes both the strategic planning (as that exercised by boards of directors) and the day-to-day management and administration of business operations.

**E. Subcontract**

Subcontract means any agreement, other than one involving an employer-employee relationship, entered into by a Federal government funding agreement awardee calling for supplies or services required solely for the performance of the original funding agreement.

**F. Historically Underutilized Business Zone (HUBZone)**

A small business concern that meets the following criteria:

1. Located in “historically underutilized business zone” or HUBZone area located in one or more of the following:
  - a) A qualified census tract (as defined in Section 42(d)(5)(i)(1) of the Internal Revenue Code of 1986);
  - b) A qualified “non –metropolitan county” (as defined in Section 143(k)(2)(B) of the Internal Revenue Code of 1986) with a median household income of less than 80% of the State median household income or with an unemployment of not less than 140% of the Statewide average based on U.S. Department of Labor recent data; or
  - c) Lands within the boundaries of federally recognized Indian reservations.
2. Owned and controlled by one or more U.S. citizen(s).
3. At least 35% of its employees must reside in a HUBZone.

### III. PROPOSAL PREPARATION INSTRUCTIONS AND REQUIREMENTS

#### A. Limitation on Length of Proposal

**In Program Year 2005, proposals may be submitted either electronically or in hard copy format.** (See Section VI for hard copy requirements)

Please note that:

- (1) SBIR Phase I proposals shall not exceed a total of 25 pages (regular size type - no smaller than 10 point font size - single or double spaced, standard 8 1/2" X 11" pages) including proposal cover sheet, contract pricing proposal and all enclosures or attachments.
- (2) Attachments, appendices and references are included in the 25 page limitation. Proposals in excess of 25 pages will not be considered for review or award.

#### **Electronic Submission Requirements:**

- Each proposal shall not exceed 25 pages.
- Proposals must be a PDF file attached to e-mail.
- No duplicate proposals shall be sent by any other means.
- Proposals must be sent via e-mail to: [henebury@volpe.dot.gov](mailto:henebury@volpe.dot.gov).
- Proposals must be received by 5:00 p.m. EST on May 16, 2005.
- *You must submit a completed and signed hardcopy of Appendices A, B, and C postmarked no later than May 16, 2005 to: Joseph Henebury, DOT SBIR Program Director, DTS-22, U.S. DOT/RITA/VNTSC, 55 Broadway, Cambridge, MA 02142-1093.*
- The proposal file name shall contain eight (8) characters-the first three shall be the topic number you are proposing to (i.e., FH3,) and the remaining five characters shall be a unique abbreviation of your company's name.

Your proposal will have the same protection/security as DOT e-mail. It will be available to only the team of DOT engineers and/or scientists responsible for evaluating your proposal.

**If you intend to submit your proposal electronically, you must register at our website:**

<http://www.volpe.dot.gov/sbir> by April 15, 2005.

#### B. Proposal Cover Sheet

Complete the proposal cover sheet in Appendix A as Page 1 of your proposal. All pages shall be numbered consecutively, beginning with the proposal cover sheet.

#### C. Project Summary

Complete the form in Appendix B as Page 2 of your proposal. The Project Summary shall include a technical abstract with a brief statement of the problem or opportunity, project objectives, and description of the effort. Anticipated results and potential applications of the proposed research shall also be summarized in the space provided. The Project Summary of successful proposals may be published by the DOT and, therefore, shall not contain classified or proprietary information. The technical abstract must be limited to two hundred words in the space provided on the Project Summary form.

#### D. Technical Content

Submitted proposals must include the following:

- (1) **Identification and Significance of the Problem or Opportunity.** The specific technical problem or innovative research opportunity addressed and its potential benefit to the national transportation system shall be clearly stated.
- (2) **Phase I Technical Objectives.** State the specific objectives of the Phase I research or R&D effort, including the technical questions it will try to answer to determine the feasibility of the proposed approach.

(3) **Phase I Work Plan.** Describe the Phase I research or R&D plan. The plan shall indicate what will be done, where it will be done, and how the research or R&D will be managed or directed and carried out. Phase I research or R&D shall address the objectives and the questions cited in (2) above. The methods planned to achieve each objective or task shall be discussed in detail, including the level of effort associated with each task.

(4) **Related Research or R&D.** Describe significant research or R&D that is directly related to the proposal including any conducted by the project manager/principal investigator or by the proposing firm. Describe how it relates to the proposed effort, and any planned coordination with outside sources. The proposer must persuade reviewers of his or her awareness of key recent research or R&D conducted by others in the specific topic area.

(5) **Key Personnel and Bibliography of Directly Related Work.** Identify key personnel involved in Phase I including their directly related education, experience, and bibliographic information. Where vitae are extensive, summaries that focus on the most relevant experience or publications are desired and may be necessary to meet proposal page limitation.

(6) **Relationship with Future Research and Development.**

- (a) State the anticipated results of the proposed approach if the project is successful (Phase I and Phase II).
- (b) Discuss the significance of the Phase I effort in providing a foundation for Phase II research or R&D effort.

(7) **Facilities.** Provide a detailed description, availability and location of instrumentation and physical facilities proposed for Phase I.

(8) **Consultants.** Involvement of consultants in the planning and research stages of the project is permitted. If such involvement is intended, it shall be described in detail.

(9) **Potential Applications.** Briefly describe:

- (a) Whether and by what means the proposed project appears to have potential commercial application.
- (b) Whether and by what means the proposed project appears to have potential use by the Federal government.

(10) **Similar Proposals or Awards.** Warning - while it is permissible, with proposal notification, to submit identical proposals or proposals containing a significant amount of essentially equivalent work for consideration under numerous Federal program solicitations, it is unlawful to enter into contracts or grants requiring essentially equivalent effort. If there is any question concerning this, it must be disclosed to the soliciting agency or agencies before award.

If a firm elects to submit identical proposals or proposals containing a significant amount of essentially equivalent work under other Federal program solicitations, a statement must be included in each such proposal indicating:

- (a) The name and address of the agencies to which proposals were submitted or from which awards were received;
- (b) Date of proposal submission or date of award;
- (c) Title, number, and date of SBIR Program solicitations under which proposals were submitted or awards received;
- (d) The applicable research topics for each SBIR proposal submitted or award received;
- (e) Titles of research projects; and
- (f) Name and title of Project Manager or Principal Investigator for each proposal submitted or award received.

#### **E. Contract Pricing Proposal**

A firm fixed price Phase I Contract Pricing Proposal (Schedule 1) must be submitted in detail as shown in

Appendix C. Note: Firm Fixed Price is the type of contract to be used for Phase I SBIR awards. Some cost breakdown items of Appendix C may not apply to the proposed project. If such is the case, there is no need to provide information for each and every item. It is important, however, to provide enough information to allow the DOT to understand how the proposer plans to use the requested funds if the contract is awarded. Phase I contract awards may include profit.

**F. Central Contracting Registration (CCR) and DUNS Identification Number**

Since October 1, 2003, it is federally mandated that any business wishing to do business with the Federal government under a Federal Acquisition Regulation (FAR)-based contract must be registered in CCR before being awarded a contract. You can find more information on CCR and the registration process in their handbook, <http://www.ccr.gov/handbook.asp>. You can register online at [www.ccr.gov](http://www.ccr.gov) by clicking on “Start New Registration” if you already have a Data Universal Numbering System (DUNS) number. If you need a DUNS number you can find instructions at <http://www.ccr.gov/vendor.asp#5a>.

A firm must note its DUNS identification number on Appendix C, Contract Pricing Proposal, Schedule 1. This number is assigned by Dun & Bradstreet, Inc.

**G. Acknowledgement of Proposal Receipt**

Proposers shall fill out the proposal acknowledgement form and include it with the proposal to DOT.

**H. Prior SBIR Phase II Awards**

If the small business concern has received more than 15 Phase II awards in the prior 5 fiscal years, submit name of awarding agency, date of award, funding agreement number, amount, topic or subtopic title, follow-on agreement amount, source and date of commitment and current commercialization status for each Phase II. (This required proposal information shall not be counted toward the proposal 25-page count limitation.)

## IV. METHOD OF SELECTION AND EVALUATION CRITERIA

### A. General

All Phase I and Phase II proposals will be evaluated and judged on a competitive basis. Initially, all proposals will be screened to determine responsiveness to the solicitation. Proposals passing this screening will be evaluated to determine the most promising technical and scientific approaches. Each proposal will be judged on its own merit. The DOT is under no obligation to fund any proposal or any specific number of proposals on a given topic or subtopic. It may elect to fund several or none of the proposed approaches to the same topic or subtopic.

### B. Evaluation Criteria

The evaluation process involves the following factors:

- (1) Scientific and technical merit and the feasibility of the proposal's commercial potential, as evidenced by:
  - a) Past record of successful commercialization of SBIR or other research;
  - b) Existence of Phase III funding commitments from private sector or non-SBIR funding sources;
  - c) Presence of other indicators of the commercial potential of the idea.
- (2) The adequacy of the work plan and approach to achieve specified work tasks and stated objectives of the proposed effort within budgetary constraints and on a timely schedule.
- (3) Qualifications of the proposed principal/key investigator(s) including demonstrated expertise in a disciplinary field related to the particular research or R&D topic that is proposed for investigation.
- (4) Adequacy of supporting staff and facilities, equipment, and data for the successful completion of the proposed research or R&D.

### C. Prescreening

Each proposal submission will be examined to determine if it is complete and contains adequate technical and pricing data. Proposals that do not meet the basic requirements of the solicitation will be excluded from further consideration. Each proposer will be notified promptly by letter of such action.

### D. Schedule

All DOT reviews shall be completed and awards recommended within 5 months of the closing date for Phase I proposals.

### E. Program Selection

A Proposal Review Panel, chaired by the Department's SBIR Program Director and comprising senior management officials representing the Department's Operating Administrations and the Office of the Secretary, will arrange for review and evaluation of proposals by professionals, in their respective organizations, of all Phase I proposals that meet the requirements of this solicitation. The Proposal Review Panel will review the technical evaluations by the engineers and/or scientists and recommend to the DOT SBIR Program Director the proposals for awards. The DOT SBIR Program Director will announce the awards.

### F. Contact with DOT

Contact with DOT relative to this solicitation during the Phase I proposal preparation and evaluation period is restricted for reasons of competitive fairness. Technical questions pertaining to the 2005 DOT SBIR solicitation research topics must be submitted to the DOT SBIR Program Office by e-mail: [henebury@volpe.dot.gov](mailto:henebury@volpe.dot.gov). Technical questions will be researched and answers provided in as timely a manner as possible. Technical questions submitted to the DOT SBIR Program Office during the few weeks prior to the closing date for receipt of Phase I proposals may not be able to be answered before the closing date.

No information on proposal status will be available until the complete list of 2005 Phase I Award

Recommendations is posted on the DOT SBIR Program Web Page: <http://www.volpe.dot.gov/sbir>. For planning purposes the notification of 2005 Phase I Award Recommendations is expected to be posted on the DOT SBIR Program Web Page by October 1, 2005. **Phase I proposals which are not included in the October 1st list of 2005 Phase I Award Recommendations will not receive an award. NO WRITTEN CORRESPONDENCE REGARDING PROPOSAL STATUS WILL BE ANSWERED.**

After the 2005 Phase I Award Recommendations are posted on the DOT SBIR Program Web Page, a debriefing comprised of the overall comments on the proposal may be provided to the proposer upon request.

Debriefing requests should be submitted to the Contracting Officer by e-mail to: [William.H.Moore@volpe.dot.gov](mailto:William.H.Moore@volpe.dot.gov), and must include the proposer's name, address, research topic number, and the proposal identification number assigned on the acknowledgement of receipt card. The identity of the evaluators will not be disclosed.

## V. CONSIDERATIONS

### A. Awards

It is estimated that during Fiscal Year 2005, DOT will award approximately 8 Phase I contracts with an anticipated potential maximum of 9 awards, depending on actual funding available and the responses from small business firms to the solicited research topics in Section VIII.

All Phase I awards will be firm fixed price contracts and may be up to \$100,000 each unless otherwise noted. Phase II awards anticipate cost-plus-fixed-fee contracts with a value of up to \$750,000 each unless otherwise noted. Phase II awardees will be required to have an acceptable accounting system to receive a cost-plus-fixed-fee contract.

Only recipients of Phase I contracts will be eligible to compete for Phase II awards.

DOT's Operating Administrations contribute to SBIR funding. Each Operating Administration's contribution may be used only to support research of concern to that Operating Administration. For example, funds furnished by the Federal Highway Administration may not support research solely of concern to the National Highway Traffic Safety Administration. Based on anticipated funding levels, there may not be adequate funding within the DOT SBIR Program to support Phase I and/or Phase II awards for research which is solely of concern to the following Operating Administrations: Federal Aviation Administration, Federal Highway Administration, Federal Motor Carrier Safety Administration, Federal Railroad Administration, Federal Transit Administration, National Highway Traffic Safety Administration, Research and Innovative Technologies Administration and Pipeline Hazardous Materials Safety Administration. Phase I and Phase II awards for such research will depend on the actual funding available.

### B. Reports

Under Phase I SBIR contracts, three reports will be required, consisting of two interim letter reports, and a comprehensive final report.

### C. Payment Schedule

Payments for Phase I contracts will be made in three equal installments upon submission of invoices by the

contractor in conjunction with the submission of acceptable reports as described in paragraph B above.

### D. Innovations, Inventions, and Patents

1. **Proprietary Information.** Information contained in unsuccessful proposals will remain the property of the proposer. The Government may, however, retain copies of all proposals. Public release of information in any proposal submitted will be subject to existing statutory and regulatory requirements.

If proprietary information is provided by a proposer in a proposal which constitutes a trade secret, proprietary commercial or financial information, confidential personal information or data affecting the national security, it will be treated in confidence, to the extent permitted by law, provided this information is clearly marked by the proposer with the term "confidential proprietary information" and provided the following legend appears on the title page of the proposal:

"For any purpose other than to evaluate the proposal, these data shall not be disclosed outside the Government and shall not be duplicated, used, or disclosed in whole or in part, provided that if a contract is awarded to this proposer as a result of or in connection with the submission of these data, the Government shall have the right to duplicate, use, or disclose the data to the extent provided in the contract. This restriction does not limit the Government's right to use information contained in the data if obtained from another source without restriction. The data subject to this restriction is contained pages \_\_\_\_\_ of this proposal."

Any other legend may be unacceptable to the Government and may constitute grounds for return of the proposal without further consideration and without assuming any liability for inadvertent disclosure. The Government will limit dissemination of such information to within official channels.

The DOT prefers that proposers avoid inclusion of proprietary data in their proposals. If the inclusion of proprietary data is considered essential for meaningful evaluation of a proposal submission, then such data

should be provided on a separate page with a numbering system to key it to the appropriate place in the proposal.

2. **Rights in Data Developed under SBIR**

**Contracts.** Rights in technical data, including software developed under any contract resulting from this solicitation, shall remain with the contractor except that the Government shall have the limited right to use such data for Government purposes and shall not release such data outside the Government without permission of the contractor for a period of four years from completion of the project from which the data were generated. However, effective at the conclusion of the four-year period, the Government shall retain a royalty-free license for Federal government use of any technical data delivered under an SBIR contract whether patented or not.

3. **Copyrights.** With prior written permission of the Contracting Officer, the contractor normally may copyright and publish (consistent with appropriate national security considerations, if any) material developed with DOT support. The DOT receives a royalty-free license for the Federal government and requires that each publication contain an appropriate acknowledgement and disclaimer statement.

4. **Patents.** Small business firms normally may retain the principal worldwide patent rights to any invention developed with Government support. The Government receives a royalty-free license for Federal government use, reserves the right to require the patent holder to license others in certain circumstances, and requires that anyone exclusively licensed to sell the invention in the United States must normally manufacture it domestically. To the extent authorized by 35 U.S.C. 205, the Government will not make public any information disclosing a Government-supported invention for a two-year period to allow the contractor a reasonable time to pursue a patent.

**E. Cost-Sharing**

Cost-sharing is permitted for Phase II proposals under the topic areas identified in this solicitation; however, cost-sharing is not required nor will it be a factor in proposal evaluations.

**F. Profit or Fee**

A profit is allowed on awards to small business concerns under the DOT SBIR Program.

**G. Joint Ventures or Limited Partnerships**

Joint ventures and limited partnerships are permitted provided the entity created qualifies as a small business concern in accordance with the Small Business Act, 15 U.S.C. 631, and the definition included in this solicitation.

**H. Research and Analytical Work**

1. **For Phase I, a minimum of two-thirds of the research and/or analytical effort must be performed by the proposing firm** unless otherwise approved in writing by the Contracting Officer.

2. **For Phase II, a minimum of one-half of the research and/or analytical effort must be performed by the proposing firm** unless otherwise approved in writing by the Contracting Officer.

**I. Contractor Commitments**

Upon award of a contract, the awardee will be required to make certain legal commitments through acceptance of numerous contract clauses. The outline that follows is illustrative of the types of clauses to which the contractor would be committed. This list shall not be understood to represent a complete list of clauses to be included in Phase I contracts, nor to be the specific wording of such clauses. A complete copy of terms and conditions will be provided upon issuance of the model contract for signature prior to award.

1. **Standards of Work.** Work performed under the contract must conform to high professional standards.

2. **Inspection.** Work performed under the contract is subject to Government inspection and evaluation at all times.

3. **Examination of Records.** The Comptroller General (or a duly authorized representative) shall have the right to examine any directly pertinent records of the contractor involving transactions related to this contract.

4. **Default.** The Government may terminate the contract if the contractor fails to perform the work contracted. offered to any representative of the Government to secure the contract.
  5. **Termination for Convenience.** The contract may be terminated at any time by the Government if it deems termination to be in its best interest, in which case the contractor will be compensated for work performed and for reasonable termination costs.
  6. **Disputes.** Any dispute concerning the contract which cannot be resolved by agreement shall be decided by the Contracting Officer with right of appeal.
  7. **Contract Work Hours.** The contractor may not require an employee to work more than eight hours a day or forty hours a week unless the employee is compensated accordingly (i.e., overtime pay).
  8. **Equal Opportunity.** The contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, or national origin.
  9. **Affirmative Action for Veterans.** The contractor will not discriminate against any employee or applicant for employment because he or she is a disabled veteran or veteran of the Vietnam era.
  10. **Affirmative Action for Handicapped.** The contractor will not discriminate against any employee or applicant for employment because he or she is physically or mentally handicapped.
  11. **Officials Not to Benefit.** No member of or delegate to Congress shall benefit from the contract.
  12. **Covenant Against Contingent Fees.** No person or agency has been employed to solicit or secure the contract upon an understanding for compensation except bonafide employees or commercial agencies maintained by the contractor for the purpose of securing business.
  13. **Gratuities.** The contract may be terminated by the Government if any gratuities have been
  14. **Patent Infringement.** The contractor shall report each notice or claim of patent infringement based on the performance of the contract.
  15. **Procurement Integrity.** Submission of a proposal under this solicitation subjects the proposer to the procurement integrity provision (§27) of the Office of Federal Procurement Policy Act (41 U.S.C. 423). This statute, as implemented by Federal Acquisition Regulation (FAR, 48 CFR) §3.104, proscribes the following conduct by competing contractors during an agency procurement: offering or discussing future employment or business opportunities with an agency procurement official; promising or offering a gratuity to an agency procurement official; and/or soliciting or obtaining proprietary or source selection information regarding the procurement. Violations of the statute may result in criminal and/or civil penalties, disqualification of a proposer, cancellation of the procurement, or other appropriate remedy.
  16. **Section 508 Access Board Standards .**  
All electronic and information technology deliverables rendered must comply with Section 508 of the Rehabilitation Act and the Access Board Standards available for viewing at <http://www.section508.gov>. Unless otherwise indicated, the contractor represents by signature on a contract that all deliverables will comply with the Access Board Standards.
- J. Additional Information**
1. This solicitation is intended for informational purposes and reflects current planning. If there is any inconsistency between the information contained herein and the terms of any resulting SBIR contract, the terms of the contract are controlling.
  2. Before award of an SBIR contract, the Government may request the proposer to submit certain organizational, management, personnel, and financial information to assure responsibility of the proposer.

3. The Government is not responsible for any monies expended by the proposer before award of any contract. previously been, nor is currently being paid for essentially equivalent work by any agency of the Federal government.
4. This solicitation is not an offer by the Government and does not obligate the Government to make any specific number of awards. Also, awards under this program are contingent upon the availability of funds.
5. The DOT SBIR Program is not a substitute for existing unsolicited proposal mechanisms. Unsolicited proposals shall not be accepted under the DOT SBIR Program in either Phase I or Phase II. See <http://www.volpe.dot.gov/procure/unsolguide.com> for specifics on unsolicited proposal submission requirements.
6. If an award is made pursuant to a proposal submitted under this solicitation, the contractor will be required to certify that he or she has not
7. When purchasing equipment or a product with funds provided under the DOT SBIR Program, purchase only American made equipment and products, to the extent possible in keeping with the overall purposes of the program.
8. In accordance with FAR 52.233-2, Service of Protest, the following Service of Protest procedures shall be followed. Protests, as defined in Section 33.101 of the FAR that are filed directly with an agency, and copies of any protests that are filed with the Government Accountability Office (GAO), shall be served on the Contracting Officer (addressed as follows) by obtaining written and dated acknowledgement of receipt from: William H. Moore, DOT/RITA/Volpe Center, 55 Broadway, DTS-853, Cambridge, MA 02142-1093

## VI. SUBMISSION OF PROPOSALS

### A. Submittal Instructions

#### Hard Copy Requirements:

An original and four copies of each proposal submitted under the DOT SBIR Program shall be sent to:

Joseph Henebury  
DOT SBIR Program Director, DTS-22  
U.S. DOT/RITA/VNTSC  
55 Broadway  
Cambridge, MA 02142-1093  
Telephone: (617) 494-2051

Proposals must be postmarked NO LATER than May 16, 2005 to qualify for acceptance and consideration under the current DOT SBIR Program. Proposals postmarked or received via e-mail later than May 16, 2005 will not be accepted.

Proposals delivered to the DOT SBIR Program Office by any means other than the U.S. Postal Service, must be received at the above address on or before May 16, 2005.

#### Electronic Submission Requirements:

- Each proposal shall not exceed 25 pages.
- All proposals must be a PDF file attached to e-mail.
- No duplicate proposals shall be sent by any other means.
- Proposals must be sent via e-mail to: [henebury@volpe.dot.gov](mailto:henebury@volpe.dot.gov).
- Proposals must be received by 5:00 p.m. EST on May 16, 2005.
- *You must submit a completed and signed hardcopy of Appendices A, B, and C postmarked no later than May 16, 2005 to: Joseph Henebury, DOT SBIR Program Director, at above address.*

- The proposal file shall contain eight (8) characters-the first three shall be the topic number you are proposing to (i.e., FH3), and the remaining five characters shall be a unique abbreviation of your company's name.

Your proposal will have the same protection/security as DOT e-mail. It will be available to only the team of DOT engineers and/or scientists responsible for evaluating your proposal.

#### If you intend to submit your proposal electronically you must register at our website:

<http://www.volpe.dot.gov/sbir> by April 15, 2005.

### B. Additional Information

1. **Bindings.** Please do not use special bindings or covers. Staple the pages in the upper left corner of the cover sheet of the proposal with a single staple.
2. **Packaging.** All hardcopies of the paper proposal shall be sent in one package together with the acknowledgement form which appears on the last page of this document.
3. **Confirmation.** The DOT SBIR Program Office will assign an identification number to each paper of email proposal received at the above address by May 31, 2005. This number will appear on the proposal acknowledgement form which will be sent to the proposer by return mail confirming receipt of the proposal.

**Proposers who submitted their proposals electronically will receive their proposal number via e-mail no later than May 31, 2005**

## VII. SCIENTIFIC AND TECHNICAL INFORMATION SOURCES

The following organizations may be sources for providing technology search and/or document services and may be contacted directly for service and cost information:

Center for Technology Commercialization  
1400 Computer Drive  
Westborough, MA 01581  
(508) 870-0042

Federal Information Exchange, Inc.  
555 Quince Orchard Road, Suite 360  
Gaithersburg, MD 20878  
(301) 975-0103

Midcontinent Technology Transfer Center  
Texas Engineering Extension Service  
The Texas A&M University System  
301 Tarrow Street, Suite 119  
College Station, TX 77840-7896  
(409) 845-8762

MidAtlantic Technology Applications Center  
University of Pittsburgh  
3400 Forbes Avenue, 5<sup>th</sup> Floor  
Pittsburgh, PA 15260  
(412) 383-2500

Great Lakes Industrial Technology Center  
25000 Great Northern Corporation Center, Suite 260  
Cleveland, OH 44070-5320  
(440) 734-0094

Southern Technology Applications Center  
University of Florida  
1900 SW 34<sup>th</sup> Street, Suite 206  
Gainesville, FL 32608  
(352) 294-7822

National Technical Information Service  
5285 Port Royal Road  
Springfield, VA 22161  
(800) 553-6847

Technology Transfer Center  
University of Southern California  
3716 South Hope Street, Suite 200  
Los Angeles, CA 90007-4344  
(213) 743-2352

## VIII. RESEARCH TOPICS

Phase I research topics for DOT Operating Administrations are listed below. These topics indicate the specific areas for which proposals are to be considered for acceptance by DOT. The topics are not listed in any order of priority. Each proposal must respond to one (and only one) topic as described in this section. A proposal may, however, indicate and describe its relevance to other topics.

<b>DOT OPERATING ADMINISTRATION/TOPIC</b>	<b>POTENTIAL MAXIMUM FY05 PHASE I AWARDS</b>
<b>FEDERAL HIGHWAY ADMINISTRATION (FHWA)</b>	<b>3 AWARDS</b>
05-FH1 <sup>1</sup> Compact Laser Shearography System for Crack Detection	
05-FH2 <sup>1</sup> Low Cost Workzone Collision Warning System	
05-FH3 <sup>1</sup> Accurate Measurement of Signature, Speed, Acceleration and Jerk (SSAJ) with inductive loops for Intersection Collision Avoidance (ICA), Red Light Running Prevention (RLRP) Systems and Origin Destination (O-D)	
<sup>1</sup> Phase I may be up to \$96,000 and Phase II may be up to \$720,00	
<b>RESEARCH AND INNOVATIVE TECHNOLOGY ADMINISTRATION (RITA)</b>	<b>3 AWARDS</b>
05-RT1 Use of Remotely Piloted Vehicles (RPV) to conduct traffic analysis audits for transportation management systems	
05-RT2 Use of Remotely Piloted Vehicles (RPV) – Zeppelins to create “as built” plans for transportation infrastructures and roadway inventory	
05-RT3 Use of Remotely Piloted Vehicles (RPV) – to create “as built” plans for transportation infrastructures and roadway inventory for improved maintenance, and emergency preparedness and management	
<b>PIPELINE AND HAZARDOUS MATERIALS SAFETY ADMINISTRATION</b>	<b>1 AWARD</b>
05-PH1 Innovative Safety, Reliability and Inspection Technologies for Pipeline Safety	
<b>FEDERAL AVIATION ADMINISTRATION</b>	<b>1 AWARD</b>
05-FA1 Development of a low cost, voice activated cockpit for General Aviation (GA) aircraft and helicopters for use in Precision Visual Flight Rules (PVFR) operations.	

# Federal Highway Administration (FHWA)

## **05-FH1<sup>1</sup> Compact Laser Shearography System for Crack Detection**

The Federal Highway Administration has a critical need for nondestructive technology that can measure very fine cracks (<1 micron) in steel or concrete. Laser shearography is such a method, which is already being used in a number of industries such as aerospace. It employs a single beam of laser light which is reflected off the specimen. The camera then produces a pair of laterally sheared images in the image plane and hence the method is called shearography. The effect of shearing is to map a point on the image into two points in the image. The two overlapped portions of the sheared images interfere and produce a speckle pattern. When the object is deformed, the speckle pattern is slightly modified. Comparing the two speckle patterns (stressed and unstressed) produces a fringe pattern which depicts the relative displacement of two neighboring points. Since the magnitude of shearing is small, the fringe pattern approximately represents the derivative of displacement with respect to the shearing direction. This differs from conventional holography which depicts displacement rather than its derivative. This difference from holography results in shearography being much less sensitive to external vibration interference and hence much more suitable for production and field environments.

As a preliminary test of the method, a commercial laser shearography system was applied to existing concrete specimens in which cracking had been induced. The method was able to find cracks which were not visible by optical microscopy, implying a resolution of less than 10  $\mu\text{m}$ . What is now needed is a laser shearography system that is specifically adapted to the needs of the highway inspection community. It should be rugged, portable, low-cost and capable of being used in hard to access places.

## **05-FH2<sup>1</sup> Low Cost Workzone Collision Warning System**

Reducing the number of fatalities and crashes is a major goal of FHWA, the States and their contractors in improving highway safety. Fatalities in highway work zones reached 1028 in 2003.

Rear-end collision fatalities in work zones are disproportionately high, accounting for 15% of all highway fatalities, while the non-work zone counterparts accounted for only 5%. Some studies indicated that large speed differentials, difficult spots in work zones such as cross-overs and entrance ramps, and speeding are major factors to cause rear-end crashes. The deployment of some type of system to deal with these problems would greatly lower the risk of rear-end collision, and the benefit from this project would be significant.

Phase I of this project would design and test 20 low-cost workzone collision warning system units, based on previous research results and specifications (University of Michigan, etc.). Each of the units must include integrated LED warning lights, speed sensors, and wireless communication modules. A central wireless coordination unit will also be designed and built. Based on the University's simulator experiments, such a real-time warning system could effectively alert drivers and slow down the speed when the vehicles are really in risk of collision and the speed really needs to be reduced.

In this concept, fast vehicles (yellow) approaching the end of slow traffic flow (red) would meet green light workzone collision warning system units first, then meet yellow and red light workzone collision warning system units as they approach slow vehicles. In this way, the driver would be alerted to the risk of collision if their speed is not reduced to a safe level. The required design would use integrated units (including lights) mounted on top of traffic control drums.

Phase II of this proposal would develop a manufacturing prototype, test the advanced manufacturing prototype in a driver simulation laboratory, modify Corsim to simulate its operation and demonstrate its use in a work zone.

This project requires significant experience in sensors, traffic engineering, work zones, and manufacturing. Although not required, it would be helpful if proposers provide working samples of their work with sensors and displays.

## **05-FH3<sup>1</sup> Accurate Measurement of signature, speed, acceleration and jerk (SSAJ) with inductive loops for Intersection Collision Avoidance (ICA), Red Light Running Prevention (RLRP) systems and Origin Destination (O-D)**

Advanced real time traffic logic (NCHRP 3-66 advanced signal transition logic & TrEPS), ICA and RLRP systems running on the Real Time Linux Operating System (RTLOS) for the Advanced Transportation Controller (ATC) require accurate measurement of the signal from inductive loops to produce vehicle signature, speed, acceleration and jerk (SSAJ) rather than a simple on/off pulse. This project would utilize advanced technologies building on research done by PATH and other researchers and existing loop detector technology rather than building new sensors entirely from scratch. This sensor would enable [1] vehicle tracking through networks purposes such as TrEPS, origin destination (O-D) studies, queue estimation, and surface street incident detection and [2] accurate prediction of vehicle trajectories for intersection collision avoidance and red light running prevention systems. The unit would have to be licenseable so that other vendors could adapt it for their proprietary sensors.

Phase I would develop and demonstrate prototype software and hardware embodying a simplified version of the SSAJ and demonstrate its use with the ATC, the ATC API and the Los Angeles ATC software. To encourage research, the unit should have the signature processor as a separate hardware module with loadable software & documented interfaces by which others could develop software to run on it. Phase I would determine what the “real time” needs and accuracies are for the SSAJ and what outputs from the SSAJ would be suitable for traffic control applications. Ways for the SSAJ to communicate with the ATC via the serial communications bus, ATC Ethernet, and the NTCIP 1211 protocol would be examined. The software and hardware would be demonstrated using real world ATC, loops and speed measurement equipment.

Phase II, staged to produce interim demonstratable results, would enhance the SSAJ. The last segment of Phase II would add the ability to the ATC LA software to track vehicles from one sensor to another. This would enable ATC controllers to perform trajectory and link to link tracking as a step towards implementing the NCHRP 3-66 signal transition logic & adding the capability of conducting low cost O-D studies. The TEXAS simulation model should be modified to run with the SSAJ in the loop via the Controller Interface Device. This project requires significant experience in inductive loops, traffic engineering, real time Linux for embedded applications, and programming of traffic signal controllers.

Although not required, it would be helpful if proposers provide working samples of their work with inductive loop detectors and advanced sensing. Strong consideration should be given to using the Real Time Linux and interfaces being developed under SBIR Research Topic No. 03-FH5.

<sup>1</sup> Phase I may be up to \$96,000 and Phase II may be up to \$720,00

## **Research and Innovative Technology Administration (RITA)**

### **05-RT1 Use of Remotely Piloted Vehicles (RPV) to conduct traffic analysis audits for transportation management systems**

RITA’s remote surveillance program has proved the potential for using RPVs to collect data on traffic flow. By collecting this data at higher resolutions and frame rates and using differential Global Positioning System (GPS) data along with Atomic Clock time, it might be possible to use RPVs for detailed surveys of traffic flows. Through data fusion, a traffic management system could combine the wide area data collection of an aerial vehicle with the narrow area video data of surface based traffic monitoring technologies, such as the Virginia Research Council SmartTravel Van, and freeway-management camera systems. Use of LIDAR (Light Detection and Ranging) and multi-spectral imaging might provide unique insight into the response of traffic to hazardous materials and other incidents in the context of the surrounding transportation infrastructure. Use of stereo imaging would expedite the identification and tracking of vehicles in real time around incidents. Under an open source license such as the GNU General Public License, analytic software might be developed.

Data fusion between different aerial sensors and between aerial sensors and ground-based sensors would allow a high fidelity analysis of the data. This would allow a full analysis of the transportation facility within the transportation environment as well as the construction of very realistic simulator environments for learning how to better manage traffic incidents.

This project would create open source software to analyze high resolution imagery data of transportation flow and merge it with the high resolution data from surface data collection systems such as the VDOT Data Collection Van and traffic control and surveillance systems.

### **05-RT2 Use of Remotely Piloted Vehicles (RPV) – Zeppelins to create “as built” plans for transportation infrastructures and roadway inventory**

RITA’s remote surveillance program has proved the potential for using RPVs to collect data on transportation structures. By collecting the data at higher resolutions and frame rates and using differential Global Positioning System (GPS) data along with Atomic Clock time, it might be possible to use RPVs for detailed surveys of roads within their topographical environment. However, model airplane RPVs have limited flight time and cannot hover while remotely piloted helicopters have a catastrophic failure mode. This project would utilize a model Zeppelin to combine the mobility of the model airplane with the hovering capability of the model helicopter. Current model airplanes require larger landing fields and highly skilled pilots for landing.

Use of a model zeppelin would allow a higher sensor payload without a high fuel penalty. Data fusion between different aerial sensors with the higher sensor payload and lower vibration platform would allow a higher fidelity analysis of the data. This would allow a more detailed identification of the transportation infrastructure for emergencies affecting transportation and ensure transportation readiness during civilian and national security crises.

This project would create open source software to merge high resolution imagery data of transportation infrastructure with the FHWA Data Collection Van by utilizing a stable low vibration aerial vehicle with a safe failure mode and requiring a less skilled remote pilot because of the simpler take offs and landing features of the Zeppelin.

### **05-RT3 Use of Remotely Piloted Vehicles (RPV) – to create “as built” plans for transportation infrastructures and roadway inventory for improved maintenance, and emergency preparedness and management**

RITA’s remote surveillance program has proved the potential for using RPVs to collect data on transportation structures. By collecting the data at higher resolutions and frame rates and using differential Global Positioning System (GPS) data and Atomic Clock time, it might be possible to use RPVs for detailed surveys of roads within their topographical environment. By combining the wide area data collection of an aerial vehicle with the narrow area data of FHWA’s Digital Highway Measurement Van, it would be possible to create as-built plans with the surrounding terrain, plant, structure, and signage data. Use of LIDAR (Light Detection and Ranging) and multi-spectral imaging would facilitate examination of the condition and location of transportation structures and roadside flora. Stereo imaging would determine the location of signage and utilities in and near the right of way.

Data fusion between different aerial sensors and between aerial sensors and ground-based sensors would produce a high fidelity analysis of the data, and thereby facilitate the creation of a full assessment of the transportation facility within its surroundings as well as the construction of very realistic simulator environments. It would also allow detailed identification of the transportation infrastructure for emergencies affecting transportation and ensure transportation readiness during natural catastrophes and national security emergencies.

This project has the potential to create open source software to analyze high-resolution imagery data of transportation infrastructure and merge it with the high-resolution data from the FHWA Highway Data Collection Van.

## **Pipeline and Hazardous Materials Safety Administration**

### **05-PH1 Innovative Safety, Reliability and Inspection Technologies for Pipeline Safety Integrity Management**

America receives over two-thirds of the crude and petroleum products for more than 55 million residential and commercial customers, through more than 160,000 miles of pipelines (based on year 2004 liquid pipeline operator national mileage information). In addition, over 326,000 miles of gas transmission pipeline transport natural gas to local companies that

distribute it to local customers. This supply of energy has too often been disrupted by local pipeline leaks. PHMSA/OPS has designed a SBIR topic for 2005 to help address this continuing problem. The focus areas described below support the DOT Secretary's strategic vision of using SBIR funds to develop "safer, simpler and smarter transportation solutions".

Historically, mechanical damage is the single largest cause of failures on pipelines (transporting both natural gas and hazardous liquids). Mechanical damage usually occurs after a pipeline has been constructed and is caused by excavation equipment, which deforms the shape of the pipe, scrapes away metal and coating resulting in changes to the mechanical properties of the pipe near the damage.

Phase I research is sought on the use of innovative tools or concepts that allow for enhancing process management, pipeline monitoring and detection of metal loss due to mechanical damage in liquid and or natural gas applications. Areas of interest include but are not limited to:

1. Pipeline Integrity management software tools.

As an oversight tool, the development and demonstration of a dynamic database, for safe, smart operation of pipeline transportation infrastructure. From the process management perspective, this tool could integrate the process. Anticipated results from this effort are: a single database to support the requirements of an Integrity Management Plan while providing active notification protocols, critical punch list, and forms or documentation automation with timelines. At the tasking level, the tool could identify ordered, activities, notification and status distribution in accordance with Pipeline and Hazardous Materials Safety Administration's, Office of Pipeline Safety protocols. This innovative workflow, process based, decision database provides enhancements within operator's integrity management plans. Proposals are sought for a fully working prototype tool to assist operators of all sizes to manage protocol process areas with respect to their Integrity Management Plan.

2. Cost effective technologies for pipeline coating assessment and fingerprinting

Various types of coating materials are used on pipelines. The American Society for Testing and Materials (ASTM) and other organizations developed procedures and standards to determine a materials' endurance for use in the pipeline industry. New inspection techniques or technologies for accurate coating condition assessment provide information that could be compared to its original manufacture specifications in addition to fingerprinting current specific coating conditions. Anticipated results would provide quantifiable and reliable improvements of in-field repairs. Proposals are sought to develop and demonstrate improved pipeline coating assessment and fingerprinting technologies.

3. Risk base probability modeling

Risk base probability modeling to assess consequences of pipeline failure will assist industry and regulators towards baselining Direct Assessment (DA) issues with natural gas and hazardous materials pipelines. While the categories and statistics of failures are evident from the Office of Pipeline Safety incident data. An analytical framework model to calculate the risk probability or consequence of rupture that consider distance from pipeline, product carried, pressure, pipeline composition and vintage could provide a valuable tool towards pipeline safety analysis for DA. Proposals to develop and demonstrate a risk based model incorporating additional engineering information from industry on external corrosion, stress corrosion cracking, internal corrosion, girth weld defects, seam defects, and rock impingement are sought to assess all consequences of pipeline failures.

## **FEDERAL AVIATION ADMINISTRATION (FAA)**

### **05-FA1 Development of a low cost, voice activated cockpit for General Aviation (GA) aircraft and helicopters for use in Precision Visual Flight Rules (PVFR) operations.**

The concept of PVFR is based on the hypothesis that aircraft navigating precisely, using Wide Area Augmentation System (WAAS) Global Positioning System (GPS) navigation capabilities, within narrow, obstacle-protected airways can reduce Controlled Flight Into Terrain (CFIT) accidents when operating under marginal Visual Meteorological Conditions (VMC) or other disorientating, potentially dangerous conditions such as very dark night conditions in obstacle rich environments.

Develop a prototype voice activated cockpit that will allow a pilot operating in marginal VMC to manipulate controls via voice commands and receive voice feedback for verification of settings.

Create a system where tasks usually accomplished by looking at an item and manually entering data, turning knobs, or pushing buttons are accomplished via voice commands.

Create a system that provides audio feedback based on settings accomplished via voice commands.

## **IX. SUBMISSION FORMS AND CERTIFICATIONS**

- |    |                               |            |
|----|-------------------------------|------------|
| 1. | PROPOSAL COVER SHEET          | Appendix A |
| 2. | PROJECT SUMMARY               | Appendix B |
| 3. | CONTRACT PRICING PROPOSAL     | Appendix C |
| 4. | PROPOSAL CHECKLIST            | Appendix D |
| 5. | PROPOSAL ACKNOWLEDGEMENT FORM | Appendix E |

**U.S. DEPARTMENT OF TRANSPORTATION  
SMALL BUSINESS INNOVATION RESEARCH PROGRAM  
SOLICITATION NO. DTRT57--5-R-SBIR**

**PROPOSAL COVER SHEET**

Project Title \_\_\_\_\_

Research Topic No. \_\_\_\_\_ Research Topic Title \_\_\_\_\_

Submitted by: Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip + \_\_\_\_\_

Amount Requested (Phase I) \$ \_\_\_\_\_  
(May be up to \$100,000 unless otherwise indicated)

Proposed Duration \_\_\_\_\_  
(in months) (Not to exceed six months)

1. The above concern certifies it is a small business firm and meets the definition stated in Section II.B; and that it meets the eligibility requirement in Section I.C. Yes \_\_\_\_\_ No \_\_\_\_\_
  
2. The above concern certifies it \_\_\_\_\_ does \_\_\_\_\_ does not qualify as a minority and disadvantaged small business as defined in Section II.C. (For statistical purposes only.)
  
3. The above concern certifies it \_\_\_\_\_ does \_\_\_\_\_ does not qualify as a women-owned small business as defined in Section II.D. (For statistical purposes only.)
  
4. This firm and/or Principal Investigator has submitted proposals containing a significant amount of essentially equivalent work under other federal program solicitations, or has received other federal awards containing a significant amount of essentially equivalent work. (If yes, identify proposals in the Section III. D.10. "Similar Proposals or Awards".) Yes \_\_\_\_\_ No \_\_\_\_\_
  
5. Will you permit the Government to disclose the title and technical abstract of your proposed project, plus the name, address, and telephone number of the Corporate/Business Official and Principal Investigator of your firm, if your proposal does not result in an award, to any party that may be interested in contacting you for further information? Yes \_\_\_\_\_ No \_\_\_\_\_
  
6. Do you qualify as a HUBZone-owned and meet the definition as stated in this solicitation? (For statistical purposes only) Yes \_\_\_\_\_ No \_\_\_\_\_

Principal Investigator  
Name \_\_\_\_\_  
Title \_\_\_\_\_  
Signature \_\_\_\_\_ Date \_\_\_\_\_  
Telephone No. \_\_\_\_\_

Corporate/Business Official  
Name \_\_\_\_\_  
Title \_\_\_\_\_  
Signature \_\_\_\_\_ Date \_\_\_\_\_  
Telephone No. \_\_\_\_\_

**PROPRIETARY NOTICE (IF APPLICABLE, SEE SECTION V.D.1)**

**U.S. DEPARTMENT OF TRANSPORTATION  
SMALL BUSINESS INNOVATION RESEARCH PROGRAM  
SOLICITATION NO. DTRT57-05-R-SBIR**

**PROJECT SUMMARY**

Name and Address of Proposer	<b>FOR DOT USE ONLY</b>
	Proposal No.

Name and Title of Principal Investigator

Project Title

Research Topic No.	Research Topic Title
--------------------	----------------------

Technical Abstract (Limited to two hundred words in this space only with no classified or proprietary information/data).

Anticipated Results/Potential Commercial Applications of Results.

Provide key words (8 maximum) description of the project useful in identifying the technology, research thrust and/or potential commercial application.

**U.S. DEPARTMENT OF TRANSPORTATION  
SMALL BUSINESS INNOVATION RESEARCH PROGRAM  
SOLICITATION NO. DTRT57-05-R-SBIR**

**CONTRACT PRICING PROPOSAL**

<b>PROPOSAL COVER SHEET</b>				1. SOLICITATION/CONTRACT/MODIFICATION NUMBER			
2a. NAME OF OFFEROR				3a. NAME OF OFFEROR'S POINT OF CONTACT			
2b. FIRST LINE ADDRESS				3b. TITLE OF OFFEROR'S POINT OF CONTACT			
2c. STREET ADDRESS				3c. TELEPHONE		3c. FACSMILIE	
2d. CITY	2e. STATE	2f. ZIP CODE		AREA CODE	NUMBER	AREA CODE	NUMBER
4. TYPE OF CONTRACT OR SUBCONTRACT ( <i>Check</i> ) <input checked="" type="checkbox"/> FFP <input type="checkbox"/> CPFF <input type="checkbox"/> CPIF <input type="checkbox"/> CPAF <input type="checkbox"/> FPI <input type="checkbox"/> OTHER ( <i>Specify</i> )				5. <input type="checkbox"/> PRIME OFFEROR <input type="checkbox"/> SUBCONTRACTOR _____ <div style="text-align:right;">PRIME OFFEROR'S NAME</div>			
6. ESTIMATED COST, FEE AND PROFIT INFORMATION							
A. ESTIMATED COST							
B. PROFIT							
C. TOTAL PRICE							
7. PROVIDE THE FOLLOWING							
NAME OF COGNIZANT CONTRACT ADMINISTRATIVE AGENCY				NAME OF COGNIZANT GOVERNMENT AUDIT AGENCY			
STREET ADDRESS				STREET ADDRESS			
CITY	STATE	ZIP CODE		CITY	STATE	ZIP CODE	
TELEPHONE	AREA CODE	NUMBER		TELEPHONE	AREA CODE	NUMBER	
FACSIMILE	AREA CODE	NUMBER		FACSIMILE	AREA CODE	NUMBER	
NAME OF CONTACT				NAME OF CONTACT			
PROPERTY SYSTEM <input type="checkbox"/> Reviewed by cognizant contract administrative agency and determined acceptable <input type="checkbox"/> Reviewed by cognizant contract administrative agency and determined not acceptable <input type="checkbox"/> Never reviewed				APPROXIMATE DATE OF LAST AUDIT			
PURCHASING SYSTEM <input type="checkbox"/> Reviewed by cognizant contract administrative agency and determined acceptable <input type="checkbox"/> Reviewed by cognizant contract administrative agency and determined not acceptable <input type="checkbox"/> Never reviewed				PURPOSE OF AUDIT  (e.g. proposal review, establishment of billing rates, finalize indirect rates, etc.)			
				ACCOUNTING SYSTEM <input type="checkbox"/> Audited and determined acceptable <input type="checkbox"/> Audited and determined not acceptable <input type="checkbox"/> Never audited			
8a. NAME OF OFFEROR ( <i>Typed</i> )				OFFEROR'S FISCAL YEAR			
8b. TITLE OF OFFEROR ( <i>Typed</i> )				9. NAME OF FIRM			
10. SIGNATURE						11. DATE OF SUBMISSION	

**U.S. DEPARTMENT OF TRANSPORTATION  
SMALL BUSINESS INNOVATION RESEARCH PROGRAM  
CONTRACT PRICING PROPOSAL**

**Background**

The following items, as appropriate, should be included in proposals responsive to this Solicitation.

**Cost Breakdown Items** (in this order, as appropriate) (See Section III.E)

1. Name of proposer
2. Address of proposer
3. Location where work will be performed
4. Proposer's Project Title
5. Research topic number and title from DOT SBIR Program Solicitation
6. Total dollar amount of the proposal (dollars)
7. Direct material costs
  - a. Purchased parts (dollars)
  - b. Subcontracted items (dollars)
  - c. Other
    - (1) Raw materials (dollars)
    - (2) Standard commercial items (dollars)
  - d. Total direct materials (dollars)
8. Material overhead rate \_\_\_\_\_ % x total direct material = dollars
9. Direct labor (specify)
  - a. Type of labor, estimated hours, rate per hour and dollar cost for each type
  - b. Total estimated direct labor (dollars)
10. Labor overhead
  - a. Identify overhead rate, the hour base and dollar cost
  - b. Total estimated labor overhead (dollars)
11. Special testing (include field work at Government installations)
  - a. Specify each item of special testing, including estimated usage and unit cost
  - b. Estimated total special testing (dollars)
12. Other special equipment
  - a. If direct charge, specify each item of special equipment, including usage and unit cost
  - b. Estimated total other special equipment (dollars)

**APPENDIX C Continued**

13. Travel (if direct charge)
  - a. Transportation (detailed breakdown and dollars)
  - b. Per diem or subsistence (details and dollars)
  - c. Estimated total travel (dollars)
14. Consultants Service
  - a. Identify each consultant, including purpose and dollar rates
  - b. Total estimated consultant service costs (dollars)
15. Other direct costs (specify)
  - a. Total estimated direct cost and overhead (dollars)
16. General and administrative expense
  - a. Percentage rate applied
  - b. Total estimated cost of G&A expense (dollars)
17. Royalties (specify)
  - a. Estimated cost (dollars)
18. Profit (dollars)
19. Total estimated cost and profit (dollars)
20. The cost breakdown portion of a proposal must be signed by a responsible official of the firm (include typed name and title and date of signature).
21. Provide a yes or no answer to each of the following questions:
  - a. Has any executive agency of the United States Government performed any review of your accounts or records in connection with any other government prime contract or subcontract within the past twelve months? If yes, provide the name and address of the reviewing office, name of the individual and telephone/extension.
  - b. Will you require the use of any government property in the performance of this proposal? If yes, identify.
  - c. Do you require government contract financing to perform this proposed contract? If yes, specify type as advanced payments or progress payments.
22. Type of contract proposed, firm-fixed price.
23. DUNS number, if available \_\_\_\_\_  
(See Section III.F)
24. Tax Identification Number, if available.

**U.S. DEPARTMENT OF TRANSPORTATION  
SMALL BUSINESS INNOVATION RESEARCH PROGRAM  
SOLICITATION NO. DTRT57-05-R-SBIR**

**PROPOSAL CHECKLIST**

This is a CHECKLIST OF REQUIREMENTS for your proposal. Please review the checklist carefully to assure that your proposal meets the DOT SBIR requirements. Failure to meet these requirements may result in your proposal being returned without consideration. (See Sections III and IV.C of this Solicitation). **Do not include this checklist with your proposal.**

- \_\_\_\_\_ 1. The proposal reflects the fact that for Phase I a minimum of two-thirds (and for Phase II a minimum of one-half) of the research and/or analytical effort will be performed by the proposing firm as required (see Sections V.H.1 and V.H.2) and the primary employment of the principal investigator (for both Phase I and Phase II) must be with the small business firm at the time of award and during the conduct of the proposed research as required (see Section I.C).
- \_\_\_\_\_ 2. The proposal is 25 PAGES OR LESS in length. This limitation does not apply to the additional information required by Section III.H.
- \_\_\_\_\_ 3. The proposal is limited to only ONE of the research topics in Section VIII.
- \_\_\_\_\_ 4. The proposal budget may be up to \$100,000 unless otherwise indicated and duration does not exceed six months.
- \_\_\_\_\_ 5. The technical abstract contains no proprietary information, does not exceed 200 words, and is limited to the space provided on the Project Summary sheet (Appendix B).
- \_\_\_\_\_ 6. The proposal contains only pages of 8 1/2" x 11" size.
- \_\_\_\_\_ 7. The proposal contains no type smaller than 10 point font size.
- \_\_\_\_\_ 8. The COVER SHEET (Appendix A) has been completed and is PAGE 1 of the proposal.
- \_\_\_\_\_ 9. The PROJECT SUMMARY (Appendix B) has been completed and is PAGE 2 of the proposal.
- \_\_\_\_\_ 10. The TECHNICAL CONTENT of the proposal begins on PAGE 3 and includes the items identified in SECTION III.D of the Solicitation.
- \_\_\_\_\_ 11. The Contract Pricing Proposal (Appendix C) has been included as the last section of the proposal.
- \_\_\_\_\_ 12. The acknowledgement of proposal receipt card on the last page of the solicitation should be filled out and included with the proposal package.
- \_\_\_\_\_ 13. An original and four copies of the proposal are submitted.
- \_\_\_\_\_ 14. The additional information on prior Phase II awards, if required, in accordance with Section III.H.
- \_\_\_\_\_ 15. The proposal must be postmarked (or delivered to the DOT SBIR Program Office) no later than May 16, 2005 as required (see Section VI.A). If submitted electronically, the proposal must be received by May 16, 2005, as well.

**DOT SBIR PROGRAM SOLICITATION  
DTRT57-05-R-SBIR**

TO BE FILLED OUT BY THE PROPOSER:

Project Title \_\_\_\_\_  
\_\_\_\_\_

TO BE FILLED OUT BY THE DEPARTMENT OF TRANSPORTATION:

Date Received \_\_\_\_\_ Proposal No. \_\_\_\_\_

The form for acknowledging receipt of proposal appears above. Please include it in the same package with the proposal submitted to DOT and provide your address on the reverse side.