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

PROGRAM SOLICITATION

Small Business Innovation Research Program

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Closing Date: May 3, 2004

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

CONTENTS

SECTION		PAGE
I.	PROGRAM DESCRIPTION	1
II.	DEFINITIONS	3
III.	PROPOSAL PREPARATION INSTRUCTIONS AND REQUIREMENTS	5
IV.	METHOD OF SELECTION AND EVALUATION CRITERIA	8
V.	CONSIDERATIONS	10
VI.	SUBMISSION OF PROPOSALS	14
VII.	SCIENTIFIC AND TECHNICAL INFORMATION SOURCES	15
VIII.	RESEARCH TOPICS	16
IX.	SUBMISSION FORMS AND CERTIFICATIONS	23
APPENDICES		
A.	PROPOSAL COVER SHEET	24
B.	PROJECT SUMMARY	25
C.	CONTRACT PRICING PROPOSAL (Schedule 1)	26
D.	PROPOSAL CHECKLIST	29
E.	PROPOSAL ACKNOWLEDGEMENT FORM	30

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 by P.L. 99-443, and P.L. 103-564, Small Business Research and Development Act of 1992, signed October 28, 1992.

On December 15, 2000, Congress reauthorized the Program by P.L. 106-554. The law seeks to encourage the initiative of the private sector and to use small business as effectively as possible in meeting Federal research and development objectives.

The purposes of the Act are:

(1) To stimulate technological innovation;
(2) To use small business to meet Federal research and development needs;
(3) To increase private sector commercialization of innovations derived from Federal research and development; and
(4) To foster and encourage minority and disadvantaged participation 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 is for the conduct of feasibility-related experimental or theoretical research or 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 may be up to six months. The primary basis for award will be the scientific and technical merit of the proposal and its relevance to DOT requirements. **Only awardees in Phase I are eligible to participate in Phase II (by invitation only).**

Phase II. Phase II is the principal research or research and development (R&D) effort having a period of performance of approximately two years with a dollar value of up to $750,000 unless otherwise noted. 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. 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 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 funding agreements. 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 shall 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 proposals on advanced, innovative concepts from small business firms having strong capabilities in applied science or engineering.

The Phase I research 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).

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/RSPA/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 or 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 the following criteria:

(1) Is independently owned and operated, is not dominant in the field of operation in which it is proposing, and has its principal place of business located in the United States and is organized for profit;

(2) Is at least 51 percent owned, or in the case of a publicly owned business, at least 51 percent of its voting stock is owned by United States citizens or lawfully admitted permanent resident aliens; and

(3) Has, including its affiliates, a number of employees not exceeding 500, and meets the other regulatory requirements found in 13 CFR Part 121. Business concerns, other than investment companies licensed, or state development companies qualifying under the Small Business Investment Act of 1958, 15 U.S.C. 661, et seq., are 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 or parties controls or has the power to control both. Control can be exercised through common ownership, common management, and contractual relationships. The term "affiliation" is defined in greater detail in 13 CFR 121.401. The term "number of employees" is defined in 13 CFR 121.407. Business concerns include, but are not limited to, any individual, partnership, corporation, joint venture, association or cooperative.

C. Minority and Disadvantaged Small Business Concern

A minority and disadvantaged small business concern is one that is:

(1) At least 51 percent owned by one or more minority and disadvantaged individuals; or in the case of a publicly owned business, at least 51 percent of the voting stock of which is owned by minority and disadvantaged individuals; and

(2) Whose management and daily business operations are controlled by one or more such individuals.

A minority and disadvantaged individual is defined as a member of any of the following groups:

(1) Black Americans.

(2) Hispanic Americans.

(3) Native Americans.

(4) Asian-Pacific Americans.

(5) Subcontinent Asian Americans.

D. Women-Owned Small Business Concern

A women-owned small business concern is one that is at least 51 percent owned by a woman or women who also control and operate it. "Control" in this context means exercising the power to make policy decisions. "Operate" in this context means being actively involved in the day-to-day management.

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 meeting 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)(l) 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 percent of the State median household income or with an unemployment of not less than 140 percent of the Statewide average based on US 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 percent of its employees must reside in a HUBZone.

III. PROPOSAL PREPARATION INSTRUCTIONS AND REQUIREMENTS

A. Limitation on Length of Proposal

In the Program Year 2004, 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.
- 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 .
- Proposals must be received by 5:00 p.m. on May 3, 2004.
- ***You must submit a completed and signed hardcopy of Appendices A, B, and C postmarked no later than May 3rd to: Joseph Henebury, DOT SBIR Program Director, DTS-22, U.S. DOT/RSPA/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: www.volpe.dot.gov/sbir **by April 15, 2004.**

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 (FFP) 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. DUNS Identification Number

A firm must note its Data Universal Numbering System (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 second phase funding commitments from private sector or non-SBIR funding sources;

c) Existence of third phase, follow-on commitments; and

d) 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 an adequate amount of 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 2004 DOT SBIR solicitation research topics must be submitted to the DOT SBIR Program Office by e-mail: 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 2004 Phase I Award Recommendations to receive funding is posted on the DOT SBIR Program Web Page: http://www.volpe.dot.gov/sbir. For planning purposes the notification of 2004 Phase I Award Recommendations is expected to be posted on the DOT SBIR Program Web Page by October 1, 2004. **Phase I proposals which are not included in the October 1st list of 2004 Phase I Award Recommendations will not receive funding. NO WRITTEN CORRESPONDENCE REGARDING PROPOSAL STATUS WILL BE ANSWERED.**

After the 2004 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: dohertym@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 2004, DOT will award approximately 12 Phase I contracts with an anticipated potential maximum of 13 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 acceptable accounting systems 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, and/or the Research and Special Programs 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 which consist 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 it is obtained from another source without restriction. The data subject to this restriction is contained in 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.

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 offered to any representative of the Government to secure the contract.

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, prescribes 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.

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 **www.volpe.dot.gov/procure/unsolguide.html** 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 previously been, nor is currently being paid for essentially equivalent work by any agency of the Federal government.

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 General Accounting Office (GAO), shall be served on the Contracting Officer (addressed as follows) by obtaining written and dated acknowledgement of receipt from: Mary E. Doherty, DOT/RSPA/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/RSPA/VNTSC
55 Broadway
Cambridge, MA 02142-1093
Telephone: (617) 494-2051

Proposals must be postmarked NO LATER than May 3, 2004 to qualify for acceptance and consideration under the current DOT SBIR Program. Proposals postmarked or received via e-mail later than May 3, 2004 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 3, 2004.

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 .
- Proposals must be received by 5:00 p.m. on May 3, 2004.
- ***You must submit a completed and signed hardcopy of Appendices A, B, and C postmarked no later than May 3rd to: Joseph Henebury, DOT SBIR Program Director, DTS-22, U.S. DOT/RSPA/VNTSC, 55 Broadway, Cambridge, MA 02142-1093***.
- 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: www.volpe.dot.gov/sbir by April 15, 2004.

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 copies of the 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 proposal received at the above address by May 3, 2004. 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 21, 2004.

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, 5th 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 34th 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) 743-2353

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.

DOT OPERATING ADMINISTRATION/TOPIC **POTENTIAL MAXIMUM FY04 PHASE I AWARDS**

FEDERAL AVIATION ADMINISTRATION **1 AWARD**

[4]04-FA1 Development of the Airborne Internet Collaborative Information Services Environment

FEDERAL HIGHWAY ADMINISTRATION (FHWA) **3 AWARDS**

[1]04-FH1 In Vehicle Collision Warning System Using Infrastructure Messages

[1]04-FH2 Equipment for Undergrounding Utility Lines at Lower Cost

[1]04-FH3 Pedestrian Detection System for Use With IVI Collision Warning and Signal Control Systems

FEDERAL RAILROAD ADMINISTRATION (FRA) **1 AWARD**

[2]04-FR1 Wireless Brake Shoe Force Measurement System for Railroad Freight Cars

FEDERAL TRANSIT ADMINISTRATION **3 AWARDS**

[3]04-FT1 Commuter Rail Accessibility for Persons with Disabilities

[3]04-FT2 Introducing Children to Mass Transit

[3]04-FT3 Application of New Methods, Techniques, and Technologies Designed to Increase Mass Transit Ridership

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION (NHTSA) **2 AWARDS**

[4]04-NH1 Development of a Device for Enhancing the Seating Position for Short-Stature Older Drivers to Improve Safety and Mobility

[4]04-NH2 Development of a Low Cost Ethanol Sensor System with Wireless Capabilities to Deter Repeat DWI Offenders

RESEARCH AND SPECIAL PROGRAMS ADMINSTRATION (RSPA) **2 AWARDS**

04-RS1 Transportation Infrastructure Renewal

04-RS2 Innovative Safety and Reliability Technologies for Pipeline System Integrity Management

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[1] Phase I may be up to $96,000 and Phase II may be up to $720,000
[2] Phase I may be up to $100,000 and Phase II may be up to $250,000
[3] Phase I may be up to $100,000 and Phase II may be up to $500,000
[4] Phase I may be up to $100,000 and Phase II may be up to $300,000

Federal Aviation Administration (FAA)

[4]04-FA1 Development of the Airborne Internet Collaborative Information Services Environment

Airborne Internet (A.I.) is a rapidly emerging data communications capability for aircraft and transportation systems. A.I. will provide a general purpose, multi-application data channel that will provide mobile information connectivity to the aircraft. This research topic is focused at exploring the extent of the development of the collaborative information environment and information transfer that the A.I. will facilitate (ie "web services"). The result of this work can be used as a basis to publish the prototype Web services to the general public, tie the prototype Web services into a data grid, and eventually to create a Virtual Airborne Internet (all of which support the implementation of the Airborne Internet Collaborative Information Services Environment).

Develop prototype Airborne Internet Web services to provide information about and relative to Airport/Facility Directory, restricted airspace. The web service must be useable with XML, SOAP, WSDL, and UDDI.

a. Create a Web service based on weather data from the NOAA Aviation Digital Data Service (ADDS) website (http://adds.aviationweather.noaa.gov) using the Java 2 Platform, Enterprise Edition (J2EE) platform.
b. Create a Web service that contains Airport/Facility Directory information. (one possible solution might be to use the Microsoft .NET framework)
c. Create a "restricted airspace" Web service based on data available from the FAA NOTAM website (http://tfr.faa.gov/TFR/jsp/list.jsp).

- Must be able to write and create XML Web services
- Must be able to define XML markup languages using XML Schema and declare Namespaces
- Must have previous work experience in the definition of Web service standards for aviation
- Must have conceptual knowledge of and be able to articulate the Airborne Internet

FEDERAL HIGHWAY ADMINISTRATION (FHWA)

[1]04-FH1 In Vehicle Collision Warning System Using Infrastructure Messages

The IVI Infrastructure Consortium is developing infrastructure based warnings of potential collisions. The in vehicle system would utilize Dedicated Short Range Communications (DSRC), High Accuracy Nationwide Differential GPS (HANDGPS), and a handheld Linux based computer to acquire and analyze the infrastructure warnings to alert drivers.

This project would use object oriented structured programming techniques and JAVA and ADA to develop an interactive interface to the infrastructure based intersection collision warning system for intersections (stop sign, pretimed and actuated traffic signals) and process its messages. The user interface would be based on concepts in the Safety Warning System (SWS) and human factors concepts developed by the Infrastructure Consortium. The interface and data analysis programs would be copyrighted with the Free Software Foundation copyleft statement. The vendor would be expected to make their profits through support and maintenance of the tool and sale of the handheld devices with the tool incorporated.

The model would be programmed in GNU software foundation ADA and Java and run under an embedded Linux (such as the RTAI kernel) to achieve platform independence. The IV-ICWS would be able to import maps, data and graphics files to use as templates, backgrounds or data. It would be able to acquire and interpret data from the Infrastructure Consortium's warning systems.

Phase I would develop a simple interface without import features. Phase II would enhance compatibility with the Infrastructure Consortium's devices, improve the human factors elements of the in-vehicle warning provided by the device and add multiple data import features. Phase II would be staged with interim deliverables. For this reason, experience in human factors for traffic engineering, JAVA, ADA, real time programming and traffic operations are critical.

Note: Although not required, it would be helpful if offerers provide a working example to demonstrate their ability to work with Java and user interfaces.

[1]04-FH2 Equipment for Undergrounding Utility Lines at Lower Cost

Each year, 1200 to 2000 people are killed and an additional 60,000 to 110,000 people are injured due to collisions between motor vehicles and timber utility poles. The societal cost of these run-off-road collisions is estimated to exceed $4 billion per year. This project will develop new and/or improved equipment that can significantly reduce the cost of installing utility lines underground. Undergrounding utility lines will improve roadside safety by reducing the number of utility poles in service.

Most of the utility poles are located on two lane roads. These utility pole lines typically support more than one utility. For example, they may support electric power, cable TV (CATV), telephone and fiber optic lines. A line of utility poles costs about $60,000 per mile. Converting overhead utilities to underground utilities on existing highways is expensive. Putting utility lines underground costs 4 to 10 times as much as it does to construct a pole line. Consequently, converting to underground utility lines has been done primarily for aesthetic reasons. However, there are other advantages. Underground utility lines are less susceptible to damage due to impacting vehicles, storms, vandals and terrorists.

Utility companies currently use open trenching machines for direct burial of utility lines and conduits. Open trenching is preferred because it is the lowest cost method. Directional boring machines are used to feed utility lines under sidewalks, driveways and streets. There is a need to develop new and/or improved equipment that can significantly reduce the cost of undergrounding utility lines in both urban and rural areas. Equipment for locating existing underground facilities can be part of the installation system, but the emphasis in this study is on developing equipment for placing utility lines underground.

Phase I of this study will investigate the feasibility of developing new and/or improved equipment or novel undergrounding techniques. If appropriate, conceptual designs of this equipment will be prepared. In Phase II, detailed designs will be prepared and prototypes of the new and/or improved equipment will be fabricated and field tested.

[1]04-FH3 Pedestrian Detection System for Use With IVI Collision Warning and Signal Control Systems

Current pedestrian detectors do not do an adequate job of detecting and tracking pedestrians to support collision warning systems. A pedestrian detection system using stereo imaging and artificial intelligence algorithms for pulling out and tracking pedestrians might significantly increase this capability.

Phase I would develop and demonstrate prototype software and hardware that would embody a simplified version of the system. The software would run on top of RTAI Linux or another open source Linux real time operating system to demonstrate the capabilities.

Phase I would determine what the “real time” needs are for the algorithms to pass information to the IVI and traffic control applications. The software would be demonstrated at the TFHRC IVI intersection. The algorithms and software should be prototyped and validated using MathCad.

Phase II would enhance the system algorithms and interface it to a real time ATC signal controller. Phase II would address issues related to making the system at least minimally functional during rain and snow events through data fusion with other sensors. This project requires significant experience in traffic engineering, real time control, Linux, video sensing and pedestrian detection. Phase II should be staged to produce interim demonstratable results. Phase II should provide final documented copies of the MathCad algorithms.

This project is needed to allow maximum benefit from the advanced traffic controller (ATC) and intersection collision avoidance (IVI-ICA) algorithms developed by FHWA for ITS. Current ATC controllers have the processing power of minicomputers but still do not sensors and interfaces to adequately handle pedestrians. Algorithms and MathCad software developed under this project should be open source at the end of Phase II to facilitate future research and development of pedestrian detection.

Note: Although not required, it would be helpful if offerers provide a working example to demonstrate their ability to sense pedestrians.

Federal Railroad Administration (FRA)

[2]04-FR1 Wireless Brake Shoe Force Measurement System for Railroad Freight Cars

With the increasing desire to monitor actual braking capabilities there is a need to develop a self powered system that will permit the measurement of individual brake shoe forces and transmitting this information in a wireless manner to a car mounted sensor box. The shoe force measurement system must allow for replacement of the shoe with minimal effort. Railroad freight cars have four wheel truck suspensions on each end. The suspensions incorporate brake beams which force the individual brake shoes against the wheel tread surfaces. It is expected that the data acquisition and communication system will sample the shoe forces at a rate which is appropriate for the monitoring function to be performed.

Federal Transit Administration (FTA)

[3]04-FT1 Commuter Rail Accessibility for Persons with Disabilities

Since 1990, the Americans with Disabilities Act (ADA) and other related regulations have been implemented in mass transit, specifically to provide accessible transportation to persons with disabilities. Agencies that provide commuter rail service have developed methods for achieving accessibility for persons using wheelchairs or with other disabilities that preclude climbing stairs or traveling long distances in order to board a train. However many of these alternatives present specific drawbacks to both the passenger and the operator. A solution is needed that will work for passengers, freight railroads, and commuter rail operators.

One of the most difficult accessibility issues is level boarding from platforms (or lifts) in areas where long platform-commuter rail car setbacks are required because of freight service on the same track as commuter rail service.

The goal of this project will be to identify solutions that meet the ADA requirements for level boarding at commuter rail stations while maintaining setbacks that freight railroads may require as a condition of granting operating rights. Proposed solutions should include improved accessibility to commuter rail trains for persons with disabilities without sacrificing passenger safety or requiring boarding areas that are long distances from the principal boarding area, or unduly adding delays to tightly scheduled train service. The ultimate effect would be to increase commuter rail ridership. An improved method or technology for bridging the platform-rail car gap would achieve faster boarding for all passengers (parents with strollers, etc.), and would result in increased ridership and reduce train dwell times.

[3]04-FT2 Introducing Children to Mass Transit

Any long-term program for increasing transit ridership and sustaining that ridership must target the inclusion of children. After all, if people are not introduced to transit as a viable option and shown how it enriches their lives when they are young, will they even consider transit when they grow up? Use of transit is a learned behavior -- not an inherited behavior. This project will focus on the potential for developing a package of commercially viable marketing tools/materials or services designed to educate children about the benefits of riding transit. The result should be a variety of methods that transit agencies around the nation can use to introduce young people to public transit in rich and rewarding ways that they will never forget.

[3]04-FT3 Application of New Methods, Techniques and Technologies Designed to Increase Mass Transit Ridership

One of the Federal Transit Administration's (FTA) goals is to encourage the identification and implementation of methods, techniques, and technologies that will increase transit ridership. This topic is designed to elicit ideas for the development and application of cost effective ITS technologies designed to increase transit ridership in a Bus Rapid Transit system or service.

National Highway Traffic Safety Administration (NHTSA)

[4]04-NH1 Development of Device for Enhancing the Seating Position of Short-Stature Older Drivers to Improve Safety and Mobility

Older drivers are the fastest growing group of drivers on the road today (a 39 percent increase over the past decade alone), yet they also account for nearly double the number of annual traffic fatalities in comparison to their proportion in the general population. This proposed SBIR topic suggests the development of a seating device to accommodate short-statured drivers (5' 3" and below), with particular emphasis on older drivers. Loss of height is an issue for many older drivers, especially older women. Thus, this issue particularly affects seniors.

The goal is to develop a user-friendly product that will enhance operation of a vehicle and improve both safety and mobility. Since the use of a device for adjusting the seating position of the driver may have implications for safety, consideration should also be given to corollary products, such as pedal extenders, that would allow the driver to sit further back from the driver's side airbag, which also affects short-statured drivers. Research has shown that mobility is central to qualify of life. Mobility involves the ability to travel independently and this includes driving for many seniors. A seating position enhancement may allow some senior drivers to drive more safely for a longer period of time before they have to give up the keys.

The seating enhancement would also benefit younger drivers who are short statured as well. Anecdotally we are aware that many short-statured adults use pillows or other devices (like phone books) to sit higher in the driver's seat. While some vehicles have mechanisms that allow the driver's seat to be raised to an appropriate height, many vehicles do not. Even those that do allow seat adjustments often do not adjust high enough for the short-statured driver to see clearly in all directions. Moreover, vehicles that do not have adjustable shoulder-belt harnesses are often extremely uncomfortable for short-statured drivers who are therefore more likely to not use or misuse the shoulder belt portion by placing it behind their back or under their arm. A mechanism for enhancing the seating position could help solve this problem by raising the driver high enough so that the shoulder belt would fit properly.

In developing an approach, proposers should also consider crashworthiness issues (e.g., air bag deployment) related to the use of a device for enhancing a driver's seat position, including the relationship between the position of the driver and the steering wheel. In developing the system, the contractor should ensure that the proposed product is compatible with relevant Federal Standards as specified in CFR 49 and does not interfere with existing vehicle safety equipment.

[4]04-NH2 Development of a Low Cost Ethanol Sensor System with Wireless Capabilities to Deter Repeat DWI Offenders

More than 17,000 persons died in alcohol-related (A/R) crashes in 2002. With increasing attention directed at developing innovative approaches for reducing the incidence of A/R), it appears that one promising approach is to couple conventional deterrence with recent advances in technology. Past research indicates that substantial reductions in A/R crashes can be obtained when roadside alcohol checkpoints are frequently used. Nevertheless, it is extremely difficult to detect alcohol-impaired drivers during the brief interviews (lasting a few seconds) that are typically conducted by police at checkpoints. Research has shown that detection rates are low and many high-risk alcohol impaired drivers slip through the system. Law enforcement officers have employed hand-held passive alcohol detectors at roadside checkpoints to increase detection rates, but these types of devices have problems that have limited their applicability. The proposed approach would merge new, low cost sensor technologies with wireless capabilities to provide a system with the potential to allow authorities to screen for impaired *repeat-offenders* at checkpoints more efficiently. Such a system would provide information to supplement the information normally obtained at checkpoints through the observation of drivers and the performance of standard field sobriety tests.

The proposed system would consist of (1) an ethanol sensor to reliably distinguish ethanol from other volatile substances in the air of a driver's vehicle and (2) a combination of wireless technology (e.g., Bluetooth, WiFi) and "intelligence" on the specific vehicle (e.g., model, year, color), to transmit an alert to officers at roadside checkpoints as an enhancement to the vehicle screening process. Placement and implementation of such a system in the vehicles of *repeat-offenders* would require consideration of a number of factors, including, but not limited to, cost, operating temperature, detection range, triggering concentration, sampling, placement, ease of installation, immunity to both tampering and circumvention (e.g., open window), low false positive rate, and acceptability in both the legal and adjudicative domains. Consideration must also be given to the method for providing information to checkpoint officers such that operation of a "receiver" is hands

free and easy to interpret and use. It should be noted that actual measurement of ethanol concentration, although desirable, would not be necessary, and that only the detection of the presence of concentrations above a certain criterion level would be required.

Proposals for the Phase I development effort should be based on concepts for utilization of specific hardware, software and procedures. The proposal should demonstrate a viable approach that would validate the concepts and specifically demonstrate how the concept would provide a practicable approach for screening vehicles passing through roadside alcohol checkpoints. Upon successful completion of Phase I, the actual development of the chosen concept for commercial deployment may be undertaken.

Research and Special Programs Administration (RSPA)

04-RS1 Transportation Infrastructure Renewal

New and innovative material technologies for performing quick and durable and sustained repair of concrete and pavement structures without interference to transportation services or flow of traffic on highways.

04-RS2 Innovative Safety and Reliability Technologies for Pipeline System 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 2002 liquid pipeline operator national mileage information). In addition, over 320,000 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, such as recently occurred in Arizona that significantly reduced the supply of petroleum to Phoenix. RSPA/OPS has designed a SBIR topic for 2004 to help address this continuing problem. The topic described below supports 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, and changes 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 of a dynamic database, for safe, smart operation of pipeline transportation infrastructure. From the process management perspective, this tool could provide 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 OPS protocols. This innovative workflow, process based, decision database provides enhancements within operator's integrity management plans.

2. Cost effective approaches for pipeline monitoring using aerial surveillance.
Due to shorter visual inspection cycles, increased mileage and non-continuous High Consequence Areas (HCA), lowering the cost for aerial surveillance that incorporate monitoring technologies are needed. Approaches using innovative technologies that can quickly detect pipeline conditions, encroachments, and small leaks are desired. In addition, innovative concepts to preempt third party damage to pipelines by detecting encroachment of pipelines and their right-of-way will be considered.

3. Detection of coincidental metal loss from mechanical pipeline damage
Mechanical damage on pipelines cause dents to be formed. Those dents can be divided into two basic groups called "Cup or Saucer" dents.

"Saucer" dents are smooth, typically non-injurious, and the presence of coincidental metal loss is sometimes detectable. Even if detected at these smooth internal surface transitions, the metal loss is rarely evaluated properly due to the variables introduced by the upset in curvature. Both the Magnetic Flux Leakage (MFL) and Compression wave Ultrasonic

Transmission (UT) devices require consistent and predictable behavior of the sensor array as it passes an area of metal loss. Dents, even smooth dents, introduce sensor upset that produces other variables whose impacts are not known.

"Cup" dents and buckles are abrupt, very injurious, and the presence of coincidental metal loss is much harder to detect. The more abrupt the deformation causes a more injurious anomaly, resulting is less definition of the material loss.

For enhanced safety and reliability of pipeline integrity management, innovative in-line inspection technologies are sought that eliminate the efforts of unpredictable sensor behavior as the metal loss devices transverse an area of pipeline surface deformation.

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

APPENDIX A

U.S. DEPARTMENT OF TRANSPORTATION
SMALL BUSINESS INNOVATION RESEARCH PROGRAM
SOLICITATION NO. DTRS57-04-R-SBIR

PROPOSAL COVER SHEET

Project Title _____

Research Topic No. _____ Research Topic Title _____

Submitted by: Name _____

Address_____

City _____ State _____ Zip + _____

Amount Requested (Phase I) $ _____ Proposed Duration_____
(May be up to $100,000 unless otherwise indicated) (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 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? (Note this item is 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)

APPENDIX B

U.S. DEPARTMENT OF TRANSPORTATION
SMALL BUSINESS INNOVATION RESEARCH PROGRAM
SOLICITATION NO. DTRS57-04-R-SBIR

PROJECT SUMMARY

Name and Address of Proposer	**FOR DOT USE ONLY**
	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. DTRS57-04-R-SBIR

APPENDIX C
(SCHEDULE 1)

CONTRACT PRICING PROPOSAL

PROPOSAL COVER SHEET			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 *(Check)* ☐ FFP ☐ CPFF ☐ CPIF ☐ CPAF ☐ FPI ☐ OTHER *(Specify)*			5. ☐ PRIME OFFEROR ☐ SUBCONTRACTOR _____ PRIME OFFEROR'S NAME			

6. ESTIMATED COST, FEE AND PROFIT INFORMATION

A. ESTIMATED COST

B. FIXED FEE

C. AWARD FEE

D. PROFIT

E. 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 ☐ Reviewed by cognizant contract administrative agency and determined acceptable ☐ Reviewed by cognizant contract administrative agency and determined not acceptable ☐ Never reviewed			APPROXIMATE DATE OF LAST AUDIT PURPOSE OF AUDIT (e.g. proposal review, establishment of billing rates, finalize indirect rates, etc.)		
PURCHASING SYSTEM ☐ Reviewed by cognizant contract administrative agency and determined acceptable ☐ Reviewed by cognizant contract administrative agency and determined not acceptable ☐ Never reviewed			ACCOUNTING SYSTEM ☐ Audited and determined acceptable ☐ Audited and determined not acceptable ☐ Never audited OFFEROR'S FISCAL YEAR		
8a. NAME OF OFFEROR *(Typed)*			9. NAME OF FIRM		
8b. TITLE OF OFFEROR *(Typed)*					

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)

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. Fee or profit (dollars)
19. Total estimated cost and fee or 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.

APPENDIX D

U.S. DEPARTMENT OF TRANSPORTATION
SMALL BUSINESS INNOVATION RESEARCH PROGRAM
SOLICITATION NO. DTRS57-04-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 back cover of the solicitation has been detached, 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 3, 2004 as required (see Section VI.A). If submitted electronically, the proposal must be received by May 3, 2004, as well.

APPENDIX E

DOT SBIR PROGRAM SOLICITATION
DTRS57-04-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.