



U. S. Department
of Transportation

PROGRAM SOLICITATION

Small Business Innovation Research Program (SBIR)

Issue Date: April 2, 2012

Closing Date: June 5, 2012

**Small Business Innovation Research (SBIR) Program Office, RVT-91
John A. Volpe National Transportation Systems Center (Volpe Center)
U.S. Department of Transportation (DOT)
Research and Innovative Technology Administration (RITA)
55 Broadway
Cambridge, MA 02142-1093**

TECHNICAL QUESTIONS

Technical questions pertaining to the FY12.2 DOT SBIR solicitation research topics must be submitted to the DOT SBIR Program Office Point of Contact, Linda Duck, Linda.Duck@dot.gov. No oral questions will be accepted.

Technical questions submitted after May 24, 2012 may not be answered.

The DOT SBIR Program Office will submit all questions to the research topic authors for response. Answers will be posted on the DOT SBIR Program website, <http://www.volpe.dot.gov/sbir/current.html> under Technical Questions and Answers for 12.2 Solicitation.

CONTENTS

SECTION	PAGE
I. PROGRAM DESCRIPTION	1
II. DEFINITIONS	4
III. PROPOSAL PREPARATION INSTRUCTIONS AND REQUIREMENTS	7
IV. METHOD OF SELECTION AND EVALUATION CRITERIA	10
V. CONSIDERATIONS	12
VI RESEARCH TOPICS	17
VII SUBMISSION FORMS AND CERTIFICATIONS	26
 APPENDICES	
A. PROPOSAL COVER SHEET	27
B. PROJECT SUMMARY	29
C. CONTRACT PRICING PROPOSAL (Schedule 1)	30
D. PROPOSAL CHECKLIST	33

PROGRAM SOLICITATION for SMALL BUSINESS INNOVATION RESEARCH PROGRAM

I. PROGRAM DESCRIPTION

A. Introduction

This solicitation for research proposals is issued by the U.S. Department of Transportation (DOT) pursuant to the Small Business Innovation Development Act of 1982, P.L. 97-219 (codified at 15 U.S.C. 638) as amended by the Small Business Innovation Research (SBIR) Program, Extension, P.L. 99-443 which extended the program through September 30, 1993. On October 28, 1992, through the Small Business Innovation Research and Development Act of 1992 (P.L. 102-564), Congress reauthorized and extended the SBIR program for another seven years (2000). Subsequently, on December 21, 2000, through the Small Business Reauthorization Act of 2000 (P.L. 106-554) Congress again reauthorized the SBIR program. With the approval of H.R. 2608, Continuing Appropriations Act 2012, the SBIR Program was authorized through December 31, 2011. On December 31, 2011, the President signed into law the National Defense Reauthorization Act of 2012 (Defense Reauthorization Act), P. L. 112-81, Section 5001, Division E of the Defense Reauthorization Act contains the SBIR/STTR Reauthorization Act of 2011 (SBIR/STTR Reauthorization Act)), which extends both the SBIR and Small Business Technology Transfer (STTR) programs through September 30, 2017.

The SBIR Program encourages small businesses to engage in research or research and development (R/R&D) that has the potential for commercialization and meets Federal research or research and development objectives.

The goals and objectives of the SBIR Program are:

- (1) Stimulate technological innovation;
- (2) Meet Federal research and development needs;
- (3) Foster and encourage participation in innovation and entrepreneurship by socially and economically disadvantaged persons; and
- (4) Increase private sector commercialization of innovations derived from Federal research and development funding.

In consonance with the statutory obligations of the Act, the DOT has established a Small Business Innovation Research Program (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 generally a three phase process.

THIS SOLICITATION IS FOR PHASE I PROPOSALS ONLY. The DOT SBIR Program does not accept unsolicited proposals.

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 \$150,000 unless otherwise noted and is subject to the availability of funding. The period of performance is six months. The basis for award will be the scientific and technical merit of the proposal and its relevance to DOT requirements and current research priorities. **Only awardees in Phase I will be eligible to participate in Phase II which is by invitation only and subject to the availability of funding.**

Phase II. The objective of Phase II is to continue the R/R&D effort from the completed Phase I. Funding of a Phase II is based upon the results of Phase I and the scientific and technical merit and commercial potential of the Phase II proposal. Commercial potential includes the potential to transition the technology to private sector applications, Government applications, or Government contractor applications.

DOT SBIR Phase II invitations may be issued to firms which have previously received a DOT Phase I award. Phase II proposals may be funded up to \$1,000,000 (except where a lower ceiling is specifically identified) and have a period of performance up to 24 months. Special consideration may be given to proposals that have obtained commitments for follow-on funding from non-Federal sources for Phase III.

The Government is neither obligated to issue a Phase II invitation to a Phase I awardee nor is it obligated to fund any specific Phase II proposal.

Phase II B Program. In Fiscal Year (FY) 2011, the DOT SBIR Program established a Phase II B Enhancement Program. DOT agencies interested in participating in the Phase II B Program will reserve a portion of their SBIR budget to fund Phase II B projects. The intent of the Phase II B Program is to advance and/or accelerate current active Phase II SBIR-funded technologies towards commercialization. The contracts will be a one-time bridge award to the most promising Phase II project(s) and are subject to the availability of funding of up to \$1,000,000 resulting in a maximum of \$2,000,000 for Phase II contract awards. This is an invitation only process. Candidate project(s) will be identified by DOT agency SBIR Contracting Officer Representatives (CORs). Thereafter, the DOT SBIR Program will invite small businesses to submit a Phase II B technical proposal. Evaluation criteria for Phase II B proposals will focus on commercialization potential.

Phase III. SBIR Phase III refers to work that derives from, extends, or logically concludes effort(s) performed under a DOT or another Department's Phase I and/or Phase II funding agreement. Phase III is funded by sources other than the set-aside funds dedicated to the SBIR Program. Phase III work is typically oriented towards commercialization of SBIR research or technology and may be for products, production, services, R/R&D or a combination thereof. Each of the following types of activities constitutes SBIR Phase III work.

- (i) Commercial application of SBIR-funded R/R&D financed by non-Federal sources of capital. (Note: this pertains to any non-SBIR Federally-funded work described in (ii) and (iii) below.)
- (ii) SBIR-derived products or services intended for use by the Federal Government, funded by non-SBIR sources of Federal funding.
- (iii) Continuation of R/R&D that has been competitively selected using peer review or scientific review criteria, supported by non-SBIR funding.

A Phase III award is by its nature an SBIR award and is accorded SBIR data rights. The requirements of the Federal Property and Administrative Services Act of 1949, [as amended through P.L. 106-580, Dec. 29, 2000] and the Competition in Contracting Act are satisfied by the competition of the Phase I award, as there is no competition for Phase II or Phase II B awards (by invitation only). There is no limit on the number, duration, type, or dollar value of Phase III awards made to a small business concern. There is no limit on the time that may elapse between a Phase I, Phase II, Phase II B award and a Phase III award, or between a Phase III award and any subsequent Phase

III award. The small business size limits for Phase I, Phase II, and Phase II B awards do not apply to Phase III awards.

C. Executive Order (EO) 13329, Encouraging Innovation in Manufacturing, February 26, 2004

"Encouraging Innovation in Manufacturing" requires SBIR agencies, to the extent permitted by law and in a manner consistent with the mission of that department or agency, to give high priority within the SBIR Programs to manufacturing-related research and development (R&D). "Manufacturing-related" is defined as "relating to manufacturing processes, equipment and systems; or manufacturing workforce skills and protection."

The DOT SBIR Program solicits manufacturing-related projects through the call for topics distributed twice annually to each of the Department's SBIR participating agencies.

Additionally, the U.S. Small Business Administration (SBA) requires each agency with an SBIR program to develop a written policy on the implementation of E.O. 13329 and publish an annual report. The DOT SBIR Program Office Implementation Plan and Annual Report are posted on the Program website.

D. Energy Independence and Security Act of 2007, December 19, 2007

The Energy Independence and Security Act of 2007 (P.L. 110-140) amends the Small Business Act to instruct the SBA Administrator to ensure that certain federal departments and agencies give high priority to small business concerns that participate in or conduct energy efficiency or renewable energy system research and development projects.

The DOT SBIR Program Office solicits energy efficiency or renewable energy system R/R&D projects through the call for SBIR research topics distributed twice annually to each of the Department's SBIR participating agencies. DOT SBIR projects that focus on conducting R/R&D in energy efficiency and/or renewable energy are reported annually to SBA.

E. Eligibility

Each small business concern submitting a proposal must qualify as a small business at the time of award of Phase I, Phase II and II B 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.** Primary employment means that more than one-half of the principal investigator's time is spent with the small business. Additionally, for Phase I, Phase II and II B, the

R/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, and 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.

F. General Information

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

The Phase I R/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 research topics listed in Section VI.

A proposal may respond to any of the research topics listed in Section VI, but must be limited to one topic. The same proposal may not be accepted under more than one topic. A small business 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 offeror shall choose that topic which appears to be most relevant to the offeror'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 R/R&D, particularly on advanced or innovative concepts. Proposals 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.**

The proposal shall be self-contained and checked carefully by the offeror to ensure that all preparation instructions have been followed (see Proposal Checklist, Appendix D).

Please address **general inquiries, not pertaining to this solicitation** on the DOT SBIR Program to:

DOT SBIR Program Office, RVT-91
John A. Volpe National Transportation Systems Center
(Volpe Center)
U.S. Department of Transportation (DOT)
Research and Innovative Technology Administration
(RITA)
55 Broadway
Cambridge, MA 02142-1093
Telephone: (617) 494-2051
Fax: (617) 494-2370

Volpe Center Website: <http://www.volpe.dot.gov/sbir>

II. DEFINITIONS

A. Research or Research and Development (R/R&D)

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, Phase II and Phase II B contracts meets all of the following criteria:

- (1) Is organized for profit, with a place of business located in the United States, which operates primarily within the United States or which makes a significant contribution to the United States economy through payment of taxes or use of American products, materials or labor;
- (2) Is in the legal form of an individual proprietorship, partnership, limited liability company, corporation, joint venture, association, trust or cooperative, except that where the form is a joint venture, there can be no more than 49 percent participation by large business entities in the joint venture;
- (3) Is (i) at least 51% owned and controlled by one or more individuals who are citizens of the United States or permanent resident aliens in the United States, (ii) at least 51% owned and controlled by another business concern that is itself at least 51% owned and controlled by individuals who are citizens of, or permanent resident aliens in the United States; or (iii) a joint venture in which each entity to the venture must meet the requirements of either (i) or (ii) of this subparagraph;
- (4) Has, including its affiliates, not more than 500 employees.

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 Woman-Owned Small Business Concern is at least 51 percent owned by one or more women; or, in the case of any publicly owned business, at least 51 percent of the stock of which is owned by one or more women; and whose management and daily business operations are controlled by one or more women; or a small business concern eligible under the Women-Owned Small Business Program in accordance with 13 C.F.R. Part 127 (see FAR subpart 19.15)

E. Veteran-Owned Small Business

A Veteran-Owned Small Business Concern is one that is at least 51% owned by one or more veterans (as defined at 38 U.S.C. 101(2)) or, in the case of any publicly owned business, not less than 51% of the stock of which is owned by one or more veterans, and the management and daily business operations of which are controlled by one or more veterans.

F. Subcontract

Subcontract means any agreement, except a grant or cooperative agreement, entered into by a Federal Government funding agreement awardee calling for supplies or services required solely for the performance of the original funding agreement.

G. Historically Underutilized Business Zone (HUB Zone)

A HUB Zone Small Business Concern is one that meets the following criteria:

- (1) At least 51% owned and controlled by 1 or more persons, each of whom is a United States citizen;
- (2) An ANC owned and controlled by Natives (as determined pursuant to section 29(e) (1) of the ANCSA, 43 U.S.C. 1626(e) (1));
- (3) A direct or indirect subsidiary corporation, joint venture, or partnership of an ANC qualifying pursuant to section 29(e)(1) of the ANCSA, 43 U.S.C. 1626(e)(1), if that subsidiary, joint venture, or partnership is owned and controlled by Natives (as determined pursuant to section 29(e)(2) of the ANCSA, 43 U.S.C. 1626(e)(2));
- (4) Wholly owned by one or more Indian Tribal Governments or by a corporation that is wholly owned by one or more Indian Tribal Governments;
- (5) An SBC that is owned in part by one or more Indian Tribal Governments or in part by a corporation that is wholly owned by one or more Indian Tribal Governments, if all other owners are either United States citizens or SBCs;
- (6) An SBC that is wholly owned by a CDC or owned in part by one or more CDCs, if all other owners are either United States citizens or SBCs; or
- (7) An SBC that is a small agricultural cooperative organized or incorporated in the United States, wholly owned by one or more small agricultural cooperatives organized or incorporated in the United States or owned in part by one or more small agricultural cooperatives organized or incorporated in the United States, provided that all other owners are small business concerns or United States citizens.

Indian reservation (1) Has the same meaning as the term “Indian country” in 18 U.S.C. 1151, except that such term does not include:

- (i) Any lands that are located within a State in which a tribe did not exercise governmental jurisdiction as of December 21, 2000, unless that tribe is recognized after that date by either an Act of Congress or pursuant to regulations of the Secretary of the Interior for the

administrative recognition that an Indian group exists as an Indian tribe (25 CFR part 83); and

- (ii) Lands taken into trust or acquired by an Indian tribe after December 21, 2000 if such lands are not located within the external boundaries of an Indian reservation or former reservation or are not contiguous to the lands held in trust or restricted status as of December 21, 2000; and

(2) In the State of Oklahoma, means lands that:

- (i) Are within the jurisdictional areas of an Oklahoma Indian tribe (as determined by the Secretary of the Interior); and
- (ii) Are recognized by the Secretary of the Interior as of December 21, 2000, as eligible for trust land status under 25 CFR part 151.

Indian Tribal Government means the governing body of any Indian tribe, band, nation, pueblo, or other organized group or community which is recognized as eligible for the special programs and services provided by the United States to Indians because of their status as Indians.

Interested party means any concern that submits an offer for a specific HUBZone sole source or set-aside contract, any concern that submitted an offer in full and open competition and its opportunity for award will be affected by a price evaluation preference given a qualified HUBZone SBC, the contracting activity's contracting officer, or SBA.

Lands within the external boundaries of an Indian reservation include all lands within the perimeter of an Indian reservation, whether tribally owned and governed or not. For example, land that is individually owned and located within the perimeter of an Indian reservation is “lands within the external boundaries of an Indian reservation.” By contrast, an Indian-owned parcel of land that is located outside the perimeter of an Indian reservation is not “lands within the external boundaries of an Indian reservation.”

H. Service Disabled Veteran-Owned Concern

A Service Disabled Veteran-Owned Small Business Concern is not less than 51 percent owned by one or more service-disabled veterans or, in the case of any publicly owned business, not less than 51 percent of the stock of which is owned by one or more service-disabled veterans; and the management and daily business operations are

controlled by one or more service-disabled veterans with permanent and severe disability, the spouse or permanent caregiver of such veteran.

I. Economically Disadvantaged Women-Owned Small Business (EDWOSB)

A Economically Disadvantaged Women-Owned Small Business Concern is at least 51 percent directly and unconditionally owned and controlled by one or more women who are citizens (born or naturalized) of the United States and who are economically disadvantaged. The EDWOSB automatically qualifies as a women-owned small business eligible for the Women-Owned Small Business (WOSB) Program.

III. PROPOSAL PREPARATION INSTRUCTIONS AND REQUIREMENTS

A. Proposal Submission Requirements

Each proposal shall not exceed 25 pages (regular size type – no smaller than 10 point font size – single or double spaced, standard 8 ½” by 11” pages) including proposal cover sheet, contract pricing proposal, and all enclosures or attachments.

Proposals must be in a PDF file.

No duplicate proposals shall be sent by any other means.

Proposals may only be submitted online, a link to the web page can found here:

<http://www.volpe.dot.gov/sbir/current.html>. Instructions are provided on the “Submission” page.

Proposals must be received no later than 11:59P.M. EST on June 5, 2012. Proposals received after that time will be automatically rejected, no exception will be permitted.

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.

Proposals will be available only to the DOT team of engineers and/or scientists responsible for evaluating your proposal, the DOT SBIR Program Office, and pertinent other Volpe Center staff such as the Volpe Center’s Acquisition Division.

B. Proposal Cover Sheet

Complete the Proposal Cover Sheet in Appendix A as Pages 1 and 2 of your proposal. All pages shall be numbered consecutively, beginning with the Proposal Cover Sheet.

C. Project Summary

Complete the Project Summary Sheet in Appendix B as Page 3 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 200 words in the space provided on the Project Summary sheet.

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 R/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 R/R&D plan. The plan shall indicate what will be done, where it will be done, and how the R/R&D will be managed or directed and carried out. Phase I R/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 R/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 offeror must persuade reviewers of their awareness of key recent R/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 limitations.
- (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 R/R&D effort.
- (7) **Facilities.** Provide a detailed description of the 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 within the proposal. **Consultants are only permitted to conduct no more than 1/3 of the work.**
- (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.** 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 similar or identical proposals or proposals containing 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.

(11) **Fraudulent Information**

Submitting plagiarized information and/or false proposal information pertaining to the company, the Principal Investigator and/or work to be performed may result in:

- the cancellation of the topic within a solicitation,
- a proposal being deemed non-responsive,
- a recommendation for Phase I award being rescinded,
- an invitation for a Phase II/II B project being rescinded, or
- the termination of an award.

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 offeror plans to use the requested funds if the contract is awarded. Phase I contract awards may include profit.

F. Central Contracting Registration (CCR) and Data Universal Numbering System (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 <http://www.ccr.gov> by clicking on "Start New Registration" if you already have a DUNS number. If you need a DUNS number, you can find instructions at <http://fedgov.dnb.com/webform/displayHomePage.do>

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. Prior SBIR Phase II Awards

If the small business concern has received more than 15 Phase II and Phase II B awards in the prior five 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 towards the page limitation.)**

IV. METHOD OF SELECTION AND EVALUATION CRITERIA

A. General

All Phase I proposals will be evaluated and judged on a competitive basis. Initially, all proposals will be screened to determine responsiveness to the solicitation. Proposals that meet the solicitation requirements will be evaluated to determine the most promising technical and scientific approaches. Each proposal will be judged on its own merit. A Phase I award will be made to the responsive and responsible Offerors whose proposal provides the best value to the Government, based on the Technical and Scientific Merit of the proposal. **The DOT is under no obligation to fund any proposal or any specific number of proposals on a given topic. For any given topic, DOT may elect to award more or less than the anticipated quantity of awards stated in Section VI. Research Topics.**

A Phase II award will be made to the responsive and responsible Offerors whose offers provide the best value to the Government, based on the Technical Proposal and Cost Proposal. Phase II awards will be made to those offerors with the greatest commercialization potential and will be subject to the availability of funding.

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; and
 - 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 R/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 R/R&D.

- (5) The commercialization potential of the innovation will be a factor for both Phase II and II B proposals.

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 evaluation and offerors will receive an email notifying them of the rejection.**

D. Schedule

All DOT evaluations shall be completed and recommendations for award will be submitted to the DOT SBIR Program Office within eight weeks of the closing date for Phase I proposals.

E. Program Selection

Each of the Department's Operating Administrations will establish technical evaluation teams comprised of Federal staff, including engineers and/or scientists and provide written evaluations and recommendations for award to the DOT SBIR Program Director. The DOT SBIR Program Office will post a listing of awards on the webpage: <http://www.volpe.dot.gov/sbir>.

F. Contact with DOT

In order to ensure full and open competition, contact with DOT relative to this solicitation during the Phase I proposal preparation and evaluation period is restricted to the officials stated in this solicitation.

Technical questions pertaining to the FY12.2 DOT SBIR solicitation research topics must be submitted to the DOT SBIR Program Office Point of Contact, Linda Duck, Linda.Duck@dot.gov. No oral questions will be accepted.

Technical questions submitted after May 24, 2012 may not be answered.

The DOT SBIR Program Office will submit all questions to the research topic authors for response. Answers will be posted on the DOT SBIR Program website, <http://www.volpe.dot.gov/sbir/current.html>, under Technical Questions and Answers for 12.2 Solicitation.

No information on proposal status will be available until the complete list of FY12.2 Phase I Award Recommendations is posted on the DOT SBIR Program Webpage: <http://www.volpe.dot.gov/sbir/index.html>

For planning purposes the FY12.2 Phase I Award Recommendations are expected to be posted on the DOT SBIR Program webpage by 5 PM Eastern Time, **on/or about July 30, 2012**. **The Phase I proposals which are not included in the list of FY12.2 Phase I Award Recommendations will not receive an award.** Upon the posting of the recommended proposals, contact with DOT remains restricted to the SBIR Program Office and the SBIR Program Contracting Officer.

Contact with DOT officials, other than those identified above, relative to this solicitation during any of the restricted times may result in the rejection of the proposal.

NO INFORMATION PERTAINING TO PROPOSAL STATUS WILL BE ANSWERED.

After the FY12.2 Phase I Award Recommendations are posted on the DOT SBIR Program webpage, a written debriefing comprised of the overall comments on the proposal may be provided to the offeror upon request.

G. Debriefing Requests:

Debriefing requests should be submitted to the SBIR Program Contracting Officer by e-mail to: Donald.MacGee@dot.gov, and must include the offeror's name, address, research topic number, and the proposal identification number assigned and provided through an automated email notification sent to you upon receipt of your proposal. The identity of the evaluators will not be disclosed.

V. CONSIDERATIONS

A. Awards

The Government anticipates awarding approximately 12 Phase I contracts with the possibility for additional or fewer awards. The actual number of contract awards is subject to the availability of funding and the responses from small business firms to the solicited research topics described in Section VI.

Phase I contract awards: All Phase I awards will be firm fixed price contracts and **may be** funded up to \$150,000. The period of performance for a Phase I contract is 6 months. Funding levels for each topic are determined by the agency sponsoring the research and are provided in Section VI. Research Topics.

Phase II contract awards: Phase II contracts can be funded up to \$1,000,000. Funding estimates are determined by the agency sponsoring the research. The period of performance for a Phase II contract is 2 years. Phase II funding estimates are provided in Section VI., Research Topics. Phase II and Phase II B awards will be either cost-plus-fixed-fee or firm fixed price contracts.

Phase II B contract awards: Phase II B awards of up to \$250,000 extend the period of performance to 1 year. Phase II B awards with a period of performance of more than 1 year may exceed \$250,000. A multi-year award may be funded up to \$1,000,000 and has a period of performance of no more than 2 years.

The maximum funding level for Phase II and Phase II B contract award is \$2,000,000. The funding level and period of performance are determined by the agency sponsoring the research.

The number of awards and the amount of each award is subject to the availability of funds.

Accounting System Audits: Phase II awardees will be required to have an **acceptable accounting system** in place to receive a cost-plus-fixed-fee contract. **If a small business has not had an audit of their accounting system, Defense Contract Audit Agency (DCAA) will conduct an on-site pre-award audit prior to contract award.** This process can take up to three to four months in addition to the time for processing an award. For information pertaining to DCAA accounting system requirements and audits, please go to the DCAA webpage, <http://www.dcaa.mil>

Only recipients of Phase I contracts will be eligible to receive a Phase II invitation. Only recipients of Phase II contracts will be eligible for a Phase II B invitation.

DOT SBIR Program Set-aside Budget:

Beginning in FY 2012, DOT's Operating Administrations will contribute 2.6% of their agency's Extramural Research Budget for SBIR Program funding. Each DOT Operating Administration's SBIR contribution may only be used to support research of concern to that Operating Administration. For example, funds furnished by the Federal Highway Administration (FHWA) may not support research solely of concern to the National Highway Traffic Safety Administration (NHTSA). 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 Highway Administration (FHWA), Federal Motor Carrier Safety Administration (FMCSA), Federal Railroad Administration (FRA), Federal Transit Administration (FTA), National Highway Traffic Safety Administration (NHTSA), Research and Innovative Technology Administration (RITA), and Pipeline Hazardous Materials Safety Administration (PHMSA). The Phase I and Phase II awards for such research will be subject to the availability of funding.

B. Reports

1. Under Phase I SBIR contracts, 3 reports will be required, consisting of 2 interim narrative reports, and a comprehensive final report.
2. Under Phase II, Phase II B and Phase III SBIR contracts, monthly progress reports, monthly cost reports, commercialization reports (due every 6 months), and a summary of results will be required.

C. Payment Schedule

Payments for Phase I contracts will be made in 3 equal installments upon submission of invoices by the contractor in conjunction with the submission of acceptable reports as described in Paragraph B above.

Payments for Phase II, Phase II B, and Phase III contracts will be made upon submission of acceptable reports as described in Paragraph B above. The amount and schedule of payments will be established at time of award.

D. Innovations, Inventions, and Patents

1. **Proprietary Information.** Information contained in the proposals will remain the property of the offeror. 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 offeror in a proposal which constitutes a trade secret, proprietary commercial or financial information, confidential personal information or information effecting national security, it will be treated in confidence, to the extent permitted by law, provided this information is clearly marked by the offeror with the terms "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, this proprietary information 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 offeror as a result of or in connection with the submission of this information, the Government shall have the right to duplicate, use, or disclose the information to the extent provided in the contract. This restriction does not limit the Government's right to use information contained in the document if obtained from another source without restriction. The information subject to this restriction is contained in page(s) _____ 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.

DOT prefers that offerors 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/Invention Reporting.** 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.

Invention Reporting Process:

Awardees shall report SBIR inventions to the DOT through the iEdison Invention Reporting System, <http://www.iedison.gov>. Use of the iEdison System satisfies all invention reporting requirements mandated by any award.

E. Cost Sharing

Cost sharing is permitted for Phase II and Phase II B 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 firm fixed price awards to small business concerns under the DOT SBIR Program.

A fee is allowed on cost plus fixed fee (Phase II and Phase II B only) 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 and Phase II B, 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. Contractual Commitments

Upon award of a contract, the awardee will be required to make certain legal commitments through acceptance of numerous Federal Acquisition Regulation (FAR) and Transportation Acquisition Regulation (TAR) 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 the 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 adhere to the terms of 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 40 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 to the SBIR Program Contracting Officer.
15. **Procurement Integrity.** Submission of a proposal under this solicitation subjects the offeror 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 an offeror, 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.

17. **Government Property.** Equipment either furnished or acquired under this contract is subject to Federal Acquisition Regulation (FAR) Clause 52.245-1 Government Property (August 2010) (and SBIR Program Policy Directive, Section 8 (c)).

FAR: <https://www.acquisition.gov/far/index.html>

SBIR Policy Directive:

<http://www.sbir.gov/about/about-sbir>

J. SBIR Program Contractor Requirements

Upon contract award and for the duration of the contract the awardee will be required to adhere to SBIR Program Requirements. The following list is illustrative of the requirements to which the contractor will be committed. A complete copy of the terms and conditions will be provided upon issuance of the Phase I contract for signature prior to award.

1. The company must meet the Small Business Administration's (SBA) requirements for a small business, including being majority American owned and have 500 employees or fewer (see Section II, Definitions, and Items B-H).
2. The Principal Investigators primary employment must be with the company during the contract period. The Principal Investigator may not be employed full time elsewhere (see Section I, Program Description, Item D. Eligibility).
3. For Phase I, a minimum of two thirds of the research effort must be performed by the contract awardee. For Phase II a minimum of one-half of the research must be performed by the contract awardee.

Work performed by a subcontractor or university research lab is NOT work completed by the contract awardee (see Section V, Considerations, Item H. Research and Analytical Work).

4. Disclosures

Duplicate or overlapping work previously submitted to other agencies may not be submitted without full disclosure to all agencies. See Section III, Proposal Preparation, Item 10, Similar Proposals or Awards.

University employees participating on a SBIR award shall disclose their involvement and the use

of university facilities to the Government. Disclosure should be provided to the university as well as their use of university facilities.

K. Corrective Actions

Fraudulent reports or other deliverables knowingly submitted under an awarded contract may result in termination of an active award. If the contract is terminated for fraud or any other illegal or improper activity the Government is entitled to recover, in addition to any penalty prescribed by law, the amount expended under the contract.

For any questions pertaining to your proposal or award, contact the DOT SBIR Program Director and/or SBIR Program Contracting Officer.

L. Additional Information

1. This solicitation is intended for informational purposes and reflects current planning. Although not expected there may be inconsistencies between the information contained in the 12.2 solicitation and the terms and conditions of any resulting SBIR contract. The terms of the contract once executed are controlling.
2. Before award of an SBIR contract, the offeror shall complete Online Representations and Certifications Application: <https://orca.bpn.gov>
3. The Government may request the offeror to submit additional management, personnel, and financial information to assure responsibility of the offeror.
4. The Government is not responsible for any monies expended by the offeror before award of any contract.
5. 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.
6. 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. For information pertaining to submission requirements for unsolicited proposals please go to the following web page: <http://www.volpe.dot.gov/procure/unsolguide.html>.
7. If an award is made pursuant to a proposal submitted under this solicitation, the contractor will be required to certify that they have not previously been, nor are currently being paid for essentially

equivalent work by any agency of the Federal Government.

8. 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.
9. In accordance with FAR 52.233-2, Service of Protest:
 - (a) Protests, as defined in section [33.101](#) of the Federal Acquisition Regulation, that is 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:

Donald MacGee, Contracting Officer
Volpe Center, RVP-32
55 Broadway
Cambridge, MA 02142-1001
(617) 494-2803
 - (b) The copy of any protest shall be received in the office designated above within one day of filing a protest with the GAO.

VI. 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 submitted must respond to one (and only one) topic and/or focus area as described in this section. A proposal may, however, indicate and describe its relevance to other topics.

Topic number & Title	Maximum Number of Anticipated Awards	Estimated Award Amount Phase I	Estimated Award Amount Phase II*
<u>Federal Highway Administration</u> 12.2-FH1 Delivering In-Vehicle Messages in Temporary Work Zones	1	\$150K	\$600K
<u>Federal Highway Administration</u> 12.2-FH2 Advanced Rapid Non-destructive test method to determine chemical composition of concrete materials in the field	1	\$150K	\$750K
<u>Federal Highway Administration</u> 12.2-FH3 Pedestrian Auto Enforcement Program (PAEP)	1	\$150K	\$1M
<u>Federal Highway Administration</u> 12.2-FH4 Tracking of heavy vehicles for estimating heavy load distribution across the highway system and Weigh-In-Motion Calibration	1	\$150K	\$800K
<u>Federal Highway Administration</u> 12.2-FH5 Three dimensional mapping of utilities and underground infrastructure for intersection design, repair or reconstruction	2	\$150K	\$750K
<u>Federal Railroad Administration</u> 12.2-FR1 Small Scale Diesel Generator for Railway Applications	2	\$150K	\$300K
<u>Federal Railroad Administration</u> 12.2-FR2 System for Prevention of Lens Surface Contamination	2	\$150K	\$300K
<u>Federal Aviation Administration</u> 12.2-FA1 Creating Spatial Disorientation in Flight Simulation	2	\$150K	\$800K

*The Phase II funding level noted above is an estimate only, is subject to the availability of funds and/or the technical requirements to accelerate the development of a commercial product and/or innovation. Any changes to the Phase II estimated funding level listed above will be communicated to the small business after the completion of the Phase I project.

Federal Highway Administration (FHWA)

12.2-FH1 Delivering In-Vehicle Messages in Temporary Work Zones

There are thousands of work zones on US highways daily. With a majority of these work zones in place to allow the rehabilitation and improvement of existing roadways, these work zones necessarily have some effect on regular traffic flow. These effects may result from a lane shift, a lane closure with a merge, reduced speed limits, trucks entering/leaving the work area, or a range of other conditions. Alerting drivers to these changed traffic conditions ahead can allow for smoother, safer traffic flow and increased time for slowing or stopping when needed. Commercial vehicles require additional stopping distance and can especially benefit from additional early warning of unusual traffic conditions ahead, particularly since they are over-represented in work zone crashes. The devices most commonly used to communicate temporary traffic changes to road users in work zones are channelizing devices, static signs, and portable changeable message signs (PCMS). Due to the nature of work zones, existing permanent intelligent transportation systems in the area are often disabled and PCMS are the primary means of delivering dynamic information to drivers. Delivering PCMS messages into vehicles could enhance their effectiveness, particularly in situations of driver distraction or when visibility is obscured due to large vehicles.

A means is sought to use or enhance devices already commonly used in work zones to provide up-to-date, in-vehicle warning to drivers about traffic conditions ahead. The means should:

1. Use devices already commonly used in temporary work zones.
2. Enable communication with and updating of the devices remotely and automatically.
3. Communicate to in-vehicle systems via dedicated short range communications (DSRC).
4. Be useful for all types of vehicles, including commercial vehicles.
5. Allow for networking across multiple devices.
6. Be portable enough for use in the changing traffic conditions of a work zone.
7. Meet or exceed safety requirements, such as the Manual on Uniform Traffic Control Devices (MUTCD) and Manual for Assessing Safety Hardware (MASH).
8. Allow retrofitting to much of existing stocks of work zone devices.

This application for temporary work zones is intended to complement the roadside-to-vehicle work being done for permanent situations by the Department of Transportation (DOT) connected vehicle efforts. The product described will satisfy FHWA strategic goals of System Performance and National Leadership, and DOT's strategic goals of Safety. This project is also of interest to the Federal Motor Carrier Safety Administration.

Expected Phase I Outcomes:

Outcomes expected from the Phase 1 include a detailed concept that demonstrates the viability of creating a prototype that satisfies the attributes described above. In addition, a high level cost-benefit analysis and assessment of the practicality of the concept's large scale deployment feasibility.

Expected Phase II Outcomes:

Phase 2 efforts include manufacturing and demonstrating a working prototype of the Contractor's approach to validate its retrofitting capabilities and in-vehicle message delivery. This would include measurements of networking of multiple devices, success rate for message delivery, accuracy of messages, and system operational reliability.

12.2-FH2 Advanced Rapid Non-destructive test method to determine chemical composition of concrete materials in the field

Deterioration of concrete structures is caused by many different mechanisms, such as reinforcement corrosion, sulfate damage, freezing and thawing, and alkali-silica reactivity. Extracting concrete cores and conducting laboratory analyses are the most common methods for determining the cause of deterioration of concrete structures. For example, a common form of assessment of chloride¹ content in concrete consists of extracting and analyzing concrete cores by means of chemical testing such as titration. Although these methods are relatively accurate, they are destructive, labor intensive, time consuming, and costly. The challenge State DOTs and other highway agencies face is performing analytical chemistry testing on concrete structures in the field and obtaining test results accurately and rapidly.

There is a need for an inexpensive, portable device and protocol that can easily be used in the field to determine chemical composition of materials in concrete structures (on the surface and below the surface of concrete) non-destructively. This will assist field engineers to determine the cause of deterioration of the concrete, and to take suitable measures at the appropriate time to minimize further deterioration of the concrete.

Phase I objectives:

The overall objective of the proposed study is to investigate and develop an inexpensive, rugged protocol capable of determining chemical composition at the surface and below the surface of concrete non-destructively. The protocol at a minimum should meet the following:

- Provide a real- time chemical composition of materials in concrete at surface and below the surface (up to 2 inches) non-destructively.
- Yield highly precise quantitative results of chemical composition of materials in concrete structures that have been exposed in harsh environments (e.g., deicing, etc.) and those with treated, deteriorated concrete (e.g., silane, siloxane, lithium compound, etc.)
- Be easy to calibrate and operate in the field.
- Capable of storing data during testing and transferring the data to a laptop computer.
- Compact and portable to be carried in the field.
- Rugged enough for normal inspection operation in the field.
- Safe to operate.

Expected Phase I Outcomes:

Phase I will demonstrate the feasibility of a protocol to conduct field tests rapidly and accurately and determine the chemical composition of materials in concrete. Outcomes expected from the Phase I include a detailed concept that demonstrates the viability of the protocol that satisfies the series of test results as described below:

Laboratory Testing

1. Coordinate with highway agencies and extract cores from deteriorated structures and conduct series of tests as listed below:

- Conduct tests on extracted concrete cores from structure(s) affected by alkali-silica reactivity.
- Conduct tests on extracted concrete cores from structure(s) affected by steel corrosion.
- Conduct tests on extracted concrete cores from structure(s) with sulfate damage.

Determine the chemical composition of materials using the protocol and verify the cause of deterioration.

2. Coordinate with highway agencies and extract cores from deteriorated structures and conduct series of tests as listed below:

- Conduct tests on extracted concrete cores from structure(s) treated with lithium² compound including lithium nitrate.
- Conduct tests on extracted concrete cores from structure(s) treated with silane³, and siloxane⁴.

Determine the chemical composition substances and verify the depth of the penetration of substance (e.g. lithium compound including lithium nitrate, silane, and siloxane).

Expected Phase II Outcomes:

Phase II efforts include refining the protocol system (product) and demonstrating that the system meets the objectives specified in the contract.

12.2-FH3 Pedestrian Auto Enforcement Program (PAEP)

This Phase I project will combine two countermeasures that are critical for intersection safety in urban areas throughout the country. It will link the enforcement of red light running with pedestrian safety to enhance the safety and improve the environment for motor vehicles, pedestrian and other road users. This project combines existing technology that has not been used before in this application. It will enhance enforcement of existing pedestrian laws at legal crossings by using automated enforcement. Similar to Red Light Running Cameras, this project would use pedestrian detection technology combined with automated enforcement technology to issue citations to vehicles that do not yield or stop for pedestrians at legal crossings.

Background: Although vehicle to vehicle crashes can be tragic, there is a higher risk of fatality or serious injury in a vehicle to pedestrian crash. In New York, for example, over 25% of the annual fatalities are attributable to vehicle to pedestrian crashes. Red Light Running Programs have existed for many years and have been proven to reduce serious injury and fatality crashes. Establishing a similar program for pedestrians can lower the rate of pedestrian fatalities, as it would target vehicles that don't yield or stop for pedestrians at legal crossings. Although Engineering and Education improvements can increase safety, the third E, enforcement, is also needed to achieve the best effective results. However agencies do not have the resources to place law enforcement officers everywhere they are needed. The PAEP will assist in closing this gap. The technology to detect pedestrians is available. Companies such as Google, Volvo, BMW, and Volkswagen are developing autonomous vehicles which can detect pedestrians. Red light camera technology has been around for several years. Merging the two concepts would provide a tool an agency can utilize in a city, county or Statewide for much less cost than the resources needed to provide a similar level of effort with uniformed police presence. With the proper marketing the PAEP should lead to better compliance of yield and stop laws, which should reduce crashes, which will reduce fatalities and injuries, as it's the case with motor vehicle red light running programs.

Phase I:

Develop a PAEP where information can be captured to warrant citing vehicles that do not yield or stop for pedestrians at legal controlled crossings. The infraction, just as with the red light running program, would have to be validated by a police officer and be given due process prior to disposition. Although it appears pedestrian detection technology and video detection/photo enforcement is the most viable form of executing the desired program, we would encourage companies to explore all forms of technology.

Potential Benefits: First and foremost we believe the PAEP has the potential to dramatically reduce the number of pedestrian injuries and fatalities.

Existing Red Light Camera technology provides video of the incident before and after the incident. Video allows law enforcement officers as well as judges to view the motorist infraction and determine fault; therefore reducing the chances of a successful challenge to a citation. An opportunity to educate the public about pedestrian safety exists with the start and continuation of the PAEP.

The PEAP could be revenue neutral, or it may generate revenue. If revenue was part of the motivation of this program, implementing agencies may consider spending the revenue generated to improve pedestrian or roadway safety.

Challenges: Although Red Light Running cameras have been effective at reducing the number of red light runners, and as a surrogate to crash reduction at intersections, it has also had its fair share of negative press due to the focus on revenue generation. Safety is the primary purpose of this project. FHWA believes that people will accept pedestrian automated enforcement because of the consequences of a vehicle to pedestrian crash is so much more serious, especially for children and older pedestrians that are even more vulnerable at even slow speeds. Therefore the challenge of kicking off the program in a positive manner is crucial.

Not all agencies may have the laws to allow a PAEP. The New York City Metropolitan Transportation Authority, for example, is an agency that may be able to pilot the PAEP. Emmett McDevitt, safety engineer for the NY Division office, has shown support for the program and believes the program would complement the pedestrian safety efforts currently in place in New York City.

In addition, data collected of pedestrians violating the law could help law enforcement with prioritizing where they focus their enforcement activities.

Expected Phase I Outcomes:

A detailed concept of operations that demonstrates the viability of using new or existing technology to detect and capture information of vehicles that fail to yield to pedestrians at intersections or other legal crossings.

Expected Phase II Outcomes:

Fully developing and demonstrating a working product that detects vehicles violating pedestrian's right of way at intersections or legal crossings, captures and provides accurate information on the violators successfully.

12.2-FH4 Tracking of heavy vehicles for estimating heavy load distribution across the highway system and Weigh-In-Motion Calibration

There are now over 5,000 permanent volume counting sites with over 2,500 of them being classification sites and 800 of them being weigh-in-motion (WIM) sites. There are thousands of additional loop sensors deployed at ITS and signalized intersections and ramps. New advances in vehicle signature sensors such as inductive loop signature sensors, magnetic signature sensors, and Bluetooth signature equipment allow us to obtain the necessary elements to allow for the re-identification of heavy vehicles between WIM sites.

Utilizing vehicle signatures, reidentification can tie information on individual vehicles from WIM sites with their rich details (speeds, vehicle length, axle spacings and axle weights) to less complicated classification and volume sites and even signalized intersection locations. By comparing the weights of the same vehicle at

consecutive WIM sites systems, out of calibration sites could also be identified. Variances in axle spacings, vehicle lengths, speeds and weights could be used identify problems and keep all sites working at their optimum level. With detailed origin and destination information and link speeds by vehicle type it might be possible to calculate travel patterns for all vehicle types and thus loading distributions for pavement design to level 1 (site specific) specifications. (see References 1-4)

Expected Phase I Outcomes:

Phase I will develop a re-identification tool that will use loop signature detectors at two existing WIM stations (at least 30 miles apart). The system will uniquely classify and identify vehicles and tag them with the full WIM measurement data and transfer that information to a downstream WIM station for processing and reidentification of the same unique vehicle on a per lane basis at each site. The system will then use statistical methods to determine which measured values are out of bound using speed, expected arrival time and known site specific information to predict vehicles arrivals. The system will use direct communication with the sensor cards. The system software must allow for output of vehicle: signature, speed, vehicle bumper-to-bumper length, axle spacing(s), axle weight(s) data. Phase I will include a state partner so that user feedback is incorporated in to the basic system design. Phase I will conclude with a demonstration of the concept as a system of hardware and software to use existing methods to re-identify vehicles and apply measurement statistics between two WIM sites (at least 30 miles apart). The demonstration shall track attributes of vehicle and calibration values to include speed, vehicle length, axle spacing, and axle weight.

Expected Phase II Outcomes:

Phase II will extend the software and hardware capabilities from being able to handle two sites to being able to handle up to 15 independent Weigh-in-Motion, Classification and counting sites. In addition, the Phase II system will add origin and destination data, link speeds, and network movements of vehicles. The Phase II system will use the data from the WIM sites to apply advanced vehicle attributes to re-identified vehicles at non-WIM sites. Phase II will include the design of environmentally hardened electronics that meets or exceeds requirements for NEMA, 170, 2070 and ATC cabinet interfacing and other related requirements. The system shall allow for interpolation of calibration adjustments, adjustment of parameters and for the use of the flat file data by researchers for further data mining. Phase II will develop an independent open source visual validation and verification system based on the CalTrans system developed by Joe Palen, of their research office, to be used to validate the correct operation of sensor systems (see references 5 and 6). The final system design would use encryption and other techniques based on the text “Translucent Databases” (reference 7) to assure that hackers and others could not link data from the system with other data to match the uniquely identified vehicles in the system to their real world owners.

NOTE: Vendors or researchers of signature and Bluetooth sensor systems include but are not limited to Berkeley Transportation Systems, CLR Analytics, Diamond Traffic, Reno A&E, Eberle Design, Sensys, and TRAFFAX.

References:

- (1) Liu, Hang; Jeng, Shin-Ting(Cindy); Tok, Yeow Chern Andre; Ritchie, Stephen G.; **Commercial Vehicle Classification using Vehicle Signature Data**, 88th Annual Meeting of the Transportation Research Board, 2009 January 11, Washington D.C. www.uctc.net/papers/860.pdf
- (2) Gary E Shoup, **Traffic Signal System Offset Tuning Procedure Using Travel Time Data**, MSCE Thesis, December 1998
- (3) Benjamin Andre Coifman, **Vehicle Reidentification and Travel Time Measurement Using Loop Detector Speed Traps**, 1999

- (4) Yeow Chern, Andre Tok, **Commercial Vehicle Classification System using Advanced Inductive Loop Technology**, 2008, UCTC PhD Dissertation
- (5) OVERHEAD TRAFFIC DETECTOR MOUNTING SYSTEM, FINAL TECHNICAL REPORT
- (6) SuWhan Kim, A Skarbonis, **Multi-Sensor Traffic Data Fusion**, Berkeley Highway Laboratory-Path Paper UCB-ITS-PWP-2003-3
- (7) **Translucent Databases 2nd Edition: Confusion, Misdirection, Randomness, Sharing, Authentication And Steganography To Defend Privacy**, CreateSpace, Peter Wayner, Jan 8, 2009, ISBN-13: 978-1441421340

12.2-FH5 Three dimensional mapping of utilities and underground infrastructure for intersection design, repair or reconstruction

There are thousands of intersections on the highways across the United States which must be modified for the addition of new underground infrastructure or rebuilt due to deterioration or obsolescence. The presence of underground features and infrastructure and the condition of the subgrade and supporting soils needs to be accurately characterized prior to construction, repair or reconstruction. Missing or inaccurately locating underground utilities, wires or infrastructure can cause serious problems during the construction process.

Recent research has identified the possibilities of mapping in-pavement sensors and access wires to the sensors (small and large) using ground penetrating radars, ultrasonic's and other techniques.

Therefore, to improve the safety and effectiveness of intersection construction or reconstruction, research needs to be done into what types of in-pavement and below-pavement infrastructure can be located and mapped in three dimensions. To be successful, the system should be capable of locating the following features:

1. Magnetometer and magnetic sensor structures, and access wires to the sensors
2. Electrical wires
3. Small and large water, gas or other utility feeder pipes
4. Very large storm and sewage drainage pipes
5. Other underground structures
6. Water and moisture intrusions
7. Three dimensional location and visualization of the above within the structure of the roadway and soil or rock substructures below it,

Expected Phase I Outcomes:

Outcomes expected from Phase I include a detailed proof of concept that demonstrates the viability of accurately locating and sizing the in-pavement and below-pavement items identified above in three dimensions. A prototype marketing strategy that anticipates how such a system could be marketed and a possible deployment strategy based on a cost benefit approach shall also be developed.

Expected Phase II Outcomes:

Phase II outcomes include developing a product and visualization software for utilizing the outputs of the product. A "laboratory" application at a site such as the FHWA R&D Accelerated Loading Facility would be necessary to demonstrate accuracy and ease of use with a test pavement section with underground sensors, wires and pipe facilities located similarly to real world conditions to demonstrate to the market the viability of this approach. A "real world" demonstration in conjunction with a real world intersection reconstruction of an intersection would then be conducted to complete the proof of commercial prototype. The ability to create "as-built" plans of the intersection will be a requirement.

NOTE: The technology to be used in developing this tool is specifically not specified. The offeror must propose a technology or technologies and justify why it will meet the needs described above.

Federal Railroad Administration (FRA)

12.2-FR1 Small Scale Diesel Generator for Railway Applications

The Federal Railroad Administration (FRA) is actively supporting the development of technologies that will ensure the safety of the US railway system. One objective of this research is to develop autonomous inspection technologies to increase conditional awareness of track safety and maintenance issues. These inspection systems operate without human interaction and are deployed on freight and passenger railway vehicles. Many of these technologies require electrical power to collect and disseminate data while traveling in train sets. Some of the required power can be supplied by on-board solar, wind harvesting, and battery systems, however, these systems are unlikely to satisfy system power requirements under all possible conditions. Supplemental electrical power is needed to ensure inspection system availability. A small scale diesel fueled electrical generator or fuel cell is needed. The FRA has a preference for systems that are lightweight, compact in size, and energy efficient with the following performance characteristics:

- 200 to 500 watts total output.
- Regulated (clean) output waveform (AC or DC current) suitable for battery charging and direct powering of sensitive electrical instruments.
- Operation with standard, railroad locomotive-grade diesel fuel.
- Self-starting, self-stopping operation from external trigger.
- 80% duty cycle rating.
- 90-day minimum maintenance interval.
- Mounting systems and environmental protection suitable for exterior mounting to the under floor of a freight-type railcar.
- System fault logic and other features to prevent unsafe operation.

Expected Phase I Outcomes:

The Phase I outcome for this project should be delivery of a prototype generator or fuel cell suitable for limited field testing. Design data, laboratory performance test reports and maintenance requirements documentation will also be a requirement for the Phase I work.

Expected Phase II Outcomes:

The expected Phase II work will involve the production of a system capable of extended field testing.

12.2-FR2 System for Prevention of Lens Surface Contamination

At least one of the track inspection systems currently utilized by the Federal Railroad Administration (FRA), as well as the railroad industry, includes a critical lens component. It is common for this lens component to become covered with water and mud when in use. As a result, the quality of the data collected with the system degrades. FRA desires an innovative solution for keeping particles, specifically water and mud droplets, from making contact with the surface of this lens. Prior systems have focused on periodic cleaning of the lens (for example, using rolling film and wipers) while in service. Such systems have proved unsatisfactory. The focus of this research topic is to design a system for *preventing* water and mud particles from reaching the lens

surface. The system may use an air flow or other alternative means to achieve this goal. A cylindrical tube may be used in order to contain the air flow. The diameter of the tube must be at least wide enough to accommodate the lens, and the maximum allowable length of the tube will be a function of distance away from the lens as the tube cannot interfere with a diverging laser beam that exits the lens. All other evaluation criteria being equal, systems with superior power efficiencies will be rated higher.

Expected Phase I Outcomes:

The Phase I outcome will include delivery of a prototype unit suitable for lab testing and limited field testing. Design data, laboratory performance test reports and maintenance requirements documentation will also be a requirement of Phase I work.

Expected Phase II Outcomes:

The Phase II outcome will be to develop a system capable of extended field testing.

Federal Aviation Administration

12.2-FA1 Creating Spatial Disorientation in Flight Simulation

Loss-of-control is the leading cause of fatalities worldwide in the commercial jet fleet. A Federal Aviation Administration study categorized approximately 10% of the 75 loss-of-control accidents, occurring between 1993 and 2007, being due to pilot spatial disorientation. Such disorientation can arise from limitations in human perception arising from the inner-ear sensor capabilities. A typical example is the perception of pitching upwards that occurs while accelerating on a level runway during the takeoff roll. Comparable perceptual errors that have occurred in flight have caused some pilots to apply inappropriate control inputs, which have contributed to loss-of-control accidents. Since flight simulators are used to train the vast majority of pilots in the commercial jet fleet, it would be helpful to determine what types and levels of spatial disorientation can be simulated in simulators with widely varying capabilities. To effectively allow simulator users to maximize the capability of their simulator to simulate spatial disorientation, a software prototype is needed with the following attributes:

1. It provides succinct and effective spatial disorientation academic information that is useful for commercial jet pilots prior to simulation training.
2. It accounts for varying simulator motion and visual capabilities when determining what spatial disorientation situations may be possible to simulate.
3. It quantifies the differences that may result between in-flight spatial disorientation and the simulated spatial disorientation owing to the simulator limitations.

The product described is expected to reduce the number of fatalities in commercial jet aviation due to spatial disorientation.

Expected Phase I Outcomes:

Outcomes expected from the Phase 1 include a detailed concept that demonstrates the viability of creating a prototype that satisfies the attributes described above.

Expected Phase II Outcomes:

Phase 2 efforts include developing a working prototype accomplishing the identified attributes. The accomplishment of the attributes must be demonstrated in a motion-based Level D flight simulator.

VII. SUBMISSION FORMS AND CERTIFICATIONS

- | | | |
|----|---|------------|
| 1. | PROPOSAL COVER SHEET | Appendix A |
| 2. | PROJECT SUMMARY | Appendix B |
| 3. | CONTRACT PRICING PROPOSAL | Appendix C |
| 4. | PROPOSAL CHECKLIST
(Do not include with your proposal – for your use only) | Appendix D |

**U.S. DEPARTMENT OF TRANSPORTATION
SMALL BUSINESS INNOVATION RESEARCH PROGRAM
SOLICITATION NO. DTRT57-12-R-SBIR2
FY12.2**

PROPOSAL COVER SHEET

Project Title	
Research Topic No.	
Research Topic Title	
Submitted by:	Company Name
	Address
	City, State, Zip
Representations & Certifications	Central Contractor Registration Valid Until _____(Date) www.ccr.gov
	Online Representations and Certifications Valid Until _____(Date) https://orca.bpn.gov/login.aspx
Amount Requested \$ (May be up to \$150, 000 unless otherwise indicated)	
Proposed Duration (in months) (Not to exceed 6 months)	

By signing and submitting this coversheet under Solicitation No. DTRT57-12-R-SBIR2, Topic No. _____, certifies that:

1. The above firm, together with its affiliate's _____ is _____ is not a small business firm and meets the definition stated in Section II.B; and that it meets the eligibility requirement in Section I.E.
2. The SBIR Applicant is (check one):
 - a. at least 51% owned and controlled by one or more individuals who are citizens of the United States, or permanent resident aliens in the United States; or
 - b. at least 51% owned and controlled by another business concern that is itself at least 51% owned and controlled by individuals who are citizens of, or permanent resident aliens in the United States; or
 - c. a joint venture in which each entity to the venture meets the requirements set forth in 2.a or 2.b above.
3. The above firm, _____ will _____ will not primarily employ the Principal Investigator at the time of award and during the conduct of research.
4. The above firm _____ does _____ does not qualify as a socially or economically disadvantaged small business as defined in Section II.C. (The information is for statistical purposes only.)
5. The above firm _____ does _____ does not qualify as a women-owned small business as defined in Section II.D. (The information is for statistical purposes only.)
6. The above firm _____ does _____ does not qualify as a HUB Zone-owned small business and meet the definition as stated in this Section II. G
7. The above firm and/or Principal Investigator _____ has, _____ has not submitted proposals containing the same, or a significant portion of equivalent or overlapping work to other Federal agencies. (If yes, identify proposals in the Section III. D.10., Similar Proposals.)
8. The above firm and/or Principal Investigator _____ has, _____ has not been funded under any other Federal grant, contract or subcontract program solicitations, or has received other Federal awards to conduct essentially equivalent work or overlapping work. (If yes, identify proposals in the Section III. D.10., Awards.)
9. The Principal Investigator's primary employment _____ is, _____ is not with the above firm.
10. The above firm _____ will, _____ will not 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 is recommended for award, to any party that may be interested in contacting you for further information?

By signing and submitting this proposal in response to Solicitation No. DTRT57-12-R-SBIR2, Topic No. _____, I am representing on my own behalf, and on behalf of the SBIR applicant, that the information provided in this certification, the application, and all other information submitted in connection with this application, is true and correct as the date of the submission. I acknowledge that any intentional or negligent misrepresentation of the information contained in this certification may result in criminal, civil or administrative sanctions, including but not limited to: (1) fines, restitution and/or imprisonment under 18 U.S.C. § 1001; (2) treble damages and civil penalties under the False Claims Act (31 U.S.C. § 3729 *et seq.*); (3) double damages and civil penalties under the Program Fraud Civil Remedies Act (31 U.S.C. § 3801 *et seq.*); (4) civil recovery of award funds, (5) suspension and/or debarment from all Federal procurement and non-procurement transactions (FAR Subpart 9.4 or 2 C.F.R. part 180); and (5) other administrative penalties including termination of SBIR awards.

Principal Investigator

Name _____

Title _____

Signature _____ Date _____

Telephone No. _____

E-mail _____

Corporate/Business Official

Name _____

Title _____

Signature _____ Date _____

Telephone No. _____

E-mail _____

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

**U.S. DEPARTMENT OF TRANSPORTATION
 SMALL BUSINESS INNOVATION RESEARCH PROGRAM
 SOLICITATION NO. DTRT57-12-R-SBIR2
 FY12.2
 PROJECT SUMMARY**

Name and Address of Offeror	
	Proposal No.

Name and Title of Principal Investigator

Project Title

Research Topic No.	Research Topic Title
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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 word (eight 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
CONTRACT PRICING PROPOSAL
FY12.2**

Topic No:				
Offerors Project Title:				
Name of Offeror:				
Address:				
City, State, Zip:				
Offerors Point of Contact:				
Title of Offerors Point of Contact:				
Telephone:				
E-mail:				
DUNS No. If available:				
Tax Identification No. If available:				
To best of my knowledge and belief, cost and pricing data are true and complete, and current as of the date of signature below. I understand that the willful provision of false information or concealing a material fact in this report or any other communication submitted to DOT is a criminal offense (U.S. Code, Title 18, Section 1001).				
THE COST PROPOSAL MUST BE SIGNED BY A RESPONSIBLE OFFICIAL OF THE FIRM. Authorized Company Officer: Printed Nme _____ Title _____ Signature _____ Date _____				
1	Total Firm Fixed Price Proposal Amount			\$ _____
2.	Direct Material Costs			
	a. Purchased Parts & Subcontracted Items			\$ _____
	Description	Unit Price	Qty	Total
	b. Raw Materials			\$ _____
	Description	Unit Price	Qty	Total
	c. Standard Commercial Items			\$ _____
	Description	Unit Price	Qty	Total
	Total Direct Materials (TDM)			\$ _____
3	Materials Overhead			
			Rate	Amount
	Total Material Overhead (TMO)			\$ _____ %
4	Total Materials (TDM + TMO)			\$ _____
5	Direct Labor			

Topic No:				
Offerors Project Title:				
Name of Offeror:				
	Type / Personnel	Hours	Rate (\$ / Hr)	Cost
				\$
				\$
				\$
	Total Direct Labor (TDL)			\$
6	Labor Overhead (TDL x Overhead Rate)			
		Rate	Amount	
	Total Labor Overhead (TLO)	%	\$	
7	Labor: Fringe Benefits (TDL x Benefit Rate)			
		Rate (% or \$ / Hr)	Amount	
	Fringe Benefits		\$	
8	Total Labor (TDL + TLO + Fringe)			Amount
				\$
9	Direct Costs: Special Testing (Include field work at Government installations)			
	Item and Anticipated Use	Unit Cost	Estimated Cost	
			\$	
			\$	
			\$	
			\$	
	Estimated Total Special Testing			\$
10	Direct Costs: Special Equipment			
	Item and Anticipated Use	Unit Cost	Amount	
			\$	
			\$	
			\$	
	Estimated Total Special Equipment			\$
11	Direct Costs: Travel			
	Travel Location	Mode of Travel	Number of Trips	Per Diem
				Amount
				\$
				\$
	Travel			\$
12	Direct Costs: Consultant Services			
	Description of Service	Amount		
		\$		
		\$		
	Total Consultant Services			\$
13	Direct Costs: Other Direct Costs (ODC)			
	Item & Anticipated Use	Unit Cost if applicable	Amount	
			\$	
			\$	
			\$	
	Total ODCs			\$
14	Total Direct Costs (TDC) (Sums of Line No. 9 – 13)			Amount
				\$

15	General & Administrative Expense (Total Materials + Total Labor + Total ODC) x Rate)		
		Rate %	Amount
			\$
16	Royalties		
	Description	Amount	
	Total	\$	
17	Total Cost (Sums of lines 4, 8, 14, 15 & 16)		Amount
			\$
18	Profit (Total Cost x Profit Rate)		
		Rate %	Calculated Amount
			\$
19	Total Firm Fixed Price Amount (Total Cost + Profit)		\$
20	An executive agency of the United States Government ____has ____ has not performed any review of your accounts or records in connection with any other Government prime contract or subcontract within the past twelve months? If one has, then provide a copy of the audit report and the name and address of the reviewing office, name of the individual and telephone/extension below _____ _____		
21	Government property ____is ____is not required in the performance of this proposal? If yes, identify. _____ _____		
22	Government contract financing ____is, ____ is not required to perform this proposed contract? If yes, specify type as advanced payments or progress payments.		

**U.S. DEPARTMENT OF TRANSPORTATION
SMALL BUSINESS INNOVATION RESEARCH PROGRAM
SOLICITATION NO. DTRT57-12-R-SBIR2
FY12.2
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 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.E).
- ___ 2. The proposal is 25 PAGES OR LESS in length. This limitation does not apply to the additional information required by Section III.G.
- ___ 3. The proposal is limited to only ONE of the research topics in Section VI.
- ___ 4. The proposal budget **may be up to \$150,000 unless otherwise indicated in the solicitation** 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 no type smaller than ten point font size.
- ___ 7. The COVER SHEET (Appendix A) has been completed and is PAGE one and two of the proposal.
- ___ 8. The PROJECT SUMMARY (Appendix B) has been completed and is PAGE three of the proposal.
- ___ 9. The TECHNICAL CONTENT of the proposal begins on PAGE four and includes the items identified in SECTION III.D of the Solicitation.
- ___ 10. The Contract Pricing Proposal (Appendix C) has been signed included as the last section of the proposal.
- ___ 11. The additional information on prior Phase II awards, if required, in accordance with Section III.G.
- ___ 12. The proposal must be a PDF file and submitted online by 11:59 p.m., June 5, 2012.
Proposals may only be submitted online, a link to the web form can be found here: <http://www.volpe.dot.gov/sbir/current.html>. Proposals received via email will not be accepted. Do not send duplicate proposals via email or by any other means. Instructions for online submission are included on the submission page.