



U. S. Department  
of Transportation

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FY 2024.2

# **Small Business Innovation Research (SBIR) Program**

## **PHASE I PROGRAM SOLICITATION**

**Complete Streets Artificial Intelligence (CSAI)**

**Initiative**

**Topic No. 24-CS1**

**NAICS CODE: 541715**

**Issue Date: March 11, 2024**

**Closing Date: May 10, 2024, 3:00 p.m. ET**

**Small Business Innovation Research (SBIR) Program  
U.S. Department of Transportation (U.S. DOT)  
Office of the Assistant Secretary for Research and Technology  
John A. Volpe National Transportation Systems Center (Volpe Center)  
220 Binney Street  
Cambridge, MA 02142-1093**

## INFORMATION ABOUT IMPORTANT DATES

Date	Description
March 11, 2024	Solicitation Open Date
	Pre-solicitation Questions & Answers (Q&A) available on the U.S. DOT SBIR website (see Section I.D)
March 20, 2024, 5:00 p.m. ET	Registration Deadline for Pre-Offer Webinar (see below)
March 21, 2024, 1:00 p.m. ET	Pre-Offer Webinar (see below)
May 3, 2024, 3:00 p.m. ET	Administrative and Contract Pricing Worksheet (Appendix C) Questions Due (see Section I.D)
May 10, 2024, 3:00 p.m. ET	Solicitation Closing Date (See Section V)

### A. Solicitation Open with Amendments to the CSAI Initiative Topic Description:

The proposed topic description included within the pre-solicitation has been amended for the U.S. DOT FY24.2 Phase I Solicitation to provide clarifications as follows:

- Phase I is focused on demonstrating the potential of novel data generation and processing methods to produce useful data for Complete Streets.
- Phase II is focused on 1) scaling Phase I approaches to data generation/processing methods, and 2) building a functioning, beta software solution.
- Offerors may select any geographic area that meets the criteria for each Phase.
- The Offeror's chosen geographic area does not need to address all of the data elements in Table 2 of the topic description.
- Offerors may select which data elements in Table 2 of the topic description to work on and/or other data elements of their choosing.
- Data, methodologies, and/or tools generated by awardees during all Phases are encouraged to be made publicly available in a standard digital data format, to the greatest extent practicable, omitting any intellectual property, proprietary methodologies, or source input data.

## B. Pre-Offer Webinar

The Pre-Offer Webinar will be held on Thursday, March 21, 2024, at 1:00 p.m. ET. The Government encourages all small businesses, persons that are interested in or considering submitting an offer, and other interested parties to attend the pre-offer webinar. Small businesses and other interested parties may attend this webinar only virtually via a webinar conference. The webinar will provide an overview of the application process. Administrative questions about the solicitation will be collected during the webinar, but no technical questions will be accepted.

To register, visit: [https://usdot.zoomgov.com/webinar/register/WN\\_\\_2zBPLVsSK-gw6KByeYMrA](https://usdot.zoomgov.com/webinar/register/WN__2zBPLVsSK-gw6KByeYMrA).

**The deadline to register for the webinar is Wednesday, March 20, 2024, at 5:00 p.m. ET.**

After the webinar, a recording will be posted to the U.S. DOT SBIR Program website <https://www.volpe.dot.gov/work-us/small-business-innovation-research/us-dot-sbir-fiscal-year-20242-fy242-solicitation-now>.

## C. Closing Date

Offers must be received through the U.S. DOT's automated proposal website no later than **Friday, May 10, 2024, at 3:00 p.m. ET**. The U.S. DOT's automated proposal website is located at [https://usg.valideval.com/teams/usdot\\_2024\\_2/signup](https://usg.valideval.com/teams/usdot_2024_2/signup).

## D. Partnering and Teaming Resource: DOT Office of Small and Disadvantaged Business Utilization's (OSDBU) Connections Marketplace (CMP) Platform

In support of the FY24.2 Solicitation and offer preparation, the U.S. DOT SBIR is providing information regarding a DOT resource – the Connections Marketplace (CMP) Platform. The CMP Platform is available to interested offerors and other parties to meet potential teaming partners. Partnerships and teaming can provide interested offerors additional expertise and resources to successfully meet the goals of the CSAI Initiative. Please note the use of CMP as a resource for developing partnerships and/or teaming arrangements is NOT required. Use of this resource is voluntary and WILL NOT inform evaluation decisions.

The aim of OSDBU's CMP Platform is to expand, innovate and provide interested offerors opportunities for meaningful connections leading to more competitive proposals. Offerors and other parties interested in using this resource for purposes of DOT's FY24.2 Solicitation, Topic No. 24-CS1 can register at <https://www.dotcmp.com/>.

## U.S. DOT SOLICITATION FOR SMALL BUSINESS INNOVATION RESEARCH PROGRAM

**How to Use the CMP Platform:** When registering it is recommended that your profile use the North American Industries Classification System (NAICS) code 541715: “Research and Development in the Physical, Engineering, and Life Sciences (except Nanotechnology and Biotechnology)”. This number should be submitted within the Business Opportunities section of your profile. It is also recommended that NAICS code 541175 be used when searching the CMP Platform for potential partners.

Questions about registering and using the CMP Platform shall be directed to the OSDBU Office at [dot-osdbu@dot.gov](mailto:dot-osdbu@dot.gov) or 202-366-1930. Questions relating to the CMP Platform submitted to the U.S. DOT SBIR Program will not be responded to.

By including information on the CMP Platform within DOT’s FY24.2 Solicitation, Topic No. 24-CS1, the U.S. DOT SBIR Program does NOT endorse, sponsor, or otherwise evaluate the qualifications of the individuals and organizations that are self-identifying themselves within the CMP Platform.

## Contents

<b>INFORMATION ABOUT IMPORTANT DATES .....</b>	<b>I</b>
A. SOLICITATION OPEN WITH AMENDMENTS TO THE CSAI INITIATIVE TOPIC DESCRIPTION: .....	I
THE PROPOSED TOPIC DESCRIPTION INCLUDED WITHIN THE PRE-SOLICITATION HAS BEEN AMENDED FOR THE U.S. DOT FY24.2 PHASE I SOLICITATION TO PROVIDE CLARIFICATIONS AS FOLLOWS: .....	I
B. PRE-OFFER WEBINAR .....	II
C. CLOSING DATE.....	II
D. PARTNERING AND TEAMING RESOURCE: DOT OFFICE OF SMALL AND DISADVANTAGED BUSINESS UTILIZATION'S (OSDBU) CONNECTIONS MARKETPLACE (CMP) PLATFORM .....	II
<b>I. PROGRAM DESCRIPTION .....</b>	<b>1</b>
A. INTRODUCTION .....	1
B. THREE-PHASE PROGRAM .....	1
C. ELIGIBILITY .....	3
D. CONTACT INFORMATION.....	5
E. DEFINITIONS.....	6
F. REPORT SBIR FRAUD, WASTE, AND ABUSE .....	8
G. OTHER INFORMATION .....	8
<b>II. OFFER PREPARATION INSTRUCTIONS AND REQUIREMENTS .....</b>	<b>9</b>
A. OVERVIEW .....	9
B. SOLICITATION REQUIREMENTS .....	9
1. SBA Company Registry Confirmation.....	9
2. Submission of Offer.....	9
3. Offer File Names .....	10
4. Offer Submission Deadline.....	11
5. Duplicate Offers .....	11
C. OTHER INFORMATION .....	15
1. Offer Handling. ....	15
2. Fraudulent Information .....	15
3. Technical and Business Assistance (TABAs).....	16
4. National Institute of Standards and Technology (NIST)/Hollings Manufacturing Extension Partnership (MEP).....	16
D. SYSTEM FOR AWARD MANAGEMENT (SAM) .....	17
<b>III. METHOD OF SELECTION AND EVALUATION CRITERIA .....</b>	<b>18</b>
A. BASIS OF AWARD .....	18
B. PHASE I EVALUATION CRITERIA .....	18
C. OFFER RESPONSIVENESS REVIEW.....	18
D. TIME TO AWARD REQUIREMENTS .....	19
E. DEBRIEFING REQUESTS .....	19
<b>IV. CONSIDERATIONS.....</b>	<b>20</b>
A. FUNDING AWARDS .....	20
B. REPORTS .....	21
C. PAYMENT SCHEDULE.....	21
D. INNOVATIONS, INVENTIONS, AND PATENTS .....	21
E. COST SHARING.....	23
F. PROFIT .....	23
G. JOINT VENTURES OR LIMITED PARTNERSHIPS .....	23

## U.S. DOT SOLICITATION FOR SMALL BUSINESS INNOVATION RESEARCH PROGRAM

H.	RESEARCH AND ANALYTICAL WORK .....	23
I.	AWARDEE COMMITMENTS .....	23
J.	SUMMARY STATEMENTS .....	24
K.	ADDITIONAL INFORMATION .....	26
<b>V.</b>	<b>SUBMISSION OF OFFERS .....</b>	<b>28</b>
<b>VI.</b>	<b>SCIENTIFIC AND TECHNICAL INFORMATION SOURCES .....</b>	<b>29</b>
<b>VII.</b>	<b>SUBMISSION FORMS AND CERTIFICATION (APPENDICES) .....</b>	<b>30</b>
A.	OFFER SIGNATURE PAGE (APPENDIX A) .....	31
B.	PROJECT SUMMARY (APPENDIX B) .....	32
C.	CONTRACT PRICING WORKSHEET (APPENDIX C) .....	33
D.	OFFER SUBMISSION CHECKLIST (APPENDIX D) .....	34
<b>VIII.</b>	<b>RESEARCH TOPIC .....</b>	<b>36</b>
A.	COMPLETE STREETS ARTIFICIAL INTELLIGENCE INITIATIVE: GENERATING, INTEGRATING, AND ACTIVATING DATA FOR MOBILITY	37

## I. PROGRAM DESCRIPTION

### A. Introduction

The United States Department of Transportation (U.S. DOT) welcomes small businesses to participate in the U.S. DOT's Small Business Innovation Research (SBIR) program. The purpose of this solicitation is to invite small businesses, with their valuable resources and creative capabilities, to submit innovative research ideas and solutions in response to this solicitation's topic as identified by the U.S. DOT as described in Section VIII. Under the SBIR Program, the U.S. DOT does not accept unsolicited proposals.

The goals and objectives of the SBIR Program are to:

- Stimulate technological innovation;
- Meet Federal research or research and development (R/R&D) needs;
- Foster and encourage participation in innovation and entrepreneurship by socially and economically disadvantaged persons; and
- Increase private sector commercialization of innovations derived from Federal R/R&D funding.

The SBIR Program encourages small businesses to engage in R/R&D that has the potential for commercialization and meets Federal R/R&D objectives. The Small Business Innovation Development Act of 1982 [Public Law (P.L.) 97-219 codified at 15 U.S.C. 638] established the SBIR Program. More information is available at <https://www.sbir.gov/about/about-sbir>.

### B. Three-Phase Program

The U.S. DOT SBIR Program is a three-phase program.

#### **THIS SOLICITATION IS FOR PHASE I OFFERS ONLY.**

**Phase I.** Phase I is the conduct of feasibility-related experimental or theoretical R/R&D efforts on research related to the CSAI Initiative described herein. Phase I offers can be funded up to \$200,000 for this solicitation. The period of performance of the resulting contract shall be six (6) months. The basis for award is the scientific and technical merit of the offer, its commercial potential, and its relevance to the CSAI Initiative. The U.S. DOT intends to award Firm-Fixed-Price (FFP) purchase orders utilizing Federal Acquisition Regulation (FAR) Part 13 Simplified Acquisition Procedures. A purchase order is an offer by the Government to buy supplies or services, including research and development, upon specified terms and conditions (in this instance, this solicitation and the contractor's offer). The U.S. DOT will require written acceptance of the purchase order by the Small Business Concern (SBC) at the time of award via the SBC signing the purchase order, thus creating a binding contract between the SBC and the

## U.S. DOT SOLICITATION FOR SMALL BUSINESS INNOVATION RESEARCH PROGRAM

Government. Award of a bilaterally signed purchase order is subject to the availability of funding.

All U.S. DOT SBIR Phase I awardees who have successfully completed Phase I are eligible to submit a Phase II proposal for evaluation and possible selection for award.

**Phase II.** The objective of Phase II is to continue the R/R&D effort from the completed Phase I. Award of a contract for a Phase II effort is based on the results of Phase I, the scientific and technical merit of the Phase II proposal, and the commercial potential of the proposed Phase II project. Commercial potential includes the capability to transition the technology to private sector applications, Government applications, or Government contractor applications. For this U.S. DOT SBIR Program solicitation, contracts for Phase II proposals for this solicitation can be funded up to \$1,800,000 and have a period of performance of up to 18 months from the date of contract award. The Government is not obligated to fund any specific Phase II proposal.

The U.S. DOT typically awards Firm-Fixed-Price (FFP), FFP-Level-of-Effort (FFPLOE), or Cost-Plus-Fixed-Fee (CPFF) negotiated contracts for Phase II efforts utilizing FAR Part 15 Contracting by Negotiation procedures. Approximately 30 days prior to the end of Phase I efforts, the U.S. DOT SBIR Program will provide Phase I contract awardees instructions for the submission of their Phase II proposal. The content instructions will include at a minimum, details on the value, due date, content, submission requirements, and evaluation criteria for Phase II proposals. The instructions may also include additional information and/or technical recommendations. A summary of Phase II proposal submission requirements can be found on the U.S. DOT's SBIR website at <https://www.volpe.dot.gov/work-with-us/small-business-innovation-research/submit-proposal>.

**Phase III.** SBIR Phase III refers to work that derives from, extends, or logically concludes effort(s) performed under a U.S. DOT or another Agency'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 toward commercialization of SBIR research or technology and may be for products, production, services, R/R&D, or a combination thereof. The following activities are some of the types of SBIR Phase III work:

- Commercial application of SBIR-funded R/R&D financed by non-Federal sources of capital.
- SBIR-derived products or services intended for use by the Federal Government, funded by non-SBIR sources of funding.
- Continuation of SBIR work, funded by non-SBIR sources of Federal funding including R/R&D.



## C. Eligibility

### Size Rule

Regulations governing size and eligibility requirements for the SBIR program are found at 13 CFR Part 121.701-121.705. See SBA's Guide to SBIR/STTR (Small Business Technology Transfer) Program Eligibility at [http://sbir.gov/sites/default/files/elig\\_size\\_compliance\\_guide.pdf](http://sbir.gov/sites/default/files/elig_size_compliance_guide.pdf) for further details. 13 CFR Part 121.702 includes a provision that allows agency discretion relating to the participation by firms that are majority-owned by multiple venture capital operating companies, private equity firms or hedge funds. **The U.S. DOT elects at this time not to use the authority that would allow venture capital operating companies (VCOCs), hedge funds or private equity firms to participate in the SBIR Program. Offers submitted by these parties will not be considered for award.** This does **NOT** include allowable VCOCs per 13 CFR 121.702(a)(1)(i) that are majority-owned by a single VCOC, hedge fund, or private equity firm that is in of itself a small business concern.

Each SBC submitting an offer must qualify as an SBC at the time of award of Phase I and Phase II contracts (see Section I. E. for the definition of an SBC). An SBC, together with its affiliates, must not have more than 500 employees. In addition, the following requirements must be met:

- The primary employment of the principal investigator must always 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 employment time is spent working for the small business. This typically precludes full-time employment with another organization.
- For Phase I, a minimum of two-thirds of the research or analytical effort, measured in total contract dollars using simple math, must be performed by the awardee (i.e., 66.7% of total contract cost must be for other than subcontractor/consultant costs).
- For Phase II, a minimum of one-half of the research or analytical effort, measured in total contract dollars using simple math, must be performed by the awardee (i.e., 50% of total contract cost must be for other than subcontractor/consultant costs).
- For both Phase I and Phase II, all the R/R&D work must be performed in the United States. "United States" means the 50 states, the territories and possessions of the Federal Government, the Commonwealth of Puerto Rico, the Republic of the Marshall Islands, the Federated States of Micronesia, the Republic of Palau, and the District of Columbia.

## Performance Benchmark Requirements for Phase I Eligibility

Section 6(a)(7) of the SBIR Policy Directive requires each Federal agency participating in SBIR to set a Phase II transition rate benchmark per Section 5165 of the SBIR/STTR Reauthorization Act of 2011. General information on the Performance Benchmark requirements is available at <https://www.sbir.gov/performance-benchmarks/>.

Before submitting an offer to this solicitation, all potential offerors should verify their Transition Rate eligibility for Phase I awards on SBA's SBIR website at <https://www.sbir.gov/>. On June 1st of each year, Phase I applicants that meet the Phase I to Phase II transition rate are eligible to submit an offer for a new Phase I award.

**Phase I to Phase II Transition Rate:** The U.S. DOT's Phase I to Phase II Transition Rate uses a five-year period and counts an offeror's total number of Phase I awards over the past five fiscal years, excluding the most recently completed fiscal year; and the total number of Phase II awards over the last five fiscal years, excluding the most recently completed fiscal year. The U.S. DOT SBIR Phase I to II Transition Benchmark is: at least 0.25.

**Effective July 25, 2013, for all U.S. DOT SBIR Program Phase I offerors that have received 21 or more Phase I awards during the past five fiscal years, the ratio of Phase II awards received to Phase I awards received must be at least 0.25.**

### Commercialization Benchmark:

The Commercialization Benchmark requirement applies only to SBIR and STTR Phase I applicants that have received 16 or more Phase II awards during the past 10 fiscal years, excluding the two most recently completed fiscal years. These companies must have achieved at least the minimum required levels of commercialization activity, resulting from their past Phase II work, to be eligible to submit a proposal for a new Phase I (or Direct-to-Phase II) award. The current Commercialization Benchmark requirement, agreed upon and established by all 11 SBIR agencies, was published for public comment in the Federal Register (FR) at 78 FR 48537 in August 2013 with a reopening of the comment period at 78 FR 59410 in September 2013. It requires the awardee applicant to average at least \$100,000.00 of sales and/or investments per Phase II award received during the period or have received a number of patents resulting from the SBIR work equal to or greater than 15% of the number of Phase II awards received during the period.

As of April 2021, the Small Business Administration (SBA) is enforcing the Commercialization Benchmark and is compiling a list of companies that will be deemed ineligible to submit a proposal for a new Phase I (or Direct-to-Phase II) award due to failure to meet the Commercialization Benchmark requirement.

## U.S. DOT SOLICITATION FOR SMALL BUSINESS INNOVATION RESEARCH PROGRAM

SBIR and STTR awardees are required to update and maintain their organization's SBIR.gov Company Commercialization Report, accessible when logged in to the Company Registry profile as an authorized user under the "My Dashboard" section. Commercialization information is required upon completion of the last deliverable under the funding agreement. SBIR and STTR awardees are requested to voluntarily update the information in the database annually thereafter for a minimum period of 5 years.

### Foreign Disclosure Notice

The SBIR and STTR Extension Act of 2022 (P.L. 117-183), Section 4(c), requires each SBC submitting a proposal or application for a federally funded award to disclose information in the proposal or application regarding ties to the People's Republic of China and other foreign countries. As such, all offerors submitting in response to this solicitation are required to complete a disclosure form at the U.S. DOT's online page at:

<https://forms.office.com/g/BmmrYKqhpz> on or before the solicitation closing date.

Details on the requirements of the Extension Act and disclosures can be found at

<https://www.congress.gov/bill/117th-congress/senate-bill/4900/text>.

The Disclosure Form was also published by the SBA in the Federal Register on April 4, 2023.

## D. Contact Information

If you have any administrative questions not listed on our Frequently Asked Questions (FAQs) web page (<https://www.volpe.dot.gov/work-with-us/small-business-innovation-research/faqs>), or questions regarding this Solicitation's Appendix C: Contract Pricing Worksheet, please submit such questions via email to:

U.S. DOT SBIR Program  
[dotsbir@dot.gov](mailto:dotsbir@dot.gov)

All administrative and Appendix C questions must be submitted **no later than 3:00 p.m. ET on Friday, May 3, 2024**. Questions received after 3:00 p.m. ET on May 3, 2024, may not be answered. The Government reserves the right to address a late question, if the Government determines an answer is in its best interests.

### PLEASE NOTE:

- Technical questions pertaining to this solicitation will not be answered during the solicitation period, as technical questions were only permitted during the pre-solicitation period. To review the technical questions and answers, visit <https://usdot.uservoice.com/forums/958370>.
- Inquiries regarding offer status will not be answered.

## U.S. DOT SOLICITATION FOR SMALL BUSINESS INNOVATION RESEARCH PROGRAM

For general SBIR Program inquiries not pertaining to this solicitation, please contact:

U.S. DOT's SBIR Hotline  
(617) 494-2051  
[dotsbir@dot.gov](mailto:dotsbir@dot.gov)

To support full and open competition and comply with the Procurement Integrity Act, 41 USC Sections 2101-2107 requirements, during the Phase I submittal and evaluation period, offeror or potential offeror contact with U.S. DOT relative to this Solicitation is restricted to the officials identified in this Solicitation. During the open period of this Solicitation (from solicitation issuance until release of award recommendation list), contact with U.S. DOT officials (excluding certain offices and positions such as the DOT Office of the Inspector General (see herein) and the U.S. DOT/Office of the Secretary) from or at any U.S. DOT agency, other than those U.S. DOT officials identified in this Solicitation, may result in rejection of the offer attributable to such unauthorized contact.

### E. Definitions

#### **Funding Agreement**

Any contract, grant, or cooperative agreement entered into between any Federal Agency and any SBC for the performance of experimental, developmental, or research work, including products or services, funded in whole or in part by the Federal Government.

NOTE: The U.S. DOT does not award grants or cooperative agreements under the SBIR Program.

#### **Historically Underutilized Business Zone (HUBZone)**

An SBC that meets the requirements described in 13 CFR § 126.200 (<https://www.ecfr.gov/current/title-13/chapter-I/part-126/subpart-B/section-126.200>), is certified by the SBA, and designated by SBA as a HUBZone SBC in the Dynamic Small Business Search (<https://www.ecfr.gov/current/title-13/chapter-I/part-126/subpart-A/section-126.103>). SBA's designation also appears in SAM.

#### **Research or Research and Development (R/R&D)**

Any activity that is:

- A systematic study directed toward greater knowledge or understanding of the subject studied;
- A systematic study directed specifically toward applying knowledge and innovation to meet a recognized but unmet need; or
- A systematic application of knowledge and innovation 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.

### **SBIR Data**

All data developed or generated in the performance of an SBIR award, including Technical Data and Computer Software developed or generated in the performance of an SBIR award. The term neither includes pre-existing data nor include information incidental to contract administration, such as financial, administrative, cost or pricing or management information.

### **SBIR Data Rights**

The Government's license rights in properly marked SBIR Data during the SBIR protection period as follows: SBIR Technical Data Rights in SBIR Data that are Technical Data or any other type of Data other than Computer Software and SBIR Computer Software Rights in SBIR Data that is Computer Software. Upon expiration of the protection period for SBIR Data, the Government has a royalty-free license to use, and to authorize others to use on its behalf, these Data for Government purposes, and is relieved of all disclosure prohibitions and assumes no liability for unauthorized use of these Data by third parties. The Government receives unlimited rights in all Form, Fit, and Function Data, Operations, Maintenance, Installation, or Training Purposes (OMIT) Data, and unmarked SBIR Data.

### **Small Business Concern (SBC)**

A concern that meets the SBIR program eligibility requirements set forth in 13 CFR § 121.702, which can be found here: <https://www.law.cornell.edu/cfr/text/13/121.702>.

### **Socially and Economically Disadvantaged SBC (SDB)**

For Eligibility, and Certification relating to Federal SDB Programs, See 13 CFR § 124, Subpart B at <https://www.law.cornell.edu/cfr/text/13/part-124/subpart-B>.

### **Subcontract**

Any agreement, other than one involving an employer-employee relationship, entered into by an awardee of a funding agreement calling for supplies or services for the performance of the original funding agreement.

### **Veteran-Owned SBC**

An SBC:

1. Not less than 51% of which is owned by one or more veterans (as defined at 38 USC 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,
2. The management and daily business operations of which are controlled by one or more veterans.

### **Women-Owned SBC (WOSB)**

An SBC that is at least 51% owned by one or more women, or in the case of any publicly owned business, at least 51% of the stock is owned by women, and women control the management and daily business operations.

## **F. Report SBIR Fraud, Waste, and Abuse**

The U.S. DOT Office of Inspector General Hotline (Phone: 800-424-9071, Email: [hotline@oig.dot.gov](mailto:hotline@oig.dot.gov)) accepts concerns and other tips from all sources about allegations of fraud, waste, abuse, and/or mismanagement in U.S. DOT programs. If an allegation of fraud, waste, abuse, and/or mismanagement pertains to the SBIR Program, then the reporting individual should indicate that the alleged fraud, waste, abuse, and/or mismanagement pertains to an SBIR solicitation or contract. Additionally, the U.S. DOT SBIR Program website contains information and links to report potential fraud, waste, abuse, and/or mismanagement: <https://www.volpe.dot.gov/work-with-us/small-business-innovation-research/report-fraud-waste-and-abuse>.

## **G. Other Information**

### **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 R&D. “Manufacturing-related” is defined as “relating to manufacturing processes, equipment and systems; or manufacturing workforce skills and protection.”

The U.S. DOT SBIR Program solicits manufacturing-related projects through the call for topics distributed to each of the Department’s SBIR participating agencies. Additionally, the SBA requires each agency with an SBIR program to develop a written policy on the implementation of EO 13329 as well as publish an annual report.

### **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 (15 U.S.C. Section 636(a)) to instruct the SBA Administrator to ensure that certain Federal Departments and agencies give priority to SBCs that participate in or conduct energy efficiency or renewable energy system research and development projects. U.S. DOT SBIR projects that focus on conducting R/R&D in energy efficiency and/or renewable energy are reported annually to SBA.

## II. OFFER PREPARATION INSTRUCTIONS AND REQUIREMENTS

### A. Overview

This is a solicitation for Phase I R/R&D offers on advanced, innovative concepts from SBCs having strong capabilities in applied science or engineering. Phase I R/R&D offers shall demonstrate a sound approach to the investigation as it relates to the objectives of the CSAI Initiative.

The proposed research must have relevance to the CSAI Initiative. Offers shall be confined principally to scientific or engineering research, which may be carried out through construction and evaluation. Offers must be for R/R&D, particularly on advanced or innovative concepts. Multiple offers may be submitted by an SBC if the offers provide distinct differences as it related to technical approach.

Each offer shall be self-contained and checked carefully by the offeror to ensure compliance with all preparation instructions (see Appendix D, Offer Submission Checklist).

**All offers must be submitted using U.S. DOT's SBIR online submittal page:**

[https://usg.valideval.com/teams/usdot\\_2024\\_2/signup](https://usg.valideval.com/teams/usdot_2024_2/signup)

If more than one offer is submitted, then the first offer must be submitted before the second offer submission is started. The first may be edited by the SBC any time prior to the close of the solicitation.

### B. Solicitation Requirements

The following requirements must be met by the submission deadline, May 10, 2024, for the offer to be evaluated for award:

1. **SBA Company Registry Confirmation** – Each SBC applying to the SBIR program is required to complete its registration in SBA's Company Registry (<http://sbir.gov/registration>) **prior to** submitting its Offer. At a minimum, registration requires Unique Entity ID (UEI) and employer identification (EIN) numbers. Completed registrations will receive a unique SBC Control ID and PDF file, which should be submitted as the first page in the Technical Section of the Offer.
2. **Submission of Offer** – Offers must be submitted using the U.S. DOT SBIR Program's online submission process ([https://usg.valideval.com/teams/usdot\\_2024\\_2/signup](https://usg.valideval.com/teams/usdot_2024_2/signup)) during

## U.S. DOT SOLICITATION FOR SMALL BUSINESS INNOVATION RESEARCH PROGRAM

open solicitation periods only. Offers must be complete, accurate and submitted as four separate files.

- a. **Technical Section** – The technical section must be submitted in PDF format in accordance with the following requirements:
    - i. The technical section shall not exceed 15 pages. Any information over the 15-page limit may not be considered and could adversely affect the offer evaluation. A Table of Contents, the SBA Company Registry Confirmation, and Prior Phase II Awards do not count toward the 15-page limit.
    - ii. Font size shall be no smaller than 10-point.
    - iii. Offers shall be on standard letter size pages (8.5" by 11").
    - iv. All pages should be numbered consecutively.
  - b. **Appendices A and B** – Appendix A: Signature Page and Appendix B: Project Summary must be submitted as a PDF file, which does not count toward the 15-page limit for the technical section.
  - c. **Appendix C: Contract Pricing Worksheet** – The Contract Pricing Worksheet should be submitted as an Excel file. This section does not count toward the 15-page limit for the technical section. SBCs **must** use the template provided by the U.S. DOT SBIR Program to be considered responsive.
  - d. **Contract Pricing Worksheet Supporting Documentation** – Supporting documentation for Appendix C: Contract Pricing Worksheet must be submitted as a PDF file, and include the required supporting information described on page 15 of this Solicitation and in Appendix C. This section does not count toward the 15-page limit for the technical section. There is no limit on the number of pages for the Contract Pricing Worksheet Supporting Documentation.
3. **Offer File Names** – Offer file names for each of the four separate files **must** include the following:
- a. The first three characters must be the topic number, CS1.
  - b. The remaining characters must include an abbreviation of the company's name and a distinct character to designate each file (e.g., CS1ABC1, CS1ABC2, CS1ABC3, and CS1ABC4).

To submit more than one offer, please add a, b, c, etc. after the topic number to indicate it



## U.S. DOT SOLICITATION FOR SMALL BUSINESS INNOVATION RESEARCH PROGRAM

is a new submission (e.g., Small Business, Inc. – CS1a). This will create a new profile for each offer. Only one offer can have draft status. To submit a second or third offer in the proposal website, the previous offers must be submitted prior to beginning a subsequent offer. All offers once submitted may be edited prior to the close of the solicitation.

For Chrome users please note that the drop and drag feature when using Chrome browsers does not attach the file. When using Chrome please browse, for the file to attach it to the offer. Another option is to use another browser like Firefox or Microsoft Edge.

4. **Offer Submission Deadline** – Offers must be received no later than **3:00 p.m. ET on Friday, May 10, 2024**, through U.S. DOT’s automated proposal website at [https://usg.valideval.com/teams/usdot\\_2024\\_2/signup](https://usg.valideval.com/teams/usdot_2024_2/signup). Offers received after this time will be automatically rejected; no exceptions will be permitted. Please be aware that the submittal process requires answering several questions; be sure to allow sufficient time to complete the multi-step submittal process. Offers shall not be considered received by the Government until this multi-step process is complete. Offerors are encouraged to submit their offers as early as possible.
5. **Duplicate Offers** – Offers shall only be submitted through the U.S. DOT’s automated proposal website. No duplicate offers shall be sent by any other means. An SBC may submit multiple separate offers on the topic under this solicitation. Note: If submitting two or more offers, please follow instructions in Section II(B)(3), Offer File Names, above.

### Technical Section (PDF)

*Includes SBA Registry Confirmation, Technical Section, and Prior Phase II Awards.*

<i>SBA Company Registry Confirmation (does not count toward the 15-page limit)</i>  <i>Page 1 of PDF</i>	All SBIR applicants are required to be registered in SBA’s company registry database. The confirmation page from registering in the database should be included as the first page of the Technical Section. It does not count towards the 15-page limit. See <a href="https://www.sbir.gov/registration">https://www.sbir.gov/registration</a> to register or print your registration confirmation.
<i>Technical Section (not to exceed 15 pages)</i>	Submitted offers are encouraged to have a Table of Contents (which does not count toward the page limit). Offers must include the following headings in bold (in cases where a section does not apply, please state “Not Applicable”): <ol style="list-style-type: none"><li>1. <b>Identification and Significance of the Problem or Opportunity.</b> State the specific technical problem or innovative research opportunity addressed and its potential benefit to the national transportation system.</li></ol>

U.S. DOT SOLICITATION FOR SMALL BUSINESS INNOVATION RESEARCH PROGRAM

	<ol style="list-style-type: none"><li>2. <b>Phase I Technical Objectives.</b> State the specific objectives of the Phase I R/R&amp;D effort; including the technical question(s) the research seeks to answer to determine the feasibility of the proposed approach.</li><li>3. <b>Phase I Work Plan.</b> Describe the Phase I R/R&amp;D plan. The plan shall indicate what will be done, where it will be done, when it will be done, and how the R/R&amp;D will be managed or directed and carried out. Phase I R/R&amp;D shall address the objectives and the question(s) cited above in No. 2. Discuss in detail the methods planned to achieve each objective or task, including the level of effort associated with each task.</li><li>4. <b>Related Research or R&amp;D.</b> Describe significant R/R&amp;D that is directly related to the offer including any R/R&amp;D conducted by the project manager/principal investigator or by the proposing firm. Describe how related research affects the proposed effort, and any planned coordination with outside sources. The SBC must persuade reviewers of its awareness of recent, key R/R&amp;D conducted by others in the areas pertaining to this solicitation.</li><li>5. <b>Key Personnel and Bibliography of Directly Related Work.</b> Identify key personnel involved in Phase I including 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 page limitation.</li><li>6. <b>Relationship with Future Research and Development.</b> State the anticipated results of the proposed approach if the project is successful (Phase I and Phase II). Discuss the significance of the Phase I effort in providing a foundation for a Phase II R/R&amp;D effort.</li><li>7. <b>Facilities.</b> Provide a detailed description of the availability and location of instrumentation and physical facilities proposed for Phase I.</li><li>8. <b>Subcontractors/Consultants.</b> Involvement of consultants in the planning and research stages of the project is permitted. Describe any intended consultant involvement in detail. For Phase I, a maximum of one-third of the research or analytical effort, measured in total contract dollars using simple math, may be performed by subcontractors/consultants.</li><li>9. <b>Potential Post Applications.</b> Briefly describe whether and how the proposed project appears to have (1) potential commercial application; and (2) potential use by the Federal Government.</li></ol>
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**U.S. DOT SOLICITATION FOR SMALL BUSINESS INNOVATION RESEARCH PROGRAM**

	<p><b>10. Similar Offers and/or Awards.</b> While it is allowed, with notification, to submit identical offers or offers containing a significant amount of essentially equivalent work for consideration under numerous federal program solicitations, <b>it is unlawful to enter into funding agreements requiring essentially equivalent effort.</b> If there is any question concerning this, it must be disclosed to the soliciting agency or agencies before award. If an SBC elects to submit similar or identical offers containing equivalent work under other Federal program solicitations, a statement must be included in each offer indicating:</p> <ul style="list-style-type: none"> <li>• The name and address of the agencies to which offers were submitted or from which awards were received;</li> <li>• Date of offer submission or date of award;</li> <li>• Title, number, and date of SBIR Program solicitations under which offers were submitted or awards received;</li> <li>• The research topic for each SBIR offer submitted or award received;</li> <li>• Titles of research projects;</li> <li>• Name and Title of Principal Investigator or Program Manager for each offer submitted or award received.</li> </ul> <p><b>11. Human Factors.</b> Research that involves human subjects may be subject to additional regulations found in 49 C.F.R. Part 11 (Part 11) as well as other applicable federal and state laws and regulations. Research will be considered to involve human subjects under Part 11 if the research obtains (1) data through intervention or interaction with an individual(s), and/or (2) identifiable private information. Unless exempt under 49 CFR §11.104, human subject research must adhere to the regulations of Part 11, which includes review and approval of the research by a federally approved Institutional Review Board (IRB). Due to the short timeframe associated with Phase I of the SBIR process, the DOT does not recommend the submission of Phase I offers that require the use of Human Subjects Testing. For more information, visit the FAQ at <a href="https://www.volpe.dot.gov/work-with-us/small-business-innovation-research/faqs">https://www.volpe.dot.gov/work-with-us/small-business-innovation-research/faqs</a>.</p>
<p><i>Prior SBIR Phase II Awards (does not count toward the 15-page limit)</i></p>	<p>If the SBC has received more than a total of 15 Phase II awards in the prior five fiscal years, submit the name of the awarding agency, date of award, funding agreement number, dollar amount, topic or subtopic title, follow-on agreement dollar amount, source and date of commitment, and current commercialization status for each Phase II. Provide the name and</p>

## U.S. DOT SOLICITATION FOR SMALL BUSINESS INNOVATION RESEARCH PROGRAM

	title of the project manager or principal investigator for each award received.
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### Appendices A and B (PDF)

<i>Signature Page</i> ( <a href="#">Appendix A</a> - page 1 of PDF)	Complete the signature page in Appendix A. The “topic title” block is to list the topic name as shown in this solicitation. The “offer title” block should be the name given to the offeror’s proposed solution and should differ from the topic title block. Sign and date in blocks where indicated; the date used should be the date the offer is submitted to the Government.
<i>Project Summary</i> ( <a href="#">Appendix B</a> - page 2 of PDF)	<p>Complete the Project Summary Sheet in Appendix B. The Project Summary of successful offers may be published by U.S. DOT and, therefore, must not contain classified or proprietary information.</p> <p>The Project Summary must include at a minimum:</p> <ol style="list-style-type: none"><li>1. A technical abstract with a brief statement of the problem or opportunity, project objectives, and description of the effort.<ol style="list-style-type: none"><li>a. The technical abstract shall be prepared in accordance with the instructions on the Appendix B Project Summary sheet, e.g., word limit using space on form, no proprietary/classified information.</li></ol></li><li>2. Anticipated results and potential applications of the proposed research.</li></ol>

### Appendix C: Contract Pricing Worksheet (Excel)

<i>The required <a href="#">Appendix C</a> template is available on our website in Microsoft Excel format.</i>	<p>A Phase I Contract Pricing Worksheet must be submitted using the template provided. SBCs must use the template provided by DOT. 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 every item. When completing your cost offer, please consider the following:</p> <ul style="list-style-type: none"><li>• It is important to provide enough information to allow the U.S. DOT to understand how the SBC plans to use the requested funds if an award is made.</li></ul>
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## U.S. DOT SOLICITATION FOR SMALL BUSINESS INNOVATION RESEARCH PROGRAM

	<ul style="list-style-type: none"><li>• Phase I contract awards may include profit. Note: FFP purchase orders are the type used for Phase I SBIR awards.</li><li>• Travel is allowable, however, unusual, for Phase I projects.</li><li>• The SBC must note its EIN and UEI numbers in Appendix C, in the Contract Pricing Worksheet Coversheet. The UEI is assigned through SAM.gov (See III (D) below). If you are not able to receive a UEI number before the solicitation deadline, please indicate “Pending” in the UEI field of Appendix C.</li><li>• If you have any trouble accessing the Appendix C spreadsheet, please contact the U.S. DOT SBIR Program via email at <a href="mailto:dotsbir@dot.gov">dotsbir@dot.gov</a> no later than 3:00 pm ET on May 3, 2024.</li><li>• Offers that exceed the Phase I Estimated Award Amount listed in Section VIII <b><u>will not be considered for award.</u></b></li></ul>
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### Contract Pricing Worksheet Supporting Documentation (PDF)

<i>See the first two tabs of <a href="#">Appendix C</a> for instructions and further examples of supporting documentation.</i>	Supporting documentation for the costs and pricing proposed in Appendix C must be submitted as a separate file in PDF format. Supporting documentation is required for <b>all</b> costs proposed (e.g., material quotes, subcontractor proposals, indirect rate calculations, etc.).
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## C. Other Information

1. **Offer Handling.** Offers will be available only to Government employees in the U.S. Government team of engineers and/or scientists responsible for evaluating the offer, the U.S. DOT SBIR Program, and/or Volpe Center staff pertinent to the SBIR program.
2. **Fraudulent Information.** Submitting plagiarized information and/or false information pertaining to the company, the principal investigator and/or work to be performed may result in:
  - a. An offer being deemed non-responsive;
  - b. A recommendation for Phase I award being rescinded;
  - c. Termination of an award; and/or
  - d. Possible referral to the Suspension and Debarment authority for review and

action.

3. **Technical and Business Assistance (TABA).** The SBIR Program Policy Directive permits an agency to provide TABA to an SBIR awardee. For the U.S. DOT, this amount shall be up to and not exceed \$6,500 for Phase I awards. This amount is in addition to the award amount for Phase I awards.

The purpose of TABA, as defined by the SBA Policy Directive, is to assist SBIR awardees in: (1) making better technical decisions on SBIR projects; (2) solving technical problems that arise during SBIR projects; (3) minimizing technical risks associated with SBIR projects; and (4) commercializing the SBIR products or processes.

A U.S. DOT SBIR awardee can receive support through TABA in one of two ways:

- a. The U.S. DOT SBIR Program has a Blanket Purchase Agreement (BPA) with Foresight Science & Technology Incorporated (34 Hayden Rowe St., Hopkinton, MA) that can provide support to Phase I and Phase II awardees. Once an offer is recommended for award, the prospective awardee will receive notification from the U.S. DOT SBIR Program identifying the services available and guidance on how to obtain these services at no cost to the small business.

These services for Phase I include a kick-off meeting with the TABA vendor and an individualized Commercialization Readiness Assessment report to support the development of the Phase II proposal's commercialization strategy,

**OR**

- b. Awardees can receive assistance in an amount not to exceed \$6,500 not using the BPA of the U.S. DOT SBIR Program. To do so, an awardee must, through its own efforts, obtain a vendor to provide TABA services.

If recommended for award, the SBIR Program will contact the awardee and require them to provide an outline of the specific services its proposed vendor will provide and the detailed qualifications and experience of the proposed vendor, as well as pricing information. This information should not be included within Appendix C contract pricing worksheet.

4. **National Institute of Standards and Technology (NIST)/Hollings Manufacturing Extension Partnership (MEP).** An SBC may wish to contact its local NIST Hollings MEP for manufacturing and other business-related support services. The MEP works with small and mid-sized companies to help them create and retain jobs, increase profits, and save time and money. The nationwide network provides a variety of services, from business development assistance to innovation strategies to process improvements and

## U.S. DOT SOLICITATION FOR SMALL BUSINESS INNOVATION RESEARCH PROGRAM

the identification of commercialization opportunities. MEP is a nationwide network of locally managed extension centers with over 1,400 technical experts, located in every state. To contact an MEP center, call 1-800-MEP-4-MFG (1-800-637-4634) or visit MEP's website at <http://www.nist.gov/mep>.

### **D. System for Award Management (SAM)**

Any business that seeks to work with the Federal Government under a FAR-based contract is mandated to register with SAM before being awarded a contract. It is recommended that such business register in SAM before submitting an offer as some items in SAM are due at the time of or before offer submission. Additional information on SAM and the registration process is provided on the SAM website at: <https://sam.gov/content/home>. A UEI number is also provided through SAM. More information on the UEI can be found at: <https://www.gsa.gov/about-us/organization/federal-acquisition-service/office-of-systems-management/integrated-award-environment-iae/iae-systems-information-kit/unique-entity-identifier-update>.

### III. METHOD OF SELECTION AND EVALUATION CRITERIA

#### A. Basis of Award

All Phase I offers will be evaluated and judged on a competitive basis. Initially, all offers will be screened to determine responsiveness to the solicitation. All non-responsive offers will be rejected by the Government and will not be further evaluated.

Each offer will be judged on its own merit. A Phase I contract award will be made to the responsive and responsible SBC(s) whose offer provides the best value to the Government. The best value determination is based on the technical and scientific merit as evaluated the evaluation criteria described in Section III.B.

**The U.S. DOT is under no obligation to fund any offer or any specific number of offers submitted in response to this solicitation. The U.S. DOT reserves the right to award more or less than the anticipated quantity of awards stated in Section IV, and to make no awards.**

#### B. Phase I Evaluation Criteria

Offerors will be evaluated based on the criteria outlined below. Selections will be based on best value to the Government considering the following criteria, which are listed in descending order of importance. Details of what are considered within each criterion are included below.

<b>Technical Merit &amp; Feasibility</b>	Demonstration of understanding of the problem and solution alignment with the topic description; innovative approach; scientific feasibility
<b>Experience, Qualifications, and Facilities</b>	Description of technical personnel; equipment and facilities; and partnerships/subcontracts (when applicable)
<b>Effectiveness of Proposed Work Plan</b>	Clarity of technical plan and timeline
<b>Commercial Potential</b>	Market understanding and awareness of regulatory, compliance, or legal issues
<b>Offer Quality</b>	Quality of narrative and supporting evidence

#### C. Offer Responsiveness Review

Each offer will be examined to determine if it is complete and contains adequate technical data. **An offer that does not meet the requirements of the solicitation as described in Section II.B may be excluded from further consideration.**



## **D. Time to Award Requirements**

The SBIR Program Policy Directive requires all SBIR agencies to make Phase I awards within 180 days after the close of the solicitation.

The U.S. DOT SBIR Program intends to make recommendations for SBIR Phase I awards no later than 90 days after the closing date of this solicitation. If circumstances are such that notification to each applicant cannot be met within 90 days after the solicitation closing date, the U.S. DOT SBIR Program shall notify each applicant as soon as practicable.

## **E. Debriefing Requests**

Each offeror will have an opportunity to access a written debriefing regarding the evaluation of its offer. Debriefings will be available electronically via the offer submission website.

Debriefing information will consist of a summary of ratings across all evaluation criteria and may include comments received by the Government evaluators. The identity of the evaluators will not be disclosed. Debriefings will be available as follows:

Offerors may access its written debriefing within ten (10) calendar days from the notification from the Government within the proposal submission site. If there is no response from the SBC within these ten (10) calendars days, the debriefing shall close without further notice.

## IV. CONSIDERATIONS

### A. Funding Awards

The Government anticipates awarding 10 Phase I awards, but reserves the right to make fewer, more, or no awards if it is in the best interest of the Government. The actual number of contract awards is subject to the availability of funding and the responses from small business firms.

1. **Dollar Value of Awards.** The U.S. DOT SBIR Program has set the maximum thresholds for Phase I and Phase II awards for this solicitation at \$200,000 and \$1,800,000, respectively.

- a. **Phase I Awards.** Phase I is the conduct of feasibility-related experimental or theoretical research or R/R&D efforts on the research topic described herein. For this U.S. DOT SBIR Program solicitation, Phase I offers can be funded up to \$200,000. The U.S. DOT intends to award Firm-Fixed-Price (FFP) purchase orders utilizing FAR Part 13 Simplified Acquisition Procedures. A purchase order is an offer by the Government to buy supplies or services, including research and development, upon specified terms and conditions (in this instance, this solicitation and the contractor's offer). The U.S. DOT will require written acceptance of the purchase order by the SBC at the time of award via the SBC signing the purchase order thus creating a binding contract between the SBC and the Government. Award of a bilaterally signed purchase order is subject to the availability of funding.

All U.S. DOT SBIR Phase I awardees who have successfully completed Phase I are eligible to submit a Phase II proposal for evaluation and possible selection for award.

- b. **Phase II Awards.** The objective of Phase II is to continue the R/R&D effort from the completed Phase I. Award of a contract for a Phase II effort is based on the results of Phase I, the scientific and technical merit of the Phase II proposal, and the commercial potential of the proposed Phase II project. Commercial potential includes the capability to transition the technology to private sector applications, Government applications, or Government contractor applications. For this U.S. DOT SBIR Program solicitation, contracts for Phase II proposals can be funded up to \$1,800,000 and can have a period of performance of up to 18 months from the date of contract award. The Government is neither obligated to fund any specific Phase II proposal nor fund at the estimated levels within this solicitation.

The U.S. DOT typically awards Firm-Fixed-Price (FFP), FFP-Level-of-Effort (FFPLOE), or Cost-Plus-Fixed-Fee (CPFF) negotiated contracts for Phase II efforts utilizing FAR Part 15 Contracting by Negotiation procedures. Approximately 30 days prior to the end of Phase I efforts, the U.S. DOT SBIR Program will provide Phase I contract awardees details on the due date, content, submission requirements, and

## U.S. DOT SOLICITATION FOR SMALL BUSINESS INNOVATION RESEARCH PROGRAM

evaluation criteria for Phase II proposals. A summary of Phase II proposal submission requirements can be found on the U.S. DOT's SBIR website at:

<https://www.volpe.dot.gov/work-with-us/small-business-innovation-research/submit-proposal>.

2. **Phase II Contract Type and Accounting System Audits.** The Contracting Officer will determine whether a FFP, FFPLOE, CPFF, or other contract type(s) is appropriate for each Phase II award. Phase II awardees **MUST** have an accounting system that is adequate for determining costs applicable to the contract or order to receive a cost type contract.

### B. Reports

Under Phase I SBIR efforts, three (3) reports will be required, consisting of two (2) interim narrative reports, and a comprehensive final report. These reports are due at two-month intervals starting at the end of month two. An acceptable report is one that is comprehensive and describes all efforts and progression made on the R&D from the start of the funding agreement through the report submitted time.

### C. Payment Schedule

The SBC may invoice for three (3) partial payments for Phase I awards based on the SBC's delivery of, and the Government's acceptance of, each report. The SBC must ensure invoices are submitted in accordance with instructions in the award document, in conjunction with or after the submission by the SBC of an acceptable report(s) as described in above Paragraph B. Invoices submitted before submission of a due report will be rejected until the Phase I awardee submits an acceptable report.

Contracts for Phase II, and/or III will allow for incremental payments to the successful SBC as work progresses dependent on the negotiated contract type, invoice/payment contract requirements, and/or payment schedule incorporated into the contract.

### D. Innovations, Inventions, and Patents

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

The U.S. DOT prefers that SBC offers avoid the inclusion of proprietary data. If the inclusion of proprietary data is considered essential for meaningful evaluation of an offer it must adhere to the terms explained in this paragraph IV.D.

## U.S. DOT SOLICITATION FOR SMALL BUSINESS INNOVATION RESEARCH PROGRAM

If proprietary information is provided by a SBC in an offer that constitutes a trade secret, or commercial or financial information, it will be treated in confidence, to the extent permitted by law, provided the offer is clearly marked by the SBC as follows:

The following legend **must** appear on the title page of the offer:

"This offer contains information that shall not be disclosed outside the Federal Government and shall not be duplicated, used, or disclosed in whole or in part for any purpose other than evaluation of this offer, unless authorized by law. The Government shall have the right to duplicate, use, or disclose the data to the extent provided in the resulting contract if award is made as a result of the submission of this offer. The information subject to these restrictions are contained on all pages of the offer except for pages [*insert page numbers or other identification of pages that contain no restricted information.*]

(End of Legend)"; and,

The following legend must appear on each page of the offer that contains information the SBC wishes to protect:

"Use or disclosure of information contained on this sheet is subject to the restriction on the title page of this offer."

**2. Protection Period for Rights in Data Developed under SBIR Funding Agreements.**

Rights in technical data, including software developed under any award resulting from this solicitation, shall remain with the SBC 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 SBC for not less than a period of twenty years from the award date of the Phase I project from which the data was generated. However, effective at the conclusion of the protection 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 SBC may copyright and publish (subject to and consistent with appropriate national security considerations, if any) material developed with U.S. DOT support. The U.S. 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.** SBCs 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

## U.S. DOT SOLICITATION FOR SMALL BUSINESS INNOVATION RESEARCH PROGRAM

invention in the United States must 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 SBC a reasonable time to pursue a patent.

5. **Invention Reporting Process.** Awardees shall report SBIR inventions to the U.S. 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

The U.S. DOT permits cost sharing for its Phase II efforts under the topic areas identified in this solicitation; however, cost sharing is not required nor is it a factor in evaluation. Cost Sharing is not applicable to Phase I offers or awards.

### F. Profit

A profit is allowed on awards to SBCs under the U.S. DOT SBIR Program consistent with the Federal Acquisition Regulations.

### G. Joint Ventures or Limited Partnerships

Joint venture (JV) and limited partnerships are permitted to submit offer(s) to this solicitation provided the entity created qualifies as an SBC in accordance with the Small Business Act, 15 U.S.C. 632, and the definition of SBC included in this solicitation (Paragraph I.E). JVs must be properly registered in SAM as a JV prior to receiving an award. As this can be a time-consuming process, if offering as a JV, working with SAM to get the registration done before offer submission is highly recommended.

### H. Research and Analytical Work

1. For Phase I, a minimum of two-thirds of the research or analytical effort, measured in total contract dollars using simple math, must be performed by the awardee (i.e., 66.7% of total contract cost must be for other than subcontractor/consultant costs).
2. For Phase II, a minimum of one-half of the research or analytical effort, measured in total contract dollars using simple math, must be performed by the awardee (i.e., 50% of total contract cost must be for other than subcontractor/consultant costs).

### I. Awardee Commitments

Upon award of a U.S. DOT SBIR contract, the SBC will be required to make certain legal

## U.S. DOT SOLICITATION FOR SMALL BUSINESS INNOVATION RESEARCH PROGRAM

commitments through acceptance of FAR and Transportation Acquisition Regulation (TAR) clauses, and other Government requirements. The FAR and TAR may be found using the following links:

- FAR: <https://www.acquisition.gov/browse/index/far>
- TAR: <https://www.acquisition.gov/tar>

The Summary Statements that follow are illustrative of the types of clauses to which the SBC would be committed. This list does not represent a complete list of clauses to be included in Phase I awards and does not provide the specific wording of such clauses. A complete copy of the terms and conditions will be provided upon issuance of the contract for signature prior to award.

### J. Summary Statements

1. **Standards of Work.** Work performed under all SBIR efforts must conform to high professional standards.
2. **Inspection.** Work performed under all SBIR efforts are subject to Government inspection and evaluation.
3. **Cause/Default.** The Government may terminate the funding agreement if the Contractor fails to adhere to its terms.
4. **Termination for Convenience.** The Government may terminate the funding agreement if the Government deems termination to be in the Government's best interest. In such case, the Contractor may submit its costs for work performed and for reasonable termination costs.
5. **Disputes.** Any dispute concerning the funding agreement which cannot be resolved by agreement shall be decided by the Contracting Officer with right of appeal in accordance with the Contracts Disputes Act of 1978, 41 U.S.C. 71.
6. **Certain Telecommunications and Video Surveillance Services or Equipment.** Work performed under all SBIR efforts will require certification by an Awardee as to its use of and/or delivery of covered telecommunications equipment/services and compliance with any restrictions/prohibitions based on that certification. The offeror shall review a list of excluded parties in SAM for entities excluded from receiving federal awards for "covered telecommunication equipment or services" as specifically prohibited by Section 889 of the John S. McCain National Defense Authorization Act for Fiscal Year 2019 (Pub. L. 115-232).
7. **Equal Opportunity.** The Contractor shall not discriminate against any employee or applicant for employment because of race, color, religion, sex, sexual orientation, gender identity, or national origin.

## U.S. DOT SOLICITATION FOR SMALL BUSINESS INNOVATION RESEARCH PROGRAM

8. **Equal Opportunity for Veterans.** The Contractor shall not discriminate against any qualified employee or applicant for employment because he or she is a disabled veteran, recently separated veteran, active-duty wartime or campaign badge veteran, or Armed Forces service medal veteran.
9. **Equal Opportunity for Workers with Disabilities.** The Contractor shall not discriminate against any qualified employee or applicant for employment because he or she is physically or mentally disabled.
10. **Officials Not to Benefit.** No Government official must benefit personally from the SBIR funding agreement.
11. **Gratuities.** The Government may terminate the funding agreement if any gratuity is or was offered to any representative of the Government to secure the award.
12. **Patent/Copyright Infringement.** The Contractor shall report each notice or claim of patent or copyright infringement based on the performance of the funding agreement to the SBIR Program Contracting Officer.
13. **Procurement Integrity.** Submission of an offer under this solicitation subjects the Offeror to the “Restrictions on Obtaining and Disclosing Certain Information” (41 U.S.C. §2101-2107, commonly known as the Procurement Integrity Act). This statute, as implemented by FAR (48 C.F.R. §3.104), prohibits the following conduct during an agency procurement: prohibits federal employees and certain Government contractors involved in federal procurements from **disclosing** contractor bid or proposal information or source selection information (§2102); prohibits any individual from obtaining contractor bid or proposal information or source selection information prior to award (§2102); requires agency officials to **report employment contacts** regarding non-Federal employment (§2103); and bans for a definitive period certain personnel from accepting compensation from the vendor and the vendor from compensating such certain personnel during this definitive period (§2104). Violations of the statute may result in criminal and/or civil penalties, and administrative actions (e.g., suspension and debarment, cancellation of the procurement, and/or rescission of the contract).
14. **Section 508 Access Board Standards.** All information and communication technology (ICT) deliverables rendered under this contract must comply with the Revised Section 508 Standards of the Rehabilitation Act and the Access Board Standards, available for viewing at <https://section508.gov>. For purposes of Revised Section 508 compliance, the definition of ICT includes information technology and other equipment, systems, technologies, or processes, for which the principal function is the creation, manipulation, storage, display, receipt, or transmission of electronic data and information, as well as any associated content. ICT acquired by a contractor incidental to this contract shall not be required to conform to

## U.S. DOT SOLICITATION FOR SMALL BUSINESS INNOVATION RESEARCH PROGRAM

the Revised 508 Standards. Unless otherwise indicated, the contractor represents by signature on a contract or order that all deliverables will comply with the Access Board Standards.

15. **Government Property.** Materials, equipment, special tooling, and special test equipment either furnished by the Government or, in a cost type contract, acquired or fabricated by the contractor, is subject to FAR clause 52.245-1 Government Property and may also be subject to special clauses specific to certain items of property.
16. **American Made Equipment and Products.** When purchasing equipment or products under an SBIR funding agreement, purchase only American-made items whenever possible.
17. **Prohibition on ByteDance Limited (TikTok).** The Contractor shall not have/use TikTok on any information technology owned or managed by the Government, or on any information technology used or provided by the Contractor under the contract.
18. **Data Jurisdiction.** The Contractor shall ensure that all data centers and cloud services that the Contractor owns and operates reside within the United States, specifically, the 50 states, the District of Columbia, the Commonwealth of Puerto Rico, and the territories and possessions of the United States Government.
19. **Data Storage.** Data collected, developed, received, transmitted, or stored on the ‘cloud,’ shall be done so using a cloud service provider that meets security requirements equivalent to those established by the Government for the Federal Risk and Authorization Management Program (FedRAMP) and has been granted an Authority to Operate (ATO) at a Moderate security level.
20. **Reporting Cyber Adverse Events.** Cyber adverse events occur when electronic communication networks and computer networks experience a negative consequence, such as system crashes, packet floods, unauthorized use of system privileges, unauthorized access to sensitive data, and/or execution of malware that destroys data. Such adverse events include computer security related events and excludes events caused by natural disasters, power failures, etc. The Contractor shall report all cyber adverse events that affect its business/systems. Any such events shall be reported, within 24 hours of event realization, to the Cybersecurity and Infrastructure Security Agency (CISA) via the CISA Incident Reporting Form. Additionally, within 24 hours of the reporting to CISA, the Contractor shall notify its U.S. DOT SBIR Contracting Officer of the event via email or phone.

## K. Additional Information

1. This solicitation reflects current planning. Although not expected, there may be inconsistencies between the information contained in the FY 2024.1 solicitation and the terms and conditions of any resulting SBIR contract. The terms and conditions of the contract once executed are controlling.



## **U.S. DOT SOLICITATION FOR SMALL BUSINESS INNOVATION RESEARCH PROGRAM**

2. The SBC shall complete an Online Representations and Certifications Application at <https://sam.gov/content/home>. The SBC should be certified in the designated North American Industry Classification System (NAICS) code (541715) of this solicitation. The size standard of NAICS code 541715 for the SBIR program is 500 employees.
3. The Government may request the SBC to submit additional management, personnel, and financial information for the Government to consider and determine the responsibility of the SBC.
4. The Government is not responsible for any monies expended by the SBC 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 U.S. DOT SBIR Program is not a substitute for existing unsolicited offer mechanisms. Unsolicited offers shall not be accepted under the U.S. DOT SBIR Program for either Phase I or Phase II efforts. For information pertaining to submission requirements for unsolicited offers please refer to the U.S. DOT's Guidelines for Unsolicited Proposal Submission at <https://www.volpe.dot.gov/work-with-us/guidelines-unsolicited-proposal-submission>.

## V. SUBMISSION OF OFFERS

Offers must be received no later than **3:00 PM ET on Friday, May 10, 2024**, through the U.S. DOT's automated proposal website at [https://usg.valideval.com/teams/usdot\\_2024\\_2/signup](https://usg.valideval.com/teams/usdot_2024_2/signup).

Offers received after that time will be automatically rejected; no exceptions will be permitted. Please be aware that the submittal process requires answering several questions; be sure to allow ample time to complete the multi-step submittal process. Offers will not be considered received by the Government until this multi-step process is complete. Offerors are encouraged to submit their offers as early as possible.

## VI. SCIENTIFIC AND TECHNICAL INFORMATION SOURCES

The following data and other resources related to the CSAI Initiative are detailed below.

- U.S. DOT Complete Streets Artificial Initiative Website, Datasets and Other Resources, [https://its.dot.gov/csai/datasets\\_externalLink.html](https://its.dot.gov/csai/datasets_externalLink.html)
- *Moving to a Complete Streets Design Model: A Report to Congress on Opportunities and Challenges*, Federal Highway Administration, March 2022  
<https://highways.dot.gov/sites/fhwa.dot.gov/files/2022-03/Complete%20Streets%20Report%20to%20Congress.pdf>
- Complete Streets in FHWA, website, <https://highways.dot.gov/complete-streets>
- FHWA Safety Programs, Proven Safety Measures, Bicycle Lanes, website, <https://highways.dot.gov/safety/proven-safety-countermeasures/bicycle-lanes>

## VII. SUBMISSION FORMS AND CERTIFICATION (APPENDICES)

A. Offer Signature Page (Appendix A)

PDF version of [Appendix A](#) (page 1 of PDF) is available on U.S. DOT's SBIR website.  
A sample is provided in this solicitation document.

B. Project Summary (Appendix B)

PDF Version of [Appendix B](#) (page 2 of PDF) is available on U.S. DOT's SBIR website.  
A sample is provided in this solicitation document.

C. Contract Pricing Worksheet (Appendix C)

MS Excel Version of [Appendix C](#) is available on U.S. DOT's SBIR website.

D. Offer Submission Checklist (Appendix D)

(Do not include with offer – for offeror's use only)

**U.S. DOT SOLICITATION FOR SMALL BUSINESS INNOVATION RESEARCH PROGRAM**

**A. Offer Signature Page (Appendix A)**

**U.S. DEPARTMENT OF TRANSPORTATION  
SMALL BUSINESS INNOVATION RESEARCH PROGRAM  
SOLICITATION NO. 6913G624QSBIR2, FY 2024.2  
SIGNATURE PAGE**

Offer Information		
Topic No. 24-CS1	Solicitation No.: 6913G624QSBIR2	
Topic Title:		
Offer Title:		
Company Information		
Company:		
Address:		
City:	State:	Zip:

Offeror Certification	
<p>By signing below and submitting this offer in response to Solicitation No. 6913G624QSBIR2, Topic Number 24-CS1, I(We) am(are) representing on my(our) 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 of the date of 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 <i>et seq.</i>); (3) double damages and civil penalties under the Program Fraud Civil Remedies Act (31 U.S.C. § 3801 <i>et seq.</i>); (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 (6) other administrative penalties including termination of SBIR awards.</p>	
Principal Investigator Name:	Corporate/Business Official Name:
Title:	Title:
Address:	Address:
Telephone Number:	Telephone Number:
Email:	Email:
Signature:	Signature:
Date:	Date:

**B. Project Summary (Appendix B)**

**U.S. DEPARTMENT OF TRANSPORTATION  
SMALL BUSINESS INNOVATION RESEARCH PROGRAM  
SOLICITATION NO. 6913G624QSBIR2 FY 2024.2  
PROJECT SUMMARY**

<b>Project Summary</b>
<b>Abstract (Limited to two hundred words in this space only. The Project Summary of successful offers may be published by the U.S. DOT and, therefore, shall not contain classified or proprietary information.).</b>
<b>Anticipated Results/Potential Commercial Applications of Results.</b>
<b>Keywords</b>

## C. Contract Pricing Worksheet (Appendix C)

**U.S. DEPARTMENT OF TRANSPORTATION  
SMALL BUSINESS INNOVATION RESEARCH PROGRAM  
SOLICITATION NO. 6913G624QSBIR2, FY 2024.2  
CONTRACT PRICING WORKSHEET**

**Appendix C can be found on our website [here](#)** in Microsoft Excel format. Please fill out the spreadsheets as directed in the instructions.

Additional information about the contract pricing worksheet and its requirements can be found in the Appendix C instructions in the first two tabs of the workbook and on our FAQ page (<https://www.volpe.dot.gov/work-with-us/small-business-innovation-research/faqs>).

If you have any questions regarding Appendix C not listed on our FAQ page, please submit such questions via email to:

U.S. DOT SBIR Program  
[dotsbir@dot.gov](mailto:dotsbir@dot.gov)

All administrative and Appendix C questions must be submitted no later than 3:00 p.m. ET on Friday, May 3, 2024. Questions received after 3:00 p.m. ET on May 3, 2024, may not be answered. The Government reserves the right to address a late question if the Government determines an answer is in its best interest.

## D. Offer Submission Checklist (Appendix D)

**U.S. DEPARTMENT OF TRANSPORTATION  
SMALL BUSINESS INNOVATION RESEARCH PROGRAM  
SOLICITATION NO. 6913G624QSBIR2, FY 2024.2  
OFFER SUBMISSION CHECKLIST**

This is a CHECKLIST OF REQUIREMENTS for your offer. Please review the checklist carefully to assure that your offer meets the U.S. DOT SBIR requirements. Failure to meet these requirements may result in your offer being returned without consideration. (See Section II.B of this Solicitation). **Do not include this checklist with your offer.**

- \_\_\_\_\_ 1. The offer reflects that for Phase I, a minimum of two-thirds of the research or analytical effort, measured in total contract dollars using simple math, must be performed by the awardee (i.e., 66.7% of total contract cost must be for other than subcontractor/consultant costs).
- \_\_\_\_\_ 2. A Foreign Disclosure form has been completed for the U.S. DOT at <https://forms.office.com/g/BmmrYKqhpz>.
- \_\_\_\_\_ 3. The offer is submitted according to the requirements described in Section II.
- \_\_\_\_\_ 4. The budget may be up to \$200,000 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 offer contains no type smaller than ten-point font size.
- \_\_\_\_\_ 7. All Appendices (A, B, and C) have been completed.
- \_\_\_\_\_ 8. The Technical Section includes all items identified in Section II.B of the Solicitation and does not exceed 15 pages per II.B requirements.
- \_\_\_\_\_ 9. Additional information on prior Phase II awards, if required, in accordance with Section II.B, is included.
- \_\_\_\_\_ 10. The Contract Pricing Worksheet (Appendix C) has been completed and the Contract Pricing Worksheet Supporting Documentation file provides the necessary supporting



**U.S. DOT SOLICITATION FOR SMALL BUSINESS INNOVATION RESEARCH PROGRAM**

information.

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11. The offer must be submitted online and received by the U.S. DOT automated proposal website by **3:00 p.m. ET, May 10, 2024. Offers received via email or any other means will not be accepted. Do not send duplicate offers via email or by any other means.**

## **VIII. Research Topic**

The FY 2024.2 Solicitation Phase I research topic is listed below. Each offer submitted must respond to the topic described herein. Offerors are encouraged to review Section VI of this solicitation for scientific and technical information sources that may be referenced in the topic description.

<b>Topic Number &amp; Title</b>	<b>Estimated Award Amount Phase I*</b>	<b>Estimated Award Amount Phase II**</b>
24-CS1: Complete Streets Artificial Intelligence Initiative	\$200,000	\$1,800,000

\* Offers that exceed the Phase I Estimated Award Amount will not be considered for award.

\*\*The Phase II funding level noted 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 when instructions on the Phase II process are sent approximately 1 month prior to the end of the Phase I project.

## A. Complete Streets Artificial Intelligence Initiative: Generating, Integrating, and Activating Data for Mobility

The Complete Streets Artificial Intelligence (CSAI) Initiative is a multi-phase effort to develop a suite of powerful new decision-support software tools for state, local, and tribal transportation agencies that assists in the siting, design, and deployment of Complete Streets. The initiative is nested within the U.S. Department of Transportation's (DOT) Small Business Innovation Research (SBIR) program. DOT anticipates funding small businesses for up to three phases of activity. These phases, in their entirety, will propel early-stage concepts out of research and development and into nationwide products for public and private use. Small businesses are expected to utilize teams with expertise in transportation planning, data science, and software development. The anticipated funding, timeline and number of awards for each phase are described in the solicitation instructions document.

### Background:

Complete Streets are “streets and networks that prioritize safety, comfort, and connectivity to destinations for all people who use the street network.”<sup>1</sup> This includes people who walk, bike, use micromobility, or use mobility assistance devices (collectively, “active transportation”); people who use public transportation and on-demand paratransit services; children, older individuals, and individuals with disabilities; people who operate freight and delivery vehicles; and people who drive and ride in personal vehicles.

The CSAI Initiative groups “data” into three categories: Infrastructure, Traveler Behavior/Safety, and Context.

- Infrastructure: Complete Streets treatments are reflected in Infrastructure, the primary category that tells us *how complete* a street or network is. Complete Streets treatments provide localized benefits such as safe pedestrian crossings, reliable transit service, convenient bicycle facilities, and efficient freight routes. The benefits of Complete Streets treatments accrue at scale as *complete networks* that provide continuous and connected routes, especially for people using active and public transportation. Complete networks increase opportunities for people to travel by active and public transportation.
- Traveler Behavior/Safety: Traveler Behavior/Safety data help us know *what kind* of Complete Streets treatments to implement. Not every road can serve each transportation mode equally. Prioritizing different modes on different parts of the network requires an understanding of travelers' current and future needs and behaviors, including their travel modes, trip purposes, and the behavior and safety of other travelers.
- Context: Context data inform both *where* and *what kind* of Complete Streets treatments to implement. Understanding context allows practitioners to allocate limited rights-of-way to prioritize the modes that best serve the needs of those traveling to and within that context. This requires an understanding of land use, key destinations, urban design, local and regional population trends, and other contextual characteristics that are the settings for travel.

To achieve the safety, equity, economic, and climate benefits of a truly multimodal transportation system, the people who shape its ongoing evolution need rigorous analytical tools and methods. The solutions

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<sup>1</sup> <https://highways.dot.gov/complete-streets>

## U.S. DOT SOLICITATION FOR SMALL BUSINESS INNOVATION RESEARCH PROGRAM

resulting from the CSAI Initiative aim to enable practitioners to better plan, design, build, manage, and evaluate infrastructure and operational strategies that increase people's opportunity to use active and public transportation, while also facilitating safe and efficient freight and vehicular travel.

### **Decision Support Tool:**

This SBIR topic, the CSAI Initiative, will leverage novel approaches in data science, machine learning, and artificial intelligence to accelerate implementation of Complete Streets and the complete networks they support. Awardees will use improved data collection, data fusion, and analysis methods to build tools that help identify network gaps, test and/or propose solutions, and display the impact of network and operational changes on mobility, access and accessibility, equity, safety, and other characteristics. Awardees are expected to utilize a variety of methods, including but not limited to big data, internet-of-things, artificial intelligence, machine learning, large language models, natural language processing, and/or computer vision. The resultant tool(s) will support state, local, and tribal practitioners and other users by providing quantitative, segment-scale and network-scale insights to help shape decision making for planning, designing, and implementing Complete Streets projects.

At the completion of the multi-phased effort, the DOT expects functional software tools that can, at a minimum, identify, represent, and analyze physical transportation infrastructure. The tool(s) will represent this infrastructure as a high-fidelity graph network or similar format that reflects the physical and operational details that impact the safety and utility of active transportation, transit, freight and delivery, and personal vehicles.

The following examples illustrate just two of many different potential capabilities of a final tool(s):

#### Example #1:

- **Prompt:** Identify existing routes for pedestrians (people walking and using mobility devices) to get from their homes to a grocery store; suggest infrastructure improvements to increase by 15 percent the number of people who can reach a grocery store by such modes within 20 minutes.
- **Output:** Tool identifies absent sidewalk segments, missing curb ramps, and indirect routing on otherwise suitable infrastructure that prevents a 20-minute trip by pedestrians. Tool proposes changes to the network to increase by 15 percent the number of pedestrians who can complete the trip in 20 minutes. Changes include new sidewalks, retrofitted curb ramps, and new crosswalks. Tool offers user choices to fine tune automated solutions, and outputs the resultant impact on the population.

## U.S. DOT SOLICITATION FOR SMALL BUSINESS INNOVATION RESEARCH PROGRAM

### Example #2:

- Prompt: Propose infrastructure and operational changes to provide low-traffic-stress (“all-ages-and-abilities”)<sup>2</sup> bicycle facilities that afford access between the residence of 50 percent of the population and 50 percent of civic, institutional, and employment destinations.
- Output: Tool identifies roadway segments and other alignments with proposed changes, including new and/or upgraded infrastructure such as bike markings, lanes, and physical separation to reduce conflict points; bike signals, intersection treatments, and traffic calming; and operational changes such as reduced speed limits and signal timing changes that achieve low-traffic-stress access between 50 percent of the population and 50 percent of noted destinations.

### CSAI Initiative Phasing:

This multi-phased effort is designed to scale the volume and completeness of data elements, the geographic coverage of those data, and the analytical capabilities of the final products. The anticipated progression of this initiative is presented in Table 1. The requirements beyond Phase I are subject to change in response to Phase I results. The purpose of outlining an intended progression is to provide insight into anticipated expectations and outcomes beyond Phase I. These are presented to help interested parties more fully contextualize the Initiative. The U.S. DOT does not expect Offerors to build a software solution until Phase II.

*Table 1: Anticipated Phase Progression*

Phase	Goals	Expected Functionality & Outcomes
Phase I	Demonstrate the potential of novel data generation and processing methods to produce useful content for proposed Complete Streets analysis capabilities.	<p>1) Select one (1) contiguous geographic area representing both urban and suburban development patterns and different roadway contexts (residential, commercial, industrial, civic, recreational/natural, etc.) and comprising at least 250,000 people.</p> <p>2) Generate data elements for the fullest extent of the geographic area practicable from among each of the three primary data categories: Infrastructure, Traveler Behavior/Safety, Context, (see Table 2).</p> <p>3) Describe source input data, data processing pipeline, data validation, and intended Phase II analytical capabilities.<sup>3</sup></p>

<sup>2</sup> <https://highways.dot.gov/safety/proven-safety-countermeasures/bicycle-lanes>

<sup>3</sup> While proprietary information should be protected, some explanation of sources and methods is expected.

## U.S. DOT SOLICITATION FOR SMALL BUSINESS INNOVATION RESEARCH PROGRAM

Phase II	Scale promising novel data generation and processing methods to greater geographic extents and completeness; implement Complete Streets analysis capabilities in a functioning software solution.	<p>1) Expand coverage to include five new, non-contiguous geographic areas representing both urban and suburban development patterns and different roadway contexts (residential, commercial, industrial, civic, recreational/natural, etc.) and comprising at least 250,000 people each (1.5 million total, including Phase 1 geography).</p> <p>2) Generate additional data elements and higher fidelity data, building on Phase I, for the fullest extent of the expanded geographic area practicable, from among each of the three primary data categories: Infrastructure, Traveler Behavior/Safety, Context (see Table 2).</p> <p>3) Update the description of the source input data, data processing pipeline, data validation, and anticipated future analytical capabilities.<sup>3</sup></p> <p>4) Build a working beta software with functioning automated and query-based analytical capabilities using the generated data.</p>
Follow-on funding	Expand software to national scale.	<p>1) Expand coverage to greater than 50 percent of the U.S. population.</p> <p>2) Generate additional data elements and higher fidelity data, building on Phase II, for the fullest extent of the expanded geographic area practicable, from among each of the three primary data categories: Infrastructure, Traveler Behavior/Safety, Context (see Table 2).</p> <p>3) Update the description of the source input data, data processing pipeline, data validation, and analytical capabilities.<sup>3</sup></p> <p>4) Build a fully functioning software application of the automated and query-based analytical tool using the generated data.</p>

## U.S. DOT SOLICITATION FOR SMALL BUSINESS INNOVATION RESEARCH PROGRAM

### Data Gaps and Analysis:

The Federal Highway Administration's 2022 [Complete Streets Report to Congress](#) identifies data collection and analysis as the first of five critical opportunity areas to advance Complete Streets efforts. Basic data about parts of the transportation network like roadway assets (such as bike lanes and sidewalks) and traveler volumes (such as counts of pedestrians and bicyclists) are often incomplete or unavailable. The available data can also be biased towards certain populations, income levels, or geographies. National crash data sources represent an incomplete picture of safety and underrepresent injury crash events, especially for pedestrians and bicyclists.

The CSAI Initiative categorizes data elements into three categories: Infrastructure, Traveler Behavior/Safety, and Context as described above. Table 2 provides a list of priority data elements that are most relevant to Complete Streets. Some elements may need to be generated or enhanced because nationwide data is unavailable or incomplete. These are the data for which novel identification and processing methods are most needed and are expected to be a significant focus of the effort throughout all phases. Other elements within Table 2 are identified because there are nationally available data of sufficient quality to support Complete Streets planning and analysis objectives.

The inclusion of as many data elements as practicable is desired, given the parameters of the performance period and funding for each phase. Some methods may result in relatively larger or smaller areas of geographic coverage, depending on the availability and characteristics of input data and other factors. Offerors are not required to include all listed data elements and may add other elements at their discretion. A balance of data volume, fidelity, accuracy, and extent is needed to ensure the development of tools that can perform the highest impact Complete Streets analyses possible.

Data sets and other selected resources are available to help offerors consider their choices in approaching this effort and understand how practitioners would ultimately use the final tools created. Links to these resources can be found at <https://its.dot.gov/csai/> in the *Datasets & Other Resources* section at the bottom of the page. Data resources are organized under the same headings as Table 2 and include several nationally available datasets. Federal resources include relevant materials related to Safe System Approach and Complete Streets, and Infrastructure and Modeling.

## U.S. DOT SOLICITATION FOR SMALL BUSINESS INNOVATION RESEARCH PROGRAM

*Table 1: Example Data Elements*

<b>Infrastructure</b>
<p>Data elements to generate or enhance:</p> <ul style="list-style-type: none"> <li>Roadway features <ul style="list-style-type: none"> <li>Centerline roadway network</li> <li>Travel direction, number of lanes, lane markings and widths, shoulder width, edge condition barriers, guardrails</li> <li>Mid-block, intersection-approach, and through-intersection conditions (turn radii, turn lanes, intersection markings, intersection format e.g., T, X, multi-leg, roundabout)</li> </ul> </li> <li>Signals, markings, signs (including posted speed limits)</li> <li>Signal timing and phasing</li> <li>Sidewalks, crosswalks, driveways, curb ramps, medians, refuges, curb extensions</li> <li>Transit stop accessibility (ADA) features (ramp deployment clear space, tactile warning strips)</li> <li>Bicycle facilities and facility type (unmarked, unseparated, and separated facilities; intersection-approach and through-intersection treatments)</li> <li>Speed management countermeasures (speed humps, speed tables, raised intersections)</li> <li>Sidewalk surface condition (roughness, cracking, heaving)</li> <li>Fixed obstructions within pedestrian and bicycle facilities (utility poles, signposts)</li> <li>On-street curb management (parking, loading, and delivery, including freight)</li> <li>Multi-use paths and traversable public open spaces</li> </ul> <p>Generally available data:</p> <ul style="list-style-type: none"> <li>Transit stops and routes</li> <li>Rail routes and crossings</li> </ul>
<b>Traveler Behavior/Safety</b>
<p>Data elements to generate or enhance:</p> <ul style="list-style-type: none"> <li>Vehicle volumes and types (cars, trucks, freight, other)</li> <li>Vehicle operating speeds and speed distributions</li> <li>Injuries, injury severity, and near misses</li> <li>Bicycle and pedestrian user and/or trip counts</li> <li>Transit ridership</li> </ul> <p>Generally available data:</p> <ul style="list-style-type: none"> <li>Crash data (fatalities, location, crash rate, roadway classification and contexts, and crash severity)</li> </ul>
<b>Context</b>
<p>Data elements generate or enhance:</p> <ul style="list-style-type: none"> <li>Land use (residential, commercial, industrial, civic, academic, mixed-use)</li> <li>Tree cover / landscaping (including shade)</li> <li>Urban design / frontage (including adjacent site design and building setback)</li> </ul> <p>Generally available data:</p> <ul style="list-style-type: none"> <li>Key destinations (healthcare, academic, civic, employment, retail-commercial, recreation)</li> <li>Housing and employment density</li> <li>Environment (surface heat index, green space, open space)</li> <li>Social determinants of health</li> <li>Socio-economic and demographic data</li> <li>Environmental Justice and transportation disadvantaged communities</li> <li>Topography</li> <li>Designated goods movement (freight) routes</li> </ul>



## U.S. DOT SOLICITATION FOR SMALL BUSINESS INNOVATION RESEARCH PROGRAM

### Expectations

The CSAI Initiative seeks outcomes that use novel methodologies to fill data gaps and provide validation of processes to increase data coverage, fidelity, and accuracy; reduce biases; and fuse data sources in novel ways to generate more complete information. These methodologies may include applying computer vision, machine learning, and/or other artificial intelligence approaches to a range of data sources and types. Data may include (but not be limited to) satellite, aerial, or street-level video and still photography; satellite, aerial, or street-level lidar data; sensor-based and crowdsourced data; vehicle probe data and telemetry, including shared micromobility and transit modes; multimodal volume/count data; and other sources and types.

The initiative is sequenced in phases to support collective progress in addressing different parts of this effort; see the narrative description of expected outcomes for each phase below, as a complement to Table 1. As noted above, future phases may change to reflect the results of prior phases.

### Expectations in all phases:

- The data is expected to be current, no earlier than 2020 unless being used to inform or validate broader data sources, or unless a more recent source is unavailable. Offerors should keep in mind that many travel behaviors and other patterns were atypical during the height of the COVID-19 pandemic and strive to choose data that is representative of the most current and/or typical conditions.
- The data generation process is expected to anticipate and be able to accommodate regular updates to reflect evolving real-world conditions. Planned update frequency is expected to be annual at least, and preferably seasonal (e.g., spring, summer, fall, and winter).
- Outputs from the tool are expected to be built upon and/or easily interface with existing, widely used planning and mapping platforms and tools; this expectation is intended to facilitate integration with existing data analysis processes, network quality assessments, or evaluation rubrics for specific transportation modes; and, support broad adoption and use of the tool and generated data among practitioners.
- Any data collected, developed, received, transmitted, or stored on the ‘cloud;’ shall be done so using a cloud service provider that meets security requirements equivalent to those established by the Government for the Federal Risk and Authorization Management Program (FedRAMP) Moderate baseline.
- The Government should not receive any data with Personally Identifiable Information (PII). Offerors should be mindful of reidentification and other risks of data sharing and have an approach to minimize these risks in their final products.
- To the greatest extent practicable, data, methodologies, and/or tools generated by awardees are encouraged to be made publicly available in a standard digital data format. The materials sought to be made publicly available include, but are not limited to, bicycle, pedestrian, and accessibility infrastructure features and their characteristics. Materials made publicly available should not include any intellectual property, proprietary methodologies, or source input data.

## U.S. DOT SOLICITATION FOR SMALL BUSINESS INNOVATION RESEARCH PROGRAM

### Expected Phase I Outcomes:

Phase I will focus on generating data layers that geographically represent elements from among those listed in Table 2. Phase I requires awardees to:

- Produce a proof-of-concept report including:
  - List of the data that awardees have generated and the characteristics or features of those data;
  - Description of methods used to generate the data;
  - Evaluation of the scalability of data generation methods, and assessment of data coverage limitations and gaps;
  - Transparent validation of data accuracy, to be carried out remotely or digitally by the awardee;
  - Description of intended analytics capabilities and user interface/user experience that the data will support in a future software tool; and,
- Submit the data layers that awardees have generated for their chosen geographic region in a standard geospatial format (e.g., GeoJSON), for internal DOT use only.

Following the completion of Phase I, DOT anticipates hosting a virtual technology presentation to provide Phase I awardees the opportunity to showcase the data generated for areas within their selected geography. This event is expected to be open to the public and awardee participation in the event, if held, is **voluntary**. Therefore, effort towards and costs of preparation and participation in this opportunity are not to be proposed in a Phase I proposal submission.

### Expected Phase II Outcomes:

Small businesses selected to continue in Phase II will expand and add new data layers, achieve higher data fidelity and accuracy, and scale their methodologies for data generation to cover additional geographies. During Phase II, awardees will build functioning beta software tool(s).

The tool(s) shall enable practitioners and other users to explore each data layer individually to ensure transparency, explainability, and trust. Additionally, the tools are expected to enable users to add other data layers and types. The tools will use generated data, along with other available data sources, to perform analysis in response to queries from users. These queries may be for automated actions, such as detecting network gaps and proposing solutions, and may also allow users to fine tune queries with filters or parameters. The software is also expected to allow users to run analyses on specific, proposed changes to the transportation network. The resultant software tools are expected to facilitate network analysis for people who use active and public transportation and may feed data into other external tools or analyses. The tools are expected to allow users to visualize existing and proposed multimodal characteristics and traveler outcomes at the segment- and network-scale.

DOT intends to host a second technology presentation towards the conclusion of Phase II. The purpose of the event is to provide Phase II awardees the opportunity to present capabilities of the software tool and its use of the data generated for areas within their selected geographies. Additional detail will be provided with instructions for submitting a Phase II proposal.

## **U.S. DOT SOLICITATION FOR SMALL BUSINESS INNOVATION RESEARCH PROGRAM**

### **Expected effort outcomes from an additional follow-on funding agreement:**

Additional follow-on funding agreement(s) may be awarded to support expanding Phase II work to a national scale covering at least 50 percent of the U.S. population. At the conclusion of this phase, the tool is expected to be poised for commercialization to serve the needs of a broad cross-section of public, private, academic, and non-profit users.