

AMENDMENT 2

DEPARTMENT OF DEFENSE SMALL BUSINESS INNOVATION RESEARCH (SBIR) PROGRAM SBIR 23.4 Annual Program Broad Agency Announcement (BAA)

The purpose of Amendment 2 is to provide additional information in sections 4.3, 5.3.f, 5.3.h and 5.3.i.

The purpose of Amendment 1 is to incorporate important programmatic changes as required by the SBIR and STTR Extension Act of 2022 (Pub. L. 117-183), to include:

- a. Add Section 2.2 Due Diligence Program to Assess Security Risks; renumber subsequent sections.
- b. Replace Attachment 2: Foreign Ownership or Control Disclosure with Attachment 2: Disclosures of Foreign Affiliations or Relationships to Foreign Countries
- c. Add definitions to Section 3, as highlighted.
- d. Revisions to section 4.2.e., as highlighted.
- e. Add Section 4.3 Disclosures Regarding Ties to People's Republic of China and Other Foreign Countries; renumber subsequent sections.
- f. Revise Section 5.3.h.
- g. Add Section 5.3.i and corresponding Attachment 4: Disclosure of Funding Sources
- h. Revisions to section 6.0, as highlighted.
- i. Removal of section 8.1.bb. (DFARS 252.209-7002, Disclosure of Ownership or Control by a Foreign Government).
- j. Add Section 8.2; renumber subsequent sections.
- k. Various text updates, as highlighted below.

IMPORTANT

The DoD SBIR FY2023.4 Annual BAA is structured to allow participating DoD Components to advertise SBIR topics throughout the course of the fiscal year, outside of the three pre-determined BAA cycles. To be notified of SBIR opportunities released under this BAA and to receive e-mail updates on the DoD SBIR and STTR Programs, it is highly encouraged that proposing small business concerns subscribe to the DoD SBIR/STTR Listserv by visiting <https://www.dodsbirsttr.mil/submissions/login> and clicking "DSIP Listserv" located under Quick Links.

In addition to the instructions provided in this BAA, each topic release will be accompanied by Component-specific proposal submission instructions, which will detail requirements such as proposal content, formatting, structure, budget/duration and proposal submission deadlines. **Only proposals submitted in response to an active topic under this BAA will be evaluated.**

Active topic releases and associated Component-specific instructions can be viewed at: <https://www.defensesbirsttr.mil/SBIR-STTR/Opportunities/>. **A full topic release index can be viewed in Appendix A of this BAA.**

This BAA and the Defense SBIR/STTR Innovation Portal (DSIP) sites are designed to reduce the time and cost required to prepare a formal proposal. DSIP is the official portal for DoD SBIR/STTR proposal submission. Proposing small business concern are required to submit proposals via DSIP; proposals submitted by any other means will be disregarded. Proposing small business concern submitting through this site for the first time will be asked to register. Proposing small business concerns are required to register for a Login.gov account and link it to their DSIP account. See section 4.14 for more information regarding registration.

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IMPORTANT (continued)

The Small Business Administration (SBA), through its SBIR/STTR Policy Directive, purposely departs from normal Government solicitation formats and requirements, thus authorizing agencies to simplify the SBIR/STTR award process and minimize the regulatory burden on small business. Therefore, consistent with the SBA SBIR/STTR Policy Directive, the Department of Defense is soliciting proposals as a Broad Agency Announcement (BAA).

The DoD SBIR/STTR Programs follow the policies and practices of the SBA SBIR/STTR Policy Directive, current version. The guidelines presented in this BAA incorporate and make use of the flexibility of the SBA SBIR/STTR Policy Directive to encourage proposals based on scientific and technical approaches most likely to yield results important to the DoD and the private sector. The SBIR/STTR Policy Directive is available [HERE](#).

Classified proposals will not be accepted under the DoD SBIR Program.

This BAA incorporates **MANDATORY** foreign disclosure requirements and other important programmatic changes as required by the SBIR and STTR Extension Act of 2022 (Pub. L. 117-183). These updates can be found in sections **2.2, 2.5, 3.0, 4.2.e., 4.3, 6.0, 8.2 and Attachment 2**. Small business concerns are highly encouraged to review the full BAA to remain apprised of any additional recent programmatic changes.

Questions: Please refer to the DSIP [Customer Support Document](#) for general information regarding the DoD SBIR/STTR process in DSIP. For additional assistance with the DSIP application, please visit the Learning & Support section of the DSIP at <https://www.dodsbirsttr.mil/submissions/learning-support/>. Email DSIP Support at DoDSBIRSupport@reisystems.com only for further assistance with issues pertaining directly to the DSIP application. Questions submitted to DSIP Support will be addressed in the order received during normal operating hours (Monday through Friday, 9:00 a.m. to 5:00 p.m. ET). See **section 4.14 for further information on where to direct questions regarding instructions and topics in this BAA.**

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1.0 INTRODUCTION

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The Department of Defense (DoD), Office of the Undersecretary of Defense, Research and Engineering (OUSD(R&E)) invites small business concerns to submit proposals under this BAA for the Small Business Innovation Research (SBIR) Program. Proposing small business concerns with the capability to conduct research and development (R&D) in any of the defense-related topic areas described in this BAA, and to commercialize the results of that R&D, are encouraged to participate.

DoD Components may elect to release topics under this BAA throughout the duration of fiscal year 2023. Each topic release will have its own corresponding pre-release, open and close dates, which will be outlined within the Component-specific instructions contained in each release. Topics will be published for at least 45 days prior to the deadline for proposal submission. Proposing small business concerns can stay informed of the release of topics by visiting <https://www.defensesbirsttr.mil/SBIR-STTR/Opportunities/> and <https://www.dodsbirsttr.mil/submissions/login>, as well as by subscribing to the DoD SBIR/STTR Listserv by visiting <https://www.dodsbirsttr.mil/submissions/login> and clicking “DSIP Listserv” located under Quick Links. **Only proposals submitted in response to an active topic under this BAA will be evaluated.**

Active topic releases and associated Component-specific instructions can be viewed at: <https://www.defensesbirsttr.mil/SBIR-STTR/Opportunities/>. A full topic release index can be viewed in Appendix A of this BAA.

All proposing small business concerns that receive a Phase I award originating from this BAA will be eligible to participate in Phase II competitions and potential Phase III awards. A separate BAA will not be issued requesting Phase II or Phase III proposals. Unsolicited proposals will not be accepted. DoD Components will notify Phase I awardees of the Phase II proposal submission requirements. The details on the due date, content, and submission requirements for Phase II proposals will be provided by the awarding DoD Component either in the Phase I award or by subsequent notification. Submission of Phase II proposals will be in accordance with instructions provided by the individual Components. If a proposing small business concern submits its Phase II proposal prior to the time specified by the individual Components, it will be rejected without evaluation.

DoD is not obligated to make any awards under Phase I, Phase II, or Phase III. All awards are subject to the availability of funds. DoD is not responsible for any monies expended by the proposing small business concern before the issuance of any award.

2.0 PROGRAM DESCRIPTION

2.1 Objectives

The objectives of the DoD SBIR Program include stimulating technological innovation, strengthening the role of small business in meeting DoD research and development needs, fostering and encouraging participation by minority and disadvantaged persons in technological innovation, and increasing the commercial application of DoD-supported research or research and development results.

2.2 Due Diligence Program to Assess Security Risks

The SBIR and STTR Extension Act of 2022 (Pub. L. 117-183) requires the Department of Defense, in coordination with the Small Business Administration, to establish and implement a due diligence program to assess security risks presented by small business concerns seeking a Federally funded award. The full text of the SBIR and STTR Extension Act of 2022 is available at

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<https://www.congress.gov/117/plaws/publ183/PLAW-117publ183.pdf>.

As previously stated, the DoD SBIR/STTR Programs follow the policies and practices of the Small Business Administration (SBA) SBIR/STTR Policy Directive. The SBA revisions to the Policy Directive are in effect as of May 3, 2023. The Federal Register Notice is available at: <https://www.federalregister.gov/documents/2023/04/03/2023-06870/small-business-innovation-research-program-and-small-business-technology-transfer-program-policy>. This revision is incorporated into this BAA, including the utilization of the Appendix III, Disclosure Questions, as Attachment 2 “Disclosures of Foreign Affiliations or Relationships to Foreign Countries”.

In accordance with Section 4 of the SBIR and STTR Extension Act of 2022, the Department of Defense will review all proposals submitted in response to this BAA to assess security risks presented by small business concerns seeking a Federally funded award. The Department will use information provided by the small business concern in response to the Disclosures of Foreign Affiliations or Relationships to Foreign Countries (Attachment 2) and the proposal to conduct a risk-based due diligence review on the cybersecurity practices, patent analysis, employee analysis, and foreign ownership of a small business concern, including the financial ties and obligations (which shall include surety, equity, and debt obligations) of the small business concern and employees of the small business concern to a foreign country, foreign person, or foreign entity. The Department will also assess proposals utilizing open-source analysis and analytical tools, for the nondisclosures of the information set forth in 15 U.S.C. 638(g)(13).

DoD has partnered with Project Spectrum to provide an online course on Understanding Foreign Ownership, Control, or Influence (FOCI). This course defines FOCI, explains what it means to be under FOCI, and details FOCI's effect on a company seeking initial or continued eligibility for access to a federally funded award. Small business concerns can register and access this course by following the instructions below:

1. Go to projectspectrum.io
2. Click “Profile/Dashboard” in the top right and then click “Sign Up” from the dropdown menu.
3. Follow the instructions to sign up for an account. Descriptions of the account types are provided below each option.
4. Verify your email by entering the code sent to the email address you provided when signing up.
5. Log in to Project Spectrum by clicking “Profile/Dashboard > Login” in the top right.
6. Find the Training Course on “Understanding Foreign Ownership, Control, or Influence (FOCI)” by clicking “Courses > Training Courses”
7. Copy the provided password.
8. Click on the course and log in to Encite.io using your email address and the copied password.
9. Enroll in the course and click “Enter” to begin.

For assistance with registration or access to the Project Spectrum website, please contact support@projectspectrum.io.

2.3 OUSD(R&E) Critical Technology Areas

Each DoD Component develops SBIR and STTR topics that are mission-oriented to their programs, however topics generally align with the OUSD(R&E) Critical Technology Areas. While many technologies may cross between these categories, these areas represent the broad and different approaches that are required to advance technologies crucial to the Department. By focusing efforts and investments

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into these critical technology areas, the Department will accelerate transitioning key capabilities to the Military Services and Combatant Commands.

OUSD(R&E) Critical Technology Areas:

- FutureG
- Trusted AI and Autonomy
- Biotechnology
- Advanced Computing and Software
- Integrated Sensing and Cyber
- Directed Energy (DE)
- Hypersonics
- Microelectronics
- Integrated Network Systems-of-Systems
- Quantum Science
- Space Technology
- Renewable Energy Generation and Storage
- Advanced Materials
- Human-Machine Interfaces

Below are additional technology areas supporting DoD Component-specific mission-critical areas:

- Advanced Infrastructure & Advanced Manufacturing
- Combat Casualty Care
- Emerging Threat Reduction
- Military Infectious Diseases
- Military Operational Medicine
- Mission Readiness & Disaster Preparedness
- Nuclear
- Sustainment & Logistics

Full descriptions of the above technology areas can be reviewed here:

https://media.defense.gov/2023/Mar/21/2003183351/-1/-1/1/OUSDRE_SBIR_STTR_CRITICAL_TECH_AREAS.PDF.

2.4 Three Phase Program

The SBIR Program is a three-phase program. Phase I is to determine, to the extent possible, the scientific, technical, and commercial merit and feasibility of ideas submitted under the SBIR Program. Phase I awards are made in accordance with the SBA Policy Directive guidelines, current version. The period of performance is generally between six to twelve months with twelve months being the maximum period allowable. Proposals should concentrate on research or research and development which will significantly contribute to proving the scientific and technical feasibility, and commercialization potential of the proposed effort, the successful completion of which is a prerequisite for further DoD support in Phase II. Proposing small business concerns are encouraged to consider whether the research or research and development being proposed to DoD Components also has private sector potential, either for the proposed application or as a base for other applications.

Phase II awards will be made to proposing small business concerns based on the results of their Phase I effort and/or the scientific merit, technical merit, or commercialization potential of a Phase II proposal. Phase II awards are made in accordance with the SBA Policy Directive guidelines, current version. The period of performance is generally 24 months. Phase II is the principal research or research and development effort and is expected to produce a well-defined deliverable prototype. A Phase II contractor may receive up to one additional, sequential Phase II award for continued work on the project.

Under Phase III, the proposing small business concern is required to obtain funding from either the private sector, a non-SBIR Government source, or both, to develop the prototype into a viable product or non-R&D service for sale in military or private sector markets. SBIR Phase III refers to work that derives from, extends, or completes an effort made under prior SBIR funding agreements, but is funded by sources other than the SBIR Program. Phase III work is typically oriented towards commercialization of SBIR research or technology.

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2.5 Program on Innovation Open Topics

Section 7 of the SBIR and STTR Extension Act of 2022 requires the Department of Defense to establish innovation open topic activities in order to—

- (A) increase the transition of commercial technology to the Department of Defense;
- (B) expand the small business nontraditional industrial base;
- (C) increase commercialization derived from investments of the Department of Defense; and
- (D) expand the ability for qualifying small business concerns to propose technology solutions to meet the needs of the Department of Defense.

Unlike conventional topics, which specify the desired technical objective and output, open topics can use generalized mission requirements or specific technology areas to adapt commercial products or solutions to close capability gaps, improve performance, or provide technological advancements in existing capabilities.

A small business concern may only submit one (1) proposal to each open topic. If more than one proposal from a small business concern is received for a single open topic, only the most recent proposal to be certified and submitted prior to the submission deadline will receive an evaluation. All prior proposals submitted by the small business concern for the same open topic will be marked as nonresponsive and will not receive an evaluation.

Open topics released under this BAA will be clearly identified as such in the title and objective of the topic. Proposal preparation instructions for open topics may vary significantly across DoD Components. Proposing small business concerns are advised to carefully read and follow all instructions from the DoD Component for the open topic of interest. Unless specifically noted in the Component instructions, all requirements outlined in this BAA remain in effect for open topics.

3.0 DEFINITIONS

The following definitions from the SBA SBIR/STTR Policy Directive, the Federal Acquisition Regulation (FAR) and other cited regulations apply for the purposes of this BAA:

Commercialization

The process of developing products, processes, technologies, or services and the production and delivery (whether by the originating party or others) of the products, processes, technologies, or services for sale to or use by the Federal government or commercial markets.

Cooperative Research and Development

Research and development conducted jointly by a small business concern and a research institution. For purposes of the STTR Program, 40% of the work is performed by the small business concern, and not less than 30% of the work is performed by the single research institution. For purposes of the SBIR Program, this refers to work conducted by a research institution as a subcontractor to the small business concern. At least two-thirds of the research and/or analytical work in Phase I must be conducted by the proposing small business concern.

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Covered Individual

An individual who contributes in a substantive, meaningful way to the scientific development or execution of a research and development (R&D) project proposed to be carried out with a Federally funded award from DoD. DoD has further designated covered individuals as including all proposed key personnel.

Essentially Equivalent Work

Work that is substantially the same research, which is proposed for funding in more than one contract proposal or grant application submitted to the same Federal agency or submitted to two or more different Federal agencies for review and funding consideration; or work where a specific research objective and the research design for accomplishing the objective are the same or closely related to another proposal or award, regardless of the funding source.

Export Control

The International Traffic in Arms Regulations (ITAR), 22 CFR Parts 120 through 130, and the Export Administration Regulations (EAR), 15 CFR Parts 730 through 799, will apply to all projects with military or dual-use applications that develop beyond fundamental research, which is basic and applied research ordinarily published and shared broadly within the scientific community. More information is available at https://www.pmdetc.state.gov/detc_public.

NOTE: Export control compliance statements found in the individual Component-specific proposal instructions are not meant to be all inclusive. They do not remove any liability from the submitter to comply with applicable ITAR or EAR export control restrictions or from informing the Government of any potential export restriction as fundamental research and development efforts proceed.

Federal Laboratory

As defined in 15 U.S.C. §3703, means any laboratory, any federally funded research and development center (FFRDC), or any center established under 15 U.S.C. §§ 3705 & 3707 that is owned, leased, or otherwise used by a Federal agency and funded by the Federal Government, whether operated by the Government or by a contractor.

Federally Funded Award

A Phase I, Phase II (including Direct to Phase II, sequential Phase II/subsequent Phase II and cross-agency Phase II), or Phase III SBIR or STTR award made using a funding agreement.

Foreign Affiliation

As defined in 15 U.S.C. § 638(e)(16), foreign affiliation means a funded or unfunded academic, professional, or institutional appointment or position with a foreign government or government-owned entity, whether full-time, part-time, or voluntary (including adjunct, visiting, or honorary). This includes appointments or positions deemed adjunct, visiting, or honorary with research institutions located in a foreign country of concern.

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Foreign Country of Concern

As defined in 15 U.S.C. § 638(e)(17), foreign country of concern means the People’s Republic of China, the Democratic People’s Republic of Korea, the Russian Federation, the Islamic Republic of Iran, or any other country determined to be a country of concern by the Secretary of State.

Foreign Entity

Foreign entity means any branch, partnership, group or sub-group, association, estate, trust, corporation or division of a corporation, non-profit, academic institution, research center, or organization established, directed, or controlled by foreign owners, foreign investors, foreign management, or a foreign government.

Foreign Government

Foreign government means any government or governmental body, organization, or instrumentality, including government owned-corporations, other than the United States Government or United States state, territorial, tribal, or jurisdictional governments or governmental bodies. The term includes, but is not limited to, non-United States national and subnational governments, including their respective departments, agencies, and instrumentalities.

Foreign Nationals

Foreign Nationals (also known as Foreign Persons) as defined by 22 CFR 120.16 means any natural person who is not a lawful permanent resident as defined by 8 U.S.C. § 1101(a)(20) or who is not a protected individual as defined by 8 U.S.C. § 1324b(a)(3). It also means any foreign corporation, business association, partnership, trust, society or any other entity or group that is not incorporated or organized to do business in the United States, as well as international organizations, foreign governments and any agency or subdivision of foreign governments (e.g., diplomatic missions).

“Lawfully admitted for permanent residence” means the status of having been lawfully accorded the privilege of residing permanently in the United States as an immigrant in accordance with the immigration laws, such status not having changed.

"Protected individual" means an individual who (A) is a citizen or national of the United States, or (B) is an alien who is lawfully admitted for permanent residence, is granted the status of an alien lawfully admitted for temporary residence under 8 U.S.C. § 1160(a) or 8 U.S.C. § 1255a(a)(1), is admitted as a refugee under 8 U.S.C. § 1157, or is granted asylum under Section 8 U.S.C. § 1158; but does not include (i) an alien who fails to apply for naturalization within six months of the date the alien first becomes eligible (by virtue of period of lawful permanent residence) to apply for naturalization or, if later, within six months after November 6, 1986, and (ii) an alien who has applied on a timely basis, but has not been naturalized as a citizen within 2 years after the date of the application, unless the alien can establish that the alien is actively pursuing naturalization, except that time consumed in the Service's processing the application shall not be counted toward the 2-year period.

Fraud, Waste and Abuse

- a. **Fraud** includes any false representation about a material fact or any intentional deception designed to deprive the United States unlawfully of something of value or to secure from the

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United States a benefit, privilege, allowance, or consideration to which an individual or business is not entitled.

- b. **Waste** includes extravagant, careless or needless expenditure of Government funds, or the consumption of Government property, that results from deficient practices, systems, controls, or decisions.
- c. **Abuse** includes any intentional or improper use of Government resources, such as misuse of rank, position, or authority or resources.
- d. The SBIR Program training related to Fraud, Waste and Abuse is available at: <https://www.sbir.gov/tutorials/fraud-waste-abuse/tutorial-1>. See Section 4.17 for reporting Fraud, Waste and Abuse.

Funding Agreement

Any contract, grant, or cooperative agreement entered into between any Federal Agency and any small business concern for the performance of experimental, developmental, or research work, including products or services, funded in whole or in part by the Federal Government. Only **contracts and other transaction authority (OTA) agreements** will be used by DoD Components for all SBIR awards.

Historically Black Colleges and Universities and Minority Institutions (HBCU/MI)

Listings for the Historically Black Colleges and Universities (HBCU) and Minority Institutions (MI) are available through the Department of Education Web site, <http://www.ed.gov/about/offices/list/ocr/edlite-minorityinst.html>.

Certified HUBZone Small Business Concern

An SBC that has been certified by SBA under the Historically Underutilized Business Zones (HUBZone) Program (13 C.F.R. § 126) as a HUBZone firm listed in the Dynamic Small Business Search (DSBS).

Malign Foreign Talent Recruitment Program

As defined in 42 U.S.C § 19237, the term “malign foreign talent recruitment program” means-

- (A) any program, position, or activity that includes compensation in the form of cash, in-kind compensation, including research funding, promised future compensation, complimentary foreign travel, things of non de minimis value, honorific titles, career advancement opportunities, or other types of remuneration or consideration directly provided by a foreign country at any level (national, provincial, or local) or their designee, or an entity based in, funded by, or affiliated with a foreign country, whether or not directly sponsored by the foreign country, to the targeted individual, whether directly or indirectly stated in the arrangement, contract, or other documentation at issue, in exchange for the individual-
 - (i) engaging in the unauthorized transfer of intellectual property, materials, data products, or other nonpublic information owned by a United States entity or developed with a Federal research and development award to the government of a foreign country or an entity based in, funded by, or affiliated with a foreign country regardless of whether that government or entity provided support for the development of the intellectual property, materials, or data products;
 - (ii) being required to recruit trainees or researchers to enroll in such program, position, or activity;
 - (iii) establishing a laboratory or company, accepting a faculty position, or undertaking any other employment or appointment in a foreign country or with an entity based in, funded by, or

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- affiliated with a foreign country if such activities are in violation of the standard terms and conditions of a Federal research and development award;
- (iv) being unable to terminate the foreign talent recruitment program contract or agreement except in extraordinary circumstances;
 - (v) through funding or effort related to the foreign talent recruitment program, being limited in the capacity to carry out a research and development award or required to engage in work that would result in substantial overlap or duplication with a Federal research and development award;
 - (vi) being required to apply for and successfully receive funding from the sponsoring foreign government's funding agencies with the sponsoring foreign organization as the recipient;
 - (vii) being required to omit acknowledgment of the recipient institution with which the individual is affiliated, or the Federal research agency sponsoring the research and development award, contrary to the institutional policies or standard terms and conditions of the Federal research and development award;
 - (viii) being required to not disclose to the Federal research agency or employing institution the participation of such individual in such program, position, or activity; or
 - (ix) having a conflict of interest or conflict of commitment contrary to the standard terms and conditions of the Federal research and development award; and
- (B) a program that is sponsored by-
- (i) a foreign country of concern or an entity based in a foreign country of concern, whether or not directly sponsored by the foreign country of concern;
 - (ii) an academic institution on the list developed under section 1286(c)(8) of the John S. McCain National Defense Authorization Act for Fiscal Year 2019 (10 U.S.C. 2358 note; 1 Public Law 115–232) ; or
 - (iii) a foreign talent recruitment program on the list developed under section 1286(c)(9) of the John S. McCain National Defense Authorization Act for Fiscal Year 2019 (10 U.S.C. 2358 note; 1 Public Law 115–232).

Performance Benchmark Requirements

Companies with multiple SBIR/STTR awards must meet minimum performance requirements to be eligible to apply for a new Phase I or Direct-to-Phase II award. The purpose of these requirements is to ensure that Phase I applicants that have won multiple prior SBIR/STTR awards are making progress towards commercializing the work done under those awards. The Phase I to Phase II Transition Rate addresses the extent to which an awardee progresses a project from Phase I to Phase II. The Commercialization Benchmark addresses the extent to which an awardee has moved past Phase II work towards commercialization.

The SBIR and STTR Extension Act of 2022 (Pub. L. 117-183) amended the application of these benchmarks for more experienced firms. Detailed information on benchmark calculations and increased performance standards for more experienced firms can be found at <https://www.sbir.gov/performance-benchmarks>.

Personal Conflict of Interest

A situation in which an individual has a financial interest, personal activity, or relationship that could impair the employee's ability to act impartially and in the best interest of the Government when performing under the contract. (A de minimis interest that would not "impair the employee's ability to act impartially and in the best interest of the Government" is not covered under this definition.)

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Among the sources of personal conflicts of interest are-

- (i) Financial interests of the covered employee, of close family members, or of other members of the covered employee's household;
- (ii) Other employment or financial relationships (including seeking or negotiating for prospective employment or business); and
- (iii) Gifts, including travel.

Financial interests referred to in paragraph (1) of this definition may arise from-

- (i) Compensation, including wages, salaries, commissions, professional fees, or fees for business referrals;
- (ii) Consulting relationships (including commercial and professional consulting and service arrangements, scientific and technical advisory board memberships, or serving as an expert witness in litigation);
- (iii) Services provided in exchange for honorariums or travel expense reimbursements;
- (iv) Research funding or other forms of research support;
- (v) Investment in the form of stock or bond ownership or partnership interest (excluding diversified mutual fund investments);
- (vi) Real estate investments;
- (vii) Patents, copyrights, and other intellectual property interests; or
- (viii) Business ownership and investment interests.

Principal Investigator

The principal investigator/project manager is the one individual designated by the applicant to provide the scientific and technical direction to a project supported by the funding agreement.

For both Phase I and Phase II, the primary employment of the principal investigator must be with the proposing small business concern at the time of award and during the conduct of the proposed project. Primary employment means that more than one-half of the principal investigator's time is spent in the employ of the small business. This precludes full-time employment with another organization. Occasionally, deviations from this requirement may occur, and must be approved in writing by the contracting officer after consultation with the agency SBIR/STTR Program Manager/Coordinator. Further, a proposing small business concern or research institution may replace the principal investigator on an SBIR/STTR Phase I or Phase II award, subject to approval in writing by the contracting officer.

Proprietary Information

Proprietary information is any information that a small business concern considers to be non-public information that is owned by the small business concern and is marked accordingly.

Research Institution

Any organization located in the United States that is:

- a. A university.
- b. A nonprofit institution as defined in Section 4(5) of the Stevenson-Wydler Technology Innovation Act of 1980.
- c. A contractor-operated federally funded research and development center, as identified by the National Science Foundation in accordance with the government-wide Federal Acquisition

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Regulation issued in accordance with Section 35(c)(1) of the Office of Federal Procurement Policy Act. A list of eligible FFRDCs is available at: <https://www.nsf.gov/statistics/ffrdclist/>.

Research or Research and Development

Any activity that is:

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

Research Involving Animal Subjects

All activities involving animal subjects shall be conducted in accordance with DoDI 3216.01 “Use of Animals in DoD Programs,” 9 C.F.R. parts 1-4 “Animal Welfare Regulations,” National Academy of Sciences Publication “Guide for the Care & Use of Laboratory Animals,” as amended, and the Department of Agriculture rules implementing the Animal Welfare Act (7 U.S.C. §§ 2131-2159), as well as other applicable federal and state law and regulation and DoD instructions.

“Animal use” protocols apply to all activities that meet any of the following criteria:

- a. Any research, development, test, evaluation or training, (including experimentation) involving an animal or animals.
- b. An animal is defined as any living or dead, vertebrate organism (non-human) that is being used or is intended for use in research, development, test, evaluation or training.
- c. A vertebrate is a member of the subphylum Vertebrata (within the phylum Chordata), including birds and cold-blooded animals.

See DoDI 3216.01 for definitions of these terms and more information about the applicability of DoDI 3216.01 to work involving animals.

Research Involving Human Subjects

All research involving human subjects shall be conducted in accordance with 32 C.F.R. § 219 “The Common Rule,” 10 U.S.C. § 980 “Limitation on Use of Humans as Experimental Subjects,” and DoDI 3216.02 “Protection of Human Subjects and Adherence to Ethical Standards in DoD-Supported Research,” as well as other applicable federal and state law and regulations, and DoD component guidance. Proposing small business concerns must be cognizant of and abide by the additional restrictions and limitations imposed on the DoD regarding research involving human subjects, specifically as they regard vulnerable populations (DoDI 3216.02), recruitment of military research subjects (DoDI 3216.02), and informed consent and surrogate consent (10 U.S.C. § 980) and chemical and biological agent research (DoDI 3216.02). Food and Drug Administration regulation and policies may also apply.

“Human use” protocols apply to all research that meets any of the following criteria:

- a. Any research involving an intervention or an interaction with a living person that would not be occurring or would be occurring in some other fashion but for this research.
- b. Any research involving identifiable private information. This may include data/information/specimens collected originally from living individuals (broadcast video, web-

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use logs, tissue, blood, medical or personnel records, health data repositories, etc.) in which the identity of the subject is known, or the identity may be readily ascertained by the investigator or associated with the data/information/specimens.

See DoDI 3216.02 for definitions of these terms and more information about the applicability of DoDI 3216.02 to research involving human subjects.

Research Involving Recombinant DNA Molecules

Any recipient performing research involving recombinant DNA molecules and/or organisms and viruses containing recombinant DNA molecules shall comply with the National Institutes of Health Guidelines for Research Involving Recombinant DNA Molecules, dated January 2011, as amended. The guidelines can be found at: https://osp.od.nih.gov/wp-content/uploads/2016/05/NIH_Guidelines.pdf. Recombinant DNA is defined as (i) molecules that are constructed outside living cells by joining natural or synthetic DNA segments to DNA molecules that can replicate in living cells or (ii) molecules that result from the replication of those described in (i) above.

Service-Disabled Veteran-Owned Small Business (SDVOSB)

A small business concern owned and controlled by a Service-Disabled Veteran or Service-Disabled Veterans, as defined in Small Business Act 15 USC § 632(q)(2) and SBA's implementing SDVOSB regulations (13 CFR 125).

Small Business Concern (SBC)

A concern that meets the requirements set forth in 13 C.F.R. § 121.702 (available [here](#)).

An SBC must satisfy the following conditions on the date of award:

- a. Is organized for profit, with a place of business located in the United States, which operates primarily within the United States or which makes a significant contribution to the United States economy through payment of taxes or use of American products, materials or labor;
- b. Is in the legal form of an individual proprietorship, partnership, limited liability company, corporation, joint venture, association, trust or cooperative, except that if the concern is a joint venture, each entity to the venture must meet the requirements set forth in paragraph (c) below;
- c. Is more than 50% directly owned and controlled by one or more individuals (who are citizens or permanent resident aliens of the United States), other small business concerns (each of which is more than 50% directly owned and controlled by individuals who are citizens or permanent resident aliens of the United States), or any combination of these; and
- d. Has, including its affiliates, not more than 500 employees. (For explanation of affiliate, see www.sba.gov/size.)

Subcontract

A subcontract is 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. This includes consultants.

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Subcontractor

Subcontractor means any supplier, distributor, vendor, firm, academic institution, research center, or other person or entity that furnishes supplies or services pursuant to a subcontract, at any tier.

United States

"United States" means the fifty 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.

Women-Owned Small Business Concern

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.

4.0 PROPOSAL FUNDAMENTALS

4.1 Introduction

The proposal must provide sufficient information to demonstrate to the evaluator(s) that the proposed work represents an innovative approach to the investigation of an important scientific or engineering problem and is worthy of support under the stated criteria. The proposed research or research and development must be responsive to the chosen topic, although it need not use the exact approach specified in the topic. Anyone contemplating a proposal for work on any specific topic should determine:

- a. The technical approach has a reasonable chance of meeting the topic objective,
- b. This approach is innovative, not routine, with potential for commercialization and
- c. The proposing small business concern has the capability to implement the technical approach, i.e., has or can obtain people and equipment suitable to the task.

a. Direct to Phase II

15 U.S.C. §638 (cc) allows DoD to make a SBIR Phase II award to a small business concern with respect to a project, without regard to whether the small business concern was provided an award under Phase I of the SBIR program with respect to such project. Participating DoD Components may elect to conduct a "Direct to Phase II" implementation of this authority for select topics under this BAA, as specified in the Component-specific instructions contained within the topic release. DoD does not guarantee Direct to Phase II opportunities will be offered in future BAAs.

Each eligible topic requires that proposing small business concerns provide documentation to demonstrate feasibility described in the Phase I section of the topic has been met. **Feasibility documentation cannot be based upon or logically extend from any prior or ongoing federally funded SBIR or STTR work.** Work submitted within the feasibility documentation must have been substantially performed by the proposing small business concern and/or the PI. If technology in the feasibility documentation is subject to Intellectual Property (IP), the proposing small business concern must either own the IP, or must have obtained license rights

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to such technology prior to proposal submission, to enable it and its subcontractors to legally carry out the proposed work.

If the proposing small business concern fails to demonstrate technical merit and feasibility equivalent to the Phase I level as described in the associated topic, the related Phase II proposal will not be accepted or evaluated, in accordance with the Component-specific Direct to Phase II instructions.

Please refer to the Component-specific instructions for full details regarding Component Direct to Phase II processes and proposal preparation requirements.

4.2 Proposing Small Business Concern Eligibility and Performance Requirements

- a. Each proposing small business concern must qualify as a small business concern as defined by 13 C.F.R §§ 701-705 at time of award and certify to this in the Cover Sheet section of the proposal. The eligibility requirements for the SBIR/STTR programs are unique and do not correspond to those of other small business programs (see Section 3 of this BAA). Proposing small business concerns must meet eligibility requirements for Small Business Ownership and Control (see 13 CFR § 121.702 and Section 4.4 of this BAA).
- b. A minimum of two-thirds of the research and/or analytical work in Phase I must be conducted by the proposing Small business concern. For Phase II, a minimum of one-half (50%) of the research and/or analytical work must be performed by the proposing small business concern. The percentage of work is measured by both direct and indirect costs. Occasionally, deviations from these SBIR requirements may occur, and must be approved in writing by the Funding Agreement officer after consultation with the agency SBIR/STTR program manager/coordinator. For more information on the percentage of work calculation during proposal submission, refer to section 5.3.
- c. For both Phase I and II, the primary employment of the principal investigator must be with the proposing small business concern at the time of the award and during the conduct of the proposed effort. Primary employment means that more than one-half of the principal investigator's time is spent with the small business. Primary employment with a small business concern precludes full-time employment at another organization.
- d. For both Phase I and Phase II, all research or research and development work must be performed by the small business concern and its subcontractors in the United States.
- e. **Benchmarks.** Proposing small business concerns with prior SBIR/STTR awards must meet two benchmark requirements as determined by the Small Business Administration (SBA) on June 1 each year.
 - (1) Phase I to Phase II Transition Rate: For all proposing small business concerns with greater than 20 Phase I awards over the past five fiscal years excluding the most recent year, the ratio of Phase II awards to Phase I awards must be at least 0.25.
 - (2) Commercialization Benchmark: For all proposing small business concerns with greater than 15 Phase II awards over the last ten fiscal years excluding the last two years, the proposing small business concern must have received, to date, an average of at least \$100,000 of sales and/or investments per Phase II award received or have received a

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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.

The SBIR and STTR Extension Act of 2022 (Pub. L. 117-183) amended the application of these benchmarks for more experienced firms. Detailed information on benchmark calculations, increased performance standards for more experienced firms and consequence of failure to meet benchmarks can be found at <https://www.sbir.gov/performance-benchmarks>.

As defined by the SBIR/STTR Policy Directive, Department of the Army, Department of the Navy, and Department of the Air Force each constitute its own Federal agency, and the remaining DoD Components fall under the executive agency of the Department of Defense. Companies that fail to meet either of the benchmarks under the Increased Performance Standards for more Experienced Firms may not receive more than an overall total of 80 awards from DoD, as detailed in the breakdown below:

Army – 20 total Phase I and Direct to Phase II awards

Navy – 20 total Phase I and Direct to Phase II awards

Air Force – 20 total Phase I and Direct to Phase II awards

All other DoD Components - 20 Phase I and Direct to Phase II awards, combined

4.3 Disclosures Regarding Ties to People’s Republic of China and Other Foreign Countries

Each proposing small business concern is required to complete Attachment 2 of this BAA, “Disclosures of Foreign Affiliations or Relationships to Foreign Countries” and upload the form to Volume 5, Supporting Documents. **Proposals that do not include Attachment 2 in Volume 5 will be deemed noncompliant and will not receive an evaluation.** The disclosure requires the following information:

- (A) the identity of all owners and covered individuals of the small business concern who are a party to any foreign talent recruitment program of any foreign country of concern, including the People’s Republic of China;
- (B) the existence of any joint venture or subsidiary of the small business concern that is based in, funded by, or has a foreign affiliation with any foreign country of concern, including the People’s Republic of China;
- (C) any current or pending contractual or financial obligation or other agreement specific to a business arrangement, or joint venture-like arrangement with an enterprise owned by a foreign state or any foreign entity;
- (D) whether the small business concern is wholly owned in the People’s Republic of China or another foreign country of concern;
- (E) the percentage, if any, of venture capital or institutional investment by an entity that has a general partner or individual holding a leadership role in such entity who has a foreign affiliation with any foreign country of concern, including the People’s Republic of China;
- (F) any technology licensing or intellectual property sales to a foreign country of concern, including the People’s Republic of China, during the five-year period preceding submission of the proposal; and
- (G) any foreign entity, offshore entity, or entity outside the United States related to the small business concern.

After reviewing the above listed disclosures of the proposing small business concern, and if determined appropriate by the DoD, the Department may ask the small business concern may to provide true copies of any contractual or financial obligation or other agreement specific to a business arrangement or joint-

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venture like arrangement with an enterprise owned by a foreign state or any foreign entity in effect during the five-year period preceding submission of the proposal with respect to which the small business concern made the disclosures.

4.4 Joint Ventures

Joint ventures and limited partnerships are permitted, provided that the entity created qualifies as a small business in accordance with the Small Business Act, 13 U.S.C. § 121.701. Proposing small business concerns must disclose joint ventures with existing (or planned) relationships/partnerships with any foreign entity or any foreign government-controlled companies.

A small business joint venture entity must submit, with its proposal, the representation required in paragraph (c) of FAR solicitation provision 52.212-3, Offeror Representations and Certifications-Commercial Products and Commercial Services, and paragraph (c) of FAR solicitation provision 52.219-1, Small Business Program Representations, in accordance with 52.204-8(d) and 52.212-3(b) for the following categories:

- (A) Small business;
- (B) Service-disabled veteran-owned small business;
- (C) Women-owned small business (WOSB) under the WOSB Program;
- (D) Economically disadvantaged women-owned small business under the WOSB Program; or
- (E) Historically underutilized business zone small business.

These representations can be found as Attachment 3 to this BAA and must be uploaded to Volume 5, Supporting Documents of the proposal submission in DSIP, if applicable.

4.5 Majority Ownership in Part by Multiple Venture Capital, Hedge Fund, and Private Equity Firms

Unless otherwise noted in the participating Component instructions, proposing small business concerns that are owned in majority part by multiple venture capital operating companies (VCOCs), hedge funds, or private equity funds are ineligible to submit applications or receive awards for opportunities in this BAA. Component instructions will specify if participation by a small business majority owned in part by VCOCs, hedge funds, or private equity funds is allowable **for a specific topic in the BAA**. If a Component authorizes such participation, any proposing small business concern that is owned, in whole in or in part, by any VCOC, hedge fund, and/or private equity fund must identify each foreign national, foreign entity, or foreign government holding or controlling greater than a 5% equity stake in the proposing small business concern, whether such equity stake is directly or indirectly held. The proposing small business concern must also identify any and all of its ultimate parent owner(s) and any other entities and/or individuals owning more than a 5% equity stake in its chain of ownership.

4.6 Conflicts of Interest

Contract awards to proposing small business concerns owned by or employing current or previous Federal Government employees could create conflicts of interest for those employees, which may be a violation of federal law.

4.7 Organizational Conflicts of Interest (OCI)

FAR 9.5 Requirements

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In accordance with FAR 9.5, proposing small business concerns are required to identify and disclose all facts relevant to potential OCIs involving the proposing small business concern's organization and any proposed team member (sub-awardee, consultant). Under this Section, the proposing small business concern is responsible for providing this disclosure with each proposal submitted to the BAA. The disclosure must include the proposing small business concern's, and as applicable, proposed team member's OCI mitigation plan. The OCI mitigation plan must include a description of the actions the proposing small business concern has taken, or intends to take, to prevent the existence of conflicting roles that might bias the proposing small business concern's judgment and to prevent the proposing small business concern from having unfair competitive advantage. The OCI mitigation plan will specifically discuss the disclosed OCI in the context of each of the OCI limitations outlined in FAR 9.505-1 through FAR 9.505-4.

Agency Supplemental OCI Policy

In addition, DoD Components may have a supplemental OCI policy that prohibits contractors/performers from concurrently providing Scientific Engineering Technical Assistance (SETA), Advisory and Assistance Services (A&AS) or similar support services and being a technical performer. Therefore, as part of the FAR 9.5 disclosure requirement above, a proposing small business concern must affirm whether the proposing small business concern or any proposed team member (sub-awardee, consultant) is providing SETA, A&AS, or similar support to any DoD Component office(s) under: (a) a current award or sub-award; or (b) a past award or sub-award that ended within one calendar year prior to the proposal's submission date.

If SETA, A&AS, or similar support is being or was provided to any DoD Component office(s), the proposal must include:

- The name of the DoD Component office receiving the support;
- The prime contract number;
- Identification of proposed team member (sub-awardee, consultant) providing the support; and
- An OCI mitigation plan in accordance with FAR 9.5.

Government Procedures

In accordance with FAR 9.503, 9.504 and 9.506, the Government will evaluate OCI mitigation plans to avoid, neutralize or mitigate potential OCI issues before award and to determine whether it is in the Government's interest to grant a waiver. The Government will only evaluate OCI mitigation plans for proposals that are determined selectable under the BAA evaluation criteria and funding availability.

The Government may require proposing small business concerns provide additional information to assist the Government in evaluating the proposing small business concern's OCI mitigation plan.

If the Government determines that a proposing small business concern failed to fully disclose an OCI; or failed to provide the affirmation of Government support as described above; or failed to reasonably provide additional information requested by the Government to assist in evaluating the proposing small business concern's OCI mitigation plan, the Government may reject the proposal and withdraw it from consideration for award.

4.8 Classified Proposals

Classified proposals will not be accepted under the DoD SBIR Program. If topics will require classified work during Phase II, the proposing small business concern must have a facility clearance in order to perform the Phase II work. For more information on facility and personnel clearance procedures and

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requirements, please visit the Defense Counterintelligence and Security Agency (DCSA) website at: <https://www.dcsa.mil/mc/ctp/fc/>.

4.9 Research Involving Human Subjects

All research involving human subjects, to include use of human biological specimens and human data, shall comply with the applicable federal and state laws and agency policy/guidelines for human subject protection (see Section 3).

Institutions to be awarded funding for research involving human subjects must provide documentation of a current Federal Assurance of Compliance with Federal regulations for human subject protection, for example a Department of Health and Human Services, Office for Human Research Protections Federal-wide Assurance (<http://www.hhs.gov/ohrp>). Additional Federal Assurance documentation may also be requested by the awarding DoD Component. All institutions engaged in human subject research, to include subcontractors, must also have a valid Assurance. In addition, personnel involved in human subjects research must provide documentation of completing appropriate training for the protection of human subjects. Institutions proposing to conduct human subject research that meets one of the exemption criteria in 32 CFR 219.101 are not required to have a Federal Assurance of Compliance. Proposing small business concerns should clearly segregate research activities involving human subjects from other research and development activities in their proposal.

If selected, institutions must also provide documentation of Institutional Review Board (IRB) approval or a determination from an appropriate official in the institution that the work meets one of the exemption criteria with 32 CFR 219. As part of the IRB review process, evidence of appropriate training for all investigators should accompany the protocol. The protocol, separate from the proposal, must include a detailed description of the research plan, study population, risks and benefits of study participation, recruitment and consent process, data collection and data analysis.

The amount of time required for the IRB to review and approve the protocol will vary depending on such things as the IRB's procedures, the complexity of the research, the level of risk to study participants and the responsiveness of the Investigator. The average IRB approval process can last between one and three months. Once the IRB has approved the research, the awarding DoD Component will review the protocol and the IRB's determination to ensure that the research will be conducted in compliance with DoD and DoD Component policies. The DoD review process can last between three to six months. Ample time should be allotted to complete both the IRB and DoD approval processes prior to recruiting subjects.

No funding can be used towards human subject research until ALL approvals are granted. Submitters proposing research involving human and/or animal use are encouraged to separate these tasks in the technical proposal and cost proposal in order to avoid potential delay of contract award.

4.10 Research Involving Animal Subjects

All research, development, testing, experimentation, education or training involving the use of animals shall comply with the applicable federal and agency rules on animal acquisition, transport, care, handling, and use (see Section 3).

For submissions containing animal use, proposals should briefly describe plans for their Institutional Animal Care and Use Committee (IACUC) review and approval.

All Recipients must receive their IACUC's approval as well as secondary or headquarters-level approval by a DoD veterinarian who is trained or experienced in laboratory animal medicine and science. **No**

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animal research may be conducted using DoD funding until all the appropriate DoD office(s) grant approval. Submitters proposing research involving human and/or animal use are encouraged to separate these tasks in the technical proposal and cost proposal in order to avoid potential delay of contract award.

4.11 Research Involving Recombinant DNA Molecules

All research involving recombinant DNA molecules shall comply with the applicable federal and state law, regulation and any additional agency guidance. Research shall be approved by an Institutional Biosafety Committee.

4.12 Debriefing/Technical Evaluation Narrative

After final award decisions have been announced, the technical evaluations of the submitter's proposal may be provided to the submitter. Please refer to the Component-specific instructions of your topics of interest for Component debriefing processes.

4.13 Pre-Award and Post Award BAA Protests

Interested parties have the right to protest in accordance with the procedures in FAR Subpart 33.1.

Pre-award agency protests related to the terms of this BAA must be served to: osd.ncr.ousd-re.mbx.SBIR-STTR-Protest@mail.mil.

Post award agency protests related to a selection or award decision must be served to the point-of-contact (POC) listed in the instructions of the DoD Component that authored the topic.

Protests filed with the Government Accountability Office (GAO) shall be in accordance with FAR § 33.104, a copy of the protest shall be submitted to the email address above (pre-award ONLY) or DoD Component POC (selection/award decision ONLY) within one day of filing with the GAO.

Size protests regarding the small business status of a selected proposing small business concern may be made to the Small Business Administration in accordance with the procedures in FAR § 19.302.

4.14 Award Information

All Phase I proposals will be evaluated and judged on a competitive basis in terms of technical capability and technical value. Proposals will be initially screened to determine responsiveness to the topic objective. Proposals passing this initial screening will be technically evaluated by engineers or scientists to determine the most promising technical and scientific approaches. As a common statement of work does not exist, each proposal will be assessed on the merit of the approach in achieving the technical objectives established in the topic. DoD is under no obligation to fund any proposal or any specific number of proposals in a given topic. It also may elect to fund several or none of the proposed approaches to the same topic.

- a. **Number of Awards.** The number of awards will be consistent with the Component's RDT&E budget. No contracts will be awarded until evaluation of all qualified proposals for a specific topic is completed.
- b. **Type of Funding Agreement.** Each proposal selected for award will be funded under negotiated contracts or purchase orders and will include a reasonable fee or profit consistent with normal profit margins provided to profit-making firms for R/R&D work. Firm-Fixed-Price, Firm-Fixed-

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Price Level of Effort, Labor Hour, Time & Material, or Cost-Plus-Fixed-Fee type contracts can be negotiated and are at the discretion of the Component Contracting Officer.

- c. **Dollar Value.** The contract value varies among the DoD Components; it is therefore important for the proposing small business concern to review Component-specific instructions regarding award size.
- d. **Timing.** Proposing small business concerns will be notified of selection or non-selection status for award by the DoD Component that originated the topic within 90 days of the closing date for the topic. Please refer to the Component-specific instructions for details.

The SBA SBIR/STTR Policy Directive, Section 7(c)(1)(ii), states that agencies should issue the Phase I award no more than 180 days after the closing date of the topic. However, across DoD, the median time between the date that the SBIR BAA closes and the award of a Phase I contract is approximately four months.

4.15 Questions about this BAA and BAA Topics

a. General SBIR Questions/Information.

(1) DSIP Support:

Email DSIP Support at DoDSBIRSupport@reisystems.com only for assistance with using the DSIP application. Questions regarding DSIP can be emailed to DSIP Support and will be addressed in the order received, during normal operating hours (Monday through Friday, 9:00 a.m. to 5:00 p.m. ET). Please include information on your small business concern, a proposal number (if applicable), and screenshots of any pertinent errors or issues encountered.

DSIP Support cannot provide updates to proposal status after submission, such as proposal selection/non-selection status or contract award status. Contact the DoD Component that originated the topic in accordance with the Component-specific instructions given at the beginning of that Component's topics.

(2) Websites:

The Defense SBIR/STTR Innovation Portal (DSIP) at <https://www.dodsbirsttr.mil/submissions/login>, which provides the following resources:

- SBIR and STTR Program Opportunities
- Topics Search Engine
- Topic Q&A
- All Electronic Proposal Submission for Phase I and Phase II Proposals.
Proposing Small business concerns submitting through this site for the first time will be asked to register on <https://www.dodsbirsttr.mil/submissions>.

DoD SBIR/STTR website at <https://www.defensesbirsttr.mil/>, which provides the following resources:

- [Customer Support Information](#)
- SBIR and STTR Program Opportunities
- Dates for Current and Upcoming Opportunities
- Past SBIR and STTR Program Opportunities

(3) SBIR/STTR Updates and Notices:

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To be notified of SBIR/STTR opportunities and to receive e-mail updates on the DoD SBIR and STTR Programs, subscribe to the Listserv by selecting “DSIP Listserv” under Quick Links on the DSIP login page.

- b. **General Questions about a DoD Component.** General questions pertaining to a particular DoD Component and the Component-specific BAA instructions should be submitted in accordance with the instructions given at the beginning of the Component-specific instructions with each topic release.
- c. **Direct Contact with Topic Authors.** During the pre-release period, proposing small business concerns have an opportunity to contact topic authors by telephone or e-mail to ask technical questions about specific BAA topics. Questions should be limited to specific information related to improving the understanding of a particular topic’s requirements. Proposing small business concerns may not ask for advice or guidance on solution approach and you may not submit additional material to the topic author. If information provided during an exchange with the topic author is deemed necessary for proposal preparation, that information will be made available to all parties through Topic Q&A. After this period questions must be asked through Topic Q&A as described below.
- d. **Topic Q&A.** Once a topic enters the open period and DoD begins accepting proposals, no further direct contact between proposing small business concerns and topic authors is allowed unless the Topic Author is responding to a question submitted during the pre-release period. However, proposing small business concerns may submit written questions through Topic Q&A at <https://www.dodsbirsttr.mil/submissions/login>. In Topic Q&A, all questions and answers are posted electronically for general viewing. Identifying information for the questioner and respondent is not posted.

Questions submitted through the Topic Q&A are limited to technical information related to improving the understanding of a topic’s requirements. Any other questions, such as those asking for advice or guidance on solution approach, or administrative questions, such as SBIR or STTR program eligibility, technical proposal/cost proposal structure and page count, budget and duration limitations, or proposal due date WILL NOT receive a response. Refer to the Component-specific instructions given at the beginning of that Component's topics for help with an administrative question.

Proposing small business concerns may use the Topic Search feature on DSIP to locate a topic of interest. Then, using the form at the bottom of the topic description, enter and submit the question. Answers are generally posted within seven (7) business days of question submission (answers will also be e-mailed directly to the inquirer).

Proposing small business concerns are advised to monitor Topic Q&A during the topic pre-release and open period for questions and answers. Proposing small business concerns should also frequently monitor DSIP for updates and amendments to the topics.

4.16 Registrations and Certifications

Individuals from proposing small business concerns must be registered in the Defense SBIR/STTR Innovation Portal (DSIP) in order to prepare and submit proposals. **The DSIP application is only accessible from within the United States, which is defined as the fifty 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.** All users are required to have an individual user account to access DSIP. As DSIP user accounts are authenticated by Login.gov, all users, who do not already have a Login.gov account, will be required to create one. If you already have a Login.gov account, you can link your existing Login.gov

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account with your DSIP account. Job Aids and Help Videos to walk you through the process are in the Learning & Support section of DSIP, can be accessed here:

<https://www.dodsbirsttr.mil/submissions/learning-support/training-materials>.

Be advised that the sharing of accounts and passwords is a violation of the Terms of Use for Login.gov and DoD policy.

Please note that the email address you use for Login.gov should match the email address associated with your existing DSIP account. If you do not recall the email address associated with your DSIP account, or if you already have an existing Login.gov account using a different email address, you will need your Firm's UEI DUNS number and your Firm PIN in order to link your Login.gov account with your DSIP account. If the email address associated with your existing DSIP account has been used for multiple DSIP accounts within your Firm, you will also need your Firm's UEI or DUNS number and your Firm PIN in order to link your Login.gov account with your DSIP account. The Firm PIN can be obtained from your Firm Admin. You can view the Firm Admin's contact information by entering your Firm's UEI or DUNS number when prompted. If you are the Firm Admin, please ensure that you contact all DSIP users in your Firm and provide them with the Firm PIN.

Users should complete their account registrations as soon as possible to avoid any delays in proposal submissions.

The System for Award Management (SAM) allows proposing small business concerns interested in conducting business with the Federal Government to provide basic information on business structure and capabilities as well as financial and payment information. Proposing small business concerns must be registered in SAM. To register, visit www.sam.gov. A proposing small business concern that is already registered in SAM should login to SAM and ensure its registration is active and its representations and certifications are up-to-date to avoid delay in award.

On April 4, 2022, the DUNS Number was replaced by the Unique Entity ID (SAM). The Federal Government will use the UEI (SAM) to identify organizations doing business with the Government. The DUNS number will no longer be a valid identifier. If the proposing small business concerns has an entity registration in SAM.gov (even if the registration has expired), a UEI (SAM) has already been assigned. This can be found by signing into SAM.gov and selecting the Entity Management widget in the Workspace or by signing in and searching entity information. **For proposing small business concerns with established Defense SBIR/STTR Innovation Portal (DSIP) accounts, update the Small business concern profile with the UEI (SAM) as soon as possible.**

For new proposing small business concern registrations, follow instructions during SAM registration on how to obtain a Commercial and Government Entry (CAGE) code and be assigned the UEI (SAM). Once a CAGE code and UEI (SAM) are obtained, update the Small business concern's profile on the DSIP at <https://www.dodsbirsttr.mil/submissions/>.

In addition to the standard federal and DoD procurement certifications, the SBA SBIR Policy Directive requires the collection of certain information from proposing small business concerns at time of award and during the award life cycle. Each proposing small business concerns must provide this additional information at the time of the Phase I and Phase II award, prior to final payment on the Phase I award, prior to receiving 50% of the total award amount for a Phase II award, and prior to final payment on the Phase II award.

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4.17 Promotional Materials

Promotional and non-project related discussion is discouraged, and additional information provided via Universal Resource Locator (URL) links or on computer disks, CDs, DVDs, video tapes or any other medium will not be accepted or considered in the proposal evaluation.

4.18 Prior, Current, or Pending Support of Similar Proposals or Awards

IMPORTANT -- While it is permissible, with proposal notification, to submit identical proposals or proposals containing a significant amount of essentially equivalent work (see Section 3) for consideration under numerous federal program BAAs or solicitations, it is unlawful to enter into contracts or grants requiring essentially equivalent effort. If there is any question concerning prior, current, or pending support of similar proposals or awards, it must be disclosed to the soliciting agency or agencies as early as possible. See Section 5.4.c(11).

4.19 Fraud and Fraud Reporting

Knowingly and willfully making any false, fictitious, or fraudulent statements or representations may be a felony under the Federal Criminal False Statement Act (18 U.S.C. Sec 1001), punishable by a fine of up to \$10,000, up to five years in prison, or both.

The Department of Defense, Office of Inspector General Hotline (“Defense Hotline”) is an important avenue for reporting fraud, waste, abuse, and mismanagement within the Department of Defense. The Office of Inspector General operates this hotline to receive and investigate complaints or information from contractor employees, DoD civilians, military service members and public citizens. Individuals who wish to report fraud, waste or abuse may contact the Defense Hotline at (800) 424-9098 between 8:00 a.m. and 5:00 p.m. Eastern Time or visit <http://www.dodig.mil/Components/Administrative-Investigations/DoD-Hotline/Hotline-Complaint/> to submit a complaint. Mailed correspondence should be addressed to the Defense Hotline, The Pentagon, Washington, DC 20301-1900, or e-mail addressed to hotline@dodig.mil.

4.20 State and Other Assistance Available

Many states have established programs to provide services to those proposing small business concerns and individuals wishing to participate in the Federal SBIR Program. These services vary from state to state, but may include:

- Information and technical assistance;
- Matching funds to SBIR recipients;
- Assistance in obtaining Phase III funding.

Contact your State SBIR/STTR Support office at https://www.sbir.gov/state_services?state=105813# for further information. Small business concerns may seek general administrative guidance from small and disadvantaged business utilization specialists located in various Defense Contract Management activities throughout the continental United States.

4.21 Discretionary Technical and Business Assistance (TABAs)

DoD has not mandated the use of TABAs pending further SBA guidance and establishment of a limit on the amount of technical and business assistance services that may be received or purchased by a small business concern that has received multiple Phase II SBIR or STTR awards for a fiscal year. However, Proposing small business concerns should carefully review individual component instructions to determine if TABAs are being offered and follow specific proposal requirements for requesting TABA funding.

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5.0 PHASE I PROPOSAL

5.1 Introduction

This BAA and the Defense SBIR/STTR Innovation Portal (DSIP) sites are designed to reduce the time and cost required to prepare a formal proposal. DSIP is the official portal for DoD SBIR/STTR proposal submission. Proposing small business concerns are required to submit proposals via DSIP; proposals submitted by any other means will be disregarded. Proposing small business concerns submitting through this site for the first time will be asked to register. It is recommended that proposing small business concerns register as soon as possible upon identification of a proposal opportunity to avoid delays in the proposal submission process.

The information in this section is applicable to Phase I proposals only. If a topic is accepting **Direct to Phase II** proposals, refer to the Component-specific instructions for more information on Direct to Phase II proposal preparation.

Guidance on allowable proposal content may vary by Component. A completed proposal submission in DSIP does NOT indicate that each proposal volume has been completed in accordance with the Component-specific instructions. Accordingly, it is the proposing small business concern's responsibility to consult the Component-specific instructions for detailed guidance, including required proposal documentation and structure, cost and duration limitations, budget structure, TABA allowance and proposal page limits.

DSIP provides a structure for providing the following proposal volumes:

- Volume 1: Proposal Cover Sheet
- Volume 2: Technical Volume
- Volume 3: Cost Volume
- Volume 4: Company Commercialization Report
- Volume 5: Supporting Documents
 - a. Contractor Certification Regarding Provision of Prohibition on Contracting for Certain Telecommunications and Video Surveillance Services or Equipment (Attachment 1) MANDATORY
 - b. Disclosures of Foreign Affiliations or Relationships to Foreign Countries (Attachment 2) MANDATORY
 - c. Verification of Eligibility of Small Business Joint Ventures (Attachment 3), if applicable
 - d. Disclosure of Funding Sources (Attachment 4) MANDATORY
 - e. Other supporting documentation (Refer to Component-specific instructions for additional Volume 5 requirements)

A completed proposal submission in DSIP does NOT indicate that the mandatory supporting documents have been uploaded. It is the responsibility of the proposing small business concern to ensure that the mandatory documents listed above have been uploaded and included with the proposal submission.

Volume 6: Fraud, Waste and Abuse Training

All proposing small business concerns must complete the following:

- Volume 4: Company Commercialization Report (upload of CCR from SBIR.gov to DSIP is required for proposing small business concerns with prior Federal SBIR or STTR awards)

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- Volume 5(a): Contractor Certification Regarding Provision of Prohibition on Contracting for Certain Telecommunications and Video Surveillance Services or Equipment (Attachment 1)
- Volume 5(b): Disclosures of Foreign Affiliations or Relationships to Foreign Countries (Attachment 2)
- Volume 5(c): Disclosure of Funding Sources (Attachment 4)
- Volume 6: Fraud, Waste and Abuse training.

Refer to Section 5.3 below for full details on these proposal requirements.

A Phase I Proposal Template is available to provide helpful guidelines for completing each section of your Phase I technical proposal. This can be found at <https://www.dodsbirsttr.mil/submissions/learning-support/firm-templates>.

Detailed guidance on registering in DSIP and using DSIP to submit a proposal can be found at <https://www.dodsbirsttr.mil/submissions/learning-support/training-materials>. If the proposal status is “In Progress” or “Ready to Certify” it will NOT be considered submitted, even if all volumes are added prior to the topic close date. The proposing small business concern may modify all proposal volumes prior to the topic close date.

Although signatures are not required on the electronic forms at the time of submission the proposal must be certified electronically by the corporate official for it to be considered submitted. If the proposal is selected for negotiation and possible award, the DoD Component program will contact the proposing small business concern for signatures prior to award.

5.2 Marking Proprietary Proposal Information

Proposing small business concerns that include in their proposals data that they do not want disclosed to the public for any purpose, or used by the Government except for evaluation purposes, shall:

(1) Mark the first page of each Volume of the proposal submission with the following legend:

"This proposal includes data that shall not be disclosed outside the Government and shall not be duplicated, used, or disclosed-in whole or in part-for any purpose other than to evaluate this proposal. If, however, a contract is awarded to this proposing small business concern as a result of-or in connection with-the submission of this data, the Government shall have the right to duplicate, use, or disclose the data to the extent provided in the resulting contract. This restriction does not limit the Government's right to use information contained in this data if it is obtained from another source without restriction. The data subject to this restriction are contained in pages [insert numbers or other identification of sheets]"; and

(2) Mark each sheet of data it wishes to restrict with the following legend:

"Use or disclosure of data contained on this page is subject to the restriction on the first page of this volume."

The DoD assumes no liability for disclosure or use of unmarked data and may use or disclose such data for any purpose.

Restrictive notices notwithstanding, proposals and final reports submitted through the Defense SBIR/STTR Innovation Portal (DSIP) may be handled, for administrative purposes only, by

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support contractors. All support contractors are bound by appropriate non-disclosure agreements.

5.3 Phase I Proposal Instructions

a. Proposal Cover Sheet (Volume 1)

On the Defense SBIR/STTR Innovation Portal (DSIP) at <https://www.dodsbirsttr.mil/submissions/>, prepare the Proposal Cover Sheet.

The Cover Sheet must include a brief technical abstract that describes the proposed R&D project and a discussion of anticipated benefits and potential commercial applications. Each section should be no more than 200 words. **Do not include proprietary or classified information in the Proposal Cover Sheet.** If your proposal is selected for negotiation and possible award, the technical abstract and discussion of anticipated benefits may be publicly released on the Internet. Once the Cover Sheet is saved, the system will assign a proposal number. You may modify the cover sheet as often as necessary until the BAA closes.

Effective January 2023, the amounts listed in the Percentage of Work (POW) certification question on the Proposal Cover Sheet are derived from information entered by the proposing small business concern in the Cost Volume (Volume 3). Details on the calculation can be viewed in DSIP during proposal submission.

If the POW calculations fall below eligibility requirements, a letter of explanation or approval by the Funding Agreement officer must be uploaded to the certification question to complete the submission. Some DoD Components will not accept any deviations from the POW minimum requirements. Please refer to the Component instructions regarding acceptance of deviations to the POW requirements.

b. Format of Technical Volume (Volume 2)

- (1) **Type of file:** The Technical Volume must be a single Portable Document Format (PDF) file, including graphics. Perform a virus check before uploading the Technical Volume file. If a virus is detected, it may cause rejection of the proposal. **Do not lock or encrypt the uploaded file. Do not include or embed active graphics such as videos, moving pictures, or other similar media in the document.**
- (2) **Length:** It is the proposing small business concern's responsibility to verify that the Technical Volume does not exceed the page limit after upload to DSIP. Please refer to Component-specific instructions for how a technical volume is handled if the stated page count is exceeded. Some Components will reject the entire technical proposal if the proposal exceeds the stated page count.
- (3) **Layout:** Number all pages of your proposal consecutively. Those who wish to respond must submit a direct, concise, and informative research or research and development proposal (no type smaller than 10-point on standard 8-1/2" x 11" paper with one-inch margins). The header on each page of the Technical Volume should contain your company name, topic number, and proposal number assigned by the Defense SBIR/STTR Innovation Portal (DSIP) when the Cover Sheet was created. The header may be included in the one-inch margin.

c. Content of the Technical Volume (Volume 2)

The Technical Volume should cover the following items in the order given below:

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- (1) **Identification and Significance of the Problem or Opportunity.** Define the specific technical problem or opportunity addressed and its importance.
- (2) **Phase I Technical Objectives.** Enumerate the specific objectives of the Phase I work, including the questions the research and development effort will try to answer to determine the feasibility of the proposed approach.
- (3) **Phase I Statement of Work (including Subcontractors' Efforts)**
 - a. Provide an explicit, detailed description of the Phase I approach. If a Phase I option is required or allowed by the Component, describe appropriate research activities which would commence at the end of Phase I base period should the Component elect to exercise the option. The Statement of Work should indicate what tasks are planned, how and where the work will be conducted, a schedule of major events, and the final product(s) to be delivered. The Phase I effort should attempt to determine the technical feasibility of the proposed concept. The methods planned to achieve each objective or task should be discussed explicitly and in detail. This section should be a substantial portion of the Technical Volume section.
 - b. This BAA may contain topics that have been identified by the Program Manager as research or activities involving Human/Animal Subjects and/or Recombinant DNA. In the event that Phase I performance includes performance of these kinds of research or activities, please identify the applicable protocols and how those protocols will be followed during Phase I. Please note that funds cannot be released or used on any portion of the project involving human/animal subjects or recombinant DNA research or activities until all of the proper approvals have been obtained (see Sections 4.7 - 4.9). **Small business concerns proposing research involving human and/or animal use are encouraged to separate these tasks in the technical proposal and cost proposal in order to avoid potential delay of contract award.**
- (4) **Related Work.** Describe significant activities directly related to the proposed effort, including any conducted by the principal investigator, the proposing small business concern, consultants, or others. Describe how these activities interface with the proposed project and discuss any planned coordination with outside sources. The technical volume must persuade reviewers of the proposing small business concern's awareness of the state-of-the-art in the specific topic. Describe previous work not directly related to the proposed effort but similar. Provide the following:
 - a. Short description,
 - b. Client for which work was performed (including individual to be contacted and phone number), and
 - c. Date of completion.
- (5) **Relationship with Future Research or Research and Development**
 - a. State the anticipated results of the proposed approach if the project is successful.
 - b. Discuss the significance of the Phase I effort in providing a foundation for Phase II research or research and development effort.
 - c. Identify the applicable clearances, certifications and approvals required to conduct Phase II testing and outline the plan for ensuring timely completion of said authorizations in support of Phase II research or research and development effort.

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- (6) **Commercialization Strategy.** Describe in approximately one page your company's strategy for commercializing this technology in DoD, other Federal Agencies, and/or private sector markets. Provide specific information on the market need the technology will address and the size of the market. Also include a schedule showing the quantitative commercialization results from this SBIR project that your company expects to achieve.
- (7) **Key Personnel.** Identify key personnel who will be involved in the Phase I effort including information on directly related education and experience. A concise technical resume of the principal investigator, including a list of relevant publications (if any), must be included (Please do not include Privacy Act Information). All resumes will count toward the page limitations for Volume 2.
- (8) **Foreign Citizens.** Identify any foreign citizens or individuals holding dual citizenship expected to be involved on this project as a direct employee, subcontractor, or consultant. For these individuals, please specify their country of origin, the type of visa or work permit under which they are performing and an explanation of their anticipated level of involvement on this project. Proposing small business concerns frequently assume that individuals with dual citizenship or a work permit will be permitted to work on an SBIR project and do not report them. This is not necessarily the case and a proposal may be deemed nonresponsive if the requested information is not provided. Therefore, proposing small business concerns should report any and all individuals expected to be involved on this project that are considered a foreign national as defined in Section 3 of the BAA. You may be asked to provide additional information during negotiations in order to verify the foreign citizen's eligibility to participate on a SBIR contract. Supplemental information provided in response to this paragraph will be protected in accordance with the Privacy Act (5 U.S.C. 552a), if applicable, and the Freedom of Information Act (5 U.S.C. 552(b)(6)).
- (9) **Facilities/Equipment.** Describe available instrumentation and physical facilities necessary to carry out the Phase I effort. Justify equipment purchases in this section and include detailed pricing information in the Cost Volume. State whether or not the facilities where the proposed work will be performed meet environmental laws and regulations of federal, state (name), and local Governments for, but not limited to, the following groupings: airborne emissions, waterborne effluents, external radiation levels, outdoor noise, solid and bulk waste disposal practices, and handling and storage of toxic and hazardous materials.
- (10) **Subcontractors/Consultants.** Involvement of a university or other subcontractors or consultants in the project may be appropriate. If such involvement is intended, it should be identified and described to the same level of detail as the prime contractor costs. A minimum of two-thirds of the research and/or analytical work in Phase I, as measured by direct and indirect costs, must be conducted by the proposing small business concern, unless otherwise approved in writing by the Contracting Officer. SBIR efforts may include subcontracts with Federal Laboratories and Federally Funded Research and Development Centers (FFRDCs). A waiver is no longer required for the use of federal laboratories and FFRDCs; however, proposing small business concerns must certify their use of such facilities on the Cover Sheet of the proposal.
- (11) **Prior, Current, or Pending Support of Similar Proposals or Awards.** If a proposal submitted in response to this BAA is substantially the same as another proposal that was funded, is now being funded, or is pending with another Federal Agency, or another or the

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same DoD Component, you must reveal this on the Proposal Cover Sheet and provide the following information:

- a. Name and address of the Federal Agency(s) or DoD Component to which a proposal was submitted, will be submitted, or from which an award is expected or has been received.
- b. Date of proposal submission or date of award.
- c. Title of proposal.
- d. Name and title of principal investigator for each proposal submitted or award received.
- e. Title, number, and date of BAA(s) or solicitation(s) under which the proposal was submitted, will be submitted, or under which award is expected or has been received.
- f. If award was received, state contract number.
- g. Specify the applicable topics for each SBIR proposal submitted or award received.

Note: If this does not apply, state in the proposal "No prior, current, or pending support for proposed work."

d. Content of the Cost Volume (Volume 3)

Complete the Cost Volume by using the on-line cost volume form on the Defense SBIR/STTR Innovation Portal (DSIP). Some items in the cost breakdown may not apply to the proposed project. If that is the case, there is no need to provide information on each and every item. What matters is that enough information be provided to allow us to understand how you plan to use the requested funds if a contract is awarded.

- (1) List all key personnel by name as well as by number of hours dedicated to the project as direct labor.
- (2) While special tooling and test equipment and material cost may be included under Phases I, the inclusion of equipment and material will be carefully reviewed relative to need and appropriateness for the work proposed. The purchase of special tooling and test equipment must, in the opinion of the Component Contracting Officer, be advantageous to the Government and should be related directly to the specific topic. These may include such items as innovative instrumentation or automatic test equipment. Title to property furnished by the Government or acquired with Government funds will be vested with the DoD Component, unless it is determined that transfer of title to the contractor would be more cost effective than recovery of the equipment by the DoD Component.
- (3) Cost for travel funds must be justified and related to the needs of the project.
- (4) Cost sharing is permitted for proposals under this BAA; however, cost sharing is not required nor will it be an evaluation factor in the consideration of a Phase I proposal.
- (5) A Phase I Option (if applicable) should be fully costed separately from the Phase I (base) approach.
- (6) All subcontractor costs and consultant costs, such as labor, travel, equipment, materials, must be detailed at the same level as prime contractor costs. Provide detailed substantiation of subcontractor costs in your cost proposal. Volume 5, Supporting Documents, may be used if additional space is needed.

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When a proposal is selected for negotiation and possible award, you must be prepared to submit further documentation to the Component Contracting Officer to substantiate costs (e.g., an explanation of cost estimates for equipment, materials, and consultants or subcontractors). For more information about cost proposals and accounting standards, see <https://www.dcaa.mil/Guidance/Audit-Process-Overview/>.

e. **Company Commercialization Report (Volume 4)**

The Company Commercialization Report (CCR) allows companies to report funding outcomes resulting from prior SBIR and STTR awards. SBIR and STTR awardees are required by SBA to update and maintain their organization's CCR on SBIR.gov. Commercialization information is required upon completion of the last deliverable under the funding agreement. Thereafter, SBIR and STTR awardees are requested to voluntarily update the information in the database annually for a minimum period of 5 years.

If the proposing small business concern has prior DoD and/or non-DoD Phase I and/or Phase II SBIR/STTR awards, regardless of whether the project has any commercialization to date, a PDF of the CCR must be downloaded from SBIR.gov and uploaded to the Firm Forms section of DSIP by the Firm Admin. Firm Forms are completed by the DSIP Firm Admin and are applied across all proposals the proposing small business concern submits. The DSIP CCR requirement is fulfilled by completing the following:

1. Log into the firm account at <https://www.sbir.gov/>.
2. Navigate to My Dashboard > My Documents to view or print the information currently contained in the Company Registry Commercialization Report.
3. Create or update the commercialization record, from the company dashboard, by scrolling to the "My Commercialization" section, and clicking the create/update Commercialization tab under "Current Report Version". Please refer to the "Instructions" and "Guide" documents contained in this section of the Dashboard for more detail on completing and updating the CCR. **Ensure the report is certified and submitted.**
4. Click the "Company Commercialization Report" PDF under the My Documents section of the dashboard to download a PDF of the CCR.
5. Upload the PDF of the CCR (downloaded from SBIR.gov in previous step) to the Company Commercialization Report in the Firm Forms section of DSIP. This upload action must be completed by the Firm Admin.

This version of the CCR, uploaded to DSIP from SBIR.gov, is inserted into all proposal submissions as Volume 4.

During proposal submission, the proposing small business concern will be prompted with the question: "Do you have a new or revised Company Commercialization Report to upload?". There are three possible courses of action:

- a. If the proposing small business concern has prior DoD and/or non-DoD Phase I and/or Phase II SBIR/STTR awards, and **DOES have a new or revised CCR from SBIR.gov to upload to DSIP**, select YES.
 - If the user is the Firm Admin, they can upload the PDF of the CCR from SBIR.gov directly on this page. It will also be updated in the Firm Forms and be associated with all new or in-progress proposals submitted by the proposing small business concern. If the user is not the Firm Admin, they will receive a message that they do not have access and must contact the Firm Admin to complete this action.

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- **WARNING:** Uploading a new CCR under the Firm Forms section of DSIP or clicking “Save” or “Submit” in Volume 4 of one proposal submission is considered a change for ALL proposals under any open BAAs or CSOs. If a proposing small business concern has previously certified and submitted any Phase I or Direct to Phase II proposals under *any* BAA or CSO *that is still open*, those proposals will be automatically reopened. Proposing small business concerns will have to recertify and resubmit such proposals. If a proposing Small business concern does not recertify or resubmit such proposals, they will not be considered fully submitted and will not be evaluated.
- b. If the proposing small business concern has prior DoD and/or non-DoD Phase I and/or Phase II SBIR/STTR awards, and **DOES NOT have a new or revised CCR from SBIR.gov to upload to DSIP**, select NO.
- If a prior CCR was uploaded to the Firm Forms, the proposing small business concern will see a file dialog box at the bottom of the page and can view the previously uploaded CCR. This read-only access allows the proposing small business concern to confirm that the CCR has been uploaded by the Firm Admin.
 - If no file dialog box is present at the bottom of the page that is an indication that **there is no previously uploaded CCR in the DSIP Firm Forms**. To fulfill the DSIP CCR requirement the Firm Admin must follow steps 1-5 listed above to download a PDF of the CCR from SBIR.gov and upload it to the DSIP Firm Forms to be included with all proposal submissions.
- c. If the proposing small business concern has **NO** prior DoD and/or non-DoD Phase I and/or Phase II SBIR/STTR awards, the upload of the CCR from SBIR.gov is not required and proposing small business concern will select NO. The CCR section of the proposal will be marked complete.

While all proposing small business concerns with prior DoD and/or non-DoD Phase I and/or Phase II SBIR/STTR awards must report funding outcomes resulting from these awards through the CCR from SBIR.gov and upload a copy of this report to their Firm Forms in DSIP, **please refer to the Component-specific instructions for details on how this information will be considered during proposal evaluations.**

f. **Supporting Documents (Volume 5)**

Volume 5 is provided for proposing small business concerns to submit additional documentation to support the Coversheet (Volume 1), Technical Volume (Volume 2), and the Cost Volume (Volume 3).

All proposing small business concerns are REQUIRED to submit the following documents to Volume 5:

1. Contractor Certification Regarding Provision of Prohibition on Contracting for Certain Telecommunications and Video Surveillance Services or Equipment (Attachment 1)
2. Disclosures of Foreign Affiliations or Relationships to Foreign Countries (Attachment 2)
3. Disclosure of Funding Sources (Attachment 4)

A completed proposal submission in DSIP does NOT indicate that the mandatory supporting documents have been uploaded. It is the responsibility of the proposing small

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business concern to ensure that the mandatory documents listed above have been uploaded and included with the proposal submission.

Any of the following documents may be included in Volume 5 if applicable to the proposal. Refer to Component-specific instructions for additional Volume 5 requirements.

1. Letters of Support
2. Additional Cost Information
3. Funding Agreement Certification
4. Technical Data Rights (Assertions)
5. Lifecycle Certification
6. Allocation of Rights
7. **Verification of Eligibility of Small Business Joint Ventures (Attachment 3)**
8. Other

- g. **Contractor Certification Regarding Provision of Prohibition on Contracting for Certain Telecommunications and Video Surveillance Services or Equipment**

The DoD must comply with Section 889(a)(1)(B) of the National Defense Authorization Act (NDAA) for Fiscal Year 2019, and is working to reduce or eliminate contracts with entities that use any equipment, system, or service that uses covered telecommunications equipment or services (as defined in BAA Attachment 1) as a substantial or essential component of any system, or as critical technology as part of any system.

All proposals must include certifications in Defense Federal Acquisition Regulation Supplement (DFARS) provisions 252.204-7016, 252.204-7017, and clause 252.204-7018, executed by the proposing small business concern's authorized company representative. The DFARS provisions and clause may be found in BAA Attachment 1. **These certifications must be signed by the authorized company representative and uploaded as a separate PDF file in the supporting documents sections of Volume 5 for all proposal submissions.**

The effort to complete the required certification clauses includes the proposing small business concern and any contractors that may be proposed as a part of the submission including research partners and suppliers. Therefore, proposing small business concerns are strongly encouraged to review the requirements of these certifications early in the proposal development process. Failure to submit or complete the required certifications as a part of the proposal submission process may be cause for rejection of the proposal submission without evaluation.

h. Disclosures of Foreign Affiliations or Relationships to Foreign Countries

In accordance with Section 4 of the SBIR and STTR Extension Act of 2022 and the SBA SBIR/STTR Policy Directive, the Department of Defense will review all proposals submitted in response to this BAA to assess security risks presented by small business concerns seeking a Federally funded award. **Proposing small business concerns must complete Attachment 2: Disclosures of Foreign Affiliations or Relationships to Foreign Countries and upload to Volume 5. Proposals that do not include Attachment 2 in Volume 5 will be deemed noncompliant and will not receive an evaluation.** For additional details, please refer to Section 2.2 and 4.3.

i. Certification Regarding Disclosure of Funding Sources

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The proposing small business concern must comply with Section 223(a) of the William M. (Mac) Thornberry National Defense Authorization Act for Fiscal Year 2021, which requires that covered individuals:

- (A) disclose the amount, type, and source of all current and pending research support received by, or expected to be received by, the individual as of the time of the disclosure;
- (B) certify that the disclosure is current, accurate, and complete; and
- (C) agree to update such disclosure at the request of the agency prior to the award of support and at any subsequent time the agency determines appropriate during the term of the award

Small business concerns must also certify that each covered individual who is employed by the small business and listed on the proposal has been made aware of the requirements listed above. **The disclosure and certification must be made by completing Attachment 4 of this BAA and uploading to Volume 5, Supporting Documents of the proposal submission in DSIP, utilizing the “Other” category for document type.**

j. **Fraud, Waste and Abuse Training (Volume 6)**

The Fraud, Waste and Abuse (FWA) training is **required** for Phase I and Direct to Phase II proposals. FWA training provides information on what represents FWA in the SBIR/STTR program, the most common mistakes that lead to FWA, as well as the penalties and ways to prevent FWA in your small business concern. This training material can be found in the Volume 6 section of the proposal submission module in DSIP and must be thoroughly reviewed once per year. Plan ahead and leave ample time to complete this training based on the proposal submission deadline. FWA training must be completed by one DSIP firm user with read/write access (Proposal Owner, Corporate Official or Firm Admin) on behalf of the proposing small business concern.

6.0 PHASE I EVALUATION CRITERIA

Proposals will be evaluated based on the criteria outlined below, unless otherwise specified in the Component-specific instructions. Selections will be based on a determination of the overall technical value of each proposal and an evaluation of the cost volume, with the appropriate method of analysis given the contract type to be awarded, in order for selection of the proposal(s) most advantageous to the Government, considering the following factors which are listed in descending order of importance:

- a. The soundness, technical merit, and innovation of the proposed approach and its incremental progress toward topic or subtopic solution.
- b. The qualifications of the proposed principal/key investigators, supporting staff, and consultants. Qualifications include not only the ability to perform the research and development but also the ability to commercialize the results.
- c. The potential for commercial (Government or private sector) application and the benefits expected to accrue from this commercialization.

Cost or budget data submitted with the proposals will be considered during evaluation.

Technical reviewers will base their conclusions only on information contained in the proposal. It cannot be assumed that reviewers are acquainted with the proposing small business concern or key individuals or any referenced experiments. Relevant supporting data such as journal articles, literature, including

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Government publications, etc., should be included based on requirements provided in Component-specific instructions.

Denial of Awards

The DoD will not make an award under the SBIR program if it determines that—

- (A) the small business concern submitting the proposal —
 - (i) has an owner or covered individual that is party to a malign foreign talent recruitment program;
 - (ii) has a business entity, parent company, or subsidiary located in the People’s Republic of China or another foreign country of concern; or
 - (iii) has an owner or covered individual that has a foreign affiliation with a foreign entity located in the People’s Republic of China or another foreign country of concern; and
- (B) the relationships and commitments described in clauses (i) through (iii) of subparagraph (A)—
 - (i) interfere with the capacity for activities supported by the DoD to be carried out;
 - (ii) create duplication with activities supported by the DoD;
 - (iii) present concerns about conflicts of interest;
 - (iv) were not appropriately disclosed to the DoD;
 - (v) violate Federal law or terms and conditions of contracts or other agreements awarded by the DoD; or
 - (vi) pose a risk to national security.

7.0 PHASE II PROPOSAL INFORMATION

7.1 Introduction

Unless the Component is participating in Direct to Phase II, Phase II proposals may only be submitted by Phase I awardees. Submission of Phase II proposals are not permitted at this time, and if submitted, may be rejected without evaluation. Phase II proposal preparation and submission instructions will be provided by the DoD Components to Phase I awardees. See Component-specific instructions for more information on Direct to Phase II Program preparation and submission instructions.

7.2 Proposal Provisions

IMPORTANT -- While it is permissible, with proposal notification, to submit identical proposals or proposals containing a significant amount of essentially equivalent work for consideration under numerous federal program BAAs and solicitations, it is unlawful to enter into contracts or grants requiring essentially equivalent effort. If there is any question concerning this, it must be disclosed to the soliciting agency or agencies as early as possible. If a proposal submitted for a Phase II effort is substantially the same as another proposal that was funded, is now being funded, or is pending with another Federal Agency, or another or the same DoD Component, you must reveal this on the Cover Sheet and provide the information required in Section 5.4.c(11).

Due to specific limitations on the amount of funding and number of awards that may be awarded to a particular proposing small business concern per topic using SBIR/STTR program funds, Head of Agency Determinations are now required before a different agency may make an award using another agency’s topic. This limitation does not apply to Phase III funding. Please contact your original sponsoring agency before submitting a Phase II proposal to an agency other than the one who sponsored the original topic.

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Section 4(b)(1)(i) of the SBIR/STTR Policy Directive provides that, at the agency’s discretion, projects awarded a Phase I under a solicitation for SBIR may transition in Phase II to STTR and vice versa. A proposing small business concern wishing to transfer from one program to another must contact their designated technical monitor to discuss the reasons for the request and the agency’s ability to support the request. The transition may be proposed prior to award or during the performance of the Phase II effort. Agency disapproval of a request to change programs shall not be grounds for granting relief from any contractual performance requirement. All approved transitions between programs must be noted in the Phase II award or award modification signed by the contracting officer that indicates the removal or addition of the research institution and the revised percentage of work requirements.

7.3 Commercialization Strategy

At a minimum, your commercialization strategy must address the following five questions:

- (1) What is the first product that this technology will go into?
- (2) Who will be the customers, and what is the estimated market size?
- (3) How much money will be needed to bring the technology to market, and how will that money be raised?
- (4) Does the company contain marketing expertise and, if not, how will that expertise be brought into the company?
- (5) Who are the proposing small business concern’s competitors, and what is the price and/or quality advantage over those competitors?

The commercialization strategy must also include a schedule showing the anticipated quantitative commercialization results from the Phase II project at one year after the start of Phase II, at the completion of Phase II, and after the completion of Phase II (i.e., amount of additional investment, sales revenue, etc.). After Phase II award, the company is required to report actual sales and investment data in its SBA Company Commercialization Report via “My Dashboard” on SBIR.gov at least annually. For information on formatting, page count and other details, please refer to the Component-specific instructions.

7.4 Phase II Evaluation Criteria

Phase II proposals will be evaluated based on the criteria outlined above in section 6.0, unless otherwise specified in the Component-specific instructions.

7.5 Phase II Award Information

DoD Components will notify Phase I awardees of the Phase II proposal submission requirements. Submission of Phase II proposals will be in accordance with instructions provided by individual Components. The details on the due date, content, and submission requirements of the Phase II proposal will be provided by the awarding DoD Component either in the Phase I award or by subsequent notification.

7.6 Adequate Accounting System

In order to reduce risk to the small business and avoid potential contracting delays, it is suggested that companies interested in pursuing Phase II SBIR contracts and other contracts of similar size with the Department of Defense (DoD), have an adequate accounting system per General Accepted Accounting Principles (GAAP), Generally Accepted Government Auditing Standards (GAGAS), Federal Acquisition Regulation (FAR) and Cost Accounting Standards (CAS) in place. The accounting system will be audited

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by the Defense Contract Audit Agency (DCAA). DCAA's requirements and standards are available on their Website at <https://www.dcaa.mil/Guidance/Audit-Process-Overview/> and <https://www.dcaa.mil/Checklists-Tools/Pre-award-Accounting-System-Adequacy-Checklist/>.

7.7 Phase II Enhancement Policy

To further encourage the transition of SBIR research into DoD acquisition programs as well as the private sector, certain DoD Components have developed their own Phase II Enhancement policy. Under this policy, the Component will provide a Phase II awardee with additional Phase II SBIR funding if the company can match the additional SBIR funds with non-SBIR funds from DoD acquisition programs or the private sector.

See component instructions for more details on Phase II Enhancement opportunities.

7.8 Commercialization Readiness Program (CRP)

The SBIR/STTR Reauthorization Act of 2011 established the Commercialization Pilot Program (CPP) as a long-term program titled the Commercialization Readiness Program (CRP).

Each Military Department (Army, Navy, and Air Force) has established a Commercialization Readiness Program. Please check the Component instructions for further information.

The DoD SBIR/STTR Program has established the OSD Transitions SBIR Technology (OTST) Pilot Program. The OTST pilot program is an interim technology maturity phase (Phase II), inserted into the SBIR development.

For more information contact osd.ncr.ousd-r-e.mbx.sbir-sttr-tech-transition@mail.mil.

8.0 CONTRACTUAL REQUIREMENTS

8.1 Additional Contract Requirements

Upon award of a contract, the contractor will be required to make certain legal commitments through acceptance of Government contract clauses in the Phase I contract. The outline that follows is illustrative of the types of provisions required by the Federal Acquisition Regulation that will be included in the Phase I contract. This is not a complete list of provisions to be included in Phase I contracts, nor does it contain specific wording of these clauses. Copies of complete general provisions will be made available prior to award.

Examples of general provisions:

- a. **Standards of Work.** Work performed under the contract must conform to high professional standards.
- b. **Inspection.** Work performed under the contract is subject to Government inspection and evaluation at all reasonable times.
- c. **Examination of Records.** The Comptroller General (or a fully authorized representative) shall have the right to examine any directly pertinent records of the contractor involving transactions related to this contract.

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- d. **Default.** The Government may terminate the contract if the contractor fails to perform the work contracted.
- e. **Termination for Convenience.** The contract may be terminated at any time by the Government if it deems termination to be in its best interest, in which case the contractor will be compensated for work performed and for reasonable termination costs.
- f. **Disputes.** Any dispute concerning the contract which cannot be resolved by agreement shall be decided by the contracting officer with right of appeal.
- g. **Contract Work Hours.** The contractor may not require an employee to work more than eight hours a day or forty hours a week unless the employee is compensated accordingly (that is, receives overtime pay).
- h. **Equal Opportunity.** The contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, or national origin.
- i. **Affirmative Action for Veterans.** The contractor will not discriminate against any employee or applicant for employment because he or she is a disabled veteran.
- j. **Affirmative Action for Handicapped.** The contractor will not discriminate against any employee or applicant for employment because he or she is physically or mentally handicapped.
- k. **Officials Not to Benefit.** No member of or delegate to Congress shall benefit from the contract.
- l. **Covenant Against Contingent Fees.** No person or agency has been employed to solicit or secure the contract upon an understanding for compensation except bona fide employees or commercial agencies maintained by the contractor for the purpose of securing business.
- m. **Gratuities.** The contract may be terminated by the Government if any gratuities have been offered to any representative of the Government to secure the contract.
- n. **Patent Infringement.** The contractor shall report each notice or claim of patent infringement based on the performance of the contract.
- o. **Military Security Requirements.** The contractor shall safeguard any classified information associated with the contracted work in accordance with applicable regulations.
- p. **American Made Equipment and Products.** When purchasing equipment or a product under the SBIR funding agreement, purchase only American-made items whenever possible.

Applicable Federal Acquisition Regulation (FAR) and/or Defense Federal Acquisition Regulation Supplement (DFARS) Clauses:

- q. **Unique Identification (UID).** If your proposal identifies hardware that will be delivered to the government, be aware of the possible requirement for unique item identification in accordance with DFARS 252.211-7003.
- r. **Disclosure of Information.** In accordance with FAR 252.204-7000, Government review and approval will be required prior to any dissemination or publication, regardless of medium (e.g., film, tape, document), pertaining to any part of this contract or any program related to this contract except within and between the Contractor and any subcontractors, of unclassified and non-fundamental information developed under this contract or contained in the reports to be furnished pursuant to this contract.
- s. **Animal Welfare.** Contracts involving research, development, test, evaluation, or training on vertebrate animals will incorporate DFARS clause 252.235-7002.
- t. **Protection of Human Subjects.** Effective 29 July 2009, contracts that include or may include research involving human subjects in accordance with 32 CFR Part 219, DoD Directive 3216.02 and 10 U.S.C. 980, including research that meets exemption criteria under 32 CFR 219.101(b), will incorporate DFARS clause 252.235-7004.
- u. **E-Verify.** Contracts exceeding the simplified acquisition threshold may include the FAR clause 52.222-54 "Employment Eligibility Verification" unless exempted by the conditions listed at FAR 22.1803.

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- v. **ITAR.** In accordance with DFARS 225.7901-4, Export Control Contract Clauses, the clause found at DFARS 252.225-7048, Export-Controlled Items (June 2013), must be included in all BAAs/solicitations and contracts. Therefore, all awards resulting from this BAA will include DFARS 252.225-7048. Full text of the clause may be found at <https://www.govinfo.gov/content/pkg/CFR-2013-title48-vol3/pdf/CFR-2013-title48-vol3-sec252-225-7048.pdf>.
- w. **Cybersecurity.** Any small business concern receiving an SBIR/STTR award is required to provide adequate cybersecurity on all covered contractor information systems. Specific security requirements and cyber incident reporting requirements are listed in DFARS 252.204.7012. To learn about cybersecurity resources for your SBIR/STTR contract visit the Blue Cyber webpage: <https://www.safcn.af.mil/CISO/Small-Business-Cybersecurity-Information/>.
- x. **Safeguarding Covered Defense Information Controls.** As prescribed in DFARS 252.204-7008, for covered contractor information systems that are not part of an information technology service or system operated on behalf of the Government, the SBC represents that it will implement the security requirements specified by National Institute of Standards and Technology (NIST) Special Publication (SP) 800-171, “Protecting Controlled Unclassified Information in Nonfederal Information Systems and Organizations”.
- y. **Limitations on the Use or Disclosure of Third- Party Contractor Reported Cyber Incident Information.** As required in DFARS 252.204-7009, the Contractor must agree that certain conditions apply to any information it receives or creates in the performance of a resulting contract that is information obtained from a third-party's reporting of a cyber incident pursuant to DFARS clause 252.204-7012, Safeguarding Covered Defense Information and Cyber Incident Reporting (or derived from such information obtained under that clause).
- z. **Notice of NIST SP 800-171 DoD Assessment Requirements.** As prescribed by DFARS 252.204-7019, in order to be considered for award, the SBC is required to implement NIST SP 800-171. The SBC shall have a current assessment (see 252.204-7020) for each covered contractor information system that is relevant to the offer, contract, task order, or delivery order. The Basic, Medium, and High NIST SP 800-171 DoD Assessments are described in the NIST SP 800-171 DoD Assessment Methodology located at https://www.acq.osd.mil/dpap/pdi/cyber/strategically_assessing_contractor_implementation_of_NIST_SP_800-171.html. In accordance with DFARS 252.204-7020, the SBC shall provide access to its facilities, systems, and personnel necessary for the Government to conduct a Medium or High NIST SP 800-171 DoD Assessment, as described in NIST SP 800-171 DoD Assessment Methodology, linked above. Notification of specific requirements for NIST SP 800-171 DoD assessments and assessment level will be provided as part of the component instructions, topic, or award.
- aa. **Contractor Certification Regarding Provision of Prohibition on Contracting for Certain Telecommunications and Video Surveillance Services or Equipment.** In accordance with DFARS Subpart 204.21, DFARS provisions 252.204-7016, 252.204-7017, and clause 252.204-7018 are incorporated into this solicitation. This subpart implements section 1656 of the National Defense Authorization Act for Fiscal Year 2018 (Pub. L. 115-91) and section 889(a)(1)(A) of the National Defense Authorization Act for Fiscal Year 2019 (Pub. L. 115-232). Full text of the provisions and clause and required offeror representations can be found in Attachment 1 of this BAA.

8.2 Agency Recovery Authority and Ongoing Reporting

In accordance with Section 5 of the SBIR and STTR Extension Act of 2022, the DoD will –

- 1) require a small business concern receiving an award under its SBIR program to repay all amounts received from the Federal agency under the award if—

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- (A) the small business concern makes a material misstatement that the Federal agency determines poses a risk to national security; or
 - (B) there is a change in ownership, change to entity structure, or other substantial change in circumstances of the small business concern that the Federal agency determines poses a risk to national security; and
- 2) require a small business concern receiving an award under its SBIR program to regularly report to the Federal agency and the Administration throughout the duration of the award on—
- (A) any change to a disclosure required under subparagraphs (A) through (G) of section 4.3 above;
 - (B) any material misstatement made under section 8.2 paragraph (A) above; and
 - (C) any change described in section 8.2 paragraph (B) above.

8.3 Basic Safeguarding of Covered Contractor Information Systems

FAR 52.204-21, Basic Safeguarding of Covered Contractor Information Systems, is incorporated into this solicitation. In accordance with FAR 52.204-21, the contractor shall apply basic safeguarding requirements and procedures when the contractor or a subcontractor at any tier may have Federal contract information residing in or transiting through its information system.

FAR 52.204-21 Basic Safeguarding of Covered Contractor Information Systems (NOV 2021)

(a) **Definitions.** As used in this clause -

- (1) *Covered contractor information system* means an information system that is owned or operated by a contractor that processes, stores, or transmits Federal contract information.
- (2) *Federal contract information* means information, not intended for public release, that is provided by or generated for the Government under a contract to develop or deliver a product or service to the Government, but not including information provided by the Government to the public (such as on public websites) or simple transactional information, such as necessary to process payments.
- (3) *Information* means any communication or representation of knowledge such as facts, data, or opinions, in any medium or form, including textual, numerical, graphic, cartographic, narrative, or audiovisual (Committee on National Security Systems Instruction (CNSSI) 4009).
- (4) *Information system* means a discrete set of information resources organized for the collection, processing, maintenance, use, sharing, dissemination, or disposition of information (44 U.S.C. 3502).
- (5) *Safeguarding* means measures or controls that are prescribed to protect information systems.

(b) Safeguarding requirements and procedures.

(1) The Contractor shall apply the following basic safeguarding requirements and procedures to protect covered contractor information systems. Requirements and procedures for basic safeguarding of covered contractor information systems shall include, at a minimum, the following security controls:

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- (i) Limit information system access to authorized users, processes acting on behalf of authorized users, or devices (including other information systems).
- (ii) Limit information system access to the types of transactions and functions that authorized users are permitted to execute.
- (iii) Verify and control/limit connections to and use of external information systems.
- (iv) Control information posted or processed on publicly accessible information systems.
- (v) Identify information system users, processes acting on behalf of users, or devices.
- (vi) Authenticate (or verify) the identities of those users, processes, or devices, as a prerequisite to allowing access to organizational information systems.
- (vii) Sanitize or destroy information system media containing Federal Contract Information before disposal or release for reuse.
- (viii) Limit physical access to organizational information systems, equipment, and the respective operating environments to authorized individuals.
- (ix) Escort visitors and monitor visitor activity; maintain audit logs of physical access; and control and manage physical access devices.
- (x) Monitor, control, and protect organizational communications (i.e., information transmitted or received by organizational information systems) at the external boundaries and key internal boundaries of the information systems.
- (xi) Implement subnetworks for publicly accessible system components that are physically or logically separated from internal networks.
- (xii) Identify, report, and correct information and information system flaws in a timely manner.
- (xiii) Provide protection from malicious code at appropriate locations within organizational information systems.
- (xiv) Update malicious code protection mechanisms when new releases are available.
- (xv) Perform periodic scans of the information system and real-time scans of files from external sources as files are downloaded, opened, or executed.

(2) Other requirements. This clause does not relieve the Contractor of any other specific safeguarding requirements specified by Federal agencies and departments relating to covered contractor information systems generally or other Federal safeguarding requirements for controlled unclassified information (CUI) as established by Executive Order 13556.

(c) Subcontracts. The Contractor shall include the substance of this clause, including this paragraph (c), in subcontracts under this contract (including subcontracts for the acquisition of

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commercial products or commercial services, other than commercially available off-the-shelf items), in which the subcontractor may have Federal contract information residing in or transiting through its information system.

(End of clause)

8.4 Prohibition on Contracting with Persons that have Business Operations with the Maduro Regime

DFARS 252.225-7055, Representation Regarding Business Operations with the Maduro Regime, is incorporated into this solicitation. In accordance with section 890 of the National Defense Authorization Act for Fiscal Year 2020 (Pub. L. 116-92), DoD is prohibited from entering into a contract for the procurement of products or services with any person that has business operations with an authority of the government of Venezuela that is not recognized as the legitimate government of Venezuela by the United States Government, unless the person has a valid license to operate in Venezuela issued by the Office of Foreign Assets Control of the Department of the Treasury.

8.5 Copyrights

With prior written permission of the Contracting Officer, the awardee may copyright (consistent with appropriate national security considerations, if any) material developed with DoD support. DoD receives a royalty-free license for the Federal Government and requires that each publication contain an appropriate acknowledgment and disclaimer statement.

8.6 Patents

Proposing small business concerns normally may retain the principal worldwide patent rights to any invention developed with Government support. The Government receives a royalty-free license for its use, reserves the right to require the patent holder to license others in certain limited circumstances, and requires that anyone exclusively licensed to sell the invention in the United States must normally manufacture it domestically. To the extent authorized by 35 U.S.C. § 205, the Government will not make public any information disclosing a Government-supported invention for a period of five years to allow the awardee to pursue a patent. See also Invention Reporting in Section 8.7.

8.7 Technical Data Rights

Rights in technical data, including software, developed under the terms of any contract resulting from proposals submitted in response to this BAA generally remain with the contractor, except that the Government obtains a royalty-free license to use such technical data only for Government purposes during the period commencing with contract award and ending twenty years after completion of the project under which the data were generated. This data should be marked with the restrictive legend specified in DFARS 252.227-7018 Class Deviation 2020-O0007. Upon expiration of the twenty-year restrictive license, the Government has Government Purpose Rights in the SBIR data. During the license period, the Government may not release or disclose SBIR data to any person other than its support services contractors except: (1) For evaluation purposes; (2) As expressly permitted by the contractor; or (3) A use, release, or disclosure that is necessary for emergency repair or overhaul of items operated by the Government. See [DFARS clause 252.227-7018 Class Deviation 2020-O0007](#) "Rights in Noncommercial Technical Data and Computer Software – Small Business Innovation Research (SBIR) Program."

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If a proposing small business concern plans to submit assertions in accordance with DFARS 252.227-7017 Class Deviation 2020-O0007, those assertions must be identified and assertion of use, release, or disclosure restriction MUST be included with your proposal submission, at the end of the technical volume. The contract cannot be awarded until assertions have been approved.

8.8 Invention Reporting

SBIR awardees must report inventions to the Component within two months of the inventor's report to the awardee. The reporting of inventions may be accomplished by submitting paper documentation, including fax, or through the Edison Invention Reporting System at www.iedison.gov for those agencies participating in iEdison.

8.9 Final Technical Reports - Phase I through Phase III

- a. **Content:** A final report is required for each project phase. The reports must contain in detail the project objectives, work performed, results obtained, and estimates of technical feasibility. A completed SF 298, "Report Documentation Page," will be used as the first page of the report. Submission resources are available at <https://discover.dtic.mil/submit-documents/>. In addition, monthly status and progress reports may be required by the DoD Component.
- b. **SF 298 Form "Report Documentation Page" Preparation:**
 - (1) If desirable, language used by the company in its Phase II proposal to report Phase I progress may also be used in the final report.
 - (2) For each unclassified report, the company submitting the report should fill in Block 12 (Distribution/Availability Statement) of the SF 298, "Report Documentation Page," with the following statement: "Distribution authorized to U.S. Government only; Proprietary Information, (Date of Determination). Other requests for this document shall be referred to the Component SBIR Program Office."

Note: Data developed under a SBIR contract is subject to SBIR Data Rights which allow for protection under DFARS 252.227-7018 Class Deviation 2020-O0007 (see Section 8.5, Technical Data Rights). The sponsoring DoD activity, after reviewing the company's entry in Block 12, has final responsibility for assigning a distribution statement.

For additional information on distribution statements see the following Defense Technical Information Center (DTIC) Web site: https://discover.dtic.mil/wp-content/uploads/2018/09/distribution_statements_and_reasonsSept2018.pdf

 - (3) Block 14 (Abstract) of the SF 298, "Report Documentation Page" must include as the first sentence, "Report developed under SBIR contract for topic [insert BAA topic number. [Follow with the topic title, if possible.]]" The abstract must identify the purpose of the work and briefly describe the work conducted, the findings or results and the potential applications of the effort. **Since the abstract will be published by the DoD, it must not contain any proprietary or classified data and type "UU" in Block 17.**
 - (4) Block 15 (Subject Terms) of the SF 298 must include the term "SBIR Report".
- c. **Submission:** In accordance with DoD Directive 3200.12 and DFARS clause 252.235-7011, a copy of the final report shall be submitted (electronically or on disc) to:

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Defense Technical Information Center
ATTN: DTIC-OA (SBIR)
8725 John J Kingman Road, Suite 0944
Ft. Belvoir, VA 22060-6218

Delivery will normally be within 30 days after completion of the Phase I technical effort.

Other requirements regarding submission of reports and/or other deliverables will be defined in the Contract Data Requirements List (CDRL) of each contract. Special instructions for the submission of CLASSIFIED reports will be defined in the delivery schedule of the contract.

DO NOT E-MAIL Classified or controlled unclassified reports, or reports containing SBIR Data Rights protected under DFARS 252.227-7018 Class Deviation 2020-O0007.

AMENDMENT 2**APPENDIX A****DoD SBIR 23.4 Annual BAA
Topic Release Index**

Active topic releases and associated Component-specific instructions can be viewed at:
<https://www.defensesbirsttr.mil/SBIR-STTR/Opportunities/>.

Please note, Component release numbers may not appear consecutively due to variations in topic development timelines.

| Component Release Number | Topic Number | Topic Title | Release Dates |
|----------------------------------|---------------------|---|---|
| <u>Army R7</u> | A234-010 | xTechSBIR Pacific Finalist Open Topic Competition | Pre-release: March 9, 2023 Open: September 20, 2023 Close: October 11, 2023, 12:00 pm ET |
| <u>Army R10</u> | A234-P015 | xTechPrime | Pre-release: April 25, 2023 Open: January 2, 2024 Close: January 16, 2024, 12:00 pm ET |
| <u>Army R12</u> | A234-P017 | xTechSBIR Autonomy Finalist Open Topic Competition | Pre-release: May 25, 2023 Open: October 10, 2023 Close: October 17, 2023, 12:00 pm ET |
| <u>DARPA R11</u> | HR0011SB20234-17 | Artificial Intelligence Cyber Challenge (AIxCC) | Pre-Release: August 2, 2023 Open: August 17, 2023 Close: October 3, 2023, 12:00 pm ET |
| <u>OSD R2</u> | OSD234-P002 | Strategic Capabilities Office SBIR Open Topic Call | Pre-Release: August 15, 2023 Open: September 6, 2023 Close: October 17, 2023, 12:00 pm ET |
| <u>SOCOM R4</u> | SOCOM234-004 | Out-of-Band GNSS Tracker | Pre-Release: August 22, 2023 Open: September 6, 2023 Close: October 5, 2023, 12:00 pm ET |
| | SOCOM234-005 | Slim Form Cargo Loader/Unloader | |
| <u>DTRA R1</u> | DTRA234-001 | Portable Automated Solution for the Library Preparation for Sequencing | Pre-Release: August 23, 2023 Open: September 20, 2023 Close: October 18, 2023, 12:00 pm ET |
| | DTRA234-002 | Capability to Determine the Effect of Dust and Debris on the Chemistry Environment post CWMD Weapons Strike | |
| | DTRA234-003 | Deep Learning and Extraction of Chemical Synthesis or Biosynthetic Pathways from Scientific Literature | |
| | DTRA234-004 | Remote Through-Container Identification of CBRNE materials | |
| | DTRA234-005 | Signature Detection and Training via Application of Digital Product-Insertion Technologies | |
| | DTRA234-006 | Acoustic Agglomeration to aid fine aerosol particulate collection | |
| | DTRA234-P01 | OPEN TOPIC: Replacing User Name/Password Defaults - Alternative User Authentication Methods | |
| <u>Army R19</u> | A234-P027 | Energy Demand Reduction and Clean Energy Tech Open Topic | Pre-Release: September 14, 2023 Open: September 28, 2023 |

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|---------------------------------|-------------|---|--|
| <u>OSD R3</u> | OSD234-P003 | Rapid development of effective behaviorally aligned training simulations for human relations practitioners (Open Topic) | Close: October 31, 2023, 12:00 pm ET Pre-Release: September 20, 2023 Open: October 4, 2023 Close: November 7, 2023, 12:00 pm ET |
| <u>DMEA R1</u> | DMEA234-D01 | High Performance Clock Oscillator | Pre-Release: September 27, 2023 Open: October 12, 2023 Close: November 14, 2023, 12:00 pm ET |
| <u>Army R20</u> | A234-028 | Remote Breaching of Obstacles | Pre-Release: September 28, 2023 Open: October 24, 2023 Close: November 14, 2023, 12:00 pm ET |
| <u>CBD R1</u> | CBD234-P001 | Decontamination of Open Wounds – Open Topic | Pre-Release: September 28, 2023 Open: October 12, 2023 Close: November 14, 2023, 12:00 pm ET |

| Archived Topic Releases | | | |
|---------------------------------|---------------------|---|---|
| Component Release Number | Topic Number | Topic Title | Release Dates |
| <u>Army R1</u> | A234-001 | AI/ML for Nitramine Recrystallization and Coating | Pre-release: November 17, 2022 Open: November 30, 2022 Close: January 4, 2023, 12:00 pm ET |
| | A234-002 | Non-HFC Extinguishing | |
| | A234-003 | Non-Refrigerant Based Cooling System for Cabin Cooling | |
| <u>Army R2</u> | A234-004 | Diver Performance Monitoring System | Pre-release: December 6, 2022 Open: January 10, 2023 Close: January 31, 2023, 12:00 pm ET |
| <u>Army R4</u> | A234-006 | Wearable Radiation Sensors | Pre-release: December 15, 2022 Open: January 10, 2023 Close: January 31, 2023, 12:00 pm ET |
| | A234-007 | Artificial Intelligence (AI)/ Machine Learning (ML) Open Topic | |
| <u>Army R3</u> | A234-005 | Holistic Health and Fitness Readiness Kit | Pre-release: December 7, 2022 Open: January 17, 2023 Close: February 14, 2023, 12:00 pm ET |
| <u>DARPA R1</u> | HR0011SB20234-01 | Vibe: Innovation in Commodity Coherence | Pre-release: January 18, 2023 Open: February 2, 2023 Close: March 7, 2023, 12:00 pm ET |
| | HR0011SB20234-02 | Synthetic User Personas (SUP) | |
| | HR0011SB20234-03 | Space Metamaterial Electronically Scanned Array (Space-MESA) | |
| <u>SOCOM R1</u> | SOCOM234-001 | Analyzing Narrative Evolution Across Social Networks | Pre-release: February 7, 2023 Open: February 21, 2023 Close: March 23, 2023, 12:00 pm ET |
| <u>DARPA R2</u> | HR0011SB20234-04 | Super-resolution Thermal Metrology for High Power Density Devices | Pre-release: February 16, 2023 Open: March 07, 2023 Close: April 06, 2023, 12:00 pm ET |
| | HR0011SB20234-05 | Wearables at the Edge to Augment Readiness (WEAR) | |

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|---------------------------------|--------------------|---|---|
| | HR0011SB20234-06 | Exploiting Sparsity in Python (ESPy) | |
| <u>Army R5</u> | A234-008 | Army Tech Marketplace | Pre-release: February 21, 2023 Open: March 16, 2023 Close: April 11, 2023, 12:00 pm ET |
| <u>Army R6</u> | A234-009 | Casualty Care Training- Mixed Reality Manikin Solution for Female Soldier Survivability | Pre-release: March 8, 2023 Open: April 5, 2023 Close: May 4, 2023, 12:00 pm ET |
| <u>DHA R1</u> | DHA234-D001 | Anti-Shock Drug, Pre-Hospital (ASD-PH) | Pre-release: March 9, 2023 Open: March 23, 2023 Close: April 25, 2023, 12:00 pm ET |
| <u>DARPA R3</u> | HR0011SB20234XL-01 | Safe Food for Everyone (SaFE) - SBIR XL | Pre-release: March 14, 2023 Open: March 29, 2023 Close: May 2, 2023, 12:00 pm ET |
| <u>Army R8</u> | A234-011 | Conformable Energy Storage | Pre-release: March 14, 2023 Open: March 30, 2023 Close: May 2, 2023, 12:00 pm ET |
| | A234-012 | Hydrogen Generator | |
| <u>SOCOM R2</u> | SOCOM234-P002 | Open Topic for Family of Special Operations Vehicles | Pre-release: April 4, 2023 Open: April 19, 2023 Close: May 18, 2023, 12:00 pm ET |
| <u>DARPA R4</u> | HR0011SB20234-07 | Deuce Coupe | Pre-release: April 11, 2023 Open: April 26, 2023 Close: May 31, 2023, 12:00 pm ET |
| <u>Army R9</u> | A234-013 | Dual Band Imager | Pre-release: April 25, 2023 Open: May 18, 2023 Close: June 13, 2023, 12:00 pm ET |
| | A234-P014 | Sustainable Building Materials and Technologies Open Topic | |
| <u>DARPA R5</u> | HR0011SB20234-08 | 2D Polyglots | Pre-release: April 27, 2023 Open: May 18, 2023 Close: June 15, 2023, 12:00 pm ET |
| | HR0011SB20234-09 | Passive Analytics for Remote Quantification of External Resources (PARQER) | |
| | HR0011SB20234-10 | Assessing Virtual Private Network (VPN) Networkiness (AVN) | |
| | HR0011SB20234-11 | Electronic Control Unit Authentication in Autonomous Vehicles (ECU2A) | |
| | HR0011SB20234-12 | Network Black Box (NBB) | |
| | HR0011SB20234-13 | 5G Test Environment (5GTE) | |
| <u>DARPA R6</u> | HR0011SB20234XL-02 | Empirical Proving Ground for Cryptographic Engineering Challenges in Large-scale Deployments (EPiC EagLe) - SBIR XL | Pre-release: April 27, 2023 Open: May 18, 2023 Close: June 15, 2023, 12:00 pm ET |
| <u>Army R11</u> | A234-016 | Lethal Payloads for Small Unmanned Aerial Systems | Pre-release: May 11, 2023 Open: June 1, 2023 Close: June 27, 2023, 12:00 pm ET |
| <u>DARPA R7</u> | HR0011SB20234XL-03 | Bright ELection and Light Sources (BELLS) - SBIR XL | Pre-release: May 23, 2023 Open: June 7, 2023 Close: July 11, 2023, 12:00 pm ET |
| <u>Army R13</u> | A234-018 | Digital Erasure of Sensitive FPDA Systems | Pre-release: May 30, 2023 Open: June 14, 2023 Close: July 18, 2023, 12:00 pm ET |
| <u>Army R16</u> | A234-022 | Heavy Lift Vertical Take-off and Landing; Heavy VTOL | Pre-release: June 13, 2023 Open: July 6, 2023 Close: August 1, 2023, 12:00 pm ET |
| <u>Army R14</u> | A234-P019 | xTech Search 7 SBIR Finalist Open Topic Competition | Open: June 22, 2023 Close: July 25, 2023, 12:00 pm ET |
| <u>Army R15</u> | A234-020 | DEEP-BIM: Dynamic Enhanced Environment Perception - Building Information Models | Pre-release: June 21, 2023 Open: July 6, 2023 |

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| | A234-021 | Machine Translation for Indo-Pacific Low Resource Languages | Close: August 8, 2023, 12:00 pm ET |
| <u>DARPA R8</u> | HR0011SB20234-P01 | Autonomous Systems at Scale - Open Topic | Pre-Release: June 27, 2023 Open: July 12, 2023 Close: August 10, 2023, 12:00 pm ET |
| <u>Navy R1</u> | N234-P01 | MCSC Open Topic for Logistics in a Contested Environment | Pre-release: June 15, 2023 Open: July 13, 2023 Close: August 15, 2023, 12:00 pm ET |
| | N234-P02 | NAVAIR Open Topic for Logistics in a Contested Environment | |
| | N234-P03 | NAVSEA Open Topic for Operations and Logistics in a Contested Environment: Improve/Manage Energy Efficiency for the DON's Non-nuclear Deployable Power Generators | |
| | N234-P04 | NAVSEA Open Topic for Operations and Logistics in a Contested Environment: Improve Launch and Recovery of Air, Sea Surface, and UUV from Naval Vessels | |
| | N234-P05 | NAVSEA Open Topic for Operations and Logistics in a Contested Environment: Enhance Mission Capabilities of USV/UUV and Systems | |
| | N234-P06 | NAVSEA Open Topic for Operations and Logistics in a Contested Environment: Expand Lethality of Technologies of Maritime Mining and Mine Countermeasures | |
| | N234-P07 | NAVWAR Open Topic for Holistic Common Operational Picture (COP): PMW 170 | |
| | N234-P08 | NAVWAR Open Topic for Holistic Common Operational Picture (COP): PMW 150 | |
| <u>DARPA R9</u> | HR0011SB20234-14 | Canopies for High-speed Ultra-Long Terrain Execution (CHUTE) | Pre-Release: June 29, 2023 Open: July 18, 2023 Close: August 22, 2023, 12:00 pm ET |
| | HR0011SB20234XL-04 | Fast, Light, Airworthy, Repackable Parachute (FLARE) - SBIR XL | |
| <u>SOCOM R3</u> | SOCOM234-003 | Visual Augmentation Systems (VAS) Range Finder | Pre-Release: July 6, 2023 Open: July 20, 2023 Close: August 22, 2023, 12:00 pm ET |
| <u>DHA R2</u> | DHA234-P001 | Open Topic for Temporary Stabilization of Corneal and Corneoscleral Injuries | Open: May 30, 2023 Whitepapers Due: July 18, 2023 Full Proposal Due: August 23, 2023 |
| <u>DARPA R10</u> | HR0011SB20234-15 | Additive Components Enhanced for Extreme Environments (ACE3) | Pre-Release: July 6, 2023 Open: July 25, 2023 Close: August 24, 2023, 12:00 pm ET |
| | HR0011SB20234-16 | Prospero: Modernizing Secure Facility Design, Construction, and Accreditation | |
| <u>OSD-FutureG R1</u> | OSD234-P001 | 5G Radio Frequency (RF) Coverage in Challenging Interior Spaces Open Topic | Pre-Release: July 11, 2023 Open: July 25, 2023 Close: August 29, 2023, 12:00 pm ET |
| <u>Army R17</u> | A234-023 | Knowledge-Level Distributed Active Data Platforms for Ops-Log Synchronization | Pre-Release: July 18, 2023 Open: July 27, 2023 Close: September 5, 2023, 12:00 pm ET |

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| <u>DARPA</u> <u>R12</u> | HR0011SB20234XL-05 | Project CAPTURE: Capturing Aerial Payloads To Unleash Reliable Exploitation – SBIR XL | Pre-Release: August 3, 2023 Open: August 22, 2023 Close: September 21, 2023, 12:00 pm ET |
| <u>Army R18</u> | A234-024 | Low Cost SWIR Laser Sensor | Pre-Release: August 8, 2023 |
| | A234-025 | Medium-Format Displays for Mixed Reality (MR) Systems | Open: August 24, 2023 |
| | A234-026 | Porting RTK to High Assurance Kernel | Close: September 26, 2023, 12:00 pm ET |

AMENDMENT 2

ATTACHMENT 1

**Department of Defense (DoD)
Small Business Innovation Research (SBIR) Program
Small Business Technology Transfer (STTR) Program**

**CONTRACTOR CERTIFICATION REGARDING
PROVISION OF PROHIBITION ON CONTRACTING FOR CERTAIN
TELECOMMUNICATIONS AND VIDEO SURVEILLANCE SERVICES OR
EQUIPMENT (DFARS SUBPART 204.21)**

| | |
|-------------------|--|
| Contractor's Name | |
| Company Name | |
| Office Tel # | |
| Mobile # | |
| Email | |

Name of person authorized to sign: _____

Signature of person authorized: _____

Date: _____

The penalty for making false statements is prescribed in the U.S. Criminal Code, 18 U.S.C. 1001.

DFARS PROVISIONS INCORPORATED IN FULL TEXT:

**252.204-7016 Covered Defense Telecommunications Equipment or Services—
Representation**

**COVERED DEFENSE TELECOMMUNICATIONS EQUIPMENT OR SERVICES—
REPRESENTATION (DEC 2019)**

(a) *Definitions.* As used in this provision, “covered defense telecommunications equipment or services” has the meaning provided in the clause [252.204-7018](#) , Prohibition on the Acquisition of Covered Defense Telecommunications Equipment or Services.

AMENDMENT 2

(b) *Procedures.* The Offeror shall review the list of excluded parties in the System for Award Management (SAM) (<https://www.sam.gov/>) for entities excluded from receiving federal awards for “covered defense telecommunications equipment or services”.

(c) *Representation.* The Offeror represents that it does, does not provide covered defense telecommunications equipment or services as a part of its offered products or services to the Government in the performance of any contract, subcontract, or other contractual instrument.

252.204-7017 Prohibition on the Acquisition of Covered Defense Telecommunications Equipment or Services—Representation

PROHIBITION ON THE ACQUISITION OF COVERED DEFENSE TELECOMMUNICATIONS EQUIPMENT OR SERVICES—REPRESENTATION (MAY 2021)

The Offeror is not required to complete the representation in this provision if the Offeror has represented in the provision at 252.204-7016 , Covered Defense Telecommunications Equipment or Services—Representation, that it “does not provide covered defense telecommunications equipment or services as a part of its offered products or services to the Government in the performance of any contract, subcontract, or other contractual instrument.”

(a) *Definitions.* “Covered defense telecommunications equipment or services,” “covered mission,” “critical technology,” and “substantial or essential component,” as used in this provision, have the meanings given in the [252.204-7018](#) clause, Prohibition on the Acquisition of Covered Defense Telecommunications Equipment or Services, of this solicitation.

(b) *Prohibition.* Section 1656 of the National Defense Authorization Act for Fiscal Year 2018 (Pub. L. 115-91) prohibits agencies from procuring or obtaining, or extending or renewing a contract to procure or obtain, any equipment, system, or service to carry out covered missions that uses covered defense telecommunications equipment or services as a substantial or essential component of any system, or as critical technology as part of any system.

(c) *Procedures.* The Offeror shall review the list of excluded parties in the System for Award Management (SAM) at <https://www.sam.gov> for entities that are excluded when providing any equipment, system, or service to carry out covered missions that uses covered defense telecommunications equipment or services as a substantial or essential component of any system, or as critical technology as part of any system, unless a waiver is granted.

Representation. If in its annual representations and certifications in SAM the Offeror has represented in paragraph (c) of the provision at [252.204-7016](#) , Covered Defense Telecommunications Equipment or Services—Representation, that it “does” provide covered defense telecommunications equipment or services as a part of its offered products or services to the Government in the performance of any contract, subcontract, or other contractual instrument, then the Offeror shall complete the following additional representation:

AMENDMENT 2

The Offeror represents that it will will not provide covered defense telecommunications equipment or services as a part of its offered products or services to DoD in the performance of any award resulting from this solicitation.

(e) *Disclosures*. If the Offeror has represented in paragraph (d) of this provision that it “will provide covered defense telecommunications equipment or services,” the Offeror shall provide the following information as part of the offer:

(1) A description of all covered defense telecommunications equipment and services offered (include brand or manufacturer; product, such as model number, original equipment manufacturer (OEM) number, manufacturer part number, or wholesaler number; and item description, as applicable).

(2) An explanation of the proposed use of covered defense telecommunications equipment and services and any factors relevant to determining if such use would be permissible under the prohibition referenced in paragraph (b) of this provision.

(3) For services, the entity providing the covered defense telecommunications services (include entity name, unique entity identifier, and Commercial and Government Entity (CAGE) code, if known).

(4) For equipment, the entity that produced or provided the covered defense telecommunications equipment (include entity name, unique entity identifier, CAGE code, and whether the entity was the OEM or a distributor, if known).

(End of provision)

252.204-7018 Prohibition on the Acquisition of Covered Defense Telecommunications Equipment or Services

PROHIBITION ON THE ACQUISITION OF COVERED DEFENSE TELECOMMUNICATIONS EQUIPMENT OR SERVICES (JAN 2021)

Definitions. As used in this clause—

“Covered defense telecommunications equipment or services” means—

(1) Telecommunications equipment produced by Huawei Technologies Company or ZTE Corporation, or any subsidiary or affiliate of such entities;

(2) Telecommunications services provided by such entities or using such equipment; or

(3) Telecommunications equipment or services produced or provided by an entity that the Secretary of Defense reasonably believes to be an entity owned or controlled by, or otherwise connected to, the government of a covered foreign country.

AMENDMENT 2

“Covered foreign country” means—

- (1) The People’s Republic of China; or
- (2) The Russian Federation.

“Covered missions” means—

- (1) The nuclear deterrence mission of DoD, including with respect to nuclear command, control, and communications, integrated tactical warning and attack assessment, and continuity of Government; or
- (2) The homeland defense mission of DoD, including with respect to ballistic missile defense.

“Critical technology” means—

- (1) Defense articles or defense services included on the United States Munitions List set forth in the International Traffic in Arms Regulations under subchapter M of chapter I of title 22, Code of Federal Regulations;
- (2) Items included on the Commerce Control List set forth in Supplement No. 1 to part 774 of the Export Administration Regulations under subchapter C of chapter VII of title 15, Code of Federal Regulations, and controlled—
 - (i) Pursuant to multilateral regimes, including for reasons relating to national security, chemical and biological weapons proliferation, nuclear nonproliferation, or missile technology; or
 - (ii) For reasons relating to regional stability or surreptitious listening;
- (3) Specially designed and prepared nuclear equipment, parts and components, materials, software, and technology covered by part 810 of title 10, Code of Federal Regulations (relating to assistance to foreign atomic energy activities);
- (4) Nuclear facilities, equipment, and material covered by part 110 of title 10, Code of Federal Regulations (relating to export and import of nuclear equipment and material);
- (5) Select agents and toxins covered by part 331 of title 7, Code of Federal Regulations, part 121 of title 9 of such Code, or part 73 of title 42 of such Code; or
- (6) Emerging and foundational technologies controlled pursuant to section 1758 of the Export Control Reform Act of 2018 (50 U.S.C. 4817).

“Substantial or essential component” means any component necessary for the proper function or performance of a piece of equipment, system, or service.

AMENDMENT 2

(b) *Prohibition.* In accordance with section 1656 of the National Defense Authorization Act for Fiscal Year 2018 (Pub. L. 115-91), the contractor shall not provide to the Government any equipment, system, or service to carry out covered missions that uses covered defense telecommunications equipment or services as a substantial or essential component of any system, or as critical technology as part of any system, unless the covered defense telecommunication equipment or services are covered by a waiver described in Defense Federal Acquisition Regulation Supplement [204.2104](#).

(c) *Procedures.* The Contractor shall review the list of excluded parties in the System for Award Management (SAM) at <https://www.sam.gov> for entities that are excluded when providing any equipment, system, or service, to carry out covered missions, that uses covered defense telecommunications equipment or services as a substantial or essential component of any system, or as critical technology as part of any system, unless a waiver is granted.

(d) *Reporting.*

(1) In the event the Contractor identifies covered defense telecommunications equipment or services used as a substantial or essential component of any system, or as critical technology as part of any system, during contract performance, the Contractor shall report at <https://dibnet.dod.mil> the information in paragraph (d)(2) of this clause.

(2) The Contractor shall report the following information pursuant to paragraph (d)(1) of this clause:

(i) Within 3 business days from the date of such identification or notification: the contract number; the order number(s), if applicable; supplier name; brand; model number (original equipment manufacturer number, manufacturer part number, or wholesaler number); item description; and any readily available information about mitigation actions undertaken or recommended.

(ii) Within 30 business days of submitting the information in paragraph (d)(2)(i) of this clause: any further available information about mitigation actions undertaken or recommended. In addition, the Contractor shall describe the efforts it undertook to prevent use or submission of a covered defense telecommunications equipment or services, and any additional efforts that will be incorporated to prevent future use or submission of covered telecommunications equipment or services.

(e) *Subcontracts.* The Contractor shall insert the substance of this clause, including this paragraph (e), in all subcontracts and other contractual instruments, including subcontracts for the acquisition of commercial items.

(End of clause)

AMENDMENT 2**ATTACHMENT 2**

**Department of Defense (DoD)
Small Business Innovation Research (SBIR) Program
Small Business Technology Transfer (STTR) Program**

**DISCLOSURES OF FOREIGN AFFILIATIONS OR
RELATIONSHIPS TO FOREIGN COUNTRIES**

In accordance with the SBIR and STTR Extension Act of 2022 (Pub. L. 117-183) and the Small Business Administration (SBA) SBIR/STTR Policy Directive, small business concerns are required to disclose the information requested below about the small business's investment and foreign ties.

Responses to disclosure questions may contain trade secrets or commercial or financial information that is privileged or confidential and is exempt from public disclosure. Such information shall be used or disclosed only for evaluation purposes or in accordance with an award between the submitter and the Government.

Relevant definitions can be found at the end of this document. An up-to-date list of countries determined to be countries of concern by the Secretary of State will be maintained and accessible on SBIR.gov.

| | |
|---|--|
| Small Business Concern (SBC) | |
| SBC Unique Entity ID (UEI) | |
| Proposal # (assigned by DSIP when proposal is created) | |
| SBC Point of Contact (POC) Name | |
| SBC POC Phone # | |
| SBC POC Email | |

The information provided in response to the Disclosure Questions listed below is certified to be accurate and complete.

Name of person authorized to sign: _____

Signature of person authorized: _____

Date: _____

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Disclosure Questions

1. Is any owner or covered individual of the applicant or awardee party to any malign foreign talent recruitment program?

- Yes No

If yes, disclose the first and last name of each owner or covered individual, identify their role (i.e., owner or covered individual), and the malign foreign talent recruitment program.

2. Is there a parent company, joint venture, or subsidiary, of the applicant or awardee that is based in or receives funding from, any foreign country of concern?

- Yes No

If yes, disclose the name, full address, applicant or awardee relationships (i.e., parent company, joint venture, or subsidiary) of each entity based in, or funded by, any foreign country of concern.

3. Does the applicant or awardee have any current or pending contractual or financial obligation or other agreement specific to a business arrangement, or joint venture-like arrangement with an enterprise owned by a foreign state or any foreign entity?

- Yes No

If yes, disclose the name of each enterprise or foreign entity, type of obligation, agreement, or arrangement (*i.e.*, contractual, financial, or other), description of obligation, agreement, or arrangement, and the foreign state(s) and/or the country of the foreign entity (or entities).

4. Is the applicant or awardee wholly owned in a foreign country?

- Yes No

If yes, disclose the foreign country.

5. Does the applicant or awardee have any venture capital or institutional investment?

- Yes No

If yes, proceed to question 5a. If no, proceed to question 6.

5a. Does the investing entity have a general partner or any other individual holding a leadership role who has a foreign affiliation with any foreign country of concern?

- Yes No Unable to determine

AMENDMENT 2

If yes or unable to determine, disclose the venture capital or institutional investing entity's name, the percentage of ownership obtained by the investing entity, and the type of investment (i.e., equity, debt, or combination of equity and debt).

6. During the previous 5-year period, did the applicant or awardee have any technology licensing or intellectual property sales or transfers, to a foreign country of concern?

Yes No

If yes, disclose the name, address, and country, of the institution or entity that licensed, purchased, or received the technology or intellectual property.

7. Is there any foreign business entity, offshore entity, or entity outside the United States related to the applicant or awardee?

Yes No

If yes, disclose the entity name, relationship type (i.e., foreign business entity, offshore entity, entity outside the United States), description of the relationship to the applicant or awardee, and entity address and country.

8. Does the applicant or awardee have an owner, officer, or covered individual that has a foreign affiliation with a research institution located in a foreign country of concern?

Yes No

If yes, disclose the first and last name of each owner, officer, or covered individual that has a foreign affiliation with a foreign country of concern, identify their role (i.e., owner, officer, or covered individual), and the name of the foreign research institution and the foreign country of concern where it is located.

Relevant Definitions

Covered individual — An individual who contributes in a substantive, meaningful way to the scientific development or execution of a research and development (R&D) project proposed to be carried out with a Federally funded award from DoD. DoD has further designated covered individuals as including all proposed key personnel.

Federally funded award — A Phase I, Phase II (including Direct to Phase II, sequential Phase II/subsequent Phase II and cross-agency Phase II), or Phase III SBIR or STTR award made using a funding agreement.

Foreign affiliation — As defined in 15 U.S.C. § 638(e)(16), foreign affiliation means a funded or unfunded academic, professional, or institutional appointment or position with a foreign government or government-owned entity, whether full-time, part-time, or voluntary (including adjunct, visiting, or

AMENDMENT 2

honorary). This includes appointments or positions deemed adjunct, visiting, or honorary with research institutions located in a foreign country of concern.

Foreign country of concern — As defined in 15 U.S.C. § 638(e)(17), foreign country of concern means the People’s Republic of China, the Democratic People’s Republic of Korea, the Russian Federation, the Islamic Republic of Iran, or any other country determined to be a country of concern by the Secretary of State.

Malign foreign talent recruitment program — As defined in 42 U.S.C § 19237, the term “malign foreign talent recruitment program” means-

- (C) any program, position, or activity that includes compensation in the form of cash, in-kind compensation, including research funding, promised future compensation, complimentary foreign travel, things of non de minimis value, honorific titles, career advancement opportunities, or other types of remuneration or consideration directly provided by a foreign country at any level (national, provincial, or local) or their designee, or an entity based in, funded by, or affiliated with a foreign country, whether or not directly sponsored by the foreign country, to the targeted individual, whether directly or indirectly stated in the arrangement, contract, or other documentation at issue, in exchange for the individual-
 - (x) engaging in the unauthorized transfer of intellectual property, materials, data products, or other nonpublic information owned by a United States entity or developed with a Federal research and development award to the government of a foreign country or an entity based in, funded by, or affiliated with a foreign country regardless of whether that government or entity provided support for the development of the intellectual property, materials, or data products;
 - (xi) being required to recruit trainees or researchers to enroll in such program, position, or activity;
 - (xii) establishing a laboratory or company, accepting a faculty position, or undertaking any other employment or appointment in a foreign country or with an entity based in, funded by, or affiliated with a foreign country if such activities are in violation of the standard terms and conditions of a Federal research and development award;
 - (xiii) being unable to terminate the foreign talent recruitment program contract or agreement except in extraordinary circumstances;
 - (xiv) through funding or effort related to the foreign talent recruitment program, being limited in the capacity to carry out a research and development award or required to engage in work that would result in substantial overlap or duplication with a Federal research and development award;
 - (xv) being required to apply for and successfully receive funding from the sponsoring foreign government's funding agencies with the sponsoring foreign organization as the recipient;
 - (xvi) being required to omit acknowledgment of the recipient institution with which the individual is affiliated, or the Federal research agency sponsoring the research and development award, contrary to the institutional policies or standard terms and conditions of the Federal research and development award;
 - (xvii) being required to not disclose to the Federal research agency or employing institution the participation of such individual in such program, position, or activity; or
 - (xviii) having a conflict of interest or conflict of commitment contrary to the standard terms and conditions of the Federal research and development award; and
- (D) a program that is sponsored by-
 - (iv) a foreign country of concern or an entity based in a foreign country of concern, whether or not directly sponsored by the foreign country of concern;

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- (v) an academic institution on the list developed under section 1286(c)(8) of the John S. McCain National Defense Authorization Act for Fiscal Year 2019 (10 U.S.C. 2358 note; 1 Public Law 115–232) ; or
- (vi) a foreign talent recruitment program on the list developed under section 1286(c)(9) of the John S. McCain National Defense Authorization Act for Fiscal Year 2019 (10 U.S.C. 2358 note; 1 Public Law 115–232).

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ATTACHMENT 3

**Department of Defense (DoD)
Small Business Innovation Research (SBIR) Program
Small Business Technology Transfer (STTR) Program**

Verification of Eligibility of Small Business Joint Ventures

A small business joint venture offeror must submit, with its offer, the representation required in paragraph (c) of FAR solicitation provision 52.212-3, Offeror Representations and Certifications-Commercial Products and Commercial Services, and paragraph (c) of FAR solicitation provision 52.219-1, Small Business Program Representations, in accordance with 52.204-8(d) and 52.212-3(b) for the following categories:

- (A) Small business;
- (B) Service-disabled veteran-owned small business;
- (C) Women-owned small business (WOSB) under the WOSB Program;
- (D) Economically disadvantaged women-owned small business under the WOSB Program; or
- (E) Historically underutilized business zone small business

| | |
|-----------------------------|--|
| Contractor's Name | |
| Small Business Concern Name | |
| Office Tel # | |
| Mobile # | |
| Email | |

Name of person authorized to sign: _____

Signature of person authorized: _____

Date: _____

FAR Provision Incorporated in Full Text:

52.219-1 Small Business Program Representations (Oct 2022)

(a) *Definitions.* As used in this provision-

Economically disadvantaged women-owned small business (EDWOSB) concern means a small business concern that is at least 51 percent directly and unconditionally owned by, and the management

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and daily business operations of which are controlled by, one or more women who are citizens of the United States and who are economically disadvantaged in accordance with [13 CFR part 127](#), and the concern is certified by SBA or an approved third-party certifier in accordance with [13 CFR 127.300](#). It automatically qualifies as a women-owned small business concern eligible under the WOSB Program.

Service-disabled veteran-owned small business concern-

(1) Means a small business concern-

(i) Not less than 51 percent of which is owned by one or more service-disabled veterans or, in the case of any publicly owned business, not less than 51 percent of the stock of which is owned by one or more service-disabled veterans; and

(ii) The management and daily business operations of which are controlled by one or more service-disabled veterans or, in the case of a service-disabled veteran with permanent and severe disability, the spouse or permanent caregiver of such veteran.

(2) "Service-disabled veteran" means a veteran, as defined in [38 U.S.C.101\(2\)](#), with a disability that is service-connected, as defined in [38 U.S.C.101\(16\)](#).

Small business concern—

(1) Means a concern, including its affiliates, that is independently owned and operated, not dominant in its field of operation, and qualified as a small business under the criteria in [13 CFR part 121](#) and the size standard in paragraph (b) of this provision.

(2) *Affiliates*, as used in this definition, means business concerns, one of whom directly or indirectly controls or has the power to control the others, or a third party or parties control or have the power to control the others. In determining whether affiliation exists, consideration is given to all appropriate factors including common ownership, common management, and contractual relationships. SBA determines affiliation based on the factors set forth at 13 CFR 121.103.

Small disadvantaged business concern, consistent with 13 CFR 124.1002, means a small business concern under the size standard applicable to the acquisition, that-

(1) Is at least 51 percent unconditionally and directly owned (as defined at 13 CFR 124.105) by-

(i) One or more socially disadvantaged (as defined at 13 CFR 124.103) and economically disadvantaged (as defined at 13 CFR 124.104) individuals who are citizens of the United States, and

(ii) Each individual claiming economic disadvantage has a net worth not exceeding \$750,000 after taking into account the applicable exclusions set forth at 13 CFR 124.104(c)(2); and

(2) The management and daily business operations of which are controlled (as defined at 13 CFR 124.106) by individuals who meet the criteria in paragraphs (1)(i) and (ii) of this definition.

Veteran-owned small business concern means a small business concern-

AMENDMENT 2

(1) Not less than 51 percent of which is owned by one or more veterans (as defined at [38 U.S.C.101\(2\)](#)) or, in the case of any publicly owned business, not less than 51 percent 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 small business concern means a small business concern-

(1) That is at least 51 percent owned by one or more women; or, in the case of any publicly owned business, at least 51 percent of the stock of which is owned by one or more women; and

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

Women-owned small business (WOSB) concern eligible under the WOSB Program (in accordance with [13 CFR part 127](#)) means a small business concern that is at least 51 percent directly and unconditionally owned by, and the management and daily business operations of which are controlled by, one or more women who are citizens of the United States, and the concern is certified by SBA or an approved third-party certifier in accordance with [13 CFR 127.300](#).

(b) (1) The North American Industry Classification System (NAICS) code for this acquisition is _____ [*insert NAICS code*].

(2) The small business size standard is _____ [*insert size standard*].

(3) The small business size standard for a concern that submits an offer, other than on a construction or service acquisition, but proposes to furnish an end item that it did not itself manufacture, process, or produce (*i.e.*, nonmanufacturer), is 500 employees if the acquisition—

(i) Is set aside for small business and has a value above the simplified acquisition threshold;

(ii) Uses the HUBZone price evaluation preference regardless of dollar value, unless the offeror waives the price evaluation preference; or

(iii) Is an 8(a), HUBZone, service-disabled veteran-owned, economically disadvantaged women-owned, or women-owned small business set-aside or sole-source award regardless of dollar value.

(c) *Representations.*

(1) The offeror represents as part of its offer that—

(i) it is, is not a small business concern; or

(ii) It is, is not a small business joint venture that complies with the requirements of [13 CFR 121.103\(h\)](#) and [13 CFR 125.8\(a\)](#) and (b). [*The offeror shall enter the name and unique entity identifier of each party to the joint venture: __.*]

AMENDMENT 2

(2) *[Complete only if the offeror represented itself as a small business concern in paragraph (c)(1) of this provision.]* The offeror represents that it is, is not, a small disadvantaged business concern as defined in 13 CFR 124.1002.

(3) *[Complete only if the offeror represented itself as a small business concern in paragraph (c)(1) of this provision.]* The offeror represents as part of its offer that it is, is not a women-owned small business concern.

(4) *Women-owned small business (WOSB) joint venture eligible under the WOSB Program.* The offeror represents as part of its offer that it is, is not a joint venture that complies with the requirements of [13 CFR 127.506\(a\)](#) through [\(c\)](#). *[The offeror shall enter the name and unique entity identifier of each party to the joint venture: __.]*

(5) *Economically disadvantaged women-owned small business (EDWOSB) joint venture.* The offeror represents as part of its offer that it is, is not a joint venture that complies with the requirements of 13 CFR 127.506(a) through (c). *[The offeror shall enter the name and unique entity identifier of each party to the joint venture: __.]*

(6) *[Complete only if the offeror represented itself as a small business concern in paragraph (c)(1) of this provision.]* The offeror represents as part of its offer that it is, is not a veteran-owned small business concern.

(7) *[Complete only if the offeror represented itself as a veteran-owned small business concern in paragraph (c)(6) of this provision.]* The offeror represents as part of its offer that

(i) It is, is not a service-disabled veteran-owned small business concern; or

(ii) It is, is not a service-disabled veteran-owned joint venture that complies with the requirements of [13 CFR 125.18\(b\)\(1\)](#) and [\(2\)](#). *[The offeror shall enter the name and unique entity identifier of each party to the joint venture: __.]* Each service-disabled veteran-owned small business concern participating in the joint venture shall provide representation of its service-disabled veteran-owned small business concern status.

(8) *[Complete only if the offeror represented itself as a small business concern in paragraph (c)(1) of this provision.]* The offeror represents, as part of its offer, that-

(i) It is, is not a HUBZone small business concern listed, on the date of this representation, as having been certified by SBA as a HUBZone small business concern in the Dynamic Small Business Search and SAM, and will attempt to maintain an employment rate of HUBZone residents of 35 percent of its employees during performance of a HUBZone contract (see [13 CFR 126.200\(e\)\(1\)](#)); and

(ii) It is, is not a HUBZone joint venture that complies with the requirements of [13 CFR 126.616\(a\)](#) through [\(c\)](#). *[The offeror shall enter the name and unique entity identifier of each party to the joint venture: __.]* Each HUBZone small business concern participating in the HUBZone joint venture shall provide representation of its HUBZone status.

AMENDMENT 2

(d) *Notice.* Under [15 U.S.C.645\(d\)](#), any person who misrepresents a firm's status as a business concern that is small, HUBZone small, small disadvantaged, service-disabled veteran-owned small, economically disadvantaged women-owned small, or women-owned small eligible under the WOSB Program in order to obtain a contract to be awarded under the preference programs established pursuant to section 8, 9, 15, 31, and 36 of the Small Business Act or any other provision of Federal law that specifically references section 8(d) for a definition of program eligibility, shall-

- (1) Be punished by imposition of fine, imprisonment, or both;
- (2) Be subject to administrative remedies, including suspension and debarment; and
- (3) Be ineligible for participation in programs conducted under the authority of the Act.

(End of provision)

AMENDMENT 2

Attachment 4

**Department of Defense (DoD)
Small Business Innovation Research (SBIR) Program
Small Business Technology Transfer (STTR) Program**

DISCLOSURE OF FUNDING SOURCES

In accordance with Section 223 of the William M. (Mac) Thornberry National Defense Authorization Act (NDAA) for Fiscal Year 2021, DoD shall require, as part of any application for a research and development award—

- (1) that each covered individual listed on the application—
 - (A) disclose the amount, type, and source of all current and pending research support received by, or expected to be received by, the individual as of the time of the disclosure;
 - (B) certify that the disclosure is current, accurate, and complete; and
 - (C) agree to update such disclosure at the request of the agency prior to the award of support and at any subsequent time the agency determines appropriate during the term of the award; and
- (2) that any entity applying for such award certify that each covered individual who is employed by the entity and listed on the application has been made aware of the requirements under paragraph (1).

Full text of Section 223 of the FY21 NDAA, including relevant definitions, can be found on pages 84-86: <https://www.congress.gov/116/plaws/publ283/PLAW-116publ283.pdf>.

| | |
|---|--|
| Small Business Concern (SBC) | |
| SBC Unique Entity ID (UEI) | |
| Proposal # (assigned by DSIP when proposal is created) | |
| SBC Point of Contact (POC) Name | |
| SBC POC Phone # | |
| SBC POC Email | |

The SBC has been made aware of the requirements outlined in Section 223(a) of the William M. (Mac) Thornberry National Defense Authorization Act for Fiscal Year 2021 and certifies that the disclosures provided below are current, accurate, and complete. The SBC further agrees to update such disclosure at the request of DoD prior to the award of support and at any subsequent time DoD determines appropriate during the term of the award.

Name of person authorized to sign: _____

Signature of person authorized: _____

Date: _____

AMENDMENT 2

Covered individuals have no current or pending research support to disclose in accordance with Section 223 of the FY21 NDAA, as described above.

Disclosures

| | |
|---|--|
| Covered Individual's Name: Covered Individual's Position: Current and Pending Funding Amount: Current and Pending Funding Type: Current and Pending Funding Source: | |
| | |
| Covered Individual's Name: Covered Individual's Position: Current and Pending Funding Amount: Current and Pending Funding Type: Current and Pending Funding Source: | |
| | |
| Covered Individual's Name: Covered Individual's Position: Current and Pending Funding Amount: Current and Pending Funding Type: Current and Pending Funding Source: | |
| | |
| Covered Individual's Name: Covered Individual's Position: Current and Pending Funding Amount: Current and Pending Funding Type: Current and Pending Funding Source: | |
| | |
| Covered Individual's Name: Covered Individual's Position: Current and Pending Funding Amount: Current and Pending Funding Type: Current and Pending Funding Source: | |

AMENDMENT 2

[Additional space as needed]

DEPARTMENT OF THE ARMY
DoD 23.4 Small Business Innovation Research (SBIR)
Annual Broad Agency Announcement (BAA)
Component-Specific Proposal Instructions

November 17, 2022: Topics issued for pre-release

November 30, 2022: Army begins accepting proposals via DSIP

December 20, 2022: DSIP Topic Q&A closes to new questions at 12:00 p.m. ET

January 4, 2023: Deadline for receipt of proposals no later than 12:00 p.m. ET

INTRODUCTION

The future Army must be capable of conducting Multi-Domain Operations (MDO) as part of an integrated Joint Force across an array of situations in multiple theaters by 2035. The MDO concept describes how the Army will support the Joint Force in the rapid and continuous integration of all domains of warfare – land, sea, air, and cyberspace – to deter and prevail as we compete short of conflict, and fight and win if deterrence fail. The Army must provide game-changing capabilities to our Soldiers. To capitalize on small business innovation, the Army has implemented an approach to advertise SBIR funding opportunities through the Department of Defense (DoD) Annual BAA process, outside of the three pre-determined BAA cycles. This approach also strives to create a more rapid award time from solicitation to closing.

CONTACT INFORMATION

Direct Specific questions pertaining to the administration of the Department of the Army SBIR Program and proposal preparation instructions to the Point of Contact identified in the Topic announcement. General questions can be directed to the following:

Email: usarmy.pentagon.hqda-asa-alt.mbx.army-applied-sbir-program@mail.mil

Mailing Address:

Army Applied SBIR Office 2530 Crystal Dr; Ste 11192
Arlington, VA 22202

RESPONSIVENESS AND TIMELINESS

All proposals will be evaluated and judged on a competitive basis. Proposals will only be evaluated in response to an active, corresponding Army topic. Proposals will be initially screened to determine responsiveness and timeliness. Proposals passing this initial screening will be technically evaluated by engineers or scientists to determine the most promising technical and scientific approaches. Assessment of responsiveness may continue during technical evaluation and after selection. If at any point the proposal is deemed untimely, unresponsive, ineligible, or non-responsible, the proposal will be rejected / the contract action will be cancelled.

Interested firms shall follow the DoD Program BAA instructions as well as the Army's component-specific proposal instructions herein, when preparing and submitting proposals. The DoD 23.4 SBIR Program BAA can be found here: <https://www.defensesbirsttr.mil/SBIR-STTR/Opportunities/>.

SYSTEM FOR AWARD MANAGEMENT (SAM)

Interested firms are required to be registered in SAM (www.sam.gov) before submitting a proposal and shall continue to be registered until time of award, during performance, and through final payment of any contract.

PHASE I PROPOSAL INSTRUCTIONS

The Defense SBIR/STTR Innovation Portal (DSIP) is the official portal for DoD SBIR/STTR proposal submission. Proposers (also referred to herein as “offeror(s)”) are required to submit proposals via DSIP; proposals submitted by any other means will be disregarded. Detailed instructions regarding registration and proposal submission via DSIP are provided in the DoD SBIR Program BAA.

Proposal Coversheet (Volume 1)

The proposal coversheet must follow the instructions and requirements provided in the DoD SBIR Program BAA.

The offeror shall certify that to the best of its knowledge and belief, its eligibility information under the SBIR Program is accurate, complete, and current as of the date of the offer.

Technical Volume (Volume 2)

The technical volume is not to exceed 5 pages and must follow the formatting requirements provided in the DoD SBIR Program BAA. A commercialization plan must also accompany the technical proposal and shall be no more than 10 slides. The commercialization plan must be converted to a pdf and attached to the end of the technical volume, resulting in one pdf file to be uploaded to DSIP as Volume 2. The commercialization plan does not count towards the technical volume 5-page limit. Any proposals submitted without a commercialization plan or in a format other than that provided by the BAA will not be reviewed.

Content of the Technical Volume

The Technical Volume shall contain three key sections – technical approach, team qualifications and commercialization section. The technical approach section shall contain details on how the proposer is going to solve the problem. It shall detail key elements of the firm’s approach, any risks, relevant past work and how success is measured. The team qualifications section shall highlight the key personnel working on the project, and the resources that will be brought to bear on solving the problem. The commercialization plan shall include:

- Company information: Focused objectives/core competencies; specialization area(s); products with significant sales; and history of previous Federal and non-Federal funding, regulatory experience, and subsequent commercialization successes.
- Customer and Competition: Clear description of key technology objectives, current competition, and advantages compared to competing products or services; description of hurdles to acceptance of the innovation.
- Market: Milestones, target dates, analyses of market size, and estimated market share after first year sales and after 5 years; explanation of plan to obtain market share.
- Intellectual Property: Patent status, technology lead, trade secrets or other demonstration of a plan to achieve sufficient protection to realize the commercialization stage and attain at least a temporal competitive advantage.
- Financing: Plans for securing necessary non-SBIR funding.
- Assistance and mentoring: Plans for securing needed technical or business assistance through mentoring, partnering, or through arrangements with government sponsored (e.g., State assistance programs, Federally-funded research laboratories, Manufacturing Extension Partnership centers), not-for-profits (e.g., SBDC), commercial accelerators, DOD Prime Contractors, or other assistance provider.

These instructions supersede those stated in section 5.3.c of the DoD Program BAA.

Cost Volume (Volume 3)

The Cost Volume must follow all instructions and requirements provided in the DoD SBIR Program BAA. Supplemental requirements are as follows:

Unless otherwise noted in the topic, the Phase I Base amount must not exceed \$250,000 for a 6-month period of performance. Phase I Options are not anticipated at this time. If an option is identified in the topic posting, costs for the Base and Option must be separated and clearly identified on the Proposal Cover Sheet (Volume 1) and in Volume 3. Awards for these topics will be in the form of a firm fixed price contract.

For pricing purposes, offerors shall assume a contract or agreement start date of approximately ninety (90) days after submission of the proposal. For this BAA, adequate price competition (APC), as defined in FAR 15.403-1(c), is anticipated. In the event that adequate price competition is not realized (i.e. only one proposal is received for a given topic), the Government may choose to conduct additional proposal analysis, in accordance with the techniques identified at FAR 15.404-1. Additionally, offerors are to provide any current Forward Pricing Rate Agreements (FPRA) in effect at time of proposal submission.

Content of the Cost Volume (Volume 3)

ALL proposed costs should be accompanied by documentation to substantiate how the cost was derived. Substantiating documentation guidance is as follows:

- LABOR:
 - List all key personnel by name as well as by number of hours dedicated to the project as direct labor.
 - Explain the basis of proposed labor hours, including required tasks, and substantiating documentation for the costs (e.g. payroll reports). Volume 5, Supporting Documents, may be used if additional space is needed.
- MATERIAL/TOOLING/EQUIPMENT:
 - Explain the basis of proposed material and equipment costs. This support should include a consolidated priced summary of individual material and equipment quantities and substantiating documentation for the costs (e.g. vendor quotes, invoice prices, competitive bids, etc.). If your choice isn't the lowest cost available, explain the decision to choose one item or supplier over another. Volume 5, Supporting Documents, may be used if additional space is needed.
 - Ensure all materials are American-made to the maximum extent practicable. Offerors who propose to use a foreign-made product in its technology may be required to find an American-made equivalent.
 - While special tooling and test equipment and material cost may be included, it will be carefully reviewed relative to need and appropriateness for the work proposed. The purchase of special tooling and test equipment must, in the opinion of the Component Contracting Officer, be advantageous to the Government and should be related directly to the specific topic. These may include such items as innovative instrumentation or automatic test equipment.

Title to property furnished by the Government or acquired with Government funds will be vested with the DoD Component, unless it is determined that transfer of title to the contractor would be more cost effective than recovery of the equipment by the DoD Component.

- TRAVEL:
 - Explain the basis of proposed travel, including to/from locations, number of trips, number of travelers per trip, and number of days/nights per trip. Include substantiating documentation for the costs (e.g. screenshots of flight cost comparison, rental car quotes, etc.). NOTE: Virtual meetings shall be utilized to the maximum extent practicable. Volume 5, Supporting Documents, may be used if additional space is needed.

- SUBCONTRACTS: A subcontract is any agreement, other than one involving an employer-employee relationship, entered into by the prime contractor (awardee) calling for supplies or services for the performance of the contract.
 - All subcontractor costs and consultant costs must be detailed at the same level as prime contractor costs in regard to labor, travel, equipment, etc.
 - Explain the basis of proposed subcontract costs. Include documented support of the offeror's price analyses and degree of competition of all subcontractor proposals. All subcontractor costs and consultant costs, such as labor, travel, equipment, materials, must be detailed at the same level as prime contractor costs. Provide detailed substantiation of subcontractor costs in your cost proposal. Volume 5, Supporting Documents, may be used if additional space is needed.
 - Certify that the following requirements are met: For Phase I, the offeror must perform a minimum of two-thirds of the research and/or analytical effort. One third may be subcontracted to another firm or research organization/facility. The percentage of work is measured by both direct and indirect costs.
 - Offerors shall not propose to subcontract to the issuing agency, to any other Federal Government agency, or to other units of the Federal Government, except Federal Laboratories in rare circumstances. As defined in 15 U.S.C. 3703, Federal Laboratory means any laboratory, any federally funded research and development center, or any center established under 15 U.S.C. 3705 and 3707 that is owned, leased, or otherwise used by a Federal Agency and funded by the Federal Government, whether operated by the Government or by a contractor.
 - Offerors shall not propose to subcontract to any prohibited sources. Proposals identifying a subcontractor/vendor arrangement with a prohibited source may be rejected.
 - Offerors shall ensure subcontracting arrangements are with United States Small Businesses to the maximum extent practicable. Offerors proposing a subcontractor arrangement with other than a United States Small Business

(such as, a large business, foreign firm, foreign government, educational institution, unit of Federal Government, etc.) may be required to submit further explanation.

- **INDIRECT COSTS:**
 - Explain the basis of the proposed indirect expense rates including overhead, general and administrative, material handling, and fringe benefits.
 - If a Defense Contract Audit Agency (DCAA) Audit has been conducted within the last five (5) years, include the audit compliance documentation in the cost proposal documents. The documentation should also include the offeror's DCAA Point of Contact (if applicable).

If selected for award, failure to include the documentation with your proposal may delay contract award, as the proposer will be asked to submit the necessary documentation to the Contracting Officer to substantiate costs. It is important to respond as quickly as possible to the Contracting Officer's request for documentation. Failure or refusal to provide documentation may result in cancellation of the contract action.

Company Commercialization Report (CCR) (Volume 4)

Completion of the CCR as Volume 4 of the proposal submission in DSIP is required. Please refer to the DoD SBIR Program BAA for full details on this requirement. Information contained in the CCR will be considered by the Department of the Army during proposal evaluations.

Supporting Documents (Volume 5)

Volume 5 is provided for proposers to submit additional documentation to support the Cover Sheet (Volume 1), Technical Volume (Volume 2), and the Cost Volume (Volume 3). In addition to the Volume 5 requirements outlined in the DoD Program BAA, the Department of the Army may accept the following documents in Volume 5:

- Additional Cost Information
- Funding Agreement Certification
- Technical Data Rights (Assertions)
- Lifecycle Certification
- Allocation of Rights
- Other (only as specified in the topic)

Please only submit documents that are identified immediately above and in the DoD Program BAA. All other documents submitted will be disregarded.

DIRECT TO PHASE II PROPOSAL INSTRUCTIONS

Offerors may submit Direct to Phase II (DP2) proposals **only if allowed pursuant to the topic posting**. In addition to the requirements in the DoD Program BAA, offerors interested in submitting a DP2 proposal in response to an eligible topic must provide documentation to substantiate that the scientific and technical merit and feasibility described in the Phase I section of the topic has been met. Offerors must also provide documentation to demonstrate potential commercial applications. Documentation shall include all relevant information including, but not limited to: technical reports, test data, prototype designs/models, and performance goals/results. Work identified within the feasibility documentation must have been substantially performed by the proposer and/or the Principal Investigator.

The Army will not evaluate the proposal if it determines that the proposer has failed to demonstrate that technical merit and feasibility has been established or the proposer has failed to demonstrate that work identified in the feasibility documentation was substantially performed by the proposer and/or the PI.

Feasibility documentation cannot be based upon any prior or ongoing federally funded SBIR or STTR work and DP2 proposals MUST NOT logically extend from any prior or ongoing federally funded SBIR or STTR work. It is the offeror's responsibility to ensure compliance. Should the Government find a violation before contract award, the proposal will be rejected. Should the Government find a violation after contract award, the Government has the right to terminate the contract.

Proposal Coversheet (Volume 1)

On the Defense SBIR/STTR Innovation Portal (DSIP) at <https://www.dodsbirsttr.mil/submissions/>, prepare the Proposal Cover Sheet.

The Cover Sheet must include a brief technical abstract that describes the proposed R&D project and a discussion of anticipated benefits and potential commercial applications. Each section should be no more than 200 words. Do not include proprietary or classified information in the Proposal Cover Sheet. If your proposal is selected for award, the technical abstract and discussion of anticipated benefits may be publicly released on the Internet. Once the Cover Sheet is saved, the system will assign a proposal number. You may modify the cover sheet as often as necessary until the BAA closes.

The offeror shall certify that to the best of its knowledge and belief, its eligibility information under the SBIR Program is accurate, complete, and current as of the date of the offer.

Technical Volume (Volume 2)

The Technical Volume must include two parts; (a) the Feasibility Documentation and (b) the Technical Proposal.

The Technical Volume must be a single Portable Document Format (PDF) file, including graphics. Perform a virus check before uploading the Technical Volume file. If a virus is detected, it may cause rejection of the proposal. Do not lock or encrypt the uploaded file. Do not include or embed active graphics such as videos, moving pictures, or other similar media in the document.

The length of the Feasibility Documentation is not to exceed 5 pages and the length of the Technical Proposal is not to exceed 10 pages. A commercialization plan must also accompany the technical proposal and shall be no more than 10 slides. Any proposals submitted in a different format, or exceed the page count limits will not be reviewed.

Number all pages of your proposal consecutively. Font size shall not be smaller than 10- point on standard 8-1/2" x 11" paper with one-inch margins. The header on each page of the Technical Volume shall contain your company name, topic number, and proposal number assigned by DSIP when the Cover Sheet was created. The header may be included in the one-inch margin.

Content of the Feasibility Documentation (Volume 2a)

The content of the Feasibility Documentation Proposers shall substantiate that the scientific and technical merit and feasibility described in the Phase I section of the topic has been met and describes the potential commercial applications. Documentation shall include all relevant information including, but not limited to: technical reports, test data, prototype designs/models,

and performance goals/results. Work submitted within the feasibility documentation must have been substantially performed by the proposer and/or the Principal Investigator.

Content of the Technical Proposal (Volume 2b)

The content of the Technical Volume shall address three key areas: the technical approach, the team carrying out the work (and the accompanied resources), and the commercialization strategy. The commercialization plan shall include:

- Company information: Focused objectives/core competencies; specialization area(s); products with significant sales; and history of previous Federal and non-Federal funding, regulatory experience, and subsequent commercialization successes.
- Customer and Competition: Clear description of key technology objectives, current competition, and advantages compared to competing products or services; description of hurdles to acceptance of the innovation.
- Market: Milestones, target dates, analyses of market size, and estimated market share after first year sales and after 5 years; explanation of plan to obtain market share.
- Intellectual Property: Patent status, technology lead, trade secrets or other demonstration of a plan to achieve sufficient protection to realize the commercialization stage and attain at least a temporal competitive advantage.
- Financing: Plans for securing necessary non-SBIR funding.
- Assistance and mentoring: Plans for securing needed technical or business assistance through mentoring, partnering, or through arrangements with government sponsored (e.g., State assistance programs, Federally-funded research laboratories, Manufacturing Extension Partnership centers), not-for-profits (e.g., SBDC), commercial accelerators, DOD Prime Contractors, or other assistance provider.

Proposers are free to structure each section as they like, so long as it provides sufficient detail for evaluators to understand the proposed work, who will carry it out, and how the business plans to commercialize results.

Cost Volume (Volume 3)

Unless otherwise noted in the topic, the Army will accept Direct to Phase II proposals for a cost up to \$1,700,000 and a period of performance up to 18-months. Proposers are required to use the Cost Proposal method as provided on the DSIP submission site. The Cost Volume (and supporting documentation) DOES NOT count toward the page limit of the Technical Volume.

For pricing purposes, offerors shall assume a contract or agreement start date of approximately ninety (90) days after submission of the proposal. For this BAA, adequate price competition (APC), as defined in FAR 15.403-1(c), is anticipated. In the event that adequate price competition is not realized (i.e. only one proposal is received for a given topic), the Government may choose to conduct additional proposal analysis, in accordance with the techniques identified at FAR 15.404-1. Additionally, offerors are to provide any current Forward Pricing Rate Agreements (FPRA) in effect at time of proposal submission.

Content of the Cost Volume (Volume 3)

ALL proposed costs should be accompanied by documentation to substantiate how the cost was derived. Substantiating documentation guidance is as follows:

- LABOR:
 - List all key personnel by name as well as by number of hours dedicated to the

project as direct labor.

- Explain the basis of proposed labor hours, including required tasks, and substantiating documentation for the costs (e.g. payroll reports). Volume 5, Supporting Documents, may be used if additional space is needed.
- MATERIAL/TOOLING/EQUIPMENT:
 - Explain the basis of proposed material and equipment costs. This support should include a consolidated priced summary of individual material and equipment quantities and substantiating documentation for the costs (e.g. vendor quotes, invoice prices, competitive bids, etc.). If your choice isn't the lowest cost available, explain the decision to choose one item or supplier over another. Volume 5, Supporting Documents, may be used if additional space is needed.
 - Ensure all materials are American-made to the maximum extent practicable. Offerors who propose to use a foreign-made product in its technology may be required to find an American-made equivalent.
 - While special tooling and test equipment and material cost may be included, it will be carefully reviewed relative to need and appropriateness for the work proposed. The purchase of special tooling and test equipment must, in the opinion of the Component Contracting Officer, be advantageous to the Government and should be related directly to the specific topic. These may include such items as innovative instrumentation or automatic test equipment. Title to property furnished by the Government or acquired with Government funds will be vested with the DoD Component, unless it is determined that transfer of title to the contractor would be more cost effective than recovery of the equipment by the DoD Component.
- TRAVEL:
 - Cost for travel must be justified and related to the needs of the project.
 - Explain the basis of proposed travel, including to/from locations, number of trips, number of travelers per trip, and number of days/nights per trip. Include substantiating documentation for the costs (e.g. screenshots of flight cost comparison, rental car quotes, etc.). NOTE: Virtual meetings shall be utilized to the maximum extent practicable. Volume 5, Supporting Documents, may be used if additional space is needed.
- SUBCONTRACTS: A subcontract is any agreement, other than one involving an employer-employee relationship, entered into by the prime contractor (awardee) calling for supplies or services for the performance of the contract.
 - All subcontractor costs and consultant costs must be detailed at the same level as prime contractor costs in regard to labor, travel, equipment, etc.
 - Explain the basis of proposed subcontract costs. Include documented support

of the offeror's price analyses and degree of competition of all subcontractor proposals. All subcontractor costs and consultant costs, such as labor, travel, equipment, materials, must be detailed at the same level as prime contractor costs. Provide detailed substantiation of subcontractor costs in your cost proposal. Volume 5, Supporting Documents, may be used if additional space is needed.

- Certify that the following requirements are met: For Phase II, the offeror must perform a minimum of one-half of the research and/or analytical effort. One-half may be subcontracted to another firm or research organization/facility. The percentage of work is measured by both direct and indirect costs.
- Offerors shall not propose to subcontract to the issuing agency, to any other Federal Government agency, or to other units of the Federal Government, except Federal Laboratories in rare circumstances. As defined in 15 U.S.C. 3703, Federal Laboratory means any laboratory, any federally funded research and development center, or any center established under 15 U.S.C. 3705 and 3707 that is owned, leased, or otherwise used by a Federal Agency and funded by the Federal Government, whether operated by the Government or by a contractor.
- Offerors shall not propose to subcontract to any prohibited sources. Proposals identifying a subcontractor/vendor arrangement with a prohibited source may be rejected.
- Offerors shall ensure subcontracting arrangements are with United States Small Businesses to the maximum extent practicable. Offerors proposing a subcontractor arrangement with other than a United States Small Business (such as, a large business, foreign firm, foreign government, educational institution, unit of Federal Government, etc.) may be required to submit further explanation.
- INDIRECT COSTS:
 - Explain the basis of the proposed indirect expense rates including overhead, general and administrative, material handling, and fringe benefits.
 - If a Defense Contract Audit Agency (DCAA) Audit has been conducted within the last five (5) years, include the audit compliance documentation in the cost proposal documents. The documentation should also include the offeror's DCAA Point of Contact (if applicable).

If selected for award, failure to include the documentation with your proposal may delay contract award, as the proposer will be asked to submit the necessary documentation to the Contracting Officer to substantiate costs. It is important to respond as quickly as possible to the Contracting Officer's request for documentation. Failure or refusal to provide documentation may result in cancellation of the contract action.

For more information about cost proposals and accounting standards, see the DCAA publication titled "Audit Process Overview – Information for Contractors" available at: <http://www.dcaa.mil>.

Company Commercialization Report (CCR) (Volume 4)

Completion of the CCR as Volume 4 of the proposal submission in DSIP is required. Please refer to the DoD SBIR Program BAA for full details on this requirement. Information contained in the CCR will be considered by the Department of the Army during proposal evaluations.

Supporting Documents (Volume 5)

Volume 5 is provided for proposers to submit additional documentation to support the Cover Sheet (Volume 1), Technical Volume (Volume 2), and the Cost Volume (Volume 3). In addition to the Volume 5 requirements outlined in the DoD Program BAA, the Department of the Army will accept the following documents in Volume 5:

- Additional Cost Information
- Funding Agreement Certification
- Technical Data Rights (Assertions)
- Lifecycle Certification
- Allocation of Rights
- Other (only as specified in the topic)

Please only submit documents that are identified immediately above and in the DoD Program BAA. All other document submissions will be disregarded.

PHASE II PROPOSAL INSTRUCTIONS

Phase II proposals may only be submitted by Phase I awardees. Phase II proposal submission window, notification process, expected budget/duration structure and additional instructions will be provided in the Phase I contract or by subsequent notification.

DISCRETIONARY TECHNICAL AND BUSINESS ASSISTANCE (TABA)

The Army, at its discretion, may provide Technical and Business Assistance (TABA). The Army will select a preferred vendor(s) for the Army SBIR TABA program through a competitive process. Alternately, a small business concern may, by contract or otherwise, select one or more vendors to assist the firm in meeting the TABA goals. The Applicant must request the authority to select its own TABA provider in its Army SBIR proposal and must demonstrate that the vendor is uniquely postured to provide the specific technical and business services required. TABA funding will be denied if the offeror fails to include the cost and detailed explanation in its proposal.

Participation in the Army SBIR TABA program is voluntary for each Army SBIR awardee. Services provided to Army SBIR firms under the auspices of the TABA program may include, but are not limited to:

1. Access to a network of scientists, engineers, and technologists focused on commercialization and transition considerations such as protected supply chain management, advanced manufacturing, process/product/production scaling, etc;
2. Assistance with intellectual property protections, such as legal considerations, intellectual property rights, patent filing, patent fees, licensing considerations, etc;
3. Commercialization and technology transition support such as market research, market validation, development of regulatory or manufacturing plans, brand development;
4. Regulatory support such as product domain regulatory considerations, regulatory planning, and regulatory strategy development.

The Army SBIR program sponsors participation in the TABA program. The resource limitation for each firm is as follows:

- Phase I Firms:
 - Army-Preferred Vendor: If approved, the contractor may receive up to \$6,500 worth of assistance services per project per year (in addition to the base SBIR award amount).
 - Firm-Selected Vendor: If approved, the contractor may receive up to \$6,500 in contract obligation (in addition to the base SBIR award amount) per project per year.
- Phase II Firms:
 - Army-Preferred Vendor: If approved, the contractor may receive up to \$50,000 worth of assistance services per project per year (in addition to the base SBIR award amount).
 - Firm-Selected Vendor: If approved, the contractor may receive up to \$50,000 in contract obligation (in addition to the base SBIR award amount) per project per year.

EVALUATION AND SELECTION

The Army will conduct an evaluation of each responsive, timely, eligible proposal in accordance with the evaluation criteria listed in the DoD Program BAA. It is the policy of the Army to ensure equitable and comprehensive proposal evaluations based on the evaluation criteria and to select the source (or sources) whose offer meets the Government's technical, policy, and programmatic goals.

As previously stated herein, timeliness, responsiveness, and eligibility will be assessed upon initial screening, during evaluation, and after selection. Proposals that do not comply with the instructions and requirements detailed in this document, the DoD Program BAA, or the corresponding Topic posting (including the research objective(s)), will be considered ineligible, nonresponsive, untimely, or non-conforming and therefore will not be evaluated or considered for award.

Using the evaluation criteria, the Government will evaluate each responsive, timely, eligible proposal in its entirety, documenting the strengths and weaknesses relative to each evaluation criterion, and, based on these identified strengths and weaknesses, make a determination of the proposal's overall selectability. Proposals will not be evaluated against each other during the evaluation process, but rather evaluated on their own individual merit to determine how well the proposal meets the criteria stated in this BAA and the corresponding opportunity.

Selected proposals are those determined to be the most advantageous to the Government, consistent with instructions and evaluation criteria specified in the DoD Program BAA, the component-specific instructions herein, the corresponding Topic posting, and availability of funding. Given the limited funding available for each opportunity, not all proposals considered selectable will be necessarily selected for funding.

For the purposes of this proposal evaluation process, a selectable proposal is defined as follows:

Selectable: A selectable proposal is a proposal that has been evaluated by the Government against the evaluation criteria and the strengths of the overall proposal outweighs its weaknesses. Additionally, there are no accumulated weaknesses that would require extensive negotiations and/or a revised proposal.

For the purposes of this proposal evaluation process, a non-selectable proposal is defined as follows:

Non-Selectable: A proposal is considered non-selectable when the proposal has been evaluated by the Government against the evaluation criteria and the strengths of the overall proposal do not outweigh its weaknesses.

Proposing firms will be notified via email of selection or non-selection status for a Phase I or direct to Phase II award within 90 days of the closing date of the Topic. The notification will be sent to the Corporate Official listed on the proposal cover sheet from the Army SBIR Program Office mailbox. The Army promotes transparency regarding the technical evaluation for all Army SBIR proposals. The Army

will provide a technical evaluation narrative to the proposer in accordance with the SBA Policy Directive, Appendix I, paragraph 4. The selection decision notice contains instructions for retrieving the technical evaluation narrative.

Proposers must not regard the notification email (selection decision notice) as an authorization to commit or expend funds. After the Army SBIR Office has recommended a proposal for award, a Government Contracting Officer may contact the proposer in order to discuss and request additional information required for award. This may include representations and certifications, certified or other than certified cost data, subcontracting plan for small businesses, and/or other information as applicable to the proposed award. Proposers must not regard these communications as an authorization to commit or expend funds. Unless a Government Contracting Officer signs the award document (i.e. contract), no obligations to provide funding are made. The Government may reject the proposal or cancel the contract action at any time.

If signed by the Government Contracting Officer, the award document is the official and authorizing instrument (i.e. contract). The anticipated period of performance start date will be determined at time of award. The Contracting Officer will email the signed, authorizing award instrument to the principal investigator (PI) and/or an authorized organization representative.

PROTESTS

Refer to the DoD SBIR Program BAA for procedures to protest the Announcement.

As further prescribed in FAR 33.106(b), FAR 52.233-3, Protests after Award shall be submitted to the Point of Contract identified in the topic solicitation:

Email: usarmy.pentagon.hqda-asa-alt.mbx.army-applied-sbir-program@mail.mil

Mailing Address:

Army Applied SBIR Office
2530 Crystal Dr; Ste 11192
Arlington, VA 22202

Appendix A Phase I Evaluation Criteria

Applied SBIR Phase I Proposal Review v2-0-3 Evaluation Criteria Defined



| | | DEFINITION |
|----------------------------------|-------------------|---|
| INTRODUCTION | <i>weight 5%</i> | Write a clear, concise description of what your innovation does or will do, and where you are in your evolution. Make clear its intended impact on the Army. Evaluators should "get it" after reading this. |
| POTENTIAL FOR ARMY IMPACT | <i>weight 25%</i> | <p>OPERATIONAL IMPACT At the scale of a single Army end-user, argue that their jobs or lives will be significantly improved if your solution is adopted. What is the impact of your solution for a soldier/Army civilian vs. today's solutions?</p> <p>POTENTIAL SCALE OF IMPACT Here, we're looking for an idea of how broad the impact you described above could be. Look into the future to a time when your solution is both technically mature and actively in use by Army personnel. Describe the scale and scope of your impact within the context of the Army.</p> |
| TECHNICAL FEASIBILITY | <i>weight 25%</i> | <p>SCIENTIFIC FEASIBILITY Is the science behind the solution sound? Convince readers who don't have deep expertise in your field that your innovation is built atop sound scientific and engineering principles.</p> <p>ENABLING TECHNOLOGIES Point to the foundational technologies that you rely on to deliver your solution. Do the required enabling technologies introduce added risk? Using proven (and ideally Army-fielded) underlying technologies and techniques helps to lower technical risk.</p> <p>ALTERNATIVE TECHNICAL APPROACHES From a technologist's perspective, why is your proposed solution the best choice for the Army? Refute the alternative engineering approaches others are using. Why does your technology win?</p> <p>TECHNICAL RISK MITIGATION No matter your current technology readiness level, technical risks remain. Identify those risks. Present a credible plan to tackle those risks.</p> |
| TRANSITION | <i>weight 20%</i> | <p>ARMY TRANSITION PATHWAY Planning for success, what's next for you after this SBIR award? Describe the next type of deal you aim to make with the Army, e.g. a CRADA, a different SBIR contract, a CSO, etc. Briefly outline your current plan to unlock that next opportunity and/or share the biggest risks you see post this SBIR award.</p> <p>SBIR MILESTONE SCHEDULE Please share with us a thoughtful execution plan. Strike a balance between giving us a sense of the detailed thinking behind the scenes and the need for your contracting officer to manage a reasonably small number of milestones during your period of performance.</p> |
| FIRM CASH FLOW | <i>weight 10%</i> | <p>FIRM SURVIVAL RISK SBIR funds are meant to fuel growth rather than stave off a firm's impending financial failure. Demonstrate that your company will survive financially as a going concern through the early stages of a Phase III contract, sometimes referred to as "transitioning" into use by Army personnel.</p> <p>OTHER PEOPLE'S MONEY Make the case that non-Army and/or non-DoD dollars will continue to fund improvements to your solution from which the Army will benefit in the future. Companies who cannot demonstrate non-Army and/or non-DoD funding sources for future solution enhancements are less attractive to the Applied SBIR program.</p> <p>FINANCIAL PROFIT POTENTIAL Through the Applied SBIR program, the Army wants to take advantage of the speed and scalability of dual-use companies. Make your best case that your product is or will be profitable. If you have more than one product, please focus your argument on the product / solution presented for this SBIR program.</p> |
| TEAM ABILITY | <i>weight 10%</i> | Prove your team has executed well as a group. Please draw clear distinctions between private sector, DoD and civilian government work. What milestones have you accomplished as a group in this company? |
| SUBMISSION QUALITY | <i>weight 5%</i> | <p>QUALITY OF PROSE Prove you write clearly. Prove you argue convincingly.</p> <p>DATA QUALITY & ATTRIBUTION Support your arguments with relevant, properly attributed data to enhance your credibility.</p> |

Appendix B
Direct to Phase II Evaluation Criteria
Applied SBIR D2P2 Proposal Review v2-0-4 Evaluation Criteria Defined



| | | DEFINITION |
|----------------------------------|---|--|
| INTRODUCTION | <i>weight 2%</i> | Write a clear, concise description of what your innovation does or will do, and where you are in your evolution. Make clear its intended impact on the Army. Evaluators should "get it" after reading this. |
| POTENTIAL FOR ARMY IMPACT | OPERATIONAL IMPACT | At the scale of a single Army end-user, argue that their jobs or lives will be significantly improved if your solution is adopted. What is the impact of your solution for a soldier/Army civilian vs. today's solutions? |
| | POTENTIAL SCALE OF IMPACT | Here, we're looking for an idea of how broad the impact you described above could be. Look into the future to a time when your solution is both technically mature and actively in use by Army personnel. Describe the scale and scope of your impact within the context of the Army. |
| TECHNICAL FEASIBILITY | SCIENTIFIC FEASIBILITY | Is the science behind the solution sound? Convince readers who don't have deep expertise in your field that your innovation is built atop sound scientific and engineering principles. |
| | ENABLING TECHNOLOGIES | Point to the foundational technologies that you rely on to deliver your solution. Do the required enabling technologies introduce added risk? Using proven (and ideally Army-fielded) underlying technologies and techniques helps to lower technical risk. |
| | ALTERNATIVE TECHNICAL APPROACHES | From a technologist's perspective, why is your proposed solution the best choice for the Army? Refute the alternative engineering approaches others are using. Why does your technology win? |
| | TECHNICAL RISK MITIGATION | No matter your current technology readiness level, technical risks remain. Identify those risks. Present a credible plan to tackle those risks. |
| TRANSITION | ARMY TRANSITION PATHWAY | Planning for success, what's next for you after this SBIR award? Describe the next type of deal you aim to make with the Army, e.g. a CRADA, a different SBIR contract, a CSO, etc. Briefly outline your current plan to unlock that next opportunity and/or share the biggest risks you see post this SBIR award. |
| | SBIR MILESTONE SCHEDULE | Please share with us a thoughtful execution plan. Strike a balance between giving us a sense of the detailed thinking behind the scenes and the need for your contracting officer to manage a reasonably small number of milestones during your period of performance. |
| FIRM CASH FLOW | FIRM SURVIVAL RISK | SBIR funds are meant to fuel growth rather than stave off a firm's impending financial failure. Demonstrate that your company will survive financially as a going concern through the early stages of a Phase III contract, sometimes referred to as "transitioning" into use by Army personnel. |
| | OTHER PEOPLE'S MONEY | Make the case that non-Army and/or non-DoD dollars will continue to fund improvements to your solution from which the Army will benefit in the future. Companies who cannot demonstrate non-Army and/or non-DoD funding sources for future solution enhancements are less attractive to the Applied SBIR program. |
| | FINANCIAL PROFIT POTENTIAL | Through the Applied SBIR program, the Army wants to take advantage of the speed and scalability of dual-use companies. Make your best case that your product is or will be profitable. If you have more than one product, please focus your argument on the product / solution presented for this SBIR program. |
| TEAM ABILITY | <i>weight 10%</i> | Prove your team has executed well as a group. Please draw clear distinctions between private sector, DoD and civilian government work. What milestones have you accomplished as a group in this company? |
| SUBMISSION QUALITY | QUALITY OF PROSE | Prove you write clearly. Prove you argue convincingly. |
| | DATA QUALITY & ATTRIBUTION | Support your arguments with relevant, properly attributed data to enhance your credibility. |

Phase II Evaluation Criteria

Applied SBIR Phase II Proposal Review v2-0-3 Evaluation Criteria Defined



| | | DEFINITION |
|----------------------------------|-------------------|---|
| INTRODUCTION | <i>weight 2%</i> | Write a clear, concise description of what your innovation does or will do, and where you are in your evolution. Make clear its intended impact on the Army. Evaluators should "get it" after reading this. |
| POTENTIAL FOR ARMY IMPACT | <i>weight 20%</i> | <p>OPERATIONAL IMPACT At the scale of a single Army end-user, argue that their jobs or lives will be significantly improved if your solution is adopted. What is the impact of your solution for a soldier/Army civilian vs. today's solutions?</p> <p>POTENTIAL SCALE OF IMPACT Here, we're looking for an idea of how broad the impact you described above could be. Look into the future to a time when your solution is both technically mature and actively in use by Army personnel. Describe the scale and scope of your impact within the context of the Army.</p> |
| TECHNICAL FEASIBILITY | <i>weight 25%</i> | <p>SCIENTIFIC FEASIBILITY Is the science behind the solution sound? Convince readers who don't have deep expertise in your field that your innovation is built atop sound scientific and engineering principles.</p> <p>ENABLING TECHNOLOGIES Point to the foundational technologies that you rely on to deliver your solution. Do the required enabling technologies introduce added risk? Using proven (and ideally Army-fielded) underlying technologies and techniques helps to lower technical risk.</p> <p>ALTERNATIVE TECHNICAL APPROACHES From a technologist's perspective, why is your proposed solution the best choice for the Army? Refute the alternative engineering approaches others are using. Why does your technology win?</p> <p>TECHNICAL RISK MITIGATION No matter your current technology readiness level, technical risks remain. Identify those risks. Present a credible plan to tackle those risks.</p> |
| TRANSITION | <i>weight 25%</i> | <p>ARMY TRANSITION PATHWAY Planning for success, what's next for you after this SBIR award? Describe the next type of deal you aim to make with the Army, e.g. a CRADA, a different SBIR contract, a CSO, etc. Briefly outline your current plan to unlock that next opportunity and/or share the biggest risks you see post this SBIR award.</p> <p>SBIR MILESTONE SCHEDULE Please share with us a thoughtful execution plan. Strike a balance between giving us a sense of the detailed thinking behind the scenes and the need for your contracting officer to manage a reasonably small number of milestones during your period of performance.</p> |
| FIRM CASH FLOW | <i>weight 20%</i> | <p>FIRM SURVIVAL RISK SBIR funds are meant to fuel growth rather than stave off a firm's impending financial failure. Demonstrate that your company will survive financially as a going concern through the early stages of a Phase III contract, sometimes referred to as "transitioning" into use by Army personnel.</p> <p>OTHER PEOPLE'S MONEY Make the case that non-Army and/or non-DoD dollars will continue to fund improvements to your solution from which the Army will benefit in the future. Companies who cannot demonstrate non-Army and/or non-DoD funding sources for future solution enhancements are less attractive to the Applied SBIR program.</p> <p>FINANCIAL PROFIT POTENTIAL Through the Applied SBIR program, the Army wants to take advantage of the speed and scalability of dual-use companies. Make your best case that your product is or will be profitable. If you have more than one product, please focus your argument on the product / solution presented for this SBIR program.</p> |
| TEAM ABILITY | <i>weight 5%</i> | Prove your team has executed well as a group. Please draw clear distinctions between private sector, DoD and civilian government work. What milestones have you accomplished as a group in this company? |
| SUBMISSION QUALITY | <i>weight 3%</i> | <p>QUALITY OF PROSE Prove you write clearly. Prove you argue convincingly.</p> <p>DATA QUALITY & ATTRIBUTION Support your arguments with relevant, properly attributed data to enhance your credibility.</p> |

**Army SBIR 23.4 Topic Index
Release 1**

| | |
|----------|---|
| A234-001 | AI/ML for Nitramine Recrystallization and Coating |
| A234-002 | Non-Hydrofluorocarbon-Based Fire Extinguishing |
| A234-003 | Non-Refrigerant Based System for Cabin Cooling |

A234-001 AI/ML for Nitramine Recrystallization and Coating

OUSD (R&E) MODERNIZATION PRIORITY: Artificial Intelligence/Machine Learning

TECHNOLOGY AREA(S): Information Systems

TOPIC OBJECTIVE: To develop a suite of probe technology and machine learning algorithms which can be used throughout the energetics manufacturing process to reduce cost and increase product consistency.

TOPIC DESCRIPTION:

Currently, nitramine energetic materials have unacceptably high rework/scrap rates in a number of different munitions' energetics manufacturing processes, such as dissolution, recrystallization, and slurry coating. This is largely due to the plant operators inability to control critical manufacturing parameters such as cooling water temperature, nitramine concentration, and solvent/antisolvent ratios. To further exacerbate the problem, munitions' energetics manufacturing processes are poorly understood 'black boxes,' so the reason behind any deviation from spec is difficult to ascertain. We believe that by deploying a number of different measurement probes during various manufacturing steps, and analyzing the data via machine learning, we can dramatically reduce or even eliminate out of spec batches. The probes will collect data in real time as materials are manufactured, and the machine learning algorithms will provide nearly instantaneous recommendations to the plant operators on how to adjust their processes to target the desired properties. Beyond reducing out of spec batches, we would also like to reduce cost, environmental footprint (by mainly increasing energy efficiency and reducing solvent use), and increase throughput from existing lines. We believe in the long run, the insights gained for this program will enable easier transition of novel energetic formulations.

The purpose of this topic is to explore probe technology and machine learning algorithms that will be examined from the offerors and will be down selected based on time resolution, ruggedness, data output, safety, and suitability.

There are two key steps for this technology to be successful. The first is the development and deployment of novel probes that produce large amounts of data in real time. The second is an advanced machine learning system that can take the probe readings and provide adjustments in real time during manufacturing to produce the desired product.

PHASE I: Demonstrate proposed probe technology can produce the data required over the course of several manufacturing runs. The Phase I Base amount must not exceed \$100,000 for a 6-month period of performance.

PHASE II: Implement the probes during the manufacturing process and collect data. Use data with machine learning algorithms.

- Phase II Sequential: Expand the probes to more manufacturing lines, increasing the amount of data for machine learning systems. Direct and control energetics manufacturing based on machine learning recommendations to realize benefits

PHASE III and DUAL USE APPLICATIONS: Applying AI/ML to chemical manufacturing has a ton of commercial potential, although this specific topic is geared towards energetics; therefore, landing this topic at moderate dual-use potential for commercial capabilities.

All HMX/RDX batches are currently examined via a multitude of techniques to determine if they are meet specifications. These include assessing purity, particle size, and thermal stability. This analysis can be compared against the predictions of the machine learning algorithms and the measurements provided by the probes. We will also test the machine learning predictions against the predictions of crystallization modeling software, when appropriate.

KEYWORDS: Probe; Algorithms; Machine Learning; Manufacturing process; Energetic materials; Energy

REFERENCES:

1. <http://site.iugaza.edu.ps/ajubeh/files/2012/05/B00k-Mechanics-of-Materials-Mcgraw-2012-Ed6-978-0-07-338028-5.pdf>
2. https://books.google.com/books/about/Particle_Size_Measurements.html?id=ILx4GzA-7AUC
3. https://books.google.com/books/about/Chemical_Reactor_Modeling.html?id=mrP6RNajRs0C

TPOC-1: Rajen Patel

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TPOC-2: Jermaine Dunham

Email: Jermaine.a.dunham.civ@army.mil

A234-002 Non-Hydrofluorocarbon-Based Fire Extinguishing

OUSD (R&E) MODERNIZATION PRIORITY: General Warfighting Requirements

TECHNOLOGY AREA(S): Materials; Battlespace

TOPIC OBJECTIVE: The objective of this topic is to explore potential opportunities surrounding a non-HFC based fire extinguishing agent or system. This is needed for ground vehicle crew automatic fire extinguishing systems (AFES) to protect Soldiers and their equipment.

TOPIC DESCRIPTION: The Army relies on HFC-227ea for many of its safety-critical ground vehicle crew fire protection systems. However, production and import of hydrofluorocarbons (HFC) are now being phased down due to their high global warming potentials (GWP), as mandated by the Kigali Amendment to the Montreal Protocol and the American Innovation and Manufacturing (AIM) Act of 2020.

Development and fielding of non-HFC fire extinguishing systems directly supports Executive Order 14008: Tackling the Climate Crisis at Home and Abroad as well as the Army Climate Strategy. Meanwhile Section 103 of the Consolidated Appropriations Act, 2021 (P.L. 116-260) calls for an 85% phasedown of the production and import of HFCs by 2036.

- i. Executive Order 14008: Tackling the Climate Crisis at Home and Abroad, 2021. <https://www.federalregister.gov/documents/2021/02/01/2021-02177/tackling-the-climate-crisis-at-home-and-abroad>.
- ii. Department of the Army, Office of the Assistant Secretary of the Army for Installations, Energy and Environment. February 2022. United States Army Climate Strategy. Washington, DC.
- iii. Order 13990: Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis, 2021. 2021-01765.pdf (govinfo.gov)

Rather than relying on recovered HFCs or trying to establish a stockpile to address the impending shortages of these chemicals, our proposed strategy is to minimize, or eliminate, the Army's uses of HFC-227ea for ground vehicle crew fire protection applications.

PHASE I: Subscale proof of concept of extinguishing effectiveness. Once developed, the technology would be tested at the US Army Aberdeen Test Center in one of its full-scale testbeds for performance and safety. The Phase I Base amount must not exceed \$250,000 for a 12-month period of performance.

PHASE II: Full scale system demonstrated and tested in laboratory environment

- Phase II Sequential: Full scale system integrated and tested in vehicle
- Phase II Enhancement: Toxicology assessment, resolve any issues, document

PHASE III and DUAL USE APPLICATIONS: While many different industries will need to eventually switch to non-HFC extinguishers in the coming years, there remains barriers to adoption and scaling. Once capabilities of the system have been established, it would be integrated onto a ground vehicle(s) and evaluated against the Army's criteria.

KEYWORDS: Non-HFC; Fire Extinguish; Ground combat vehicles; Soldier safety

REFERENCES:

1. <https://www.congress.gov/committee-print/116th-congress/house-committee-print/42770>
2. <https://apps.dtic.mil/sti/citations/ADA517470#:~:text=Historically%20the%20US%20Army%20USA,of%20peacetime%20and%20combat%20fires.>

TPOC-1: Dr. Sebastian Karwaczynski

Email: Sebastian.k.karwaczynski.civ@army.mil

A234-003 Non-Refrigerant Based Cooling System for Cabin Cooling

OUSD (R&E) MODERNIZATION PRIORITY: General Warfighting Requirements

TECHNOLOGY AREA(S): Materials

TOPIC OBJECTIVE: The objective of this topic is to develop alternative air handling units or systems to cool the cabin area and/or electronics.

TOPIC DESCRIPTION: This topic calls for selected proposer(s) to design a non-refrigerant based low Global Warming Potential (GWP) Hydrofluorocarbon (HFC) Hydrofluoroolefin (HFO) free cooling system. HFC 134a is being phased out globally due to its high global warming potential (GWP), the automotive industry has switched over to HFO-1234yf which is flammable and not suitable for current military system designs.

The idea to design a non-refrigerant based cooling system directly supports the Army Climate Strategy. The HFC 134a phase down plan included in Section 103 of the Consolidated Appropriations Act, 2021 (P.L. 116-260) calls for a phase down of the production and import of HFC's down to 15% of the current levels by 2036.

Rather than trying to adapt military air conditioning system designs to address the flammability of HFO-1234yf, this design strategy is to eliminate the refrigerant loop altogether. A non-refrigerant based system would eliminate the need for the purchase and storage of refrigerants as well as the leakage issues of current systems. It would eliminate the need for large specialty equipment recovery machines which are required to maintain refrigerant systems, thus saving cost for Army wide infrastructure.

PHASE I: Quarter scale proof of concept version of cooling system. This would be tested in the Special Systems and Component Engineering (SSCE) laboratory in a thermal chamber for performance. The Phase I Base amount must not exceed \$250,000 for a 12-month period of performance.

PHASE II: Full size breadboard system tested in laboratory environment

- Phase II Sequential: Full size system installed in vehicle
- Phase II Enhancement: Resolve any issues, document, demonstrate in-vehicle performance

PHASE III and DUAL USE APPLICATIONS: As global regulations tighten around the kinds of refrigerants that can be used, all industries that require refrigeration in their operations will require a new, effective, and compliant refrigerant moving forward. However, widespread adoption and scalability remain concerns. This system would eventually be installed on a vehicle and evaluated for performance.

KEYWORDS: System cooling; Non-refrigerant; air conditioning; refrigerant loop

REFERENCES:

1. <https://www.exair.com/solutions/cooling-solutions.html>
2. <https://totech.com/peltier-thermoelectric-cooler-modules/>
3. <https://thermoelectricsolutions.com/list-of-thermoelectric-peltier-manufactures-companies-suppliers/>

TPOC-1: Dr. Sebastian Karwaczynski

Email: Sebastian.k.karwaczynski.civ@army.mil

DEPARTMENT OF THE ARMY
DoD 23.4 Small Business Innovation Research (SBIR) Annual BAA
Proposal Submission Instructions

INTRODUCTION

Where big ideas come to life, the Army SBIR and STTR programs align innovative small businesses with critical U.S. Army priorities to turnover game-changing solutions to our most critical customer – the soldier.

Proposers responding to a topic in this BAA must follow all general instructions provided in the Department of Defense (DoD) SBIR 23.4 Program BAA. The DoD 23.4 SBIR Program BAA can be found here: <https://www.defensesbirsttr.mil/SBIR-STTR/Opportunities/>. Army requirements in addition to or deviating from the DoD Program BAA are provided in the instructions below.

Specific questions pertaining to the administration of the Army SBIR Program and these proposal preparation instructions should be directed to: Dr. Ann-Kathryn Rockwell at ann.kathryn.rockwell.civ@aal.army.

December 06, 2022: Topic issued for pre-release

January 10, 2023: Army begins accepting proposals via DSIP

January 17, 2023: DSIP Topic Q&A closes to new questions at 12:00 p.m. ET

January 31, 2023: Deadline for receipt of proposals no later than 12:00 p.m. ET

From **December 06, 2022 to January 9, 2023**, this topic is issued for Pre-Release with the names of the topic authors. During the pre-release period, proposing firms have an opportunity to contact topic authors through <https://calendly.com/ak-rockwell-aal/dpms> to schedule a time to ask technical questions about the topic. Questions should be limited to specific information related to improving the understanding of the topic's requirement. Proposing firms may not ask for advice or guidance on solution approach and you may not submit additional material to the topic author. If information provided during an exchange with the topic author is deemed necessary for proposal preparation, that information will be made available to all parties through the DSIP Topic Q&A module.

Once the Army begins accepting proposals on **January 10, 2023**, no further direct contact between proposers and topic authors is allowed unless the Topic Author is responding to a question submitted during the pre-release period. However, proposers may submit written questions through the DSIP Topic Q&A module at <https://www.dodsbirsttr.mil/submissions/login>. The DSIP Topic Q&A for this topic opens on **December 06, 2022** and closes to new questions on **January 17, 2023 at 12:00PM ET**. Once the BAA closes to proposal submission, no communication of any kind with the topic author or through Topic Q&A regarding your submitted proposal is allowed.

Deadline for Receipt: Proposals must be **completely** submitted no later than **12:00 p.m.** ET, on **January 31, 2023**. Proposals submitted after 12:00 p.m. ET will not be evaluated. The final proposal submission includes successful completion of all firm level forms, all required volumes, and electronic corporate official certification.

PHASE I PROPOSAL GUIDELINES

The Defense SBIR/STTR Innovation Portal (DSIP) is the official portal for DoD SBIR/STTR proposal submission. Proposers are required to submit proposals via DSIP; proposals submitted by any other

means will be disregarded. Detailed instructions regarding registration and proposal submission via DSIP are provided in the DoD SBIR Program BAA.

Technical Volume (Volume 2)

The technical volume is not to exceed 10 pages and must follow the formatting requirements provided in the DoD SBIR Program BAA. Any pages submitted in excess of the 10 page limit will not be considered in proposal evaluations.

Content of the Technical Volume

Detailed Phase I proposal instructions can be found at: <http://aal.army/assets/files/pdf/sbir-phase-1-template.pdf>

Cost Volume (Volume 3)

The Phase I Base amount must not exceed \$150,000 for a 3 month period of performance. A no-cost two month PoP extension may be possible, based on progress.

Company Commercialization Report (CCR) (Volume 4)

Completion of the CCR as Volume 4 of the proposal submission in DSIP is required. Please refer to the DoD SBIR Program BAA for full details on this requirement. Information contained in the CCR will not be considered during proposal evaluations.

Supporting Documents (Volume 5)

Proposers can submit an optional slide deck of 10 slides in Volume 5: Supporting Documents. The slide deck can contain information on the technical approach, the team, commercialization plans, or relevant technology/research the proposers have developed, and it should contain additional/complementary information to the technical volume. If a proposer elects to submit a slide deck, its information will be used in the evaluation process. A sample Slide Deck template is located here: <http://aal.army/assets/files/pdf/sbir-optional-slide-template.pdf>.

PHASE II PROPOSAL GUIDELINES

Phase II proposals may only be submitted by Phase I awardees. Phase II proposal submission window, notification process, expected budget/duration structure and additional instructions will be provided in the Phase I contract or by subsequent notification.

DISCRETIONARY TECHNICAL AND BUSINESS ASSISTANCE (TABA)

The Army, at its discretion, may provide Technical and Business Assistance (TABA). The Army will select a preferred vendor(s) for the Army SBIR TABA program through a competitive process. Alternately, a small business concern may, by contract or otherwise, select one or more vendors to assist the firm in meeting the TABA goals. The Applicant must request the authority to select its own TABA provider in its Army SBIR proposal and must demonstrate that the vendor is uniquely postured to provide the specific technical and business services required. TABA funding will be denied if the offeror fails to include the cost and detailed explanation in its proposal.

Participation in the Army SBIR TABA program is voluntary for each Army SBIR awardee. Services provided to Army SBIR firms under the auspices of the TABA program may include, but are not limited to:

1. Access to a network of scientists, engineers, and technologists focused on commercialization and transition considerations such as protected supply chain management, advanced manufacturing, process/product/production scaling, etc;

2. Assistance with intellectual property protections, such as legal considerations, intellectual property rights, patent filing, patent fees, licensing considerations, etc;
3. Commercialization and technology transition support such as market research, market validation, development of regulatory or manufacturing plans, brand development;
4. Regulatory support such as product domain regulatory considerations, regulatory planning, and regulatory strategy development.

The Army SBIR program sponsors participation in the TABA program. The resource limitation for each firm is as follows:

- Phase I Firms:
 - Army-Preferred Vendor: If approved, the contractor may receive up to \$6,500 worth of assistance services per project per year (in addition to the base SBIR award amount).
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EVALUATION AND SELECTION

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As further prescribed in FAR 33.106(b), FAR 52.233-3, Protests after Award should be submitted to:

Email: usarmy.pentagon.hqda-asa-alt.mbx.army-applied-sbir-program@mail.mil

Mailing Address:

Army Applied SBIR Office
2530 Crystal Dr; Ste 11192
Arlington, VA 22202

AWARD AND CONTRACT INFORMATION

Please refer to Section 2.2, Three Phase Program provided in the DoD Program BAA for detailed information regarding SBIR/STTR phase structure and flexibility.

Applied SBIR Phase I Proposal Review v2-0-3 Evaluation Criteria Defined



| | | DEFINITION |
|----------------------------------|---|--|
| INTRODUCTION | <i>weight 5%</i> | Write a clear, concise description of what your innovation does or will do, and where you are in your evolution. Make clear its intended impact on the Army. Evaluators should "get it" after reading this. |
| POTENTIAL FOR ARMY IMPACT | OPERATIONAL IMPACT | At the scale of a single Army end-user, argue that their jobs or lives will be significantly improved if your solution is adopted. What is the impact of your solution for a soldier/Army civilian vs. today's solutions? |
| | POTENTIAL SCALE OF IMPACT | Here, we're looking for an idea of how broad the impact you described above could be. Look into the future to a time when your solution is both technically mature and actively in use by Army personnel. Describe the scale and scope of your impact within the context of the Army. |
| TECHNICAL FEASIBILITY | SCIENTIFIC FEASIBILITY | Is the science behind the solution sound? Convince readers who don't have deep expertise in your field that your innovation is built atop sound scientific and engineering principles. |
| | ENABLING TECHNOLOGIES | Point to the foundational technologies that you rely on to deliver your solution. Do the required enabling technologies introduce added risk? Using proven (and ideally Army-fielded) underlying technologies and techniques helps to lower technical risk. |
| | ALTERNATIVE TECHNICAL APPROACHES | From a technologist's perspective, why is your proposed solution the best choice for the Army? Refute the alternative engineering approaches others are using. Why does your technology win? |
| | TECHNICAL RISK MITIGATION | No matter your current technology readiness level, technical risks remain. Identify those risks. Present a credible plan to tackle those risks. |
| TRANSITION | ARMY TRANSITION PATHWAY | Planning for success, what's next for you after this SBIR award? Describe the next type of deal you aim to make with the Army, e.g. a CRADA, a different SBIR contract, a CSO, etc. Briefly outline your current plan to unlock that next opportunity and/or share the biggest risks you see post this SBIR award. |
| | SBIR MILESTONE SCHEDULE | Please share with us a thoughtful execution plan. Strike a balance between giving us a sense of the detailed thinking behind the scenes and the need for your contracting officer to manage a reasonably small number of milestones during your period of performance. |
| FIRM CASH FLOW | FIRM SURVIVAL RISK | SBIR funds are meant to fuel growth rather than stave off a firm's impending financial failure. Demonstrate that your company will survive financially as a going concern through the early stages of a Phase III contract, sometimes referred to as "transitioning" into use by Army personnel. |
| | OTHER PEOPLE'S MONEY | Make the case that non-Army and/or non-DoD dollars will continue to fund improvements to your solution from which the Army will benefit in the future. Companies who cannot demonstrate non-Army and/or non-DoD funding sources for future solution enhancements are less attractive to the Applied SBIR program. |
| | FINANCIAL PROFIT POTENTIAL | Through the Applied SBIR program, the Army wants to take advantage of the speed and scalability of dual-use companies. Make your best case that your product is or will be profitable. If you have more than one product, please focus your argument on the product / solution presented for this SBIR program. |
| TEAM ABILITY | <i>weight 10%</i> | Prove your team has executed well as a group. Please draw clear distinctions between private sector, DoD and civilian government work. What milestones have you accomplished as a group in this company? |
| SUBMISSION QUALITY | QUALITY OF PROSE | Prove you write clearly. Prove you argue convincingly. |
| | DATA QUALITY & ATTRIBUTION | Support your arguments with relevant, properly attributed data to enhance your credibility. |

Army SBIR 23.4 Topic Index
Release 2

A234-004 Diver Performance Monitoring System

OUSD (R&E) MODERNIZATION PRIORITY: Biotechnology

TECHNOLOGY AREA(S): Sensors; Electronics; Information Systems

OBJECTIVE:

Develop a solution that monitors relevant physiological markers and can alert divers of predetermined thresholds on risk. This solution includes form factor developments, accurate biomarker readings from sensors, durability for fresh, chlorinated, and salt-water environments, and on device computing to activate alerts based on predetermined thresholds.

DESCRIPTION: Despite significant safety and overwatch, fatalities of student divers occasionally occur during training, with causes unknown in some cases. It is necessary to accurately monitor student biomarkers to determine when to alert nearby instructors and safety divers as special operations diving safety is paramount. Technology enabling systems that can alert divers in multiple environments can provide another tool for the military to use to ensure safe operations in high risk, high stress environments. Desired capabilities are broken up into critical, essential, and enhancing to articulate the minimum acceptable capabilities up to fully desired capabilities for product development.

Critical (essential needs/must have):

- Accurate measurement of the following vital signs in fresh and chlorinated environments
 - Heart rate tracking
 - Within 5 beats of clinical-grade device
 - Blood or tissue oxygen saturation - SpO2/StO2 (within 2-5% of clinical-grade device)
- Bluetooth and/or WiFi capabilities for transferring recorded data
- Capable of implementing compatibility with the USSOCOM Human Performance Data Management System (HPDMS), i.e. Smartabase (API)
- 24-hour continuous runtime
- Adequate storage to capture 24 hours of critical data

Desired (strongly wanted features):

- Accurate measurement of the following vital signs in fresh, chlorinated and salad water
 - Heart rate tracking
 - Within 5 beats of clinical-grade device
 - Blood or tissue oxygen saturation - SpO2/StO2 (within 2-5% of clinical-grade device)
- Heart Rate Variability (HRV)
 - Sampling rate 500-1000Hz (can record data at a lower rate)
- Present real-time physiological data to the user on a wearable display
- Accurate measurement of water depth and ambient temperature (air or water)
- Ability to set alert thresholds (preferably by a dive instructor)
 - Instructors will edit thresholds in HPDMS
- Ability to alert the wearer
 - Instructors will have ability to toggle alert
- Ability to alert nearby divers underwater of the wearers alert condition
- Functional at depths up to 130ft
- Functional at water temperatures between 34^o-100^o F
- Accurate respiratory rate measurement in fresh, chlorinated, and saltwater environments

Enhancing (increases value to the user):

- Skin temperature measurement in fresh, chlorinated, and saltwater environments
- Core temperature measurement in fresh, chlorinated, and saltwater environments
- Ability to measure any other parameters vendors deem important
- Any other additional features vendors propose as potentially useful

Constraints:

- The device cannot interfere with training or other gear (BCD, dive computer, mask, etc.)
- The device shall minimize the use of buttons to display physiological parameters

PHASE I:

Design a proof-of-concept solution for a device capable of accurately monitoring physiological markers vendors conclude are necessary (e.g. heart rate, SpO₂, etc.) which can alert divers and instructors on predetermined thresholds of risk. The design should include, but not limited to, accurate measurements of heart rate and SpO₂ or StO₂ (in dry, fresh, and chlorinated environments), Bluetooth and/or WiFi capabilities, battery life and memory for a 24-hour continuous runtime, and should be capable of interfacing with the Human Performance Data Management System (HPDMS), i.e. Smartabase (API). The device can be standalone or integrated with standard dive equipment. Other features, capabilities, and/or solutions not addressed in this solicitation that vendors determine will be beneficial to improving safety of Army divers are encouraged.

Phase I will award \$150,000 over a 3-month period of performance (PoP). The 3 month period will include several virtual sessions with TPOCs and an option to travel to San Diego to assist with refinement of a final presentation on month 3. The final presentation will take into account adjustments to approach, desire to work with other vendors to solve the proposed problem, and cost effectiveness of the solution.

Proposals will be evaluated on a holistic basis based on their relevance, total cost, developmental timeline, ability to integrate into a system of systems, modularity, compatibility with open architecture, and any additional features the proposer includes.

Companies can voluntarily participate in the Army Applications Laboratory (AAL) 12-week cohort program. The AAL cohort program is designed to solve specific Army modernization challenges on a compressed timeline. The cohort program matches qualified companies with Army problems owners to speed capability development, accelerate transition, and de-risk or inform requirements. This program is designed for businesses that own unique, applicable technology and are interested in growing a new line of business into the DoD.

The cohort program will enhance technology development through the rapid exposure to Army stakeholders and the sustainment, maneuver, and robotics acquisition communities. Planned activities include a problem topic deep dive, a field week with Army sustainment and maneuver leaders and soldiers, hands-on experience with currently fielded military equipment and weapon systems, and stakeholder engagement from the requirements writer to acquisition manager to the end-user. An example cohort program for this topic is:

Week 1 – Orientation and problem deep dive (virtual)

Week 2 – Soldier Touchpoint (in-person at a military installation)

Week 3-6 – Concept research and planning

Week 7 – Mid-point concept design brief to stakeholders and SME roundtable discussion (virtual)

Week 8-11 – Concept design refinement

Week 12 – Final concept design brief to Army Senior Leaders (virtual)

Cohort programming will be provided free of charge. Proposers that plan to participate in the cohort (if awarded a Phase I) are encouraged to include travel costs for one cohort trip, within the continental US, of

4-5 days each for in-person programming. In-person events may be substituted for virtual events depending on COVID-19 travel restrictions. Details will be provided to awardees under this topic at Phase I award.

PHASE II:

Demonstrate a prototype device capable of monitoring physiological markers, established in Phase I, which can alert divers on predetermined thresholds of risk. Vendors will have quarterly touchpoints with military stakeholders and develop said prototype to conform to listed parameters throughout the 21-month PoP. Soldier touchpoints will be provided free of charge. Proposers that plan to participate in the Soldier touchpoints (if awarded a Phase II) are encouraged to include travel costs for 7 touchpoints, within the continental US, of 1-2 days each for in-person events. It is incumbent on the vendor to provide proposed, iterative deliverables over the PoP (or sooner) to complete the identified solution. Vendors will interact with military diving experts prior to delivering physical solutions to combat divers. Potential solutions can iterate and the ability to test potential solutions with a military unit is available free of charge. Solutions will be evaluated in priority of critical, essential, and enhancing priorities. Access to military diving experts during the touchpoints for feedback is free of charge, and companies should include the estimated cost of travel (assume quarterly multi day trips to various dive training locations such as San Diego, Key West, Panama City, or Pensacola for set-up, iterative prototyping, final product delivery & testing) to these touchpoints in their budget.

In addition to the Phase II deliverable of a prototype for extended Soldier touch points, companies will provide deliverable and final reports detailing performance and associated deliverables, any iterative adjustments based on user feedback, and final product details. The final report should also include plans to adopt the solution onto a military network with associated security protocols and logical access points.

PHASE III:

The objective of Phase III, where appropriate, is for the small business to pursue commercialization objectives through the effort by improving the device and developing the technology to TRL 7 and document the final design. Companies will iterate on and deliver final prototypes, make modifications to adapt to the required COTS wearables as identified through extended Soldier touch points and create a viable prototype for combat divers in various underwater scenarios. Prototypes shall be in their final form factor, capable of being worn and used by divers, and may be subjected to environmental testing at the government's discretion.

Phase III deliverables include integration with USSOCOM Human Performance Data Management System (HPDMS), i.e. Smartabase (API), user documentation, and prototype(s) for demonstration and government-sponsored testing.

WEBINAR DATE:

Tuesday December 13, 2022 10:00 am CT

To learn more about this topic, and ask questions of Army stakeholders involved in the project register for a webinar: <https://diver-performance.eventbrite.com>

The Link to the video recording of the webinar will be posted in the DSIP portal in the days following.

KEYWORDS: Human performance optimization, HPO, underwater sensors, under water, underwater, sensor, HP, high risk, high stress, combat diver, heart rate, SpO2, StO2

REFERENCES

1. [Optimizing sampling rate of wrist-worn optical sensors for physiologic monitoring | Journal of Clinical and Translational Science | Cambridge Core](#)
2. [Wearable Pulse Oximeter for Swimming Pool Safety - PMC \(nih.gov\)](#)

3. [Frontiers | Using Underwater Pulse Oximetry in Freediving to Extreme Depths to Study Risk of Hypoxic Blackout and Diving Response Phases \(frontiersin.org\)](#)
4. [The Dewey Monitor: Pulse Oximetry can Warn of Hypoxia in an Immersed Rebreather Diver in Multiple Scenarios | SpringerLink](#)
5. [AAL | Resource Center](#)
6. <http://aal.army/assets/files/pdf/sbir-phase-1-template.pdf>
7. <http://aal.army/assets/files/pdf/sbir-optional-slide-template.pdf>

DEPARTMENT OF THE ARMY
DoD 23.4 Small Business Innovation Research (SBIR) Annual BAA
Release 3
Proposal Submission Instructions

INTRODUCTION

Where big ideas come to life, the Army SBIR and STTR programs align innovative small businesses with critical U.S. Army priorities to turnover game-changing solutions to our most critical customer – the soldier.

Proposers responding to a topic in this BAA must follow all general instructions provided in the Department of Defense (DoD) SBIR 23.4 Program BAA. The DoD 23.4 SBIR Program BAA can be found here: <https://www.defensesbirsttr.mil/SBIR-STTR/Opportunities/>. Army requirements in addition to or deviating from the DoD Program BAA are provided in the instructions below.

Specific questions pertaining to the administration of the Army SBIR Program and these proposal preparation instructions should be directed to: Dr. Zach Harrell at zach.harrell.civ@aal.army

December 7, 2022: Topic issued for pre-release

January 17, 2023: Army begins accepting proposals via DSIP

January 24, 2023: DSIP Topic Q&A closes to new questions at 12:00 p.m. ET

February 14, 2023: Deadline for receipt of proposals no later than 12:00 p.m. ET

From **December 7, 2022 to January 16, 2023**, this topic is issued for Pre-Release with the names of the topic authors. During the pre-release period, proposing firms have an opportunity to contact topic authors through <https://calendly.com/zach-harrell-aal> to schedule a time to ask technical questions about the topic. Questions should be limited to specific information related to improving the understanding of the topic's requirements. Proposing firms may not ask for advice or guidance on solution approach and you may not submit additional material to the topic author. If information provided during an exchange with the topic author is deemed necessary for proposal preparation, that information will be made available to all parties through the DSIP Topic Q&A module.

Once the Army begins accepting proposals on **January 17, 2023**, no further direct contact between proposers and topic authors is allowed unless the Topic Author is responding to a question submitted during the pre-release period. However, proposers may submit written questions through the DSIP Topic Q&A module at <https://www.dodsbirsttr.mil/submissions/login>. The DSIP Topic Q&A for this topic opens on **December 7, 2022** and closes to new questions on **January 24, 2023 at 12:00PM ET**. Once the BAA closes to proposal submission, no communication of any kind with the topic author or through Topic Q&A regarding your submitted proposal is allowed.

Deadline for Receipt: Proposals must be **completely** submitted no later than **12:00 p.m.** ET, on **February 14, 2023**. Proposals submitted after 12:00 p.m. ET will not be evaluated. The final proposal submission includes successful completion of all firm level forms, all required volumes, and electronic corporate official certification.

PHASE I PROPOSAL GUIDELINES

The Defense SBIR/STTR Innovation Portal (DSIP) is the official portal for DoD SBIR/STTR proposal submission. Proposers are required to submit proposals via DSIP; proposals submitted by any other

means will be disregarded. Detailed instructions regarding registration and proposal submission via DSIP are provided in the DoD SBIR Program BAA.

Technical Volume (Volume 2)

The technical volume is not to exceed 10 pages and must follow the formatting requirements provided in the DoD SBIR Program BAA. Any pages submitted in excess of the 10 page limit will not be considered in proposal evaluations.

Content of the Technical Volume

Detailed Phase I proposal instructions can be found at: <http://aal.army/assets/files/pdf/sbir-phase-1-template.pdf>

Cost Volume (Volume 3)

The Phase I Base amount must not exceed \$200,000 for a 3 month period of performance (PoP). A no-cost two month PoP extension may be possible, based on progress.

Company Commercialization Report (CCR) (Volume 4)

Completion of the CCR as Volume 4 of the proposal submission in DSIP is required. Please refer to the DoD SBIR Program BAA for full details on this requirement. Information contained in the CCR will not be considered during proposal evaluations.

Supporting Documents (Volume 5)

Proposers can submit an optional slide deck of 10 slides in Volume 5: Supporting Documents. The slide deck can contain information on the technical approach, the team, commercialization plans, or relevant technology/research the proposers have developed, and it should contain additional/complementary information to the technical volume. If a proposer elects to submit a slide deck, its information will be used in the evaluation process. A sample Slide Deck template is located here: <http://aal.army/assets/files/pdf/sbir-optional-slide-template.pdf>.

PHASE II PROPOSAL GUIDELINES

Phase II proposals may only be submitted by Phase I awardees. Phase II proposal submission window, notification process, expected budget/duration structure and additional instructions will be provided in the Phase I contract or by subsequent notification.

DISCRETIONARY TECHNICAL AND BUSINESS ASSISTANCE (TABA)

The Army, at its discretion, may provide Technical and Business Assistance (TABA). The Army will select a preferred vendor(s) for the Army SBIR TABA program through a competitive process. Alternatively, a small business concern may, by contract or otherwise, select one or more vendors to assist the firm in meeting the TABA goals. The Applicant must request the authority to select its own TABA provider in its Army SBIR proposal and must demonstrate that the vendor is uniquely postured to provide the specific technical and business services required. TABA funding will be denied if the offeror fails to include the cost and detailed explanation in its proposal.

Participation in the Army SBIR TABA program is voluntary for each Army SBIR awardee. Services provided to Army SBIR firms under the auspices of the TABA program may include, but are not limited to:

1. Access to a network of scientists, engineers, and technologists focused on commercialization and transition considerations such as protected supply chain management, advanced manufacturing, process/product/production scaling, etc;

2. Assistance with intellectual property protections, such as legal considerations, intellectual property rights, patent filing, patent fees, licensing considerations, etc;
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Applied SBIR Phase I Proposal Review v2-0-3 Evaluation Criteria Defined



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| | DATA QUALITY & ATTRIBUTION | Support your arguments with relevant, properly attributed data to enhance your credibility. |

**Army SBIR 23.4 Topic Index
Release 3**

A234-005 Holistic Health and Fitness Readiness Kit

OUSD (R&E) MODERNIZATION PRIORITY: Advanced Materials

TECHNOLOGY AREA(S): Advanced Materials

OBJECTIVE:

Develop a solution to provide the requisite infrastructure for the Holistic Health and Fitness (H2F) Soldier Performance Readiness Center (SPRC). This facility has several critical requirements, but key innovation is focused on construction materials and techniques that drive the overall cost of the structure significantly below Army costs of ~\$16M. Additionally, the solution should be developed with efficiency in maintenance and operating costs over a period of 25 years. This solution is to be implemented in the harshest climates of US Army installations ranging from heavy snow and wind to high heat and humidity.

DESCRIPTION: The Army's Holistic Health and Fitness Program is missioned to resource 110 brigades across the Army by FY2030 with people, equipment, and facilities. Specifically to facilities, H2F has designed and budgeted for SPRCs for each brigade at 43,189 square feet. Unfortunately due to traditional construction costs and requirements from existing construction contracts, the facility as designed has an unfeasible cost of over \$16 million. Without a different solution in construction materials/techniques, the program office will need to continue forward with a facility of less than half the size. This equates individuals within brigades using the SPRC 2-3 times per week to only having access once every 10 days. In reference to human performance across all five domains of health and fitness (physical, mental, nutrition, sleep, and spiritual), the SPRC is the primary facility meant to service Soldiers for their holistic health, enable appropriate levels of readiness, and improve their human performance baseline to accomplish the mission.

Key Capabilities include:

Critical:

- 43,183 sf minimum with 16ft clear ceiling height in Zone 3 of the Physical Training Area.
- Must withstand wind gusts of 115 mph for minimum of 3 second gusts.
- Must handle a minimum of 15-92 pounds per square foot of snow load on the roof, depending on final project site.
- Must follow anti-terrorism force protection per UFC 04-010-01 02 (30 JUL 2022)
- Must include a fire protection system for safety purposes, following UFC 3-600-01 (06 MAY 2021).
- Must include costs for foundation preparation and installation. Unique approaches to foundation are encouraged.
- Must have commercial internet established for low cost upkeep with end-user.
- Energy efficiency ratings will meet or exceed traditional "brick & mortar" standards for environmental control.
- Must include all plumbing and electrical connections for HVAC, hygiene (hand washing, drinking water stations, restrooms), and lighting.

Desired:

- 25-year warranty on major structural defects to include enclosure materials (roofing/siding).

Enhancing:

- 25-year warranty on defects in wiring, piping, and ductwork in the electrical, plumbing, heating, cooling, ventilating, and mechanical systems.

- 3-year warranty on defects in workmanship and materials such as facility equipment, finishes, doors & windows.

PHASE I:

Design a proof-of-concept solution for a full scale prototype facility to service the required throughput in H2F designed programming. Other features, capabilities, and/or solutions not addressed in this solicitation that vendors determine will be beneficial to improving safety of Army Soldiers are encouraged.

Phase I will award up to \$200,000 over a 3-month period of performance (PoP). The 3 month period will include several virtual sessions with TPOCs and an option to travel to Fort Benning, GA to assist with refinement of a final presentation on month 3. The final presentation will take into account adjustments to approach, ability to innovate on semi-permanent/semi-portable techniques, and cost effectiveness of the solution.

Proposals will be evaluated holistically based on their relevance, total cost, development timeline, material uses, foundational preparation and establishment, and additional features the proposer includes.

Week 1 – Orientation and problem deep dive (virtual)

Week 2 – Soldier Touchpoint (in-person at a military installation)

Week 3-6 – Concept research and planning

Week 7 – Mid-point concept design brief to stakeholders and SME roundtable discussion (virtual)

Week 8-11 – Concept design refinement

Week 12 – Final concept design brief to Army Senior Leaders (virtual)

PHASE II:

Demonstrate a full scale prototype facility, established in Phase I, to service the required throughput in H2F designed programming. Vendors will deploy to a specified site location (either Fort Drum, Fort Bragg, or Fort Benning), prepare the ground, build the foundation and structure for testing. The target timeline for this activity is the first 6 months of the PoP. Vendors will have direct interaction with units and facilities managers at the specified site throughout the PoP. Upon completion of the build, the facility will be tested with the associated operational brigade for 9 months to ensure effective construction and can withstand heavy throughput.

If awarded for phase II, proposers are encouraged to include travel costs for the project development throughout the build, along with 3 quarterly touch points for operational unit feedback on the prototype. Assume 1-2 days for each in-person touch point at whichever location selected to perform (Fort Drum, Fort Bragg, or Fort Benning). Vendors will interact with military H2F professionals, leaders, and facilities experts at each installation. Solutions will be evaluated in priority of critical, desired, and enhancing priorities. Companies should include the estimated cost of travel for build and quarterly touchpoints at the specified location in their budget.

In addition to the Phase II deliverable of a prototype for extended Soldier touch points, companies will provide deliverable and final reports detailing performance and associated deliverables, any iterative adjustments based on user feedback, and final product details. The final report should also include price structures, cost sheets itemized, and design documentation with any adjustments due to environmental considerations by location.

PHASE III:

The objective of Phase III, where appropriate, is for the small business to pursue commercialization objectives through the effort by improving the sourcing, design, technique, or actual materials to develop

the technology to Technology Readiness Level 7 and document the final design. Companies will deliver final prototypes, make modifications to adapt the facility to different environments, or customize the facility for specific unit needs. Prototypes are to be subjected to environmental testing at the government's discretion.

Phase III deliverables include final price structures, full scale prototype with final design documentation, and a cost sheet itemized for consideration.

WEBINAR DATE:

Wednesday Jan 11, 2023 11:00 am CT

To learn more about this topic, and ask questions of Army stakeholders involved in the project register for a webinar: <https://H2FReadinessKit.eventbrite.com>

The Link to the video recording of the webinar will be posted in the DSIP portal in the days following.

KEYWORDS: Human performance optimization, HPO, construction, advanced materials, foundation, materials, utilities, structure, facility

REFERENCES

1. SPRC Army Standard, 05 MAY 2021
<https://mrsi.erd.c.dren.mil/cos/hnc/sprc/>
2. SPRC Standard Design, 30 SEP 2021
https://rfpwizard.mrsi.erd.c.dren.mil/MRSI/content/cos/hnc/sprc/Library/Standard%20Designs/Standard_Design_SPRC_Medium_Sept_2021.pdf
3. UFC 04-010-01 DoD Minimum Antiterrorism Standards for Buildings, with Change 2
<https://www.wbdg.org/ffc/dod/unified-facilities-criteria-ufc/ufc-4-010-01>
4. UFC 3-600-01 Fire Protection Engineering for Facilities, with Change 6, 06 MAY 2021
<https://www.wbdg.org/ffc/dod/unified-facilities-criteria-ufc/ufc-3-600-01>
5. <https://www.nrel.gov/docs/fy22osti/82447.pdf>

DEPARTMENT OF THE ARMY
DoD 23.4 Small Business Innovation Research (SBIR)
Annual Broad Agency Announcement (BAA)
Component-Specific Proposal Instructions
Release 4

December 15, 2022: Topics issued for pre-release
January 10, 2023: Army begins accepting proposals via DSIP
January 17, 2023: DSIP Topic Q&A closes to new questions at 12:00 p.m. ET
January 31, 2023: Deadline for receipt of proposals no later than 12:00 p.m. ET

INTRODUCTION

The future Army must be capable of conducting Multi-Domain Operations (MDO) as part of an integrated Joint Force across an array of situations in multiple theaters by 2035. The MDO concept describes how the Army will support the Joint Force in the rapid and continuous integration of all domains of warfare – land, sea, air, and cyberspace – to deter and prevail as we compete short of conflict, and fight and win if deterrence fail. The Army must provide game-changing capabilities to our Soldiers. To capitalize on small business innovation, the Army has implemented an approach to advertise SBIR funding opportunities through the Department of Defense (DoD) Annual BAA process, outside of the three pre-determined BAA cycles. This approach also strives to create a more rapid award time from solicitation to closing.

CONTACT INFORMATION

Direct Specific questions pertaining to the administration of the Department of the Army SBIR Program and proposal preparation instructions to the Point of Contact identified in the Topic announcement. General questions can be directed to the following:

Email: usarmy.pentagon.hqda-asa-alt.mbx.army-applied-sbir-program@army.mil
Website: <https://www.armysbir.army.mil/>
Mailing Address:
Army Applied SBIR Office 2530 Crystal Dr; Ste 11192
Arlington, VA 22202

RESPONSIVENESS AND TIMELINESS

All proposals will be evaluated and judged on a competitive basis. Proposals will only be evaluated in response to an active, corresponding Army topic. Proposals will be initially screened to determine responsiveness and timeliness. Proposals passing this initial screening will be technically evaluated by engineers or scientists to determine the most promising technical and scientific approaches. Assessment of responsiveness may continue during technical evaluation and after selection. If at any point the proposal is deemed untimely, unresponsive, ineligible, or non-responsible, the proposal will be rejected / the contract action will be cancelled.

Interested firms shall follow the DoD Program BAA instructions as well as the Army's component-specific proposal instructions herein, when preparing and submitting proposals. The DoD 23.4 SBIR Program BAA can be found here: <https://www.defensesbirsttr.mil/SBIR-STTR/Opportunities/>.

SYSTEM FOR AWARD MANAGEMENT (SAM)

Interested firms are required to be registered in SAM (www.sam.gov) before submitting a proposal and shall continue to be registered until time of award, during performance, and through final payment of any contract.

PHASE I PROPOSAL INSTRUCTIONS

The Defense SBIR/STTR Innovation Portal (DSIP) is the official portal for DoD SBIR/STTR proposal submission. Proposers (also referred to herein as “offeror(s)”) are required to submit proposals via DSIP; proposals submitted by any other means will be disregarded. Detailed instructions regarding registration and proposal submission via DSIP are provided in the DoD SBIR Program BAA.

Proposal Coversheet (Volume 1)

The proposal coversheet must follow the instructions and requirements provided in the DoD SBIR Program BAA.

The offeror shall certify that to the best of its knowledge and belief, its eligibility information under the SBIR Program is accurate, complete, and current as of the date of the offer.

Technical Volume (Volume 2)

The technical volume is not to exceed 5 pages and must follow the formatting requirements provided in the DoD SBIR Program BAA. A commercialization plan must also accompany the technical proposal and shall be no more than 8 slides. The commercialization plan must be converted to a pdf and attached to the end of the technical volume, resulting in one pdf file to be uploaded to DSIP as Volume 2. The commercialization plan does not count towards the technical volume 5-page limit. Any proposals submitted without a commercialization plan or in a format other than that provided by the BAA will not be reviewed.

Content of the Technical Volume

The Technical Volume shall contain three key sections – technical approach, team qualifications and commercialization section. The technical approach section shall contain details on how the proposer is going to solve the problem. It shall detail key elements of the firm’s approach, any risks, relevant past work and how success is measured. The team qualifications section shall highlight the key personnel working on the project, and the resources that will be brought to bear on solving the problem. The commercialization plan shall include:

- **Company information**: Focused objectives/core competencies; specialization area(s); products with significant sales; and history of previous Federal and non-Federal funding, regulatory experience, and subsequent commercialization successes.
- **Customer and Competition**: Clear description of key technology objectives, current competition, and advantages compared to competing products or services; description of hurdles to acceptance of the innovation.
- **Market**: Milestones, target dates, analyses of market size, and estimated market share after first year sales and after 5 years; explanation of plan to obtain market share.
- **Intellectual Property**: Patent status, technology lead, trade secrets or other demonstration of a plan to achieve sufficient protection to realize the commercialization stage and attain at least a temporal competitive advantage.
- **Financing**: Plans for securing necessary non-SBIR funding.
- **Assistance and mentoring**: Plans for securing needed technical or business assistance through mentoring, partnering, or through arrangements with government sponsored (e.g., State assistance programs, Federally-funded research laboratories, Manufacturing Extension

Partnership centers), not-for-profits (e.g., SBDC), commercial accelerators, DOD Prime Contractors, or other assistance provider.

These instructions supersede those stated in section 5.3.c of the DoD Program BAA.

Cost Volume (Volume 3)

The Cost Volume must follow all instructions and requirements provided in the DoD SBIR Program BAA. Supplemental requirements are as follows:

Unless otherwise noted in the topic, the Phase I Base amount must not exceed \$250,000 for a 6-month period of performance. Phase I Options are not anticipated at this time. If an option is identified in the topic posting, costs for the Base and Option must be separated and clearly identified on the Proposal Cover Sheet (Volume 1) and in Volume 3. Awards for these topics will be in the form of a firm fixed price contract.

Please review the updated Percentage of Work (POW) calculation details included in section 5.3 of the DoD Program BAA. Army Applied SBIR will occasionally accept deviations from the POW requirements with written approval from the Funding Agreement officer.

For pricing purposes, offerors shall assume a contract or agreement start date of approximately ninety (90) days after submission of the proposal. For this BAA, adequate price competition (APC), as defined in FAR 15.403-1(c), is anticipated. In the event that adequate price competition is not realized (i.e. only one proposal is received for a given topic), the Government may choose to conduct additional proposal analysis, in accordance with the techniques identified at FAR 15.404-1. Additionally, offerors are to provide any current Forward Pricing Rate Agreements (FPRA) in effect at time of proposal submission.

Content of the Cost Volume (Volume 3)

ALL proposed costs should be accompanied by documentation to substantiate how the cost was derived. Substantiating documentation guidance is as follows:

- **LABOR:**
 - List all key personnel by name as well as by number of hours dedicated to the project as direct labor.
 - Explain the basis of proposed labor hours, including required tasks, and substantiating documentation for the costs (e.g. payroll reports). Volume 5, Supporting Documents, may be used if additional space is needed.
- **MATERIAL/TOOLING/EQUIPMENT:**
 - Explain the basis of proposed material and equipment costs. This support should include a consolidated priced summary of individual material and equipment quantities and substantiating documentation for the costs (e.g. vendor quotes, invoice prices, competitive bids, etc.). If your choice isn't the lowest cost available, explain the decision to choose one item or supplier over another. Volume 5, Supporting Documents, may be used if additional space is needed.
 - Ensure all materials are American-made to the maximum extent practicable.

Offerors who propose to use a foreign-made product in its technology may be required to find an American-made equivalent.

- While special tooling and test equipment and material cost may be included, it will be carefully reviewed relative to need and appropriateness for the work proposed. The purchase of special tooling and test equipment must, in the opinion of the Component Contracting Officer, be advantageous to the Government and should be related directly to the specific topic. These may include such items as innovative instrumentation or automatic test equipment. Title to property furnished by the Government or acquired with Government funds will be vested with the DoD Component, unless it is determined that transfer of title to the contractor would be more cost effective than recovery of the equipment by the DoD Component.
- TRAVEL:
 - Explain the basis of proposed travel, including to/from locations, number of trips, number of travelers per trip, and number of days/nights per trip. Include substantiating documentation for the costs (e.g. screenshots of flight cost comparison, rental car quotes, etc.). NOTE: Virtual meetings shall be utilized to the maximum extent practicable. Volume 5, Supporting Documents, may be used if additional space is needed.
- SUBCONTRACTS: A subcontract is any agreement, other than one involving an employer-employee relationship, entered into by the prime contractor (awardee) calling for supplies or services for the performance of the contract.
 - All subcontractor costs and consultant costs must be detailed at the same level as prime contractor costs in regard to labor, travel, equipment, etc.
 - Explain the basis of proposed subcontract costs. Include documented support of the offeror's price analyses and degree of competition of all subcontractor proposals. All subcontractor costs and consultant costs, such as labor, travel, equipment, materials, must be detailed at the same level as prime contractor costs. Provide detailed substantiation of subcontractor costs in your cost proposal. Volume 5, Supporting Documents, may be used if additional space is needed.
 - Certify that the following requirements are met: For Phase I, the offeror must perform a minimum of two-thirds of the research and/or analytical effort. One third may be subcontracted to another firm or research organization/facility. The percentage of work is measured by both direct and indirect costs.
 - Offerors shall not propose to subcontract to the issuing agency, to any other Federal Government agency, or to other units of the Federal Government, except Federal Laboratories in rare circumstances. As defined in 15 U.S.C. 3703, Federal Laboratory means any laboratory, any federally funded research and development center, or any center established under 15 U.S.C. 3705 and 3707 that is owned, leased, or otherwise used by a Federal Agency

and funded by the Federal Government, whether operated by the Government or by a contractor.

- Offerors shall not propose to subcontract to any prohibited sources. Proposals identifying a subcontractor/vendor arrangement with a prohibited source may be rejected.
 - Offerors shall ensure subcontracting arrangements are with United States Small Businesses to the maximum extent practicable. Offerors proposing a subcontractor arrangement with other than a United States Small Business (such as, a large business, foreign firm, foreign government, educational institution, unit of Federal Government, etc.) may be required to submit further explanation.
- **INDIRECT COSTS:**
 - Explain the basis of the proposed indirect expense rates including overhead, general and administrative, material handling, and fringe benefits.
 - If a Defense Contract Audit Agency (DCAA) Audit has been conducted within the last five (5) years, include the audit compliance documentation in the cost proposal documents. The documentation should also include the offeror's DCAA Point of Contact (if applicable).

If selected, failure to include the documentation with your proposal may delay contract award, as the proposer will be asked to submit the necessary documentation to the Contracting Officer to substantiate costs. It is important to respond as quickly as possible to the Contracting Officer's request for documentation. Failure or refusal to provide documentation may result in cancellation of the contract action.

Company Commercialization Report (CCR) (Volume 4)

Completion of the CCR as Volume 4 of the proposal submission in DSIP is required. Please refer to the DoD SBIR Program BAA for full details on this requirement. Information contained in the CCR will be considered by the Department of the Army during proposal evaluations.

Supporting Documents (Volume 5)

Volume 5 is provided for proposers to submit additional documentation to support the Cover Sheet (Volume 1), Technical Volume (Volume 2), and the Cost Volume (Volume 3). In addition to the Volume 5 requirements outlined in the DoD Program BAA, the Department of the Army may accept the following documents in Volume 5:

- Additional Cost Information
- Funding Agreement Certification
- Technical Data Rights (Assertions)
- Lifecycle Certification
- Allocation of Rights
- Other (only as specified in the topic)

Please only submit documents that are identified immediately above and in the DoD Program BAA. All other documents submitted will be disregarded.

PHASE II PROPOSAL INSTRUCTIONS

Phase II proposals may only be submitted by Phase I awardees. Phase II proposal submission window, notification process, expected budget/duration structure and additional instructions will be provided in the Phase I contract or by subsequent notification.

DISCRETIONARY TECHNICAL AND BUSINESS ASSISTANCE (TAB A)

The Army, at its discretion, may provide Technical and Business Assistance (TAB A). The Army will select a preferred vendor(s) for the Army SBIR TAB A program through a competitive process. Alternately, a small business concern may, by contract or otherwise, select one or more vendors to assist the firm in meeting the TAB A goals. The Applicant must request the authority to select its own TAB A provider in its Army SBIR proposal and must demonstrate that the vendor is uniquely postured to provide the specific technical and business services required. TAB A funding will be denied if the offeror fails to include the cost and detailed explanation in its proposal.

Participation in the Army SBIR TAB A program is voluntary for each Army SBIR awardee. Services provided to Army SBIR firms under the auspices of the TAB A program may include, but are not limited to:

1. Access to a network of scientists, engineers, and technologists focused on commercialization and transition considerations such as protected supply chain management, advanced manufacturing, process/product/production scaling, etc;
2. Assistance with intellectual property protections, such as legal considerations, intellectual property rights, patent filing, patent fees, licensing considerations, etc;
3. Commercialization and technology transition support such as market research, market validation, development of regulatory or manufacturing plans, brand development;
4. Regulatory support such as product domain regulatory considerations, regulatory planning, and regulatory strategy development.

The Army SBIR program sponsors participation in the TAB A program. The resource limitation for each firm is as follows:

- Phase I Firms:
 - Army-Preferred Vendor: If approved, the contractor may receive up to \$6,500 worth of assistance services per project per year (in addition to the base SBIR award amount).
 - Firm-Selected Vendor: If approved, the contractor may receive up to \$6,500 in contract obligation (in addition to the base SBIR award amount) per project per year.
- Phase II Firms:
 - Army-Preferred Vendor: If approved, the contractor may receive up to \$50,000 worth of assistance services per project per year (in addition to the base SBIR award amount).
 - Firm-Selected Vendor: If approved, the contractor may receive up to \$50,000 in contract obligation (in addition to the base SBIR award amount) per project per year.

EVALUATION AND SELECTION

The Army will conduct an evaluation of each responsive, timely, eligible proposal in accordance with the evaluation criteria listed in the DoD Program BAA. It is the policy of the Army to ensure equitable and comprehensive proposal evaluations based on the evaluation criteria and to select the source (or sources) whose offer meets the Government's technical, policy, and programmatic goals.

As previously stated herein, timeliness, responsiveness, and eligibility will be assessed upon initial

screening, during evaluation, and after selection. Proposals that do not comply with the instructions and requirements detailed in this document, the DoD Program BAA, or the corresponding Topic posting (including the research objective(s)), will be considered ineligible, nonresponsive, untimely, or non-conforming and therefore will not be evaluated or considered for award.

Using the evaluation criteria, the Government will evaluate each responsive, timely, eligible proposal in its entirety. Proposals will not be evaluated against each other during the evaluation process, but rather evaluated on their own individual merit to determine how well the proposal meets the criteria stated in this BAA and the corresponding opportunity.

Selected proposals are those determined to be the most advantageous to the Government, consistent with instructions and evaluation criteria specified in the DoD Program BAA, the component-specific instructions herein, the corresponding Topic posting, and availability of funding.

Proposing firms will be notified via email of selection or non-selection status for a Phase I or direct to Phase II award within 90 days of the closing date of the Topic. The notification will be sent to the Corporate Official listed on the proposal cover sheet from the Army SBIR Program Office mailbox. The Army promotes transparency regarding the technical evaluation for all Army SBIR proposals. The Army will provide a technical evaluation narrative to the proposer in accordance with the SBA Policy Directive, Appendix I, paragraph 4. The selection decision notice contains instructions for retrieving the technical evaluation narrative.

Proposers must not regard the notification email (selection decision notice) as an authorization to commit or expend funds. After the Army SBIR Office has recommended a proposal for award, a Government Contracting Officer may contact the proposer in order to discuss and request additional information required for award. This may include representations and certifications, certified or other than certified cost data, subcontracting plan for small businesses, and/or other information as applicable to the proposed award. Proposers must not regard these communications as an authorization to commit or expend funds. Unless a Government Contracting Officer signs the award document (i.e. contract), no obligations to provide funding are made. The Government may reject the proposal or cancel the contract action at any time.

If signed by the Government Contracting Officer, the award document is the official and authorizing instrument (i.e. contract). The anticipated period of performance start date will be determined at time of award. The Contracting Officer will email the signed, authorizing award instrument to the principal investigator (PI) and/or an authorized organization representative.

PROTESTS

Refer to the DoD SBIR Program BAA for procedures to protest the Announcement.


As further prescribed in FAR 33.106(b), FAR 52.233-3, Protests after Award shall be submitted to the Point of Contract identified in the topic solicitation:

Email: usarmy.pentagon.hqda-asa-alt.mbx.army-applied-sbir-program@mail.mil

Mailing Address:

Army Applied SBIR Office
2530 Crystal Dr; Ste 11192
Arlington, VA 22202

Appendix A Phase I Evaluation Criteria


| Applied SBIR Phase I Proposal Review v2-0-3 Evaluation Criteria Defined | |  |
|---|---|--|
| | | DEFINITION |
| INTRODUCTION | weight 5% | Write a clear, concise description of what your innovation does or will do, and where you are in your evolution. Make clear its intended impact on the Army. Evaluators should "get it" after reading this. |
| POTENTIAL FOR ARMY IMPACT | OPERATIONAL IMPACT | At the scale of a single Army end-user, argue that their jobs or lives will be significantly improved if your solution is adopted. What is the impact of your solution for a soldier/Army civilian vs. today's solutions? |
| | weight 25% | POTENTIAL SCALE OF IMPACT Here, we're looking for an idea of how broad the impact you described above could be. Look into the future to a time when your solution is both technically mature and actively in use by Army personnel. Describe the scale and scope of your impact within the context of the Army. |
| TECHNICAL FEASIBILITY | SCIENTIFIC FEASIBILITY | Is the science behind the solution sound? Convince readers who don't have deep expertise in your field that your innovation is built atop sound scientific and engineering principles. |
| | ENABLING TECHNOLOGIES | Point to the foundational technologies that you rely on to deliver your solution. Do the required enabling technologies introduce added risk? Using proven (and ideally Army fielded) underlying technologies and techniques helps to lower technical risk. |
| | ALTERNATIVE TECHNICAL APPROACHES | From a technologist's perspective, why is your proposed solution the best choice for the Army? Refute the alternative engineering approaches others are using. Why does your technology win? |
| | weight 25% | TECHNICAL RISK MITIGATION No matter your current technology readiness level, technical risks remain. Identify those risks. Present a credible plan to tackle those risks. |
| TRANSITION | ARMY TRANSITION PATHWAY | Planning for success, what's next for you after this SBIR award? Describe the next type of deal you aim to make with the Army, e.g. a CRADA, a different SBIR contract, a CSO, etc. Briefly outline your current plan to unlock that next opportunity and/or share the biggest risks you see post this SBIR award. |
| | weight 20% | SBIR MILESTONE SCHEDULE Please share with us a thoughtful execution plan. Strike a balance between giving us a sense of the detailed thinking behind the scenes and the need for your contracting officer to manage a reasonably small number of milestones during your period of performance. |
| FIRM CASH FLOW | FIRM SURVIVAL RISK | SBIR funds are meant to fuel growth rather than stave off a firm's impending financial failure. Demonstrate that your company will survive financially as a going concern through the early stages of a Phase III contract, sometimes referred to as "transitioning" into use by Army personnel. |
| | OTHER PEOPLE'S MONEY | Make the case that non-Army and/or non-DoD dollars will continue to fund improvements to your solution from which the Army will benefit in the future. Companies who cannot demonstrate non-Army and/or non-DoD funding sources for future solution enhancements are less attractive to the Applied SBIR program. |
| | weight 10% | FINANCIAL PROFIT POTENTIAL Through the Applied SBIR program, the Army wants to take advantage of the speed and scalability of dual-use companies. Make your best case that your product is or will be profitable. If you have more than one product, please focus your argument on the product / solution presented for this SBIR program. |
| TEAM ABILITY | weight 10% | Prove your team has executed well as a group. Please draw clear distinctions between private sector, DoD and civilian government work. What milestones have you accomplished as a group in this company? |
| SUBMISSION QUALITY | QUALITY OF PROSE | Prove you write clearly. Prove you argue convincingly. |
| | weight 5% | DATA QUALITY & ATTRIBUTION Support your arguments with relevant, properly attributed data to enhance your credibility. |

Appendix B Direct to Phase II Evaluation Criteria

| Applied SBIR D2P2 Proposal Review v2-0-4 Evaluation Criteria Defined | | DEFINITION |
|--|------------|---|
| INTRODUCTION | weight 2% | Write a clear, concise description of what your innovation does or will do, and where you are in your evolution. Make clear its intended impact on the Army. Evaluators should "get it" after reading this. |
| POTENTIAL FOR ARMY IMPACT | weight 20% | <p>OPERATIONAL IMPACT At the scale of a single Army end-user, argue that their jobs or lives will be significantly improved if your solution is adopted. What is the impact of your solution for a soldier/Army civilian vs. today's solutions?</p> <p>POTENTIAL SCALE OF IMPACT Here, we're looking for an idea of how broad the impact you described above could be. Look into the future to a time when your solution is both technically mature and actively in use by Army personnel. Describe the scale and scope of your impact within the context of the Army.</p> |
| TECHNICAL FEASIBILITY | weight 30% | <p>SCIENTIFIC FEASIBILITY Is the science behind the solution sound? Convince readers who don't have deep expertise in your field that your innovation is built atop sound scientific and engineering principles.</p> <p>ENABLING TECHNOLOGIES Point to the foundational technologies that you rely on to deliver your solution. Do the required enabling technologies introduce added risk? Using proven (and ideally Army-felted) underlying technologies and techniques helps to lower technical risk.</p> <p>ALTERNATIVE TECHNICAL APPROACHES From a technologist's perspective, why is your proposed solution the best choice for the Army? Refute the alternative engineering approaches others are using. Why does your technology win?</p> <p>TECHNICAL RISK MITIGATION No matter your current technology readiness level, technical risks remain. Identify those risks. Present a credible plan to tackle those risks.</p> |
| TRANSITION | weight 20% | <p>ARMY TRANSITION PATHWAY Planning for success, what's next for you after this SBIR award? Describe the next type of deal you aim to make with the Army, e.g. a CRADA, a different SBIR contract, a CSO, etc. Briefly outline your current plan to unlock that next opportunity and/or share the biggest risks you see post this SBIR award.</p> <p>SBIR MILESTONE SCHEDULE Please share with us a thoughtful execution plan. Strike a balance between giving us a sense of the detailed thinking behind the scenes and the need for your contracting officer to manage a reasonably small number of milestones during your period of performance.</p> |
| FIRM CASH FLOW | weight 15% | <p>FIRM SURVIVAL RISK SBIR funds are meant to fuel growth rather than stave off a firm's impending financial failure. Demonstrate that your company will survive financially as a going concern through the early stages of a Phase III contract, sometimes referred to as "transitioning" into use by Army personnel.</p> <p>OTHER PEOPLE'S MONEY Make the case that non-Army and/or non-DoD dollars will continue to fund improvements to your solution from which the Army will benefit in the future. Companies who cannot demonstrate non-Army and/or non-DoD funding sources for future solution enhancements are less attractive to the Applied SBIR program.</p> <p>FINANCIAL PROFIT POTENTIAL Through the Applied SBIR program, the Army wants to take advantage of the speed and scalability of dual-use companies. Make your best case that your product is or will be profitable. If you have more than one product, please focus your argument on the product / solution presented for this SBIR program.</p> |
| TEAM ABILITY | weight 10% | Prove your team has executed well as a group. Please draw clear distinctions between private sector, DoD and civilian government work. What milestones have you accomplished as a group in this company? |
| SUBMISSION QUALITY | weight 3% | <p>QUALITY OF PROSE Prove you write clearly. Prove you argue convincingly.</p> <p>DATA QUALITY & ATTRIBUTION Support your arguments with relevant, properly attributed data to enhance your credibility.</p> |



Appendix C Phase II Evaluation Criteria

| Applied SBIR Phase II Proposal Review v2-0-3 Evaluation Criteria Defined | |  |
|--|---|--|
| | | DEFINITION |
| INTRODUCTION | weight 2% | Write a clear, concise description of what your innovation does or will do, and where you are in your evolution. Make clear its intended impact on the Army. Evaluators should "get it" after reading this. |
| POTENTIAL FOR ARMY IMPACT | OPERATIONAL IMPACT | At the scale of a single Army end-user, argue that their jobs or lives will be significantly improved if your solution is adopted. What is the impact of your solution for a soldier/Army civilian vs. today's solutions? |
| | weight 20% | POTENTIAL SCALE OF IMPACT |
| | | Here, we're looking for an idea of how broad the impact you described above could be. Look into the future to a time when your solution is both technically mature and actively in use by Army personnel. Describe the scale and scope of your impact within the context of the Army. |
| TECHNICAL FEASIBILITY | SCIENTIFIC FEASIBILITY | Is the science behind the solution sound? Convince readers who don't have deep expertise in your field that your innovation is built atop sound scientific and engineering principles. |
| | ENABLING TECHNOLOGIES | Point to the foundational technologies that you rely on to deliver your solution. Do the required enabling technologies introduce added risk? Using proven (and ideally Army-fielded) underlying technologies and techniques helps to lower technical risk. |
| | ALTERNATIVE TECHNICAL APPROACHES | From a technologist's perspective, why is your proposed solution the best choice for the Army? Refute the alternative engineering approaches others are using. Why does your technology win? |
| | weight 25% | TECHNICAL RISK MITIGATION |
| | | No matter your current technology readiness level, technical risks remain. Identify those risks. Present a credible plan to tackle those risks. |
| TRANSITION | ARMY TRANSITION PATHWAY | Planning for success, what's next for you after this SBIR award? Describe the next type of deal you aim to make with the Army, e.g. a CRADA, a different SBIR contract, a CSO, etc. Briefly outline your current plan to unlock that next opportunity and/or share the biggest risks you see post this SBIR award. |
| | weight 25% | SBIR MILESTONE SCHEDULE |
| | | Please share with us a thoughtful execution plan. Strike a balance between giving us a sense of the detailed thinking behind the scenes and the need for your contracting officer to manage a reasonably small number of milestones during your period of performance. |
| FIRM CASH FLOW | FIRM SURVIVAL RISK | SBIR funds are meant to fuel growth rather than stave off a firm's impending financial failure. Demonstrate that your company will survive financially as a going concern through the early stages of a Phase III contract, sometimes referred to as "transitioning" into use by Army personnel. |
| | OTHER PEOPLE'S MONEY | Make the case that non-Army and/or non-DoD dollars will continue to fund improvements to your solution from which the Army will benefit in the future. Companies who cannot demonstrate non-Army and/or non-DoD funding sources for future solution enhancements are less attractive to the Applied SBIR program. |
| | weight 20% | FINANCIAL PROFIT POTENTIAL |
| | | Through the Applied SBIR program, the Army wants to take advantage of the speed and scalability of dual-use companies. Make your best case that your product is or will be profitable. If you have more than one product, please focus your argument on the product / solution presented for this SBIR program. |
| TEAM ABILITY | weight 5% | Prove your team has executed well as a group. Please draw clear distinctions between private sector, DoD and civilian government work. What milestones have you accomplished as a group in this company? |
| SUBMISSION QUALITY | QUALITY OF PROSE | Prove you write clearly. Prove you argue convincingly. |
| | weight 2% | DATA QUALITY & ATTRIBUTION |
| | | Support your arguments with relevant, properly attributed data to enhance your credibility. |

Appendix D

Commercialization Plan Template

Instructions:

1. The slide deck will not exceed a maximum of 8 slides, per Component Instructions. Font size shall be no smaller than 10-point font.
2. The template is to give you basic guidance and information that the evaluation team would like to see regarding your small business. How you define, answer and implement that information within the slide deck is up to your creative technical expertise.
3. Slides should display the slide number in bottom right corner
4. All text (including tables, charts, plots, axes labels, legends, captions) must be readable without zooming and understandable without voice-over
5. For plots and charts:
 - a. Include title/bullet describing importance of plot/chart, and/or data (be specific)
 - b. Axes must be meaningfully labeled (to be understandable by non-experts) and include scale
6. Avoid jargon; define technical terms
7. Save as a PDF file for submission to DSIP
8. To insert images, capture a screenshot of the image and paste it into the slide. Please do not drag-drop a file into the presentation or use the Insert Pictures menu function.
9. Use PowerPoint's "Compress Pictures" feature to reduce file size
 - a. Select 96ppi resolution
 - b. Uncheck "For this picture only"
10. Replace the boilerplate footer below with distribution markings as appropriate
11. Do not put any company logos (Twitter, Reddit, GitHub, etc) on your slides

Any submission over 10 slides will be deemed noncompliant and will not be evaluated.

Appendix D
Commercialization Plan Template cont.

Firm Name

SBIR Project Title

Principal Investigator Name / Title
Key (or other relevant) Personnel, and
Subcontractors

.....
Insert Topic Number
Insert Proposal Number

Distribution markings as appropriate for your organization

BLUF: Bottom Line Up Front

- **BLUF:**
 - 1. Company information and background** : Core competencies, significant sales, previous funding, commercialization successes.
 - 2. Customer and Competition** : Clear description of key technology objectives, current competition, and advantages.
 - 3. Market**: Plan to obtain market share.
 - 4. Intellectual Property**: Patent status, technology lead, trade secrets or other demonstration of a plan to protect the company's technical advantage.
 - 5. Financing/Revenue**: Plans for securing necessary non -SBIR funding.
 - 6. Assistance and mentoring** : Plans for securing needed technical or business assistance.

Distribution markings as appropriate for your organization

Appendix D Commercialization Plan Template cont.

Company Information and Background

- Core competencies and areas of specialization.
- Products with significant sales.
- Concise history of previous Federal and non -Federal funding/investments.
- Regulatory experience (if applicable).
- Past commercialization successes.
- Past failure and how you overcame.

Distribution markings as appropriate for your organization

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Customer & Competition

- Description of key technology objectives.
- Current competition and/or alternative solutions.
- Advantages of company's offer compared to competing products or services.
- Hurdles to acceptance of the proposed innovation.
- Description of possible areas where your technology may be utilized or is under utilized.

Distribution markings as appropriate for your organization

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Appendix D Commercialization Plan Template cont.

Market

- Analysis of market size and 1 and 5 year forecasted market share.
- Explanation of milestones and target dates of plan to obtain that market share.
- What experience do you have with marketing to this target market?
- What commercialization strategy appears to be the best for bringing this product to the target market?
- What experience do you have with bring products to market – either through this company or through other companies with which you have worked.
- Does the company currently market, manufacture, or license technology? Describe what you do.

Distribution markings as appropriate for your organization

5

Intellectual Property

- Patent status, technology lead, trade secrets or other demonstration of a plan to achieve sufficient protection to realize the commercialization stage and attain at least a temporary competitive advantage .
- Describe how you will protect the intellectual property that enables commercialization of its products while keeping competitors at bay. Note any actions you may consider to attain at least a temporary competitive advantage. Also consider your company's prior record in this area. Comment on your company's strategy to build a sustainable business through protection of intellectual property.

Distribution markings as appropriate for your organization

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Appendix D Commercialization Plan Template cont.

Financing

- Plan for securing non-SBIR, private or government funding necessary to enter low rate of production of anticipated technical solution.
- Describe your revenue stream generation to include but not limited to:
 - Manufacture and direct sales
 - Sales through value added resellers or other distributors
 - Joint venture

Distribution markings as appropriate for your organization

7

Assistance & Mentoring

- Plans for securing needed technical or business assistance through mentoring, partnering, or arrangements with government sponsored (e.g., SBIR funded Discretionary Technical and Business Assistance (TABAs), State assistance programs, Federally-funded research laboratories, Manufacturing Extension Partnership centers), not-for-profits (e.g., Small Business Development Center (SBDC) or Small Business Technical Development Center (SBTDC)), commercial accelerators, DOD Prime Contractors, SBA Mentor - Protégé program, Procurement Technical Assistance Center (PTAC) or other assistance provider.

Distribution markings as appropriate for your organization

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**Army SBIR 23.4 Topic Index
Release 4**

| | |
|----------|--|
| A234-006 | Wearable Radiation Sensors |
| A234-007 | Artificial Intelligence (AI)/ Machine Learning (ML) Open Topic |

OUSD (R&E) CRITICAL TECHNOLOGY AREA(S): Advanced Materials

TOPIC OBJECTIVE: The topic focuses on developing technology that will allow the radiation detection industry to develop and propose low-cost dose rate meters that is significantly smaller and better wearable than those based on current GM-tube. Smaller RADIACs (radiation detectors) will decrease the weight burden of equipment on its users, reducing fatigue and improving maneuverability. The impact of this topic will be lighter and smaller equipment that the wearer may carry. The scale has potential to be throughout the Army and other commercial platforms.

TOPIC DESCRIPTION: The innovative approach of this topic is the focus on SWAP (size, weight, and power) in addition to performance. Since the 1920's, Geiger-Muller tubes (GM tubes) have been the technology used in almost all military RADIACs. The current systems, UDR-13, UDR-14, and UDR-15, all use GM-tubes. While the GM tubes can offer the needed performance, they have major drawbacks that limit the reduction of SWAP. The GM tubes' low sensitivity per volume and relatively high-power consumption will severely limit any SWAP reduction. If a new suitable technology is not matured and the JPD-S must use GM-tube technology, then the new JPD-S will be about the same size as the current 30-year-old UDR-13. Evolving ground-breaking technology such as solid-state gamma dose rate sensors offers the potential to greatly reduce the SWAP, with an overall objective of reducing SWAP by half.

The potential end users of this technology may be the ground combat troops. Those RADIACs are deployed at one RADIAC per squad level (about 10 soldiers). The soldiers will rely on the JPD-S to provide accurate information about the radiation levels throughout the operational environment from response to disasters such as the Army's response in Operation Tomodachi (the US support to Japan after the 2011 earthquake, tsunami, and nuclear power plant accident) to operations on the nuclear battlefield. Soldiers rely on their RADIACs to provide accurate information about the radiation level to help minimize and document exposures.

PHASE I: Starting in FY23, Phase I would be multiple awards for 6-month efforts focused on scientific, technical, commercial merit and feasibility of proposed solutions. If a performer proposed an existing detector, then the performer would need to demonstrate a clear path for temperature range and nuclear survivability. If a performer proposed a new sensor material, then the performer would need to demonstrate that the new sensor material can accurately measure radiation.

PHASE II: Starting in FY 24, Phase II would be at least two awards focused on development of the technology, integration into a detector, and testing. JPEO would consider the possibility of a Phase II enhancement depending on the progress made by the performers in Phase II.

PHASE III and DUAL USE APPLICATIONS: In FY27, JPEO plans to start the program of record. Based on previous successes, JPEO plans to the following path:

- Issue an RFP (request for proposal) requiring extensive data showing that their proposed equipment meets the needs of the Army and is low risk at that point plus an operating prototype
- Select 3 to 5 prototypes for testing
- Based on test results, down select to one system
- Complete development
- Conduct Development and operational test
- Develop logistic (manuals, repair process, etc.)
- Procure and field

KEYWORDS: Radiation detectors; RADAIC; ground combat troops; dose rate meter; meter

REFERENCES:

Fabjan, C. W. and Schopper, H. (eds.) 2020, Particle Physics Reference Library, Volume 2: Detectors for Particles and Radiation

Krutul, K, et. al., “Radiation Hardness Studies of PIN-Diode Detectors Irradiated with Heavy Ions”, Acta Physica Polonica B Proceedings Supplement, Vol. 13 (2020)

Menichelli, M., et. al., “Hydrogenated amorphous silicon detectors for particle detection, beam flux monitoring and dosimetry in high-dose radiation environment”, arXiv:2002.10848 [physics.ins-det]

A234-007 Artificial Intelligence (AI)/ Machine Learning (ML) Open Topic

OUSD (R&E) CRITICAL TECHNOLOGY AREA(S): Trusted AI and Autonomy

TOPIC OBJECTIVE: The purpose of an Artificial Intelligence (AI)/ Machine Learning (ML) focused Open Topic is to bring potentially valuable small business innovations to the Army and create an opportunity to expand the relevance of the Army SBIR program to firms who do not normally compete for SBIR awards.

TOPIC DESCRIPTION: This open topic is a Phase I submission only. The period of performance is a maximum of 3 months and a maximum funding limit of \$150,000 per award.

While the AI/ML Open Topic will accept proposals on any technical challenge requiring an AI/ML application, submissions addressing the following six out of eleven AI/ML TBT core priorities will be prioritized for award:

- Synthetic data generation – production data applicable to a given situation that are not obtained by direct measurement.
- Automated detection and prevention – automated systemic-based controls where they can stop threats automatically as well as predict the next attack for better future prevention.
- Automated data label – quickly curate and label data for an AI model.
- Biometrics – authentication is used in computer science as a form of identification and access control
- Natural language technology – focused on programming computers to process and analyze large amounts of natural language data.
- Supply chain resilience – automating risks and vulnerabilities within the supply chains to prevent major impacts.

PHASE I: The Phase 1 period of performance will be 3 months. Small businesses shall deliver a proof of technical feasibility at the end of the Period of Performance.

Phase 1 submission materials:

- 5-page technical volume for down-select
- 8-slide commercialization plan; template provided in announcement.
- A Statement of Work” is required outlining intermediate and final anticipated deliverables during the Phase 1 award period

Post-Phase 1 Deliverables:

- Small Business: A feasibility study to demonstrate the technical and commercial practicality of the concept to include an assessment of its technical readiness and potential applicability to military and commercial markets.
- TPOC and Transition Partner: Commitment secured from TPOC and Transition Partner to associate with potential P2 work.

PHASE II: Produce prototype solutions that will be easy to operate by a Soldier. These products will be provided to select Army units for further evaluation by the soldiers. In addition, companies will provide a technology transition and commercialization plan for DOD and commercial markets.

PHASE III and DUAL USE APPLICATIONS: Complete the maturation of the company's technology developed in Phase II to TRL 6/7 and produce prototypes to support further development and commercialization. The Army will evaluate each product in a realistic field environment and provide small solutions to stakeholders for further evaluation. Based on soldier evaluations in the field, companies will be requested to update the previously delivered prototypes to meet final design configuration.

KEYWORDS: Artificial Intelligence; Machine Learning; Open topic; automation; synthetic data generation; data labeling; supply chain resilience

REFERENCES: <https://www.armysbir.army.mil/topics/>

DEPARTMENT OF THE ARMY
DoD 23.4 Small Business Innovation Research (SBIR)
Annual Broad Agency Announcement (BAA)
Component-Specific Proposal Instructions
Release 5

February 21, 2023: Topics issued for pre-release
March 16, 2023: Army begins accepting proposals via DSIP
March 28, 2023: DSIP Topic Q&A closes to new questions at 12:00 p.m. ET
April 11, 2023: Deadline for receipt of proposals no later than 12:00 p.m. ET

INTRODUCTION

The future Army must be capable of conducting Multi-Domain Operations (MDO) as part of an integrated Joint Force across an array of situations in multiple theaters by 2035. The MDO concept describes how the Army will support the Joint Force in the rapid and continuous integration of all domains of warfare – land, sea, air, and cyberspace – to deter and prevail as we compete short of conflict, and fight and win if deterrence fail. The Army must provide game-changing capabilities to our Soldiers. To capitalize on small business innovation, the Army has implemented an approach to advertise SBIR funding opportunities through the Department of Defense (DoD) Annual BAA process, outside of the three pre-determined BAA cycles. This approach also strives to create a more rapid award time from solicitation to closing.

CONTACT INFORMATION

Direct Specific questions pertaining to the administration of the Department of the Army SBIR Program and proposal preparation instructions to the Point of Contact identified in the Topic announcement. General questions can be directed to the following:

Email: usarmy.pentagon.hqda-asa-alt.mbx.army-applied-sbir-program@army.mil

Website: <https://www.armysbir.army.mil/>

Mailing Address:

Army Applied SBIR Office 2530 Crystal Dr; Ste 11192
Arlington, VA 22202

RESPONSIVENESS AND TIMELINESS

All proposals will be evaluated and judged on a competitive basis. Proposals will only be evaluated in response to an active, corresponding Army topic. Proposals will be initially screened to determine responsiveness and timeliness. Proposals passing this initial screening will be technically evaluated by engineers or scientists to determine the most promising technical and scientific approaches. Assessment of responsiveness may continue during technical evaluation and after selection. If at any point the proposal is deemed untimely, unresponsive, ineligible, or non-responsible, the proposal will be rejected / the contract action will be cancelled.

Interested firms shall follow the DoD Program BAA instructions as well as the Army's component-specific proposal instructions herein, when preparing and submitting proposals. The DoD 23.4 SBIR Program BAA can be found here: <https://www.defensesbirsttr.mil/SBIR-STTR/Opportunities/>.

SYSTEM FOR AWARD MANAGEMENT (SAM)

Interested firms are required to be registered in SAM (www.sam.gov) before submitting a proposal and shall continue to be registered until time of award, during performance, and through final payment of any contract.

PHASE I PROPOSAL INSTRUCTIONS

The Defense SBIR/STTR Innovation Portal (DSIP) is the official portal for DoD SBIR/STTR proposal submission. Proposers (also referred to herein as “offeror(s)”) are required to submit proposals via DSIP; proposals submitted by any other means will be disregarded. Detailed instructions regarding registration and proposal submission via DSIP are provided in the DoD SBIR Program BAA.

Proposal Coversheet (Volume 1)

The proposal coversheet must follow the instructions and requirements provided in the DoD SBIR Program BAA.

The offeror shall certify that to the best of its knowledge and belief, its eligibility information under the SBIR Program is accurate, complete, and current as of the date of the offer.

Technical Volume (Volume 2)

The technical volume proposal is not to exceed 5 word document pages and must follow the formatting requirements provided in the DoD SBIR Program BAA. A commercialization plan must also accompany the technical volume proposal and must be 8 slides. The required content to include within these slides are described in Appendix D. The commercialization plan must be converted from slides to pdf and attached to the end of the technical volume proposal, resulting in one pdf file to be uploaded to DSIP as Volume 2. The commercialization plan does not count towards the technical volume 5-page limit. Any proposals submitted without a commercialization plan or in a format other than that provided in these Component Instructions and by the BAA will be deemed unresponsive and will not be reviewed.

Content of the Technical Volume

The Technical Volume shall contain three key sections – technical approach, team qualifications and commercialization section. The technical approach section shall contain details on how the proposer is going to solve the problem. It shall detail key elements of the firm’s approach, any risks, relevant past work and how success is measured. The team qualifications section shall highlight the key personnel working on the project, and the resources that will be brought to bear on solving the problem. The commercialization plan shall include:

- **Company information**: Focused objectives/core competencies; specialization area(s); products with significant sales; and history of previous Federal and non-Federal funding, regulatory experience, and subsequent commercialization successes.
- **Customer and Competition**: Clear description of key technology objectives, current competition, and advantages compared to competing products or services; description of hurdles to acceptance of the innovation.
- **Market**: Milestones, target dates, analyses of market size, and estimated market share after first year sales and after 5 years; explanation of plan to obtain market share.
- **Intellectual Property**: Patent status, technology lead, trade secrets or other demonstration of a plan to achieve sufficient protection to realize the commercialization stage and attain at least a temporal competitive advantage.
- **Financing**: Plans for securing necessary non-SBIR funding.
- **Assistance and mentoring**: Plans for securing needed technical or business assistance through mentoring, partnering, or through arrangements with government sponsored (e.g., State

assistance programs, Federally-funded research laboratories, Manufacturing Extension Partnership centers), not-for-profits (e.g., SBDC), commercial accelerators, DOD Prime Contractors, or other assistance provider.

These instructions supersede those stated in section 5.3.c of the DoD Program BAA.

Cost Volume (Volume 3)

The Cost Volume must follow all instructions and requirements provided in the DoD SBIR Program BAA. Supplemental requirements are as follows:

The Phase I Base amount must not exceed **\$200,000** for a 4-month period of performance. Phase I Options are not anticipated at this time. If an option is identified in the topic posting, costs for the Base and Option must be separated and clearly identified on the Proposal Cover Sheet (Volume 1) and in Volume 3. Awards for these topics will be in the form of a firm fixed price contract.

Please review the updated Percentage of Work (POW) calculation details included in section 5.3 of the DoD Program BAA. Army Applied SBIR will occasionally accept deviations from the POW requirements with written approval from the Funding Agreement officer.

For pricing purposes, offerors shall assume a contract or agreement start date of approximately ninety (90) days after submission of the proposal. For this BAA, adequate price competition (APC), as defined in FAR 15.403-1(c), is anticipated. In the event that adequate price competition is not realized (i.e. only one proposal is received for a given topic), the Government may choose to conduct additional proposal analysis, in accordance with the techniques identified at FAR 15.404-1. Additionally, offerors are to provide any current Forward Pricing Rate Agreements (FPRA) in effect at time of proposal submission.

Content of the Cost Volume (Volume 3)

ALL proposed costs should be accompanied by documentation to substantiate how the cost was derived. Substantiating documentation guidance is as follows:

- **LABOR:**
 - List all key personnel by name as well as by number of hours dedicated to the project as direct labor.
 - Explain the basis of proposed labor hours, including required tasks, and substantiating documentation for the costs (e.g. payroll reports). Volume 5, Supporting Documents, may be used if additional space is needed.
- **MATERIAL/TOOLING/EQUIPMENT:**
 - Explain the basis of proposed material and equipment costs. This support should include a consolidated priced summary of individual material and equipment quantities and substantiating documentation for the costs (e.g. vendor quotes, invoice prices, competitive bids, etc.). If your choice isn't the lowest cost available, explain the decision to choose one item or supplier over another. Volume 5, Supporting Documents, may be used if additional space is needed.
 - Ensure all materials are American-made to the maximum extent practicable.

Offerors who propose to use a foreign-made product in its technology may be required to find an American-made equivalent.

- While special tooling and test equipment and material cost may be included, it will be carefully reviewed relative to need and appropriateness for the work proposed. The purchase of special tooling and test equipment must, in the opinion of the Component Contracting Officer, be advantageous to the Government and should be related directly to the specific topic. These may include such items as innovative instrumentation or automatic test equipment. Title to property furnished by the Government or acquired with Government funds will be vested with the DoD Component, unless it is determined that transfer of title to the contractor would be more cost effective than recovery of the equipment by the DoD Component.
- TRAVEL:
 - Explain the basis of proposed travel, including to/from locations, number of trips, number of travelers per trip, and number of days/nights per trip. Include substantiating documentation for the costs (e.g. screenshots of flight cost comparison, rental car quotes, etc.). NOTE: Virtual meetings shall be utilized to the maximum extent practicable. Volume 5, Supporting Documents, may be used if additional space is needed.
- SUBCONTRACTS: A subcontract is any agreement, other than one involving an employer-employee relationship, entered into by the prime contractor (awardee) calling for supplies or services for the performance of the contract.
 - All subcontractor costs and consultant costs must be detailed at the same level as prime contractor costs in regard to labor, travel, equipment, etc.
 - Explain the basis of proposed subcontract costs. Include documented support of the offeror's price analyses and degree of competition of all subcontractor proposals. All subcontractor costs and consultant costs, such as labor, travel, equipment, materials, must be detailed at the same level as prime contractor costs. Provide detailed substantiation of subcontractor costs in your cost proposal. Volume 5, Supporting Documents, may be used if additional space is needed.
 - Certify that the following requirements are met: For Phase I, the offeror must perform a minimum of two-thirds of the research and/or analytical effort. One third may be subcontracted to another firm or research organization/facility. The percentage of work is measured by both direct and indirect costs.
 - Offerors shall not propose to subcontract to the issuing agency, to any other Federal Government agency, or to other units of the Federal Government, except Federal Laboratories in rare circumstances. As defined in 15 U.S.C. 3703, Federal Laboratory means any laboratory, any federally funded research and development center, or any center established under 15 U.S.C. 3705 and 3707 that is owned, leased, or otherwise used by a Federal Agency

and funded by the Federal Government, whether operated by the Government or by a contractor.

- Offerors shall not propose to subcontract to any prohibited sources. Proposals identifying a subcontractor/vendor arrangement with a prohibited source may be rejected.
- Offerors shall ensure subcontracting arrangements are with United States Small Businesses to the maximum extent practicable. Offerors proposing a subcontractor arrangement with other than a United States Small Business (such as, a large business, foreign firm, foreign government, educational institution, unit of Federal Government, etc.) may be required to submit further explanation.
- **INDIRECT COSTS:**
 - Explain the basis of the proposed indirect expense rates including overhead, general and administrative, material handling, and fringe benefits.
 - If a Defense Contract Audit Agency (DCAA) Audit has been conducted within the last five (5) years, include the audit compliance documentation in the cost proposal documents. The documentation should also include the offeror's DCAA Point of Contact (if applicable).

If selected, failure to include the documentation with your proposal may delay contract award, as the proposer will be asked to submit the necessary documentation to the Contracting Officer to substantiate costs. It is important to respond as quickly as possible to the Contracting Officer's request for documentation. Failure or refusal to provide documentation may result in cancellation of the contract action.

Company Commercialization Report (CCR) (Volume 4)

Completion of the CCR as Volume 4 of the proposal submission in DSIP is required. Please refer to the DoD SBIR Program BAA for full details on this requirement. Information contained in the CCR will be considered by the Department of the Army during proposal evaluations.

Supporting Documents (Volume 5)

Volume 5 is provided for proposers to submit additional documentation to support the Cover Sheet (Volume 1), Technical Volume (Volume 2), and the Cost Volume (Volume 3). In addition to the Volume 5 requirements outlined in the DoD Program BAA, the Department of the Army may accept the following documents in Volume 5:

- Additional Cost Information
- Funding Agreement Certification
- Technical Data Rights (Assertions)
- Lifecycle Certification
- Allocation of Rights
- Other (only as specified in the topic)

Please only submit documents that are identified immediately above and in the DoD Program BAA. All other documents submitted will be disregarded.

PHASE II PROPOSAL INSTRUCTIONS

Phase II proposals may only be submitted by Phase I awardees. Phase II proposal submission window, notification process, expected budget/duration structure and additional instructions will be provided in the Phase I contract or by subsequent notification.

DISCRETIONARY TECHNICAL AND BUSINESS ASSISTANCE (TABA)

The Army, at its discretion, may provide Technical and Business Assistance (TABA). The Army will select a preferred vendor(s) for the Army SBIR TABA program through a competitive process. Alternately, a small business concern may, by contract or otherwise, select one or more vendors to assist the firm in meeting the TABA goals. The Applicant must request the authority to select its own TABA provider in its Army SBIR proposal and must demonstrate that the vendor is uniquely postured to provide the specific technical and business services required. TABA funding will be denied if the offeror fails to include the cost and detailed explanation in its proposal.

Participation in the Army SBIR TABA program is voluntary for each Army SBIR awardee. Services provided to Army SBIR firms under the auspices of the TABA program may include, but are not limited to:

1. Access to a network of scientists, engineers, and technologists focused on commercialization and transition considerations such as protected supply chain management, advanced manufacturing, process/product/production scaling, etc;
2. Assistance with intellectual property protections, such as legal considerations, intellectual property rights, patent filing, patent fees, licensing considerations, etc;
3. Commercialization and technology transition support such as market research, market validation, development of regulatory or manufacturing plans, brand development;
4. Regulatory support such as product domain regulatory considerations, regulatory planning, and regulatory strategy development.

The Army SBIR program sponsors participation in the TABA program. The resource limitation for each firm is as follows:

- Phase I Firms:
 - Army-Preferred Vendor: If approved, the contractor may receive up to \$6,500 worth of assistance services per project per year (in addition to the base SBIR award amount).
 - Firm-Selected Vendor: If approved, the contractor may receive up to \$6,500 in contract obligation (in addition to the base SBIR award amount) per project per year.
- Phase II Firms:
 - Army-Preferred Vendor: If approved, the contractor may receive up to \$50,000 worth of assistance services per project per year (in addition to the base SBIR award amount).
 - Firm-Selected Vendor: If approved, the contractor may receive up to \$50,000 in contract obligation (in addition to the base SBIR award amount) per project per year.

EVALUATION AND SELECTION

The Army will conduct an evaluation of each responsive, timely, eligible proposal in accordance with the evaluation criteria listed in the DoD Program BAA. It is the policy of the Army to ensure equitable and comprehensive proposal evaluations based on the evaluation criteria and to select the source (or sources) whose offer meets the Government's technical, policy, and programmatic goals.

As previously stated herein, timeliness, responsiveness, and eligibility will be assessed upon initial

screening, during evaluation, and after selection. Proposals that do not comply with the instructions and requirements detailed in this document, the DoD Program BAA, or the corresponding Topic posting (including the research objective(s)), will be considered ineligible, nonresponsive, untimely, or non-conforming and therefore will not be evaluated or considered for award.

Using the evaluation criteria, the Government will evaluate each responsive, timely, eligible proposal in its entirety. Proposals will not be evaluated against each other during the evaluation process, but rather evaluated on their own individual merit to determine how well the proposal meets the criteria stated in this BAA and the corresponding opportunity.

Selected proposals are those determined to be the most advantageous to the Government, consistent with instructions and evaluation criteria specified in the DoD Program BAA, the component-specific instructions herein, the corresponding Topic posting, and availability of funding.

Proposing firms will be notified via email of selection or non-selection status for a Phase I or direct to Phase II award within 90 days of the closing date of the Topic. The notification will be sent to the Corporate Official listed on the proposal cover sheet from the Army SBIR Program Office mailbox. The Army promotes transparency regarding the technical evaluation for all Army SBIR proposals. The Army will provide a technical evaluation narrative to the proposer in accordance with the SBA Policy Directive, Appendix I, paragraph 4. The selection decision notice contains instructions for retrieving the technical evaluation narrative.

Proposers must not regard the notification email (selection decision notice) as an authorization to commit or expend funds. After the Army SBIR Office has recommended a proposal for award, a Government Contracting Officer may contact the proposer in order to discuss and request additional information required for award. This may include representations and certifications, certified or other than certified cost data, subcontracting plan for small businesses, and/or other information as applicable to the proposed award. Proposers must not regard these communications as an authorization to commit or expend funds. Unless a Government Contracting Officer signs the award document (i.e. contract), no obligations to provide funding are made. The Government may reject the proposal or cancel the contract action at any time.

If signed by the Government Contracting Officer, the award document is the official and authorizing instrument (i.e. contract). The anticipated period of performance start date will be determined at time of award. The Contracting Officer will email the signed, authorizing award instrument to the principal investigator (PI) and/or an authorized organization representative.

PROTESTS

Refer to the DoD SBIR Program BAA for procedures to protest the Announcement.


As further prescribed in FAR 33.106(b), FAR 52.233-3, Protests after Award shall be submitted to the Point of Contract identified in the topic solicitation:

Email: usarmy.pentagon.hqda-asa-alt.mbx.army-applied-sbir-program@mail.mil

Mailing Address:

Army Applied SBIR Office
2530 Crystal Dr; Ste 11192
Arlington, VA 22202

Appendix A Phase I Evaluation Criteria


| Applied SBIR Phase I Proposal Review v2-0-3 Evaluation Criteria Defined | |  |
|---|---|--|
| | | DEFINITION |
| INTRODUCTION | weight 5% | Write a clear, concise description of what your innovation does or will do, and where you are in your evolution. Make clear its intended impact on the Army. Evaluators should "get it" after reading this. |
| POTENTIAL FOR ARMY IMPACT | OPERATIONAL IMPACT | At the scale of a single Army end-user, argue that their jobs or lives will be significantly improved if your solution is adopted. What is the impact of your solution for a soldier/Army civilian vs. today's solutions? |
| | weight 25% | POTENTIAL SCALE OF IMPACT Here, we're looking for an idea of how broad the impact you described above could be. Look into the future to a time when your solution is both technically mature and actively in use by Army personnel. Describe the scale and scope of your impact within the context of the Army. |
| TECHNICAL FEASIBILITY | SCIENTIFIC FEASIBILITY | Is the science behind the solution sound? Convince readers who don't have deep expertise in your field that your innovation is built atop sound scientific and engineering principles. |
| | ENABLING TECHNOLOGIES | Point to the foundational technologies that you rely on to deliver your solution. Do the required enabling technologies introduce added risk? Using proven (and ideally Army fielded) underlying technologies and techniques helps to lower technical risk. |
| | ALTERNATIVE TECHNICAL APPROACHES | From a technologist's perspective, why is your proposed solution the best choice for the Army? Refute the alternative engineering approaches others are using. Why does your technology win? |
| | weight 25% | TECHNICAL RISK MITIGATION No matter your current technology readiness level, technical risks remain. Identify those risks. Present a credible plan to tackle those risks. |
| TRANSITION | ARMY TRANSITION PATHWAY | Planning for success, what's next for you after this SBIR award? Describe the next type of deal you aim to make with the Army, e.g. a CRADA, a different SBIR contract, a CSO, etc. Briefly outline your current plan to unlock that next opportunity and/or share the biggest risks you see post this SBIR award. |
| | weight 20% | SBIR MILESTONE SCHEDULE Please share with us a thoughtful execution plan. Strike a balance between giving us a sense of the detailed thinking behind the scenes and the need for your contracting officer to manage a reasonably small number of milestones during your period of performance. |
| FIRM CASH FLOW | FIRM SURVIVAL RISK | SBIR funds are meant to fuel growth rather than stave off a firm's impending financial failure. Demonstrate that your company will survive financially as a going concern through the early stages of a Phase III contract, sometimes referred to as "transitioning" into use by Army personnel. |
| | OTHER PEOPLE'S MONEY | Make the case that non-Army and/or non-DoD dollars will continue to fund improvements to your solution from which the Army will benefit in the future. Companies who cannot demonstrate non-Army and/or non-DoD funding sources for future solution enhancements are less attractive to the Applied SBIR program. |
| | weight 10% | FINANCIAL PROFIT POTENTIAL Through the Applied SBIR program, the Army wants to take advantage of the speed and scalability of dual-use companies. Make your best case that your product is or will be profitable. If you have more than one product, please focus your argument on the product / solution presented for this SBIR program. |
| TEAM ABILITY | weight 10% | Prove your team has executed well as a group. Please draw clear distinctions between private sector, DoD and civilian government work. What milestones have you accomplished as a group in this company? |
| SUBMISSION QUALITY | QUALITY OF PROSE | Prove you write clearly. Prove you argue convincingly. |
| | weight 5% | DATA QUALITY & ATTRIBUTION Support your arguments with relevant, properly attributed data to enhance your credibility. |

Appendix B Direct to Phase II Evaluation Criteria

| Applied SBIR D2P2 Proposal Review v2-0-4 Evaluation Criteria Defined | | DEFINITION |
|--|------------|---|
| INTRODUCTION | weight 2% | Write a clear, concise description of what your innovation does or will do, and where you are in your evolution. Make clear its intended impact on the Army. Evaluators should "get it" after reading this. |
| POTENTIAL FOR ARMY IMPACT | weight 20% | <p>OPERATIONAL IMPACT At the scale of a single Army end-user, argue that their jobs or lives will be significantly improved if your solution is adopted. What is the impact of your solution for a soldier/Army civilian vs. today's solutions?</p> <p>POTENTIAL SCALE OF IMPACT Here, we're looking for an idea of how broad the impact you described above could be. Look into the future to a time when your solution is both technically mature and actively in use by Army personnel. Describe the scale and scope of your impact within the context of the Army.</p> |
| TECHNICAL FEASIBILITY | weight 30% | <p>SCIENTIFIC FEASIBILITY Is the science behind the solution sound? Convince readers who don't have deep expertise in your field that your innovation is built atop sound scientific and engineering principles.</p> <p>ENABLING TECHNOLOGIES Point to the foundational technologies that you rely on to deliver your solution. Do the required enabling technologies introduce added risk? Using proven (and ideally Army-felted) underlying technologies and techniques helps to lower technical risk.</p> <p>ALTERNATIVE TECHNICAL APPROACHES From a technologist's perspective, why is your proposed solution the best choice for the Army? Refute the alternative engineering approaches others are using. Why does your technology win?</p> <p>TECHNICAL RISK MITIGATION No matter your current technology readiness level, technical risks remain. Identify those risks. Present a credible plan to tackle those risks.</p> |
| TRANSITION | weight 20% | <p>ARMY TRANSITION PATHWAY Planning for success, what's next for you after this SBIR award? Describe the next type of deal you aim to make with the Army, e.g. a CRADA, a different SBIR contract, a CSO, etc. Briefly outline your current plan to unlock that next opportunity and/or share the biggest risks you see post this SBIR award.</p> <p>SBIR MILESTONE SCHEDULE Please share with us a thoughtful execution plan. Strike a balance between giving us a sense of the detailed thinking behind the scenes and the need for your contracting officer to manage a reasonably small number of milestones during your period of performance.</p> |
| FIRM CASH FLOW | weight 15% | <p>FIRM SURVIVAL RISK SBIR funds are meant to fuel growth rather than stave off a firm's impending financial failure. Demonstrate that your company will survive financially as a going concern through the early stages of a Phase III contract, sometimes referred to as "transitioning" into use by Army personnel.</p> <p>OTHER PEOPLE'S MONEY Make the case that non-Army and/or non-DoD dollars will continue to fund improvements to your solution from which the Army will benefit in the future. Companies who cannot demonstrate non-Army and/or non-DoD funding sources for future solution enhancements are less attractive to the Applied SBIR program.</p> <p>FINANCIAL PROFIT POTENTIAL Through the Applied SBIR program, the Army wants to take advantage of the speed and scalability of dual-use companies. Make your best case that your product is or will be profitable. If you have more than one product, please focus your argument on the product / solution presented for this SBIR program.</p> |
| TEAM ABILITY | weight 10% | Prove your team has executed well as a group. Please draw clear distinctions between private sector, DoD and civilian government work. What milestones have you accomplished as a group in this company? |
| SUBMISSION QUALITY | weight 3% | <p>QUALITY OF PROSE Prove you write clearly. Prove you argue convincingly.</p> <p>DATA QUALITY & ATTRIBUTION Support your arguments with relevant, properly attributed data to enhance your credibility.</p> |



Appendix C Phase II Evaluation Criteria

| Applied SBIR Phase II Proposal Review v2-0-3 Evaluation Criteria Defined | |  |
|--|---|--|
| | | DEFINITION |
| INTRODUCTION | weight 2% | Write a clear, concise description of what your innovation does or will do, and where you are in your evolution. Make clear its intended impact on the Army. Evaluators should "get it" after reading this. |
| POTENTIAL FOR ARMY IMPACT | OPERATIONAL IMPACT | At the scale of a single Army end-user, argue that their jobs or lives will be significantly improved if your solution is adopted. What is the impact of your solution for a soldier/Army civilian vs. today's solutions? |
| | POTENTIAL SCALE OF IMPACT | Here, we're looking for an idea of how broad the impact you described above could be. Look into the future to a time when your solution is both technically mature and actively in use by Army personnel. Describe the scale and scope of your impact within the context of the Army. |
| TECHNICAL FEASIBILITY | SCIENTIFIC FEASIBILITY | Is the science behind the solution sound? Convince readers who don't have deep expertise in your field that your innovation is built atop sound scientific and engineering principles. |
| | ENABLING TECHNOLOGIES | Point to the foundational technologies that you rely on to deliver your solution. Do the required enabling technologies introduce added risk? Using proven (and ideally Army-fielded) underlying technologies and techniques helps to lower technical risk. |
| | ALTERNATIVE TECHNICAL APPROACHES | From a technologist's perspective, why is your proposed solution the best choice for the Army? Refute the alternative engineering approaches others are using. Why does your technology win? |
| | TECHNICAL RISK MITIGATION | No matter your current technology readiness level, technical risks remain. Identify those risks. Present a credible plan to tackle those risks. |
| TRANSITION | ARMY TRANSITION PATHWAY | Planning for success, what's next for you after this SBIR award? Describe the next type of deal you aim to make with the Army, e.g. a CRADA, a different SBIR contract, a CSO, etc. Briefly outline your current plan to unlock that next opportunity and/or share the biggest risks you see post this SBIR award. |
| | SBIR MILESTONE SCHEDULE | Please share with us a thoughtful execution plan. Strike a balance between giving us a sense of the detailed thinking behind the scenes and the need for your contracting officer to manage a reasonably small number of milestones during your period of performance. |
| FIRM CASH FLOW | FIRM SURVIVAL RISK | SBIR funds are meant to fuel growth rather than stave off a firm's impending financial failure. Demonstrate that your company will survive financially as a going concern through the early stages of a Phase III contract, sometimes referred to as "transitioning" into use by Army personnel. |
| | OTHER PEOPLE'S MONEY | Make the case that non-Army and/or non-DoD dollars will continue to fund improvements to your solution from which the Army will benefit in the future. Companies who cannot demonstrate non-Army and/or non-DoD funding sources for future solution enhancements are less attractive to the Applied SBIR program. |
| | FINANCIAL PROFIT POTENTIAL | Through the Applied SBIR program, the Army wants to take advantage of the speed and scalability of dual-use companies. Make your best case that your product is or will be profitable. If you have more than one product, please focus your argument on the product / solution presented for this SBIR program. |
| TEAM ABILITY | weight 5% | Prove your team has executed well as a group. Please draw clear distinctions between private sector, DoD and civilian government work. What milestones have you accomplished as a group in this company? |
| SUBMISSION QUALITY | QUALITY OF PROSE | Prove you write clearly. Prove you argue convincingly. |
| | DATA QUALITY & ATTRIBUTION | Support your arguments with relevant, properly attributed data to enhance your credibility. |

Appendix D

Commercialization Plan Template

General Instructions/Guidance:

1. The slide deck must be 8 slides total, per Component Instructions, and follow the formatting contained in the template. Font size shall be no smaller than 10-point font.
2. Slides should display the slide number in bottom right corner
3. All text (including tables, charts, plots, axes labels, legends, captions) must be readable without zooming and understandable without voice-over
4. For plots and charts:
 - a. Include title/bullet describing importance of plot/chart, and/or data (be specific)
 - b. Axes must be meaningfully labeled (to be understandable by non-experts) and include scale
5. Avoid jargon; define technical terms
6. Convert from slide format to a PDF file for submission to DSIP alongside the technical volume proposal
7. To insert images, capture a screenshot of the image and paste it into the slide. Please do not drag-drop a file into the presentation or use the Insert Pictures menu function.
8. Use PowerPoint's "Compress Pictures" feature to reduce file size
 - a. Select 96ppi resolution
 - b. Uncheck "For this picture only"
9. Replace the boilerplate footer below with distribution markings as appropriate
10. Do not put any company logos (Twitter, Reddit, GitHub, etc) on your slides

To be considered valid proposals, Commercialization Plan submissions must follow the number and content of each slide as contained in the attached template.

Appendix D
Commercialization Plan Template cont.

Firm Name

SBIR Project Title

Principal Investigator Name / Title
Key (or other relevant) Personnel, and
Subcontractors

.....
Insert Topic Number
Insert Proposal Number

Distribution markings as appropriate for your organization

BLUF: Bottom Line Up Front

- **BLUF:**
 - 1. Company information and background** : Core competencies, significant sales, previous funding, commercialization successes.
 - 2. Customer and Competition** : Clear description of key technology objectives, current competition, and advantages.
 - 3. Market:** Plan to obtain market share.
 - 4. Intellectual Property:** Patent status, technology lead, trade secrets or other demonstration of a plan to protect the company's technical advantage.
 - 5. Financing/Revenue:** Plans for securing necessary non -SBIR funding.
 - 6. Assistance and mentoring** : Plans for securing needed technical or business assistance.

Distribution markings as appropriate for your organization

Appendix D

Commercialization Plan Template cont.

Company Information and Background

- Core competencies and areas of specialization.
- Products with significant sales.
- Concise history of previous Federal and non -Federal funding/investments.
- Regulatory experience (if applicable).
- Past commercialization successes.
- Past failure and how you overcame .

Distribution markings as appropriate for your organization

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Customer & Competition

- Description of key technology objectives.
- Current competition and/or alternative solutions.
- Advantages of company's offer compared to competing products or services.
- Hurdles to acceptance of the proposed innovation.
- Description of possible areas where your technology may be utilized or is under utilized.

Distribution markings as appropriate for your organization

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Appendix D Commercialization Plan Template cont.

Market

- Analysis of market size and 1 and 5 year forecasted market share.
- Explanation of milestones and target dates of plan to obtain that market share.
- What experience do you have with marketing to this target market?
- What commercialization strategy appears to be the best for bringing this product to the target market?
- What experience do you have with bring products to market – either through this company or through other companies with which you have worked.
- Does the company currently market, manufacture, or license technology? Describe what you do.

Intellectual Property

- Patent status, technology lead, trade secrets or other demonstration of a plan to achieve sufficient protection to realize the commercialization stage and attain at least a temporary competitive advantage .
- Describe how you will protect the intellectual property that enables commercialization of its products while keeping competitors at bay. Note any actions you may consider to attain at least a temporary competitive advantage. Also consider your company's prior record in this area. Comment on your company's strategy to build a sustainable business through protection of intellectual property.

Appendix D Commercialization Plan Template cont.

Financing

- Plan for securing non-SBIR, private or government funding necessary to enter low rate of production of anticipated technical solution.
- Describe your revenue stream generation to include but not limited to:
 - Manufacture and direct sales
 - Sales through value added resellers or other distributors
 - Joint venture

Distribution markings as appropriate for your organization

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Assistance & Mentoring

- Plans for securing needed technical or business assistance through mentoring, partnering, or arrangements with government sponsored (e.g., SBIR funded Discretionary Technical and Business Assistance (TABAs), State assistance programs, Federally-funded research laboratories, Manufacturing Extension Partnership centers), not-for-profits (e.g., Small Business Development Center (SBDC) or Small Business Technical Development Center (SBTDC)), commercial accelerators, DOD Prime Contractors, SBA Mentor - Protégé program, Procurement Technical Assistance Center (PTAC) or other assistance provider.

Distribution markings as appropriate for your organization

8

Army SBIR 23.4 Topic Index
Release 5

A234-008 Army Tech Marketplace

OUSD (R&E) CRITICAL TECHNOLOGY AREA(S): Advanced Computing and Software, Integrated Network Systems-of-Systems and Trusted AI and Autonomy

TOPIC OBJECTIVE: To develop, integrate and deploy a technology with a simple intuitive user interface to improve information exchange and the discovery of collaboration opportunities within the Army R&D and Acquisitions communities as well as between the Army and private sector technology providers and private sector technology integrators. The intent is to improve the transition of R&D-funded technologies into the Army enterprise.

TOPIC DESCRIPTION: The Army research and development ecosystem does not have a simple, intuitive portal for Army research centers and acquisition offices to access information related to Army R&D investments, including technology capabilities, technology maturity level, milestone delivery schedules, etc. The lack of direct access to internal information and data limits internal Army awareness and analysis of potentially valuable technologies to support the Army enterprise. The result is a less robust use of R&D investments, missed collaborations and co-investments, and an overall decrease in the likelihood of critical technologies transitioning into the Army enterprise to support the Soldier.

The Army Tech Marketplace is envisioned as a web-based knowledge management and collaboration platform with an intuitive user-friendly interface that enhances transparency and simplifies access to R&D-funded technologies for Army stakeholders and private sector innovators to share, retrieve, and analyze information, and collaborate. The Army Tech Marketplace should provide an artificial intelligence and data-fusion capability to assess the probability of technologies to transition, identify trends within the Army enterprise, and maximize the value of business intelligence data to support agile Army decision-making.

This effort seeks to create a platform for sharing information at the appropriate level first between different Army offices and second with members of the innovation economy. The effort will prioritize an internal Army-focused side connecting R&D needs and gaps with funding and resource opportunities. Internally, it must be a common, IL4 secure space for the Army and eventually, Joint Service research centers, acquisitions, and SBIR programs to learn of cross-organizational activities, mitigate R&D risks by learning from others, and dynamically exploit opportunities for collaboration. It will also have a generally accessible, external-to-the-Army side connecting innovation economy firms with Army technology challenges and the Army Program Executive Offices working to address those challenges. Externally, the Army Tech Marketplace permits Army, Joint Services, and innovation economy members to appropriately share information, build relationships, and facilitate collaboration, contracts, and integration of innovations into the Army enterprise.

Integral to the platform must be data analytics and artificial intelligence enabled tools to assist internal Army Tech Marketplace users to assess technologies and trends to improve interactions with external members, as well as leverage the total value of the data on the platform to improve Army Tech Marketplace operations. These capabilities should be accessed through a simple graphical intuitive user interface that can serve users of various proficiencies and knowledge. The platform should be vetted from both a software and usability standpoint.

The following are the generalized steps required of the company performing this work to frame and inform their proof-of-concept deliverable:

1. Work with Army SBIR Program to align project goals, requirements, and roles.

2. Engage key stakeholders identified by Army SBIR Program to conduct problem framing and stakeholder mapping activities to engage, discover questions, clarify language, and develop instruments useful to the stakeholders.
3. Review and present findings on similar products and services that other military Services and private organizations use that may have similar or overlapping use cases.
4. Collaborate with Army SBIR Program to identify and outline a detailed project plan, timeline, goals, scoping, and discovery outline intended to form the basis of anticipated Phase 2 work.

The following are success criteria for this effort:

1. Internal Army and External Innovation Economy: Separation within the platform of internal Army stakeholder site from external emerging technology accessible site. The internal, Army-only site must achieve DOD IL-4 to handle Army data up to Controlled Unclassified Information (CUI). The external, innovative economy-oriented side of the platform should achieve DOD IL 2 (Public or Non-Critical Mission Information).
2. Collaboration: Enable collaboration across multiple Army users and private sector innovation economy firms.
3. Ease of Use: An intuitive interface informed by a human-centered design approach that results in a layout and graphics requiring minimal familiarization for basic portal navigation. Must be easy to customize fields to provide flexibility and offer a simplified Search Engine.
4. Workflow: Process tracking, routing, reminders, and ability to assign follow-on tasks.
5. Platform Modularity: Build a modular platform capable of easy expansion in both scale of participants and the scope of capabilities.
6. Reporting & Accountability: The ability to easily retrieve data and insights and track progress on pre-determined metrics. Includes but not limited to reporting and dashboards or other business intelligence tools to help visualize the data.
7. Analytics: Offer data analytics and artificial intelligence enabled tools for trend analysis, customer discovery, and continuous improvement actions across the platform.
8. Lifecycle Cost: Respecting the platform's modular approach, create a total lifecycle cost model to account for implementation, training, and ongoing licensing/support costs.

PHASE I: Starting in FY23, Phase I would be for multiple awards of \$200,000 each with a 4-month period focused on technical value, commercial merit, and feasibility of proposed solutions. At a minimum, the deliverable from Phase I would be a detailed technical presentation on the design and attributes of the proposed platform conforming to the eight success criteria listed in the Topic Description.

PHASE II: In FY 23, an award would be made to refine the plan developed in Phase I and create a minimum viable platform for testing and evaluation by the Army Applied SBIR Program and its stakeholders employing the eight success criteria listed in this Topic Description. These criteria are subject to revision based on the results of the outcome of the Phase I effort.

PHASE III DUAL USE APPLICATIONS: The proposed technology has potential use within the Army Small Business Innovation Research Program as well as other Army Research Centers and acquisition programs.

KEYWORDS: R&D; research and development; portal; Webpage integration; knowledge management; collaboration platform; innovation economy; tech marketplace; software; website

REFERENCES:

<https://www.armysbir.army.mil/topics/>

<https://www.ausa.org/sites/default/files/SR-1990-A-Primer-on-Research-and-Development-in-the-US-Army.pdf>

DEPARTMENT OF THE ARMY
DoD 23.4 Small Business Innovation Research (SBIR) Annual BAA
Release 6
Proposal Submission Instructions

INTRODUCTION

Where big ideas come to life, the Army SBIR and STTR programs align innovative small businesses with critical U.S. Army priorities to turnover game-changing solutions to our most critical customer – the soldier.

Proposers responding to a topic in this BAA must follow all general instructions provided in the Department of Defense (DoD) SBIR 23.4 Program BAA. The DoD 23.4 SBIR Program BAA can be found here: <https://www.defensesbirsttr.mil/SBIR-STTR/Opportunities/>. Army requirements in addition to or deviating from the DoD Program BAA are provided in the instructions below.

Specific questions pertaining to the administration of the Army SBIR Program and these proposal preparation instructions should be directed to: Ms. Jessica Larson at Jessica.larson.civ@aal.army

March 8, 2023: Topic issued for pre-release

April 5, 2023: Army begins accepting proposals via DSIP

April 24, 2023: DSIP Topic Q&A closes to new questions at 12:00 p.m. ET

May 4, 2023: Deadline for receipt of proposals no later than 12:00 p.m. ET

From **March 8, 2023 to April 5, 2023**, this topic is issued for Pre-Release with the names of the topic authors. During the pre-release period, proposing firms have an opportunity to contact topic authors through <https://calendly.com/jessica-larson-civ/casualty-care> to schedule a time to ask technical questions about the topic. Questions should be limited to specific information related to improving the understanding of the topic's requirements. Proposing firms may not ask for advice or guidance on solution approach and you may not submit additional material to the topic author. If information provided during an exchange with the topic author is deemed necessary for proposal preparation, that information will be made available to all parties through the DSIP Topic Q&A module.

Once the Army begins accepting proposals on **April 5, 2023**, no further direct contact between proposers and topic authors is allowed unless the Topic Author is responding to a question submitted during the pre-release period. However, proposers may submit written questions through the DSIP Topic Q&A module at <https://www.dodsirsttr.mil/submissions/login>. The DSIP Topic Q&A for this topic opens on **March 8, 2023** and closes to new questions on **April 24, 2023 at 12:00PM ET**. Once the BAA closes to proposal submission, no communication of any kind with the topic author or through Topic Q&A regarding your submitted proposal is allowed.

Deadline for Receipt: Proposals must be **completely** submitted no later than **12:00 p.m.** ET, on **May 4, 2023**. Proposals submitted after 12:00 p.m. ET will not be evaluated. The final proposal submission includes successful completion of all firm level forms, all required volumes, and electronic corporate official certification.

PHASE I PROPOSAL GUIDELINES

The Defense SBIR/STTR Innovation Portal (DSIP) is the official portal for DoD SBIR/STTR proposal submission. Proposers are required to submit proposals via DSIP; proposals submitted by any other

means will be disregarded. Detailed instructions regarding registration and proposal submission via DSIP are provided in the DoD SBIR Program BAA.

Technical Volume (Volume 2)

The technical volume is not to exceed 10 pages and must follow the formatting requirements provided in the DoD SBIR Program BAA. Any pages submitted in excess of the 10 page limit will not be considered in proposal evaluations.

Content of the Technical Volume

Detailed Phase I proposal instructions can be found at: <http://aal.army/assets/files/pdf/sbir-phase-1-template.pdf>

Cost Volume (Volume 3)

The Phase I Base amount must not exceed \$200,000 for a 3 month period of performance (PoP). A no-cost two month PoP extension may be possible, based on progress.

Company Commercialization Report (CCR) (Volume 4)

Completion of the CCR as Volume 4 of the proposal submission in DSIP is required. Please refer to the DoD SBIR Program BAA for full details on this requirement. Information contained in the CCR will not be considered during proposal evaluations.

Supporting Documents (Volume 5)

Proposers can submit an optional slide deck of 10 slides in Volume 5: Supporting Documents. The slide deck can contain information on the technical approach, the team, commercialization plans, or relevant technology/research the proposers have developed, and it should contain additional/complementary information to the technical volume. If a proposer elects to submit a slide deck, its information will be used in the evaluation process. A sample Slide Deck template is located here: <http://aal.army/assets/files/pdf/sbir-optional-slide-template.pdf>.

PHASE II PROPOSAL GUIDELINES

Phase II proposals may only be submitted by Phase I awardees. Phase II proposal submission window, notification process, expected budget/duration structure and additional instructions will be provided in the Phase I contract or by subsequent notification.

DISCRETIONARY TECHNICAL AND BUSINESS ASSISTANCE (TAB A)

The Army, at its discretion, may provide Technical and Business Assistance (TAB A). The Army will select a preferred vendor(s) for the Army SBIR TAB A program through a competitive process. Alternatively, a small business concern may, by contract or otherwise, select one or more vendors to assist the firm in meeting the TAB A goals. The Applicant must request the authority to select its own TAB A provider in its Army SBIR proposal and must demonstrate that the vendor is uniquely postured to provide the specific technical and business services required. TAB A funding will be denied if the offeror fails to include the cost and detailed explanation in its proposal.

Participation in the Army SBIR TAB A program is voluntary for each Army SBIR awardee. Services provided to Army SBIR firms under the auspices of the TAB A program may include, but are not limited to:

1. Access to a network of scientists, engineers, and technologists focused on commercialization and transition considerations such as protected supply chain management, advanced manufacturing, process/product/production scaling, etc;

2. Assistance with intellectual property protections, such as legal considerations, intellectual property rights, patent filing, patent fees, licensing considerations, etc;
3. Commercialization and technology transition support such as market research, market validation, development of regulatory or manufacturing plans, brand development;
4. Regulatory support such as product domain regulatory considerations, regulatory planning, and regulatory strategy development.

The Army SBIR program sponsors participation in the TABA program. The resource limitation for each firm is as follows:

- Phase I Firms:
 - Army-Preferred Vendor: If approved, the contractor may receive up to \$6,500 worth of assistance services per project per year (in addition to the base SBIR award amount).
 - Firm-Selected Vendor: If approved, the contractor may receive up to \$6,500 in contract obligation (in addition to the base SBIR award amount) per project per year.
- Phase II Firms:
 - Army-Preferred Vendor: If approved, the contractor may receive up to \$50,000 worth of assistance services per project per year (in addition to the base SBIR award amount).
 - Firm-Selected Vendor: If approved, the contractor may receive up to \$50,000 in contract obligation (in addition to the base SBIR award amount) per project per year.

EVALUATION AND SELECTION

The Army will conduct an evaluation of each responsive, timely, eligible proposal in accordance with the evaluation criteria listed in the DoD Program BAA. It is the policy of the Army to ensure equitable and comprehensive proposal evaluations based on the evaluation criteria and to select the source (or sources) whose offer meets the Government's technical, policy, and programmatic goals.

As previously stated herein, timeliness, responsiveness, and eligibility will be assessed upon initial screening, during evaluation, and after selection. Proposals that do not comply with the instructions and requirements detailed in this document, the DoD Program BAA, or the corresponding Topic posting (including the research objective(s)), will be considered ineligible, nonresponsive, untimely, or non-conforming and therefore will not be evaluated or considered for award.

Using the evaluation criteria, the Government will evaluate each responsive, timely, eligible proposal in its entirety, documenting the strengths and weaknesses relative to each evaluation criterion. Proposals will not be evaluated against each other during the evaluation process, but rather evaluated on their own individual merit to determine how well the proposal meets the criteria stated in this BAA and the corresponding opportunity.

Selected proposals are those determined to be the most advantageous to the Government, consistent with instructions and evaluation criteria specified in the DoD Program BAA, the component-specific instructions herein, the corresponding Topic posting, and availability of funding.

Proposing firms will be notified via email of selection or non-selection status for a Phase I or direct to Phase II award within 90 days of the closing date of the Topic. The notification will be sent to the Corporate Official listed on the proposal cover sheet from the Army SBIR Program Office mailbox. The Army promotes transparency regarding the technical evaluation for all Army SBIR proposals. The Army will provide a technical evaluation narrative to the proposer in accordance with the SBA Policy Directive, Appendix I, paragraph 4. The selection decision notice contains instructions for retrieving the technical evaluation narrative.

Proposers must not regard the notification email (selection decision notice) as an authorization to commit or expend funds. After the Army SBIR Office has recommended a proposal for award, a Government Contracting Officer may contact the proposer in order to discuss and request additional information required for award. This may include representations and certifications, certified or other than certified cost data, subcontracting plan for small businesses, and/or other information as applicable to the proposed award. Proposers must not regard these communications as an authorization to commit or expend funds. Unless a Government Contracting Officer signs the award document (i.e. contract), no obligations to provide funding are made. The Government may reject the proposal or cancel the contract action at any time.

If signed by the Government Contracting Officer, the award document is the official and authorizing instrument (i.e. contract). The anticipated period of performance start date will be determined at time of award. The Contracting Officer will email the signed, authorizing award instrument to the principal investigator (PI) and/or an authorized organization representative.

Refer to the DoD SBIR Program BAA for procedures to protest the Announcement.

As further prescribed in FAR 33.106(b), FAR 52.233-3, Protests after Award should be submitted to:

Email: usarmy.pentagon.hqda-asa-alt.mbx.army-applied-sbir-program@mail.mil

Mailing Address:

Army Applied SBIR Office
2530 Crystal Dr; Ste 11192
Arlington, VA 22202

AWARD AND CONTRACT INFORMATION

Please refer to the DoD Program BAA for detailed information regarding SBIR/STTR phase structure and flexibility.

Army SBIR 23.4 Topic Index
Release 6

A234-009 Casualty Care Training- Mixed Reality Manikin Solution for Female Soldier
Survivability

A234-009 Casualty Care Training- Mixed Reality Manikin Solution for Female Soldier Survivability

OUSD (R&E) CRITICAL TECHNOLOGY AREA(S): Combat Casualty Care; Human-Machine Interfaces

OBJECTIVE:

Develop, demonstrate, and deliver solutions for enhanced female combat trauma mixed reality (MR) training manikin that incorporates open architecture utilizing high fidelity simulations for combat-trauma-related scenarios.

DESCRIPTION:

A study of the Army's medical training literature found significant disregard for the anatomical and physiological differences between males and females resulting in lower survivability rates for female casualties in comparison to males: 35.9% vs 17% and 14.5% vs 12% (Operation Iraqi Freedom) (Cross, Johnson, Wenke, Bosse, & Ficke, 2011). The Army currently trains Soldiers using male manikins when teaching Tactical Combat Casualty Care (TCCC). The Army is looking to invest in technology that improves training to better care for Soldiers, specifically female Soldiers, on the battlefield and save lives at point of injury. Training using realistic, female anatomy can help reduce hesitation to provide treatment of battlefield injuries and reduce female deaths.

The Army is seeking a solution for a hybrid training tool utilizing a combination of augmented reality, virtual reality, and physical manikins to address female combat casualty care. To build out the best-in-breed training solution, all components need to be open architecture with plug-and-play capabilities to develop modular training independent of gender or scenario.

While medical training is extremely hands-on, and the ability to physically feel what is happening is critical in training, virtual training provides ease and modularity for creating different training scenarios and reduces the cost of training. Currently, trauma medical training is done in either virtual *or* physical training environments. There are limitations for both approaches but combining the two will increase training effectiveness and reduce costs overall.

Current Army medical training is male-centric with significant gaps in female trauma care (Bell, Thomson, Mazzeo, & Pike, 2020). According to the Department of Defense Personnel and Readiness Report of 2019, 14.9% of the United States Army population is female (2019, p. 93). This effort will not only move the needle to address female needs on the battlefield for the military, but it will also have applications in the civilian sector, better preparing medical professionals for trauma cases.

PHASE I:

Design a proof-of-concept solution for an end-to-end system, or components of a system that effectively trains Soldiers utilizing an anatomically correct physical female manikin, physical task trainers, software simulators/trainers, and provides Soldier training feedback. Solutions will be evaluated based on a holistic view of factors including the ability to integrate designated Army open standards, cost of development, adaptability of solution based on individual Soldiers' needs or scenarios, and any additional factors proposed. The objective of Phase I is to establish the technical merit, feasibility, and commercial potential of the proposed effort, and to determine the quality of performance of the awarded companies prior to providing further support in Phase II. Final deliverable will be a concept design presentation, proof of technology demonstration, and plans for follow-on Phase II work.

Companies can voluntarily participate in the Army Applications Laboratory (AAL) 12-week cohort program. The AAL cohort program is designed to solve specific Army modernization challenges on a compressed timeline. The cohort program matches qualified companies with Army problem owners to speed capability development, accelerate transition, and de-risk or inform requirements. This program is designed for businesses that own unique, applicable technology and are interested in growing a new line of business through the DoD.

The cohort program will enhance technology development through rapid exposure to Army stakeholders and the Army medical simulation community. Planned activities include a problem topic deep dive, a field week with Army leaders and Soldiers, hands-on experience with currently fielded military equipment, and stakeholder engagement from the requirements writer, to the acquisition manager, to the end-user. An example cohort program for this topic is:

- Week 1 – Orientation and problem deep-dive (virtual)
- Week 2 – Soldier Touchpoint (in-person at an Army installation)
- Week 3-6 – Concept research and planning
- Week 7 – Mid-point concept design brief to Army Senior Leaders and SME roundtable discussion (in-person at an Army installation)
- Week 8-11 – Concept design refinement
- Week 12 – Final concept design brief to Army Senior Leaders (in-person at an Army installation)

Cohort programming will be provided free of charge. Proposers who plan to participate in the cohort (if awarded a Phase I) are encouraged to include travel costs for three cohort trips, within the continental US, for four to five days each for in-person programming. In-person events may be substituted for virtual events depending on COVID-19 travel restrictions. Details will be provided to awardees under this topic at Phase I award.

PHASE II:

Design a prototype demonstration for the continued development efforts initiated in Phase I. Prototypes should be capable of integration with existing Army systems or newly developed systems from other awardees. They should also showcase modularity and prove effective during simulated or operational demonstrations.

Phase II deliverables include a demonstration and delivery of a Technology Readiness Level (TRL) 6 prototype for further Army evaluation, as well as quarterly and final reports detailing design and performance analysis of the prototype.

Awardees may also be eligible for Phase IIb award after completion of Phase II period of performance. Phase IIb can extend the period of performance with additional funding and additional matching opportunities to finish building out solutions with the stakeholders' discretion.

PHASE III:

The objective of Phase III, where appropriate, is for the small business to pursue commercialization objectives through the effort. Companies may develop a manufacturing-ready product design, capable of integration with the existing or future system, and demonstrate technology integration. Low-rate production will occur as required. Companies will engage in laboratory or operational testing as required. Phase III deliverables include system-level integration technical data package, installation documentation, and system-level prototype for demonstration and government-sponsored testing

WEBINAR DATE:

Two Webinars will be conducted with this solicitation on Tuesday, 21 March: Webinar 1 (1500-1600 CST) and Thursday, 23 March: Webinar 2 (1200-1300 CST). Please register at:

<https://casualtycaretrainingwebinar.eventbrite.com>

KEYWORDS:

Female Manikin, Combat Casualty Trauma, Combat Trauma Manikin, MOHSES, Augmented Reality Medical Training, Virtual Reality Medical Training, Open Architecture

REFERENCES:

Bell, E. Thomson, R., Mazzeo, M. Pike, W. (2020). Same injury, different outcome? Investigating hesitation while treating female casualties. Proceedings of the 2020 Interservice/Industry Training, Simulation, and Education Conference. https://media.defense.gov/2023/Mar/06/2003173353/-1/-1/1/BELL_THOMSON_CASUALTIES.PDF

Cross, J. D., Johnson, A. E., Wenke, J. C., Bosse, M. J., & Ficke, J. R. (2011). Mortality in female war veterans of Operations Enduring Freedom and Iraqi Freedom. *Clinical Orthopaedics and Related Research*®, 469(7), 1956-1961. Retrieved November 21 from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3111768/>

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Office of the Under Secretary for Personnel and Readiness Report, 2019. Retrieved October 2, 2019 from <https://prhome.defense.gov/M-RA/Inside-M-RA/TFM/Reports/>

Reed, A. M., Janak, J. C., Orman, J. A., & Hudak, S. J. (2018). Genitourinary injuries among female US service members during Operation Iraqi Freedom and Operation Enduring Freedom: findings from the Trauma Outcomes and Urogenital Health (TOUGH) project. *Military Medicine*, 183(7-8), e304-e309. <https://pubmed.ncbi.nlm.nih.gov/29420771/>

Sotomayor, T. M., Mazzeo M. V., Maraj, C. S., & Page, A. J. (2018). Saving female lives using simulation: elevating the training experience.. *Launching Innovation Through Medical Modeling and Simulation Technologies*, 6(4), 28 – 37. Retrieved October 2, 2019, from <https://csiac.org/articles/saving-female-lives-using-simulation-elevating-the-training-experience/>

Department of the Army
23.4 Small Business Innovation Research (SBIR)
Pacific Open Topic
Component-Specific Proposal Instructions

March 9, 2023: Topic issued for pre-release

September 20, 2023: Army begins accepting proposals via DSIP

September 20, 2023: DSIP Topic Q&A closes to new questions at 12:00pm. ET

October 11, 2023: Deadline for receipt of proposals no later than 12:00 pm. ET

IMPORTANT: This topic is open for all interested U.S based small businesses to submit for a SBIR award. The U.S. Army would like to invite interested entities to participate in the Pacific Open Topic, and submit for a Phase I or Direct to Phase II SBIR award.

INTRODUCTION

The future Army must be capable of conducting Multi-Domain Operations (MDO) as part of an integrated Joint Force across an array of situations in multiple theaters by 2035. The MDO concept describes how the Army will support the Joint Force in the rapid and continuous integration of all domains of warfare – land, sea, air, and cyberspace – to deter and prevail as we compete short of conflict, and fight and win if deterrence fail. The Army must provide game-changing capabilities to our Soldiers. To capitalize on small business innovation, the Army has implemented an approach to advertise SBIR funding opportunities through the Department of Defense (DoD) Annual BAA process, outside of the three pre-determined BAA cycles. This approach also strives to create a more rapid award time from solicitation to closing.

Proposers are encouraged to thoroughly review the DoD Program BAA and register for the DSIP Listserv to remain apprised of important programmatic and contractual changes.

- The DoD Program BAA is located at: <https://www.defensesbirsttr.mil/SBIR-STTR/Opportunities/#announcements>. Be sure to select the tab for the appropriate BAA cycle.
- Register for the DSIP Listserv at: <https://www.dodsbirsttr.mil/submissions/login>.

CONTACT INFORMATION

Direct Specific questions pertaining to the administration of the Department of the Army SBIR Program and proposal preparation instructions to the Point of Contact identified in the Topic announcement. General questions can be directed to the following:

Email: usarmy.pentagon.hqda-asa-alt.mbx.army-applied-sbir-program@army.mil

Website: <https://www.armysbir.army.mil/>

Mailing Address:

Army Applied SBIR Office 2530 Crystal Dr; Ste 11192
Arlington, VA 22202

RESPONSIVENESS AND TIMELINESS

All proposals will be evaluated and judged on a competitive basis. Proposals will only be evaluated in response to an active, corresponding Army topic. Proposals will be initially screened to determine responsiveness and timeliness. Proposals passing this initial screening will be technically evaluated by engineers or scientists to determine the most promising technical and scientific approaches. Assessment of responsiveness may continue during technical evaluation and after selection. If at any point the proposal is deemed untimely, unresponsive, ineligible, or non-responsive, the proposal will be rejected / the contract action will be cancelled.

SYSTEM FOR AWARD MANAGEMENT (SAM)

Interested firms are required to be registered and active in SAM (www.sam.gov) before submitting a proposal and shall continue to be registered until time of award, during performance, and through final payment of any contract. The proper North American Industry Classification System (NAICS) code and Product and Service Code are as follows:

NAICS: 541715, Research and Development in the Physical, Engineering, and Life Sciences (except Nanotechnology and Biotechnology)

PSC: AC12, National Defense R&D Services; Department of Defense - Military; Applied Research

Proposing firms with no SAM registration, inactive SAM registration(s), or SAM registration(s) with improper representations and certifications will be disqualified.

A firm may NOT submit an offer on behalf of another entity. The proposed firm must be the same firm (Cage Code/DoDAAC/UEI/Duns) that receives the award.

ELIGIBILITY

The eligibility requirements for the SBIR/STTR programs are unique and do not correspond to those of other small business programs. Please refer to Section 3.1, Eligible Applicants, of BAA 23.4 for full eligibility requirements.

Ownership in Part by Multiple Venture Capital, Hedge Fund, and Private Equity Firms

Proposing small business concerns that are owned in majority part by multiple venture capital operating companies (VCOCs), hedge funds, or private equity funds are eligible to submit applications or receive awards for this topic.

- Proposing small business concerns must identify each foreign national, foreign entity, or foreign government holding or controlling greater than a 5% equity stake in the proposing small business concern, whether such equity stake is directly or indirectly held.
- The proposing small business concern must also identify any and all of its ultimate parent owner(s) and any other entities and/or individuals owning more than a 5% equity stake in its chain of ownership.

Venture capital operating companies, hedge funds and private equity firms are allowed to hold minority shares of SBIR/STTR awardee so long as they do not have control of the awardee company and so long as their affiliation with the awardee, if any, does not put the awardee firm over the size limit.

If the VCOC is itself more than 50% directly owned and controlled by one or more individuals who are citizens or permanent resident aliens of the United States, the VCOC is allowed to have majority ownership and control of the awardee. In that case, the VCOC and the awardee, and all other affiliates, must have a total of 500 employees or less.

Anticipated Structure/Award Information

For this topic, Department of the Army will accept Phase I proposals for the cost of up to \$250,000 for up to 6-month period of performance and Direct to Phase II proposals for a cost up to \$1,900,000 for an 18-month period of performance.

Proposals that do not comply with the requirements detailed in BAA 23.4 and the research objectives of these Component Instructions are considered non-conforming and therefore are not evaluated nor considered for award.

Phase I proposals in response to this BAA include the following:

- Volume 1: Proposal Cover Sheet
- Volume 2: Technical Volume (13 pages maximum; breakdown below)
 - Technical Proposal (5 pages maximum)

- Commercialization Plan (8 pages maximum saved as PDF)
- Volume 3: Cost Volume
- Volume 4: Company Commercialization Report (REQUIRED)
- Volume 5: Supporting Documents (Requirements outlined in the DoD Program BAA)
 - Contractor Certification Regarding Provision of Prohibition on Contracting for Certain Telecommunications and Video Surveillance Services or Equipment
 - Disclosures of Foreign Affiliations or Relationships to Foreign Countries
 - Disclosure of Funding Sources - Please refer to the DoD Program BAA for more information.)
 - Fraud, Waste, and Abuse Training Certificate

PHASE I PROPOSAL INSTRUCTIONS

The Defense SBIR/STTR Innovation Portal (DSIP) is the official portal for DoD SBIR/STTR proposal submission. Proposers (also referred to herein as “offeror(s)”) are required to submit proposals via DSIP; proposals submitted by any other means will be disregarded. Detailed instructions regarding registration and proposal submission via DSIP are provided in the DoD SBIR Program BAA.

Proposal Coversheet (Volume 1)

The proposal coversheet must follow the instructions and requirements provided in the DoD SBIR Program BAA.

The offeror shall certify that to the best of its knowledge and belief, its eligibility information under the SBIR Program is accurate, complete, and current as of the date of the offer.

Volume 2 (Technical Volume)

The technical volume is not to exceed 5 pages and must follow the formatting requirements provided in the DoD SBIR Program BAA. A commercialization plan must also accompany the technical proposal and must be 8 slides. The required content to include within these slides are described in Appendix D. The commercialization plan must be converted to a pdf and attached to the end of the technical volume, resulting in one pdf file to be uploaded to DSIP as Volume 2. The commercialization plan does not count towards the technical volume 5-page limit. Any proposals submitted without a commercialization plan or in a format other than that provided by the BAA will not be reviewed.

Volume 2 (Part One Technical Proposal)

The Technical Volume shall contain two key sections – technical approach and team qualifications. The technical approach section shall contain details on how the proposer is going to solve the problem. It shall detail key elements of the firm’s approach, any risks, relevant past work and how success is measured. The team qualifications section shall highlight the key personnel working on the project, and the resources that will be brought to bear on solving the problem.

Volume 2 (Part Two Commercialization Plan)

The commercialization plan shall include:

- Company information: Focused objectives/core competencies; specialization area(s); products with significant sales; and history of previous Federal and non-Federal funding, regulatory experience, and subsequent commercialization successes.
- Customer and Competition: Clear description of key technology objectives, current competition, and advantages compared to competing products or services; description of hurdles to acceptance of the innovation.
- Market: Milestones, target dates, analyses of market size, and estimated market

share after first year sales and after 5 years; explanation of plan to obtain market share.

- **Intellectual Property:** Patent status, technology lead, trade secrets or other demonstration of a plan to achieve sufficient protection to realize the commercialization stage and attain at least a temporal competitive advantage.
- **Financing:** Plans for securing necessary non-SBIR funding.
- **Assistance and mentoring:** Plans for securing needed technical or business assistance through mentoring, partnering, or through arrangements with government sponsored (e.g., State assistance programs, Federally-funded research laboratories, Manufacturing Extension Partnership centers), not-for-profits (e.g., SBDC), commercial accelerators, DOD Prime Contractors, or other assistance provider.

These instructions supersede those stated in section 5.3.c of the DoD Program BAA.

Cost Volume (Volume 3)

The Cost Volume must follow all instructions and requirements provided in the DoD SBIR Program BAA. Supplemental requirements are as follows:

Unless otherwise noted in the topic, the Phase I Base amount must not exceed \$250,000 for a 6-month period of performance. Phase I Options are not anticipated at this time. If an option is identified in the topic posting, costs for the Base and Option must be separated and clearly identified on the Proposal Cover Sheet (Volume 1) and in Volume 3. Awards for these topics will be in the form of a firm fixed price contract.

Content of the Cost Volume (Volume 3)

For pricing purposes, offerors should assume a contract or agreement start date of approximately ninety (90) days after submission of the proposal. Awards are executed as FAR-based firm-fixed-price contracts. Fixed price payments shall be tied to measurable milestones, as agreed to by the Government.

In the event that adequate price competition, as defined in FAR 15.403-1(1), is not realized, the Government will conduct additional proposal analysis, in accordance with the techniques identified at FAR 15.404-1. In accordance with FAR 15.402(a), Contracting officers shall purchase supplies and services from responsible sources at fair and reasonable prices. If the Contracting Officer is unable to deem the offeror as responsible (FAR 9.1), the offeror will be disqualified. Proposals lacking a fair and reasonable price will be eliminated.

ALL proposed costs should be accompanied by documentation to substantiate how the cost was derived. For example, if you proposed travel costs to attend a project-related meeting or conference, and used a travel website to compare flight costs, include a screenshot of the comparison. Similarly, if you proposed to purchase materials or equipment, and used the internet to search for the best source, include your market research for those items. You do not necessarily have to propose the cheapest item or supplier, but you should explain your decision to choose one item or supplier over another. It's important to provide enough information to allow contracting personnel to understand how the proposer plans to use the requested funds. Some items in the cost breakdown may not apply to the proposed project. If that is the case, there is no need to provide information on each and every item.

ALL proposed costs should be accompanied by documentation to substantiate how the cost was derived. Substantiating documentation guidance is as follows:

- **LABOR:**
 - List all key personnel by name as well as by number of hours dedicated to the project as direct labor.
 - Explain the basis of proposed labor hours, including required tasks, and substantiating documentation for the costs (e.g. payroll reports). Volume 5, Supporting Documents, may be used if additional space is needed.

- **MATERIAL/TOOLING/EQUIPMENT:**
 - Explain the basis of proposed material and equipment costs. This support should include a consolidated priced summary of individual material and equipment quantities and substantiating documentation for the costs (e.g. vendor quotes, invoice prices, competitive bids, etc.). If your choice isn't the lowest cost available, explain the decision to choose one item or supplier over another. Volume 5, Supporting Documents, may be used if additional space is needed.
 - Ensure all materials are American-made to the maximum extent practicable. Offerors who propose to use a foreign-made product in its technology may be required to find an American-made equivalent.
 - While special tooling and test equipment and material cost may be included, it will be carefully reviewed relative to need and appropriateness for the work proposed. The purchase of special tooling and test equipment must, in the opinion of the Component Contracting Officer, be advantageous to the Government and should be related directly to the specific topic. These may include such items as innovative instrumentation or automatic test equipment. Title to property furnished by the Government or acquired with Government funds will be vested with the DoD Component, unless it is determined that transfer of title to the contractor would be more cost effective than recovery of the equipment by the DoD Component.

- **TRAVEL:**
 - Explain the basis of proposed travel, including to/from locations, number of trips, number of travelers per trip, and number of days/nights per trip. Include substantiating documentation for the costs (e.g. screenshots of flight cost comparison, rental car quotes, etc.). NOTE: Virtual meetings shall be utilized to the maximum extent practicable. Volume 5, Supporting Documents, may be used if additional space is needed.

- **SUBCONTRACTS:** A subcontract is any agreement, other than one involving an employer-employee relationship, entered into by the prime contractor (awardee) calling for supplies or services for the performance of the contract.
 - All subcontractor costs and consultant costs must be detailed at the same level as prime contractor costs in regard to labor, travel, equipment, etc.
 - Explain the basis of proposed subcontract costs. Include documented support of the offeror's price analyses and degree of competition of all subcontractor

proposals. All subcontractor costs and consultant costs, such as labor, travel, equipment, materials, must be detailed at the same level as prime contractor costs. Provide detailed substantiation of subcontractor costs in your cost proposal. Volume 5, Supporting Documents, may be used if additional space is needed.

- Certify that the following requirements are met: For Phase I, the offeror must perform a minimum of two-thirds of the research and/or analytical effort. One third may be subcontracted to another firm or research organization/facility. The percentage of work is measured by both direct and indirect costs.
- Offerors shall not propose to subcontract to the issuing agency, to any other Federal Government agency, or to other units of the Federal Government, except Federal Laboratories in rare circumstances. As defined in 15 U.S.C. 3703, Federal Laboratory means any laboratory, any federally funded research and development center, or any center established under 15 U.S.C. 3705 and 3707 that is owned, leased, or otherwise used by a Federal Agency and funded by the Federal Government, whether operated by the Government or by a contractor.
- Offerors shall not propose to subcontract to any prohibited sources. Proposals identifying a subcontractor/vendor arrangement with a prohibited source may be rejected.
- Offerors shall ensure subcontracting arrangements are with United States Small Businesses to the maximum extent practicable. Offerors proposing a subcontractor arrangement with other than a United States Small Business (such as, a large business, foreign firm, foreign government, educational institution, unit of Federal Government, etc.) may be required to submit further explanation.
- **INDIRECT COSTS:**
 - Explain the basis of the proposed indirect expense rates including overhead, general and administrative, material handling, and fringe benefits.
 - If a Defense Contract Audit Agency (DCAA) Audit has been conducted within the last five (5) years, include the audit compliance documentation in the cost proposal documents. The documentation should also include the offeror's DCAA Point of Contact (if applicable).
 - Offerors shall provide any current Forward Pricing Rate Agreements (FPRA) in effect at time of proposal submission.

If selected for award, failure to include the documentation with your proposal may delay contract award, as the proposer will be asked to submit the necessary documentation to the Contracting Officer to substantiate costs. It is important to respond as quickly as possible to the Contracting Officer's request for documentation. Failure or refusal to provide documentation may result in cancellation of the contract action.

Company Commercialization Report (CCR) (Volume 4)

Completion of the CCR as Volume 4 of the proposal submission in DSIP is required. Please refer to the DoD SBIR Program BAA for full details on this requirement. Information contained in the CCR will be considered by the Department of the Army during proposal evaluations.

Supporting Documents (Volume 5)

Volume 5 is provided for proposers to submit additional documentation to support the Cover Sheet (Volume 1), Technical Volume (Volume 2), and the Cost Volume (Volume 3).

All proposing small business concerns are REQUIRED to submit the following documents to Volume 5:

1. Contractor Certification Regarding Provision of Prohibition on Contracting for Certain Telecommunications and Video Surveillance Services or Equipment
2. Disclosures of Foreign Affiliations or Relationships to Foreign Countries
3. Disclosure of Funding Sources - Please refer to the DoD Program BAA for more information.
4. Fraud, Waste, and Abuse Training Certificate

In addition to the Volume 5 requirements outlined in the DoD Program BAA, the Department of the Army may accept the following documents in Volume 5:

- Additional Cost Information
- Funding Agreement Certification
- Technical Data Rights (Assertions)
- Lifecycle Certification
- Allocation of Rights
- Other (only as specified in the topic)

Please only submit documents that are identified immediately above and in the DoD Program BAA. All other documents submitted will be disregarded.

DIRECT TO PHASE II PROPOSAL (DP2) GUIDELINES

Proposers interested in submitting a DP2 proposal in response to this particular topic must provide documentation to substantiate that the scientific and technical merit and feasibility described in the Phase I section of the topic has been met and describes the potential commercial applications. Documentation should include all relevant information including, but not limited to: technical reports, test data, prototype designs/models, and performance goals/results. Work submitted within the feasibility documentation must have been substantially performed by the proposer and/or the Principal Investigator.

The Army will not evaluate the proposer's related Phase II proposal if it determines that the proposer has failed to demonstrate that technical merit and feasibility has been established or the proposer has failed to demonstrate that work submitted in the feasibility documentation was substantially performed by the proposer and/or the PI.

Feasibility documentation cannot be based upon any prior or ongoing federally funded SBIR or STTR work and DP2 proposals MUST NOT logically extend from any prior or ongoing federally funded SBIR or STTR work.

Format of Technical Volume (Volume 2)

The Technical Volume must include three parts, the Feasibility Documentation, the Technical Proposal, and the Commercialization Plan.

The Technical Volume must be a single Portable Document Format (PDF) file, including graphics. Perform a virus check before uploading the Technical Volume file. If a virus is detected, it may cause rejection of the proposal. Do not lock or encrypt the uploaded file. Do not include or embed active graphics such as videos, moving pictures, or other similar media in the document.

The length of the Feasibility Documentation is not to exceed 5 pages and the length of the Technical Proposal is not to exceed 10 pages. A commercialization plan must also accompany the technical proposal and should be 8 slides. The required content to include within these slides are described in Appendix D. Any proposals submitted in a different format, or exceed the page count limits will not be reviewed.

Number all pages of your proposal consecutively. Font size should not be smaller than 10- point on standard 8-1/2" x 11" paper with one-inch margins. The header on each page of the Technical Volume should contain your company name, topic number, and proposal number assigned by DSIP when the Cover Sheet was created. The header may be included in the one-inch margin.

Volume 2, PART ONE: Feasibility and Technical Proposal (15 pages maximum)

Offerors are free to structure each section of Volume 2, PART ONE as they like, so long as it provides sufficient detail for evaluators to understand the proposed work, who will carry it out, and how the business plans to commercialize results. Volume 2, PART ONE shall include the following:

Volume 2, PART ONE A: Feasibility Documentation (5 pages):

- The offeror shall provide documentation in its proposal to substantiate that the scientific and technical merit and feasibility described in the Phase I section of the topic component-specific instructions has been met and describes the potential commercial applications. Documentation shall include all relevant information including, but not limited to: technical reports (summary and citation), test data, prototype designs/models, and performance goals/results from the Phase I effort.
- If references exist, the offeror shall include a reference list or works cited list as the last page of the feasibility documentation. This will count towards the total page limit.
- Work listed within the feasibility documentation must have been substantially performed by the offeror and/or the Principal Investigator (PI) during the Phase I effort.
- If technology in the feasibility documentation is subject to Intellectual Property (IP), the offeror must either own the IP, or must have obtained license rights to such technology prior to proposal submission, to enable it and its subcontractors to legally carry out the proposed work. Documentation of IP ownership or license rights shall be included in the Technical Volume of the proposal.

Volume 2, PART ONE B: Technical Proposal (10 pages). At a minimum, the technical proposal shall address all of the following:

- What are you trying to do? Describe your firm's technical approach/solution. Articulate your firm's objectives without jargon.
- What is new in your firm's approach and why will your firm be successful?
- If your firm is successful, what difference will this technology make?

- What are the technical risks?
- What is the Period of Performance? In other words, how long will it take to complete the contract, including a milestone schedule to justify the requested period of performance.

Volume 2, PART TWO: Commercialization Plan (8 slides/pages maximum saved as a PDF and attached with the Technical Proposal as part of the Technical Volume, MUST follow the Appendix D Template provided as an additional attachment to these instructions).

The Army is equally interested in dual use commercialization of SBIR/STTR projects that result in products sold to the U.S. military, the private sector market, or both. The Army expects explicit discussion of key activities to achieve this result in the commercialization strategy part of the proposal.

- What is the commercialization plan for the proposed technology? The commercialization plan shall include the following and adhere to the Appendix D Template attached:
 - Company information: Focused objectives/core competencies; specialization area(s); products with significant sales; and history of previous Federal and non-Federal funding, regulatory experience, and subsequent commercialization successes.
 - Customer and Competition: Clear description of key technology objectives, current competition, and advantages compared to competing products or services; description of hurdles to acceptance of the innovation.
 - Market: Milestones, target dates, analyses of market size, and estimated market share after first year sales and after 5 years; explanation of plan to obtain market share.
 - Intellectual Property: Patent status, technology lead, trade secrets or other demonstration of a plan to achieve sufficient protection to realize the commercialization stage and attain at least a temporal competitive advantage.
 - Financing: Plans for securing necessary non-SBIR funding.
 - Assistance and mentoring: Plans for securing needed technical or business assistance through mentoring, partnering, or through arrangements with government sponsored (e.g., State assistance programs, Federally-funded research laboratories, Manufacturing Extension Partnership centers), not-for-profits (e.g., Small Business Development Centers or Procurement Technical Assistance Centers), commercial accelerators, DOD Prime Contractors, or other assistance provider.

The commercialization plan should include the following elements:

- A summary of transition and commercialization activities, and the Technology Readiness Level (TRL) achieved. Discuss how the preliminary transition and commercialization path or paths may evolve during the Phase II project.
- Describe key proposed technical milestones during Phase II that will advance the technology towards product such as: prototype development, laboratory and systems testing, integration, testing in operational environment, and demonstrations.

- Description of Product(s) and/or System Application(s). Identify the commercial product(s) and/or DoD system(s), or system(s) under development, or potential new system(s). Identify the potential DoD end- users, Federal customers, and/or private sector customers who would likely use the technology.
- Business Model(s)/Procurement Mechanism(s). Discuss your current business model hypothesis for bringing the technology to market. Describe plans to license, partner, or self-produce your product. How do you plan to generate revenue? Understanding the Army's goal of creating and sustaining viable small businesses that support and generate advanced Army technologies, describe how you intend to develop your product and supply chains to enable this differentiation.
- Target Market. Describe the market and customer sets you propose to target, their size, their growth rate, and their key reasons they would consider procuring the technology.
- Describe competing technologies existent today on the market as well as those being developed in the lab.
- Funding Requirements. Describe your company's funding history. How much external financing have you raised? Describe your plans for future funding sources (internal, loan, angel, venture capital, etc.).
- Commercialization Risks. Describe the major technology, market and team risks associated with achieving successful transition of the Army funded technology.
- Expertise/Qualifications of Team/Company Readiness. Describe the expertise and qualifications of your management, marketing/business development and technical team that will support the transition of the technology from the prototype to the commercial market and into government operational environments. Has this team previously taken similar products/services to market? If the present team does not have this needed expertise, how do you intend to obtain it? What is the financial history and health of your company (e.g., availability of cash, profitability, revenue growth, etc.)?
- Anticipated Commercialization Results. Include a schedule showing the anticipated quantitative commercialization results from the Phase II project at one year after the start of Phase II, at the completion of Phase II, and after the completion of the Sequential Phase II (i.e., amount of additional investment, sales revenue, etc.). After a Phase II award, the company is required to report actual sales and investment data in its Company Commercialization Report at least annually.

Cost Volume (Volume 3)

Unless otherwise noted in the topic, the Army will accept Direct to Phase II proposals for a cost up to \$1,900,000 for an 18-month period of performance. Proposers are required to use the Cost Proposal method as provided on the DSIP submission site. The Cost Volume (and supporting documentation) DOES NOT count toward the page limit of the Technical Volume.

For pricing purposes, offerors should assume a contract or agreement start date of approximately ninety (90) days after submission of the proposal. Awards are executed as FAR-based firm-fixed-price contracts. Fixed price payments shall be tied to measurable milestones, as agreed to by the Government.

In the event that adequate price competition, as defined in FAR 15.403-1(1), is not realized, the Government will conduct additional proposal analysis, in accordance with the techniques identified at FAR 15.404-1. In accordance with FAR 15.402(a), Contracting officers shall purchase supplies and services from responsible sources at fair and reasonable prices. If the Contracting Officer is unable to deem the offeror as responsible (FAR 9.1), the offeror will be disqualified. Proposals lacking a fair and reasonable price will be eliminated.

Content of the Cost Volume (Volume 3)

ALL proposed costs should be accompanied by documentation to substantiate how the cost was derived. For example, if you proposed travel costs to attend a project-related meeting or conference, and used a travel website to compare flight costs, include a screenshot of the comparison. Similarly, if you proposed to purchase materials or equipment, and used the internet to search for the best source, include your market research for those items. You do not necessarily have to propose the cheapest item or supplier, but you should explain your decision to choose one item or supplier over another. It's important to provide enough information to allow contracting personnel to understand how the proposer plans to use the requested funds. Some items in the cost breakdown may not apply to the proposed project. If that is the case, there is no need to provide information on each and every item.

Cost Breakdown Guidance:

ALL proposed costs should be accompanied by documentation to substantiate how the cost was derived. Substantiating documentation guidance is as follows:

- **LABOR:**

- List all key personnel by name as well as by number of hours dedicated to the project as direct labor.
- Explain the basis of proposed labor hours, including required tasks, and substantiating documentation for the costs (e.g. payroll reports). Volume 5, Supporting Documents, may be used if additional space is needed.

- **MATERIAL/TOOLING/EQUIPMENT:**

- Explain the basis of proposed material and equipment costs. This support should include a consolidated priced summary of individual material and equipment quantities and substantiating documentation for the costs (e.g. vendor quotes, invoice prices, competitive bids, etc.). If your choice isn't the lowest cost available, explain the decision to choose one item or supplier over another. Volume 5, Supporting Documents, may be used if additional space is needed.
- Ensure all materials are American-made to the maximum extent practicable. Offerors who propose to use a foreign-made product in its technology may be required to find an American-made equivalent.
- While special tooling and test equipment and material cost may be included, it will be carefully reviewed relative to need and appropriateness for the work proposed. The purchase of special tooling and test equipment must, in the opinion of the Component Contracting Officer, be advantageous to the Government and should be related directly to the specific topic. These may include such items as innovative instrumentation or automatic test equipment. Title to property furnished by the Government or acquired with Government funds will be vested with the DoD Component, unless it is determined that transfer of title to the contractor would be more cost effective than recovery of

the equipment by the DoD Component.

- TRAVEL:

- Explain the basis of proposed travel, including to/from locations, number of trips, number of travelers per trip, and number of days/nights per trip. Include substantiating documentation for the costs (e.g. screenshots of flight cost comparison, rental car quotes, etc.). NOTE: Virtual meetings shall be utilized to the maximum extent practicable. Volume 5, Supporting Documents, may be used if additional space is needed.

- SUBCONTRACTS: A subcontract is any agreement, other than one involving an employer-employee relationship, entered into by the prime contractor (awardee) calling for supplies or services for the performance of the contract.

- All subcontractor costs and consultant costs must be detailed at the same level as prime contractor costs in regard to labor, travel, equipment, etc.

- Explain the basis of proposed subcontract costs. Include documented support of the offeror's price analyses and degree of competition of all subcontractor proposals. All subcontractor costs and consultant costs, such as labor, travel, equipment, materials, must be detailed at the same level as prime contractor costs. Provide detailed substantiation of subcontractor costs in your cost proposal. Volume 5, Supporting Documents, may be used if additional space is needed.

- Certify that the following requirements are met: For a Direct to Phase II, the offeror must perform a minimum of one-half of the research and/or analytical effort. Less than one-half may be subcontracted to another firm or research organization/facility. The percentage of work is measured by both direct and indirect costs.

- Offerors shall not propose to subcontract to the issuing agency, to any other Federal Government agency, or to other units of the Federal Government, except Federal Laboratories in rare circumstances. As defined in 15 U.S.C. 3703, Federal Laboratory means any laboratory, any federally funded research and development center, or any center established under 15 U.S.C. 3705 and 3707 that is owned, leased, or otherwise used by a Federal Agency and funded by the Federal Government, whether operated by the Government or by a contractor.

- Offerors shall not propose to subcontract to any prohibited sources. Proposals identifying a subcontractor/vendor arrangement with a prohibited source may be rejected.

- Offerors shall ensure subcontracting arrangements are with United States Small Businesses to the maximum extent practicable. Offerors proposing a subcontractor arrangement with other than a United States Small Business (such

as, a large business, foreign firm, foreign government, educational institution, unit of Federal Government, etc.) may be required to submit further explanation.

- **INDIRECT COSTS:**

- Explain the basis of the proposed indirect expense rates including overhead, general and administrative, material handling, and fringe benefits.
- If a Defense Contract Audit Agency (DCAA) Audit has been conducted within the last five (5) years, include the audit compliance documentation in the cost proposal documents. The documentation should also include the offeror's DCAA Point of Contact (if applicable).
- Offerors shall provide any current Forward Pricing Rate Agreements (FPRA) in effect at time of proposal submission.

If selected for award, failure to include the documentation with your proposal may delay contract award, as the proposer will be asked to submit the necessary documentation to the Contracting Officer to substantiate costs. It is important to respond as quickly as possible to the Contracting Officer's request for documentation. Failure or refusal to provide documentation may result in cancellation of the contract action.

For more information about cost proposals and accounting standards, see the DCAA publication titled "Audit Process Overview – Information for Contractors" available at: <http://www.dcaa.mil>.

Company Commercialization Report (CCR) (Volume 4)

Completion of the CCR as Volume 4 of the proposal submission in DSIP is required. Please refer to the DoD SBIR Program BAA for full details on this requirement. Information contained in the CCR will be considered by the Department of the Army during proposal evaluations.

Supporting Documents (Volume 5)

Volume 5 is provided for proposers to submit additional documentation to support the Cover Sheet (Volume 1), Technical Volume (Volume 2), and the Cost Volume (Volume 3).

All proposing small business concerns are **REQUIRED** to submit the following documents to Volume 5:

1. Contractor Certification Regarding Provision of Prohibition on Contracting for Certain Telecommunications and Video Surveillance Services or Equipment
2. Disclosures of Foreign Affiliations or Relationships to Foreign Countries
3. Disclosure of Funding Sources - Please refer to the DoD Program BAA for more information.
4. Fraud, Waste, and Abuse Training Certificate

In addition to the Volume 5 requirements outlined in the DoD Program BAA, the Department of the Army will accept the following documents in Volume 5:

- Additional Cost Information

- Funding Agreement Certification
- Technical Data Rights (Assertions)
- Lifecycle Certification
- Allocation of Rights
 - Other (only as specified in the topic)

Please only submit documents that are identified in the topic instructions. All other submissions will be disregarded.

PHASE II PROPOSAL INSTRUCTIONS

Phase II proposals may only be submitted by Phase I awardees. Phase II proposal submission window, notification process, expected budget/duration structure and additional instructions will be provided in the Phase I contract or by subsequent notification.

DISCRETIONARY TECHNICAL AND BUSINESS ASSISTANCE (TAB A)

The Army, at its discretion, may provide Technical and Business Assistance (TAB A). The Army will select a preferred vendor(s) for the Army SBIR TAB A program through a competitive process. Alternately, a small business concern may, by contract or otherwise, select one or more vendors to assist the firm in meeting the TAB A goals. The Applicant must request the authority to select its own TAB A provider in its Army SBIR proposal and must demonstrate that the vendor is uniquely postured to provide the specific technical and business services required. TAB A funding will be denied if the offeror fails to include the cost and detailed explanation in its proposal.

Participation in the Army SBIR TAB A program is voluntary for each Army SBIR awardee. Services provided to Army SBIR firms under the auspices of the TAB A program may include, but are not limited to:

1. Access to a network of scientists, engineers, and technologists focused on commercialization and transition considerations such as protected supply chain management, advanced manufacturing, process/product/production scaling, etc;
2. Assistance with intellectual property protections, such as legal considerations, intellectual property rights, patent filing, patent fees, licensing considerations, etc;
3. Commercialization and technology transition support such as market research, market validation, development of regulatory or manufacturing plans, brand development;
4. Regulatory support such as product domain regulatory considerations, regulatory planning, and regulatory strategy development.

The Army SBIR program sponsors participation in the TAB A program. The resource limitation for each firm is as follows:

- Phase I Firms:
 - Army-Preferred Vendor: If approved, the contractor may receive up to \$6,500 worth of assistance services per project per year (in addition to the base SBIR award amount).
 - Firm-Selected Vendor: If approved, the contractor may receive up to \$6,500 in contract obligation (in addition to the base SBIR award amount) per project per year.
- Phase II Firms:
 - Army-Preferred Vendor: If approved, the contractor may receive up to \$50,000 worth of assistance services per project per year (in addition to the base SBIR award amount).
 - Firm-Selected Vendor: If approved, the contractor may receive up to \$50,000 in contract obligation (included in the base SBIR award amount) per project per year.

EVALUATION AND SELECTION

All proposals will be evaluated during the Pacific Open Topic in accordance with the evaluation criteria that has been provided to the Pacific Open Topic. It is the policy of the Army to ensure equitable and comprehensive proposal evaluations based on the evaluation criteria provided to the finalists and to select the source (or sources) whose offer meets the Government's technical, policy, and programmatic goals.

All proposal evaluations will be based solely on the above evaluation criteria. The Army will conduct an evaluation of each conforming proposal. Proposals that do not comply with the requirements detailed in this BAA and the research objective(s) of the corresponding opportunity are considered non-conforming and therefore will not be evaluated nor considered for award.

Proposals will not be evaluated against each other during the evaluation process, but rather evaluated on their own individual merit to determine how well the proposal meets the criteria stated in this BAA and the corresponding opportunity.

Selected proposals are those determined to be the most advantageous to the Government, consistent with instructions and evaluation criteria specified in the DoD Program BAA, the component-specific instructions herein, the corresponding Topic posting, and availability of funding.

Proposing firms will be notified via email of selection or non-selection status for a Phase I or direct to Phase II award within 90 days of the closing date of the Topic. The notification will be sent to the Corporate Official listed on the proposal cover sheet from the Army SBIR Program Office mailbox. The Army promotes transparency regarding the technical evaluation for all Army SBIR proposals. The Army will provide a technical evaluation narrative to the proposer in accordance with the SBA Policy Directive, Appendix I, paragraph 4. The selection decision notice contains instructions for retrieving the technical evaluation narrative.

Proposers must not regard the notification email (selection decision notice) as an authorization to commit or expend funds. After the Army SBIR Office has recommended a proposal for award, a Government Contracting Officer may contact the proposer in order to discuss and request additional information required for award. This may include representations and certifications, certified or other than certified cost data, subcontracting plan for small businesses, and/or other information as applicable to the proposed award. Proposers must not regard these communications as an authorization to commit or expend funds. Unless a Government Contracting Officer signs the award document (i.e. contract), no obligations to provide funding are made. The Government may reject the proposal or cancel the contract action at any time.

If signed by the Government Contracting Officer, the award document is the official and authorizing instrument (i.e. contract). The anticipated period of performance start date will be determined at time of award. The Contracting Officer will email the signed, authorizing award instrument to the principal investigator (PI) and/or an authorized organization representative.

PROTESTS

Refer to the DoD SBIR Program BAA for procedures to protest the Announcement.

As further prescribed in FAR 33.106(b), FAR 52.233-3, Protests after Award shall be submitted to the Point of Contract identified in the topic solicitation:

Email: usarmy.pentagon.hqda-asa-alt.mbx.army-applied-sbir-program@mail.mil

Mailing Address:

Army Applied SBIR Office
2530 Crystal Dr; Ste 11192
Arlington, VA 22202

Appendix A Phase I Evaluation Criteria

Applied SBIR Phase I Proposal Review v2-0-3 Evaluation Criteria Defined



| | | DEFINITION |
|----------------------------------|---|--|
| INTRODUCTION | weight 5% | Write a clear, concise description of what your innovation does or will do, and where you are in your evolution. Make clear its intended impact on the Army. Evaluators should "get it" after reading this. |
| POTENTIAL FOR ARMY IMPACT | OPERATIONAL IMPACT | At the scale of a single Army end-user, argue that their jobs or lives will be significantly improved if your solution is adopted. What is the impact of your solution for a soldier/Army civilian vs. today's solutions? |
| | POTENTIAL SCALE OF IMPACT | Here, we're looking for an idea of how broad the impact you described above could be. Look into the future to a time when your solution is both technically mature and actively in use by Army personnel. Describe the scale and scope of your impact within the context of the Army. |
| TECHNICAL FEASIBILITY | SCIENTIFIC FEASIBILITY | Is the science behind the solution sound? Convince readers who don't have deep expertise in your field that your innovation is built atop sound scientific and engineering principles. |
| | ENABLING TECHNOLOGIES | Point to the foundational technologies that you rely on to deliver your solution. Do the required enabling technologies introduce added risk? Using proven (and ideally Army fielded) underlying technologies and techniques helps to lower technical risk. |
| | ALTERNATIVE TECHNICAL APPROACHES | From a technologist's perspective, why is your proposed solution the best choice for the Army? Refute the alternative engineering approaches others are using. Why does your technology win? |
| | TECHNICAL RISK MITIGATION | No matter your current technology readiness level, technical risks remain. Identify those risks. Present a credible plan to tackle those risks. |
| TRANSITION | ARMY TRANSITION PATHWAY | Planning for success, what's next for you after this SBIR award? Describe the next type of deal you aim to make with the Army, e.g. a CRADA, a different SBIR contract, a CSO, etc. Briefly outline your current plan to unlock that next opportunity and/or share the biggest risks you see post this SBIR award. |
| | SBIR MILESTONE SCHEDULE | Please share with us a thoughtful execution plan. Strike a balance between giving us a sense of the detailed thinking behind the scenes and the need for your contracting officer to manage a reasonably small number of milestones during your period of performance. |
| FIRM CASH FLOW | FIRM SURVIVAL RISK | SBIR funds are meant to fuel growth rather than stave off a firm's impending financial failure. Demonstrate that your company will survive financially as a going concern through the early stages of a Phase III contract, sometimes referred to as "transitioning" into use by Army personnel. |
| | OTHER PEOPLE'S MONEY | Make the case that non-Army and/or non-DoD dollars will continue to fund improvements to your solution from which the Army will benefit in the future. Companies who cannot demonstrate non-Army and/or non-DoD funding sources for future solution enhancements are less attractive to the Applied SBIR program. |
| | FINANCIAL PROFIT POTENTIAL | Through the Applied SBIR program, the Army wants to take advantage of the speed and scalability of dual-use companies. Make your best case that your product is or will be profitable. If you have more than one product, please focus your argument on the product / solution presented for this SBIR program. |
| TEAM ABILITY | weight 10% | Prove your team has executed well as a group. Please draw clear distinctions between private sector, DoD and civilian government work. What milestones have you accomplished as a group in this company? |
| SUBMISSION QUALITY | QUALITY OF PROSE | Prove you write clearly. Prove you argue convincingly. |
| | DATA QUALITY & ATTRIBUTION | weight 5% |

Appendix B Direct to Phase II Evaluation Criteria

Applied SBIR D2P2 Proposal Review v2-0-4 Evaluation Criteria Defined



| | | DEFINITION |
|----------------------------------|---|--|
| INTRODUCTION | weight 2% | Write a clear, concise description of what your innovation does or will do, and where you are in your evolution. Make clear its intended impact on the Army. Evaluators should "get it" after reading this. |
| POTENTIAL FOR ARMY IMPACT | OPERATIONAL IMPACT | At the scale of a single Army end-user, argue that their jobs or lives will be significantly improved if your solution is adopted. What is the impact of your solution for a soldier/Army civilian vs. today's solutions? |
| | POTENTIAL SCALE OF IMPACT | Here, we're looking for an idea of how broad the impact you described above could be. Look into the future to a time when your solution is both technically mature and actively in use by Army personnel. Describe the scale and scope of your impact within the context of the Army. |
| TECHNICAL FEASIBILITY | SCIENTIFIC FEASIBILITY | Is the science behind the solution sound? Convince readers who don't have deep expertise in your field that your innovation is built atop sound scientific and engineering principles. |
| | ENABLING TECHNOLOGIES | Point to the foundational technologies that you rely on to deliver your solution. Do the required enabling technologies introduce added risk? Using proven (and ideally Army-fielded) underlying technologies and techniques helps to lower technical risk. |
| | ALTERNATIVE TECHNICAL APPROACHES | From a technologist's perspective, why is your proposed solution the best choice for the Army? Refute the alternative engineering approaches others are using. Why does your technology win? |
| | TECHNICAL RISK MITIGATION | No matter your current technology readiness level, technical risks remain. Identify those risks. Present a credible plan to tackle those risks. |
| TRANSITION | ARMY TRANSITION PATHWAY | Planning for success, what's next for you after this SBIR award? Describe the next type of deal you aim to make with the Army, e.g. a CRADA, a different SBIR contract, a CSO, etc. Briefly outline your current plan to unlock that next opportunity and/or share the biggest risks you see post this SBIR award. |
| | SBIR MILESTONE SCHEDULE | Please share with us a thoughtful execution plan. Strike a balance between giving us a sense of the detailed thinking behind the scenes and the need for your contracting officer to manage a reasonably small number of milestones during your period of performance. |
| FIRM CASH FLOW | FIRM SURVIVAL RISK | SBIR funds are meant to fuel growth rather than stave off a firm's impending financial failure. Demonstrate that your company will survive financially as a going concern through the early stages of a Phase III contract, sometimes referred to as "transitioning" into use by Army personnel. |
| | OTHER PEOPLE'S MONEY | Make the case that non-Army and/or non-DoD dollars will continue to fund improvements to your solution from which the Army will benefit in the future. Companies who cannot demonstrate non-Army and/or non-DoD funding sources for future solution enhancements are less attractive to the Applied SBIR program. |
| | FINANCIAL PROFIT POTENTIAL | Through the Applied SBIR program, the Army wants to take advantage of the speed and scalability of dual-use companies. Make your best case that your product is or will be profitable. If you have more than one product, please focus your argument on the product / solution presented for this SBIR program. |
| TEAM ABILITY | weight 10% | Prove your team has executed well as a group. Please draw clear distinctions between private sector, DoD and civilian government work. What milestones have you accomplished as a group in this company? |
| SUBMISSION QUALITY | QUALITY OF PROSE | Prove you write clearly. Prove you argue convincingly. |
| | DATA QUALITY & ATTRIBUTION | Support your arguments with relevant, properly attributed data to enhance your credibility. |

Appendix C Phase II Evaluation Criteria

Applied SBIR Phase II Proposal Review v2-0-3 Evaluation Criteria Defined



| | | DEFINITION |
|----------------------------------|---|--|
| INTRODUCTION | weight 2% | Write a clear, concise description of what your innovation does or will do, and where you are in your evolution. Make clear its intended impact on the Army. Evaluators should "get it" after reading this. |
| POTENTIAL FOR ARMY IMPACT | OPERATIONAL IMPACT | At the scale of a single Army end-user, argue that their jobs or lives will be significantly improved if your solution is adopted. What is the impact of your solution for a soldier/Army civilian vs. today's solutions? |
| | POTENTIAL SCALE OF IMPACT | Here, we're looking for an idea of how broad the impact you described above could be. Look into the future to a time when your solution is both technically mature and actively in use by Army personnel. Describe the scale and scope of your impact within the context of the Army. |
| TECHNICAL FEASIBILITY | SCIENTIFIC FEASIBILITY | Is the science behind the solution sound? Convince readers who don't have deep expertise in your field that your innovation is built atop sound scientific and engineering principles. |
| | ENABLING TECHNOLOGIES | Point to the foundational technologies that you rely on to deliver your solution. Do the required enabling technologies introduce added risk? Using proven (and ideally Army-fielded) underlying technologies and techniques helps to lower technical risk. |
| | ALTERNATIVE TECHNICAL APPROACHES | From a technologist's perspective, why is your proposed solution the best choice for the Army? Refute the alternative engineering approaches others are using. Why does your technology win? |
| | TECHNICAL RISK MITIGATION | No matter your current technology readiness level, technical risks remain. Identify those risks. Present a credible plan to tackle those risks. |
| TRANSITION | ARMY TRANSITION PATHWAY | Planning for success, what's next for you after this SBIR award? Describe the next type of deal you aim to make with the Army, e.g. a CRADA, a different SBIR contract, a CSO, etc. Briefly outline your current plan to unlock that next opportunity and/or share the biggest risks you see post this SBIR award. |
| | SBIR MILESTONE SCHEDULE | Please share with us a thoughtful execution plan. Strike a balance between giving us a sense of the detailed thinking behind the scenes and the need for your contracting officer to manage a reasonably small number of milestones during your period of performance. |
| FIRM CASH FLOW | FIRM SURVIVAL RISK | SBIR funds are meant to fuel growth rather than stave off a firm's impending financial failure. Demonstrate that your company will survive financially as a going concern through the early stages of a Phase III contract, sometimes referred to as "transitioning" into use by Army personnel. |
| | OTHER PEOPLE'S MONEY | Make the case that non-Army and/or non-DoD dollars will continue to fund improvements to your solution from which the Army will benefit in the future. Companies who cannot demonstrate non-Army and/or non-DoD funding sources for future solution enhancements are less attractive to the Applied SBIR program. |
| | FINANCIAL PROFIT POTENTIAL | Through the Applied SBIR program, the Army wants to take advantage of the speed and scalability of dual-use companies. Make your best case that your product is or will be profitable. If you have more than one product, please focus your argument on the product / solution presented for this SBIR program. |
| TEAM ABILITY | weight 5% | Prove your team has executed well as a group. Please draw clear distinctions between private sector, DoD and civilian government work. What milestones have you accomplished as a group in this company? |
| SUBMISSION QUALITY | QUALITY OF PROSE | Prove you write clearly. Prove you argue convincingly. |
| | DATA QUALITY & ATTRIBUTION | Support your arguments with relevant, properly attributed data to enhance your credibility. |

Appendix D
Commercialization Plan Template

General Instructions/Guidance:

1. The slide deck must be 8 slides total, per Component Instructions, and follow the formatting contained in the template. Font size shall be no smaller than 10-point font.
2. Slides should display the slide number in bottom right corner
3. All text (including tables, charts, plots, axes labels, legends, captions) must be readable without zooming and understandable without voice-over
4. For plots and charts:
 - a. Include title/bullet describing importance of plot/chart, and/or data (be specific)
 - b. Axes must be meaningfully labeled (to be understandable by non-experts) and include scale
5. Avoid jargon; define technical terms
6. Convert from slide format to a PDF file for submission to DSIP alongside the technical volume proposal
7. To insert images, capture a screenshot of the image and paste it into the slide. Please do not drag-drop a file into the presentation or use the Insert Pictures menu function.
8. Use PowerPoint's "Compress Pictures" feature to reduce file size
 - a. Select 96ppi resolution
 - b. Uncheck "For this picture only"
9. Replace the boilerplate footer below with distribution markings as appropriate
10. Do not put any company logos (Twitter, Reddit, GitHub, etc) on your slides

To be considered valid proposals, Commercialization Plan submissions must follow the number and content of each slide as contained in the attached template.

Appendix D
Commercialization Plan Template cont.

Firm Name

SBIR Project Title

Principal Investigator Name / Title
Key (or other relevant) Personnel, and
Subcontractors

.....
Insert Topic Number
Insert Proposal Number

Distribution markings as appropriate for your organization.

BLUF: Bottom Line Up Front

- BLUF:
 1. **Company information and background** : Core competencies, significant sales, previous funding, commercialization successes.
 2. **Customer and Competition** : Clear description of key technology objectives, current competition, and advantages.
 3. **Market**: Plan to obtain market share.
 4. **Intellectual Property**: Patent status, technology lead, trade secrets or other demonstration of a plan to protect the company's technical advantage.
 5. **Financing/Revenue**: Plans for securing necessary non -SBIR funding.
 6. **Assistance and mentoring** : Plans for securing needed technical or business assistance.

Distribution markings as appropriate for your organization.

2

Company Information and Background

- Core competencies and areas of specialization.
- Products with significant sales.
- Concise history of previous Federal and non -Federal funding/investments.
- Regulatory experience (if applicable).
- Past commercialization successes.
- Past failure and how you overcame.

Distribution markings as appropriate for your organization

3

Customer & Competition

- Description of key technology objectives.
- Current competition and/or alternative solutions.
- Advantages of company's offer compared to competing products or services.
- Hurdles to acceptance of the proposed innovation.
- Description of possible areas where your technology may be utilized or is under utilized.

Distribution markings as appropriate for your organization

4

Market

- Analysis of market size and 1 and 5 year forecasted market share.
- Explanation of milestones and target dates of plan to obtain that market share.
- What experience do you have with marketing to this target market?
- What commercialization strategy appears to be the best for bringing this product to the target market?
- What experience do you have with bring products to market – either through this company or through other companies with which you have worked.
- Does the company currently market, manufacture, or license technology? Describe what you do.

Distribution markings as appropriate for your organization

5

Intellectual Property

- Patent status, technology lead, trade secrets or other demonstration of a plan to achieve sufficient protection to realize the commercialization stage and attain at least a temporary competitive advantage .
- Describe how you will protect the intellectual property that enables commercialization of its products while keeping competitors at bay. Note any actions you may consider to attain at least a temporary competitive advantage. Also consider your company's prior record in this area. Comment on your company's strategy to build a sustainable business through protection of intellectual property.

Distribution markings as appropriate for your organization

6

Financing

- Plan for securing non-SBIR, private or government funding necessary to enter low rate of production of anticipated technical solution.
- Describe your revenue stream generation to include but not limited to:
 - Manufacture and direct sales
 - Sales through value added resellers or other distributors
 - Joint venture

Assistance & Mentoring

- Plans for securing needed technical or business assistance through mentoring, partnering, or arrangements with government sponsored (e.g., SBIR funded Discretionary Technical and Business Assistance (TABAs), State assistance programs, Federally-funded research laboratories, Manufacturing Extension Partnership centers), not-for-profits (e.g., Small Business Development Center (SBDC) or Small Business Technical Development Center (SBTDC)), commercial accelerators, DOD Prime Contractors, SBA Mentor - Protégé program, Procurement Technical Assistance Center (PTAC) or other assistance provider.

**Army SBIR 23.4 Topic Index
Release 7**

A234-P010 Pacific Open Topic

A234-P010

Pacific Open Topic

Critical Technical Area(s): Advanced Computing and Software; Integrated Network Systems-of-Systems; Renewable Energy Generation and Storage; Human-machine Interfaces

OBJECTIVE:

It has been noted that when it comes to conflict, America is often the “away team.” The U.S. is often fighting wars in areas thousands of miles from U.S. shores. This fact creates a “tyranny of distance,” meaning that, distance lessens military strength and increases the cost of conflicts. The impact of long distances can affect overall strategy, tactics, and logistics. Even with unrivaled capabilities, the ability to collect and understand intelligence can decay over distance. The supply chain is also heavily impacted, as distance increases, the time to provide supplies increases, supply routes can be contested, and even when supplies arrive safely, upkeep and maintenance are still a concern. These are just a few of the ways that distance impacts the effectiveness of our military overseas.

The U.S. Army is interested in enabling technologies that could help overcome the “tyranny of distance”. Examples of technologies that address this issue include but are not limited to the following domains:

- **Logistics/Supply Chain:** To ensure rapid resupply of material and aid.
- **Sustainment and Climate:** To limit the need for resupply across geographically dispersed troops.
- **Communications:** To ensure secured communication in degraded environments over extraordinary distances.
- **Internet of Things (IoT)/Sensing:** To increase force control and introduce autonomous capabilities in Theater.
- **Information Advantage:** To increase real-time situational awareness through information operations and a commons intelligence picture.

DESCRIPTION:

This topic is open for all interested U.S based small businesses to submit a Phase I or Direct to Phase II proposal. The U.S. Army would like to invite interested entities to participate in the Pacific Open Topic, and submit for a Phase I or Direct to Phase II SBIR award. The Pacific Open Topic offers an opportunity for eligible participants to submit novel technology solutions directly to the Army addressing tyranny of distance challenges faced across the country.

The U.S. Army Combat Capabilities Development Command (DEVCOM)-Pacific, U.S. Army Pacific (USAPAC), and Hawaii Technology Development Corporation (HTDC) in partnership with the Assistant Secretary of the Army (Acquisition, Logistics, and Technology) (ASA(ALT)), recognizes that the Army must enhance engagements with eligible small businesses by: (1) understanding the spectrum of ‘world-class’ technologies being developed commercially that may benefit the Army; (2) integrating the sector of commercial innovators into the Army’s Science and Technology (S&T) ecosystem; and (3) providing mentorship and expertise to accelerate, mature, and transition technologies of interest to the Army.

PHASE I:

Companies will complete a feasibility study that demonstrates the firm’s competitive technical advantage relative to other commercial products (if other products exist) and develop concept plans for how the company’s technology can be applied to Army modernization priority areas. Studies should clearly detail and identify a firm’s technology at both the individual component and system levels, provide supporting literature for technical feasibility, highlight existing performance data, showcase the technology’s application opportunities to a broad base of customers outside the defense

space, a market strategy for the commercial space, how the technology directly addresses the Army's modernization area as well as include a technology development roadmap to demonstrate scientific and engineering viability.

At the end of Phase I, the company will be required to provide a concept demonstration of their technology to demonstrate a high probability that continued design and development will result in a Phase II mature product.

PHASE II:

Produce prototype solutions that will be easy to operate by a Soldier. These products will be provided to select Army units for further evaluation by the soldiers. In addition, companies will provide a technology transition and commercialization plan for DOD and commercial markets.

PHASE III DUAL USE APPLICATIONS:

Complete the maturation of the company's technology developed in Phase II to TRL 6/7 and produce prototypes to support further development and commercialization. The Army will evaluate each product in a realistic field environment and provide small solutions to stakeholders for further evaluation. Based on soldier evaluations in the field, companies will be requested update the previously delivered prototypes to meet final design configuration.

REFERENCES: <https://www.xtech.army.mil/competitions/>

KEYWORDS: logistics; supply chain; climate; Open Topic; Pacific; internet of things; information collection; data collection; sensing; communications

DEPARTMENT OF THE ARMY
DoD 23.4 Small Business Innovation Research (SBIR)
Annual Broad Agency Announcement (BAA)
Component-Specific Proposal Instructions
Release 8

March 14, 2023: Topics issued for pre-release

March 30, 2023: Army begins accepting proposals via DSIP

April 18, 2023: DSIP Topic Q&A closes to new questions at 12:00 p.m. ET

May 2, 2023: Deadline for receipt of proposals no later than 12:00 p.m. ET

INTRODUCTION

The future Army must be capable of conducting Multi-Domain Operations (MDO) as part of an integrated Joint Force across an array of situations in multiple theaters by 2035. The MDO concept describes how the Army will support the Joint Force in the rapid and continuous integration of all domains of warfare – land, sea, air, and cyberspace – to deter and prevail as we compete short of conflict, and fight and win if deterrence fail. The Army must provide game-changing capabilities to our Soldiers. To capitalize on small business innovation, the Army has implemented an approach to advertise SBIR funding opportunities through the Department of Defense (DoD) Annual BAA process, outside of the three pre-determined BAA cycles. This approach also strives to create a more rapid award time from solicitation to closing.

CONTACT INFORMATION

Direct Specific questions pertaining to the administration of the Department of the Army SBIR Program and proposal preparation instructions to the Point of Contact identified in the Topic announcement. General questions can be directed to the following:

Email: usarmy.pentagon.hqda-asa-alt.mbx.army-applied-sbir-program@army.mil

Website: <https://www.armysbir.army.mil/>

Mailing Address:

Army Applied SBIR Office 2530 Crystal Dr; Ste 11192
Arlington, VA 22202

RESPONSIVENESS AND TIMELINESS

All proposals will be evaluated and judged on a competitive basis. Proposals will only be evaluated in response to an active, corresponding Army topic. Proposals will be initially screened to determine responsiveness and timeliness. Proposals passing this initial screening will be technically evaluated by engineers or scientists to determine the most promising technical and scientific approaches. Assessment of responsiveness may continue during technical evaluation and after selection. If at any point the proposal is deemed untimely, unresponsive, ineligible, or non-responsible, the proposal will be rejected / the contract action will be cancelled.

Interested firms shall follow the DoD Program BAA instructions as well as the Army's component-specific proposal instructions herein, when preparing and submitting proposals. The DoD 23.4 SBIR Program BAA can be found here: <https://www.defensesbirsttr.mil/SBIR-STTR/Opportunities/>.

SYSTEM FOR AWARD MANAGEMENT (SAM)

Interested firms are required to be registered in SAM (www.sam.gov) before submitting a proposal and shall continue to be registered until time of award, during performance, and through final payment of any contract.

PHASE I PROPOSAL INSTRUCTIONS

The Defense SBIR/STTR Innovation Portal (DSIP) is the official portal for DoD SBIR/STTR proposal submission. Proposers (also referred to herein as “offeror(s)”) are required to submit proposals via DSIP; proposals submitted by any other means will be disregarded. Detailed instructions regarding registration and proposal submission via DSIP are provided in the DoD SBIR Program BAA.

Proposal Coversheet (Volume 1)

The proposal coversheet must follow the instructions and requirements provided in the DoD SBIR Program BAA.

The offeror shall certify that to the best of its knowledge and belief, its eligibility information under the SBIR Program is accurate, complete, and current as of the date of the offer.

Technical Volume (Volume 2)

The technical volume proposal is not to exceed 5 word document pages and must follow the formatting requirements provided in the DoD SBIR Program BAA. A commercialization plan must also accompany the technical volume proposal and must be 8 slides. The required content to include within these slides are described in Appendix D. The commercialization plan must be converted from slides to pdf and attached to the end of the technical volume proposal, resulting in one pdf file to be uploaded to DSIP as Volume 2. The commercialization plan does not count towards the technical volume 5-page limit. Any proposals submitted without a commercialization plan or in a format other than that provided in these Component Instructions and by the BAA will be deemed unresponsive and will not be reviewed.

Content of the Technical Volume

The Technical Volume shall contain three key sections – technical approach, team qualifications and commercialization section. The technical approach section shall contain details on how the proposer is going to solve the problem. It shall detail key elements of the firm’s approach, any risks, relevant past work and how success is measured. The team qualifications section shall highlight the key personnel working on the project, and the resources that will be brought to bear on solving the problem. The commercialization plan shall include:

- **Company information**: Focused objectives/core competencies; specialization area(s); products with significant sales; and history of previous Federal and non-Federal funding, regulatory experience, and subsequent commercialization successes.
- **Customer and Competition**: Clear description of key technology objectives, current competition, and advantages compared to competing products or services; description of hurdles to acceptance of the innovation.
- **Market**: Milestones, target dates, analyses of market size, and estimated market share after first year sales and after 5 years; explanation of plan to obtain market share.
- **Intellectual Property**: Patent status, technology lead, trade secrets or other demonstration of a plan to achieve sufficient protection to realize the commercialization stage and attain at least a temporal competitive advantage.
- **Financing**: Plans for securing necessary non-SBIR funding.
- **Assistance and mentoring**: Plans for securing needed technical or business assistance through mentoring, partnering, or through arrangements with government sponsored (e.g., State

assistance programs, Federally-funded research laboratories, Manufacturing Extension Partnership centers), not-for-profits (e.g., SBDC), commercial accelerators, DOD Prime Contractors, or other assistance provider.

These instructions supersede those stated in section 5.3.c of the DoD Program BAA.

Cost Volume (Volume 3)

The Cost Volume must follow all instructions and requirements provided in the DoD SBIR Program BAA. Supplemental requirements are as follows:

The Phase I Base amount must not exceed \$250,000 for a 6-month period of performance. Phase I Options are not anticipated at this time. If an option is identified in the topic posting, costs for the Base and Option must be separated and clearly identified on the Proposal Cover Sheet (Volume 1) and in Volume 3. Awards for these topics will be in the form of a firm fixed price contract.

Please review the updated Percentage of Work (POW) calculation details included in section 5.3 of the DoD Program BAA. Army Applied SBIR will occasionally accept deviations from the POW requirements with written approval from the Funding Agreement officer.

For pricing purposes, offerors shall assume a contract or agreement start date of approximately ninety (90) days after submission of the proposal. For this BAA, adequate price competition (APC), as defined in FAR 15.403-1(c), is anticipated. In the event that adequate price competition is not realized (i.e. only one proposal is received for a given topic), the Government may choose to conduct additional proposal analysis, in accordance with the techniques identified at FAR 15.404-1. Additionally, offerors are to provide any current Forward Pricing Rate Agreements (FPRA) in effect at time of proposal submission.

Content of the Cost Volume (Volume 3)

ALL proposed costs should be accompanied by documentation to substantiate how the cost was derived. Substantiating documentation guidance is as follows:

- **LABOR:**
 - List all key personnel by name as well as by number of hours dedicated to the project as direct labor.
 - Explain the basis of proposed labor hours, including required tasks, and substantiating documentation for the costs (e.g. payroll reports). Volume 5, Supporting Documents, may be used if additional space is needed.
- **MATERIAL/TOOLING/EQUIPMENT:**
 - Explain the basis of proposed material and equipment costs. This support should include a consolidated priced summary of individual material and equipment quantities and substantiating documentation for the costs (e.g. vendor quotes, invoice prices, competitive bids, etc.). If your choice isn't the lowest cost available, explain the decision to choose one item or supplier over another. Volume 5, Supporting Documents, may be used if additional space is needed.
 - Ensure all materials are American-made to the maximum extent practicable.

Offerors who propose to use a foreign-made product in its technology may be required to find an American-made equivalent.

- While special tooling and test equipment and material cost may be included, it will be carefully reviewed relative to need and appropriateness for the work proposed. The purchase of special tooling and test equipment must, in the opinion of the Component Contracting Officer, be advantageous to the Government and should be related directly to the specific topic. These may include such items as innovative instrumentation or automatic test equipment. Title to property furnished by the Government or acquired with Government funds will be vested with the DoD Component, unless it is determined that transfer of title to the contractor would be more cost effective than recovery of the equipment by the DoD Component.
- TRAVEL:
 - Explain the basis of proposed travel, including to/from locations, number of trips, number of travelers per trip, and number of days/nights per trip. Include substantiating documentation for the costs (e.g. screenshots of flight cost comparison, rental car quotes, etc.). NOTE: Virtual meetings shall be utilized to the maximum extent practicable. Volume 5, Supporting Documents, may be used if additional space is needed.
- SUBCONTRACTS: A subcontract is any agreement, other than one involving an employer-employee relationship, entered into by the prime contractor (awardee) calling for supplies or services for the performance of the contract.
 - All subcontractor costs and consultant costs must be detailed at the same level as prime contractor costs in regard to labor, travel, equipment, etc.
 - Explain the basis of proposed subcontract costs. Include documented support of the offeror's price analyses and degree of competition of all subcontractor proposals. All subcontractor costs and consultant costs, such as labor, travel, equipment, materials, must be detailed at the same level as prime contractor costs. Provide detailed substantiation of subcontractor costs in your cost proposal. Volume 5, Supporting Documents, may be used if additional space is needed.
 - Certify that the following requirements are met: For Phase I, the offeror must perform a minimum of two-thirds of the research and/or analytical effort. One third may be subcontracted to another firm or research organization/facility. The percentage of work is measured by both direct and indirect costs.
 - Offerors shall not propose to subcontract to the issuing agency, to any other Federal Government agency, or to other units of the Federal Government, except Federal Laboratories in rare circumstances. As defined in 15 U.S.C. 3703, Federal Laboratory means any laboratory, any federally funded research and development center, or any center established under 15 U.S.C. 3705 and 3707 that is owned, leased, or otherwise used by a Federal Agency

and funded by the Federal Government, whether operated by the Government or by a contractor.

- Offerors shall not propose to subcontract to any prohibited sources. Proposals identifying a subcontractor/vendor arrangement with a prohibited source may be rejected.
 - Offerors shall ensure subcontracting arrangements are with United States Small Businesses to the maximum extent practicable. Offerors proposing a subcontractor arrangement with other than a United States Small Business (such as, a large business, foreign firm, foreign government, educational institution, unit of Federal Government, etc.) may be required to submit further explanation.
- **INDIRECT COSTS:**
 - Explain the basis of the proposed indirect expense rates including overhead, general and administrative, material handling, and fringe benefits.
 - If a Defense Contract Audit Agency (DCAA) Audit has been conducted within the last five (5) years, include the audit compliance documentation in the cost proposal documents. The documentation should also include the offeror's DCAA Point of Contact (if applicable).

If selected, failure to include the documentation with your proposal may delay contract award, as the proposer will be asked to submit the necessary documentation to the Contracting Officer to substantiate costs. It is important to respond as quickly as possible to the Contracting Officer's request for documentation. Failure or refusal to provide documentation may result in cancellation of the contract action.

Company Commercialization Report (CCR) (Volume 4)

Completion of the CCR as Volume 4 of the proposal submission in DSIP is required. Please refer to the DoD SBIR Program BAA for full details on this requirement. Information contained in the CCR will be considered by the Department of the Army during proposal evaluations.

Supporting Documents (Volume 5)

Volume 5 is provided for proposers to submit additional documentation to support the Cover Sheet (Volume 1), Technical Volume (Volume 2), and the Cost Volume (Volume 3). In addition to the Volume 5 requirements outlined in the DoD Program BAA, the Department of the Army may accept the following documents in Volume 5:

- Additional Cost Information
- Funding Agreement Certification
- Technical Data Rights (Assertions)
- Lifecycle Certification
- Allocation of Rights
- Other (only as specified in the topic)

Please only submit documents that are identified immediately above and in the DoD Program BAA. All other documents submitted will be disregarded.

DIRECT TO PHASE II PROPOSAL GUIDELINES

Proposers interested in submitting a DP2 proposal in response to these topics must provide documentation to substantiate that the scientific and technical merit and feasibility described in the Phase I section of the topic has been met and describes the potential commercial applications. Documentation should include all relevant information including, but not limited to: technical reports, test data, prototype designs/models, and performance goals/results. Work submitted within the feasibility documentation must have been substantially performed by the proposer and/or the Principal Investigator.

The Army will not evaluate the proposer's related Phase II proposal if it determines that the proposer has failed to demonstrate that technical merit and feasibility has been established or the proposer has failed to demonstrate that work submitted in the feasibility documentation was substantially performed by the proposer and/or the PI.

Feasibility documentation cannot be based upon any prior or ongoing federally funded SBIR or STTR work and DP2 proposals MUST NOT logically extend from any prior or ongoing federally funded SBIR or STTR work.

Format of Technical Volume (Volume 2)

The Technical Volume must include two parts, the Feasibility Documentation and the Technical Proposal.

The Technical Volume must be a single Portable Document Format (PDF) file, including graphics. Perform a virus check before uploading the Technical Volume file. If a virus is detected, it may cause rejection of the proposal. Do not lock or encrypt the uploaded file. Do not include or embed active graphics such as videos, moving pictures, or other similar media in the document.

The length of the Feasibility Documentation is not to exceed 5 pages and the length of the Technical Proposal is not to exceed 10 pages. A commercialization plan must also accompany the technical proposal and should be no more than 8 slides. Any proposals submitted in a different format, or exceed the page count limits will not be reviewed.

Number all pages of your proposal consecutively. Font size should not be smaller than 10- point on standard 8-1/2" x 11" paper with one-inch margins. The header on each page of the Technical Volume should contain your company name, topic number, and proposal number assigned by DSIP when the Cover Sheet was created. The header may be included in the one-inch margin.

Content of the Feasibility Documentation (Volume 2a)

The content of the Feasibility Documentation Proposers should substantiate that the scientific and technical merit and feasibility described in the Phase I section of the topic has been met and describes the potential commercial applications. Documentation should include all relevant information including, but not limited to: technical reports, test data, prototype designs/models, and performance goals/results. Work submitted within the feasibility documentation must have been substantially performed by the proposer and/or the Principal Investigator.

Content of the Technical Proposal (Volume 2b)

The content of the Technical Volume should address three key areas: the technical approach, the team carrying out the work (and the accompanied resources), and the commercialization strategy. The commercialization plan should include:

- Company information: Focused objectives/core competencies; specialization area(s); products with significant sales; and history of previous Federal and non-Federal funding, regulatory experience, and subsequent commercialization successes.
- Customer and Competition: Clear description of key technology objectives, current competition, and advantages compared to competing products or services; description of hurdles to acceptance of the innovation.
- Market: Milestones, target dates, analyses of market size, and estimated market share after first year sales and after 5 years; explanation of plan to obtain market share.
- Intellectual Property: Patent status, technology lead, trade secrets or other demonstration of a plan to achieve sufficient protection to realize the commercialization stage and attain at least a temporal competitive advantage.
- Financing: Plans for securing necessary non-SBIR funding.
- Assistance and mentoring: Plans for securing needed technical or business assistance through mentoring, partnering, or through arrangements with government sponsored (e.g., State assistance programs, Federally-funded research laboratories, Manufacturing Extension Partnership centers), not-for-profits (e.g., SBDC), commercial accelerators, DOD Prime Contractors, or other assistance provider.

Proposers are free to structure each section as they like, so long as it provides sufficient detail for evaluators to understand the proposed work, who will carry it out, and how the business plans to commercialize results.

These instructions supersede those stated in section 5.3.c of the DoD Program BAA.

Cost Volume (Volume 3)

Unless otherwise noted in the topic, the Army will accept Direct to Phase II proposals for a cost up to \$1,800,000 for an 18-month period of performance. Proposers are required to use the Cost Proposal method as provided on the DSIP submission site. The Cost Volume (and supporting documentation) DOES NOT count toward the page limit of the Technical Volume.

For pricing purposes, offerors should assume a contract or agreement start date of approximately ninety (90) days after submission of the proposal. For this BAA, adequate price competition (APC), as defined in FAR 15.403-1(c), is anticipated. In the event that adequate price competition is not realized (i.e. only one proposal is received for a given topic), the Government may choose to conduct additional proposal analysis, in accordance with the techniques identified at FAR 15.404-1. Additionally, offerors are to provide any current Forward Pricing Rate Agreements (FPRA) in effect at time of proposal submission.

Content of the Cost Volume (Volume 3)

ALL proposed costs should be accompanied by documentation to substantiate how the cost was derived. For example, if you proposed travel costs to attend a project-related meeting or conference, and used a travel website to compare flight costs, include a screenshot of the comparison. Similarly, if you proposed to purchase materials or equipment, and used the internet to search for the best source, include your market research for those items. You do not necessarily have to propose the cheapest item or supplier, but you should explain your decision to choose one item or supplier over another. It's important to provide enough information to allow contracting personnel to understand how the proposer plans to use the requested funds.

Some items in the cost breakdown may not apply to the proposed project. If that is the case, there is no need to provide information on each and every item.

Cost Breakdown Guidance:

- List all key personnel by name as well as by number of hours dedicated to the project as direct labor.
- Special tooling and test equipment and material cost may be included. The inclusion of equipment and material will be carefully reviewed relative to need and appropriateness for the work proposed. The purchase of special tooling and test equipment must, in the opinion of the Contracting Officer, be advantageous to the Government and should be related directly to the specific topic. These may include such items as innovative instrumentation and/or automatic test equipment. Title to property furnished by the Government or acquired with Government funds will be vested with the Army; unless it is determined that transfer of title to the contractor would be more cost effective than recovery of the equipment by the Army.
- Cost for travel funds must be justified and related to the needs of the project.
- Cost sharing is permitted for proposals under this announcement; however, cost sharing is not required, nor will it be an evaluation factor in the consideration of a proposal.
- All subcontractor costs and consultant costs must be detailed at the same level as prime contractor costs in regard to labor, travel, equipment, etc. Provide detailed substantiation of subcontractor costs in your cost proposal. Enter this information in the Explanatory Material section of the on-line cost proposal form. The Supporting Documents Volume (Volume 5) may be used if additional space is needed.

If a DCAA Audit has been conducted within the last five (5) years, include the audit compliance documentation in the cost proposal documents. The documentation should also include the offeror's DCAA Point of Contact (if applicable).

If selected for award, failure to include the documentation with your proposal will delay contract negotiation, and the proposer will be asked to submit the necessary documentation to the Contracting Officer to substantiate costs (e.g., cost estimates for equipment, materials, and consultants or subcontractors). It is important to respond as quickly as possible to the Contracting Officer's request for documentation.

For more information about cost proposals and accounting standards, see the DCAA publication titled "Audit Process Overview – Information for Contractors" available at: <http://www.dcaa.mil>.

Company Commercialization Report (CCR) (Volume 4)

Completion of the CCR as Volume 4 of the proposal submission in DSIP is required. Please refer to the DoD SBIR Program BAA for full details on this requirement. Information contained in the CCR will be considered by the Department of the Army during proposal evaluations.

Supporting Documents (Volume 5)

Volume 5 is provided for proposers to submit additional documentation to support the Cover Sheet (Volume 1), Technical Volume (Volume 2), and the Cost Volume (Volume 3). In addition to the Volume 5 requirements outlined in the DoD Program BAA, the Department of the Army will accept the following documents in Volume 5:

- Additional Cost Information
- Funding Agreement Certification
- Technical Data Rights (Assertions)
- Lifecycle Certification
- Allocation of Rights
- Other (only as specified in the topic)

Please only submit documents that are identified in the topic instructions. All other submissions will be disregarded.

PHASE II PROPOSAL INSTRUCTIONS

Phase II proposals may only be submitted by Phase I awardees. Phase II proposal submission window, notification process, expected budget/duration structure and additional instructions will be provided in the Phase I contract or by subsequent notification.

DISCRETIONARY TECHNICAL AND BUSINESS ASSISTANCE (TABA)

The Army, at its discretion, may provide Technical and Business Assistance (TABA). The Army will select a preferred vendor(s) for the Army SBIR TABA program through a competitive process. Alternately, a small business concern may, by contract or otherwise, select one or more vendors to assist the firm in meeting the TABA goals. The Applicant must request the authority to select its own TABA provider in its Army SBIR proposal and must demonstrate that the vendor is uniquely postured to provide the specific technical and business services required. TABA funding will be denied if the offeror fails to include the cost and detailed explanation in its proposal.

Participation in the Army SBIR TABA program is voluntary for each Army SBIR awardee. Services provided to Army SBIR firms under the auspices of the TABA program may include, but are not limited to:

1. Access to a network of scientists, engineers, and technologists focused on commercialization and transition considerations such as protected supply chain management, advanced manufacturing, process/product/production scaling, etc;
2. Assistance with intellectual property protections, such as legal considerations, intellectual property rights, patent filing, patent fees, licensing considerations, etc;
3. Commercialization and technology transition support such as market research, market validation, development of regulatory or manufacturing plans, brand development;
4. Regulatory support such as product domain regulatory considerations, regulatory planning, and regulatory strategy development.

The Army SBIR program sponsors participation in the TABA program. The resource limitation for each firm is as follows:

- Phase I Firms:
 - Army-Preferred Vendor: If approved, the contractor may receive up to \$6,500 worth of assistance services per project per year (in addition to the base SBIR award amount).
 - Firm-Selected Vendor: If approved, the contractor may receive up to \$6,500 in contract obligation (in addition to the base SBIR award amount) per project per year.
- Phase II Firms:
 - Army-Preferred Vendor: If approved, the contractor may receive up to \$50,000 worth of assistance services per project per year (in addition to the base SBIR award amount).
 - Firm-Selected Vendor: If approved, the contractor may receive up to \$50,000 in contract obligation (in addition to the base SBIR award amount) per project per year.

EVALUATION AND SELECTION

The Army will conduct an evaluation of each responsive, timely, eligible proposal in accordance with the evaluation criteria listed in the DoD Program BAA. It is the policy of the Army to ensure equitable and comprehensive proposal evaluations based on the evaluation criteria and to select the source (or sources)

whose offer meets the Government's technical, policy, and programmatic goals.

As previously stated herein, timeliness, responsiveness, and eligibility will be assessed upon initial screening, during evaluation, and after selection. Proposals that do not comply with the instructions and requirements detailed in this document, the DoD Program BAA, or the corresponding Topic posting (including the research objective(s)), will be considered ineligible, nonresponsive, untimely, or non-conforming and therefore will not be evaluated or considered for award.

Using the evaluation criteria, the Government will evaluate each responsive, timely, eligible proposal in its entirety. Proposals will not be evaluated against each other during the evaluation process, but rather evaluated on their own individual merit to determine how well the proposal meets the criteria stated in this BAA and the corresponding opportunity.

Selected proposals are those determined to be the most advantageous to the Government, consistent with instructions and evaluation criteria specified in the DoD Program BAA, the component-specific instructions herein, the corresponding Topic posting, and availability of funding.

Proposing firms will be notified via email of selection or non-selection status for a Phase I or direct to Phase II award within 90 days of the closing date of the Topic. The notification will be sent to the Corporate Official listed on the proposal cover sheet from the Army SBIR Program Office mailbox. The Army promotes transparency regarding the technical evaluation for all Army SBIR proposals. The Army will provide a technical evaluation narrative to the proposer in accordance with the SBA Policy Directive, Appendix I, paragraph 4. The selection decision notice contains instructions for retrieving the technical evaluation narrative.

Proposers must not regard the notification email (selection decision notice) as an authorization to commit or expend funds. After the Army SBIR Office has recommended a proposal for award, a Government Contracting Officer may contact the proposer in order to discuss and request additional information required for award. This may include representations and certifications, certified or other than certified cost data, subcontracting plan for small businesses, and/or other information as applicable to the proposed award. Proposers must not regard these communications as an authorization to commit or expend funds. Unless a Government Contracting Officer signs the award document (i.e. contract), no obligations to provide funding are made. The Government may reject the proposal or cancel the contract action at any time.

If signed by the Government Contracting Officer, the award document is the official and authorizing instrument (i.e. contract). The anticipated period of performance start date will be determined at time of award. The Contracting Officer will email the signed, authorizing award instrument to the principal investigator (PI) and/or an authorized organization representative.

PROTESTS

Refer to the DoD SBIR Program BAA for procedures to protest the Announcement.


As further prescribed in FAR 33.106(b), FAR 52.233-3, Protests after Award shall be submitted to the Point of Contract identified in the topic solicitation:

Email: usarmy.pentagon.hqda-asa-alt.mbx.army-applied-sbir-program@mail.mil

Mailing Address:

Army Applied SBIR Office
2530 Crystal Dr; Ste 11192
Arlington, VA 22202

Appendix A Phase I Evaluation Criteria


| Applied SBIR Phase I Proposal Review v2-0-3 Evaluation Criteria Defined | |  |
|---|---|--|
| | | DEFINITION |
| INTRODUCTION | weight 5% | Write a clear, concise description of what your innovation does or will do, and where you are in your evolution. Make clear its intended impact on the Army. Evaluators should "get it" after reading this. |
| POTENTIAL FOR ARMY IMPACT | OPERATIONAL IMPACT | At the scale of a single Army end-user, argue that their jobs or lives will be significantly improved if your solution is adopted. What is the impact of your solution for a soldier/Army civilian vs. today's solutions? |
| | weight 25% | POTENTIAL SCALE OF IMPACT Here, we're looking for an idea of how broad the impact you described above could be. Look into the future to a time when your solution is both technically mature and actively in use by Army personnel. Describe the scale and scope of your impact within the context of the Army. |
| TECHNICAL FEASIBILITY | SCIENTIFIC FEASIBILITY | Is the science behind the solution sound? Convince readers who don't have deep expertise in your field that your innovation is built atop sound scientific and engineering principles. |
| | ENABLING TECHNOLOGIES | Point to the foundational technologies that you rely on to deliver your solution. Do the required enabling technologies introduce added risk? Using proven (and ideally Army fielded) underlying technologies and techniques helps to lower technical risk. |
| | ALTERNATIVE TECHNICAL APPROACHES | From a technologist's perspective, why is your proposed solution the best choice for the Army? Refute the alternative engineering approaches others are using. Why does your technology win? |
| | weight 25% | TECHNICAL RISK MITIGATION No matter your current technology readiness level, technical risks remain. Identify those risks. Present a credible plan to tackle those risks. |
| TRANSITION | ARMY TRANSITION PATHWAY | Planning for success, what's next for you after this SBIR award? Describe the next type of deal you aim to make with the Army, e.g. a CRADA, a different SBIR contract, a CSO, etc. Briefly outline your current plan to unlock that next opportunity and/or share the biggest risks you see post this SBIR award. |
| | weight 20% | SBIR MILESTONE SCHEDULE Please share with us a thoughtful execution plan. Strike a balance between giving us a sense of the detailed thinking behind the scenes and the need for your contracting officer to manage a reasonably small number of milestones during your period of performance. |
| FIRM CASH FLOW | FIRM SURVIVAL RISK | SBIR funds are meant to fuel growth rather than stave off a firm's impending financial failure. Demonstrate that your company will survive financially as a going concern through the early stages of a Phase III contract, sometimes referred to as "transitioning" into use by Army personnel. |
| | OTHER PEOPLE'S MONEY | Make the case that non-Army and/or non-DoD dollars will continue to fund improvements to your solution from which the Army will benefit in the future. Companies who cannot demonstrate non-Army and/or non-DoD funding sources for future solution enhancements are less attractive to the Applied SBIR program. |
| | weight 10% | FINANCIAL PROFIT POTENTIAL Through the Applied SBIR program, the Army wants to take advantage of the speed and scalability of dual-use companies. Make your best case that your product is or will be profitable. If you have more than one product, please focus your argument on the product / solution presented for this SBIR program. |
| TEAM ABILITY | weight 10% | Prove your team has executed well as a group. Please draw clear distinctions between private sector, DoD and civilian government work. What milestones have you accomplished as a group in this company? |
| SUBMISSION QUALITY | QUALITY OF PROSE | Prove you write clearly. Prove you argue convincingly. |
| | weight 5% | DATA QUALITY & ATTRIBUTION Support your arguments with relevant, properly attributed data to enhance your credibility. |

Appendix B Direct to Phase II Evaluation Criteria

| Applied SBIR D2P2 Proposal Review v2-0-4 Evaluation Criteria Defined | | DEFINITION |
|--|------------|---|
| INTRODUCTION | weight 2% | Write a clear, concise description of what your innovation does or will do, and where you are in your evolution. Make clear its intended impact on the Army. Evaluators should "get it" after reading this. |
| POTENTIAL FOR ARMY IMPACT | weight 20% | <p>OPERATIONAL IMPACT At the scale of a single Army end-user, argue that their jobs or lives will be significantly improved if your solution is adopted. What is the impact of your solution for a soldier/Army civilian vs. today's solutions?</p> <p>POTENTIAL SCALE OF IMPACT Here, we're looking for an idea of how broad the impact you described above could be. Look into the future to a time when your solution is both technically mature and actively in use by Army personnel. Describe the scale and scope of your impact within the context of the Army.</p> |
| TECHNICAL FEASIBILITY | weight 30% | <p>SCIENTIFIC FEASIBILITY Is the science behind the solution sound? Convince readers who don't have deep expertise in your field that your innovation is built atop sound scientific and engineering principles.</p> <p>ENABLING TECHNOLOGIES Point to the foundational technologies that you rely on to deliver your solution. Do the required enabling technologies introduce added risk? Using proven (and ideally Army-felted) underlying technologies and techniques helps to lower technical risk.</p> <p>ALTERNATIVE TECHNICAL APPROACHES From a technologist's perspective, why is your proposed solution the best choice for the Army? Refute the alternative engineering approaches others are using. Why does your technology win?</p> <p>TECHNICAL RISK MITIGATION No matter your current technology readiness level, technical risks remain. Identify those risks. Present a credible plan to tackle those risks.</p> |
| TRANSITION | weight 20% | <p>ARMY TRANSITION PATHWAY Planning for success, what's next for you after this SBIR award? Describe the next type of deal you aim to make with the Army, e.g. a CRADA, a different SBIR contract, a CSO, etc. Briefly outline your current plan to unlock that next opportunity and/or share the biggest risks you see post this SBIR award.</p> <p>SBIR MILESTONE SCHEDULE Please share with us a thoughtful execution plan. Strike a balance between giving us a sense of the detailed thinking behind the scenes and the need for your contracting officer to manage a reasonably small number of milestones during your period of performance.</p> |
| FIRM CASH FLOW | weight 15% | <p>FIRM SURVIVAL RISK SBIR funds are meant to fuel growth rather than stave off a firm's impending financial failure. Demonstrate that your company will survive financially as a going concern through the early stages of a Phase III contract, sometimes referred to as "transitioning" into use by Army personnel.</p> <p>OTHER PEOPLE'S MONEY Make the case that non-Army and/or non-DoD dollars will continue to fund improvements to your solution from which the Army will benefit in the future. Companies who cannot demonstrate non-Army and/or non-DoD funding sources for future solution enhancements are less attractive to the Applied SBIR program.</p> <p>FINANCIAL PROFIT POTENTIAL Through the Applied SBIR program, the Army wants to take advantage of the speed and scalability of dual-use companies. Make your best case that your product is or will be profitable. If you have more than one product, please focus your argument on the product / solution presented for this SBIR program.</p> |
| TEAM ABILITY | weight 10% | Prove your team has executed well as a group. Please draw clear distinctions between private sector, DoD and civilian government work. What milestones have you accomplished as a group in this company? |
| SUBMISSION QUALITY | weight 3% | <p>QUALITY OF PROSE Prove you write clearly. Prove you argue convincingly.</p> <p>DATA QUALITY & ATTRIBUTION Support your arguments with relevant, properly attributed data to enhance your credibility.</p> |



Appendix C Phase II Evaluation Criteria

| Applied SBIR Phase II Proposal Review v2-0-3 Evaluation Criteria Defined | |  |
|--|--------------------------------|--|
| | | DEFINITION |
| INTRODUCTION | weight 2% | Write a clear, concise description of what your innovation does or will do, and where you are in your evolution. Make clear its intended impact on the Army. Evaluators should "get it" after reading this. |
| POTENTIAL FOR ARMY IMPACT | OPERATIONAL IMPACT | At the scale of a single Army end-user, argue that their jobs or lives will be significantly improved if your solution is adopted. What is the impact of your solution for a soldier/Army civilian vs. today's solutions? |
| | weight 20% | POTENTIAL SCALE OF IMPACT |
| TECHNICAL FEASIBILITY | SCIENTIFIC FEASIBILITY | Is the science behind the solution sound? Convince readers who don't have deep expertise in your field that your innovation is built atop sound scientific and engineering principles. |
| | | ENABLING TECHNOLOGIES |
| | | Point to the foundational technologies that you rely on to deliver your solution. Do the required enabling technologies introduce added risk? Using proven (and ideally Army-fielded) underlying technologies and techniques helps to lower technical risk. |
| | | ALTERNATIVE TECHNICAL APPROACHES |
| | | From a technologist's perspective, why is your proposed solution the best choice for the Army? Refute the alternative engineering approaches others are using. Why does your technology win? |
| | weight 25% | TECHNICAL RISK MITIGATION |
| | | No matter your current technology readiness level, technical risks remain. Identify those risks. Present a credible plan to tackle those risks. |
| TRANSITION | ARMY TRANSITION PATHWAY | Planning for success, what's next for you after this SBIR award? Describe the next type of deal you aim to make with the Army, e.g. a CRADA, a different SBIR contract, a CSO, etc. Briefly outline your current plan to unlock that next opportunity and/or share the biggest risks you see post this SBIR award. |
| | weight 25% | SBIR MILESTONE SCHEDULE |
| | | Please share with us a thoughtful execution plan. Strike a balance between giving us a sense of the detailed thinking behind the scenes and the need for your contracting officer to manage a reasonably small number of milestones during your period of performance. |
| FIRM CASH FLOW | FIRM SURVIVAL RISK | SBIR funds are meant to fuel growth rather than stave off a firm's impending financial failure. Demonstrate that your company will survive financially as a going concern through the early stages of a Phase III contract, sometimes referred to as "transitioning" into use by Army personnel. |
| | OTHER PEOPLE'S MONEY | Make the case that non-Army and/or non-DoD dollars will continue to fund improvements to your solution from which the Army will benefit in the future. Companies who cannot demonstrate non-Army and/or non-DoD funding sources for future solution enhancements are less attractive to the Applied SBIR program. |
| | weight 20% | FINANCIAL PROFIT POTENTIAL |
| | | Through the Applied SBIR program, the Army wants to take advantage of the speed and scalability of dual-use companies. Make your best case that your product is or will be profitable. If you have more than one product, please focus your argument on the product / solution presented for this SBIR program. |
| TEAM ABILITY | weight 5% | Prove your team has executed well as a group. Please draw clear distinctions between private sector, DoD and civilian government work. What milestones have you accomplished as a group in this company? |
| SUBMISSION QUALITY | QUALITY OF PROSE | Prove you write clearly. Prove you argue convincingly. |
| | weight 2% | DATA QUALITY & ATTRIBUTION |
| | | Support your arguments with relevant, properly attributed data to enhance your credibility. |

Appendix D

Commercialization Plan Template

General Instructions/Guidance:

1. The slide deck must be 8 slides total, per Component Instructions, and follow the formatting contained in the template. Font size shall be no smaller than 10-point font.
2. Slides should display the slide number in bottom right corner
3. All text (including tables, charts, plots, axes labels, legends, captions) must be readable without zooming and understandable without voice-over
4. For plots and charts:
 - a. Include title/bullet describing importance of plot/chart, and/or data (be specific)
 - b. Axes must be meaningfully labeled (to be understandable by non-experts) and include scale
5. Avoid jargon; define technical terms
6. Convert from slide format to a PDF file for submission to DSIP alongside the technical volume proposal
7. To insert images, capture a screenshot of the image and paste it into the slide. Please do not drag-drop a file into the presentation or use the Insert Pictures menu function.
8. Use PowerPoint's "Compress Pictures" feature to reduce file size
 - a. Select 96ppi resolution
 - b. Uncheck "For this picture only"
9. Replace the boilerplate footer below with distribution markings as appropriate
10. Do not put any company logos (Twitter, Reddit, GitHub, etc) on your slides

To be considered valid proposals, Commercialization Plan submissions must follow the number and content of each slide as contained in the attached template.

Appendix D
Commercialization Plan Template cont.

Firm Name

SBIR Project Title

Principal Investigator Name / Title
Key (or other relevant) Personnel, and
Subcontractors

.....
Insert Topic Number
Insert Proposal Number

Distribution markings as appropriate for your organization

BLUF: Bottom Line Up Front

- **BLUF:**
 - 1. Company information and background** : Core competencies, significant sales, previous funding, commercialization successes.
 - 2. Customer and Competition** : Clear description of key technology objectives, current competition, and advantages.
 - 3. Market:** Plan to obtain market share.
 - 4. Intellectual Property:** Patent status, technology lead, trade secrets or other demonstration of a plan to protect the company's technical advantage.
 - 5. Financing/Revenue:** Plans for securing necessary non -SBIR funding.
 - 6. Assistance and mentoring** : Plans for securing needed technical or business assistance.

Distribution markings as appropriate for your organization

Appendix D

Commercialization Plan Template cont.

Company Information and Background

- Core competencies and areas of specialization.
- Products with significant sales.
- Concise history of previous Federal and non -Federal funding/investments.
- Regulatory experience (if applicable).
- Past commercialization successes.
- Past failure and how you overcame .

Distribution markings as appropriate for your organization

3

Customer & Competition

- Description of key technology objectives.
- Current competition and/or alternative solutions.
- Advantages of company's offer compared to competing products or services.
- Hurdles to acceptance of the proposed innovation.
- Description of possible areas where your technology may be utilized or is under utilized.

Distribution markings as appropriate for your organization

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Appendix D Commercialization Plan Template cont.

Market

- Analysis of market size and 1 and 5 year forecasted market share.
- Explanation of milestones and target dates of plan to obtain that market share.
- What experience do you have with marketing to this target market?
- What commercialization strategy appears to be the best for bringing this product to the target market?
- What experience do you have with bring products to market – either through this company or through other companies with which you have worked.
- Does the company currently market, manufacture, or license technology? Describe what you do.

Intellectual Property

- Patent status, technology lead, trade secrets or other demonstration of a plan to achieve sufficient protection to realize the commercialization stage and attain at least a temporary competitive advantage .
- Describe how you will protect the intellectual property that enables commercialization of its products while keeping competitors at bay. Note any actions you may consider to attain at least a temporary competitive advantage. Also consider your company's prior record in this area. Comment on your company's strategy to build a sustainable business through protection of intellectual property.

Appendix D Commercialization Plan Template cont.

Financing

- Plan for securing non-SBIR, private or government funding necessary to enter low rate of production of anticipated technical solution.
- Describe your revenue stream generation to include but not limited to:
 - Manufacture and direct sales
 - Sales through value added resellers or other distributors
 - Joint venture

Distribution markings as appropriate for your organization

7

Assistance & Mentoring

- Plans for securing needed technical or business assistance through mentoring, partnering, or arrangements with government sponsored (e.g., SBIR funded Discretionary Technical and Business Assistance (TABAs), State assistance programs, Federally-funded research laboratories, Manufacturing Extension Partnership centers), not-for-profits (e.g., Small Business Development Center (SBDC) or Small Business Technical Development Center (SBTDC)), commercial accelerators, DOD Prime Contractors, SBA Mentor - Protégé program, Procurement Technical Assistance Center (PTAC) or other assistance provider.

Distribution markings as appropriate for your organization

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Army SBIR 23.4 Topic Index
Release 8

A234-011 Conformable Hydrogen Storage
A234-012 Hydrogen Generator

OUSD (R&E) CRITICAL TECHNOLOGY AREA(S): Renewable Energy Generation and Storage; Biotechnology

TOPIC OBJECTIVE: The goal of this topic is to develop conformable hydrogen storage vessels that can store hydrogen at 700 bar (10,000 psi).

TOPIC DESCRIPTION: As the Army moves towards electrifying its vehicle fleet, storing enough energy onboard vehicles to match or exceed their current performance is a challenge. While batteries have made great strides in recent decades, they remain heavy and cumbersome. A potential solution for heavy vehicles is hydrogen fuel cells. Fuel cells can provide the benefits of electrification (silent mobility, silent watch, export power, high torque on demand, etc.) while maintaining current vehicle range and allowing for refueling in the same amount of time as liquid fuels. One drawback of hydrogen fuel cells is storage of the hydrogen itself. Current solutions are bulky composite overwrapped pressure vessels (COPVs) that take up significant space. A potential solution is conformable tanks that can be designed to fit unusually shaped space claims, allowing for more energy to be stored in containers, on vehicles, or in other energy storage use cases. This technology has been developed and validated to 350 bar (5,000 psi) applications, but further work is required to meet the goal of 700 bar operating pressures. Evaluation of these tanks under military ballistic testing also revealed some potential areas of improvement for this technology. It is important to develop this technology as it will enable high energy density storage that can be refilled as quickly as current liquid fuels while enabling electrification technologies and reducing thermal and acoustic footprints for energy generation systems.

Note: This technology uses emerging manufacturing techniques along with a unique design that allows for the hydrogen storage tank to fit the shape of any space claim, utilizing a higher percentage of empty space than the current state of the art. The materials used are also lower cost and have been optimized to meet the demanding requirements for vehicle use.

PHASE I: This is a Direct to Phase II topic. To justify a Direct to Phase 2, the company should provide data showing a tank system made up of multiple segments (more than one) capable of 350 bar operations. At minimum, there should be data demonstrating the system can comply with proof testing and burst testing outlined in CSA/ANSI HGV 2.

DIRECT TO PHASE II: Design a 700-bar system for vehicle use that qualifies applicable to HGV 2 standards identified by both TPOC and contractor. Demonstrate the performance of the system on an applicable vehicle system. Potential Phase II Sequential and Enhancement: Scale up the design of the 700-bar system for larger storage quantities. Undergo ballistic testing of the system with military specific ballistic threats. Incorporate lessons learned from previous testing and develop 700 bar systems for specific military vehicle applications.

PHASE III DUAL USE APPLICATIONS: There is a multitude of industries that would benefit from improved hydrogen storage, with new use cases, like P2G tech, that will rely on hydrogen storage technology for operation. Efficient hydrogen storage will become a necessity as various industries, including transportation, metal refining, and chemical manufacturing, increase their hydrogen usage. The proposed technology has potential use within the Army Small Business Innovation Research Program as well as other Army Research Centers and acquisition programs.

KEYWORDS: Hydrogen; Storage; fuel; battlespace; tank; refuel point; electrification

REFERENCES:

1. Lithium Ion Battery, Clean Energy Institute,
<https://www.cei.washington.edu/education/science-of-solar/battery-technology/>
2. Physical Hydrogen Storage, <https://www.energy.gov/eere/fuelcells/physical-hydrogen-storage>
3. Conformable Hydrogen Pressure Vessel, <https://www.osti.gov/servlets/purl/1459184>
4. Innovative pressurized hydrogen storage for integrated vehicle structures using composites,
5. <https://www.compositesworld.com/news/innovative-pressurized-hydrogen-storage-for-integrated-vehicle-structures-using-composites>
6. Materials challenges to enable hydrogen deployment at scale by 2050,
<https://www.google.com/url?sa=i&rct=j&q=&esrc=s&source=web&cd=&cad=rja&uact=8&ved=0CCYQw7AJahcKEwjg37GFof7AhUAAAAAHQAAAAAQAw&url=https%3A%2F%2Fwww.royce.ac.uk%2Fcontent%2Fuploads%2F2021%2F06%2FRoyce-Hydrogen-Conformable-Tanks-Summary.pdf&psig=AOvVaw1WyXFqjZkfpV3vNpk4zMmc&ust=1671044241186277>

OUSD (R&E) CRITICAL TECHNOLOGY AREA(S): Renewable Energy Generation and Storage; Biotechnology

TOPIC OBJECTIVE: The purpose of this topic is to develop an on-demand hydrogen generation system that can be used to quickly refuel a vehicle in situations where its main fuel tank is empty. The end user for this system would be fuel cell system operators. In the event a fuel cell system depletes the main fuel tank and battery power (assuming a hybrid fuel cell/battery electric architecture), this system can be used to provide hydrogen to the fuel tank (or directly to the fuel cell) to allow the system to provide power and return to safety. The system would be sized to be portable while providing enough energy to travel back to base, similar to how jerrycans are currently used.

TOPIC DESCRIPTION: As the Army moves towards more electrified platforms, new challenges arise, such as running out of fuel or energy while executing a mission. Current vehicles can be refueled quickly from a jerrycan, allowing them to travel to the refueling point. Fully electrified platforms are not as easily refueled on the side of the road, which puts both Soldiers and materiel in danger. As the Army explores electrification technologies, preparing for situations such as this are important to keep both Soldiers safe and protect next generation platforms. Hydrogen fuel cells are a potential electrification technology that can provide near-silent power and mobility for military vehicles while providing high torque with inherently scalable power and energy, capable of providing range beyond that of purely battery-powered electric vehicles. Hydrogen can also be refueled more quickly than batteries can charge, providing an opportunity to solve the problem of a fuel-depleted vehicle on a mission. Several technologies exist that can provide hydrogen on-demand from solid materials that can be easily and safely transported and stored. One such technology of interest is aluminum alloys that react with water to provide hydrogen.

Note: Hydrogen generators that utilize aluminum alloy and water are like an extra fuel tank, but less volatile. Aluminum powder can be safely handled and stored as a solid material, unlike liquid fuel. Several recent advances in the technology allow for the material to be manufactured at scale from scrap aluminum, providing a large source of energy in an inexpensive manner (1, 2). Compared to domestically sourcing lithium for battery production (and in order to meet future energy needs), this technology provides significant energy density without requiring rare earth metals, while at the same time needing significantly less infrastructure be developed. When exposed to water, the alloys produce hydrogen rapidly and at pressure, allowing a vehicle to be fueled quickly while providing enough energy to travel back to safety or a refueling point. The system can be designed with safety at the forefront, incorporating pressure relief devices and intrinsically safe controls.

PHASE I: It is important to note that this is a Direct to Phase II topic. To justify a Direct to Phase 2, This Direct to Phase 2 effort should have data demonstrating the operation of an aluminum-water hydrogen generation system. The data should show the flow rate of hydrogen from the system, pressure during operation, temperature of the system, the amount of aluminum and water used, and control over the reaction (data showing a controlled stop/start cycle of the reaction). The proposal should also demonstrate the hydrogen from the reaction is pure enough to operate a fuel cell by either providing performance data from a fuel cell connected to the system or analysis of the hydrogen purity.

PHASE II: Design a hydrogen generation system that can be man-portable while providing a meaningful range for vehicles in the case that fuel is depleted. Manage the thermal performance of the system, reducing both the exterior touch temperature to safe levels and overall thermal signature. Fabricate and demonstrate such a system. Demonstrate aluminum alloy production capable of supporting the manufacturing of several systems. Testing required for this technology would include measuring the flow

rate of hydrogen from the system, demonstrating that the system can operate at the designated pressure, maintaining a safe external touch temperature, and effectively removing heat from the reaction.

PHASE III DUAL USE APPLICATIONS: There is high dual-use potential for hydrogen fuel cells, as users across industries continue to adopt this technology, especially in vehicles and industrial power. The high CAGR indicated rapid, significant projected growth across all sectors. Popular use cases for fuel cells in general include power generation for electric individual and mass transportation vehicles, industrial processes, data centers, and utilities, as well as residential heating. Hydrogen fuel cells can be used to build stacks, which can allow for modular power systems that can adapt to energy requirements based on the use case. The proposed technology has potential use within the Army Small Business Innovation Research Program as well as other Army Research Centers and acquisition programs.

KEYWORDS: Hydrogen; Storage; fuel; battlespace; tank; refuel point; electrification; generator; generation system; power supply

REFERENCES:

1. Using aluminum and water to make clean hydrogen fuel—when and where it’s needed, <https://energy.mit.edu/news/using-aluminum-and-water-to-make-clean-hydrogen-fuel-when-and-where-its-needed/>
2. Nanogalvanic Aluminum Powder For Hydrogen Generation, <https://www.arl.army.mil/wp-content/uploads/2019/11/AlNanogalvanicPowder-Marketing-Sheet.pdf>
3. The production of hydrogen as an alternative energy carrier from aluminium waste, <https://energysustainsoc.biomedcentral.com/articles/10.1186/s13705-017-0110-7>

DEPARTMENT OF THE ARMY
DoD 23.4 Small Business Innovation Research (SBIR)
Annual Broad Agency Announcement (BAA)
Component-Specific Proposal Instructions
Release 9

April 25, 2023: Topics issued for pre-release

May 18, 2023: Army begins accepting proposals via DSIP

May 30, 2023: DSIP Topic Q&A closes to new questions at 12:00 p.m. ET

June 13, 2023: Deadline for receipt of proposals no later than 12:00 p.m. ET

INTRODUCTION

The future Army must be capable of conducting Multi-Domain Operations (MDO) as part of an integrated Joint Force across an array of situations in multiple theaters by 2035. The MDO concept describes how the Army will support the Joint Force in the rapid and continuous integration of all domains of warfare – land, sea, air, and cyberspace – to deter and prevail as we compete short of conflict, and fight and win if deterrence fail. The Army must provide game-changing capabilities to our Soldiers. To capitalize on small business innovation, the Army has implemented an approach to advertise SBIR funding opportunities through the Department of Defense (DoD) Annual BAA process, outside of the three pre-determined BAA cycles. This approach also strives to create a more rapid award time from solicitation to closing.

CONTACT INFORMATION

Direct Specific questions pertaining to the administration of the Department of the Army SBIR Program and proposal preparation instructions to the Point of Contact identified in the Topic announcement.

General questions can be directed to the following:

Email: usarmy.pentagon.hqda-asa-alt.mbx.army-applied-sbir-program@army.mil

Website: <https://www.armysbir.army.mil/>

Mailing Address:

Army Applied SBIR Office 2530 Crystal Dr; Ste 11192

Arlington, VA 22202

RESPONSIVENESS AND TIMELINESS

All proposals will be evaluated and judged on a competitive basis. Proposals will only be evaluated in response to an active, corresponding Army topic. Proposals will be initially screened to determine responsiveness and timeliness. Proposals passing this initial screening will be technically evaluated by engineers or scientists to determine the most promising technical and scientific approaches. Assessment of responsiveness may continue during technical evaluation and after selection. If at any point the proposal is deemed untimely, unresponsive, ineligible, or non-responsible, the proposal will be rejected / the contract action will be cancelled.

Interested firms shall follow the DoD Program BAA instructions as well as the Army's component-specific proposal instructions herein, when preparing and submitting proposals.

Proposers are encouraged to thoroughly review the DoD Program BAA and register for the DSIP Listserv to remain apprised of important programmatic and contractual changes.

- The DoD Program BAA is located at: <https://www.defensesbirstr.mil/SBIR-STTR/Opportunities/#announcements>. Be sure to select the tab for the appropriate BAA cycle.
- Register for the DSIP Listserv at: <https://www.dodsbirstr.mil/submissions/login>.

This release contains an open topic. As outlined in section 7 of the SBIR and STTR Extension Act of 2022, innovation open topic activities—

- (A) Increase the transition of commercial technology to the Department of Defense;
- (B) Expand the small business nontraditional industrial base;
- (C) Increase commercialization derived from investments of the Department of Defense; and
- (D) Expand the ability for qualifying small business concerns to propose technology solutions to meet the needs of the Department of Defense.

Unlike conventional topics, which specify the desired technical objective and output, open topics can use generalized mission requirements or specific technology areas to adapt commercial products or solutions to close capability gaps, improve performance, or provide technological advancements in existing capabilities.

A small business concern may only submit one (1) proposal to each open topic. If more than one proposal from a small business concern is received for a single open topic, only the most recent proposal to be certified and submitted prior to the submission deadline will receive an evaluation. All prior proposals submitted by the small business concern for the same open topic will be marked as nonresponsive and will not receive an evaluation.

SYSTEM FOR AWARD MANAGEMENT (SAM)

Interested firms are required to be registered in SAM (www.sam.gov) before submitting a proposal and shall continue to be registered until time of award, during performance, and through final payment of any contract.

PHASE I PROPOSAL INSTRUCTIONS

The Defense SBIR/STTR Innovation Portal (DSIP) is the official portal for DoD SBIR/STTR proposal submission. Proposers (also referred to herein as “offeror(s)”) are required to submit proposals via DSIP; proposals submitted by any other means will be disregarded. Detailed instructions regarding registration and proposal submission via DSIP are provided in the DoD SBIR Program BAA.

Proposal Coversheet (Volume 1)

The proposal coversheet must follow the instructions and requirements provided in the DoD SBIR Program BAA.

The offeror shall certify that to the best of its knowledge and belief, its eligibility information under the SBIR Program is accurate, complete, and current as of the date of the offer.

Technical Volume (Volume 2)

The technical volume proposal is not to exceed 5 word document pages and must follow the formatting requirements provided in the DoD SBIR Program BAA. A commercialization plan must also accompany the technical volume proposal and must be 8 slides. The required content to include within these slides are described in Appendix D. The commercialization plan must be converted from slides to pdf and attached to the end of the technical volume proposal, resulting in one pdf file to be uploaded to DSIP as Volume 2. The commercialization plan does not count towards the proposal 5-page limit. Any proposals submitted without a commercialization plan or in a format other than that provided in these Component Instructions and by the BAA will be deemed unresponsive and will not be reviewed.

Content of the Technical Volume

The Technical Volume shall contain three key sections – technical approach, team qualifications and commercialization section. The technical approach section shall contain details on how the proposer is going to solve the problem. It shall detail key elements of the firm’s approach, any risks, relevant past work and how success is measured. The team qualifications section shall highlight the key personnel working on the project, and the resources that will be brought to bear on solving the problem.

The commercialization plan shall include:

- Company information: Focused objectives/core competencies; specialization area(s); products with significant sales; and history of previous Federal and non-Federal funding, regulatory experience, and subsequent commercialization successes.
- Customer and Competition: Clear description of key technology objectives, current competition, and advantages compared to competing products or services; description of hurdles to acceptance of the innovation.
- Market: Milestones, target dates, analyses of market size, and estimated market share after first year sales and after 5 years; explanation of plan to obtain market share.
- Intellectual Property: Patent status, technology lead, trade secrets or other demonstration of a plan to achieve sufficient protection to realize the commercialization stage and attain at least a temporal competitive advantage.
- Financing: Plans for securing necessary non-SBIR funding.
- Assistance and mentoring: Plans for securing needed technical or business assistance through mentoring, partnering, or through arrangements with government sponsored (e.g., State assistance programs, Federally-funded research laboratories, Manufacturing Extension Partnership centers), not-for-profits (e.g., SBDC), commercial accelerators, DOD Prime Contractors, or other assistance provider.

These instructions supersede those stated in section 5.3.c of the DoD Program BAA.

Cost Volume (Volume 3)

The Cost Volume must follow all instructions and requirements provided in the DoD SBIR Program BAA. Supplemental requirements are as follows:

The Phase I Base amount must not exceed \$250,000 for a 6-month period of performance, unless otherwise specified in the topic description pages. Phase I Options are not anticipated at this time. If an option is identified in the topic posting, costs for the Base and Option must be separated and clearly identified on the Proposal Cover Sheet (Volume 1) and in Volume 3. Awards for these topics will be in the form of a firm fixed price contract.

Please review the updated Percentage of Work (POW) calculation details included in section 5.3 of the DoD Program BAA. Army Applied SBIR will occasionally accept deviations from the POW requirements with written approval from the Funding Agreement officer.

For pricing purposes, offerors shall assume a contract or agreement start date of approximately ninety (90) days after submission of the proposal. For this BAA, adequate price competition (APC), as defined in FAR 15.403-1(c), is anticipated. In the event that adequate price competition is not realized (i.e. only one proposal is received for a given topic), the Government may choose to conduct additional proposal analysis, in accordance with the techniques identified at FAR 15.404-1. Additionally, offerors are to provide any current Forward Pricing Rate Agreements (FPRA) in effect at time of proposal submission.

Content of the Cost Volume (Volume 3)

ALL proposed costs should be accompanied by documentation to substantiate how the cost was derived. Substantiating documentation guidance is as follows:

- **LABOR:**
 - List all key personnel by name as well as by number of hours dedicated to the project as direct labor.
 - Explain the basis of proposed labor hours, including required tasks, and substantiating documentation for the costs (e.g. payroll reports). Volume 5, Supporting Documents, may be used if additional space is needed.

- **MATERIAL/TOOLING/EQUIPMENT:**
 - Explain the basis of proposed material and equipment costs. This support should include a consolidated priced summary of individual material and equipment quantities and substantiating documentation for the costs (e.g. vendor quotes, invoice prices, competitive bids, etc.). If your choice isn't the lowest cost available, explain the decision to choose one item or supplier over another. Volume 5, Supporting Documents, may be used if additional space is needed.
 - Ensure all materials are American-made to the maximum extent practicable. Offerors who propose to use a foreign-made product in its technology may be required to find an American-made equivalent.
 - While special tooling and test equipment and material cost may be included, it will be carefully reviewed relative to need and appropriateness for the work proposed. The purchase of special tooling and test equipment must, in the opinion of the Component Contracting Officer, be advantageous to the Government and should be related directly to the specific topic. These may include such items as innovative instrumentation or automatic test equipment. Title to property furnished by the Government or acquired with Government funds will be vested with the DoD Component, unless it is determined that transfer of title to the contractor would be more cost effective than recovery of the equipment by the DoD Component.

- **TRAVEL:**
 - Explain the basis of proposed travel, including to/from locations, number of trips, number of travelers per trip, and number of days/nights per trip. Include substantiating documentation for the costs (e.g. screenshots of flight cost comparison, rental car quotes, etc.). NOTE: Virtual meetings shall be utilized to the maximum extent practicable. Volume 5, Supporting Documents, may be used if additional space is needed.

- **SUBCONTRACTS:** A subcontract is any agreement, other than one involving an employer-employee relationship, entered into by the prime contractor (awardee)

calling for supplies or services for the performance of the contract.

- All subcontractor costs and consultant costs must be detailed at the same level as prime contractor costs in regard to labor, travel, equipment, etc.
 - Explain the basis of proposed subcontract costs. Include documented support of the offeror's price analyses and degree of competition of all subcontractor proposals. All subcontractor costs and consultant costs, such as labor, travel, equipment, materials, must be detailed at the same level as prime contractor costs. Provide detailed substantiation of subcontractor costs in your cost proposal. Volume 5, Supporting Documents, may be used if additional space is needed.
 - Certify that the following requirements are met: For Phase I, the offeror must perform a minimum of two-thirds of the research and/or analytical effort. One third may be subcontracted to another firm or research organization/facility. The percentage of work is measured by both direct and indirect costs.
 - Offerors shall not propose to subcontract to the issuing agency, to any other Federal Government agency, or to other units of the Federal Government, except Federal Laboratories in rare circumstances. As defined in 15 U.S.C. 3703, Federal Laboratory means any laboratory, any federally funded research and development center, or any center established under 15 U.S.C. 3705 and 3707 that is owned, leased, or otherwise used by a Federal Agency and funded by the Federal Government, whether operated by the Government or by a contractor.
 - Offerors shall not propose to subcontract to any prohibited sources. Proposals identifying a subcontractor/vendor arrangement with a prohibited source may be rejected.
 - Offerors shall ensure subcontracting arrangements are with United States Small Businesses to the maximum extent practicable. Offerors proposing a subcontractor arrangement with other than a United States Small Business (such as, a large business, foreign firm, foreign government, educational institution, unit of Federal Government, etc.) may be required to submit further explanation.
- **INDIRECT COSTS:**
 - Explain the basis of the proposed indirect expense rates including overhead, general and administrative, material handling, and fringe benefits.
 - If a Defense Contract Audit Agency (DCAA) Audit has been conducted within the last five (5) years, include the audit compliance documentation in the cost proposal documents. The documentation should also include the offeror's DCAA Point of Contact (if applicable).

If selected, failure to include the documentation with your proposal may delay contract award, as the proposer will be asked to submit the necessary documentation to the Contracting Officer to

substantiate costs. It is important to respond as quickly as possible to the Contracting Officer's request for documentation. Failure or refusal to provide documentation may result in cancellation of the contract action.

Company Commercialization Report (CCR) (Volume 4)

Completion of the CCR as Volume 4 of the proposal submission in DSIP is required. Please refer to the DoD SBIR Program BAA for full details on this requirement. Information contained in the CCR will be considered by the Department of the Army during proposal evaluations.

Supporting Documents (Volume 5)

Volume 5 is provided for proposers to submit additional documentation to support the Cover Sheet (Volume 1), Technical Volume (Volume 2), and the Cost Volume (Volume 3). In addition to the Volume 5 requirements outlined in the DoD Program BAA, the Department of the Army may accept the following documents in Volume 5:

- Additional Cost Information
- Funding Agreement Certification
- Technical Data Rights (Assertions)
- Lifecycle Certification
- Allocation of Rights
- Other (only as specified in the topic)

Please only submit documents that are identified immediately above and in the DoD Program BAA. All other documents submitted will be disregarded.

DIRECT TO PHASE II PROPOSAL GUIDELINES

Proposers interested in submitting a DP2 proposal in response to these topics must provide documentation to substantiate that the scientific and technical merit and feasibility described in the Phase I section of the topic has been met and describes the potential commercial applications. Documentation should include all relevant information including, but not limited to: technical reports, test data, prototype designs/models, and performance goals/results. Work submitted within the feasibility documentation must have been substantially performed by the proposer and/or the Principal Investigator.

The Army will not evaluate the proposer's related Phase II proposal if it determines that the proposer has failed to demonstrate that technical merit and feasibility has been established or the proposer has failed to demonstrate that work submitted in the feasibility documentation was substantially performed by the proposer and/or the PI.

Feasibility documentation cannot be based upon any prior or ongoing federally funded SBIR or STTR work and DP2 proposals MUST NOT logically extend from any prior or ongoing federally funded SBIR or STTR work.

Format of Technical Volume (Volume 2)

The Technical Volume must include two parts, the Feasibility Documentation and the Technical Proposal.

The Technical Volume must be a single Portable Document Format (PDF) file, including graphics. Perform a virus check before uploading the Technical Volume file. If a virus is detected, it may cause rejection of the proposal. Do not lock or encrypt the uploaded file. Do not include or embed active graphics such as videos, moving pictures, or other similar media in the document.

The length of the Feasibility Documentation is not to exceed 5 pages and the length of the Technical Proposal is not to exceed 10 pages. A commercialization plan must also accompany the technical proposal and should be 8 slides. Any proposals submitted in a different format, or exceed the page count limits will not be reviewed.

Number all pages of your proposal consecutively. Font size should not be smaller than 10- point on standard 8-1/2" x 11" paper with one-inch margins. The header on each page of the Technical Volume should contain your company name, topic number, and proposal number assigned by DSIP when the Cover Sheet was created. The header may be included in the one-inch margin.

Content of the Feasibility Documentation (Volume 2a)

The content of the Feasibility Documentation Proposers should substantiate that the scientific and technical merit and feasibility described in the Phase I section of the topic has been met and describes the potential commercial applications. Documentation should include all relevant information including, but not limited to: technical reports, test data, prototype designs/models, and performance goals/results. Work submitted within the feasibility documentation must have been substantially performed by the proposer and/or the Principal Investigator.

Content of the Technical Proposal (Volume 2b)

The content of the Technical Volume should address three key areas: the technical approach, the team carrying out the work (and the accompanied resources), and the commercialization strategy. The commercialization plan should include:

- Company information: Focused objectives/core competencies; specialization area(s); products with significant sales; and history of previous Federal and non-Federal funding, regulatory experience, and subsequent commercialization successes.
- Customer and Competition: Clear description of key technology objectives, current competition, and advantages compared to competing products or services; description of hurdles to acceptance of the innovation.
- Market: Milestones, target dates, analyses of market size, and estimated market share after first year sales and after 5 years; explanation of plan to obtain market share.
- Intellectual Property: Patent status, technology lead, trade secrets or other demonstration of a plan to achieve sufficient protection to realize the commercialization stage and attain at least a temporal competitive advantage.
- Financing: Plans for securing necessary non-SBIR funding.
- Assistance and mentoring: Plans for securing needed technical or business assistance through mentoring, partnering, or through arrangements with government sponsored (e.g., State assistance programs, Federally-funded research laboratories, Manufacturing Extension Partnership centers), not-for-profits (e.g., SBDC), commercial accelerators, DOD Prime Contractors, or other assistance provider.

Proposers are free to structure each section as they like, so long as it provides sufficient detail for evaluators to understand the proposed work, who will carry it out, and how the business plans to commercialize results.

These instructions supersede those stated in section 5.3.c of the DoD Program BAA.

Cost Volume (Volume 3)

Unless otherwise noted in the topic, the Army will accept Direct to Phase II proposals for a cost up to \$1,900,000 for an 18-month period of performance. Proposers are required to use the Cost Proposal method as provided on the DSIP submission site. The Cost Volume (and supporting documentation) DOES NOT count toward the page limit of the Technical Volume.

For pricing purposes, offerors should assume a contract or agreement start date of approximately ninety (90) days after submission of the proposal. For this BAA, adequate price competition (APC), as defined in FAR 15.403-1(c), is anticipated. In the event that adequate price competition is not realized (i.e. only one proposal is received for a given topic), the Government may choose to conduct additional proposal analysis, in accordance with the techniques identified at FAR 15.404-1. Additionally, offerors are to provide any current Forward Pricing Rate Agreements (FPRA) in effect at time of proposal submission.

Content of the Cost Volume (Volume 3)

ALL proposed costs should be accompanied by documentation to substantiate how the cost was derived. For example, if you proposed travel costs to attend a project-related meeting or conference, and used a travel website to compare flight costs, include a screenshot of the comparison. Similarly, if you proposed to purchase materials or equipment, and used the internet to search for the best source, include your market research for those items. You do not necessarily have to propose the cheapest item or supplier, but you should explain your decision to choose one item or supplier over another. It's important to provide enough information to allow contracting personnel to understand how the proposer plans to use the requested funds.

Some items in the cost breakdown may not apply to the proposed project. If that is the case, there is no need to provide information on each and every item.

Cost Breakdown Guidance:

- List all key personnel by name as well as by number of hours dedicated to the project as direct labor.
- Special tooling and test equipment and material cost may be included. The inclusion of equipment and material will be carefully reviewed relative to need and appropriateness for the work proposed. The purchase of special tooling and test equipment must, in the opinion of the Contracting Officer, be advantageous to the Government and should be related directly to the specific topic. These may include such items as innovative instrumentation and/or automatic test equipment. Title to property furnished by the Government or acquired with Government funds will be vested with the Army; unless it is determined that transfer of title to the contractor would be more cost effective than recovery of the equipment by the Army.
- Cost for travel funds must be justified and related to the needs of the project.
- Cost sharing is permitted for proposals under this announcement; however, cost sharing is not required, nor will it be an evaluation factor in the consideration of a proposal.
- All subcontractor costs and consultant costs must be detailed at the same level as prime contractor costs in regard to labor, travel, equipment, etc. Provide detailed substantiation of subcontractor costs in your cost proposal. Enter this information in the Explanatory Material section of the on-line cost proposal form. The Supporting Documents Volume (Volume 5) may be used if additional space is needed.

If a DCAA Audit has been conducted within the last five (5) years, include the audit compliance documentation in the cost proposal documents. The documentation should also include the offeror's DCAA Point of Contact (if applicable).

If selected for award, failure to include the documentation with your proposal will delay contract negotiation, and the proposer will be asked to submit the necessary documentation to the Contracting Officer to substantiate costs (e.g., cost estimates for equipment, materials, and

consultants or subcontractors). It is important to respond as quickly as possible to the Contracting Officer's request for documentation.

For more information about cost proposals and accounting standards, see the DCAA publication titled "Audit Process Overview – Information for Contractors" available at: <http://www.dcaa.mil>.

Company Commercialization Report (CCR) (Volume 4)

Completion of the CCR as Volume 4 of the proposal submission in DSIP is required. Please refer to the DoD SBIR Program BAA for full details on this requirement. Information contained in the CCR will be considered by the Department of the Army during proposal evaluations.

Supporting Documents (Volume 5)

Volume 5 is provided for proposers to submit additional documentation to support the Cover Sheet (Volume 1), Technical Volume (Volume 2), and the Cost Volume (Volume 3). In addition to the Volume 5 requirements outlined in the DoD Program BAA, the Department of the Army will accept the following documents in Volume 5:

- Additional Cost Information
- Funding Agreement Certification
- Technical Data Rights (Assertions)
- Lifecycle Certification
- Allocation of Rights
- Other (only as specified in the topic)

Please only submit documents that are identified in the topic instructions. All other submissions will be disregarded.

PHASE II PROPOSAL INSTRUCTIONS

Phase II proposals may only be submitted by Phase I awardees. Phase II proposal submission window, notification process, expected budget/duration structure and additional instructions will be provided in the Phase I contract or by subsequent notification.

DISCRETIONARY TECHNICAL AND BUSINESS ASSISTANCE (TABA)

The Army, at its discretion, may provide Technical and Business Assistance (TABA). The Army will select a preferred vendor(s) for the Army SBIR TABA program through a competitive process. Alternately, a small business concern may, by contract or otherwise, select one or more vendors to assist the firm in meeting the TABA goals. The Applicant must request the authority to select its own TABA provider in its Army SBIR proposal and must demonstrate that the vendor is uniquely postured to provide the specific technical and business services required. TABA funding will be denied if the offeror fails to include the cost and detailed explanation in its proposal.

Participation in the Army SBIR TABA program is voluntary for each Army SBIR awardee. Services provided to Army SBIR firms under the auspices of the TABA program may include, but are not limited to:

1. Access to a network of scientists, engineers, and technologists focused on commercialization and transition considerations such as protected supply chain management, advanced manufacturing, process/product/production scaling, etc;
2. Assistance with intellectual property protections, such as legal considerations, intellectual property rights, patent filing, patent fees, licensing considerations, etc;
3. Commercialization and technology transition support such as market research, market validation, development of regulatory or manufacturing plans, brand development;

4. Regulatory support such as product domain regulatory considerations, regulatory planning, and regulatory strategy development.

The Army SBIR program sponsors participation in the TABA program. The resource limitation for each firm is as follows:

- Phase I Firms:
 - Army-Preferred Vendor: If approved, the contractor may receive up to \$6,500 worth of assistance services per project per year (in addition to the base SBIR award amount).
 - Firm-Selected Vendor: If approved, the contractor may receive up to \$6,500 in contract obligation (in addition to the base SBIR award amount) per project per year.
- Phase II Firms:
 - Army-Preferred Vendor: If approved, the contractor may receive up to \$50,000 worth of assistance services per project per year (in addition to the base SBIR award amount).
 - Firm-Selected Vendor: If approved, the contractor may receive up to \$50,000 in contract obligation (in addition to the base SBIR award amount) per project per year.

EVALUATION AND SELECTION

The Army will conduct an evaluation of each responsive, timely, eligible proposal in accordance with the evaluation criteria listed in the DoD Program BAA. It is the policy of the Army to ensure equitable and comprehensive proposal evaluations based on the evaluation criteria and to select the source (or sources) whose offer meets the Government's technical, policy, and programmatic goals.

As previously stated herein, timeliness, responsiveness, and eligibility will be assessed upon initial screening, during evaluation, and after selection. Proposals that do not comply with the instructions and requirements detailed in this document, the DoD Program BAA, or the corresponding Topic posting (including the research objective(s)), will be considered ineligible, nonresponsive, untimely, or non-conforming and therefore will not be evaluated or considered for award.

Using the evaluation criteria, the Government will evaluate each responsive, timely, eligible proposal in its entirety. Proposals will not be evaluated against each other during the evaluation process, but rather evaluated on their own individual merit to determine how well the proposal meets the criteria stated in this BAA and the corresponding opportunity.

Selected proposals are those determined to be the most advantageous to the Government, consistent with instructions and evaluation criteria specified in the DoD Program BAA, the component-specific instructions herein, the corresponding Topic posting, and availability of funding.

Proposing firms will be notified via email of selection or non-selection status for a Phase I or direct to Phase II award within 90 days of the closing date of the Topic. The notification will be sent to the Corporate Official listed on the proposal cover sheet from the Army SBIR Program Office mailbox. The Army promotes transparency regarding the technical evaluation for all Army SBIR proposals. The Army will provide a technical evaluation narrative to the proposer in accordance with the SBA Policy Directive, Appendix I, paragraph 4. The selection decision notice contains instructions for retrieving the technical evaluation narrative.

Proposers must not regard the notification email (selection decision notice) as an authorization to commit or expend funds. After the Army SBIR Office has recommended a proposal for award, a Government Contracting Officer may contact the proposer in order to discuss and request additional information required for award. This may include representations and certifications, certified or other than certified

cost data, subcontracting plan for small businesses, and/or other information as applicable to the proposed award. Proposers must not regard these communications as an authorization to commit or expend funds. Unless a Government Contracting Officer signs the award document (i.e. contract), no obligations to provide funding are made. The Government may reject the proposal or cancel the contract action at any time.

If signed by the Government Contracting Officer, the award document is the official and authorizing instrument (i.e. contract). The anticipated period of performance start date will be determined at time of award. The Contracting Officer will email the signed, authorizing award instrument to the principal investigator (PI) and/or an authorized organization representative.

PROTESTS

Refer to the DoD SBIR Program BAA for procedures to protest the Announcement.


As further prescribed in FAR 33.106(b), FAR 52.233-3, Protests after Award shall be submitted to the Point of Contract identified in the topic solicitation:

Email: usarmy.pentagon.hqda-asa-alt.mbx.army-applied-sbir-program@mail.mil

Mailing Address:

Army Applied SBIR Office
2530 Crystal Dr; Ste 11192
Arlington, VA 22202

Appendix A Phase I Evaluation Criteria


| Applied SBIR Phase I Proposal Review v2-0-3 Evaluation Criteria Defined | |  |
|---|---|--|
| | | DEFINITION |
| INTRODUCTION | weight 5% | Write a clear, concise description of what your innovation does or will do, and where you are in your evolution. Make clear its intended impact on the Army. Evaluators should "get it" after reading this. |
| POTENTIAL FOR ARMY IMPACT | OPERATIONAL IMPACT | At the scale of a single Army end-user, argue that their jobs or lives will be significantly improved if your solution is adopted. What is the impact of your solution for a soldier/Army civilian vs. today's solutions? |
| | weight 25% | POTENTIAL SCALE OF IMPACT Here, we're looking for an idea of how broad the impact you described above could be. Look into the future to a time when your solution is both technically mature and actively in use by Army personnel. Describe the scale and scope of your impact within the context of the Army. |
| TECHNICAL FEASIBILITY | SCIENTIFIC FEASIBILITY | Is the science behind the solution sound? Convince readers who don't have deep expertise in your field that your innovation is built atop sound scientific and engineering principles. |
| | ENABLING TECHNOLOGIES | Point to the foundational technologies that you rely on to deliver your solution. Do the required enabling technologies introduce added risk? Using proven (and ideally Army fielded) underlying technologies and techniques helps to lower technical risk. |
| | ALTERNATIVE TECHNICAL APPROACHES | From a technologist's perspective, why is your proposed solution the best choice for the Army? Refute the alternative engineering approaches others are using. Why does your technology win? |
| | weight 25% | TECHNICAL RISK MITIGATION No matter your current technology readiness level, technical risks remain. Identify those risks. Present a credible plan to tackle those risks. |
| TRANSITION | ARMY TRANSITION PATHWAY | Planning for success, what's next for you after this SBIR award? Describe the next type of deal you aim to make with the Army, e.g. a CRADA, a different SBIR contract, a CSO, etc. Briefly outline your current plan to unlock that next opportunity and/or share the biggest risks you see post this SBIR award. |
| | weight 20% | SBIR MILESTONE SCHEDULE Please share with us a thoughtful execution plan. Strike a balance between giving us a sense of the detailed thinking behind the scenes and the need for your contracting officer to manage a reasonably small number of milestones during your period of performance. |
| FIRM CASH FLOW | FIRM SURVIVAL RISK | SBIR funds are meant to fuel growth rather than stave off a firm's impending financial failure. Demonstrate that your company will survive financially as a going concern through the early stages of a Phase III contract, sometimes referred to as "transitioning" into use by Army personnel. |
| | OTHER PEOPLE'S MONEY | Make the case that non-Army and/or non-DoD dollars will continue to fund improvements to your solution from which the Army will benefit in the future. Companies who cannot demonstrate non-Army and/or non-DoD funding sources for future solution enhancements are less attractive to the Applied SBIR program. |
| | weight 10% | FINANCIAL PROFIT POTENTIAL Through the Applied SBIR program, the Army wants to take advantage of the speed and scalability of dual-use companies. Make your best case that your product is or will be profitable. If you have more than one product, please focus your argument on the product / solution presented for this SBIR program. |
| TEAM ABILITY | weight 10% | Prove your team has executed well as a group. Please draw clear distinctions between private sector, DoD and civilian government work. What milestones have you accomplished as a group in this company? |
| SUBMISSION QUALITY | QUALITY OF PROSE | Prove you write clearly. Prove you argue convincingly. |
| | weight 5% | DATA QUALITY & ATTRIBUTION Support your arguments with relevant, properly attributed data to enhance your credibility. |

Appendix B Direct to Phase II Evaluation Criteria

| Applied SBIR D2P2 Proposal Review v2-0-4 Evaluation Criteria Defined | | DEFINITION |
|--|------------|---|
| INTRODUCTION | weight 2% | Write a clear, concise description of what your innovation does or will do, and where you are in your evolution. Make clear its intended impact on the Army. Evaluators should "get it" after reading this. |
| POTENTIAL FOR ARMY IMPACT | weight 20% | <p>OPERATIONAL IMPACT At the scale of a single Army end-user, argue that their jobs or lives will be significantly improved if your solution is adopted. What is the impact of your solution for a soldier/Army civilian vs. today's solutions?</p> <p>POTENTIAL SCALE OF IMPACT Here, we're looking for an idea of how broad the impact you described above could be. Look into the future to a time when your solution is both technically mature and actively in use by Army personnel. Describe the scale and scope of your impact within the context of the Army.</p> |
| TECHNICAL FEASIBILITY | weight 30% | <p>SCIENTIFIC FEASIBILITY Is the science behind the solution sound? Convince readers who don't have deep expertise in your field that your innovation is built atop sound scientific and engineering principles.</p> <p>ENABLING TECHNOLOGIES Point to the foundational technologies that you rely on to deliver your solution. Do the required enabling technologies introduce added risk? Using proven (and ideally Army-felted) underlying technologies and techniques helps to lower technical risk.</p> <p>ALTERNATIVE TECHNICAL APPROACHES From a technologist's perspective, why is your proposed solution the best choice for the Army? Refute the alternative engineering approaches others are using. Why does your technology win?</p> <p>TECHNICAL RISK MITIGATION No matter your current technology readiness level, technical risks remain. Identify those risks. Present a credible plan to tackle those risks.</p> |
| TRANSITION | weight 20% | <p>ARMY TRANSITION PATHWAY Planning for success, what's next for you after this SBIR award? Describe the next type of deal you aim to make with the Army, e.g. a CRADA, a different SBIR contract, a CSO, etc. Briefly outline your current plan to unlock that next opportunity and/or share the biggest risks you see post this SBIR award.</p> <p>SBIR MILESTONE SCHEDULE Please share with us a thoughtful execution plan. Strike a balance between giving us a sense of the detailed thinking behind the scenes and the need for your contracting officer to manage a reasonably small number of milestones during your period of performance.</p> |
| FIRM CASH FLOW | weight 15% | <p>FIRM SURVIVAL RISK SBIR funds are meant to fuel growth rather than stave off a firm's impending financial failure. Demonstrate that your company will survive financially as a going concern through the early stages of a Phase III contract, sometimes referred to as "transitioning" into use by Army personnel.</p> <p>OTHER PEOPLE'S MONEY Make the case that non-Army and/or non-DoD dollars will continue to fund improvements to your solution from which the Army will benefit in the future. Companies who cannot demonstrate non-Army and/or non-DoD funding sources for future solution enhancements are less attractive to the Applied SBIR program.</p> <p>FINANCIAL PROFIT POTENTIAL Through the Applied SBIR program, the Army wants to take advantage of the speed and scalability of dual-use companies. Make your best case that your product is or will be profitable. If you have more than one product, please focus your argument on the product / solution presented for this SBIR program.</p> |
| TEAM ABILITY | weight 10% | Prove your team has executed well as a group. Please draw clear distinctions between private sector, DoD and civilian government work. What milestones have you accomplished as a group in this company? |
| SUBMISSION QUALITY | weight 3% | <p>QUALITY OF PROSE Prove you write clearly. Prove you argue convincingly.</p> <p>DATA QUALITY & ATTRIBUTION Support your arguments with relevant, properly attributed data to enhance your credibility.</p> |



Appendix C Phase II Evaluation Criteria

| Applied SBIR Phase II Proposal Review v2-0-3 Evaluation Criteria Defined | |  |
|--|---|--|
| | | DEFINITION |
| INTRODUCTION | weight 2% | Write a clear, concise description of what your innovation does or will do, and where you are in your evolution. Make clear its intended impact on the Army. Evaluators should "get it" after reading this. |
| POTENTIAL FOR ARMY IMPACT | OPERATIONAL IMPACT | At the scale of a single Army end-user, argue that their jobs or lives will be significantly improved if your solution is adopted. What is the impact of your solution for a soldier/Army civilian vs. today's solutions? |
| | POTENTIAL SCALE OF IMPACT | Here, we're looking for an idea of how broad the impact you described above could be. Look into the future to a time when your solution is both technically mature and actively in use by Army personnel. Describe the scale and scope of your impact within the context of the Army. |
| TECHNICAL FEASIBILITY | SCIENTIFIC FEASIBILITY | Is the science behind the solution sound? Convince readers who don't have deep expertise in your field that your innovation is built atop sound scientific and engineering principles. |
| | ENABLING TECHNOLOGIES | Point to the foundational technologies that you rely on to deliver your solution. Do the required enabling technologies introduce added risk? Using proven (and ideally Army-fielded) underlying technologies and techniques helps to lower technical risk. |
| | ALTERNATIVE TECHNICAL APPROACHES | From a technologist's perspective, why is your proposed solution the best choice for the Army? Refute the alternative engineering approaches others are using. Why does your technology win? |
| | TECHNICAL RISK MITIGATION | No matter your current technology readiness level, technical risks remain. Identify those risks. Present a credible plan to tackle those risks. |
| TRANSITION | ARMY TRANSITION PATHWAY | Planning for success, what's next for you after this SBIR award? Describe the next type of deal you aim to make with the Army, e.g. a CRADA, a different SBIR contract, a CSO, etc. Briefly outline your current plan to unlock that next opportunity and/or share the biggest risks you see post this SBIR award. |
| | SBIR MILESTONE SCHEDULE | Please share with us a thoughtful execution plan. Strike a balance between giving us a sense of the detailed thinking behind the scenes and the need for your contracting officer to manage a reasonably small number of milestones during your period of performance. |
| FIRM CASH FLOW | FIRM SURVIVAL RISK | SBIR funds are meant to fuel growth rather than stave off a firm's impending financial failure. Demonstrate that your company will survive financially as a going concern through the early stages of a Phase III contract, sometimes referred to as "transitioning" into use by Army personnel. |
| | OTHER PEOPLE'S MONEY | Make the case that non-Army and/or non-DoD dollars will continue to fund improvements to your solution from which the Army will benefit in the future. Companies who cannot demonstrate non-Army and/or non-DoD funding sources for future solution enhancements are less attractive to the Applied SBIR program. |
| | FINANCIAL PROFIT POTENTIAL | Through the Applied SBIR program, the Army wants to take advantage of the speed and scalability of dual-use companies. Make your best case that your product is or will be profitable. If you have more than one product, please focus your argument on the product / solution presented for this SBIR program. |
| TEAM ABILITY | weight 5% | Prove your team has executed well as a group. Please draw clear distinctions between private sector, DoD and civilian government work. What milestones have you accomplished as a group in this company? |
| SUBMISSION QUALITY | QUALITY OF PROSE | Prove you write clearly. Prove you argue convincingly. |
| | DATA QUALITY & ATTRIBUTION | Support your arguments with relevant, properly attributed data to enhance your credibility. |

Appendix D

Commercialization Plan Template

General Instructions/Guidance:

1. The slide deck must be 8 slides total, per Component Instructions, and follow the formatting contained in the template. Font size shall be no smaller than 10-point font.
2. Slides should display the slide number in bottom right corner
3. All text (including tables, charts, plots, axes labels, legends, captions) must be readable without zooming and understandable without voice-over
4. For plots and charts:
 - a. Include title/bullet describing importance of plot/chart, and/or data (be specific)
 - b. Axes must be meaningfully labeled (to be understandable by non-experts) and include scale
5. Avoid jargon; define technical terms
6. Convert from slide format to a PDF file for submission to DSIP alongside the technical volume proposal
7. To insert images, capture a screenshot of the image and paste it into the slide. Please do not drag-drop a file into the presentation or use the Insert Pictures menu function.
8. Use PowerPoint's "Compress Pictures" feature to reduce file size
 - a. Select 96ppi resolution
 - b. Uncheck "For this picture only"
9. Replace the boilerplate footer below with distribution markings as appropriate
10. Do not put any company logos (Twitter, Reddit, GitHub, etc) on your slides

To be considered valid proposals, Commercialization Plan submissions must follow the number and content of each slide as contained in the attached template.

Appendix D
Commercialization Plan Template cont.

Firm Name

SBIR Project Title

Principal Investigator Name / Title
Key (or other relevant) Personnel, and
Subcontractors

.....
Insert Topic Number
Insert Proposal Number

Distribution markings as appropriate for your organization

BLUF: Bottom Line Up Front

- **BLUF:**
 - 1. Company information and background** : Core competencies, significant sales, previous funding, commercialization successes.
 - 2. Customer and Competition** : Clear description of key technology objectives, current competition, and advantages.
 - 3. Market:** Plan to obtain market share.
 - 4. Intellectual Property:** Patent status, technology lead, trade secrets or other demonstration of a plan to protect the company's technical advantage.
 - 5. Financing/Revenue:** Plans for securing necessary non -SBIR funding.
 - 6. Assistance and mentoring** : Plans for securing needed technical or business assistance.

Distribution markings as appropriate for your organization

Appendix D

Commercialization Plan Template cont.

Company Information and Background

- Core competencies and areas of specialization.
- Products with significant sales.
- Concise history of previous Federal and non -Federal funding/investments.
- Regulatory experience (if applicable).
- Past commercialization successes.
- Past failure and how you overcame .

Distribution markings as appropriate for your organization

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Customer & Competition

- Description of key technology objectives.
- Current competition and/or alternative solutions.
- Advantages of company's offer compared to competing products or services.
- Hurdles to acceptance of the proposed innovation.
- Description of possible areas where your technology may be utilized or is under utilized.

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Appendix D Commercialization Plan Template cont.

Market

- Analysis of market size and 1 and 5 year forecasted market share.
- Explanation of milestones and target dates of plan to obtain that market share.
- What experience do you have with marketing to this target market?
- What commercialization strategy appears to be the best for bringing this product to the target market?
- What experience do you have with bring products to market – either through this company or through other companies with which you have worked.
- Does the company currently market, manufacture, or license technology? Describe what you do.

Intellectual Property

- Patent status, technology lead, trade secrets or other demonstration of a plan to achieve sufficient protection to realize the commercialization stage and attain at least a temporary competitive advantage .
- Describe how you will protect the intellectual property that enables commercialization of its products while keeping competitors at bay. Note any actions you may consider to attain at least a temporary competitive advantage. Also consider your company's prior record in this area. Comment on your company's strategy to build a sustainable business through protection of intellectual property.

Appendix D Commercialization Plan Template cont.

Financing

- Plan for securing non-SBIR, private or government funding necessary to enter low rate of production of anticipated technical solution.
- Describe your revenue stream generation to include but not limited to:
 - Manufacture and direct sales
 - Sales through value added resellers or other distributors
 - Joint venture

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Assistance & Mentoring

- Plans for securing needed technical or business assistance through mentoring, partnering, or arrangements with government sponsored (e.g., SBIR funded Discretionary Technical and Business Assistance (TABAs), State assistance programs, Federally-funded research laboratories, Manufacturing Extension Partnership centers), not-for-profits (e.g., Small Business Development Center (SBDC) or Small Business Technical Development Center (SBTDC)), commercial accelerators, DOD Prime Contractors, SBA Mentor - Protégé program, Procurement Technical Assistance Center (PTAC) or other assistance provider.

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Army SBIR 23.4 Topic Index
Release 9

A234-013 Dual Band Imager

A234-P014 Sustainable Building Materials and Technologies Open Topic

OUSD (R&E) CRITICAL TECHNOLOGY AREA(S): Integrated Sensing and Cyber

OBJECTIVE: The innovative approach of this topic is the focus on reduced SWAP (size, weight, and power) in addition to performance.

DESCRIPTION: Missions require the use of multiple sensors in order to achieve specific objectives. The sensors used extended range imaging applications relies on antiquated technology resulting in extreme sensitivity to Size, Weight, and Power (SWaP). Current dismounted sensors configurations either necessitate separate imaging devices, or complex optical filtering schemes that increase system SWaP in order to maintain operational effectiveness in all environments. Lastly, imaging sensors allow for more advanced target discrimination against advanced threats in multiple bands, complex scenes and various atmospheric conditions. If multiple sensor bands can be imaged simultaneously on the same detector, lower SWaP and less sensitive subcomponent alignments (lower SWaP/environmental factors) is gained resulting in less complex systems.

PHASE I: Phase I is anticipated 3 months to complete a System Design Review, covering systems trade analysis and optimization of performance vs anticipated SWaP, with the goals of phase II below as the basis. The final design will be illustrated with conceptual drawings and performance predictions to at the detector level to support system-level feasibility studies by the Government. Additional details/specifications to be provided to firm upon award.

PHASE II: Phase II is anticipated <20 months to further develop and finalize dual-band detectors specifically tailored for the dismounted Soldier on stacked structures for simultaneous imaging capabilities in the Short Wave and Mid-Wave Infrared. This project will study varying detector design parameters to minimize crosstalk while improving the detector Modulation Transfer Function (MTF) when paired with optimized optical configurations while producing prototypes for test and integration. The Integrated Dewar Cooler Assembly shall be tailored for dismounted applications and be light weight with minimal power consumption. The IDECA FPA shall have a minimum format of 1280 x 720 with a minimal detector pixel pitch. The project will be validated in two approaches; one with Government Furnished Equipment (GFE) optics for demonstration of final imaging performance, then retrofitted into an existing host prototype. Additional details/specifications to be provided to firm upon award.

PHASE III DUAL USE APPLICATIONS: Complete the maturation of the company's technology developed in Phase II and produce prototypes to support further development and commercialization.

KEYWORDS: Infrared; sensors; imager; camera systems; dual-band optics; laser guidance

REFERENCES: [High Operating Temperature \(HOT\) SWIR/MWIR Dual-band 2-channel and Broadband Detectors for Weapon Targeting and IR Seekers | SBIR.gov](#)

[HexaBlu | Commercial Infrared Solutions \(leonardodrs.com\)](#)

A234-P014 Sustainable Building Materials and Technologies Open Topic

OUSD (R&E) CRITICAL TECHNOLOGY AREA(S): Advanced Materials

OBJECTIVE: The purpose of a Sustainable Building Materials and Technologies focused Open Topic is to bring potentially valuable small business innovations to the Army and create an opportunity to expand the relevance of the Army SBIR program to firms who do not normally compete for SBIR awards.

Building materials and technologies are ubiquitously used by the Army CONUS and OCONUS, and account for a significant percentage of the overall Army carbon/climate footprint. This Sustainable Building Materials and Technologies topic seeks to address this carbon intensive aspect of military operations through disruptive materials, logistics, and technologies from a life-cycle assessment (LCA) perspective to meet the goals of the DoD Climate Adaptation plan and Army Climate Strategy.

DESCRIPTION: This open topic is a Phase I or Direct to Phase II submission. For Phase I awards period of performance is a maximum of 6 months and a maximum funding limit of \$250,000 per award. For Direct to Phase II awards period of performance is a maximum of 18 months and a maximum funding limit of \$1,900,000 per award.

While the Sustainable Building Materials and Technologies Open Topic will accept proposals on any technical challenge requiring an application to reduce lifecycle fossil fuel consumption and/or emissions, submissions addressing the applications of those technologies in enduring facilities and infrastructure on installations as well as low-logistics contingency construction applications will be prioritized along with efforts focused on the following technical areas:

- Low-logistics indigenous materials utilization
- Sustainability-centered materials-by-design
- Scalable sustainable building material technologies
- Forward waste utilization for sustainable low-logistics manufacturing
- Low-energy bio-based building materials
- Terrestrial carbon sequestration materials and technologies

PHASE I: The Phase I period of performance will be 6 months. Small businesses shall deliver a proof of technical feasibility at the end of the Period of Performance. Phase I submission materials:

- 5-page technical volume
- 8-slide commercialization plan; template provided in announcement

Post-Phase I Deliverables:

- **Small Business:** A feasibility study to demonstrate the technical and commercial practicality of the concept to include an assessment of its technical readiness and potential applicability to both military and commercial markets.
- **Technical POC and Transition Partner:** Commitment secured from TPOC and Transition Partner to associate with potential Phase II work. (Transition Partner is defined as an Army organization planning to integrate and fund the technology after SBIR funding has expired).

Proposers interested in submitting a Direct to Phase II (DP2) proposal must provide documentation to substantiate that the scientific and technical merit and feasibility described above has been met and describes the potential military and/or commercial applications. Documentation should include all relevant information including, but not limited to: technical reports, test data, prototype designs/models, and performance goals/results.

PHASE II: Produce prototype solutions targeted toward construction and other Army sustainability requirements. These solutions should be vetted through standard testing procedures and modeling focused on mechanical /structural performance, lifecycle durability, lifecycle sustainability, and an understanding of lifecycle cost factors. Prototypes will focus on demonstrating technology at scale including requirements for design and specifications that can easily transition for adoption by the Army. In addition, companies will provide a technology transition and commercialization plan for DOD and commercial markets.

PHASE III DUAL USE APPLICATIONS: Complete the maturation of the company's technology developed in Phase II to TRL 6/7 and produce prototypes to support further development and commercialization. The Army will evaluate each product in a realistic field environment and provide small solutions to stakeholders for further evaluation. Based on technical evaluations in the field, companies will be requested to update the previously delivered prototypes to meet final design configuration

KEYWORDS: Clean Technology; Sustainable Construction; Open topic; Materials, Sustainability, Resilience; Emissions; Green; Environmental, Facilities, Buildings, Infrastructure

REFERENCES: <https://www.armysbir.army.mil/topics/>

Department of the Army
23.4 Small Business Innovation Research (SBIR)
xTechPrime Competition Finalists
Component-Specific Proposal Instructions
Release 10

April 25, 2023: Topics issued for pre-release

January 2, 2024: Army begins accepting proposals via DSIP

February 1, 2024: Deadline for receipt of proposals no later than 12:00 p.m. ET

IMPORTANT: A prize competition, xTechPrime, will be used to identify small business concerns that meet the criteria for award. Winners selected from the xTechPrime prize competition will be the only firms eligible to submit a proposal under this topic. All other proposals will not be evaluated. See the full xTechPrime prize competition RFI here:

<https://www.xtech.army.mil/competition/xtechprime/>

INTRODUCTION

The future Army must be capable of conducting Multi-Domain Operations (MDO) as part of an integrated Joint Force across an array of situations in multiple theaters by 2035. The MDO concept describes how the Army will support the Joint Force in the rapid and continuous integration of all domains of warfare – land, sea, air, and cyberspace – to deter and prevail as we compete short of conflict, and fight and win if deterrence fail. The Army must provide game-changing capabilities to our Soldiers. To capitalize on small business innovation, the Army has implemented an approach to advertise SBIR funding opportunities through the Department of Defense (DoD) Annual BAA process, outside of the three pre-determined BAA cycles. This approach also strives to create a more rapid award time from solicitation to closing.

Proposers are encouraged to thoroughly review the DoD Program BAA and register for the DSIP Listserv to remain apprised of important programmatic and contractual changes.

- The DoD Program BAA is located at: <https://www.defensesbirsttr.mil/SBIR-STTR/Opportunities/#announcements>. Be sure to select the tab for the appropriate BAA cycle.
- Register for the DSIP Listserv at: <https://www.dodsbirsttr.mil/submissions/login>.

CONTACT INFORMATION

Direct specific questions pertaining to the administration of the Department of the Army SBIR Program and proposal preparation instructions to the Point of Contact identified in the Topic announcement. General questions can be directed to the following:

Email: usarmy.pentagon.hqda-asa-alt.mbx.army-applied-sbir-program@army.mil

Website: <https://www.armysbir.army.mil/>

Mailing Address:

Army Applied SBIR Office 2530 Crystal Dr; Ste 11192
Arlington, VA 22202

RESPONSIVENESS AND TIMELINESS

All proposals will be evaluated and judged on a competitive basis. Proposals will only be evaluated in response to an active, corresponding Army topic. Proposals will be initially screened to determine responsiveness and timeliness. Proposals passing this initial screening will be technically evaluated by engineers or scientists to determine the most promising technical and scientific approaches. Assessment of responsiveness may continue during technical evaluation and after selection. If at any point the proposal is deemed untimely, unresponsive, ineligible, or non-responsible, the proposal will be rejected / the contract action will be cancelled.

Interested firms shall follow the DoD Program BAA instructions as well as the Army's component-

specific proposal instructions herein, when preparing and submitting proposals.

SYSTEM FOR AWARD MANAGEMENT (SAM)

Interested firms are required to be registered and active in SAM (www.sam.gov) before submitting a proposal and shall continue to be registered until time of award, during performance, and through final payment of any contract. The proper North American Industry Classification System (NAICS) code and Product and Service Code are as follows:

NAICS: 541715, Research and Development in the Physical, Engineering, and Life Sciences (except Nanotechnology and Biotechnology)

PSC: AC12, National Defense R&D Services; Department of Defense - Military; Applied Research

Proposing firms with no SAM registration, inactive SAM registration(s), or SAM registration(s) with improper representations and certifications will be disqualified.

A firm may NOT submit an offer on behalf of another entity. The proposed firm must be the same firm (Cage Code/DoDAAC/UEI/Duns) that receives the award.

ELIGIBILITY

The eligibility requirements for the SBIR/STTR programs are unique and do not correspond to those of other small business programs. Please refer to Section 3.1, Eligible Applicants, of BAA 23.4 for full eligibility requirements.

A prize competition, xTechPrime, will be used to identify small business concerns that meet the criteria for award of a Direct to Phase II SBIR contract under 10 U.S.C. §2374a. Winners selected from the xTechPrime prize competition will be the only firms eligible to submit a Direct to Phase II proposal under this announcement. The xTechPrime prize competition announcement can be found at:

<https://www.xtech.army.mil/competition/xtechprime/>.

Ownership in Part by Multiple Venture Capital, Hedge Fund, and Private Equity Firms

Proposing small business concerns that are owned in majority part by multiple venture capital operating companies (VCOCs), hedge funds, or private equity funds are eligible to submit applications or receive awards for this topic.

- Proposing small business concerns must identify each foreign national, foreign entity, or foreign government holding or controlling greater than a 5% equity stake in the proposing small business concern, whether such equity stake is directly or indirectly held.
- The proposing small business concern must also identify any and all of its ultimate parent owner(s) and any other entities and/or individuals owning more than a 5% equity stake in its chain of ownership.

Venture capital operating companies, hedge funds and private equity firms are allowed to hold minority shares of SBIR/STTR awardee so long as they do not have control of the awardee company and so long as their affiliation with the awardee, if any, does not put the awardee firm over the size limit.

If the VCOC is itself more than 50% directly owned and controlled by one or more individuals who are citizens or permanent resident aliens of the United States, the VCOC is allowed to have majority ownership and control of the awardee. In that case, the VCOC and the awardee, and all other affiliates, must have a total of 500 employees or less.

Anticipated Structure/Award Information

For this topic, Department of the Army will accept Direct to Phase II proposals for the cost of up to \$1,900,000 for up to 18-month period of performance. Eligible firms will be notified to submit a Direct to Phase II proposal following completion of the xTechPrime prize competition, executed in accordance with 10 U.S.C. Section 2374a.

Proposals that do not comply with the requirements detailed in BAA 23.4 and the research objectives of these Component Instructions are considered non-conforming and therefore are not evaluated nor

considered for award.

Direct to Phase II proposals in response to this BAA include the following:

- Volume 1: Proposal Cover Sheet
- Volume 2: Technical Volume (23 pages maximum; breakdown below)
 - Feasibility Documentation (5 pages maximum)
 - Technical Proposal (10 pages maximum)
 - Commercialization Plan (8 pages maximum saved as PDF)
- Volume 3: Cost Volume
- Volume 4: Company Commercialization Report (REQUIRED)
- Volume 5: Supporting Documents (Requirements outlined in the DoD Program BAA)
 - Contractor Certification Regarding Provision of Prohibition on Contracting for Certain Telecommunications and Video Surveillance Services or Equipment
 - Disclosures of Foreign Affiliations or Relationships to Foreign Countries
 - Disclosure of Funding Sources - Please refer to the DoD Program BAA for more information.
- Volume 6: Fraud, Waste, and Abuse Training Certificate

DIRECT TO PHASE II PROPOSAL (DP2) GUIDELINES

Proposers interested in submitting a DP2 proposal in response to this particular topic must provide documentation to substantiate that the scientific and technical merit and feasibility described in the Phase I section of the topic has been met and describes the potential commercial applications. Documentation should include all relevant information including, but not limited to: technical reports, test data, prototype designs/models, and performance goals/results. Work submitted within the feasibility documentation must have been substantially performed by the proposer and/or the Principal Investigator.

The Army will not evaluate the proposer's related Phase II proposal if it determines that the proposer has failed to demonstrate that technical merit and feasibility has been established or the proposer has failed to demonstrate that work submitted in the feasibility documentation was substantially performed by the proposer and/or the PI.

Feasibility documentation cannot be based upon any prior or ongoing federally funded SBIR or STTR work and DP2 proposals MUST NOT logically extend from any prior or ongoing federally funded SBIR or STTR work.

Format of Technical Volume (Volume 2)

The Technical Volume must include three parts, the Feasibility Documentation, the Technical Proposal, and the Commercialization Plan.

The Technical Volume must be a single Portable Document Format (PDF) file, including graphics. Perform a virus check before uploading the Technical Volume file. If a virus is detected, it may cause rejection of the proposal. Do not lock or encrypt the uploaded file. Do not include or embed active graphics such as videos, moving pictures, or other similar media in the document.

The length of the Feasibility Documentation is not to exceed 5 pages and the length of the Technical Proposal is not to exceed 10 pages. A commercialization plan must also accompany the technical proposal and should be 8 slides. The required content to include within these slides are described in Appendix A. Any proposals submitted in a different format, or exceed the page count limits will not be reviewed.

Number all pages of your proposal consecutively. Font size should not be smaller than 10- point on standard 8-1/2" x 11" paper with one-inch margins. The header on each page of the Technical

Volume should contain your company name, topic number, and proposal number assigned by DSIP when the Cover Sheet was created. The header may be included in the one-inch margin.

Volume 2, PART ONE: Feasibility and Technical Proposal (15 pages maximum)

Offerors are free to structure each section of Volume 2, PART ONE as they like, so long as it provides sufficient detail for evaluators to understand the proposed work, who will carry it out, and how the business plans to commercialize results. Volume 2, PART ONE shall include the following:

Volume 2, PART ONE A: Feasibility Documentation (5 pages):

- The content of the Feasibility Documentation Proposers should substantiate that the scientific and technical merit and feasibility described in the Phase I section of the topic has been met and describes the potential commercial applications. Documentation should include all relevant information including, but not limited to: technical reports, test data, prototype designs/models, and performance goals/results. Work submitted within the feasibility documentation must have been substantially performed by the proposer and/or the Principal Investigator.
- If you have references, include a reference list or works cited list as the last page of the feasibility documentation. This will count towards the total page limit.
- Work submitted within the feasibility documentation must have been substantially performed by the proposer and/or the Principal Investigator (PI).
- If technology in the feasibility documentation is subject to Intellectual Property (IP), the proposer must either own the IP, or must have obtained license rights to such technology prior to proposal submission, to enable it and its subcontractors to legally carry out the proposed work. Documentation of IP ownership or license rights shall be included in the Technical Volume of the proposal.

Volume 2, PART ONE B: Technical Proposal (10 pages). At a minimum, the technical proposal shall address all of the following:

- What are you trying to do? Describe your firm's technical approach/solution. Articulate your firm's objectives without jargon.
- What is new in your firm's approach and why will your firm be successful?
- If your firm is successful, what difference will this technology make?
- What are the technical risks?
- What is the Period of Performance? In other words, how long will it take to complete the contract, including a milestone schedule to justify the requested period of performance.

Volume 2, PART TWO: Commercialization Plan (8 slides/pages maximum saved as a PDF and attached with the Technical Proposal as part of the Technical Volume, MUST follow the Appendix A Template provided as an additional attachment to these instructions).

The Army is equally interested in dual use commercialization of SBIR/STTR projects that result in products sold to the U.S. military, the private sector market, or both. The Army expects explicit discussion of key activities to achieve this result in the commercialization strategy part of the proposal.

The commercialization plan shall include:

- Company information: Focused objectives/core competencies; specialization area(s); products with significant sales; and history of previous Federal and non-Federal funding, regulatory experience, and subsequent commercialization successes.
- Customer and Competition: Clear description of key technology objectives,

current competition, and advantages compared to competing products or services; description of hurdles to acceptance of the innovation.

- **Market:** Milestones, target dates, analyses of market size, and estimated market share after first year sales and after 5 years; explanation of plan to obtain market share.
- **Intellectual Property:** Patent status, technology lead, trade secrets or other demonstration of a plan to achieve sufficient protection to realize the commercialization stage and attain at least a temporal competitive advantage.
- **Financing:** Plans for securing necessary non-SBIR funding.
- **Assistance and mentoring:** Plans for securing needed technical or business assistance through mentoring, partnering, or through arrangements with government sponsored (e.g., State assistance programs, Federally-funded research laboratories, Manufacturing Extension Partnership centers), not-for-profits (e.g., SBDC), commercial accelerators, DOD Prime Contractors, or other assistance provider.

The Army will accept Direct to Phase II proposals for a cost up to \$1,900,000 for an 18-month period of performance. Proposers are required to use the Cost Proposal method as provided on the DSIP submission site. The Cost Volume (and supporting documentation) DOES NOT count toward the page limit of the Technical Volume.

For pricing purposes, offerors should assume a contract or agreement start date of approximately ninety (90) days after submission of the proposal. Awards are executed as FAR-based firm-fixed-price contracts. Fixed price payments shall be tied to measurable milestones, as agreed to by the Government.

In the event that adequate price competition, as defined in FAR 15.403-1(1), is not realized, the Government will conduct additional proposal analysis, in accordance with the techniques identified at FAR 15.404-1. In accordance with FAR 15.402(a), Contracting officers shall purchase supplies and services from responsible sources at fair and reasonable prices. If the Contracting Officer is unable to deem the offeror as responsible (FAR 9.1), the offeror will be disqualified. Proposals lacking a fair and reasonable price will be eliminated.

Content of the Cost Volume (Volume 3)

ALL proposed costs should be accompanied by documentation to substantiate how the cost was derived. For example, if you proposed travel costs to attend a project-related meeting or conference, and used a travel website to compare flight costs, include a screenshot of the comparison. Similarly, if you proposed to purchase materials or equipment, and used the internet to search for the best source, include your market research for those items. You do not necessarily have to propose the cheapest item or supplier, but you should explain your decision to choose one item or supplier over another. It's important to provide enough information to allow contracting personnel to understand how the proposer plans to use the requested funds. Some items in the cost breakdown may not apply to the proposed project. If that is the case, there is no need to provide information on each and every item.

Cost Breakdown Guidance:

ALL proposed costs should be accompanied by documentation to substantiate how the cost was derived. Substantiating documentation guidance is as follows:

- **LABOR:**
 - List all key personnel by name as well as by number of hours dedicated to the project as direct labor.

- Explain the basis of proposed labor hours, including required tasks, and substantiating documentation for the costs (e.g. payroll reports). Volume 5, Supporting Documents, may be used if additional space is needed.
- **MATERIAL/TOOLING/EQUIPMENT:**
 - Explain the basis of proposed material and equipment costs. This support should include a consolidated priced summary of individual material and equipment quantities and substantiating documentation for the costs (e.g. vendor quotes, invoice prices, competitive bids, etc.). If your choice isn't the lowest cost available, explain the decision to choose one item or supplier over another. Volume 5, Supporting Documents, may be used if additional space is needed.
 - Ensure all materials are American-made to the maximum extent practicable. Offerors who propose to use a foreign-made product in its technology may be required to find an American-made equivalent.
 - While special tooling and test equipment and material cost may be included, it will be carefully reviewed relative to need and appropriateness for the work proposed. The purchase of special tooling and test equipment must, in the opinion of the Component Contracting Officer, be advantageous to the Government and should be related directly to the specific topic. These may include such items as innovative instrumentation or automatic test equipment. Title to property furnished by the Government or acquired with Government funds will be vested with the DoD Component, unless it is determined that transfer of title to the contractor would be more cost effective than recovery of the equipment by the DoD Component.
- **TRAVEL:**
 - Explain the basis of proposed travel, including to/from locations, number of trips, number of travelers per trip, and number of days/nights per trip. Include substantiating documentation for the costs (e.g. screenshots of flight cost comparison, rental car quotes, etc.). NOTE: Virtual meetings shall be utilized to the maximum extent practicable. Volume 5, Supporting Documents, may be used if additional space is needed.
- **SUBCONTRACTS:** A subcontract is any agreement, other than one involving an employer-employee relationship, entered into by the prime contractor (awardee) calling for supplies or services for the performance of the contract.
 - All subcontractor costs and consultant costs must be detailed at the same level as prime contractor costs in regard to labor, travel, equipment, etc.
 - Explain the basis of proposed subcontract costs. Include documented support of the offeror's price analyses and degree of competition of all subcontractor proposals. All subcontractor costs and consultant costs, such as labor, travel, equipment, materials, must be detailed at the same level as prime contractor costs. Provide detailed substantiation of subcontractor costs in your cost proposal. Volume 5, Supporting Documents, may be used if additional space is needed.
 - Certify that the following requirements are met: For a Direct to Phase II, the offeror must perform a minimum of one-half of the research and/or analytical effort. Less than one-half may be subcontracted to another firm or research organization/facility. The percentage of work is measured by both direct and indirect costs.
 - Offerors shall not propose to subcontract to the issuing agency, to any other Federal Government agency, or to other units of the Federal

Government, except Federal Laboratories in rare circumstances. As defined in 15 U.S.C. 3703, Federal Laboratory means any laboratory, any federally funded research and development center, or any center established under 15 U.S.C. 3705 and 3707 that is owned, leased, or otherwise used by a Federal Agency and funded by the Federal Government, whether operated by the Government or by a contractor.

- Offerors shall not propose to subcontract to any prohibited sources. Proposals identifying a subcontractor/vendor arrangement with a prohibited source may be rejected.
- Offerors shall ensure subcontracting arrangements are with United States Small Businesses to the maximum extent practicable. Offerors proposing a subcontractor arrangement with other than a United States Small Business (such as, a large business, foreign firm, foreign government, educational institution, unit of Federal Government, etc.) may be required to submit further explanation.

• **INDIRECT COSTS:**

- Explain the basis of the proposed indirect expense rates including overhead, general and administrative, material handling, and fringe benefits.
- If a Defense Contract Audit Agency (DCAA) Audit has been conducted within the last five (5) years, include the audit compliance documentation in the cost proposal documents. The documentation should also include the offeror's DCAA Point of Contact (if applicable).
- Offerors shall provide any current Forward Pricing Rate Agreements (FPRA) in effect at time of proposal submission.

If selected for award, failure to include the documentation with your proposal may delay contract award, as the proposer will be asked to submit the necessary documentation to the Contracting Officer to substantiate costs. It is important to respond as quickly as possible to the Contracting Officer's request for documentation. Failure or refusal to provide documentation may result in cancellation of the contract action.

For more information about cost proposals and accounting standards, see the DCAA publication titled "Audit Process Overview – Information for Contractors" available at: <http://www.dcaa.mil>.

Company Commercialization Report (CCR) (Volume 4)

Completion of the CCR as Volume 4 of the proposal submission in DSIP is required. Please refer to the DoD SBIR Program BAA for full details on this requirement. Information contained in the CCR will be considered by the Department of the Army during proposal evaluations.

Supporting Documents (Volume 5)

Volume 5 is provided for proposers to submit additional documentation to support the Cover Sheet (Volume 1), Technical Volume (Volume 2), and the Cost Volume (Volume 3).

All proposing small business concerns are **REQUIRED** to submit the following documents to Volume 5:

1. Contractor Certification Regarding Provision of Prohibition on Contracting for Certain Telecommunications and Video Surveillance Services or Equipment
2. Disclosures of Foreign Affiliations or Relationships to Foreign Countries
3. Disclosure of Funding Sources - Please refer to the DoD Program BAA for more information.

- In addition to the Volume 5 requirements outlined in the DoD Program BAA, the Department of the Army will accept the following documents in Volume 5: Additional Cost Information
- Funding Agreement Certification
- Technical Data Rights (Assertions)
- Lifecycle Certification
- Allocation of Rights
- Justification Documentation (1 page maximum) that will be provided by the Army Applied SBIR Office after selection as a winner of the xTech Prime prize competition
- Other (only as specified in the topic)

Please only submit documents that are identified in the topic instructions. All other submissions will be disregarded.

Fraud, Waste and Abuse Training (Volume 6)

Follow instructions provided in the DoD Program BAA for completion of the Fraud, Waste and Abuse training in DSIP.

DISCRETIONARY TECHNICAL AND BUSINESS ASSISTANCE (TABA)

The Army, at its discretion, may provide Technical and Business Assistance (TABA). The Army will select a preferred vendor(s) for the Army SBIR TABA program through a competitive process.

Alternately, a small business concern may, by contract or otherwise, select one or more vendors to assist the firm in meeting the TABA goals. The Applicant must request the authority to select its own TABA provider in its Army SBIR proposal and must demonstrate that the vendor is uniquely postured to provide the specific technical and business services required. TABA funding will be denied if the offeror fails to include the cost and detailed explanation in its proposal.

Participation in the Army SBIR TABA program is voluntary for each Army SBIR awardee. Services provided to Army SBIR firms under the auspices of the TABA program may include, but are not limited to:

1. Access to a network of scientists, engineers, and technologists focused on commercialization and transition considerations such as protected supply chain management, advanced manufacturing, process/product/production scaling, etc;
2. Assistance with intellectual property protections, such as legal considerations, intellectual property rights, patent filing, patent fees, licensing considerations, etc;
3. Commercialization and technology transition support such as market research, market validation, development of regulatory or manufacturing plans, brand development;
4. Regulatory support such as product domain regulatory considerations, regulatory planning, and regulatory strategy development.

The Army SBIR program sponsors participation in the TABA program. The resource limitation for each firm is as follows:

- Phase II Firms:
 - Army-Preferred Vendor: If approved, the contractor may receive up to \$50,000 worth of assistance services per project (in addition to the base SBIR award amount).
 - Firm-Selected Vendor: If approved, the contractor may receive up to \$50,000 in contract obligation (included in the base SBIR award amount) per project.

EVALUATION AND SELECTION

All proposals will be evaluated during the xTechPrime competition Finals in accordance with the evaluation criteria that has been provided to the xTechPrime Competition. It is the policy of the Army to ensure equitable and comprehensive proposal evaluations based on the evaluation criteria provided to the finalists and to select the source (or sources) whose offer meets the Government's technical, policy, and programmatic goals.

All proposal evaluations will be based solely on the above evaluation criteria. The Army will conduct an evaluation of each conforming proposal. Proposals that do not comply with the requirements detailed in this BAA and the research objective(s) of the corresponding opportunity are considered non-conforming and therefore will not be evaluated nor considered for award.

During the xTechPrime Competition finals, the Government will evaluate each proposal in its entirety, documenting the strengths and weaknesses relative to each evaluation criterion, and based on these identified strengths and weaknesses, make a determination of the proposal's overall qualifications. Proposals will not be evaluated against each other during the evaluation process, but rather evaluated on their own individual merit to determine how well the proposal meets the criteria stated in the xTechPrime prize competition.

As previously stated herein, timeliness, responsiveness, and eligibility will be assessed upon initial screening, during evaluation, and after selection. Proposals that do not comply with the instructions and requirements detailed in this document, the DoD Program BAA, or the corresponding Topic posting (including the research objective(s)), will be considered ineligible, nonresponsive, untimely, or non-conforming and therefore will not be evaluated or considered for award.

Using the evaluation criteria, the Government will evaluate each responsive, timely, eligible proposal in its entirety. Proposals will not be evaluated against each other during the evaluation process, but rather evaluated on their own individual merit to determine how well the proposal meets the criteria stated in this BAA and the corresponding opportunity.

Selected proposals are those determined to be the most advantageous to the Government, consistent with instructions and evaluation criteria specified in the DoD Program BAA, the component-specific instructions herein, the corresponding Topic posting, and availability of funding.

Proposing firms will be notified via email of selection or non-selection status of a direct to Phase II award within 90 days of the closing date of the Topic. The notification will be sent to the Corporate Official listed on the proposal cover sheet from the Army SBIR Program Office mailbox. The Army promotes transparency regarding the technical evaluation for all Army SBIR proposals. The Army will provide a technical evaluation narrative to the proposer in accordance with the SBA Policy Directive, Appendix I, paragraph 4. The selection decision notice contains instructions for retrieving the technical evaluation narrative.

Proposers must not regard the notification email (selection decision notice) as an authorization to commit or expend funds. After the Army SBIR Office has recommended a proposal for award, a Government Contracting Officer may contact the proposer in order to discuss and request additional information required for award. This may include representations and certifications, certified or other than certified cost data, subcontracting plan for small businesses, and/or other information as applicable to the proposed award. Proposers must not regard these communications as an authorization to commit or expend funds. Unless a Government Contracting Officer signs the award document (i.e. contract), no obligations to provide funding are made. The Government may reject the proposal or cancel the contract action at any time.

If signed by the Government Contracting Officer, the award document is the official and authorizing instrument (i.e. contract). The anticipated period of performance start date will be determined at time of award. The Contracting Officer will email the signed, authorizing award instrument to the principal investigator (PI) and/or an authorized organization representative.

PROTESTS

Refer to the DoD SBIR Program BAA for procedures to protest the Announcement.

As further prescribed in FAR 33.106(b), FAR 52.233-3, Protests after Award shall be submitted to the Point of Contract identified in the topic solicitation:

Email: usarmy.pentagon.hqda-asa-alt.mbx.army-applied-sbir-program@mail.mil

Mailing Address:

Army Applied SBIR Office
2530 Crystal Dr; Ste 11192
Arlington, VA 22202

AWARD AND CONTRACT INFORMATION

Only proposers who are winners in xTechPrime Competition Finals and follow the evaluation criteria provided to them will be during their pitch will considered for this topic. If you are NOT a winner as a result of the xTechPrime Competition finals, please do not submit proposals for this topic as they will be automatically disqualified.

Appendix A Commercialization Plan Template

General Instructions/Guidance:

1. The slide deck must be 8 slides total, per Component Instructions, and follow the formatting contained in the template. Font size shall be no smaller than 10-point font.
2. Slides should display the slide number in bottom right corner
3. All text (including tables, charts, plots, axes labels, legends, captions) must be readable without zooming and understandable without voice-over
4. For plots and charts:
 - a. Include title/bullet describing importance of plot/chart, and/or data (be specific)
 - b. Axes must be meaningfully labeled (to be understandable by non-experts) and include scale
5. Avoid jargon; define technical terms
6. Convert from slide format to a PDF file for submission to DSIP alongside the technical volume proposal
7. To insert images, capture a screenshot of the image and paste it into the slide. Please do not drag-drop a file into the presentation or use the Insert Pictures menu function.
8. Use PowerPoint's "Compress Pictures" feature to reduce file size
 - a. Select 96ppi resolution
 - b. Uncheck "For this picture only"
9. Replace the boilerplate footer below with distribution markings as appropriate
10. Do not put any company logos (Twitter, Reddit, GitHub, etc) on your slides

To be considered valid proposals, Commercialization Plan submissions must follow the number and content of each slide as contained in the attached template.

Appendix D Commercialization Plan Template cont.

Firm Name

SBIR Project Title

Principal Investigator Name / Title
Key (or other relevant) Personnel, and
Subcontractors

.....
Insert Topic Number
Insert Proposal Number

Distribution markings as appropriate for your organization

BLUF: Bottom Line Up Front

- BLUF:
 - 1. Company information and background** : Core competencies, significant sales, previous funding, commercialization successes.
 - 2. Customer and Competition** : Clear description of key technology objectives, current competition, and advantages.
 - 3. Market**: Plan to obtain market share.
 - 4. Intellectual Property**: Patent status, technology lead, trade secrets or other demonstration of a plan to protect the company's technical advantage.
 - 5. Financing/Revenue**: Plans for securing necessary non -SBIR funding.
 - 6. Assistance and mentoring** : Plans for securing needed technical or business assistance.

Distribution markings as appropriate for your organization

2

Appendix D Commercialization Plan Template cont.

Company Information and Background

- Core competencies and areas of specialization.
- Products with significant sales.
- Concise history of previous Federal and non -Federal funding/investments.
- Regulatory experience (if applicable).
- Past commercialization successes.
- Past failure and how you overcame .

Distribution markings as appropriate for your organization

3

Customer & Competition

- Description of key technology objectives.
- Current competition and/or alternative solutions.
- Advantages of company's offer compared to competing products or services.
- Hurdles to acceptance of the proposed innovation.
- Description of possible areas where your technology may be utilized or is under utilized.

Distribution markings as appropriate for your organization

4

Appendix D Commercialization Plan Template cont.

Market

- Analysis of market size and 1 and 5 year forecasted market share.
- Explanation of milestones and target dates of plan to obtain that market share.
- What experience do you have with marketing to this target market?
- What commercialization strategy appears to be the best for bringing this product to the target market?
- What experience do you have with bring products to market – either through this company or though other companies with which you have worked.
- Does the company currently market, manufacture, or license technology? Describe what you do.

Intellectual Property

- Patent status, technology lead, trade secrets or other demonstration of a plan to achieve sufficient protection to realize the commercialization stage and attain at least a temporary competitive advantage .
- Describe how you will protect the intellectual property that enables commercialization of its products while keeping competitors at bay. Note any actions you may consider to attain at least a temporary competitive advantage. Also consider your company's prior record in this area. Comment on your company's strategy to build a sustainable business through protection of intellectual property .

Appendix D Commercialization Plan Template cont.

Financing

- Plan for securing non-SBIR, private or government funding necessary to enter low rate of production of anticipated technical solution.
- Describe your revenue stream generation to include but not limited to:
 - Manufacture and direct sales
 - Sales through value added resellers or other distributors
 - Joint venture

Assistance & Mentoring

- Plans for securing needed technical or business assistance through mentoring, partnering, or arrangements with government sponsored (e.g., SBIR funded Discretionary Technical and Business Assistance (TABAs), State assistance programs, Federally-funded research laboratories, Manufacturing Extension Partnership centers), not-for-profits (e.g., Small Business Development Center (SBDC) or Small Business Technical Development Center (SBTDC)), commercial accelerators, DOD Prime Contractors, SBA Mentor - Protégé program, Procurement Technical Assistance Center (PTAC) or other assistance provider.

**Army SBIR 23.4 Topic Index
Release 10**

A234-P015 xTechPrime Finalist Open Topic Competition

OUSD (R&E) CRITICAL TECHNOLOGY AREA(S): Trusted AI and Autonomy; Advanced Computing and Software; Integrated Sensing and Cyber; Microelectronics; Integrated Network Systems-of-Systems; Renewable Energy Generation and Storage; Advanced Materials; Human-Machine Interfaces

OBJECTIVE:

xTechPrime is seeking novel, disruptive concepts and technology solutions with dual-use capabilities that can assist in tackling the Army's current needs and apply to current Army concepts. The intent is to provide the Army with transformative technology solutions while enabling cost savings throughout the Army systems' life cycle. Critical technology focus areas include Artificial Intelligence/Machine Learning (AI/ML); Autonomy; Climate and Clean Technologies; Immersive/Wearables; and Sensors. See attached document on the Valid Eval registration page for a list of the top Army SBIR Transition Broker Team topic areas.

DESCRIPTION:

The U.S. Army would like to invite interested entities to participate in the xTechPrime competition, a forum for eligible small businesses and technology integrators to form teams in order to bring forward innovative technology solutions to solve current Army needs.

A *technology integrator* is defined for this competition as "any business outside of the selected small business in Part 1, who has directly worked with the U.S. government. They have experience managing at least one subcontractor and are responsible for ensuring that the work is completed as defined in the contract, this can include but is not limited to, other small businesses, Primes, and sole proprietors."

The xTechPrime competition will challenge small businesses to work together in teams with technology integrators to submit their innovative solutions that contribute to the Army's current modernization goals. xTechPrime will assist in driving innovation, ultimately delivering novel, and often overlooked, technologies to the Army. Through the xTechPrime competition, the Army is encouraging collaboration between small businesses and technology integrators by providing an opportunity to form teams to compete for non-dilutive cash prizes and, for the original small business submitters, the potential for a Direct to Phase II SBIR contract award.

The efforts described in this notice are being pursued under the authorities of 10 U.S.C. § 4025 (formerly 2374a) and 15 U.S.C. § 638 and 10 U.S.C. § 4022 (Prototype Projects) to award cash prizes and SBIRs to only those eligible entities as described in this announcement. The xTechPrime competition will serve as the proof-of-principle that is required to receive a Direct to Phase II SBIR award. While the authority of this program is 10 U.S.C. § 4025, the xTechPrime competition may generate interest by another DOD organization for a funding opportunity outside of this program (*e.g.*, submission of a proposal under a Broad Agency Announcement). The interested DOD organization may contact the participant to provide additional information or ask for a request for proposal in a separate solicitation.

PHASE I: This is a Direct to Phase II submission. The level of maturity of the technical solution indicates that a Phase I can justifiably be foregone and prototyping can begin to complete the desired development timeline. In order for proposers to submit a Direct to Phase II (DP2) proposal, they must provide the justification documentation to substantiate that the scientific and technical merit and feasibility described above has been met and describes the potential military and/or commercial applications. Documentation should include all relevant information including, but not limited to: technical reports, test data, prototype designs/models, and performance goals/results.

(DIRECT TO) PHASE II: Produce prototype solutions that will be easy to operate by a Soldier. These producers will be provided to select Army units for further evaluation by the soldiers. In addition, companies will provide a technology transition and commercialization plan for DoD and commercial markets.

PHASE III DUAL USE APPLICATIONS: Complete the maturation of the company's technology developed in Phase II to TRL 6/7 and produce prototypes to support further development and commercialization. The Army will evaluate each product in a realistic field environment and provide small solutions to stakeholders for further evaluation. Based on soldier evaluations in the field, companies will be requested to update the previously delivered prototypes to meet final design configuration.

REFERENCES: <https://www.xtech.army.mil/competitions/>

KEYWORDS: logistics; supply chain; climate; xTech; xTechPrime; internet of things; information collection; data collection; sensing; communications; autonomy; artificial intelligence; sensors; AI/ML

DEPARTMENT OF THE ARMY
DoD 23.4 Small Business Innovation Research (SBIR) Annual BAA
Release 11
Proposal Submission Instructions

INTRODUCTION

Where big ideas come to life, the Army SBIR and STTR programs align innovative small businesses with critical U.S. Army priorities to turnover game-changing solutions to our most critical customer – the soldier.

Proposers responding to a topic in this BAA must follow all general instructions provided in the Department of Defense (DoD) SBIR 23.4 Program BAA. **Proposers are encouraged to thoroughly review the DoD Program BAA and register for the DSIP Listserv to remain apprised of important programmatic and contractual changes.**

- The DoD Program BAA is located at: <https://www.defensesbirsttr.mil/SBIR-STTR/Opportunities/#announcements>. Be sure to select the tab for the appropriate BAA cycle.
- Register for the DSIP Listserv at: <https://www.dodsbirsttr.mil/submissions/login>.

Army requirements in addition to or deviating from the DoD Program BAA are provided in the instructions below. Specific questions pertaining to the administration of the Army SBIR Program and these proposal preparation instructions should be directed to:

- A234-016 – Mr. Michael Borzcik at michael.borzcik.civ@aal.army

May 11, 2023: Topic issued for pre-release

June 1, 2023: Army begins accepting proposals via DSIP

June 14, 2023: DSIP Topic Q&A closes to new questions at 12:00 p.m. ET

June 27, 2023: Deadline for receipt of proposals no later than 12:00 p.m. ET

From **May 11, 2023 to May 31, 2023**, this topic is issued for pre-release. During the pre-release period, proposing firms have an opportunity to contact topic authors through the links provided below to schedule a time to ask technical questions about the topic. Questions should be limited to specific information related to improving the understanding of the topic's requirements. Proposing firms may not ask for advice or guidance on solution approach and you may not submit additional material to the topic author. If information provided during an exchange with the topic author is deemed necessary for proposal preparation, that information will be made available to all parties through the DSIP Topic Q&A module.

- A234-016 – <https://calendly.com/ak-rockwell-aal/lethal-payloads-for-suas>

Once the Army begins accepting proposals on **June 1, 2023**, no further direct contact between proposers and topic authors is allowed unless the Topic Author is responding to a question submitted during the pre-release period. However, proposers may submit written questions through the DSIP Topic Q&A module at <https://www.dodsbirsttr.mil/submissions/login>. The DSIP Topic Q&A for this topic opens on **June 1, 2023** and closes to new questions on **June 14, 2023 at 12:00PM ET**. Once the BAA closes to proposal submission, no communication of any kind with the topic author or through Topic Q&A regarding your submitted proposal is allowed.

Deadline for Receipt: Proposals must be **completely** submitted no later than **12:00 p.m.** ET, on **June 27, 2023**. Proposals submitted after 12:00 p.m. ET will not be evaluated. The final proposal submission includes successful completion of all firm level forms, all required volumes, and electronic corporate official certification.

PROPOSAL GUIDELINES

The Defense SBIR/STTR Innovation Portal (DSIP) is the official portal for DoD SBIR/STTR proposal submission. Proposers are required to submit proposals via DSIP; proposals submitted by any other means will be disregarded. Detailed instructions regarding registration and proposal submission via DSIP are provided in the DoD SBIR Program BAA.

Topics included in this release are accepting Direct to Phase II (DP2) proposals only. Proposers interested in submitting a DP2 proposal in response to these topics must provide documentation to substantiate that the scientific and technical merit and feasibility described in the Phase I section of the topic has been met and describes the potential commercial applications. Documentation should include all relevant information including, but not limited to: technical reports, test data, prototype designs/models, and performance goals/results. Work submitted within the feasibility documentation must have been substantially performed by the proposer and/or the Principal Investigator.

The Army will not evaluate the proposer's related Phase II proposal if it determines that the proposer has failed to demonstrate that technical merit and feasibility has been established or the proposer has failed to demonstrate that work submitted in the feasibility documentation was substantially performed by the proposer and/or the PI.

Feasibility documentation cannot be based upon any prior or ongoing federally funded SBIR or STTR work and DP2 proposals MUST NOT logically extend from any prior or ongoing federally funded SBIR or STTR work.

Format of Technical Volume (Volume 2)

The Technical Volume must include two parts, the Feasibility Documentation and the Technical Proposal.

The length of the Feasibility Documentation is not to exceed 5 pages and the length of the Technical Proposal is not to exceed 10 pages. Any pages submitted in excess of these limits will not be considered in proposal evaluations.

Content of the Feasibility Documentation (Volume 2a)

The content of the Feasibility Documentation Proposers should substantiate that the scientific and technical merit and feasibility described in the Phase I section of the topic has been met and describes the potential commercial applications. Documentation should include all relevant information including, but not limited to: technical reports, test data, prototype designs/models, and performance goals/results. Work submitted within the feasibility documentation must have been substantially performed by the proposer and/or the Principal Investigator.

Content of the Technical Proposal (Volume 2b)

Direct to Phase 2 (DP2) proposals should follow the following format:
<https://aal.army/assets/files/pdf/sbir-direct-phase-2-template.pdf>.

Cost Volume (Volume 3)

Topic A234-016 will accept DP2 proposals for a cost up to \$500,000 for a 9 month period of performance.

Proposers are required to use the Cost Proposal method as provided on the DSIP submission site. The Cost Volume (and supporting documentation) DOES NOT count toward the page limit of the Technical Volume.

Company Commercialization Report (CCR) (Volume 4)

Completion of the CCR as Volume 4 of the proposal submission in DSIP is required. Please refer to the DoD SBIR Program BAA for full details on this requirement. Information contained in the CCR will not be considered during proposal evaluations.

Supporting Documents (Volume 5)

In addition to the Volume 5 requirements outlined in the DoD Program BAA, proposers can submit an optional slide deck of 10 slides in Volume 5: Supporting Documents. The slide deck can contain information on the technical approach, the team, commercialization plans, or relevant technology/research the proposers have developed, and it should contain additional/complementary information to the technical volume. If a proposer elects to submit a slide deck, its information will be used in the evaluation process. A sample Slide Deck template is located here: <http://aal.army/assets/files/pdf/sbir-optional-slide-template.pdf>.

DISCRETIONARY TECHNICAL AND BUSINESS ASSISTANCE (TABA)

The Army will not provide Technical and Business Assistance (TABA) for these topics.

EVALUATION AND SELECTION

The Army will conduct an evaluation of each responsive, timely, eligible proposal in accordance with the evaluation criteria listed in the DoD Program BAA. It is the policy of the Army to ensure equitable and comprehensive proposal evaluations based on the evaluation criteria and to select the source (or sources) whose offer meets the Government's technical, policy, and programmatic goals.

As previously stated herein, timeliness, responsiveness, and eligibility will be assessed upon initial screening, during evaluation, and after selection. Proposals that do not comply with the instructions and requirements detailed in this document, the DoD Program BAA, or the corresponding Topic posting (including the research objective(s)), will be considered ineligible, nonresponsive, untimely, or non-conforming and therefore will not be evaluated or considered for award.

Using the evaluation criteria, the Government will evaluate each responsive, timely, eligible proposal in its entirety, documenting the strengths and weaknesses relative to each evaluation criterion. Proposals will not be evaluated against each other during the evaluation process, but rather evaluated on their own individual merit to determine how well the proposal meets the criteria stated in this BAA and the corresponding opportunity.

Selected proposals are those determined to be the most advantageous to the Government, consistent with instructions and evaluation criteria specified in the DoD Program BAA, the component-specific instructions herein, the corresponding Topic posting, and availability of funding.

Proposing firms will be notified via email of selection or non-selection status for a Phase I or Direct to Phase II award within 90 days of the closing date of the Topic. The notification will be sent to the Corporate Official listed on the proposal cover sheet from the Army SBIR Program Office mailbox. The Army promotes transparency regarding the technical evaluation for all Army SBIR proposals. The Army

will provide a technical evaluation narrative to the proposer in accordance with the SBA Policy Directive, Appendix I, paragraph 4. The selection decision notice contains instructions for retrieving the technical evaluation narrative.

Proposers must not regard the notification email (selection decision notice) as an authorization to commit or expend funds. After the Army SBIR Office has recommended a proposal for award, a Government Contracting Officer may contact the proposer in order to discuss and request additional information required for award. This may include representations and certifications, certified or other than certified cost data, subcontracting plan for small businesses, and/or other information as applicable to the proposed award. Proposers must not regard these communications as an authorization to commit or expend funds. Unless a Government Contracting Officer signs the award document (i.e. contract), no obligations to provide funding are made. The Government may reject the proposal or cancel the contract action at any time.

If signed by the Government Contracting Officer, the award document is the official and authorizing instrument (i.e. contract). The anticipated period of performance start date will be determined at time of award. The Contracting Officer will email the signed, authorizing award instrument to the principal investigator (PI) and/or an authorized organization representative.

Refer to the DoD SBIR Program BAA for procedures to protest the Announcement.

AWARD AND CONTRACT INFORMATION

Please refer to the DoD Program BAA for detailed information regarding SBIR/STTR phase structure and flexibility.

Army SBIR 23.4 Topic Index
Release 11

A234-016 Lethal Payloads for Small Unmanned Aerial Systems

A234-016 Lethal Payloads for Small Unmanned Aerial Systems

OUSD (R&E) CRITICAL TECHNOLOGY AREA(S): Air Platforms

OBJECTIVE:

Develop a lethal payload capability that can be employed on a Small Unmanned Aerial System (sUAS). The capability should employ munitions (ammunition or explosives) that are currently in the U.S. inventory and attach to one or more sUAS platforms on the Defense Innovation Unit (DIU) Blue UAS Cleared List, excluding the WingtraOne platform.

DESCRIPTION:

The ability to employ lethal payloads on existing sUAS is vital for future Army combat operations. Lethal payloads for sUAS will provide capabilities at the small unit level beyond the current use of sUAS, which focuses only on intelligence, surveillance, and reconnaissance (ISR) capabilities. Successful development of lethal payloads for sUAS would advance the U.S. Army's modernization priorities and increase the lethality of its Infantry Brigade Combat Teams (IBCTs).

Currently only one sUAS platform is fielded at the small unit level: the Short Range Reconnaissance (SRR) platform, fielded by Program Executive Office (PEO) Aviation and referred to commercially as the Skydio X2D. The SRR was developed to give infantry platoons a UAS platform for intelligence, surveillance, and reconnaissance. Under the SRR program there is currently no capability to employ the system as a lethal asset.

The Defense Innovation Unit (DIU), under the Blue UAS program, has worked with vendors to vet and scale commercial UAS technology for the Department of Defense (DoD). This program consists of five lines of effort that curate, maintain, and improve a roster of policy-approved commercial UAS which suit the diverse needs of DoD users. This effort currently has vetted 16 different platforms for DoD use.

Government labs are currently undertaking efforts to develop lethal UAS. These efforts include DEVCOM Armament Center's latest payload for the SRR platform, which delivers an M67 fragmentation grenade as the munition.

The design goals of this effort are the development of modular lethal payloads that can be employed by the current Program of Record SRR and/or any of the platforms on the DIU Blue UAS Cleared List excluding the WingtraOne platform.

These payloads should:

- Be attachable by Soldiers in the field
- Employ ammunition or explosives currently in the Government inventory, allowing units to order through standard channels
- Increase the lethal capability beyond that of the M67 fragmentation grenade-based solution currently in development
- Integrate into the selected platform
- Operate on the platform controller or include a simple system to initiate the payload (long term desire is for ATEK integration)
- Be able to pass applicable safety testing
- Be able to be made safe and dismounted from the platform if not detonated

Primary obstacles to overcome for successful operation of lethal payloads for sUAS is the integration and control of the payload to the selected platform while maintaining safe flight of the platform.

Cost should be considered in the SBIR proposals.

PHASE I:

Design a preliminary lethal payload for the Short Range Reconnaissance (SRR) platform or any sUAS platform from the DIU Blue UAS Cleared List, excluding the WingtraOne platform. Preliminary design should describe the selected sUAS platform(s) and munition(s), consist of a concept for physical attachment and electrical and software integration, and a description of the method of fire control.

This topic is accepting Direct to Phase II (DP2) proposals only. Proposers interested in submitting a DP2 proposal must provide documentation to substantiate that the scientific and technical merit and feasibility described in above has been met and describes the potential commercial applications. Documentation should include all relevant information including, but not limited to: technical reports, test data, prototype designs/models, and performance goals/results.

PHASE II:

Refine the preliminary design, produce, and deliver a prototype at Technology Readiness Level (TRL) 5 of a lethal payload for a sUAS platform. The system refinement should include mechanical and electrical integration into the selected platform, fire control, and targeting. Required Phase II deliverables include all necessary components (hardware and software) to integrate the payload to the platform, attachment of munitions, safe handling procedures for munitions, arming munitions, targeting or aiming, delivery of munition, making system safe, returning to operator, and removal of munitions and payload to be utilized again if not employed. The prototype will be demonstrated using a simulated, dummy, or inert munition at a vendor-provided, government-approved location to evaluate performance. The performer will provide the sUAS platform necessary to conduct the demonstration but is not required to deliver the sUAS platform to the Government. Additionally, the performer will deliver monthly progress reports describing all technical challenges, technical risk, and progress against the schedule, and a final technical report.

PHASE III:

The objective of Phase III, where appropriate, is to transition the technology to a U.S. Army Combat Capabilities Development Command (DEVCOM) lab for further development, or to a Program Executive Office (PEO) for potential acquisition pathways. Phase III goals may include live-fire demonstration of the technology at an appropriate test range, testing to applicable safety and airworthiness standards, end user touchpoints, and development of operator, maintenance, and safety instructions and training procedures.

KEYWORDS:

UAS, sUAS, Small Unmanned Aerial Systems, Blue UAS, SRR, Lethal Payloads

REFERENCES:

1. DIU Blue UAS Cleared Drone List, <https://www.diu.mil/blue-uas-cleared-list>
2. DIU UAS Policy Guidance, <https://www.diu.mil/blue-uas-policy>
3. U.S. Army Weapon Systems Handbook, <https://asc.army.mil/docs/wsh2/2020-2021-wsh.pdf>

Department of the Army
23.4 Small Business Innovation Research (SBIR)
xTechSBIR Autonomy Competition Finalists
Component-Specific Proposal Instructions
Release 12

May 25, 2023: Topics issued for pre-release

October 10, 2023: Army begins accepting proposals via DSIP

October 17, 2023: Deadline for receipt of proposals no later than 12:00 p.m. ET

IMPORTANT: A prize competition, xTechSBIR Autonomy Competition, will be used to identify small business concerns that meet the criteria for award. Winners selected from the xTechSBIR Autonomy prize competition will be the only firms eligible to submit a proposal under this topic. All other proposals will not be evaluated. See the full xTechSBIR Autonomy prize competition RFI here: <https://www.xtech.army.mil/competitions/>

INTRODUCTION

The future Army must be capable of conducting Multi-Domain Operations (MDO) as part of an integrated Joint Force across an array of situations in multiple theaters by 2035. The MDO concept describes how the Army will support the Joint Force in the rapid and continuous integration of all domains of warfare – land, sea, air, and cyberspace – to deter and prevail as we compete short of conflict, and fight and win if deterrence fail. The Army must provide game-changing capabilities to our Soldiers. To capitalize on small business innovation, the Army has implemented an approach to advertise SBIR funding opportunities through the Department of Defense (DoD) Annual BAA process, outside of the three pre-determined BAA cycles. This approach also strives to create a more rapid award time from solicitation to closing.

Proposers are encouraged to thoroughly review the DoD Program BAA and register for the DSIP Listserv to remain apprised of important programmatic and contractual changes.

- The DoD Program BAA is located at: <https://www.defensesbirsttr.mil/SBIR-STTR/Opportunities/#announcements>. Be sure to select the tab for the appropriate BAA cycle.
- Register for the DSIP Listserv at: <https://www.dodsbirsttr.mil/submissions/login>.

CONTACT INFORMATION

Direct specific questions pertaining to the administration of the Department of the Army SBIR Program and proposal preparation instructions to the Point of Contact identified in the Topic announcement. General questions can be directed to the following:

Email: usarmy.pentagon.hqda-asa-alt.mbx.army-applied-sbir-program@army.mil

Website: <https://www.armysbir.army.mil/>

Mailing Address:

Army Applied SBIR Office 2530 Crystal Dr; Ste 11192

Arlington, VA 22202

RESPONSIVENESS AND TIMELINESS

All proposals will be evaluated and judged on a competitive basis. Proposals will only be evaluated in response to an active, corresponding Army topic. Proposals will be initially screened to determine responsiveness and timeliness. Proposals passing this initial screening will be technically evaluated by engineers or scientists to determine the most promising technical and scientific approaches. Assessment of responsiveness may continue during technical evaluation and after selection. If at any point the proposal is deemed untimely, unresponsive, ineligible, or non-responsive, the proposal will be rejected / the contract action will be cancelled.

SYSTEM FOR AWARD MANAGEMENT (SAM)

Interested firms are required to be registered and active in SAM (www.sam.gov) before submitting a proposal and shall continue to be registered until time of award, during performance, and through final payment of any contract. The proper North American Industry Classification System (NAICS) code and Product and Service Code are as follows:

NAICS: 541715, Research and Development in the Physical, Engineering, and Life Sciences (except Nanotechnology and Biotechnology)

PSC: AC12, National Defense R&D Services; Department of Defense - Military; Applied Research

Proposing firms with no SAM registration, inactive SAM registration(s), or SAM registration(s) with improper representations and certifications will be disqualified.

A firm may NOT submit an offer on behalf of another entity. The proposed firm must be the same firm (Cage Code/DoDAAC/UEI/Duns) that receives the award.

ELIGIBILITY

The eligibility requirements for the SBIR/STTR programs are unique and do not correspond to those of other small business programs. Please refer to Section 3.1, Eligible Applicants, of BAA 23.4 for full eligibility requirements.

A prize competition, xTechSBIR Autonomy Competition, will be used to identify small business concerns that meet the criteria for award of a Phase I SBIR contract under 10 U.S.C. §2374a. Winners selected from the xTechSBIR Autonomy prize competition will be the only firms eligible to submit a Phase I proposal under this announcement. The xTechSBIR Autonomy prize competition announcement can be found at: <https://www.xtech.army.mil/competitions/>

Ownership in Part by Multiple Venture Capital, Hedge Fund, and Private Equity Firms

Proposing small business concerns that are owned in majority part by multiple venture capital operating companies (VCOCs), hedge funds, or private equity funds are eligible to submit applications or receive awards for this topic.

- Proposing small business concerns must identify each foreign national, foreign entity, or foreign government holding or controlling greater than a 5% equity stake in the proposing small business concern, whether such equity stake is directly or indirectly held.
- The proposing small business concern must also identify any and all of its ultimate parent owner(s) and any other entities and/or individuals owning more than a 5% equity stake in its chain of ownership.

Venture capital operating companies, hedge funds and private equity firms are allowed to hold minority shares of SBIR/STTR awardee so long as they do not have control of the awardee company and so long as their affiliation with the awardee, if any, does not put the awardee firm over the size limit.

If the VCOC is itself more than 50% directly owned and controlled by one or more individuals who are citizens or permanent resident aliens of the United States, the VCOC is allowed to have majority ownership and control of the awardee. In that case, the VCOC and the awardee, and all other affiliates, must have a total of 500 employees or less.

Anticipated Structure/Award Information

For this topic, Department of the Army will accept Phase I proposals for the cost of up to \$250,000 for up to 6-month period of performance. Eligible firms will be notified to submit a Phase I proposal following completion of the xTechSBIR Autonomy prize competition, executed in accordance with 10 U.S.C. Section 2374a.

Proposals that do not comply with the requirements detailed in BAA 23.4 and the research objectives of these Component Instructions are considered non-conforming and therefore are not evaluated nor considered for award.

Phase I proposals in response to this BAA include the following:

- Volume 1: Proposal Cover Sheet
- Volume 2: Technical Volume (13 pages maximum; breakdown below)
 - Technical Proposal (5 pages maximum)
 - Commercialization Plan (8 pages maximum saved as PDF)
- Volume 3: Cost Volume
- Volume 4: Company Commercialization Report (REQUIRED)
- Volume 5: Supporting Documents (Requirements outlined in the DoD Program BAA)
 - Contractor Certification Regarding Provision of Prohibition on Contracting for Certain Telecommunications and Video Surveillance Services or Equipment
 - Disclosures of Foreign Affiliations or Relationships to Foreign Countries
 - Disclosure of Funding Sources - Please refer to the DoD Program BAA for more information.
 - Fraud, Waste, and Abuse Training Certificate

PHASE I PROPOSAL INSTRUCTIONS

The Defense SBIR/STTR Innovation Portal (DSIP) is the official portal for DoD SBIR/STTR proposal submission. Proposers (also referred to herein as “offeror(s)”) are required to submit proposals via DSIP; proposals submitted by any other means will be disregarded. Detailed instructions regarding registration and proposal submission via DSIP are provided in the DoD SBIR Program BAA.

Proposal Coversheet (Volume 1)

The proposal coversheet must follow the instructions and requirements provided in the DoD SBIR Program BAA.

The offeror shall certify that to the best of its knowledge and belief, its eligibility information under the SBIR Program is accurate, complete, and current as of the date of the offer.

Volume 2 (Technical Volume)

The technical volume is not to exceed 5 pages and must follow the formatting requirements provided in the DoD SBIR Program BAA. A commercialization plan must also accompany the technical proposal and must be 8 slides. The required content to include within these slides are described in Appendix A. The commercialization plan must be converted to a pdf and attached to the end of the technical volume, resulting in one pdf file to be uploaded to DSIP as Volume 2. The commercialization plan does not count towards the technical volume 5-page limit. Any proposals submitted without a commercialization plan or in a format other than that provided by the BAA will not be reviewed.

Volume 2 (Part One Technical Proposal)

The technical proposal shall contain two key sections – technical approach and team qualifications. The technical approach section shall contain details on how the proposer is going to solve the problem. It shall detail key elements of the firm’s approach, any risks, relevant past work and how success is measured. The team qualifications section shall highlight the key personnel working on the project, and the resources that will be brought to bear on solving the problem.

Volume 2 (Part Two Commercialization Plan)

The commercialization plan shall include:

- Company information: Focused objectives/core competencies; specialization area(s); products with significant sales; and history of previous Federal and non-Federal funding, regulatory experience, and subsequent commercialization successes.
- Customer and Competition: Clear description of key technology objectives, current competition, and advantages compared to competing products or services; description of hurdles to acceptance of the innovation.

- Market: Milestones, target dates, analyses of market size, and estimated market share after first year sales and after 5 years; explanation of plan to obtain market share.
- Intellectual Property: Patent status, technology lead, trade secrets or other demonstration of a plan to achieve sufficient protection to realize the commercialization stage and attain at least a temporal competitive advantage.
- Financing: Plans for securing necessary non-SBIR funding.
- Assistance and mentoring: Plans for securing needed technical or business assistance through mentoring, partnering, or through arrangements with government sponsored (e.g., State assistance programs, Federally-funded research laboratories, Manufacturing Extension Partnership centers), not-for-profits (e.g., SBDC), commercial accelerators, DOD Prime Contractors, or other assistance provider.

These instructions supersede those stated in section 5.3.c of the DoD Program BAA.

Cost Volume (Volume 3)

The cost volume must follow all instructions and requirements provided in the DoD SBIR Program BAA. Supplemental requirements are as follows:

Unless otherwise noted in the topic, the Phase I Base amount must not exceed \$250,000 for a 6-month period of performance. Phase I Options are not anticipated at this time. If an option is identified in the topic posting, costs for the Base and Option must be separated and clearly identified on the Proposal Cover Sheet (Volume 1) and in Volume 3. Awards for these topics will be in the form of a firm fixed price contract.

Content of the Cost Volume (Volume 3)

For pricing purposes, offerors should assume a contract or agreement start date of approximately ninety (90) days after submission of the proposal. Awards are executed as FAR-based firm-fixed-price contracts. Fixed price payments shall be tied to measurable milestones, as agreed to by the Government.

In the event that adequate price competition, as defined in FAR 15.403-1(1), is not realized, the Government will conduct additional proposal analysis, in accordance with the techniques identified at FAR 15.404-1. In accordance with FAR 15.402(a), Contracting officers shall purchase supplies and services from responsible sources at fair and reasonable prices. If the Contracting Officer is unable to deem the offeror as responsible (FAR 9.1), the offeror will be disqualified. Proposals lacking a fair and reasonable price will be eliminated.

ALL proposed costs should be accompanied by documentation to substantiate how the cost was derived. For example, if you proposed travel costs to attend a project-related meeting or conference, and used a travel website to compare flight costs, include a screenshot of the comparison. Similarly, if you proposed to purchase materials or equipment, and used the internet to search for the best source, include your market research for those items. You do not necessarily have to propose the cheapest item or supplier, but you should explain your decision to choose one item or supplier over another. It's important to provide enough information to allow contracting personnel to understand how the proposer plans to use the requested funds. Some items in the cost breakdown may not apply to the proposed project. If that is the case, there is no need to provide information on each and every item.

ALL proposed costs should be accompanied by documentation to substantiate how the cost was derived. Substantiating documentation guidance is as follows:

- LABOR:
 - List all key personnel by name as well as by number of hours dedicated to the

project as direct labor.

- Explain the basis of proposed labor hours, including required tasks, and substantiating documentation for the costs (e.g. payroll reports). Volume 5, Supporting Documents, may be used if additional space is needed.
- MATERIAL/TOOLING/EQUIPMENT:
 - Explain the basis of proposed material and equipment costs. This support should include a consolidated priced summary of individual material and equipment quantities and substantiating documentation for the costs (e.g. vendor quotes, invoice prices, competitive bids, etc.). If your choice isn't the lowest cost available, explain the decision to choose one item or supplier over another. Volume 5, Supporting Documents, may be used if additional space is needed.
 - Ensure all materials are American-made to the maximum extent practicable. Offerors who propose to use a foreign-made product in its technology may be required to find an American-made equivalent.
 - While special tooling and test equipment and material cost may be included, it will be carefully reviewed relative to need and appropriateness for the work proposed. The purchase of special tooling and test equipment must, in the opinion of the Component Contracting Officer, be advantageous to the Government and should be related directly to the specific topic. These may include such items as innovative instrumentation or automatic test equipment. Title to property furnished by the Government or acquired with Government funds will be vested with the DoD Component, unless it is determined that transfer of title to the contractor would be more cost effective than recovery of the equipment by the DoD Component.
- TRAVEL:
 - Explain the basis of proposed travel, including to/from locations, number of trips, number of travelers per trip, and number of days/nights per trip. Include substantiating documentation for the costs (e.g. screenshots of flight cost comparison, rental car quotes, etc.). NOTE: Virtual meetings shall be utilized to the maximum extent practicable. Volume 5, Supporting Documents, may be used if additional space is needed.
- SUBCONTRACTS: A subcontract is any agreement, other than one involving an employer-employee relationship, entered into by the prime contractor (awardee) calling for supplies or services for the performance of the contract.
 - All subcontractor costs and consultant costs must be detailed at the same level as prime contractor costs in regard to labor, travel, equipment, etc.
 - Explain the basis of proposed subcontract costs. Include documented support of the offeror's price analyses and degree of competition of all subcontractor proposals. All subcontractor costs and consultant costs, such as labor, travel, equipment, materials, must be detailed at the same level as prime contractor costs. Provide detailed substantiation of subcontractor costs in your cost proposal. Volume 5, Supporting Documents, may be used if additional space is needed.
 - Certify that the following requirements are met: For Phase I, the offeror must

perform a minimum of two-thirds of the research and/or analytical effort. One third may be subcontracted to another firm or research organization/facility. The percentage of work is measured by both direct and indirect costs.

- Offerors shall not propose to subcontract to the issuing agency, to any other Federal Government agency, or to other units of the Federal Government, except Federal Laboratories in rare circumstances. As defined in 15 U.S.C. 3703, Federal Laboratory means any laboratory, any federally funded research and development center, or any center established under 15 U.S.C. 3705 and 3707 that is owned, leased, or otherwise used by a Federal Agency and funded by the Federal Government, whether operated by the Government or by a contractor.
- Offerors shall not propose to subcontract to any prohibited sources. Proposals identifying a subcontractor/vendor arrangement with a prohibited source may be rejected.
- Offerors shall ensure subcontracting arrangements are with United States Small Businesses to the maximum extent practicable. Offerors proposing a subcontractor arrangement with other than a United States Small Business (such as, a large business, foreign firm, foreign government, educational institution, unit of Federal Government, etc.) may be required to submit further explanation.
- **INDIRECT COSTS:**
 - Explain the basis of the proposed indirect expense rates including overhead, general and administrative, material handling, and fringe benefits.
 - If a Defense Contract Audit Agency (DCAA) Audit has been conducted within the last five (5) years, include the audit compliance documentation in the cost proposal documents. The documentation should also include the offeror's DCAA Point of Contact (if applicable).
 - Offerors shall provide any current Forward Pricing Rate Agreements (FPRA) in effect at time of proposal submission.

If selected for award, failure to include the documentation with your proposal may delay contract award, as the proposer will be asked to submit the necessary documentation to the Contracting Officer to substantiate costs. It is important to respond as quickly as possible to the Contracting Officer's request for documentation. Failure or refusal to provide documentation may result in cancellation of the contract action.

Company Commercialization Report (CCR) (Volume 4)

Completion of the CCR as Volume 4 of the proposal submission in DSIP is required. Please refer to the DoD SBIR Program BAA for full details on this requirement. Information contained in the CCR will be considered by the Department of the Army during proposal evaluations.

Supporting Documents (Volume 5)

Volume 5 is provided for proposers to submit additional documentation to support the Cover Sheet (Volume 1), Technical Volume (Volume 2), and the Cost Volume (Volume 3).

All proposing small business concerns are REQUIRED to submit the following documents to Volume 5:

1. Contractor Certification Regarding Provision of Prohibition on Contracting for Certain Telecommunications and Video Surveillance Services or Equipment
2. Disclosures of Foreign Affiliations or Relationships to Foreign Countries
3. Disclosure of Funding Sources - Please refer to the DoD Program BAA for more information.
4. Fraud, Waste, and Abuse Training Certificate

In addition to the Volume 5 requirements outlined in the DoD Program BAA, the Department of the Army may accept the following documents in Volume 5:

- Additional Cost Information
- Funding Agreement Certification
- Technical Data Rights (Assertions)
- Lifecycle Certification
- Allocation of Rights
- Other (only as specified in the topic)

Please only submit documents that are identified immediately above and in the DoD Program BAA. All other documents submitted will be disregarded.

PHASE II PROPOSAL INSTRUCTIONS

Follow-on Phase II proposals may only be submitted by Phase I awardees. Follow-on Phase II proposal submission window, notification process, expected budget/duration structure and additional instructions will be provided in the Phase II contract or by subsequent notification.

DISCRETIONARY TECHNICAL AND BUSINESS ASSISTANCE (TABA)

The Army, at its discretion, may provide Technical and Business Assistance (TABA). The Army will select a preferred vendor(s) for the Army SBIR TABA program through a competitive process. Alternately, a small business concern may, by contract or otherwise, select one or more vendors to assist the firm in meeting the TABA goals. The Applicant must request the authority to select its own TABA provider in its Army SBIR proposal and must demonstrate that the vendor is uniquely postured to provide the specific technical and business services required. TABA funding will be denied if the offeror fails to include the cost and detailed explanation in its proposal.

Participation in the Army SBIR TABA program is voluntary for each Army SBIR awardee. Services provided to Army SBIR firms under the auspices of the TABA program may include, but are not limited to:

1. Access to a network of scientists, engineers, and technologists focused on commercialization and transition considerations such as protected supply chain management, advanced manufacturing, process/product/production scaling, etc;
2. Assistance with intellectual property protections, such as legal considerations, intellectual property rights, patent filing, patent fees, licensing considerations, etc;
3. Commercialization and technology transition support such as market research, market validation, development of regulatory or manufacturing plans, brand development;
4. Regulatory support such as product domain regulatory considerations, regulatory planning, and regulatory strategy development.

The Army SBIR program sponsors participation in the TABA program. The resource limitation for each firm is as follows:

- **Phase I Firms:**
 - **Army-Preferred Vendor:** If approved, the contractor may receive up to \$6,500 worth of assistance services per project (in addition to the base SBIR award amount).
 - **Firm-Selected Vendor:** If approved, the contractor may receive up to \$6,500 in contract obligation (in addition to the base SBIR award amount) per project.

- **Phase II Firms:**
 - **Army-Preferred Vendor:** If approved, the contractor may receive up to \$50,000 worth of assistance services per project (in addition to the base SBIR award amount).
 - **Firm-Selected Vendor:** If approved, the contractor may receive up to \$50,000 in contract obligation (included in the base SBIR award amount) per project.

EVALUATION AND SELECTION

All proposals will be evaluated during the xTechSBIR Autonomy competition Finals in accordance with the evaluation criteria that has been provided to the xTechSBIR Autonomy Competition. It is the policy of the Army to ensure equitable and comprehensive proposal evaluations based on the evaluation criteria provided to the finalists and to select the source (or sources) whose offer meets the Government's technical, policy, and programmatic goals.

All proposal evaluations will be based solely on the evaluation criteria. The Army will conduct an evaluation of each conforming proposal. Proposals that do not comply with the requirements detailed in this BAA and the research objective(s) of the corresponding opportunity are considered non-conforming and therefore will not be evaluated nor considered for award.

During the xTechSBIR Autonomy Competition finals, the Government will evaluate each proposal in its entirety, documenting the strengths and weaknesses relative to each evaluation criterion, and based on these identified strengths and weaknesses, make a determination of the proposal's overall qualifications. Proposals will not be evaluated against each other during the evaluation process, but rather evaluated on their own individual merit to determine how well the proposal meets the criteria stated in the xTechSBIR Autonomy prize competition.

As previously stated herein, timeliness, responsiveness, and eligibility will be assessed upon initial screening, during evaluation, and after selection. Proposals that do not comply with the instructions and requirements detailed in this document, the DoD Program BAA, or the corresponding Topic posting (including the research objective(s)), will be considered ineligible, nonresponsive, untimely, or non-conforming and therefore will not be evaluated or considered for award.

Using the evaluation criteria, the Government will evaluate each responsive, timely, eligible proposal in its entirety. Proposals will not be evaluated against each other during the evaluation process, but rather evaluated on their own individual merit to determine how well the proposal meets the criteria stated in this BAA and the corresponding opportunity.

Selected proposals are those determined to be the most advantageous to the Government, consistent with instructions and evaluation criteria specified in the DoD Program BAA, the component-specific instructions herein, the corresponding Topic posting, and availability of funding.

Proposing firms will be notified via email of selection or non-selection status for a Phase I award within 90 days of the closing date of the topic. The notification will be sent to the Corporate Official listed on the proposal cover sheet from the Army SBIR Program Office mailbox. The Army promotes transparency regarding the technical evaluation for all Army SBIR proposals. The Army will provide a technical evaluation narrative to the proposer in accordance with the SBA Policy Directive, Appendix I, paragraph 4. The selection decision notice contains instructions for retrieving the technical evaluation narrative.

Proposers must not regard the notification email (selection decision notice) as an authorization to commit or expend funds. After the Army SBIR Office has recommended a proposal for award, a Government Contracting Officer may contact the proposer in order to discuss and request additional information required for award. This may include representations and certifications, certified or other than certified cost data, subcontracting plan for small businesses, and/or other information as applicable to the proposed award. Proposers must not regard these communications as an authorization to commit or expend funds. Unless a Government Contracting Officer signs the award document (i.e. contract), no obligations to provide funding are made. The Government may reject the proposal or cancel the contract action at any time.

If signed by the Government Contracting Officer, the award document is the official and authorizing instrument (i.e. contract). The anticipated period of performance start date will be determined at time of award. The Contracting Officer will email the signed, authorizing award instrument to the principal investigator (PI) and/or an authorized organization representative.

PROTESTS

Refer to the DoD SBIR Program BAA for procedures to protest the Announcement.

As further prescribed in FAR 33.106(b), FAR 52.233-3, Protests after Award shall be submitted to the Point of Contract identified in the topic solicitation:

Email: usarmy.pentagon.hqda-asa-alt.mbx.army-applied-sbir-program@mail.mil

Mailing Address:

Army Applied SBIR Office
2530 Crystal Dr; Ste 11192
Arlington, VA 22202

AWARD AND CONTRACT INFORMATION

Only proposers who are winners in xTechSBIR Autonomy Competition Finals and follow the evaluation criteria provided to them will be during their pitch will considered for this topic. If you are NOT a winner as a result of the xTechSBIR Autonomy Competition finals, please do not submit proposals for this topic as they will be automatically disqualified.

Appendix A Commercialization Plan Template

General Instructions/Guidance:

1. The slide deck must be 8 slides total, per Component Instructions, and follow the formatting contained in the template. Font size shall be no smaller than 10-point font.
2. Slides should display the slide number in bottom right corner
3. All text (including tables, charts, plots, axes labels, legends, captions) must be readable without zooming and understandable without voice-over
4. For plots and charts:
 - a. Include title/bullet describing importance of plot/chart, and/or data (be specific)
 - b. Axes must be meaningfully labeled (to be understandable by non-experts) and include scale
5. Avoid jargon; define technical terms
6. Convert from slide format to a PDF file for submission to DSIP alongside the technical volume proposal
7. To insert images, capture a screenshot of the image and paste it into the slide. Please do not drag-drop a file into the presentation or use the Insert Pictures menu function.
8. Use PowerPoint's "Compress Pictures" feature to reduce file size
 - a. Select 96ppi resolution
 - b. Uncheck "For this picture only"
9. Replace the boilerplate footer below with distribution markings as appropriate
10. Do not put any company logos (Twitter, Reddit, GitHub, etc) on your slides

To be considered valid proposals, Commercialization Plan submissions must follow the number and content of each slide as contained in the attached template.

Firm Name

SBIR Project Title

Principal Investigator Name / Title
Key (or other relevant) Personnel, and
Subcontractors

.....
Insert Topic Number
Insert Proposal Number

Distribution markings as appropriate for your organization

BLUF: Bottom Line Up Front

- **BLUF:**
 - 1. Company information and background** : Core competencies, significant sales, previous funding, commercialization successes.
 - 2. Customer and Competition** : Clear description of key technology objectives, current competition, and advantages.
 - 3. Market:** Plan to obtain market share.
 - 4. Intellectual Property:** Patent status, technology lead, trade secrets or other demonstration of a plan to protect the company's technical advantage.
 - 5. Financing/Revenue:** Plans for securing necessary non -SBIR funding.
 - 6. Assistance and mentoring** : Plans for securing needed technical or business assistance.

Distribution markings as appropriate for your organization

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**Appendix A
Commercialization Plan Template cont.**

Company Information and Background

- Core competencies and areas of specialization.
- Products with significant sales.
- Concise history of previous Federal and non -Federal funding/investments.
- Regulatory experience (if applicable).
- Past commercialization successes.
- Past failure and how you overcame.

Distribution markings as appropriate for your organization

3

Customer & Competition

- Description of key technology objectives.
- Current competition and/or alternative solutions.
- Advantages of company's offer compared to competing products or services.
- Hurdles to acceptance of the proposed innovation.
- Description of possible areas where your technology may be utilized or is under utilized.

Distribution markings as appropriate for your organization

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Appendix A Commercialization Plan Template cont.

Market

- Analysis of market size and 1 and 5 year forecasted market share.
- Explanation of milestones and target dates of plan to obtain that market share.
- What experience do you have with marketing to this target market?
- What commercialization strategy appears to be the best for bringing this product to the target market?
- What experience do you have with bring products to market – either through this company or through other companies with which you have worked.
- Does the company currently market, manufacture, or license technology? Describe what you do.

Intellectual Property

- Patent status, technology lead, trade secrets or other demonstration of a plan to achieve sufficient protection to realize the commercialization stage and attain at least a temporary competitive advantage .
- Describe how you will protect the intellectual property that enables commercialization of its products while keeping competitors at bay. Note any actions you may consider to attain at least a temporary competitive advantage. Also consider your company's prior record in this area. Comment on your company's strategy to build a sustainable business through protection of intellectual property.

Appendix A Commercialization Plan Template cont.

Financing

- Plan for securing non-SBIR, private or government funding necessary to enter low rate of production of anticipated technical solution.
- Describe your revenue stream generation to include but not limited to:
 - Manufacture and direct sales
 - Sales through value added resellers or other distributors
 - Joint venture

Assistance & Mentoring

- Plans for securing needed technical or business assistance through mentoring, partnering, or arrangements with government sponsored (e.g., SBIR funded Discretionary Technical and Business Assistance (TABAs), State assistance programs, Federally-funded research laboratories, Manufacturing Extension Partnership centers), not-for-profits (e.g., Small Business Development Center (SBDC) or Small Business Technical Development Center (SBTDC)), commercial accelerators, DOD Prime Contractors, SBA Mentor - Protégé program, Procurement Technical Assistance Center (PTAC) or other assistance provider.

**Army SBIR 23.4 Topic Index
Release 12**

A234-P017 xTechSBIR Autonomy Finalist Open Topic Competition

OUSD (R&E) CRITICAL TECHNOLOGY AREA(S): Autonomy; Advanced Computing and Software; Human-Machine Interfaces

OBJECTIVE:

xTechSBIR Autonomy is seeking novel capabilities and technology solutions that can support the Army's current and future needs, enable new capabilities, improve performance, faster production, and/or provide a cost savings for Army systems. The Army is particularly interested in research in autonomous ground and air vehicles, which must operate in open, urban and cluttered environments. Robotics and autonomous systems regardless of their missions require similar concepts and technologies including:

- Ability to move in very cluttered, irregular, urban and underground terrains.
- Ability to move effectively in contested environments and survive attacks.
- Technologies to enable low electronic and physical profiles.
- Techniques to allow operators to be trained quickly even for complex tasks.
- Architectures to enable reprogrammable platforms under dynamic conditions.
- Sensors to detect obscured targets and to characterize terrain obstacles.
- Autonomous ground and air structures, propulsion, and mobility components.
- Technologies to significantly reduce logistical burdens.

DESCRIPTION:

While the competition is open to any solutions within the Autonomy space, there are specific areas that are of interest to the Army which include:

- Solutions or incorporated technologies to support autonomous vehicle tasks such as cross-country mobility and navigation.
- Solutions or incorporated technologies to support advanced perception and automated mobility functions to maneuver in complex, off-road, and contested environments.
- Remote operation software and/or hardware systems capable of multi-domain situational awareness (SA) without exposing the human element of additional risk.
- Solutions or incorporated autonomous vehicle technologies to increase automation and to operate remotely within limited bandwidth and signature management constraints.
- Visual and targeted technologies to support complete situational awareness that can enhance vision in one system.
- Solutions or incorporated technologies to help protect autonomous sensors from external environmental factors (e.g., dust, dirt, rain) in an off-road environment.

The U.S. Army would like to invite interested entities to participate in the xTech Small Business Innovation Research Autonomy competition, an opportunity for eligible small businesses to engage and pitch their novel technology solutions directly to the Department of Defense, earn prize money and potentially receive a Phase I SBIR award of up to \$250,000 each.

The Army recognizes that the DoD must enhance engagements with eligible small businesses, by: (1) understanding the spectrum of 'world-class' technologies being developed commercially that may benefit the DoD in the autonomy space; (2) integrating the sector of non-traditional

innovators into the DoD Science and Technology (S&T) ecosystem; and (3) providing expertise and feedback to accelerate, mature, and transition technologies of interest to the DoD.

The xTechSBIR Autonomy competition will consist of four-rounds: (1) Call for concept white papers; (2) Final Technology Pitch event; (3) Request for Phase I SBIR Proposal Submission; and (4) Request for Phase II SBIR Demonstration. The competition will be awarding up to \$500,000 in cash prizes to select eligible entities throughout the competition. Ultimately, up to 20 winners will be selected from the technology pitch event round and will be invited to submit an application for a potential Phase I SBIR Proposal worth up to \$250,000. Up to 20 companies will be selected to receive a Phase I SBIR award and then will be invited back after six months of award to conduct a live demonstration to a key panel of DoD experts. Details on the prize structure and phases, are listed in this announcement below.

In addition to non-dilutive cash prizes, participants will have the opportunity to engage with U.S. DoD and winners from the Part 1: Concept White Paper round will be invited to conduct an in-person pitch at Grace's Quarters in Maryland.

The efforts described in this notice are being pursued under the authorities of 10 U.S.C. § 4025 (formerly 2374a, Prizes for Advanced Technology Achievements) to award cash prizes as described in this announcement and potential SBIR contracts (15 U.S. Code §638) to only those eligible and selected entities as described in this announcement. In addition, 10 U.S.C. § 4003 (Prototype Projects) can be utilized to award additional follow-on contracts for additional proof-of-concept or prototype development. While the authority of this program is 10 U.S.C. § 4025, the xTechSBIR Autonomy competition may generate interest by another U.S. Army, DoD or USG organization for a funding opportunity outside of this event. The interested organization may contact the participant to provide additional information which may or may not result in partnership opportunities.

PHASE I: Companies will complete a feasibility study that demonstrates the firm's competitive technical advantage relative to other commercial products (if other products exist) and develop concept plans for how the company's technology can be applied to Army modernization priority areas. Studies should clearly detail and identify a firm's technology at both the individual component and system levels, provide supporting literature for technical feasibility, highlight existing performance data, showcase the technology's application opportunities to a broad base of customers outside the defense space, a market strategy for the commercial space, how the technology directly addresses the Army's modernization area as well as include a technology development roadmap to demonstrate scientific and engineering viability.

At the end of Phase I, the company will be required to provide a concept demonstration of their technology to demonstrate a high probability that continued design and development will result in a Phase II mature product.

PHASE II: Produce prototype solutions that will be easy to operate by a Soldier. These products will be provided to select Army units for further evaluation by the soldiers. In addition, companies will provide a technology transition and commercialization plan for DOD and commercial markets.

PHASE III DUAL USE APPLICATIONS: Complete the maturation of the company's technology developed in Phase II to TRL 6/7 and produce prototypes to support further development and commercialization. The Army will evaluate each product in a realistic field environment and provide small solutions to stakeholders for further evaluation. Based on soldier evaluations in the field, companies will be requested to update the previously delivered prototypes to meet final design configuration.

REFERENCES: <https://www.xtech.army.mil/competitions/>

KEYWORDS: autonomy; xTech; xTechSBIR; 3D printing; additive fabrication; rapid prototyping; advanced materials; autonomous vehicles; off-roading; terrain; autonomous sensors; open topic

DEPARTMENT OF THE ARMY
DoD 23.4 Small Business Innovation Research (SBIR)
Annual Broad Agency Announcement (BAA)
Component-Specific Proposal Instructions
Release 13

May 30, 2023: Topics issued for pre-release

June 14, 2023: Army begins accepting proposals via DSIP

July 5, 2023: DSIP Topic Q&A closes to new questions at 12:00 p.m. ET

July 18, 2023: Deadline for receipt of proposals no later than 12:00 p.m. ET

INTRODUCTION

The future Army must be capable of conducting Multi-Domain Operations (MDO) as part of an integrated Joint Force across an array of situations in multiple theaters by 2035. The MDO concept describes how the Army will support the Joint Force in the rapid and continuous integration of all domains of warfare – land, sea, air, and cyberspace – to deter and prevail as we compete short of conflict, and fight and win if deterrence fail. The Army must provide game-changing capabilities to our Soldiers. To capitalize on small business innovation, the Army has implemented an approach to advertise SBIR funding opportunities through the Department of Defense (DoD) Annual BAA process, outside of the three pre-determined BAA cycles. This approach also strives to create a more rapid award time from solicitation to closing.

CONTACT INFORMATION

Direct specific questions pertaining to the administration of the Department of the Army SBIR Program and proposal preparation instructions to the Point of Contact identified in the Topic announcement. General questions can be directed to the following:

Email: usarmy.pentagon.hqda-asa-alt.mbx.army-applied-sbir-program@army.mil

Website: <https://www.armysbir.army.mil/>

Mailing Address:

Army Applied SBIR Office 2530 Crystal Dr.; Ste 11192
Arlington, VA 22202

RESPONSIVENESS AND TIMELINESS

All proposals will be evaluated and judged on a competitive basis. Proposals will only be evaluated in response to an active, corresponding Army topic. Proposals will be initially screened to determine responsiveness and timeliness. Proposals passing this initial screening will be technically evaluated by engineers or scientists to determine the most promising technical and scientific approaches. Assessment of responsiveness may continue during technical evaluation and after selection. If at any point the proposal is deemed untimely, unresponsive, ineligible, or non-responsible, the proposal will be rejected / the contract action will be cancelled.

Interested firms shall follow the DoD Program BAA instructions as well as the Army's component-specific proposal instructions herein, when preparing and submitting proposals. The DoD 23.4 SBIR Program BAA can be found here: <https://www.defensesbirsttr.mil/SBIR-STTR/Opportunities/>.

The Government reserves the right to disqualify proposals for failing to meet any of the requirements of the SBA SBIR/STTR Policy Directive, the DoD Program BAA instructions, the Army's component-

specific proposal instructions herein, and/or in the topic itself. The following include, but are not limited to, the common reasons for which proposals are disqualified:

- System for Award Management is not properly updated at time of proposal submission.
- The proposal is missing required number of signatures and/or content.
- Minimum Performance Percentage of Work is not allocated properly.
- Work as proposed does not meet the definition of Research and Development required for funding.
- Proposal submitted beyond deadline.
- Price exceeds the maximum funding amount.
- Firm is NOT an eligible small business.
- Firm does NOT meet the ownership and control requirements.
- Firm is 50% or more owned or managed by a corporate entity that is not a small business.
- Firm will NOT perform the prescribed percentage of the research and/or analytical work.
- Primary employment of the Principal Investigator for this project is NOT with the firm.
- Firm has been convicted of a fraud-related crime.
- Principal Investigator or Corporate Official has been convicted of a fraud-related crime.
- Firm and affiliates have employed, on average over the last 24 months, more than 500 employees.
- Firm has been awarded a contract from the US Government for essentially equivalent work.
- Claiming data rights assertions without including a Data Rights Assertions Table.
- Lack of proper documentation for research utilizing human/animal subjects or recombinant DNA.
- Lack of information or negative information concerning use of foreign nationals.
- Offeror requests to award to a different firm/entity after proposal submission.
- Failure or refusal to submit certified or other than certified cost data in accordance with DFARS 252.215-7010.
- Proposal is for a topic other than that which is identified.
- Etc.

SYSTEM FOR AWARD MANAGEMENT (SAM)

Interested firms are required to be registered in SAM (www.sam.gov) before submitting a proposal and shall continue to be registered until time of award, during performance, and through final payment of any contract. The proper North American Industry Classification System (NAICS) code and Product and Service Code are as follows:

- NAICS: 541715, Research and Development in the Physical, Engineering, and Life Sciences (except Nanotechnology and Biotechnology)
- PSC: AC12, National Defense R&D Services; Department of Defense - Military; Applied Research

DIRECT TO PHASE II PROPOSAL INSTRUCTIONS

The Defense SBIR/STTR Innovation Portal (DSIP) is the official portal for DoD SBIR/STTR proposal submission. Proposers (also referred to herein as “offeror(s)”) are required to submit proposals via DSIP; proposals submitted by any other means will be disregarded. Detailed instructions regarding registration and proposal submission via DSIP are provided in the DoD SBIR Program BAA.

Proposers interested in submitting a DP2 proposal in response to these topics must provide documentation to substantiate that the scientific and technical merit and feasibility described in the Phase I section of the topic has been met and describes the potential commercial applications. Documentation should include all relevant information including, but not limited to: technical reports, test data, prototype designs/models, and performance goals/results. Work submitted within the feasibility documentation must have been substantially performed by the proposer and/or the Principal Investigator.

The Army will not evaluate the proposer's related Phase II proposal if it determines that the proposer has failed to demonstrate that technical merit and feasibility has been established or the proposer has failed to demonstrate that work submitted in the feasibility documentation was substantially performed by the proposer and/or the PI.

Feasibility documentation cannot be based upon any prior or ongoing federally funded SBIR or STTR work and DP2 proposals MUST NOT logically extend from any prior or ongoing federally funded SBIR or STTR work.

Proposal Coversheet (Volume 1)

The proposal coversheet must follow the instructions and requirements provided in the DoD SBIR Program BAA.

The offeror shall certify that to the best of its knowledge and belief, its eligibility information under the SBIR Program is accurate, complete, and current as of the date of the offer.

Format of Technical Volume (Volume 2)

The Technical Volume must include two parts, the Feasibility Documentation, and the Technical Proposal.

The Technical Volume must be a single Portable Document Format (PDF) file, including graphics. Perform a virus check before uploading the Technical Volume file. If a virus is detected, it may cause rejection of the proposal. Do not lock or encrypt the uploaded file. Do not include or embed active graphics such as videos, moving pictures, or other similar media in the document.

The length of the Feasibility Documentation is not to exceed 5 pages and the length of the Technical Proposal is not to exceed 10 pages. A commercialization plan must also accompany the technical proposal and should be 8 slides. Any proposals submitted in a different format or exceed the page count limits will not be reviewed.

Number all pages of your proposal consecutively. Font size should not be smaller than 10- point on standard 8-1/2" x 11" paper with one-inch margins. The header on each page of the Technical Volume should contain your company name, topic number, and proposal number assigned by DSIP when the Cover Sheet was created. The header may be included in the one-inch margin.

Content of the Technical Volume: (Volume 2)

PART ONE: Feasibility and Technical Proposal (15 pages maximum)

Content of the Feasibility Documentation (Volume 2a)

The content of the Feasibility Documentation Proposers should substantiate that the scientific and technical merit and feasibility described in the Phase I section of the topic has been met and describes the potential commercial applications. Documentation should include all relevant information including, but not limited to: technical reports, test data, prototype designs/models, and performance goals/results. Work submitted within the feasibility documentation must have been substantially performed by the proposer and/or the Principal Investigator.

If you have references, include a reference list or works cited list as the last page of the feasibility documentation. This will count towards the total page limit.

Work submitted within the feasibility documentation must have been substantially performed by the proposer and/or the Principal Investigator (PI).

If technology in the feasibility documentation is subject to Intellectual Property (IP), the proposer must either own the IP, or must have obtained license rights to such technology prior to proposal submission, to enable it and its subcontractors to legally carry out the proposed work. Documentation of IP ownership or license rights shall be included in the Technical Volume of the proposal.

At a minimum, the technical proposal should address:

- What are you trying to do? Articulate your objectives without jargon.
- How is it done today, and what are the limits of current practice?
- What is new in your approach and why do you think it will be successful?
- Who cares? If you are successful, what difference will it make?
- What are the risks?
- How much will it cost?
- How long will it take?
- How do you measure success?
- What team will accomplish your mission?
- What existing / related SBIR, STTR, or other research proposals support this technology?
- What is the commercialization strategy for the proposed technology?

Content of the Technical Proposal (Volume 2b; part 1 continued)

The content of the Technical Volume should address three key areas: the technical approach, the team carrying out the work (and the accompanied resources), and the commercialization strategy. The commercialization plan should include:

- **Company information:** Focused objectives/core competencies; specialization area(s); products with significant sales; and history of previous Federal and non-Federal funding, regulatory experience, and subsequent commercialization successes.
- **Customer and Competition:** Clear description of key technology objectives, current competition, and advantages compared to competing products or services; description of hurdles to acceptance of the innovation.
- **Market:** Milestones, target dates, analyses of market size, and estimated market share after first year sales and after 5 years; explanation of plan to obtain market share.
- **Intellectual Property:** Patent status, technology lead, trade secrets or other demonstration of a plan to achieve sufficient protection to realize the commercialization stage and attain at least a temporal competitive advantage.
- **Financing:** Plans for securing necessary non-SBIR funding.
- **Assistance and mentoring:** Plans for securing needed technical or business assistance through mentoring, partnering, or through arrangements with government sponsored (e.g., State assistance programs, Federally-funded research laboratories, Manufacturing Extension Partnership centers), not-for-profits (e.g., Small Business Development Centers or Procurement Technical Assistance Centers), commercial accelerators, DOD Prime Contractors, or other assistance provider.

Proposers are free to structure each section as they like, so long as it provides sufficient detail for

evaluators to understand the proposed work, who will carry it out, and how the business plans to commercialize results.

PART TWO: Commercialization Plan (8 slides/pages maximum, saved as a PDF and attached with the Technical Proposal as part of the Technical Volume).

The Army is equally interested in dual use commercialization of SBIR/STTR projects that result in products sold to the U.S. military, the private sector market, or both. The Army expects explicit discussion of key activities to achieve this result in the commercialization strategy part of the proposal.

The commercialization strategy should include the following elements:

- A summary of transition and commercialization activities, and the Technology Readiness Level (TRL) achieved. Discuss how the preliminary transition and commercialization path or paths may evolve during the Phase II project.
- Describe key proposed technical milestones during Phase II that will advance the technology towards product such as: prototype development, laboratory and systems testing, integration, testing in operational environment, and demonstrations.
- Description of Product(s) and/or System Application(s). Identify the commercial product(s) and/or DoD system(s), or system(s) under development, or potential new system(s). Identify the potential DoD end- users, Federal customers, and/or private sector customers who would likely use the technology.
- Business Model(s)/Procurement Mechanism(s). Discuss your current business model hypothesis for bringing the technology to market. Describe plans to license, partner, or self-produce your product. How do you plan to generate revenue? Understanding the Army's goal of creating and sustaining viable small businesses that support and generate advanced Army technologies, describe how you intend to develop your product and supply chains to enable this differentiation.
- Target Market. Describe the market and customer sets you propose to target, their size, their growth rate, and their key reasons they would consider procuring the technology.
- Describe competing technologies existent today on the market as well as those being developed in the lab.
- Funding Requirements. Describe your company's funding history. How much external financing have you raised? Describe your plans for future funding sources (internal, loan, angel, venture capital, etc.).
- Commercialization Risks. Describe the major technology, market and team risks associated with achieving successful transition of the Army funded technology.
- Expertise/Qualifications of Team/Company Readiness. Describe the expertise and qualifications of your management, marketing/business development and technical team that will support the transition of the technology from the prototype to the commercial market and into government operational environments. Has this team previously taken similar products/services to market? If the present team does not have this needed expertise, how do you intend to obtain it? What is the financial history and health of your company (e.g., availability of cash, profitability, revenue growth, etc.)?
- Anticipated Commercialization Results. Include a schedule showing the anticipated quantitative commercialization results from the Phase II project at one year after the start of Phase II, at the completion of Phase II, and after the completion of the Sequential Phase II (i.e., amount of additional investment, sales revenue, etc.). After a Phase II

award, the company is required to report actual sales and investment data in its Company Commercialization Report at least annually.

These instructions supersede those stated in section 5.3.c of the DoD Program BAA.

Cost Volume (Volume 3)

Unless otherwise noted in the topic description, the Army will accept Direct to Phase II proposals for a cost up to \$1,300,000 for an 24-month period of performance. Proposers are required to use the Cost Proposal method as provided on the DSIP submission site. The Cost Volume (and supporting documentation) DOES NOT count toward the page limit of the Technical Volume.

Proposers are required to use the Cost Proposal method as provided on the DSIP submission site. The Cost Volume (and supporting documentation) DOES NOT count toward the page limit of the Technical Volume.

For pricing purposes, offerors should assume a contract or agreement start date of approximately ninety (90) days after submission of the proposal. For this BAA, adequate price competition (APC), as defined in FAR 15.403-1(c), is anticipated. In the event that adequate price competition is not realized (i.e. only one proposal is received for a given topic), the Government may choose to conduct additional proposal analysis, in accordance with the techniques identified at FAR 15.404-1. Additionally, offerors are to provide any current Forward Pricing Rate Agreements (FPRA) in effect at time of proposal submission.

Content of the Cost Volume (Volume 3, cont.)

ALL proposed costs should be accompanied by documentation to substantiate how the cost was derived. For example, if you proposed travel costs to attend a project-related meeting or conference, and used a travel website to compare flight costs, include a screenshot of the comparison. Similarly, if you proposed to purchase materials or equipment, and used the internet to search for the best source, include your market research for those items. You do not necessarily have to propose the cheapest item or supplier, but you should explain your decision to choose one item or supplier over another. It's important to provide enough information to allow contracting personnel to understand how the proposer plans to use the requested funds.

Some items in the cost breakdown may not apply to the proposed project. If that is the case, there is no need to provide information on each and every item.

Cost Breakdown Guidance:

ALL proposed costs should be accompanied by documentation to substantiate how the cost was derived. Substantiating documentation guidance is as follows:

- **LABOR:**
 - List all key personnel by name as well as by number of hours dedicated to the project as direct labor.
 - Explain the basis of proposed labor hours, including required tasks, and substantiating documentation for the costs (e.g. payroll reports). Volume 5, Supporting Documents, may be used if additional space is needed.

- MATERIAL/TOOLING/EQUIPMENT:
 - Explain the basis of proposed material and equipment costs. This support should include a consolidated priced summary of individual material and equipment quantities and substantiating documentation for the costs (e.g. vendor quotes, invoice prices, competitive bids, etc.). If your choice isn't the lowest cost available, explain the decision to choose one item or supplier over another. Volume 5, Supporting Documents, may be used if additional space is needed.
 - Ensure all materials are American-made to the maximum extent practicable. Offerors who propose to use a foreign-made product in its technology may be required to find an American-made equivalent.
 - While special tooling and test equipment and material cost may be included, it will be carefully reviewed relative to need and appropriateness for the work proposed. The purchase of special tooling and test equipment must, in the opinion of the Component Contracting Officer, be advantageous to the Government and should be related directly to the specific topic. These may include such items as innovative instrumentation or automatic test equipment. Title to property furnished by the Government or acquired with Government funds will be vested with the DoD Component, unless it is determined that transfer of title to the contractor would be more cost effective than recovery of the equipment by the DoD Component.

- TRAVEL:
 - Explain the basis of proposed travel, including to/from locations, number of trips, number of travelers per trip, and number of days/nights per trip. Include substantiating documentation for the costs (e.g. screenshots of flight cost comparison, rental car quotes, etc.). NOTE: Virtual meetings shall be utilized to the maximum extent practicable. Volume 5, Supporting Documents, may be used if additional space is needed.

- SUBCONTRACTS: A subcontract is any agreement, other than one involving an employer-employee relationship, entered into by the prime contractor (awardee) calling for supplies or services for the performance of the contract.
 - All subcontractor costs and consultant costs must be detailed at the same level as prime contractor costs in regard to labor, travel, equipment, etc.
 - Explain the basis of proposed subcontract costs. Include documented support of the offeror's price analyses and degree of competition of all subcontractor proposals. All subcontractor costs and consultant costs, such as labor, travel, equipment, materials, must be detailed at the same level as prime contractor costs. Provide detailed substantiation of subcontractor costs in your cost proposal. Volume 5, Supporting Documents, may be used if additional space is needed.
 - Certify that the following requirements are met: For Phase I, the offeror must

perform a minimum of two-thirds of the research and/or analytical effort. One third may be subcontracted to another firm or research organization/facility. The percentage of work is measured by both direct and indirect costs.

- Offerors shall not propose to subcontract to the issuing agency, to any other Federal Government agency, or to other units of the Federal Government, except Federal Laboratories in rare circumstances. As defined in 15 U.S.C. 3703, Federal Laboratory means any laboratory, any federally funded research and development center, or any center established under 15 U.S.C. 3705 and 3707 that is owned, leased, or otherwise used by a Federal Agency and funded by the Federal Government, whether operated by the Government or by a contractor.
 - Offerors shall not propose to subcontract to any prohibited sources. Proposals identifying a subcontractor/vendor arrangement with a prohibited source may be rejected.
 - Offerors shall ensure subcontracting arrangements are with United States Small Businesses to the maximum extent practicable. Offerors proposing a subcontractor arrangement with other than a United States Small Business (such as, a large business, foreign firm, foreign government, educational institution, unit of Federal Government, etc.) may be required to submit further explanation.
- **INDIRECT COSTS:**
 - Explain the basis of the proposed indirect expense rates including overhead, general and administrative, material handling, and fringe benefits.
 - If a Defense Contract Audit Agency (DCAA) Audit has been conducted within the last five (5) years, include the audit compliance documentation in the cost proposal documents. The documentation should also include the offeror's DCAA Point of Contact (if applicable).

If selected, failure to include the documentation with your proposal may delay contract award, as the proposer will be asked to submit the necessary documentation to the Contracting Officer to substantiate costs. It is important to respond as quickly as possible to the Contracting Officer's request for documentation. Failure or refusal to provide documentation may result in cancellation of the contract action.

For more information about cost proposals and accounting standards, see the DCAA publication titled "Audit Process Overview – Information for Contractors" available at: <http://www.dcaa.mil>.

Company Commercialization Report (CCR) (Volume 4; no page limitations)

Completion of the CCR as Volume 4 of the proposal submission in DSIP is required. Please refer to the DoD SBIR Program BAA <https://www.dodsbirsttr.mil/submissions/baa-schedule/broad-agency-announcements> for full details on this requirement. Information contained in the CCR will be considered by the Department of the Army during proposal evaluations.

Supporting Documents (Volume 5; no page limitations)

Volume 5 is provided for proposers to submit additional documentation to support the Cover Sheet (Volume 1), Technical Volume (Volume 2), and the Cost Volume (Volume 3). In addition to the Volume 5 requirements outlined in the DoD Program BAA, the Department of the Army will accept the following documents in Volume 5:

- Additional Cost Information
- Funding Agreement Certification
- Technical Data Rights (Assertions)
- Lifecycle Certification
- Allocation of Rights
- Endorsement Letters
- Other (only as specified in the topic)

DISCRETIONARY TECHNICAL AND BUSINESS ASSISTANCE (TABA)

The Army, at its discretion, may provide Technical and Business Assistance (TABA). The Army will select a preferred vendor(s) for the Army SBIR TABA program through a competitive process.

Alternately, a small business concern may, by contract or otherwise, select one or more vendors to assist the firm in meeting the TABA goals. The Applicant must request the authority to select its own TABA provider in its Army SBIR proposal and must demonstrate that the vendor is uniquely postured to provide the specific technical and business services required. TABA funding will be denied if the offeror fails to include the cost and detailed explanation in its proposal.

Participation in the Army SBIR TABA program is voluntary for each Army SBIR awardee. Services provided to Army SBIR firms under the auspices of the TABA program may include, but are not limited to:

1. Access to a network of scientists, engineers, and technologists focused on commercialization and transition considerations such as protected supply chain management, advanced manufacturing, process/product/production scaling, etc;
2. Assistance with intellectual property protections, such as legal considerations, intellectual property rights, patent filing, patent fees, licensing considerations, etc;
3. Commercialization and technology transition support such as market research, market validation, development of regulatory or manufacturing plans, brand development;
4. Regulatory support such as product domain regulatory considerations, regulatory planning, and regulatory strategy development.

The Army SBIR program sponsors participation in the TABA program. The resource limitation for each firm is as follows:

- Phase I Firms:
 - Army-Preferred Vendor: If approved, the contractor may receive up to \$6,500 worth of assistance services per project per year (in addition to the base SBIR award amount).
 - Firm-Selected Vendor: If approved, the contractor may receive up to \$6,500 in contract obligation (in addition to the base SBIR award amount) per project per year.
- Phase II Firms:
 - Army-Preferred Vendor: If approved, the contractor may receive up to \$50,000 worth of assistance services per project (in addition to the base SBIR award amount).
 - Firm-Selected Vendor: If approved, the contractor may receive up to \$50,000 in contract obligation (must be included in base SBIR award amount) per project.

EVALUATION AND SELECTION

The Army will conduct an evaluation of each responsive, timely, eligible proposal in accordance with the evaluation criteria listed in the DoD Program BAA. It is the policy of the Army to ensure equitable and comprehensive proposal evaluations based on the evaluation criteria and to select the source (or sources) whose offer meets the Government's technical, policy, and programmatic goals. Designated support contractors may review submissions for the purposes of technical evaluation. All support contractors are bound by appropriate non-disclosure agreements.

As previously stated herein, timeliness, responsiveness, and eligibility will be assessed upon initial screening, during evaluation, and after selection. Proposals that do not comply with the instructions and requirements detailed in this document, the DoD Program BAA, or the corresponding Topic posting (including the research objective(s)), will be considered ineligible, nonresponsive, untimely, or non-conforming and therefore will not be evaluated or considered for award.

Using the evaluation criteria, the Government will evaluate each responsive, timely, eligible proposal in its entirety. Proposals will not be evaluated against each other during the evaluation process, but rather evaluated on their own individual merit to determine how well the proposal meets the criteria stated in this BAA and the corresponding opportunity.

Selected proposals are those determined to be the most advantageous to the Government, consistent with instructions and evaluation criteria specified in the DoD Program BAA, the component-specific instructions herein, the corresponding Topic posting, and availability of funding.

Proposing firms will be notified via email of selection or non-selection status for a Phase I or direct to Phase II award within 90 days of the closing date of the Topic. The notification will be sent to the Corporate Official listed on the proposal cover sheet from the Army SBIR Program Office mailbox. The Army promotes transparency regarding the technical evaluation for all Army SBIR proposals. The Army will provide a technical evaluation narrative to the proposer in accordance with the SBA Policy Directive, Appendix I, paragraph 4. The selection decision notice contains instructions for retrieving the technical evaluation narrative.

Proposers must not regard the notification email (selection decision notice) as an authorization to commit or expend funds. After the Army SBIR Office has recommended a proposal for award, a Government Contracting Officer may contact the proposer in order to discuss and request additional information required for award. This may include representations and certifications, certified or other than certified cost data, subcontracting plan for small businesses, and/or other information as applicable to the proposed award. Proposers must not regard these communications as an authorization to commit or expend funds. Unless a Government Contracting Officer signs the award document (i.e. contract), no obligations to provide funding are made. The Government may reject the proposal or cancel the contract action at any time.

If signed by the Government Contracting Officer, the award document is the official and authorizing instrument (i.e. contract). The anticipated period of performance start date will be determined at time of award. The Contracting Officer will email the signed, authorizing award instrument to the principal investigator (PI) and/or an authorized organization representative.

PROTESTS

Refer to the DoD SBIR Program BAA for procedures to protest the Announcement.


Feedback will be provided to applicants that are not selected for further consideration. A notification letter will include instructions for obtaining feedback in the form of a ValidEval Report. Offerors are entitled to no more than one feedback per proposal. NOTE: Feedback is not the same as a FAR Part 15 debriefing. Acquisitions under this solicitation are awarded via “other competitive procedures (FAR 6.102(d)(2)).” Therefore, offerors are neither entitled to nor will they be provided FAR Part 15 debriefs. As further prescribed in FAR 33.106(b), FAR 52.233-3, Protests after Award shall be submitted to the Point of Contract identified in the topic solicitation:

Email: usarmy.pentagon.hqda-asa-alt.mbx.army-applied-sbir-program@mail.mil

Mailing Address:

Army Applied SBIR Office
2530 Crystal Dr.; Ste 11192
Arlington, VA 22202

Appendix A Phase I Evaluation Criteria


| Applied SBIR Phase I Proposal Review v2-0-3 Evaluation Criteria Defined | |  |
|---|---|--|
| | | DEFINITION |
| INTRODUCTION | weight 5% | Write a clear, concise description of what your innovation does or will do, and where you are in your evolution. Make clear its intended impact on the Army. Evaluators should "get it" after reading this. |
| POTENTIAL FOR ARMY IMPACT | OPERATIONAL IMPACT | At the scale of a single Army end-user, argue that their jobs or lives will be significantly improved if your solution is adopted. What is the impact of your solution for a soldier/Army civilian vs. today's solutions? |
| | weight 25% | POTENTIAL SCALE OF IMPACT Here, we're looking for an idea of how broad the impact you described above could be. Look into the future to a time when your solution is both technically mature and actively in use by Army personnel. Describe the scale and scope of your impact within the context of the Army. |
| TECHNICAL FEASIBILITY | SCIENTIFIC FEASIBILITY | Is the science behind the solution sound? Convince readers who don't have deep expertise in your field that your innovation is built atop sound scientific and engineering principles. |
| | ENABLING TECHNOLOGIES | Point to the foundational technologies that you rely on to deliver your solution. Do the required enabling technologies introduce added risk? Using proven (and ideally Army fielded) underlying technologies and techniques helps to lower technical risk. |
| | ALTERNATIVE TECHNICAL APPROACHES | From a technologist's perspective, why is your proposed solution the best choice for the Army? Refute the alternative engineering approaches others are using. Why does your technology win? |
| | weight 25% | TECHNICAL RISK MITIGATION No matter your current technology readiness level, technical risks remain. Identify those risks. Present a credible plan to tackle those risks. |
| TRANSITION | ARMY TRANSITION PATHWAY | Planning for success, what's next for you after this SBIR award? Describe the next type of deal you aim to make with the Army, e.g. a CRADA, a different SBIR contract, a CSO, etc. Briefly outline your current plan to unlock that next opportunity and/or share the biggest risks you see post this SBIR award. |
| | weight 20% | SBIR MILESTONE SCHEDULE Please share with us a thoughtful execution plan. Strike a balance between giving us a sense of the detailed thinking behind the scenes and the need for your contracting officer to manage a reasonably small number of milestones during your period of performance. |
| FIRM CASH FLOW | FIRM SURVIVAL RISK | SBIR funds are meant to fuel growth rather than stave off a firm's impending financial failure. Demonstrate that your company will survive financially as a going concern through the early stages of a Phase III contract, sometimes referred to as "transitioning" into use by Army personnel. |
| | OTHER PEOPLE'S MONEY | Make the case that non-Army and/or non-DoD dollars will continue to fund improvements to your solution from which the Army will benefit in the future. Companies who cannot demonstrate non-Army and/or non-DoD funding sources for future solution enhancements are less attractive to the Applied SBIR program. |
| | weight 10% | FINANCIAL PROFIT POTENTIAL Through the Applied SBIR program, the Army wants to take advantage of the speed and scalability of dual-use companies. Make your best case that your product is or will be profitable. If you have more than one product, please focus your argument on the product / solution presented for this SBIR program. |
| TEAM ABILITY | weight 10% | Prove your team has executed well as a group. Please draw clear distinctions between private sector, DoD and civilian government work. What milestones have you accomplished as a group in this company? |
| SUBMISSION QUALITY | QUALITY OF PROSE | Prove you write clearly. Prove you argue convincingly. |
| | weight 5% | DATA QUALITY & ATTRIBUTION Support your arguments with relevant, properly attributed data to enhance your credibility. |

Appendix B Direct to Phase II Evaluation Criteria

| Applied SBIR D2P2 Proposal Review v2-0-4 Evaluation Criteria Defined | | DEFINITION |
|--|------------|---|
| INTRODUCTION | weight 2% | Write a clear, concise description of what your innovation does or will do, and where you are in your evolution. Make clear its intended impact on the Army. Evaluators should "get it" after reading this. |
| POTENTIAL FOR ARMY IMPACT | weight 20% | <p>OPERATIONAL IMPACT At the scale of a single Army end-user, argue that their jobs or lives will be significantly improved if your solution is adopted. What is the impact of your solution for a soldier/Army civilian vs. today's solutions?</p> <p>POTENTIAL SCALE OF IMPACT Here, we're looking for an idea of how broad the impact you described above could be. Look into the future to a time when your solution is both technically mature and actively in use by Army personnel. Describe the scale and scope of your impact within the context of the Army.</p> |
| TECHNICAL FEASIBILITY | weight 30% | <p>SCIENTIFIC FEASIBILITY Is the science behind the solution sound? Convince readers who don't have deep expertise in your field that your innovation is built atop sound scientific and engineering principles.</p> <p>ENABLING TECHNOLOGIES Point to the foundational technologies that you rely on to deliver your solution. Do the required enabling technologies introduce added risk? Using proven (and ideally Army-feldded) underlying technologies and techniques helps to lower technical risk.</p> <p>ALTERNATIVE TECHNICAL APPROACHES From a technologist's perspective, why is your proposed solution the best choice for the Army? Refute the alternative engineering approaches others are using. Why does your technology win?</p> <p>TECHNICAL RISK MITIGATION No matter your current technology readiness level, technical risks remain. Identify those risks. Present a credible plan to tackle those risks.</p> |
| TRANSITION | weight 20% | <p>ARMY TRANSITION PATHWAY Planning for success, what's next for you after this SBIR award? Describe the next type of deal you aim to make with the Army, e.g. a CRADA, a different SBIR contract, a CSO, etc. Briefly outline your current plan to unlock that next opportunity and/or share the biggest risks you see post this SBIR award.</p> <p>SBIR MILESTONE SCHEDULE Please share with us a thoughtful execution plan. Strike a balance between giving us a sense of the detailed thinking behind the scenes and the need for your contracting officer to manage a reasonably small number of milestones during your period of performance.</p> |
| FIRM CASH FLOW | weight 15% | <p>FIRM SURVIVAL RISK SBIR funds are meant to fuel growth rather than stave off a firm's impending financial failure. Demonstrate that your company will survive financially as a going concern through the early stages of a Phase III contract, sometimes referred to as "transitioning" into use by Army personnel.</p> <p>OTHER PEOPLE'S MONEY Make the case that non-Army and/or non-DoD dollars will continue to fund improvements to your solution from which the Army will benefit in the future. Companies who cannot demonstrate non-Army and/or non-DoD funding sources for future solution enhancements are less attractive to the Applied SBIR program.</p> <p>FINANCIAL PROFIT POTENTIAL Through the Applied SBIR program, the Army wants to take advantage of the speed and scalability of dual-use companies. Make your best case that your product is or will be profitable. If you have more than one product, please focus your argument on the product / solution presented for this SBIR program.</p> |
| TEAM ABILITY | weight 10% | Prove your team has executed well as a group. Please draw clear distinctions between private sector, DoD and civilian government work. What milestones have you accomplished as a group in this company? |
| SUBMISSION QUALITY | weight 3% | <p>QUALITY OF PROSE Prove you write clearly. Prove you argue convincingly.</p> <p>DATA QUALITY & ATTRIBUTION Support your arguments with relevant, properly attributed data to enhance your credibility.</p> |



Appendix C Phase II Evaluation Criteria

| Applied SBIR Phase II Proposal Review v2-0-3 Evaluation Criteria Defined | |  |
|--|---|--|
| | | DEFINITION |
| INTRODUCTION | weight 2% | Write a clear, concise description of what your innovation does or will do, and where you are in your evolution. Make clear its intended impact on the Army. Evaluators should "get it" after reading this. |
| POTENTIAL FOR ARMY IMPACT | OPERATIONAL IMPACT | At the scale of a single Army end-user, argue that their jobs or lives will be significantly improved if your solution is adopted. What is the impact of your solution for a soldier/Army civilian vs. today's solutions? |
| | weight 20% | POTENTIAL SCALE OF IMPACT |
| | | Here, we're looking for an idea of how broad the impact you described above could be. Look into the future to a time when your solution is both technically mature and actively in use by Army personnel. Describe the scale and scope of your impact within the context of the Army. |
| TECHNICAL FEASIBILITY | SCIENTIFIC FEASIBILITY | Is the science behind the solution sound? Convince readers who don't have deep expertise in your field that your innovation is built atop sound scientific and engineering principles. |
| | ENABLING TECHNOLOGIES | Point to the foundational technologies that you rely on to deliver your solution. Do the required enabling technologies introduce added risk? Using proven (and ideally Army-fielded) underlying technologies and techniques helps to lower technical risk. |
| | ALTERNATIVE TECHNICAL APPROACHES | From a technologist's perspective, why is your proposed solution the best choice for the Army? Refute the alternative engineering approaches others are using. Why does your technology win? |
| | weight 25% | TECHNICAL RISK MITIGATION |
| | | No matter your current technology readiness level, technical risks remain. Identify those risks. Present a credible plan to tackle those risks. |
| TRANSITION | ARMY TRANSITION PATHWAY | Planning for success, what's next for you after this SBIR award? Describe the next type of deal you aim to make with the Army, e.g. a CRADA, a different SBIR contract, a CSO, etc. Briefly outline your current plan to unlock that next opportunity and/or share the biggest risks you see post this SBIR award. |
| | weight 25% | SBIR MILESTONE SCHEDULE |
| | | Please share with us a thoughtful execution plan. Strike a balance between giving us a sense of the detailed thinking behind the scenes and the need for your contracting officer to manage a reasonably small number of milestones during your period of performance. |
| FIRM CASH FLOW | FIRM SURVIVAL RISK | SBIR funds are meant to fuel growth rather than stave off a firm's impending financial failure. Demonstrate that your company will survive financially as a going concern through the early stages of a Phase III contract, sometimes referred to as "transitioning" into use by Army personnel. |
| | OTHER PEOPLE'S MONEY | Make the case that non-Army and/or non-DoD dollars will continue to fund improvements to your solution from which the Army will benefit in the future. Companies who cannot demonstrate non-Army and/or non-DoD funding sources for future solution enhancements are less attractive to the Applied SBIR program. |
| | weight 20% | FINANCIAL PROFIT POTENTIAL |
| | | Through the Applied SBIR program, the Army wants to take advantage of the speed and scalability of dual-use companies. Make your best case that your product is or will be profitable. If you have more than one product, please focus your argument on the product / solution presented for this SBIR program. |
| TEAM ABILITY | weight 5% | Prove your team has executed well as a group. Please draw clear distinctions between private sector, DoD and civilian government work. What milestones have you accomplished as a group in this company? |
| SUBMISSION QUALITY | QUALITY OF PROSE | Prove you write clearly. Prove you argue convincingly. |
| | weight 2% | DATA QUALITY & ATTRIBUTION |
| | | Support your arguments with relevant, properly attributed data to enhance your credibility. |

Appendix D

Commercialization Plan Template

General Instructions/Guidance:

1. The slide deck must be 8 slides total, per Component Instructions, and follow the formatting contained in the template. Font size shall be no smaller than 10-point font.
2. Slides should display the slide number in bottom right corner
3. All text (including tables, charts, plots, axes labels, legends, captions) must be readable without zooming and understandable without voice-over
4. For plots and charts:
 - a. Include title/bullet describing importance of plot/chart, and/or data (be specific)
 - b. Axes must be meaningfully labeled (to be understandable by non-experts) and include scale
5. Avoid jargon; define technical terms
6. Convert from slide format to a PDF file for submission to DSIP alongside the technical volume proposal
7. To insert images, capture a screenshot of the image and paste it into the slide. Please do not drag-drop a file into the presentation or use the Insert Pictures menu function.
8. Use PowerPoint's "Compress Pictures" feature to reduce file size
 - a. Select 96ppi resolution
 - b. Uncheck "For this picture only"
9. Replace the boilerplate footer below with distribution markings as appropriate
10. Do not put any company logos (Twitter, Reddit, GitHub, etc) on your slides

To be considered valid proposals, Commercialization Plan submissions must follow the number and content of each slide as contained in the attached template.

Appendix D
Commercialization Plan Template cont.

Firm Name

SBIR Project Title

Principal Investigator Name / Title
Key (or other relevant) Personnel, and
Subcontractors

.....
Insert Topic Number
Insert Proposal Number

Distribution markings as appropriate for your organization

BLUF: Bottom Line Up Front

- **BLUF:**
 - 1. Company information and background** : Core competencies, significant sales, previous funding, commercialization successes.
 - 2. Customer and Competition** : Clear description of key technology objectives, current competition, and advantages.
 - 3. Market:** Plan to obtain market share.
 - 4. Intellectual Property:** Patent status, technology lead, trade secrets or other demonstration of a plan to protect the company's technical advantage.
 - 5. Financing/Revenue:** Plans for securing necessary non -SBIR funding.
 - 6. Assistance and mentoring** : Plans for securing needed technical or business assistance.

Distribution markings as appropriate for your organization

Appendix D

Commercialization Plan Template cont.

Company Information and Background

- Core competencies and areas of specialization.
- Products with significant sales.
- Concise history of previous Federal and non -Federal funding/investments.
- Regulatory experience (if applicable).
- Past commercialization successes.
- Past failure and how you overcame .

Distribution markings as appropriate for your organization

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Customer & Competition

- Description of key technology objectives.
- Current competition and/or alternative solutions.
- Advantages of company's offer compared to competing products or services.
- Hurdles to acceptance of the proposed innovation.
- Description of possible areas where your technology may be utilized or is under utilized.

Distribution markings as appropriate for your organization

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Appendix D Commercialization Plan Template cont.

Market

- Analysis of market size and 1 and 5 year forecasted market share.
- Explanation of milestones and target dates of plan to obtain that market share.
- What experience do you have with marketing to this target market?
- What commercialization strategy appears to be the best for bringing this product to the target market?
- What experience do you have with bring products to market – either through this company or through other companies with which you have worked.
- Does the company currently market, manufacture, or license technology? Describe what you do.

Intellectual Property

- Patent status, technology lead, trade secrets or other demonstration of a plan to achieve sufficient protection to realize the commercialization stage and attain at least a temporary competitive advantage .
- Describe how you will protect the intellectual property that enables commercialization of its products while keeping competitors at bay. Note any actions you may consider to attain at least a temporary competitive advantage. Also consider your company's prior record in this area. Comment on your company's strategy to build a sustainable business through protection of intellectual property.

Appendix D Commercialization Plan Template cont.

Financing

- Plan for securing non-SBIR, private or government funding necessary to enter low rate of production of anticipated technical solution.
- Describe your revenue stream generation to include but not limited to:
 - Manufacture and direct sales
 - Sales through value added resellers or other distributors
 - Joint venture

Distribution markings as appropriate for your organization

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Assistance & Mentoring

- Plans for securing needed technical or business assistance through mentoring, partnering, or arrangements with government sponsored (e.g., SBIR funded Discretionary Technical and Business Assistance (TABAs), State assistance programs, Federally-funded research laboratories, Manufacturing Extension Partnership centers), not-for-profits (e.g., Small Business Development Center (SBDC) or Small Business Technical Development Center (SBTDC)), commercial accelerators, DOD Prime Contractors, SBA Mentor - Protégé program, Procurement Technical Assistance Center (PTAC) or other assistance provider.

Distribution markings as appropriate for your organization

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Army SBIR 23.4 Topic Index
Release 13

A234-018 Digital Erasure of Sensitive FPGA Systems

OUSD (R&E) CRITICAL TECHNOLOGY AREA(S): Trusted AI and Autonomy; Advanced Computing and Software

OBJECTIVE: Modern and future battlefields will see increasing use of automated platforms; however, single-use, leave-behind, or unattended U.S. military systems require sufficient protection against hardware and software components from being reverse engineered. Currently, there is not yet a cost-effective, adequate solution for this requirement. Practices such as traditional physical anti-tamper methods or warfighters having direct physical access to attempt platform destruction are not feasible for the new ecosystem of low-cost, high-count platforms. Conversely, digital erasure with its low barrier-to-entry, in terms of cost and implementation, is the suitable alternative.

DESCRIPTION: Through reverse engineering techniques, adversaries can extract information stored in non-volatile memory from abandoned, misused, single-use, leave-behind, or unattended U.S. military systems. Furthermore, utilizing volatile memory storage (i.e., Random Access Memory, RAM) for a system's Critical Program Information (CPI), proprietary information, or intellectual property (IP) is not an adequate design technique to ensure the information is unrecoverable as new, sophisticated techniques are able to "freeze" binary signatures etched onto the storage medium hardware. These capabilities enable adversaries and other nation-state actors to potentially modify, exploit, exfiltrate, or leverage U.S. military systems, including their design and information, risking Original Equipment Manufacturer (OEM) business advantages and the U.S. military's technological superiority. However, systems designed with reconfigurable logic hardware (e.g., Field Programmable Gate Arrays, FPGAs) instead of Application Specific Integrated Circuits (ASICs) to execute system functions provides a hardware fabric that can be completely erased in order to protect sensitive designs and information from being reverse engineered.

PHASE I: This is a Direct to Phase II topic (DP2). Small businesses, at the time of proposal, must have a solution capable of and, at the time of award, be able to demonstrate a proof-of-concept digital erasure solution capable of modifying the FPGA fabric to ensure the original data within memory is no longer recoverable.

DIRECT TO PHASE II: As a Direct to Phase II, proposal submissions should include discussion on the following:

- Demonstrate digital erasure functionality on commercial platforms/systems/controllers that, once activated by a trigger mechanism, will successfully erase the FPGA fabric in order to prevent data recovery through reverse engineering of the memory hardware.
- Coordination with partners will reveal applications and preferred trigger mechanisms, thus the trigger functions themselves must be protected to mitigate the potential for adversaries to attack platforms through digitally erasing systems.
- The developed tool will automatically implement digital erasure functionality onto FPGAs despite differences in vendors, components, interfaces, etc. to achieve platform-agnostic support.
- To provide resiliency against reverse engineering, digital erasure function should erase FPGA fabric by writing randomized data to memory instead of writing only 0s or only 1s.
- Optimization steps to reduce total erasure/overwrite times and resource utilization will be identified and implemented during development.
- Streamline user experience and requirements both for warfighters to trigger digital erasure and for FPGA developers to implement digital erasure functionality.
- Conduct commercialization strategy to integrate solution with existing toolchains and developer applications utilized by industry for FPGA development.

- Solution testing and evaluation will be conducted through FPGA developer tools to digitally verify that the memory has been successfully erased, and later through performing simulated data remanence attacks, where the hardware is manipulated to retain memory states which are then analyzed, to provide realistic verification whether the original data can be recovered through sophisticated reverse engineering techniques after a memory erase.

PHASE III DUAL USE APPLICATIONS: Data security is a top priority for organizations across all industries, which has companies rushing to adopt and implement the latest capabilities in data destruction and sanitation. The moderately high CAGR of 14.3% indicates sustained growth. Complete the maturation of the company's technology developed in Phase II and produce prototypes to support further development and commercialization.

KEYWORDS: Reconfigurable, Logic, Zeroize, Circuit, FPGA, System On A Chip, SoC, ASIC, Tamper, Data Assurance, Electronics, Microelectronics, Zeroization, Sanitization, Hardware, Memory

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Department of the Army
23.4 Small Business Innovation Research (SBIR)
Release 14
xTechSearch 7 Finalists
Component-Specific Proposal Instructions

October 18, 2022: Topics issued for pre-release

June 22, 2023: Army begins accepting proposals via DSIP

July 25, 2023: Deadline for receipt of proposals no later than 12:00 p.m. ET

IMPORTANT: A prize competition, xTechSearch 7 Competition, will be used to identify small business concerns that meet the criteria for award. Winners selected from the xTechSearch 7 prize competition will be the only firms eligible to submit a proposal under this topic. All other proposals will not be evaluated. See the full xTechSearch 7 prize competition RFI here: [xTechSearch 7 Competition](#)

INTRODUCTION

The future Army must be capable of conducting Multi-Domain Operations (MDO) as part of an integrated Joint Force across an array of situations in multiple theaters by 2035. The MDO concept describes how the Army will support the Joint Force in the rapid and continuous integration of all domains of warfare – land, sea, air, and cyberspace – to deter and prevail as we compete short of conflict, and fight and win if deterrence fail. The Army must provide game-changing capabilities to our Soldiers. To capitalize on small business innovation, the Army has implemented an approach to advertise SBIR funding opportunities through the Department of Defense (DoD) Annual BAA process, outside of the three pre-determined BAA cycles. This approach also strives to create a more rapid award time from solicitation to closing.

Proposers are encouraged to thoroughly review the DoD Program BAA and register for the DSIP Listserv to remain apprised of important programmatic and contractual changes.

- The DoD Program BAA is located at: <https://www.defensesbirsttr.mil/SBIR-STTR/Opportunities/#announcements>. Be sure to select the tab for the appropriate BAA cycle.
- Register for the DSIP Listserv at: <https://www.dodsbirsttr.mil/submissions/login>.

CONTACT INFORMATION

Direct Specific questions pertaining to the administration of the Department of the Army SBIR Program and proposal preparation instructions to the Point of Contact identified in the Topic announcement.

General questions can be directed to the following:

Email: usarmy.pentagon.hqda-asa-alt.mbx.army-applied-sbir-program@mail.mil

Mailing Address:

Army Applied SBIR Office 2530 Crystal Dr; Ste 11192

Arlington, VA 22202

RESPONSIVENESS AND TIMELINESS

All proposals will be evaluated and judged on a competitive basis. Proposals will only be evaluated in response to an active, corresponding Army topic. Proposals will be initially screened to determine responsiveness and timeliness. Proposals passing this initial screening will be technically evaluated by engineers or scientists to determine the most promising technical and scientific approaches. Assessment of responsiveness may continue during technical evaluation and after selection. If at any point the proposal is deemed untimely, unresponsive, ineligible, or non-responsive, the proposal will be rejected / the contract action will be cancelled.

Interested firms shall follow the DoD Program BAA instructions as well as the Army's component-specific proposal instructions herein, when preparing and submitting proposals. Please find the link to the current BAA here:

SYSTEM FOR AWARD MANAGEMENT (SAM)

Interested firms are required to be registered in SAM (www.sam.gov) before submitting a proposal and shall continue to be registered until time of award, during performance, and through final payment of any contract. The proper North American Industry Classification System (NAICS) code and Product and Service Code are as follows:

NAICS: 541715, Research and Development in the Physical, Engineering, and Life Sciences (except Nanotechnology and Biotechnology)
PSC: AC12, National Defense R&D Services; Department of Defense - Military; Applied Research

PHASE I PROPOSAL INSTRUCTIONS

The Defense SBIR/STTR Innovation Portal (DSIP) is the official portal for DoD SBIR/STTR proposal submission. Proposers (also referred to herein as "offeror(s)") are required to submit proposals via DSIP; proposals submitted by any other means will be disregarded. Detailed instructions regarding registration and proposal submission via DSIP are provided in the DoD SBIR Program BAA.

Proposal Coversheet (Volume 1)

The proposal coversheet must follow the instructions and requirements provided in the DoD SBIR Program BAA.

The offeror shall certify that to the best of its knowledge and belief, its eligibility information under the SBIR Program is accurate, complete, and current as of the date of the offer.

Technical Volume (Volume 2)

The technical volume proposal is not to exceed 5 word document pages and must follow the formatting requirements provided in the DoD SBIR Program BAA. A commercialization plan must also accompany the technical volume proposal and must be 8 slides. The required content to include within these slides are described in Appendix D. The commercialization plan must be converted from slides to pdf and attached to the end of the technical volume proposal, resulting in one pdf file to be uploaded to DSIP as Volume 2. The commercialization plan does not count towards the proposal 5-page limit. Any proposals submitted without a commercialization plan or in a format other than that provided in these Component Instructions and by the BAA will be deemed unresponsive and will not reviewed.

Content of the Technical Volume

The Technical Volume shall contain three key sections – technical approach, team qualifications and commercialization section. The technical approach section shall contain details on how the proposer is going to solve the problem. It shall detail key elements of the firm's approach, any risks, relevant past work and how success is measured. The team qualifications section shall highlight the key personnel working on the project, and the resources that will be brought to bear on solving the problem.

The commercialization plan shall include:

Company information: Focused objectives/core competencies; specialization area(s); products with significant sales; and history of previous Federal and non-Federal funding, regulatory experience, and subsequent commercialization successes.

Customer and Competition: Clear description of key technology objectives, current competition, and advantages compared to competing products or services; description of hurdles to acceptance of the innovation.

Market: Milestones, target dates, analyses of market size, and estimated market share after first year sales and after 5 years; explanation of plan to obtain market share.

Intellectual Property: Patent status, technology lead, trade secrets or other demonstration of a plan to achieve sufficient protection to realize the commercialization stage and attain at least a temporal competitive advantage.

Financing: Plans for securing necessary non-SBIR funding.

Assistance and mentoring: Plans for securing needed technical or business assistance through mentoring, partnering, or through arrangements with government sponsored (e.g., State assistance programs, Federally-funded research laboratories, Manufacturing Extension Partnership centers), not-for-profits (e.g., SBDC), commercial accelerators, DOD Prime Contractors, or other assistance provider.

These instructions supersede those stated in section 5.3.c of the DoD Program BAA.

Cost Volume (Volume 3)

The Cost Volume must follow all instructions and requirements provided in the DoD SBIR Program BAA. Supplemental requirements are as follows:

The Phase I Base amount must not exceed \$250,000 for a 6-month period of performance, unless otherwise specified in the topic description pages. Phase I Options are not anticipated at this time. If an option is identified in the topic posting, costs for the Base and Option must be separated and clearly identified on the Proposal Cover Sheet (Volume 1) and in Volume 3. Awards for these topics will be in the form of a firm fixed price contract.

Please review the updated Percentage of Work (POW) calculation details included in section 5.3 of the DoD Program BAA. Army Applied SBIR will occasionally accept deviations from the POW requirements with written approval from the Funding Agreement officer.

For pricing purposes, offerors shall assume a contract or agreement start date of approximately ninety (90) days after submission of the proposal. For this BAA, adequate price competition (APC), as defined in FAR 15.403-1(c), is anticipated. In the event that adequate price competition is not realized (i.e. only one proposal is received for a given topic), the Government may choose to conduct additional proposal analysis, in accordance with the techniques identified at FAR 15.404-1. Additionally, offerors are to provide any current Forward Pricing Rate Agreements (FPRA) in effect at time of proposal submission.

Content of the Cost Volume (Volume 3)

ALL proposed costs should be accompanied by documentation to substantiate how the cost was derived. Substantiating documentation guidance is as follows:

LABOR:

List all key personnel by name as well as by number of hours dedicated to the project as direct labor.

Explain the basis of proposed labor hours, including required tasks, and substantiating documentation for the costs (e.g. payroll reports). Volume 5, Supporting Documents, may be used if additional space is needed.

MATERIAL/TOOLING/EQUIPMENT:

Explain the basis of proposed material and equipment costs. This support should include a consolidated priced summary of individual material and equipment quantities and substantiating documentation for the costs (e.g. vendor quotes, invoice prices, competitive bids, etc.). If your choice isn't the lowest cost available, explain the decision to choose one item or supplier over another. Volume 5, Supporting Documents, may be used if additional space is needed.

Ensure all materials are American-made to the maximum extent practicable. Offerors who propose to use a foreign-made product in its technology may be required to find an American-made equivalent.

While special tooling and test equipment and material cost may be included, it will be carefully reviewed relative to need and appropriateness for the work proposed. The purchase of special tooling and test equipment must, in the opinion of the Component Contracting Officer, be advantageous to the Government and should be related directly to the specific topic. These may include such items as innovative instrumentation or automatic test equipment. Title to property furnished by the Government or acquired with Government funds will be vested with the DoD Component, unless it is determined that transfer of title to the contractor would be more cost effective than recovery of the equipment by the DoD Component.

TRAVEL:

Explain the basis of proposed travel, including to/from locations, number of trips, number of travelers per trip, and number of days/nights per trip. Include substantiating documentation for the costs (e.g. screenshots of flight cost comparison, rental car quotes, etc.). NOTE: Virtual meetings shall be utilized to the maximum extent practicable. Volume 5, Supporting Documents, may be used if additional space is needed.

SUBCONTRACTS: A subcontract is any agreement, other than one involving an employer-employee relationship, entered into by the prime contractor (awardee) calling for supplies or services for the performance of the contract.

All subcontractor costs and consultant costs must be detailed at the same level as prime contractor costs in regard to labor, travel, equipment, etc.

Explain the basis of proposed subcontract costs. Include documented support of the offeror's price analyses and degree of competition of all subcontractor proposals. All subcontractor costs and consultant costs, such as labor, travel, equipment, materials, must be detailed at the same level as prime contractor costs. Provide detailed substantiation of subcontractor costs in your cost proposal. Volume 5, Supporting Documents, may be used if additional space is needed.

Certify that the following requirements are met: For Phase I, the offeror must perform a minimum of two-thirds of the research and/or analytical effort. One third may be subcontracted to another firm or research organization/facility. The percentage of work is measured by both direct and indirect costs.

Offerors shall not propose to subcontract to the issuing agency, to any other Federal Government agency, or to other units of the Federal Government, except Federal Laboratories in rare circumstances.

As defined in 15 U.S.C. 3703, Federal Laboratory means any laboratory, any federally funded research and development center, or any center established under 15 U.S.C. 3705 and 3707 that is owned, leased, or otherwise used by a Federal Agency and funded by the Federal Government, whether operated by the Government or by a contractor.

Offerors shall not propose to subcontract to any prohibited sources. Proposals identifying a subcontractor/vendor arrangement with a prohibited source may be rejected.

Offerors shall ensure subcontracting arrangements are with United States Small Businesses to the maximum extent practicable. Offerors proposing a subcontractor arrangement with other than a United States Small Business (such as, a large business, foreign firm, foreign government, educational institution, unit of Federal Government, etc.) may be required to submit further explanation.

INDIRECT COSTS:

Explain the basis of the proposed indirect expense rates including overhead, general and administrative, material handling, and fringe benefits.

If a Defense Contract Audit Agency (DCAA) Audit has been conducted within the last five (5) years, include the audit compliance documentation in the cost proposal documents. The documentation should also include the offeror's DCAA Point of Contact (if applicable).

If selected, failure to include the documentation with your proposal may delay contract award, as the proposer will be asked to submit the necessary documentation to the Contracting Officer to substantiate costs. It is important to respond as quickly as possible to the Contracting Officer's request for documentation. Failure or refusal to provide documentation may result in cancellation of the contract action.

Company Commercialization Report (CCR) (Volume 4)

Completion of the CCR as Volume 4 of the proposal submission in DSIP is required. Please refer to the DoD SBIR Program BAA for full details on this requirement. Information contained in the CCR will be considered by the Department of the Army during proposal evaluations.

Supporting Documents (Volume 5)

All proposing small business concerns are REQUIRED to submit the following documents to Volume 5:

1. Contractor Certification Regarding Provision of Prohibition on Contracting for Certain Telecommunications and Video Surveillance Services or Equipment
2. Disclosures of Foreign Affiliations or Relationships to Foreign Countries
3. Disclosure of Funding Sources

Please refer to the DoD Program BAA for more information.

Volume 5 is provided for proposers to submit additional documentation to support the Cover Sheet (Volume 1), Technical Volume (Volume 2), and the Cost Volume (Volume 3). In addition to the Volume 5 requirements outlined in the DoD Program BAA, the Department of the Army may accept the following documents in Volume 5:

- Additional Cost Information
- Funding Agreement Certification

- Technical Data Rights (Assertions)
- Lifecycle Certification
- Allocation of Rights
- Other (only as specified in the topic)

Please only submit documents that are identified immediately above and in the DoD Program BAA. All other documents submitted will be disregarded.

PHASE II PROPOSAL INSTRUCTIONS

Phase II proposals may only be submitted by Phase I awardees. Phase II proposal submission window, notification process, expected budget/duration structure and additional instructions will be provided in the Phase I contract or by subsequent notification.

DISCRETIONARY TECHNICAL AND BUSINESS ASSISTANCE (TABA)

The Army, at its discretion, may provide Technical and Business Assistance (TABA). The Army will select a preferred vendor(s) for the Army SBIR TABA program through a competitive process. Alternately, a small business concern may, by contract or otherwise, select one or more vendors to assist the firm in meeting the TABA goals. The Applicant must request the authority to select its own TABA provider in its Army SBIR proposal and must demonstrate that the vendor is uniquely postured to provide the specific technical and business services required. TABA funding will be denied if the offeror fails to include the cost and detailed explanation in its proposal.

Participation in the Army SBIR TABA program is voluntary for each Army SBIR awardee. Services provided to Army SBIR firms under the auspices of the TABA program may include, but are not limited to:

1. Access to a network of scientists, engineers, and technologists focused on commercialization and transition considerations such as protected supply chain management, advanced manufacturing, process/product/production scaling, etc;
2. Assistance with intellectual property protections, such as legal considerations, intellectual property rights, patent filing, patent fees, licensing considerations, etc;
3. Commercialization and technology transition support such as market research, market validation, development of regulatory or manufacturing plans, brand development;
4. Regulatory support such as product domain regulatory considerations, regulatory planning, and regulatory strategy development.

The Army SBIR program sponsors participation in the TABA program. The resource limitation for each firm is as follows:

- Phase I Firms:
 - Army-Preferred Vendor: If approved, the contractor may receive up to \$6,500 worth of assistance services per project per year (in addition to the base SBIR award amount).
 - Firm-Selected Vendor: If approved, the contractor may receive up to \$6,500 in contract obligation (in addition to the base SBIR award amount) per project per year.
- Phase II Firms:
 - Army-Preferred Vendor: If approved, the contractor may receive up to \$50,000 worth of assistance services per project per year (in addition to the base SBIR award amount).
 - Firm-Selected Vendor: If approved, the contractor may receive up to \$50,000 in contract obligation (in addition to the base SBIR award amount) per project per year.

EVALUATION AND SELECTION

All proposals will be evaluated during the xTechSearch 7 Finals in accordance with the evaluation criteria that has been provided to the xTechSearch 7 Finalists. It is the policy of the Army to ensure equitable and comprehensive proposal evaluations based on the evaluation criteria provided to the finalists and to select the source (or sources) whose offer meets the Government's technical, policy, and programmatic goals.

All proposal evaluations will be based solely on the above evaluation criteria. The Army will conduct an evaluation of each conforming proposal. Proposals that do not comply with the requirements detailed in this BAA and the research objective(s) of the corresponding opportunity are considered non-conforming and therefore will not be evaluated nor considered for award.

During the xTechSearch 7 competition finals, the Government will evaluate each proposal in its entirety, documenting the strengths and weaknesses relative to each evaluation criterion, and based on these identified strengths and weaknesses, make a determination of the proposal's overall qualifications. Proposals will not be evaluated against each other during the evaluation process, but rather evaluated on their own individual merit to determine how well the proposal meets the criteria stated in the xTechSearch 7 prize competition.

Awards will be made to proposers whose proposals are determined to be the most advantageous to the Government, consistent with instructions and evaluation criteria provided to the xTechSearch 7 finalists, subsequent opportunities issued, and availability of funding. Given the limited funding available for each opportunity, not all proposals considered selectable will be necessarily selected for funding.

For the purposes of this proposal evaluation process, a selectable proposal is defined as follows:
Selectable: A selectable proposal is a proposal that has been evaluated by the Government against the evaluation criteria provided to the xTechSearch 7 Finalists, and the strengths of the overall proposal outweighs its weaknesses. Additionally, there are no accumulated weaknesses that would require extensive negotiations and/or a revised proposal.

For the purposes of this proposal evaluation process, a non-selectable proposal is defined as follows:
Non-Selectable: A proposal is considered non-selectable when the proposal has been evaluated by the Government against the evaluation criteria listed provided to the xTechSearch 7 Finalists and the strengths of the overall proposal do not outweigh its weaknesses.

Proposing firms will be notified via email of selection or non-selection status for a Phase I or direct to Phase II award within 90 days of the closing date of the Topic. The notification will be sent to the Corporate Official listed on the proposal cover sheet from the Army SBIR Program Office mailbox. The Army promotes transparency regarding the technical evaluation for all Army SBIR proposals. The Army will provide a technical evaluation narrative to the proposer in accordance with the SBA Policy Directive, Appendix I, paragraph 4. The selection decision notice contains instructions for retrieving the technical evaluation narrative.

Proposers must not regard the notification email (selection decision notice) as an authorization to commit or expend funds. After the Army SBIR Office has recommended a proposal for award, a Government Contracting Officer may contact the proposer in order to discuss and request additional information required for award. This may include representations and certifications, certified or other than certified cost data, subcontracting plan for small businesses, and/or other information as applicable to the proposed award. Proposers must not regard these communications as an authorization to commit or expend funds. Unless a Government Contracting Officer signs the award document (i.e. contract), no obligations to provide funding are made. The Government may reject the proposal or cancel the contract action at any time.

If signed by the Government Contracting Officer, the award document is the official and authorizing instrument (i.e. contract). The anticipated period of performance start date will be determined at time of award. The Contracting Officer will email the signed, authorizing award instrument to the principal investigator (PI) and/or an authorized organization representative.

PROTESTS

Refer to the DoD SBIR Program BAA for procedures to protest the Announcement.

As further prescribed in FAR 33.106(b), FAR 52.233-3, Protests after Award shall be submitted to the Point of Contract identified in the topic solicitation:

Email: usarmy.pentagon.hqda-asa-alt.mbx.army-applied-sbir-program@mail.mil

Mailing Address:

Army Applied SBIR Office
2530 Crystal Dr; Ste 11192
Arlington, VA 22202

AWARD AND CONTRACT INFORMATION

Only proposers who are winners in xTechSearch 7 Finals and follow the evaluation criteria provided to them will be during their pitch will considered for this topic. If you are NOT a winner as a result of the xTechSearch 7 finals, please do not submit proposals for this topic as they will be automatically disqualified.

Appendix A

Phase I Evaluation Criteria

Applied SBIR Phase I Proposal Review v2-0-3 Evaluation Criteria Defined



| | | DEFINITION |
|----------------------------------|---|--|
| INTRODUCTION | <i>weight 5%</i> | Write a clear, concise description of what your innovation does or will do, and where you are in your evolution. Make clear its intended impact on the Army. Evaluators should "get it" after reading this. |
| POTENTIAL FOR ARMY IMPACT | OPERATIONAL IMPACT | At the scale of a single Army end-user, argue that their jobs or lives will be significantly improved if your solution is adopted. What is the impact of your solution for a soldier/Army civilian vs. today's solutions? |
| | POTENTIAL SCALE OF IMPACT | Here, we're looking for an idea of how broad the impact you described above could be. Look into the future to a time when your solution is both technically mature and actively in use by Army personnel. Describe the scale and scope of your impact within the context of the Army. |
| TECHNICAL FEASIBILITY | SCIENTIFIC FEASIBILITY | Is the science behind the solution sound? Convince readers who don't have deep expertise in your field that your innovation is built atop sound scientific and engineering principles. |
| | ENABLING TECHNOLOGIES | Point to the foundational technologies that you rely on to deliver your solution. Do the required enabling technologies introduce added risk? Using proven (and ideally Army-fielded) underlying technologies and techniques helps to lower technical risk. |
| | ALTERNATIVE TECHNICAL APPROACHES | From a technologist's perspective, why is your proposed solution the best choice for the Army? Refute the alternative engineering approaches others are using. Why does your technology win? |
| | TECHNICAL RISK MITIGATION | No matter your current technology readiness level, technical risks remain. Identify those risks. Present a credible plan to tackle those risks. |
| TRANSITION | ARMY TRANSITION PATHWAY | Planning for success, what's next for you after this SBIR award? Describe the next type of deal you aim to make with the Army, e.g. a CRADA, a different SBIR contract, a CSO, etc. Briefly outline your current plan to unlock that next opportunity and/or share the biggest risks you see post this SBIR award. |
| | SBIR MILESTONE SCHEDULE | Please share with us a thoughtful execution plan. Strike a balance between giving us a sense of the detailed thinking behind the scenes and the need for your contracting officer to manage a reasonably small number of milestones during your period of performance. |
| FIRM CASH FLOW | FIRM SURVIVAL RISK | SBIR funds are meant to fuel growth rather than stave off a firm's impending financial failure. Demonstrate that your company will survive financially as a going concern through the early stages of a Phase III contract, sometimes referred to as "transitioning" into use by Army personnel. |
| | OTHER PEOPLE'S MONEY | Make the case that non-Army and/or non-DoD dollars will continue to fund improvements to your solution from which the Army will benefit in the future. Companies who cannot demonstrate non-Army and/or non-DoD funding sources for future solution enhancements are less attractive to the Applied SBIR program. |
| | FINANCIAL PROFIT POTENTIAL | Through the Applied SBIR program, the Army wants to take advantage of the speed and scalability of dual-use companies. Make your best case that your product is or will be profitable. If you have more than one product, please focus your argument on the product / solution presented for this SBIR program. |
| TEAM ABILITY | <i>weight 10%</i> | Prove your team has executed well as a group. Please draw clear distinctions between private sector, DoD and civilian government work. What milestones have you accomplished as a group in this company? |
| SUBMISSION QUALITY | QUALITY OF PROSE | Prove you write clearly. Prove you argue convincingly. |
| | DATA QUALITY & ATTRIBUTION | Support your arguments with relevant, properly attributed data to enhance your credibility. |

Appendix B Phase II Evaluation Criteria

Applied SBIR Phase II Proposal Review v2-0-3 Evaluation Criteria Defined



| | | DEFINITION |
|----------------------------------|---|--|
| INTRODUCTION | <i>weight 2%</i> | Write a clear, concise description of what your innovation does or will do, and where you are in your evolution. Make clear its intended impact on the Army. Evaluators should "get it" after reading this. |
| POTENTIAL FOR ARMY IMPACT | OPERATIONAL IMPACT | At the scale of a single Army end-user, argue that their jobs or lives will be significantly improved if your solution is adopted. What is the impact of your solution for a soldier/Army civilian vs. today's solutions? |
| | POTENTIAL SCALE OF IMPACT | Here, we're looking for an idea of how broad the impact you described above could be. Look into the future to a time when your solution is both technically mature and actively in use by Army personnel. Describe the scale and scope of your impact within the context of the Army. |
| TECHNICAL FEASIBILITY | SCIENTIFIC FEASIBILITY | Is the science behind the solution sound? Convince readers who don't have deep expertise in your field that your innovation is built atop sound scientific and engineering principles. |
| | ENABLING TECHNOLOGIES | Point to the foundational technologies that you rely on to deliver your solution. Do the required enabling technologies introduce added risk? Using proven (and ideally Army-fielded) underlying technologies and techniques helps to lower technical risk. |
| | ALTERNATIVE TECHNICAL APPROACHES | From a technologist's perspective, why is your proposed solution the best choice for the Army? Refute the alternative engineering approaches others are using. Why does your technology win? |
| | TECHNICAL RISK MITIGATION | No matter your current technology readiness level, technical risks remain. Identify those risks. Present a credible plan to tackle those risks. |
| TRANSITION | ARMY TRANSITION PATHWAY | Planning for success, what's next for you after this SBIR award? Describe the next type of deal you aim to make with the Army, e.g. a CRADA, a different SBIR contract, a CSO, etc. Briefly outline your current plan to unlock that next opportunity and/or share the biggest risks you see post this SBIR award. |
| | SBIR MILESTONE SCHEDULE | Please share with us a thoughtful execution plan. Strike a balance between giving us a sense of the detailed thinking behind the scenes and the need for your contracting officer to manage a reasonably small number of milestones during your period of performance. |
| FIRM CASH FLOW | FIRM SURVIVAL RISK | SBIR funds are meant to fuel growth rather than stave off a firm's impending financial failure. Demonstrate that your company will survive financially as a going concern through the early stages of a Phase III contract, sometimes referred to as "transitioning" into use by Army personnel. |
| | OTHER PEOPLE'S MONEY | Make the case that non-Army and/or non-DoD dollars will continue to fund improvements to your solution from which the Army will benefit in the future. Companies who cannot demonstrate non-Army and/or non-DoD funding sources for future solution enhancements are less attractive to the Applied SBIR program. |
| | FINANCIAL PROFIT POTENTIAL | Through the Applied SBIR program, the Army wants to take advantage of the speed and scalability of dual-use companies. Make your best case that your product is or will be profitable. If you have more than one product, please focus your argument on the product / solution presented for this SBIR program. |
| TEAM ABILITY | <i>weight 5%</i> | Prove your team has executed well as a group. Please draw clear distinctions between private sector, DoD and civilian government work. What milestones have you accomplished as a group in this company? |
| SUBMISSION QUALITY | QUALITY OF PROSE | Prove you write clearly. Prove you argue convincingly. |
| | DATA QUALITY & ATTRIBUTION | Support your arguments with relevant, properly attributed data to enhance your credibility. |

Appendix C

Commercialization Plan Template

General Instructions/Guidance:

1. The slide deck must be 8 slides total, per Component Instructions, and follow the formatting contained in the template. Font size shall be no smaller than 10-point font.
2. Slides should display the slide number in bottom right corner
3. All text (including tables, charts, plots, axes labels, legends, captions) must be readable without zooming and understandable without voice-over
4. For plots and charts:
 - a. Include title/bullet describing importance of plot/chart, and/or data (be specific)
 - b. Axes must be meaningfully labeled (to be understandable by non-experts) and include scale
5. Avoid jargon; define technical terms
6. Convert from slide format to a PDF file for submission to DSIP alongside the technical volume proposal
7. To insert images, capture a screenshot of the image and paste it into the slide. Please do not drag-drop a file into the presentation or use the Insert Pictures menu function.
8. Use PowerPoint's "Compress Pictures" feature to reduce file size
 - a. Select 96ppi resolution
 - b. Uncheck "For this picture only"
9. Replace the boilerplate footer below with distribution markings as appropriate
10. Do not put any company logos (Twitter, Reddit, GitHub, etc) on your slides

To be considered valid proposals, Commercialization Plan submissions must follow the number and content of each slide as contained in the attached template.

Appendix C
Commercialization Plan Template cont.

Firm Name

SBIR Project Title

Principal Investigator Name / Title
Key (or other relevant) Personnel, and
Subcontractors

.....
Insert Topic Number
Insert Proposal Number

Distribution markings as appropriate for your organization

BLUF: Bottom Line Up Front

- **BLUF:**
 - 1. Company information and background** : Core competencies, significant sales, previous funding, commercialization successes.
 - 2. Customer and Competition** : Clear description of key technology objectives, current competition, and advantages.
 - 3. Market**: Plan to obtain market share.
 - 4. Intellectual Property**: Patent status, technology lead, trade secrets or other demonstration of a plan to protect the company's technical advantage.
 - 5. Financing/Revenue**: Plans for securing necessary non -SBIR funding.
 - 6. Assistance and mentoring** : Plans for securing needed technical or business assistance.

Distribution markings as appropriate for your organization

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Appendix D

Commercialization Plan Template cont.

Company Information and Background

- Core competencies and areas of specialization.
- Products with significant sales.
- Concise history of previous Federal and non -Federal funding/investments.
- Regulatory experience (if applicable).
- Past commercialization successes.
- Past failure and how you overcame .

Distribution markings as appropriate for your organization

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Customer & Competition

- Description of key technology objectives.
- Current competition and/or alternative solutions.
- Advantages of company's offer compared to competing products or services.
- Hurdles to acceptance of the proposed innovation.
- Description of possible areas where your technology may be utilized or is under utilized.

Distribution markings as appropriate for your organization

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Appendix D Commercialization Plan Template cont.

Market

- Analysis of market size and 1 and 5 year forecasted market share.
- Explanation of milestones and target dates of plan to obtain that market share.
- What experience do you have with marketing to this target market?
- What commercialization strategy appears to be the best for bringing this product to the target market?
- What experience do you have with bring products to market – either through this company or through other companies with which you have worked.
- Does the company currently market, manufacture, or license technology? Describe what you do.

Distribution markings as appropriate for your organization

5

Intellectual Property

- Patent status, technology lead, trade secrets or other demonstration of a plan to achieve sufficient protection to realize the commercialization stage and attain at least a temporary competitive advantage .
- Describe how you will protect the intellectual property that enables commercialization of its products while keeping competitors at bay. Note any actions you may consider to attain at least a temporary competitive advantage. Also consider your company's prior record in this area. Comment on your company's strategy to build a sustainable business through protection of intellectual property.

Distribution markings as appropriate for your organization

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Appendix D Commercialization Plan Template cont.

Financing

- Plan for securing non-SBIR, private or government funding necessary to enter low rate of production of anticipated technical solution.
- Describe your revenue stream generation to include but not limited to:
 - Manufacture and direct sales
 - Sales through value added resellers or other distributors
 - Joint venture

Distribution markings as appropriate for your organization

7

Assistance & Mentoring

- Plans for securing needed technical or business assistance through mentoring, partnering, or arrangements with government sponsored (e.g., SBIR funded Discretionary Technical and Business Assistance (TABAs), State assistance programs, Federally-funded research laboratories, Manufacturing Extension Partnership centers), not-for-profits (e.g., Small Business Development Center (SBDC) or Small Business Technical Development Center (SBTDC)), commercial accelerators, DOD Prime Contractors, SBA Mentor - Protégé program, Procurement Technical Assistance Center (PTAC) or other assistance provider.

Distribution markings as appropriate for your organization

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**Army SBIR 23.4 Topic Index
Release 14**

A234-P019 xTech Search 7 SBIR Finalist Open Topic Competition

OUSD (R&E) CRITICAL TECHNOLOGY AREA: Trusted AI and Autonomy; Advanced Computing and Software; Emerging Threat Reduction

OBJECTIVE:

xTechSearch is seeking novel, disruptive concepts and technology solutions with dual-use capabilities that can assist in tackling the Army's current needs and apply to current Army concepts. The intent is to provide the Army with transformative technology solutions while enabling cost savings throughout the Army systems' life cycle. Critical technology focus areas include Artificial Intelligence / Machine Learning (AI/ML); Advanced Materials; Advanced Manufacturing; Autonomy; Cyber; Electronics; Human Performance; Immersive; Network Technologies; Position, Navigation and Timing (PNT); Power; Software Modernization; and Sensors. See attached document on the Valid Eval registration page for a list of the top Army Modernization Priorities and other critical Army Focus Areas.

DESCRIPTION:

The xTechSearch competition strives to integrate small businesses into the Army's S&T ecosystem by providing research opportunities with Army labs, including authorized access to the Army's organic intellectual and technical capital. Participants will receive detailed feedback from Army and Department of Defense (DoD) stakeholders. Participants will have access to training, mentorship and other support infrastructure as they progress through the contest to determine how best to align their technology solutions with real users and buyers within the Army. Finalists will be entered into the xTech Accelerator to receive intensive mentorship and access to networking events to help grow their companies for Army and commercial users. xTechSearch is an opportunity for eligible participants to pitch novel technology solutions – a new application for an existing technology or an entirely new technology concept – to the Army.

PHASE I: Companies will complete a feasibility study that demonstrates the firm's competitive technical advantage relative to other commercial products (if other products exist) and develop concept plans for how the company's technology can be applied to Army modernization priority areas. Studies should clearly detail and identify a firm's technology at both the individual component and system levels, provide supporting literature for technical feasibility, highlight existing performance data, showcase the technology's application opportunities to a broad base of customers outside the defense space, a market strategy for the commercial space, how the technology directly addresses the Army's modernization area as well as include a technology development roadmap to demonstrate scientific and engineering viability.

At the end of Phase I, the company will be required to provide a concept demonstration of their technology to demonstrate a high probability that continued design and development will result in a Phase II mature product.

PHASE II: Produce prototype solutions that will be easy to operate by a Soldier. These products will be provided to select Army units for further evaluation by the soldiers. In addition, companies will provide a technology transition and commercialization plan for DOD and commercial markets.

PHASE III DUAL USE APPLICATIONS: Complete the maturation of the company's technology developed in Phase II to TRL 6/7 and produce prototypes to support further development and

commercialization. The Army will evaluate each product in a realistic field environment and provide small solutions to stakeholders for further evaluation. Based on soldier evaluations in the field, companies will be requested to update the previously delivered prototypes to meet final design configuration.

REFERENCES: <https://www.xtechsearch.army.mil>

KEYWORDS: AI/ML; Electronics; Human performance; open topic; prize competition; autonomy; dual-use

DEPARTMENT OF THE ARMY
DoD 23.4 Small Business Innovation Research (SBIR)
Annual Broad Agency Announcement (BAA)
Component-Specific Proposal Instructions
Release 15

June 21, 2023: Topics issued for pre-release

July 6, 2023: Army begins accepting proposals via DSIP

July 25, 2023: DSIP Topic Q&A closes to new questions at 12:00 p.m. ET

August 8, 2023: Deadline for receipt of proposals no later than 12:00 p.m. ET

INTRODUCTION

The future Army must be capable of conducting Multi-Domain Operations (MDO) as part of an integrated Joint Force across an array of situations in multiple theaters by 2035. The MDO concept describes how the Army will support the Joint Force in the rapid and continuous integration of all domains of warfare – land, sea, air, and cyberspace – to deter and prevail as we compete short of conflict, and fight and win if deterrence fail. The Army must provide game-changing capabilities to our Soldiers. To capitalize on small business innovation, the Army has implemented an approach to advertise SBIR funding opportunities through the Department of Defense (DoD) Annual BAA process, outside of the three pre-determined BAA cycles. This approach also strives to create a more rapid award time from solicitation to closing.

CONTACT INFORMATION

Direct specific questions pertaining to the administration of the Department of the Army SBIR Program and proposal preparation instructions to the Point of Contact identified in the Topic announcement. General questions can be directed to the following:

Email: usarmy.pentagon.hqda-asa-alt.mbx.army-applied-sbir-program@army.mil

Website: <https://www.armysbir.army.mil/>

Mailing Address:

Army Applied SBIR Office 2530 Crystal Dr.; Ste 11192

Arlington, VA 22202

Proposers are encouraged to thoroughly review the DoD Program BAA and register for the DSIP Listserv to remain apprised of important programmatic and contractual changes.

- The DoD Program BAA is located at: <https://www.defensesbirstr.mil/SBIR-STTR/Opportunities/#announcements>. Be sure to select the tab for the appropriate BAA cycle.
- Register for the DSIP Listserv at: <https://www.dodsbirstr.mil/submissions/login>.

RESPONSIVENESS AND TIMELINESS

All proposals will be evaluated and judged on a competitive basis. Proposals will only be evaluated in response to an active, corresponding Army topic. Proposals will be initially screened to determine responsiveness and timeliness. Proposals passing this initial screening will be technically evaluated by engineers or scientists to determine the most promising technical and scientific approaches. Assessment of responsiveness may continue during technical evaluation and after selection. If at any point the proposal is deemed untimely, unresponsive, ineligible, or non-responsible, the proposal will be rejected / the contract action will be cancelled.

Interested firms shall follow the DoD Program BAA instructions as well as the Army's component-specific proposal instructions herein, when preparing and submitting proposals. The DoD 23.4 SBIR Program BAA can be found here: <https://www.defensesbirsttr.mil/SBIR-STTR/Opportunities/>.

The Government reserves the right to disqualify proposals for failing to meet any of the requirements of the SBA SBIR/STTR Policy Directive, the DoD Program BAA instructions, the Army's component-specific proposal instructions herein, and/or in the topic itself. The following include, but are not limited to, the common reasons for which proposals are disqualified:

- System for Award Management is not properly updated at time of proposal submission.
- The proposal is missing required number of signatures and/or content.
- Minimum Performance Percentage of Work is not allocated properly.
- Work as proposed does not meet the definition of Research and Development required for funding.
- Proposal submitted beyond deadline.
- Price exceeds the maximum funding amount.
- Firm is NOT an eligible small business.
- Firm does NOT meet the ownership and control requirements.
- Firm is 50% or more owned or managed by a corporate entity that is not a small business.
- Firm will NOT perform the prescribed percentage of the research and/or analytical work.
- Primary employment of the Principal Investigator for this project is NOT with the firm.
- Firm has been convicted of a fraud-related crime.
- Principal Investigator or Corporate Official has been convicted of a fraud-related crime.
- Firm and affiliates have employed, on average over the last 24 months, more than 500 employees.
- Firm has been awarded a contract from the US Government for essentially equivalent work.
- Claiming data rights assertions without including a Data Rights Assertions Table.
- Lack of proper documentation for research utilizing human/animal subjects or recombinant DNA.
- Lack of information or negative information concerning use of foreign nationals.
- Offeror requests to award to a different firm/entity after proposal submission.
- Failure or refusal to submit certified or other than certified cost data in accordance with DFARS 252.215-7010.
- Proposal is for a topic other than that which is identified.
- Etc.

SYSTEM FOR AWARD MANAGEMENT (SAM)

Interested firms are required to be registered in SAM (www.sam.gov) before submitting a proposal and shall continue to be registered until time of award, during performance, and through final payment of any contract. The proper North American Industry Classification System (NAICS) code and Product and Service Code are as follows:

- NAICS: 541715, Research and Development in the Physical, Engineering, and Life Sciences (except Nanotechnology and Biotechnology)
- PSC: AC12, National Defense R&D Services; Department of Defense - Military; Applied Research

PHASE I PROPOSAL INSTRUCTIONS

The Defense SBIR/STTR Innovation Portal (DSIP) is the official portal for DoD SBIR/STTR proposal submission. Proposers (also referred to herein as "offeror(s)") are required to submit proposals via DSIP; proposals submitted by any other means will be disregarded. Detailed instructions regarding registration and proposal submission via DSIP are provided in the DoD SBIR Program BAA.

Proposal Coversheet (Volume 1)

The proposal coversheet must follow the instructions and requirements provided in the DoD SBIR Program BAA.

The offeror shall certify that to the best of its knowledge and belief, its eligibility information under the SBIR Program is accurate, complete, and current as of the date of the offer.

Technical Volume (Volume 2)

The technical volume proposal is not to exceed 5 word document pages and must follow the formatting requirements provided in the DoD SBIR Program BAA. A commercialization plan must also accompany the technical volume proposal and must be 8 slides. The required content to include within these slides are described in Appendix D. The commercialization plan must be converted from slides to pdf and attached to the end of the technical volume proposal, resulting in one pdf file to be uploaded to DSIP as Volume 2. The commercialization plan does not count towards the proposal 5-page limit. Any proposals submitted without a commercialization plan or in a format other than that provided in these Component Instructions and by the BAA will be deemed unresponsive and will not be reviewed.

Content of the Technical Volume

The Technical Volume shall contain three key sections – technical approach, team qualifications and commercialization section. The technical approach section shall contain details on how the proposer is going to solve the problem. It shall detail key elements of the firm's approach, any risks, relevant past work and how success is measured. The team qualifications section shall highlight the key personnel working on the project, and the resources that will be brought to bear on solving the problem.

The commercialization plan shall include:

Company information: Focused objectives/core competencies; specialization area(s); products with significant sales; and history of previous Federal and non-Federal funding, regulatory experience, and subsequent commercialization successes.

Customer and Competition: Clear description of key technology objectives, current competition, and advantages compared to competing products or services; description of hurdles to acceptance of the innovation.

Market: Milestones, target dates, analyses of market size, and estimated market share after first year sales and after 5 years; explanation of plan to obtain market share.

Intellectual Property: Patent status, technology lead, trade secrets or other demonstration of a plan to achieve sufficient protection to realize the commercialization stage and attain at least a temporal competitive advantage.

Financing: Plans for securing necessary non-SBIR funding.

Assistance and mentoring: Plans for securing needed technical or business assistance through mentoring, partnering, or through arrangements with government sponsored (e.g., State assistance programs, Federally-funded research laboratories, Manufacturing Extension Partnership centers), not-for-profits (e.g., SBDC), commercial accelerators, DOD Prime Contractors, or other assistance provider.

These instructions supersede those stated in section 5.3.c of the DoD Program BAA.

Cost Volume (Volume 3)

The Cost Volume must follow all instructions and requirements provided in the DoD SBIR Program BAA. Supplemental requirements are as follows:

The Phase I Base amount must not exceed \$250,000 for a 6-month period of performance, unless otherwise specified in the topic description pages. Phase I Options are not anticipated at this time. If an option is identified in the topic posting, costs for the Base and Option must be separated and clearly identified on the Proposal Cover Sheet (Volume 1) and in Volume 3. Awards for these topics will be in the form of a firm fixed price contract.

Please review the updated Percentage of Work (POW) calculation details included in section 5.3 of the DoD Program BAA. Army Applied SBIR will occasionally accept deviations from the POW requirements with written approval from the Funding Agreement officer.

For pricing purposes, offerors shall assume a contract or agreement start date of approximately ninety (90) days after submission of the proposal. For this BAA, adequate price competition (APC), as defined in FAR 15.403-1(c), is anticipated. In the event that adequate price competition is not realized (i.e. only one proposal is received for a given topic), the Government may choose to conduct additional proposal analysis, in accordance with the techniques identified at FAR 15.404-1. Additionally, offerors are to provide any current Forward Pricing Rate Agreements (FPRA) in effect at time of proposal submission.

Content of the Cost Volume (Volume 3)

ALL proposed costs should be accompanied by documentation to substantiate how the cost was derived. Substantiating documentation guidance is as follows:

LABOR:

List all key personnel by name as well as by number of hours dedicated to the project as direct labor.

Explain the basis of proposed labor hours, including required tasks, and substantiating documentation for the costs (e.g. payroll reports). Volume 5, Supporting Documents, may be used if additional space is needed.

MATERIAL/TOOLING/EQUIPMENT:

Explain the basis of proposed material and equipment costs. This support should include a consolidated priced summary of individual material and equipment quantities and substantiating documentation for the costs (e.g. vendor quotes, invoice prices, competitive bids, etc.). If your choice isn't the lowest cost available, explain the decision to choose one item or supplier over another. Volume 5, Supporting Documents, may be used if additional space is needed.

Ensure all materials are American-made to the maximum extent practicable. Offerors who propose to use a foreign-made product in its technology may be required to find an American-made equivalent.

While special tooling and test equipment and material cost may be included, it will be carefully reviewed relative to need and appropriateness for the work proposed. The purchase of special tooling and test equipment must, in the opinion of the Component Contracting Officer, be advantageous to the Government and should be related directly to the specific topic. These may include such items as innovative instrumentation or automatic test equipment. Title to property furnished by the Government or acquired with Government funds will be vested with the DoD Component, unless it is determined that transfer of title to the contractor would be more cost effective than recovery of the equipment by the DoD Component.

TRAVEL:

Explain the basis of proposed travel, including to/from locations, number of trips, number of travelers per trip, and number of days/nights per trip. Include substantiating documentation for the costs (e.g. screenshots of flight cost comparison, rental car quotes, etc.). NOTE: Virtual meetings shall be utilized to the maximum extent practicable. Volume 5, Supporting Documents, may be used if additional space is needed.

SUBCONTRACTS: A subcontract is any agreement, other than one involving an employer-employee relationship, entered into by the prime contractor (awardee) calling for supplies or services for the performance of the contract.

All subcontractor costs and consultant costs must be detailed at the same level as prime contractor costs in regard to labor, travel, equipment, etc.

Explain the basis of proposed subcontract costs. Include documented support of the offeror's price analyses and degree of competition of all subcontractor proposals. All subcontractor costs and consultant costs, such as labor, travel, equipment, materials, must be detailed at the same level as prime contractor costs. Provide detailed substantiation of subcontractor costs in your cost proposal. Volume 5, Supporting Documents, may be used if additional space is needed.

Certify that the following requirements are met: For Phase I, the offeror must perform a minimum of two-thirds of the research and/or analytical effort. One third may be subcontracted to another firm or research organization/facility. The percentage of work is measured by both direct and indirect costs.

Offerors shall not propose to subcontract to the issuing agency, to any other Federal Government agency, or to other units of the Federal Government, except Federal Laboratories in rare circumstances. As defined in 15 U.S.C. 3703, Federal Laboratory means any laboratory, any federally funded research and development center, or any center established under 15 U.S.C. 3705 and 3707 that is owned, leased, or otherwise used by a Federal Agency and funded by the Federal Government, whether operated by the Government or by a contractor.

Offerors shall not propose to subcontract to any prohibited sources. Proposals identifying a subcontractor/vendor arrangement with a prohibited source may be rejected.

Offerors shall ensure subcontracting arrangements are with United States Small Businesses to the maximum extent practicable. Offerors proposing a subcontractor arrangement with other than a United States Small Business (such as, a large business, foreign firm, foreign government, educational institution, unit of Federal Government, etc.) may be required to submit further explanation.

INDIRECT COSTS:

Explain the basis of the proposed indirect expense rates including overhead, general and administrative, material handling, and fringe benefits.

If a Defense Contract Audit Agency (DCAA) Audit has been conducted within the last five (5) years, include the audit compliance documentation in the cost proposal documents. The documentation should also include the offeror's DCAA Point of Contact (if applicable).

If selected, failure to include the documentation with your proposal may delay contract award, as the proposer will be asked to submit the necessary documentation to the Contracting Officer to

substantiate costs. It is important to respond as quickly as possible to the Contracting Officer's request for documentation. Failure or refusal to provide documentation may result in cancellation of the contract action.

Company Commercialization Report (CCR) (Volume 4)

Completion of the CCR as Volume 4 of the proposal submission in DSIP is required. Please refer to the DoD SBIR Program BAA for full details on this requirement. Information contained in the CCR will be considered by the Department of the Army during proposal evaluations.

Supporting Documents (Volume 5)

All proposing small business concerns are REQUIRED to submit the following documents to Volume 5:

1. Contractor Certification Regarding Provision of Prohibition on Contracting for Certain Telecommunications and Video Surveillance Services or Equipment
2. Disclosures of Foreign Affiliations or Relationships to Foreign Countries
3. Disclosure of Funding Sources

Please refer to the DoD Program BAA for more information.

Volume 5 is provided for proposers to submit additional documentation to support the Cover Sheet (Volume 1), Technical Volume (Volume 2), and the Cost Volume (Volume 3). In addition to the Volume 5 requirements outlined in the DoD Program BAA, the Department of the Army may accept the following documents in Volume 5:

- Additional Cost Information
- Funding Agreement Certification
- Technical Data Rights (Assertions)
- Lifecycle Certification
- Allocation of Rights
- Other (only as specified in the topic)

Please only submit documents that are identified immediately above and in the DoD Program BAA. All other documents submitted will be disregarded.

DIRECT TO PHASE II PROPOSAL INSTRUCTIONS

The Defense SBIR/STTR Innovation Portal (DSIP) is the official portal for DoD SBIR/STTR proposal submission. Proposers (also referred to herein as "offeror(s)") are required to submit proposals via DSIP; proposals submitted by any other means will be disregarded. Detailed instructions regarding registration and proposal submission via DSIP are provided in the DoD SBIR Program BAA.

Proposers interested in submitting a DP2 proposal in response to these topics must provide documentation to substantiate that the scientific and technical merit and feasibility described in the Phase I section of the topic has been met and describes the potential commercial applications. Documentation should include all relevant information including, but not limited to: technical reports, test data, prototype designs/models, and performance goals/results. Work submitted within the feasibility documentation must have been substantially performed by the proposer and/or the Principal Investigator.

The Army will not evaluate the proposer's related Phase II proposal if it determines that the proposer has failed to demonstrate that technical merit and feasibility has been established or the proposer has failed to demonstrate that work submitted in the feasibility documentation was substantially performed by the proposer and/or the PI.

Feasibility documentation cannot be based upon any prior or ongoing federally funded SBIR or STTR work and DP2 proposals MUST NOT logically extend from any prior or ongoing federally funded SBIR or STTR work.

Proposal Coversheet (Volume 1)

The proposal coversheet must follow the instructions and requirements provided in the DoD SBIR Program BAA.

The offeror shall certify that to the best of its knowledge and belief, its eligibility information under the SBIR Program is accurate, complete, and current as of the date of the offer.

Format of Technical Volume (Volume 2)

The Technical Volume must include two parts, the Feasibility Documentation, and the Technical Proposal.

The Technical Volume must be a single Portable Document Format (PDF) file, including graphics. Perform a virus check before uploading the Technical Volume file. If a virus is detected, it may cause rejection of the proposal. Do not lock or encrypt the uploaded file. Do not include or embed active graphics such as videos, moving pictures, or other similar media in the document.

The length of the Feasibility Documentation is not to exceed 5 pages and the length of the Technical Proposal is not to exceed 10 pages. A commercialization plan must also accompany the technical proposal and should be 8 slides. Any proposals submitted in a different format or exceed the page count limits will not be reviewed.

Number all pages of your proposal consecutively. Font size should not be smaller than 10- point on standard 8-1/2" x 11" paper with one-inch margins. The header on each page of the Technical Volume should contain your company name, topic number, and proposal number assigned by DSIP when the Cover Sheet was created. The header may be included in the one-inch margin.

Content of the Technical Volume: (Volume 2)

PART ONE: Feasibility and Technical Proposal (15 pages maximum)

Content of the Feasibility Documentation (Volume 2a)

The content of the Feasibility Documentation Proposers should substantiate that the scientific and technical merit and feasibility described in the Phase I section of the topic has been met and describes the potential commercial applications. Documentation should include all relevant information including, but not limited to: technical reports, test data, prototype designs/models, and performance goals/results. Work submitted within the feasibility documentation must have been substantially performed by the proposer and/or the Principal Investigator.

If you have references, include a reference list or works cited list as the last page of the feasibility documentation. This will count towards the total page limit.

Work submitted within the feasibility documentation must have been substantially performed by the proposer and/or the Principal Investigator (PI).

If technology in the feasibility documentation is subject to Intellectual Property (IP), the proposer must either own the IP, or must have obtained license rights to such technology prior to proposal submission, to enable it and its subcontractors to legally carry out the proposed work. Documentation of IP ownership or license rights shall be included in the Technical Volume of the proposal.

At a minimum, the technical proposal should address:

- What are you trying to do? Articulate your objectives without jargon.
- How is it done today, and what are the limits of current practice?
- What is new in your approach and why do you think it will be successful?
- Who cares? If you are successful, what difference will it make?
- What are the risks?
- How much will it cost?
- How long will it take?
- How do you measure success?
- What team will accomplish your mission?
- What existing / related SBIR, STTR, or other research proposals support this technology?
- What is the commercialization strategy for the proposed technology?

Content of the Technical Proposal (Volume 2b; part 1 continued)

The content of the Technical Volume should address three key areas: the technical approach, the team carrying out the work (and the accompanied resources), and the commercialization strategy. The commercialization plan should include:

- Company information: Focused objectives/core competencies; specialization area(s); products with significant sales; and history of previous Federal and non-Federal funding, regulatory experience, and subsequent commercialization successes.
- Customer and Competition: Clear description of key technology objectives, current competition, and advantages compared to competing products or services; description of hurdles to acceptance of the innovation.
- Market: Milestones, target dates, analyses of market size, and estimated market share after first year sales and after 5 years; explanation of plan to obtain market share.
- Intellectual Property: Patent status, technology lead, trade secrets or other demonstration of a plan to achieve sufficient protection to realize the commercialization stage and attain at least a temporal competitive advantage.
- Financing: Plans for securing necessary non-SBIR funding.
- Assistance and mentoring: Plans for securing needed technical or business assistance through mentoring, partnering, or through arrangements with government sponsored (e.g., State assistance programs, Federally-funded research laboratories, Manufacturing Extension Partnership centers), not-for-profits (e.g., Small Business Development Centers or Procurement Technical Assistance Centers), commercial accelerators, DOD Prime Contractors, or other assistance provider.

Proposers are free to structure each section as they like, so long as it provides sufficient detail for evaluators to understand the proposed work, who will carry it out, and how the business plans to commercialize results.

PART TWO: Commercialization Plan (8 slides/pages maximum, saved as a PDF and attached with the Technical Proposal as part of the Technical Volume).

The Army is equally interested in dual use commercialization of SBIR/STTR projects that result in products sold to the U.S. military, the private sector market, or both. The Army expects explicit discussion of key activities to achieve this result in the commercialization strategy part of the proposal.

The commercialization strategy should include the following elements:

- A summary of transition and commercialization activities, and the Technology Readiness Level (TRL) achieved. Discuss how the preliminary transition and commercialization path or paths may evolve during the Phase II project.
- Describe key proposed technical milestones during Phase II that will advance the technology towards product such as: prototype development, laboratory and systems testing, integration, testing in operational environment, and demonstrations.
- Description of Product(s) and/or System Application(s). Identify the commercial product(s) and/or DoD system(s), or system(s) under development, or potential new system(s). Identify the potential DoD end- users, Federal customers, and/or private sector customers who would likely use the technology.
- Business Model(s)/Procurement Mechanism(s). Discuss your current business model hypothesis for bringing the technology to market. Describe plans to license, partner, or self-produce your product. How do you plan to generate revenue? Understanding the Army's goal of creating and sustaining viable small businesses that support and generate advanced Army technologies, describe how you intend to develop your product and supply chains to enable this differentiation.
- Target Market. Describe the market and customer sets you propose to target, their size, their growth rate, and their key reasons they would consider procuring the technology.
- Describe competing technologies existent today on the market as well as those being developed in the lab.
- Funding Requirements. Describe your company's funding history. How much external financing have you raised? Describe your plans for future funding sources (internal, loan, angel, venture capital, etc.).
- Commercialization Risks. Describe the major technology, market and team risks associated with achieving successful transition of the Army funded technology.
- Expertise/Qualifications of Team/Company Readiness. Describe the expertise and qualifications of your management, marketing/business development and technical team that will support the transition of the technology from the prototype to the commercial market and into government operational environments. Has this team previously taken similar products/services to market? If the present team does not have this needed expertise, how do you intend to obtain it? What is the financial history and health of your company (e.g., availability of cash, profitability, revenue growth, etc.)?
- Anticipated Commercialization Results. Include a schedule showing the anticipated quantitative commercialization results from the Phase II project at one year after the start of Phase II, at the completion of Phase II, and after the completion of the Sequential Phase II (i.e., amount of additional investment, sales revenue, etc.). After a Phase II award, the company is required to report actual sales and investment data in its Company Commercialization Report at least annually.

These instructions supersede those stated in section 5.3.c of the DoD Program BAA.

Cost Volume (Volume 3)

Unless otherwise noted in the topic description, the Army will accept Direct to Phase II proposals

for a cost up to \$1,900,000 for a 24-month period of performance. Proposers are required to use the Cost Proposal method as provided on the DSIP submission site. The Cost Volume (and supporting documentation) DOES NOT count toward the page limit of the Technical Volume.

Proposers are required to use the Cost Proposal method as provided on the DSIP submission site. The Cost Volume (and supporting documentation) DOES NOT count toward the page limit of the Technical Volume.

For pricing purposes, offerors should assume a contract or agreement start date of approximately ninety (90) days after submission of the proposal. For this BAA, adequate price competition (APC), as defined in FAR 15.403-1(c), is anticipated. In the event that adequate price competition is not realized (i.e. only one proposal is received for a given topic), the Government may choose to conduct additional proposal analysis, in accordance with the techniques identified at FAR 15.404-1. Additionally, offerors are to provide any current Forward Pricing Rate Agreements (FPRA) in effect at time of proposal submission.

Content of the Cost Volume (Volume 3, cont.)

ALL proposed costs should be accompanied by documentation to substantiate how the cost was derived. For example, if you proposed travel costs to attend a project-related meeting or conference, and used a travel website to compare flight costs, include a screenshot of the comparison. Similarly, if you proposed to purchase materials or equipment, and used the internet to search for the best source, include your market research for those items. You do not necessarily have to propose the cheapest item or supplier, but you should explain your decision to choose one item or supplier over another. It's important to provide enough information to allow contracting personnel to understand how the proposer plans to use the requested funds.

Some items in the cost breakdown may not apply to the proposed project. If that is the case, there is no need to provide information on each and every item.

Cost Breakdown Guidance:

ALL proposed costs should be accompanied by documentation to substantiate how the cost was derived. Substantiating documentation guidance is as follows:

- **LABOR:**
 - List all key personnel by name as well as by number of hours dedicated to the project as direct labor.
 - Explain the basis of proposed labor hours, including required tasks, and substantiating documentation for the costs (e.g. payroll reports). Volume 5, Supporting Documents, may be used if additional space is needed.
- **MATERIAL/TOOLING/EQUIPMENT:**
 - Explain the basis of proposed material and equipment costs. This support should include a consolidated priced summary of individual material and equipment quantities and substantiating documentation for the costs (e.g. vendor quotes, invoice prices, competitive bids, etc.). If your choice isn't the lowest cost available, explain the decision to choose one item or supplier over another. Volume 5, Supporting Documents, may be used if additional space is

needed.

- Ensure all materials are American-made to the maximum extent practicable. Offerors who propose to use a foreign-made product in its technology may be required to find an American-made equivalent.
- While special tooling and test equipment and material cost may be included, it will be carefully reviewed relative to need and appropriateness for the work proposed. The purchase of special tooling and test equipment must, in the opinion of the Component Contracting Officer, be advantageous to the Government and should be related directly to the specific topic. These may include such items as innovative instrumentation or automatic test equipment. Title to property furnished by the Government or acquired with Government funds will be vested with the DoD Component, unless it is determined that transfer of title to the contractor would be more cost effective than recovery of the equipment by the DoD Component.
- TRAVEL:
 - Explain the basis of proposed travel, including to/from locations, number of trips, number of travelers per trip, and number of days/nights per trip. Include substantiating documentation for the costs (e.g. screenshots of flight cost comparison, rental car quotes, etc.). NOTE: Virtual meetings shall be utilized to the maximum extent practicable. Volume 5, Supporting Documents, may be used if additional space is needed.
- SUBCONTRACTS: A subcontract is any agreement, other than one involving an employer-employee relationship, entered into by the prime contractor (awardee) calling for supplies or services for the performance of the contract.
 - All subcontractor costs and consultant costs must be detailed at the same level as prime contractor costs in regard to labor, travel, equipment, etc.
 - Explain the basis of proposed subcontract costs. Include documented support of the offeror's price analyses and degree of competition of all subcontractor proposals. All subcontractor costs and consultant costs, such as labor, travel, equipment, materials, must be detailed at the same level as prime contractor costs. Provide detailed substantiation of subcontractor costs in your cost proposal. Volume 5, Supporting Documents, may be used if additional space is needed.
 - Certify that the following requirements are met: For Phase I, the offeror must perform a minimum of two-thirds of the research and/or analytical effort. One third may be subcontracted to another firm or research organization/facility. The percentage of work is measured by both direct and indirect costs.
 - Offerors shall not propose to subcontract to the issuing agency, to any other Federal Government agency, or to other units of the Federal Government, except Federal Laboratories in rare circumstances. As defined in 15 U.S.C. 3703, Federal Laboratory means any laboratory, any federally funded

research and development center, or any center established under 15 U.S.C. 3705 and 3707 that is owned, leased, or otherwise used by a Federal Agency and funded by the Federal Government, whether operated by the Government or by a contractor.

- Offerors shall not propose to subcontract to any prohibited sources. Proposals identifying a subcontractor/vendor arrangement with a prohibited source may be rejected.
 - Offerors shall ensure subcontracting arrangements are with United States Small Businesses to the maximum extent practicable. Offerors proposing a subcontractor arrangement with other than a United States Small Business (such as, a large business, foreign firm, foreign government, educational institution, unit of Federal Government, etc.) may be required to submit further explanation.
- **INDIRECT COSTS:**
 - Explain the basis of the proposed indirect expense rates including overhead, general and administrative, material handling, and fringe benefits.
 - If a Defense Contract Audit Agency (DCAA) Audit has been conducted within the last five (5) years, include the audit compliance documentation in the cost proposal documents. The documentation should also include the offeror's DCAA Point of Contact (if applicable).

If selected, failure to include the documentation with your proposal may delay contract award, as the proposer will be asked to submit the necessary documentation to the Contracting Officer to substantiate costs. It is important to respond as quickly as possible to the Contracting Officer's request for documentation. Failure or refusal to provide documentation may result in cancellation of the contract action.

For more information about cost proposals and accounting standards, see the DCAA publication titled "Audit Process Overview – Information for Contractors" available at: <http://www.dcaa.mil>.

Company Commercialization Report (CCR) (Volume 4; no page limitations)

Completion of the CCR as Volume 4 of the proposal submission in DSIP is required. Please refer to the DoD SBIR Program BAA <https://www.dodsbirsttr.mil/submissions/baa-schedule/broad-agency-announcements> for full details on this requirement. Information contained in the CCR will be considered by the Department of the Army during proposal evaluations.

Supporting Documents (Volume 5; no page limitations)

All proposing small business concerns are REQUIRED to submit the following documents to Volume 5:

1. Contractor Certification Regarding Provision of Prohibition on Contracting for Certain Telecommunications and Video Surveillance Services or Equipment
2. Disclosures of Foreign Affiliations or Relationships to Foreign Countries
3. Disclosure of Funding Sources

Please refer to the DoD Program BAA for more information.

Volume 5 is provided for proposers to submit additional documentation to support the Cover Sheet (Volume 1), Technical Volume (Volume 2), and the Cost Volume (Volume 3). In addition to the Volume 5 requirements outlined in the DoD Program BAA, the Department of the Army will accept the following documents in Volume 5:

- Additional Cost Information
- Funding Agreement Certification
- Technical Data Rights (Assertions)
- Lifecycle Certification
- Allocation of Rights
- Endorsement Letters
- Other (only as specified in the topic)

DISCRETIONARY TECHNICAL AND BUSINESS ASSISTANCE (TABA)

The Army, at its discretion, may provide Technical and Business Assistance (TABA). The Army will select a preferred vendor(s) for the Army SBIR TABA program through a competitive process.

Alternately, a small business concern may, by contract or otherwise, select one or more vendors to assist the firm in meeting the TABA goals. The Applicant must request the authority to select its own TABA provider in its Army SBIR proposal and must demonstrate that the vendor is uniquely postured to provide the specific technical and business services required. TABA funding will be denied if the offeror fails to include the cost and detailed explanation in its proposal.

Participation in the Army SBIR TABA program is voluntary for each Army SBIR awardee. Services provided to Army SBIR firms under the auspices of the TABA program may include, but are not limited to:

1. Access to a network of scientists, engineers, and technologists focused on commercialization and transition considerations such as protected supply chain management, advanced manufacturing, process/product/production scaling, etc;
2. Assistance with intellectual property protections, such as legal considerations, intellectual property rights, patent filing, patent fees, licensing considerations, etc;
3. Commercialization and technology transition support such as market research, market validation, development of regulatory or manufacturing plans, brand development;
4. Regulatory support such as product domain regulatory considerations, regulatory planning, and regulatory strategy development.

The Army SBIR program sponsors participation in the TABA program. The resource limitation for each firm is as follows:

- Phase I Firms:
 - Army-Preferred Vendor: If approved, the contractor may receive up to \$6,500 worth of assistance services per project per year (in addition to the base SBIR award amount).
 - Firm-Selected Vendor: If approved, the contractor may receive up to \$6,500 in contract obligation (in addition to the base SBIR award amount) per project per year.
- Phase II Firms:
 - Army-Preferred Vendor: If approved, the contractor may receive up to \$50,000 worth of assistance services per project per year (in addition to the base SBIR award amount).
 - Firm-Selected Vendor: If approved, the contractor may receive up to \$50,000 in contract obligation (in addition to the base SBIR award amount) per project per year.

EVALUATION AND SELECTION

The Army will conduct an evaluation of each responsive, timely, eligible proposal in accordance with the evaluation criteria listed in the DoD Program BAA. It is the policy of the Army to ensure equitable and comprehensive proposal evaluations based on the evaluation criteria and to select the source (or sources) whose offer meets the Government's technical, policy, and programmatic goals.

As previously stated herein, timeliness, responsiveness, and eligibility will be assessed upon initial screening, during evaluation, and after selection. Proposals that do not comply with the instructions and requirements detailed in this document, the DoD Program BAA, or the corresponding Topic posting (including the research objective(s)), will be considered ineligible, nonresponsive, untimely, or non-conforming and therefore will not be evaluated or considered for award.

Using the evaluation criteria, the Government will evaluate each responsive, timely, eligible proposal in its entirety. Proposals will not be evaluated against each other during the evaluation process, but rather evaluated on their own individual merit to determine how well the proposal meets the criteria stated in this BAA and the corresponding opportunity.

Selected proposals are those determined to be the most advantageous to the Government, consistent with instructions and evaluation criteria specified in the DoD Program BAA, the component-specific instructions herein, the corresponding Topic posting, and availability of funding.

Proposing firms will be notified via email of selection or non-selection status for a Phase I or direct to Phase II award within 90 days of the closing date of the Topic. The notification will be sent to the Corporate Official listed on the proposal cover sheet from the Army SBIR Program Office mailbox. The Army promotes transparency regarding the technical evaluation for all Army SBIR proposals. The Army will provide a technical evaluation narrative to the proposer in accordance with the SBA Policy Directive, Appendix I, paragraph 4. The selection decision notice contains instructions for retrieving the technical evaluation narrative.

Proposers must not regard the notification email (selection decision notice) as an authorization to commit or expend funds. After the Army SBIR Office has recommended a proposal for award, a Government Contracting Officer may contact the proposer in order to discuss and request additional information required for award. This may include representations and certifications, certified or other than certified cost data, subcontracting plan for small businesses, and/or other information as applicable to the proposed award. Proposers must not regard these communications as an authorization to commit or expend funds. Unless a Government Contracting Officer signs the award document (i.e. contract), no obligations to provide funding are made. The Government may reject the proposal or cancel the contract action at any time.

If signed by the Government Contracting Officer, the award document is the official and authorizing instrument (i.e. contract). The anticipated period of performance start date will be determined at time of award. The Contracting Officer will email the signed, authorizing award instrument to the principal investigator (PI) and/or an authorized organization representative.

PROTESTS

Refer to the DoD SBIR Program BAA for procedures to protest the Announcement.

Feedback will be provided to applicants that are not selected for further consideration. A notification letter will include instructions for obtaining feedback in the form of a ValidEval Report. Offerors are

entitled to no more than one feedback per proposal. NOTE: Feedback is not the same as a FAR Part 15 debriefing. Acquisitions under this solicitation are awarded via “other competitive procedures (FAR 6.102(d)(2)).” Therefore, offerors are neither entitled to nor will they be provided FAR Part 15 debriefs. As further prescribed in FAR 33.106(b), FAR 52.233-3, Protests after Award shall be submitted to the Point of Contract identified in the topic solicitation:

Email: usarmy.pentagon.hqda-asa-alt.mbx.army-applied-sbir-program@mail.mil

Mailing Address:

Army Applied SBIR Office
2530 Crystal Dr.; Ste 11192
Arlington, VA 22202

Appendix A Phase I Evaluation Criteria

Applied SBIR Phase I Proposal Review v2-0-3 Evaluation Criteria Defined



| | | DEFINITION |
|----------------------------------|---|--|
| INTRODUCTION | <i>weight 5%</i> | Write a clear, concise description of what your innovation does or will do, and where you are in your evolution. Make clear its intended impact on the Army. Evaluators should "get it" after reading this. |
| POTENTIAL FOR ARMY IMPACT | OPERATIONAL IMPACT | At the scale of a single Army end-user, argue that their jobs or lives will be significantly improved if your solution is adopted. What is the impact of your solution for a soldier/Army civilian vs. today's solutions? |
| | POTENTIAL SCALE OF IMPACT | Here, we're looking for an idea of how broad the impact you described above could be. Look into the future to a time when your solution is both technically mature and actively in use by Army personnel. Describe the scale and scope of your impact within the context of the Army. |
| TECHNICAL FEASIBILITY | SCIENTIFIC FEASIBILITY | Is the science behind the solution sound? Convince readers who don't have deep expertise in your field that your innovation is built atop sound scientific and engineering principles. |
| | ENABLING TECHNOLOGIES | Point to the foundational technologies that you rely on to deliver your solution. Do the required enabling technologies introduce added risk? Using proven (and ideally Army-fielded) underlying technologies and techniques helps to lower technical risk. |
| | ALTERNATIVE TECHNICAL APPROACHES | From a technologist's perspective, why is your proposed solution the best choice for the Army? Refute the alternative engineering approaches others are using. Why does your technology win? |
| | TECHNICAL RISK MITIGATION | No matter your current technology readiness level, technical risks remain. Identify those risks. Present a credible plan to tackle those risks. |
| TRANSITION | ARMY TRANSITION PATHWAY | Planning for success, what's next for you after this SBIR award? Describe the next type of deal you aim to make with the Army, e.g. a CRADA, a different SBIR contract, a CSO, etc. Briefly outline your current plan to unlock that next opportunity and/or share the biggest risks you see post this SBIR award. |
| | SBIR MILESTONE SCHEDULE | Please share with us a thoughtful execution plan. Strike a balance between giving us a sense of the detailed thinking behind the scenes and the need for your contracting officer to manage a reasonably small number of milestones during your period of performance. |
| FIRM CASH FLOW | FIRM SURVIVAL RISK | SBIR funds are meant to fuel growth rather than stave off a firm's impending financial failure. Demonstrate that your company will survive financially as a going concern through the early stages of a Phase III contract, sometimes referred to as "transitioning" into use by Army personnel. |
| | OTHER PEOPLE'S MONEY | Make the case that non-Army and/or non-DoD dollars will continue to fund improvements to your solution from which the Army will benefit in the future. Companies who cannot demonstrate non-Army and/or non-DoD funding sources for future solution enhancements are less attractive to the Applied SBIR program. |
| | FINANCIAL PROFIT POTENTIAL | Through the Applied SBIR program, the Army wants to take advantage of the speed and scalability of dual-use companies. Make your best case that your product is or will be profitable. If you have more than one product, please focus your argument on the product / solution presented for this SBIR program. |
| TEAM ABILITY | <i>weight 10%</i> | Prove your team has executed well as a group. Please draw clear distinctions between private sector, DoD and civilian government work. What milestones have you accomplished as a group in this company? |
| SUBMISSION QUALITY | QUALITY OF PROSE | Prove you write clearly. Prove you argue convincingly. |
| | DATA QUALITY & ATTRIBUTION | Support your arguments with relevant, properly attributed data to enhance your credibility. |

Appendix B Direct to Phase II Evaluation Criteria

Applied SBIR D2P2 Proposal Review v2-0-4 Evaluation Criteria Defined



| | | DEFINITION |
|----------------------------------|---|--|
| INTRODUCTION | <i>weight 2%</i> | Write a clear, concise description of what your innovation does or will do, and where you are in your evolution. Make clear its intended impact on the Army. Evaluators should "get it" after reading this. |
| POTENTIAL FOR ARMY IMPACT | OPERATIONAL IMPACT | At the scale of a single Army end-user, argue that their jobs or lives will be significantly improved if your solution is adopted. What is the impact of your solution for a soldier/Army civilian vs. today's solutions? |
| | POTENTIAL SCALE OF IMPACT | Here, we're looking for an idea of how broad the impact you described above could be. Look into the future to a time when your solution is both technically mature and actively in use by Army personnel. Describe the scale and scope of your impact within the context of the Army. |
| TECHNICAL FEASIBILITY | SCIENTIFIC FEASIBILITY | Is the science behind the solution sound? Convince readers who don't have deep expertise in your field that your innovation is built atop sound scientific and engineering principles. |
| | ENABLING TECHNOLOGIES | Point to the foundational technologies that you rely on to deliver your solution. Do the required enabling technologies introduce added risk? Using proven (and ideally Army-fielded) underlying technologies and techniques helps to lower technical risk. |
| | ALTERNATIVE TECHNICAL APPROACHES | From a technologist's perspective, why is your proposed solution the best choice for the Army? Refute the alternative engineering approaches others are using. Why does your technology win? |
| | TECHNICAL RISK MITIGATION | No matter your current technology readiness level, technical risks remain. Identify those risks. Present a credible plan to tackle those risks. |
| TRANSITION | ARMY TRANSITION PATHWAY | Planning for success, what's next for you after this SBIR award? Describe the next type of deal you aim to make with the Army, e.g. a CRADA, a different SBIR contract, a CSO, etc. Briefly outline your current plan to unlock that next opportunity and/or share the biggest risks you see post this SBIR award. |
| | SBIR MILESTONE SCHEDULE | Please share with us a thoughtful execution plan. Strike a balance between giving us a sense of the detailed thinking behind the scenes and the need for your contracting officer to manage a reasonably small number of milestones during your period of performance. |
| FIRM CASH FLOW | FIRM SURVIVAL RISK | SBIR funds are meant to fuel growth rather than stave off a firm's impending financial failure. Demonstrate that your company will survive financially as a going concern through the early stages of a Phase III contract, sometimes referred to as "transitioning" into use by Army personnel. |
| | OTHER PEOPLE'S MONEY | Make the case that non-Army and/or non-DoD dollars will continue to fund improvements to your solution from which the Army will benefit in the future. Companies who cannot demonstrate non-Army and/or non-DoD funding sources for future solution enhancements are less attractive to the Applied SBIR program. |
| | FINANCIAL PROFIT POTENTIAL | Through the Applied SBIR program, the Army wants to take advantage of the speed and scalability of dual-use companies. Make your best case that your product is or will be profitable. If you have more than one product, please focus your argument on the product / solution presented for this SBIR program. |
| TEAM ABILITY | <i>weight 10%</i> | Prove your team has executed well as a group. Please draw clear distinctions between private sector, DoD and civilian government work. What milestones have you accomplished as a group in this company? |
| SUBMISSION QUALITY | QUALITY OF PROSE | Prove you write clearly. Prove you argue convincingly. |
| | DATA QUALITY & ATTRIBUTION | Support your arguments with relevant, properly attributed data to enhance your credibility. |

Appendix C Phase II Evaluation Criteria

Applied SBIR Phase II Proposal Review v2-0-3 Evaluation Criteria Defined



| | | DEFINITION |
|----------------------------------|---|--|
| INTRODUCTION | <i>weight 2%</i> | Write a clear, concise description of what your innovation does or will do, and where you are in your evolution. Make clear its intended impact on the Army. Evaluators should "get it" after reading this. |
| POTENTIAL FOR ARMY IMPACT | OPERATIONAL IMPACT | At the scale of a single Army end-user, argue that their jobs or lives will be significantly improved if your solution is adopted. What is the impact of your solution for a soldier/Army civilian vs. today's solutions? |
| | POTENTIAL SCALE OF IMPACT | Here, we're looking for an idea of how broad the impact you described above could be. Look into the future to a time when your solution is both technically mature and actively in use by Army personnel. Describe the scale and scope of your impact within the context of the Army. |
| TECHNICAL FEASIBILITY | SCIENTIFIC FEASIBILITY | Is the science behind the solution sound? Convince readers who don't have deep expertise in your field that your innovation is built atop sound scientific and engineering principles. |
| | ENABLING TECHNOLOGIES | Point to the foundational technologies that you rely on to deliver your solution. Do the required enabling technologies introduce added risk? Using proven (and ideally Army-fielded) underlying technologies and techniques helps to lower technical risk. |
| | ALTERNATIVE TECHNICAL APPROACHES | From a technologist's perspective, why is your proposed solution the best choice for the Army? Refute the alternative engineering approaches others are using. Why does your technology win? |
| | TECHNICAL RISK MITIGATION | No matter your current technology readiness level, technical risks remain. Identify those risks. Present a credible plan to tackle those risks. |
| TRANSITION | ARMY TRANSITION PATHWAY | Planning for success, what's next for you after this SBIR award? Describe the next type of deal you aim to make with the Army, e.g. a CRADA, a different SBIR contract, a CSO, etc. Briefly outline your current plan to unlock that next opportunity and/or share the biggest risks you see post this SBIR award. |
| | SBIR MILESTONE SCHEDULE | Please share with us a thoughtful execution plan. Strike a balance between giving us a sense of the detailed thinking behind the scenes and the need for your contracting officer to manage a reasonably small number of milestones during your period of performance. |
| FIRM CASH FLOW | FIRM SURVIVAL RISK | SBIR funds are meant to fuel growth rather than stave off a firm's impending financial failure. Demonstrate that your company will survive financially as a going concern through the early stages of a Phase III contract, sometimes referred to as "transitioning" into use by Army personnel. |
| | OTHER PEOPLE'S MONEY | Make the case that non-Army and/or non-DoD dollars will continue to fund improvements to your solution from which the Army will benefit in the future. Companies who cannot demonstrate non-Army and/or non-DoD funding sources for future solution enhancements are less attractive to the Applied SBIR program. |
| | FINANCIAL PROFIT POTENTIAL | Through the Applied SBIR program, the Army wants to take advantage of the speed and scalability of dual-use companies. Make your best case that your product is or will be profitable. If you have more than one product, please focus your argument on the product / solution presented for this SBIR program. |
| TEAM ABILITY | <i>weight 5%</i> | Prove your team has executed well as a group. Please draw clear distinctions between private sector, DoD and civilian government work. What milestones have you accomplished as a group in this company? |
| SUBMISSION QUALITY | QUALITY OF PROSE | Prove you write clearly. Prove you argue convincingly. |
| | DATA QUALITY & ATTRIBUTION | Support your arguments with relevant, properly attributed data to enhance your credibility. |

Appendix D

Commercialization Plan Template

General Instructions/Guidance:

1. The slide deck must be 8 slides total, per Component Instructions, and follow the formatting contained in the template. Font size shall be no smaller than 10-point font.
2. Slides should display the slide number in bottom right corner
3. All text (including tables, charts, plots, axes labels, legends, captions) must be readable without zooming and understandable without voice-over
4. For plots and charts:
 - a. Include title/bullet describing importance of plot/chart, and/or data (be specific)
 - b. Axes must be meaningfully labeled (to be understandable by non-experts) and include scale
5. Avoid jargon; define technical terms
6. Convert from slide format to a PDF file for submission to DSIP alongside the technical volume proposal
7. To insert images, capture a screenshot of the image and paste it into the slide. Please do not drag-drop a file into the presentation or use the Insert Pictures menu function.
8. Use PowerPoint's "Compress Pictures" feature to reduce file size
 - a. Select 96ppi resolution
 - b. Uncheck "For this picture only"
9. Replace the boilerplate footer below with distribution markings as appropriate
10. Do not put any company logos (Twitter, Reddit, GitHub, etc) on your slides

To be considered valid proposals, Commercialization Plan submissions must follow the number and content of each slide as contained in the attached template.

Appendix D
Commercialization Plan Template cont.

Firm Name

SBIR Project Title

Principal Investigator Name / Title
Key (or other relevant) Personnel, and
Subcontractors

.....
Insert Topic Number
Insert Proposal Number

Distribution markings as appropriate for your organization

BLUF: Bottom Line Up Front

- **BLUF:**
 - 1. Company information and background** : Core competencies, significant sales, previous funding, commercialization successes.
 - 2. Customer and Competition** : Clear description of key technology objectives, current competition, and advantages.
 - 3. Market:** Plan to obtain market share.
 - 4. Intellectual Property:** Patent status, technology lead, trade secrets or other demonstration of a plan to protect the company's technical advantage.
 - 5. Financing/Revenue:** Plans for securing necessary non -SBIR funding.
 - 6. Assistance and mentoring** : Plans for securing needed technical or business assistance.

Distribution markings as appropriate for your organization

Appendix D

Commercialization Plan Template cont.

Company Information and Background

- Core competencies and areas of specialization.
- Products with significant sales.
- Concise history of previous Federal and non -Federal funding/investments.
- Regulatory experience (if applicable).
- Past commercialization successes.
- Past failure and how you overcame .

Distribution markings as appropriate for your organization

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Customer & Competition

- Description of key technology objectives.
- Current competition and/or alternative solutions.
- Advantages of company's offer compared to competing products or services.
- Hurdles to acceptance of the proposed innovation.
- Description of possible areas where your technology may be utilized or is under utilized.

Distribution markings as appropriate for your organization

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Appendix D Commercialization Plan Template cont.

Market

- Analysis of market size and 1 and 5 year forecasted market share.
- Explanation of milestones and target dates of plan to obtain that market share.
- What experience do you have with marketing to this target market?
- What commercialization strategy appears to be the best for bringing this product to the target market?
- What experience do you have with bring products to market – either through this company or though other companies with which you have worked.
- Does the company currently market, manufacture, or license technology? Describe what you do.

Intellectual Property

- Patent status, technology lead, trade secrets or other demonstration of a plan to achieve sufficient protection to realize the commercialization stage and attain at least a temporary competitive advantage .
- Describe how you will protect the intellectual property that enables commercialization of its products while keeping competitors at bay. Note any actions you may consider to attain at least a temporary competitive advantage. Also consider your company's prior record in this area. Comment on your company's strategy to build a sustainable business through protection of intellectual property .

Appendix D

Commercialization Plan Template cont.

Financing

- Plan for securing non-SBIR, private or government funding necessary to enter low rate of production of anticipated technical solution.
- Describe your revenue stream generation to include but not limited to:
 - Manufacture and direct sales
 - Sales through value added resellers or other distributors
 - Joint venture

Distribution markings as appropriate for your organization

7

Assistance & Mentoring

- Plans for securing needed technical or business assistance through mentoring, partnering, or arrangements with government sponsored (e.g., SBIR funded Discretionary Technical and Business Assistance (TABAs), State assistance programs, Federally-funded research laboratories, Manufacturing Extension Partnership centers), not-for-profits (e.g., Small Business Development Center (SBDC) or Small Business Technical Development Center (SBTDC)), commercial accelerators, DOD Prime Contractors, SBA Mentor - Protégé program, Procurement Technical Assistance Center (PTAC) or other assistance provider.

Distribution markings as appropriate for your organization

8

Army SBIR 23.4 Topic Index
Release 15

- A234-020 DEEP-BIM: Dynamic Enhanced Environment Perception - Building Information Models
- A234-021 Machine Translation for Indo-Pacific Low Resource Languages

A234-020 DEEP-BIM: Dynamic Enhanced Environment Perception - Building Information Models

OUSD (R&E) CRITICAL TECHNOLOGY AREA(S): Trusted AI and Autonomy; Advanced Computing and Software

OBJECTIVE: The proposed topic is a Direct-to-Phase-II effort to develop and integrate advanced building model generation capabilities into the Defense Threat Reduction Agency (DTRA) Edge-Enhanced Mapping And Positioning System (E2MAPS) program.

DESCRIPTION: Charged with supporting operations to counter weapons of mass destruction (WMDs), DTRA leads a broad range of R&D programs that support Army, SOCOM, and DoD stakeholders. DTRA research includes technologies fielded to support missions conducted in underground facilities (UGFs) and subterranean (SubT) environments, such as E2MAPS.

The E2MAPS program is seeking a capability to perform real-time conversion of dense 3D point clouds to lightweight Building Information Models (Scan-to-BIM, collectively). Such a capability would benefit Army operators by enabling quicker identification of critical facility infrastructure, supporting mission planning, reducing cognitive load, and reducing network bandwidth. Existing capabilities to perform Scan-to-BIM in post-processing exist but cannot be applied to maps generated during fast-paced tactical operations. For this reason, DTRA is actively seeking the means to fund and integrate the proposed work.

PHASE I: This is a Direct to Phase II. The technologies to enable DEEP-BIM currently exist but have not yet been collectively applied to enable real-time Scan-to-BIM capabilities at the edge. Building information models of large facilities are currently able to be generated with commercial software using reasonable computer resources and little human correction. Object recognition using imaging and LiDAR exists to support these capabilities as well as a host of other applications. Edge computing capabilities are widely available and applied in multiple forms with the E2MAPS program. The proposed DEEP-BIM project will integrate these technologies and enable them to be directly applied to subterranean counter-WMD operations performed by the Army, SOCOM, and other mission stakeholders

PHASE II: This topic is a Direct-to-Phase-II. Expected Deliverables include, but are not limited to a ROS-based Scan-to-BIM software module, Phase III transition plan, and Technology roadmap outline:

- Stage 0: Requirements definition. Coordinate with E2MAPS Soldier end users to prioritize features of interest, including objects, extended infrastructure, and environment.
- Milestone 0: Delivery of prioritized requirements.
- Stage 1: Development of modular, ROS-based Scan-to-BIM framework. Integration into E2MAPS.
- Stage 2: Integration of basic WMD object models into Scan-to-BIM framework using existing DTRA datasets for laboratory object identification.
- Milestone 1: DEEP-BIM Minimum Viable Product integrated into to E2MAPS.
- Stage 3: Integration of Scan-to-BIM models for extended infrastructure in UGFs.
- Milestone 2: Assessment of Scan-to-BIM ROS module at Army end user SubT realistic training event.
- Stage 4: Refinement of Scan-to-BIM ROS module. Binary, licensing, and documentation delivery.
- Milestone 3: Delivery of stable binary, licensing, and documentation.

PHASE III DUAL USE APPLICATIONS: There is high dual-use potential for building information modeling. Investments in new construction are constantly being made in both the private and public

sector. There are many opportunities for government programs and private firms to use this technology in their planning.

KEYWORDS: information model; mapping; computation; BIM; point cloud; edge computing

REFERENCES:

1. <https://www.united-bim.com/ultimate-guide-of-scan-to-bim/>
2. <https://www.truepointscanning.com/using-3d-laser-scanning-for-facility-design-modifications>
3. Wang, et al., Vision-assisted BIM reconstruction from 3D LiDAR point clouds for MEP scenes, *Automation in Construction*, October 2021. <https://doi.org/10.1016/j.autcon.2021.103997>
4. Wallbaum, et al., Towards Real-Time Scan-Versus-BIM: Methods, Applications, and Challenges, *European Conference on Computing in Construction*, July 2021. <http://dx.doi.org/10.35490/EC3.2021.17>

OUSD (R&E) CRITICAL TECHNOLOGY AREA(S): Trusted AI and Autonomy; Advanced Computing and Software

OBJECTIVE: US Army Pacific executes Operation Pathways within the INDOPACOM AOR and the multitude of languages, populations, and cultures within the INDOPACOM AOR. In order to provide effects that instantiate and reinforce the INDOPACOM Desired Perceptions (available at the SECRET//NOFORN Level), the Theater Army requires a range of Natural Language Processing (NLP) capabilities from Machine Translation to stance detection and summarization technologies to both produce effects and assess the information environment for the range of Low Resource Languages resident within this AOR.

DESCRIPTION: Recent relevant research on this topic focuses on languages within Western, educated, industrialized, rich, and democratic demographic populations. But due to the emergence of Large Language Models such as GPT-3 and 4 and BLOOM, generational improvements in Low Resource Language NLP capabilities are technically viable. USARPAC seeks to leverage those advances for languages resident in this AOR.

Most commercial access translation technologies through API and do not perform bespoke model training. Further, most commercial services perform higher level analysis (stance detection) on already translated media where best practices would necessitate development in the source language.

Computing resources are inexpensive and scalable and available training data is likely acquirable through crowd-sourced manual labeling. Some zero-shot approaches may be effective for lower-fidelity requirements. Further, this technology leverages LLMs available through open-source repositories and emerging techniques such as Dictionary-based Phrase-level Prompting of Large Language Models for Machine Translation.

By translating and assessing media in source languages, these technologies would enable reach into previously inaccessible populations and enable at-scale assessment tools rather than endure knowledge losses due to default to-English approaches.

PHASE I: A successful Phase I will have a justifiable and solidified proof of concept for low resource language.

PHASE II: Expected deliverables of this phase include a Deployed Machine Translation model. Testing and Evaluation would be executed in accordance with standard-practice metrics based on widely accepted and emerging evaluation benchmarks (FLORES) via GEMBA, Word Error Rate, Bilingual Evaluation Understudy, and other academic-grade metrics.

PHASE III DUAL USE APPLICATIONS: Initial model development will transition to continuous training and development for use-cases specific to the transition partner, US Army Pacific. There is high dual-use potential for machine translation. The technology can be used by many industries as globalization occurs and multi-lingual communications become a priority.

KEYWORDS: large language model; natural language processing; machine translation; Low resource languages

REFERENCES:

Costa-jussà, Marta R., et al. "No language left behind: Scaling human-centered machine translation." ArXivpreprint arXiv:2207.04672 (2022).

Hendy, Amr, et al. "How good are gpt models at machine translation? a comprehensive evaluation." arXivpreprint arXiv:2302.09210 (2023).

Ghazvininejad, Marjan, Hila Gonen, and Luke Zettlemoyer. "Dictionary-based Phrase-level Prompting of Large Language Models for Machine Translation." arXiv preprint arXiv:2302.07856 (2023).

DEPARTMENT OF THE ARMY
DoD 23.4 Small Business Innovation Research (SBIR) Annual BAA
Release 16
Proposal Submission Instructions

INTRODUCTION

Where big ideas come to life, the Army SBIR and STTR programs align innovative small businesses with critical U.S. Army priorities to turnover game-changing solutions to our most critical customer – the soldier.

Proposers responding to a topic in this BAA must follow all general instructions provided in the Department of Defense (DoD) SBIR 23.4 Program BAA. The DoD 23.4 SBIR Program BAA can be found here: <https://www.defensesbirsttr.mil/SBIR-STTR/Opportunities/>. Army requirements in addition to or deviating from the DoD Program BAA are provided in the instructions below.

Specific questions pertaining to the administration of the Army SBIR Program and these proposal preparation instructions should be directed to: Dr. Zach Harrell at zach.harrell.civ@aal.army

June 13, 2023: Topic issued for pre-release

July 6, 2023: Army begins accepting proposals via DSIP

July 20, 2023: DSIP Topic Q&A closes to new questions at 12:00 p.m. ET

August 1, 2023: Deadline for receipt of proposals no later than 12:00 p.m. ET

From **June 13, 2023 to July 6, 2023**, this topic is issued for Pre-Release with the names of the topic authors. During the pre-release period, proposing firms have an opportunity to contact topic authors through <https://calendly.com/zach-harrell-aal/heavy-vtol-tpoc-call> to schedule a time to ask technical questions about the topic. Questions should be limited to specific information related to improving the understanding of the topic's requirements. Proposing firms may not ask for advice or guidance on solution approach and you may not submit additional material to the topic author. If information provided during an exchange with the topic author is deemed necessary for proposal preparation, that information will be made available to all parties through the DSIP Topic Q&A module.

Once the Army begins accepting proposals on **July 6, 2023**, no further direct contact between proposers and topic authors is allowed unless the Topic Author is responding to a question submitted during the pre-release period. However, proposers may submit written questions through the DSIP Topic Q&A module at <https://www.dodsirsttr.mil/submissions/login>. The DSIP Topic Q&A for this topic opens on **July 6, 2023**, and closes to new questions on **July 20, 2023 at 12:00PM ET**. Once the BAA closes to proposal submission, no communication of any kind with the topic author or through Topic Q&A regarding your submitted proposal is allowed.

Deadline for Receipt: Proposals must be **completely** submitted no later than **12:00 p.m.** ET, on **August 1, 2023**. Proposals submitted after 12:00 p.m. ET will not be evaluated. The final proposal submission includes successful completion of all firm level forms, all required volumes, and electronic corporate official certification.

PROPOSAL GUIDELINES

The Defense SBIR/STTR Innovation Portal (DSIP) is the official portal for DoD SBIR/STTR proposal submission. Proposers are required to submit proposals via DSIP; proposals submitted by any other

means will be disregarded. Detailed instructions regarding registration and proposal submission via DSIP are provided in the DoD SBIR Program BAA.

Content of the Technical Volume

Phase II and Direct to Phase 2 (DP2) proposals should follow the following format:

<https://aal.army/assets/files/pdf/sbir-direct-phase-2-template.pdf>.

Technical Volume (Volume 2)

The technical volume is not to exceed 15 pages and must follow the formatting requirements provided in the DoD SBIR Program BAA. Any pages submitted in excess of these limits will not be considered in proposal evaluations.

Company Commercialization Report (CCR) (Volume 4)

Completion of the CCR as Volume 4 of the proposal submission in DSIP is required. Please refer to the DoD SBIR Program BAA for full details on this requirement. Information contained in the CCR will not be considered during proposal evaluations.

Supporting Documents (Volume 5)

All proposing small business concerns are REQUIRED to submit the following documents to Volume 5:

1. Contractor Certification Regarding Provision of Prohibition on Contracting for Certain Telecommunications and Video Surveillance Services or Equipment
2. Disclosures of Foreign Affiliations or Relationships to Foreign Countries
3. Disclosure of Funding Sources

Please refer to the DoD Program BAA for more information.

Proposers can submit an optional slide deck of 10 slides in Volume 5: Supporting Documents. The slide deck can contain information on the technical approach, the team, commercialization plans, or relevant technology/research the proposers have developed, and it should contain additional/complementary information to the technical volume. If a proposer elects to submit a slide deck, its information will be used in the evaluation process. A sample Slide Deck template is located here: <http://aal.army/assets/files/pdf/sbir-optional-slide-template.pdf>.

EVALUATION AND SELECTION

The Army will conduct an evaluation of each responsive, timely, eligible proposal in accordance with the evaluation criteria listed in the DoD Program BAA. It is the policy of the Army to ensure equitable and comprehensive proposal evaluations based on the evaluation criteria and to select the source (or sources) whose offer meets the Government's technical, policy, and programmatic goals.

As previously stated herein, timeliness, responsiveness, and eligibility will be assessed upon initial screening, during evaluation, and after selection. Proposals that do not comply with the instructions and requirements detailed in this document, the DoD Program BAA, or the corresponding Topic posting (including the research objective(s)), will be considered ineligible, nonresponsive, untimely, or non-conforming and therefore will not be evaluated or considered for award.

Using the evaluation criteria, the Government will evaluate each responsive, timely, eligible proposal in its entirety, documenting the strengths and weaknesses relative to each evaluation criterion. Proposals will not be evaluated against each other during the evaluation process, but rather evaluated on their own

individual merit to determine how well the proposal meets the criteria stated in this BAA and the corresponding opportunity.

Selected proposals are those determined to be the most advantageous to the Government, consistent with instructions and evaluation criteria specified in the DoD Program BAA, the component-specific instructions herein, the corresponding Topic posting, and availability of funding.

Proposing firms will be notified via email of selection or non-selection status for a Phase I or direct to Phase II award within 90 days of the closing date of the Topic. The notification will be sent to the Corporate Official listed on the proposal cover sheet from the Army SBIR Program Office mailbox. The Army promotes transparency regarding the technical evaluation for all Army SBIR proposals. The Army will provide a technical evaluation narrative to the proposer in accordance with the SBA Policy Directive, Appendix I, paragraph 4. The selection decision notice contains instructions for retrieving the technical evaluation narrative.

Proposers must not regard the notification email (selection decision notice) as an authorization to commit or expend funds. After the Army SBIR Office has recommended a proposal for award, a Government Contracting Officer may contact the proposer in order to discuss and request additional information required for award. This may include representations and certifications, certified or other than certified cost data, subcontracting plan for small businesses, and/or other information as applicable to the proposed award. Proposers must not regard these communications as an authorization to commit or expend funds. Unless a Government Contracting Officer signs the award document (i.e. contract), no obligations to provide funding are made. The Government may reject the proposal or cancel the contract action at any time.

If signed by the Government Contracting Officer, the award document is the official and authorizing instrument (i.e. contract). The anticipated period of performance start date will be determined at time of award. The Contracting Officer will email the signed, authorizing award instrument to the principal investigator (PI) and/or an authorized organization representative.

Refer to the DoD SBIR Program BAA for procedures to protest the Announcement.

AWARD AND CONTRACT INFORMATION

Please refer to the DoD Program BAA for detailed information regarding SBIR/STTR phase structure and flexibility.

Army SBIR 23.4 Topic Index
Release 16

A234-022 Heavy Lift Vertical Take-off and Landing; Heavy VTOL

A234-022 Heavy Lift Vertical Take-off and Landing; Heavy VTOL

OUSD (R&E) CRITICAL TECHNOLOGY AREA(S): Trusted AI/Autonomy; Sustainment & Logistics

OBJECTIVE:

Design, Develop and Demonstrate Heavy-lift Vertical Takeoff and Landing (HVTOL) Systems to enhance the U.S. Army's resupply capability.

DESCRIPTION:

Heavy Vertical Takeoff and Landing (HVTOL) Systems will provide unique capabilities over currently planned VTOL systems in that they will provide upward of 10X the lift capability. This ability is vital for future Army combat operations. Successful advancement of Heavy-Lift Vertical Takeoff and Landing (HVTOL) Systems would enhance U.S. Army modernization priorities by increasing the amount of equipment that can be carried by a single platform at one time. This will reduce the number of flights it takes to resupply a forward unit, allow for heavier modular mission payloads to be carried and ultimately take Soldiers out of harm's way by utilizing an uncrewed platform.

Currently there are no uncrewed systems being fielded to US Army units. The Joint Tactical Autonomous Aerial Resupply System (JTAARS) is only requiring a lift capability of 125 lbs payload capability while other efforts are crewed cargo lift platforms at or above 3000lbs, on autonomous conversions utilizing full-sized helicopter platforms. Primary obstacles to overcome for successful operation of Heavy-Lift Vertical Takeoff and Landing (HVTOL) Systems is the balance of lift capability versus the distance a platform can fly to resupply units while displaying to Army units the time and effort saved by utilizing these platforms.

The goals of this effort are the design, development, and demonstration of Heavy Vertical Takeoff and Landing (HVTOL) Systems that can lift a threshold or minimum of 800lbs and goal of 1400lbs while having the ability to fly 100 miles threshold/minimum and a goal of greater than 100 miles.

These designs should be able to be loaded and unloaded in the field either by soldiers or autonomously, be able to fly autonomously or with human takeover, assist and fly routes while avoiding obstacles, select multiple routes, have an override system that allows soldiers to divert or modify resupply locations, autonomously select safe landing zones, have an override for human landing zone selection. Systems should be able to utilize or integrate modular mission payloads moving forward and common attachment systems are of benefit.

PHASE I:

This topic is accepting Direct to Phase II proposals only. Feasibility documentation should describe a design for a new or improved existing VTOL craft to achieve threshold or minimum of 800lbs and goal of 1400lbs payload capacity, while having the ability to fly 100 miles threshold/minimum and a goal of greater than 100 miles. The resulting design should include any relevant features or modifications to include air frame, propulsion, fuel/power systems, control, autonomy, navigation, hazardous cargo handling, and safety/loss of signal.

PHASE II:

In this Direct to Phase II solicitation, companies should be able to clearly indicate progress beyond the goals outlined in phase I in their proposals. For Direct to Phase II, companies will Develop and Demonstrate Heavy-Lift Vertical Takeoff and Landing (HVTOL) Systems. The system should include navigation controls, obstacle avoidance, override systems, loading and unloading controls, instructions, and training and safety instructions. Required Phase 2 deliverables include all necessary components (hardware and software) to control the platform, attach payload to the platform (TBD), ability to select navigation route, route override, landing or delivery zone selection, zone selection override, lost link

control, system safety, remote payload controls, ammo safe capability, soldier safety capable, a final report, and monthly progress reports. The system will be demonstrated in future Army experimentation or test events to evaluate performance.

Phase II evaluation goals will include:

- Demonstrated lift capability at test ranges, with a stage-gate lift of 500lbs at an Army experimentation or test event in early-mid 2024, prior to completion of the period of performance (PoP). Success is required to become eligible for a sequential phase II.
- Full systems, plans, designs, or other documentation that clearly shows how this technology will progress to a demonstrated lift in the 800-1400lb range during a potential phase II sequential award. Companies that do not include these detailed plans will not be eligible for full technical consideration.

Phase II duration is not to exceed 12 months and a cost of \$3 million.

This topic is planning for an immediate sequential phase II award to demonstrate lift/transport progress from the 500lb milestone to a demonstrated lift of 800 – 1400 lbs following the conclusion of the original PoP. Further requirements to be addressed in the sequential award will include ability to integrate with DoD's Modular Open Systems Architecture (MOSA), control systems, spectrum management, hardening/security, etc.

- Preferred integration with an externally supplied autonomous payload (selected vendors will be informed following contracting)
- Final performance demonstration of minimum 800lb lift at an Army experimentation or test event in spring 2025, with external autonomous payload integration.
- Test reports detailing solution performance.
- Product documentation detailing operation of prototype.
- Monthly progress reports describing all technical challenges, technical risk, and progress against the schedule.
- Final technical report, to specifically include system cost.

Sequential Phase II duration is not to exceed 12 months and a cost of \$3 million.

In accordance with the Small Business Act (15 U.S.C. §638, subsection (aa)(1)), no Federal agency may issue an award under the SBIR program or the STTR program if the size of the award exceeds the award guidelines established under this section by more than 50 percent without a waiver from the SBA. SBA shall adjust the maximum dollar amount every year for inflation. As of October 2022, agencies may issue a Phase I award (including modifications) up to \$295,924 and a Phase II award (including modifications) up to \$1,972,828 without seeking SBA approval. Any award above those levels will require a waiver. *Any award resulting from this solicitation that exceeds these amounts is subject to the SBA's prior approval of such waiver as a pre-requisite to funds availability; this solicitation does not guarantee any award.*

Army Applications Laboratory has secured a waiver to exceed the maximum phase II award amount for this solicitation as well as the follow-on sequential award.

PHASE III:

The objective of Phase III, where appropriate, is for the small business to pursue commercialization objectives through the effort. Companies may develop a manufacturing-ready product design, capable

of integration with the existing or future system, and demonstrate technology integration. Low-rate production will occur as required. Companies will engage in laboratory or operational testing as required. Phase III deliverables include system-level integration technical data package, installation documentation, and system-level prototype for demonstration and government-sponsored testing.

Additionally, Phase III goals will include:

- Additional capability developments
- Performance measurement in a variety of different operational test environments
- Test reports detailing solution performance.
- Operationally relevant demonstration of lift system integration with payload system
- Working toward further technology improvements, additional testing/modifications, and integration with Army stakeholders toward large scale adoption and commercialization.

KEYWORDS:

VTOL; Heavy UAS; Cargo UAS; Contested Logistics; Resupply; Autonomous UAS;

REFERENCES:

1. https://www.army.mil/article/219887/jtaars_concept_presented_to_industry
2. https://www.army.mil/article/265428/army_focuses_on_contested_logistics_a_threat_to_enemy
3. <https://www.forbes.com/sites/davidhambling/2021/03/16/us-army-pushes-ahead-with-battlefield-resupply-drones/?sh=b67f5796b94f>
4. <https://www.sciencedirect.com/science/article/abs/pii/S1570870522000178> (The introduction section gives good information on potential mission types and needs; the inclusion of this reference is not intended to endorse any of the article's methods or conclusions)
5. <https://warontherocks.com/2022/05/flying-dirty-unmanned-casualty-evacuation-on-the-contaminated-battlefield/>

DEPARTMENT OF THE ARMY
DoD 23.4 Small Business Innovation Research (SBIR)
Annual Broad Agency Announcement (BAA)
Component-Specific Proposal Instructions
Release 17

July 18, 2023: Topics issued for pre-release

July 27, 2023: Army begins accepting proposals via DSIP

August 15, 2023: DSIP Topic Q&A closes to new questions at 12:00 p.m. ET

September 5, 2023: Deadline for receipt of proposals no later than 12:00 p.m. ET

INTRODUCTION

The future Army must be capable of conducting Multi-Domain Operations (MDO) as part of an integrated Joint Force across an array of situations in multiple theaters by 2035. The MDO concept describes how the Army will support the Joint Force in the rapid and continuous integration of all domains of warfare – land, sea, air, and cyberspace – to deter and prevail as we compete short of conflict, and fight and win if deterrence fail. The Army must provide game-changing capabilities to our Soldiers. To capitalize on small business innovation, the Army has implemented an approach to advertise SBIR funding opportunities through the Department of Defense (DoD) Annual BAA process, outside of the three pre-determined BAA cycles. This approach also strives to create a more rapid award time from solicitation to closing.

CONTACT INFORMATION

Direct specific questions pertaining to the administration of the Department of the Army SBIR Program and proposal preparation instructions to the Point of Contact identified in the Topic announcement. General questions can be directed to the following:

Email: usarmy.pentagon.hqda-asa-alt.mbx.army-applied-sbir-program@army.mil

Website: <https://www.armysbir.army.mil/>

Mailing Address:

Army Applied SBIR Office 2530 Crystal Dr.; Ste 11192
Arlington, VA 22202

RESPONSIVENESS AND TIMELINESS

All proposals will be evaluated and judged on a competitive basis. Proposals will only be evaluated in response to an active, corresponding Army topic. Proposals will be initially screened to determine responsiveness and timeliness. Proposals passing this initial screening will be technically evaluated by engineers or scientists to determine the most promising technical and scientific approaches. Assessment of responsiveness may continue during technical evaluation and after selection. If at any point the proposal is deemed untimely, unresponsive, ineligible, or non-responsible, the proposal will be rejected / the contract action will be cancelled.

Interested firms shall follow the DoD Program BAA instructions as well as the Army's component-specific proposal instructions herein, when preparing and submitting proposals. The DoD 23.4 SBIR Program BAA can be found here: <https://www.defensesbirsttr.mil/SBIR-STTR/Opportunities/>.

The Government reserves the right to disqualify proposals for failing to meet any of the requirements of the SBA SBIR/STTR Policy Directive, the DoD Program BAA instructions, the Army's component-

specific proposal instructions herein, and/or in the topic itself. The following include, but are not limited to, the common reasons for which proposals are disqualified:

- System for Award Management is not properly updated at time of proposal submission.
- The proposal is missing required number of signatures and/or content.
- Minimum Performance Percentage of Work is not allocated properly.
- Work as proposed does not meet the definition of Research and Development required for funding.
- Proposal submitted beyond deadline.
- Price exceeds the maximum funding amount.
- Firm is NOT an eligible small business.
- Firm does NOT meet the ownership and control requirements.
- Firm is 50% or more owned or managed by a corporate entity that is not a small business.
- Firm will NOT perform the prescribed percentage of the research and/or analytical work.
- Primary employment of the Principal Investigator for this project is NOT with the firm.
- Firm has been convicted of a fraud-related crime.
- Principal Investigator or Corporate Official has been convicted of a fraud-related crime.
- Firm and affiliates have employed, on average over the last 24 months, more than 500 employees.
- Firm has been awarded a contract from the US Government for essentially equivalent work.
- Claiming data rights assertions without including a Data Rights Assertions Table.
- Lack of proper documentation for research utilizing human/animal subjects or recombinant DNA.
- Lack of information or negative information concerning use of foreign nationals.
- Offeror requests to award to a different firm/entity after proposal submission.
- Failure or refusal to submit certified or other than certified cost data in accordance with DFARS 252.215-7010.
- Proposal is for a topic other than that which is identified.
- Etc.

SYSTEM FOR AWARD MANAGEMENT (SAM)

Interested firms are required to be registered in SAM (www.sam.gov) before submitting a proposal and shall continue to be registered until time of award, during performance, and through final payment of any contract. The proper North American Industry Classification System (NAICS) code and Product and Service Code are as follows:

- NAICS: 541715, Research and Development in the Physical, Engineering, and Life Sciences (except Nanotechnology and Biotechnology)
- PSC: AC12, National Defense R&D Services; Department of Defense - Military; Applied Research

DIRECT TO PHASE II PROPOSAL INSTRUCTIONS

The Defense SBIR/STTR Innovation Portal (DSIP) is the official portal for DoD SBIR/STTR proposal submission. Proposers (also referred to herein as “offeror(s)”) are required to submit proposals via DSIP; proposals submitted by any other means will be disregarded. Detailed instructions regarding registration and proposal submission via DSIP are provided in the DoD SBIR Program BAA.

Proposers interested in submitting a DP2 proposal in response to these topics must provide documentation to substantiate that the scientific and technical merit and feasibility described in the Phase I section of the topic has been met and describes the potential commercial applications. Documentation should include all relevant information including, but not limited to: technical reports, test data, prototype designs/models, and performance goals/results. Work submitted within the feasibility documentation must have been substantially performed by the proposer and/or the Principal Investigator.

The Army will not evaluate the proposer's related Phase II proposal if it determines that the proposer has failed to demonstrate that technical merit and feasibility has been established or the proposer has failed to demonstrate that work submitted in the feasibility documentation was substantially performed by the proposer and/or the PI.

Feasibility documentation cannot be based upon any prior or ongoing federally funded SBIR or STTR work and DP2 proposals MUST NOT logically extend from any prior or ongoing federally funded SBIR or STTR work.

Proposal Coversheet (Volume 1)

The proposal coversheet must follow the instructions and requirements provided in the DoD SBIR Program BAA.

The offeror shall certify that to the best of its knowledge and belief, its eligibility information under the SBIR Program is accurate, complete, and current as of the date of the offer.

Format of Technical Volume (Volume 2)

The Technical Volume must include two parts, the Feasibility Documentation, and the Technical Proposal.

The Technical Volume must be a single Portable Document Format (PDF) file, including graphics. Perform a virus check before uploading the Technical Volume file. If a virus is detected, it may cause rejection of the proposal. Do not lock or encrypt the uploaded file. Do not include or embed active graphics such as videos, moving pictures, or other similar media in the document.

The length of the Feasibility Documentation is not to exceed 5 pages and the length of the Technical Proposal is not to exceed 10 pages. A commercialization plan must also accompany the technical proposal and should be 8 slides. Any proposals submitted in a different format or exceed the page count limits will not be reviewed.

Number all pages of your proposal consecutively. Font size should not be smaller than 10- point on standard 8-1/2" x 11" paper with one-inch margins. The header on each page of the Technical Volume should contain your company name, topic number, and proposal number assigned by DSIP when the Cover Sheet was created. The header may be included in the one-inch margin.

Content of the Technical Volume: (Volume 2)

PART ONE: Feasibility and Technical Proposal (15 pages maximum)

Content of the Feasibility Documentation (Volume 2a)

The content of the Feasibility Documentation Proposers should substantiate that the scientific and technical merit and feasibility described in the Phase I section of the topic has been met and describes the potential commercial applications. Documentation should include all relevant information including, but not limited to: technical reports, test data, prototype designs/models, and performance goals/results. Work submitted within the feasibility documentation must have been substantially performed by the proposer and/or the Principal Investigator.

If you have references, include a reference list or works cited list as the last page of the feasibility documentation. This will count towards the total page limit.

Work submitted within the feasibility documentation must have been substantially performed by the proposer and/or the Principal Investigator (PI).

If technology in the feasibility documentation is subject to Intellectual Property (IP), the proposer must either own the IP, or must have obtained license rights to such technology prior to proposal submission, to enable it and its subcontractors to legally carry out the proposed work. Documentation of IP ownership or license rights shall be included in the Technical Volume of the proposal.

At a minimum, the technical proposal should address:

- What are you trying to do? Articulate your objectives without jargon.
- How is it done today, and what are the limits of current practice?
- What is new in your approach and why do you think it will be successful?
- Who cares? If you are successful, what difference will it make?
- What are the risks?
- How much will it cost?
- How long will it take?
- How do you measure success?
- What team will accomplish your mission?
- What existing / related SBIR, STTR, or other research proposals support this technology?
- What is the commercialization strategy for the proposed technology?

Content of the Technical Proposal (Volume 2b; part 1 continued)

The content of the Technical Volume should address three key areas: the technical approach, the team carrying out the work (and the accompanied resources), and the commercialization strategy. The commercialization plan should include:

- **Company information:** Focused objectives/core competencies; specialization area(s); products with significant sales; and history of previous Federal and non-Federal funding, regulatory experience, and subsequent commercialization successes.
- **Customer and Competition:** Clear description of key technology objectives, current competition, and advantages compared to competing products or services; description of hurdles to acceptance of the innovation.
- **Market:** Milestones, target dates, analyses of market size, and estimated market share after first year sales and after 5 years; explanation of plan to obtain market share.
- **Intellectual Property:** Patent status, technology lead, trade secrets or other demonstration of a plan to achieve sufficient protection to realize the commercialization stage and attain at least a temporal competitive advantage.
- **Financing:** Plans for securing necessary non-SBIR funding.
- **Assistance and mentoring:** Plans for securing needed technical or business assistance through mentoring, partnering, or through arrangements with government sponsored (e.g., State assistance programs, Federally-funded research laboratories, Manufacturing Extension Partnership centers), not-for-profits (e.g., Small Business Development Centers or Procurement Technical Assistance Centers), commercial accelerators, DOD Prime Contractors, or other assistance provider.

Proposers are free to structure each section as they like, so long as it provides sufficient detail for

evaluators to understand the proposed work, who will carry it out, and how the business plans to commercialize results.

PART TWO: Commercialization Plan (8 slides/pages maximum, saved as a PDF and attached with the Technical Proposal as part of the Technical Volume).

The Army is equally interested in dual use commercialization of SBIR/STTR projects that result in products sold to the U.S. military, the private sector market, or both. The Army expects explicit discussion of key activities to achieve this result in the commercialization strategy part of the proposal.

The commercialization strategy should include the following elements:

- A summary of transition and commercialization activities, and the Technology Readiness Level (TRL) achieved. Discuss how the preliminary transition and commercialization path or paths may evolve during the Phase II project.
- Describe key proposed technical milestones during Phase II that will advance the technology towards product such as: prototype development, laboratory and systems testing, integration, testing in operational environment, and demonstrations.
- Description of Product(s) and/or System Application(s). Identify the commercial product(s) and/or DoD system(s), or system(s) under development, or potential new system(s). Identify the potential DoD end- users, Federal customers, and/or private sector customers who would likely use the technology.
- Business Model(s)/Procurement Mechanism(s). Discuss your current business model hypothesis for bringing the technology to market. Describe plans to license, partner, or self-produce your product. How do you plan to generate revenue? Understanding the Army's goal of creating and sustaining viable small businesses that support and generate advanced Army technologies, describe how you intend to develop your product and supply chains to enable this differentiation.
- Target Market. Describe the market and customer sets you propose to target, their size, their growth rate, and their key reasons they would consider procuring the technology.
- Describe competing technologies existent today on the market as well as those being developed in the lab.
- Funding Requirements. Describe your company's funding history. How much external financing have you raised? Describe your plans for future funding sources (internal, loan, angel, venture capital, etc.).
- Commercialization Risks. Describe the major technology, market and team risks associated with achieving successful transition of the Army funded technology.
- Expertise/Qualifications of Team/Company Readiness. Describe the expertise and qualifications of your management, marketing/business development and technical team that will support the transition of the technology from the prototype to the commercial market and into government operational environments. Has this team previously taken similar products/services to market? If the present team does not have this needed expertise, how do you intend to obtain it? What is the financial history and health of your company (e.g., availability of cash, profitability, revenue growth, etc.)?
- Anticipated Commercialization Results. Include a schedule showing the anticipated quantitative commercialization results from the Phase II project at one year after the start of Phase II, at the completion of Phase II, and after the completion of the Sequential Phase II (i.e., amount of additional investment, sales revenue, etc.). After a Phase II

award, the company is required to report actual sales and investment data in its Company Commercialization Report at least annually.

These instructions supersede those stated in section 5.3.c of the DoD Program BAA.

Cost Volume (Volume 3)

Unless otherwise noted in the topic description, the Army will accept Direct to Phase II proposals for a cost up to \$1,900,000 for a 24-month period of performance. Proposers are required to use the Cost Proposal method as provided on the DSIP submission site. The Cost Volume (and supporting documentation) DOES NOT count toward the page limit of the Technical Volume.

Proposers are required to use the Cost Proposal method as provided on the DSIP submission site. The Cost Volume (and supporting documentation) DOES NOT count toward the page limit of the Technical Volume.

For pricing purposes, offerors should assume a contract or agreement start date of approximately ninety (90) days after submission of the proposal. For this BAA, adequate price competition (APC), as defined in FAR 15.403-1(c), is anticipated. In the event that adequate price competition is not realized (i.e. only one proposal is received for a given topic), the Government may choose to conduct additional proposal analysis, in accordance with the techniques identified at FAR 15.404-1. Additionally, offerors are to provide any current Forward Pricing Rate Agreements (FPRA) in effect at time of proposal submission.

Content of the Cost Volume (Volume 3, cont.)

ALL proposed costs should be accompanied by documentation to substantiate how the cost was derived. For example, if you proposed travel costs to attend a project-related meeting or conference, and used a travel website to compare flight costs, include a screenshot of the comparison. Similarly, if you proposed to purchase materials or equipment, and used the internet to search for the best source, include your market research for those items. You do not necessarily have to propose the cheapest item or supplier, but you should explain your decision to choose one item or supplier over another. It's important to provide enough information to allow contracting personnel to understand how the proposer plans to use the requested funds.

Some items in the cost breakdown may not apply to the proposed project. If that is the case, there is no need to provide information on each and every item.

Cost Breakdown Guidance:

ALL proposed costs should be accompanied by documentation to substantiate how the cost was derived. Substantiating documentation guidance is as follows:

- **LABOR:**
 - List all key personnel by name as well as by number of hours dedicated to the project as direct labor.
 - Explain the basis of proposed labor hours, including required tasks, and substantiating documentation for the costs (e.g. payroll reports). Volume 5, Supporting Documents, may be used if additional space is needed.

- MATERIAL/TOOLING/EQUIPMENT:
 - Explain the basis of proposed material and equipment costs. This support should include a consolidated priced summary of individual material and equipment quantities and substantiating documentation for the costs (e.g. vendor quotes, invoice prices, competitive bids, etc.). If your choice isn't the lowest cost available, explain the decision to choose one item or supplier over another. Volume 5, Supporting Documents, may be used if additional space is needed.
 - Ensure all materials are American-made to the maximum extent practicable. Offerors who propose to use a foreign-made product in its technology may be required to find an American-made equivalent.
 - While special tooling and test equipment and material cost may be included, it will be carefully reviewed relative to need and appropriateness for the work proposed. The purchase of special tooling and test equipment must, in the opinion of the Component Contracting Officer, be advantageous to the Government and should be related directly to the specific topic. These may include such items as innovative instrumentation or automatic test equipment. Title to property furnished by the Government or acquired with Government funds will be vested with the DoD Component, unless it is determined that transfer of title to the contractor would be more cost effective than recovery of the equipment by the DoD Component.

- TRAVEL:
 - Explain the basis of proposed travel, including to/from locations, number of trips, number of travelers per trip, and number of days/nights per trip. Include substantiating documentation for the costs (e.g. screenshots of flight cost comparison, rental car quotes, etc.). NOTE: Virtual meetings shall be utilized to the maximum extent practicable. Volume 5, Supporting Documents, may be used if additional space is needed.

- SUBCONTRACTS: A subcontract is any agreement, other than one involving an employer-employee relationship, entered into by the prime contractor (awardee) calling for supplies or services for the performance of the contract.
 - All subcontractor costs and consultant costs must be detailed at the same level as prime contractor costs in regard to labor, travel, equipment, etc.
 - Explain the basis of proposed subcontract costs. Include documented support of the offeror's price analyses and degree of competition of all subcontractor proposals. All subcontractor costs and consultant costs, such as labor, travel, equipment, materials, must be detailed at the same level as prime contractor costs. Provide detailed substantiation of subcontractor costs in your cost proposal. Volume 5, Supporting Documents, may be used if additional space is needed.
 - Certify that the following requirements are met: For Phase I, the offeror must

perform a minimum of two-thirds of the research and/or analytical effort. One third may be subcontracted to another firm or research organization/facility. The percentage of work is measured by both direct and indirect costs.

- Offerors shall not propose to subcontract to the issuing agency, to any other Federal Government agency, or to other units of the Federal Government, except Federal Laboratories in rare circumstances. As defined in 15 U.S.C. 3703, Federal Laboratory means any laboratory, any federally funded research and development center, or any center established under 15 U.S.C. 3705 and 3707 that is owned, leased, or otherwise used by a Federal Agency and funded by the Federal Government, whether operated by the Government or by a contractor.
 - Offerors shall not propose to subcontract to any prohibited sources. Proposals identifying a subcontractor/vendor arrangement with a prohibited source may be rejected.
 - Offerors shall ensure subcontracting arrangements are with United States Small Businesses to the maximum extent practicable. Offerors proposing a subcontractor arrangement with other than a United States Small Business (such as, a large business, foreign firm, foreign government, educational institution, unit of Federal Government, etc.) may be required to submit further explanation.
- **INDIRECT COSTS:**
 - Explain the basis of the proposed indirect expense rates including overhead, general and administrative, material handling, and fringe benefits.
 - If a Defense Contract Audit Agency (DCAA) Audit has been conducted within the last five (5) years, include the audit compliance documentation in the cost proposal documents. The documentation should also include the offeror's DCAA Point of Contact (if applicable).

If selected, failure to include the documentation with your proposal may delay contract award, as the proposer will be asked to submit the necessary documentation to the Contracting Officer to substantiate costs. It is important to respond as quickly as possible to the Contracting Officer's request for documentation. Failure or refusal to provide documentation may result in cancellation of the contract action.

For more information about cost proposals and accounting standards, see the DCAA publication titled "Audit Process Overview – Information for Contractors" available at: <http://www.dcaa.mil>.

Company Commercialization Report (CCR) (Volume 4; no page limitations)

Completion of the CCR as Volume 4 of the proposal submission in DSIP is required. Please refer to the DoD SBIR Program BAA <https://www.dodsbirsttr.mil/submissions/baa-schedule/broad-agency-announcements> for full details on this requirement. Information contained in the CCR will be considered by the Department of the Army during proposal evaluations.

Supporting Documents (Volume 5; no page limitations)

Volume 5 is provided for proposers to submit additional documentation to support the Cover Sheet (Volume 1), Technical Volume (Volume 2), and the Cost Volume (Volume 3). In addition to the Volume 5 requirements outlined in the DoD Program BAA, the Department of the Army will accept the following documents in Volume 5:

- Additional Cost Information
- Funding Agreement Certification
- Technical Data Rights (Assertions)
- Lifecycle Certification
- Allocation of Rights
- Endorsement Letters
- Other (only as specified in the topic)

DISCRETIONARY TECHNICAL AND BUSINESS ASSISTANCE (TABA)

The Army, at its discretion, may provide Technical and Business Assistance (TABA). The Army will select a preferred vendor(s) for the Army SBIR TABA program through a competitive process.

Alternately, a small business concern may, by contract or otherwise, select one or more vendors to assist the firm in meeting the TABA goals. The Applicant must request the authority to select its own TABA provider in its Army SBIR proposal and must demonstrate that the vendor is uniquely postured to provide the specific technical and business services required. TABA funding will be denied if the offeror fails to include the cost and detailed explanation in its proposal.

Participation in the Army SBIR TABA program is voluntary for each Army SBIR awardee. Services provided to Army SBIR firms under the auspices of the TABA program may include, but are not limited to:

1. Access to a network of scientists, engineers, and technologists focused on commercialization and transition considerations such as protected supply chain management, advanced manufacturing, process/product/production scaling, etc;
2. Assistance with intellectual property protections, such as legal considerations, intellectual property rights, patent filing, patent fees, licensing considerations, etc;
3. Commercialization and technology transition support such as market research, market validation, development of regulatory or manufacturing plans, brand development;
4. Regulatory support such as product domain regulatory considerations, regulatory planning, and regulatory strategy development.

The Army SBIR program sponsors participation in the TABA program. The resource limitation for each firm is as follows:

- Phase I Firms:
 - Army-Preferred Vendor: If approved, the contractor may receive up to \$6,500 worth of assistance services per project per year (in addition to the base SBIR award amount).
 - Firm-Selected Vendor: If approved, the contractor may receive up to \$6,500 in contract obligation (in addition to the base SBIR award amount) per project per year.
- Phase II Firms:
 - Army-Preferred Vendor: If approved, the contractor may receive up to \$50,000 worth of assistance services per project (in addition to the base SBIR award amount).

- Firm-Selected Vendor: If approved, the contractor may receive up to \$50,000 in contract obligation (must be included in base SBIR award amount) per project.

EVALUATION AND SELECTION

The Army will conduct an evaluation of each responsive, timely, eligible proposal in accordance with the evaluation criteria listed in the DoD Program BAA. It is the policy of the Army to ensure equitable and comprehensive proposal evaluations based on the evaluation criteria and to select the source (or sources) whose offer meets the Government's technical, policy, and programmatic goals. Designated support contractors may review submissions for the purposes of technical evaluation. All support contractors are bound by appropriate non-disclosure agreements.

As previously stated herein, timeliness, responsiveness, and eligibility will be assessed upon initial screening, during evaluation, and after selection. Proposals that do not comply with the instructions and requirements detailed in this document, the DoD Program BAA, or the corresponding Topic posting (including the research objective(s)), will be considered ineligible, nonresponsive, untimely, or non-conforming and therefore will not be evaluated or considered for award.

Using the evaluation criteria, the Government will evaluate each responsive, timely, eligible proposal in its entirety. Proposals will not be evaluated against each other during the evaluation process, but rather evaluated on their own individual merit to determine how well the proposal meets the criteria stated in this BAA and the corresponding opportunity.

Selected proposals are those determined to be the most advantageous to the Government, consistent with instructions and evaluation criteria specified in the DoD Program BAA, the component-specific instructions herein, the corresponding Topic posting, and availability of funding.

Proposing firms will be notified via email of selection or non-selection status for a Phase I or direct to Phase II award within 90 days of the closing date of the Topic. The notification will be sent to the Corporate Official listed on the proposal cover sheet from the Army SBIR Program Office mailbox. The Army promotes transparency regarding the technical evaluation for all Army SBIR proposals. The Army will provide a technical evaluation narrative to the proposer in accordance with the SBA Policy Directive, Appendix I, paragraph 4. The selection decision notice contains instructions for retrieving the technical evaluation narrative.

Proposers must not regard the notification email (selection decision notice) as an authorization to commit or expend funds. After the Army SBIR Office has recommended a proposal for award, a Government Contracting Officer may contact the proposer in order to discuss and request additional information required for award. This may include representations and certifications, certified or other than certified cost data, subcontracting plan for small businesses, and/or other information as applicable to the proposed award. Proposers must not regard these communications as an authorization to commit or expend funds. Unless a Government Contracting Officer signs the award document (i.e. contract), no obligations to provide funding are made. The Government may reject the proposal or cancel the contract action at any time.

If signed by the Government Contracting Officer, the award document is the official and authorizing instrument (i.e. contract). The anticipated period of performance start date will be determined at time of award. The Contracting Officer will email the signed, authorizing award instrument to the principal investigator (PI) and/or an authorized organization representative.

PROTESTS

Refer to the DoD SBIR Program BAA for procedures to protest the Announcement.

Feedback will be provided to applicants that are not selected for further consideration. A notification letter will include instructions for obtaining feedback in the form of a ValidEval Report. Offerors are entitled to no more than one feedback per proposal. NOTE: Feedback is not the same as a FAR Part 15 debriefing. Acquisitions under this solicitation are awarded via “other competitive procedures (FAR 6.102(d)(2)).” Therefore, offerors are neither entitled to nor will they be provided FAR Part 15 debriefs. As further prescribed in FAR 33.106(b), FAR 52.233-3, Protests after Award shall be submitted to the Point of Contract identified in the topic solicitation:

Email: usarmy.pentagon.hqda-asa-alt.mbx.army-applied-sbir-program@mail.mil

Mailing Address:

Army Applied SBIR Office
2530 Crystal Dr.; Ste 11192
Arlington, VA 22202

Appendix A Phase I Evaluation Criteria

Applied SBIR Phase I Proposal Review v2-0-3 Evaluation Criteria Defined



| | | DEFINITION |
|----------------------------------|---|--|
| INTRODUCTION | <i>weight 5%</i> | Write a clear, concise description of what your innovation does or will do, and where you are in your evolution. Make clear its intended impact on the Army. Evaluators should "get it" after reading this. |
| POTENTIAL FOR ARMY IMPACT | OPERATIONAL IMPACT | At the scale of a single Army end-user, argue that their jobs or lives will be significantly improved if your solution is adopted. What is the impact of your solution for a soldier/Army civilian vs. today's solutions? |
| | POTENTIAL SCALE OF IMPACT | Here, we're looking for an idea of how broad the impact you described above could be. Look into the future to a time when your solution is both technically mature and actively in use by Army personnel. Describe the scale and scope of your impact within the context of the Army. |
| TECHNICAL FEASIBILITY | SCIENTIFIC FEASIBILITY | Is the science behind the solution sound? Convince readers who don't have deep expertise in your field that your innovation is built atop sound scientific and engineering principles. |
| | ENABLING TECHNOLOGIES | Point to the foundational technologies that you rely on to deliver your solution. Do the required enabling technologies introduce added risk? Using proven (and ideally Army-fielded) underlying technologies and techniques helps to lower technical risk. |
| | ALTERNATIVE TECHNICAL APPROACHES | From a technologist's perspective, why is your proposed solution the best choice for the Army? Refute the alternative engineering approaches others are using. Why does your technology win? |
| | TECHNICAL RISK MITIGATION | No matter your current technology readiness level, technical risks remain. Identify those risks. Present a credible plan to tackle those risks. |
| TRANSITION | ARMY TRANSITION PATHWAY | Planning for success, what's next for you after this SBIR award? Describe the next type of deal you aim to make with the Army, e.g. a CRADA, a different SBIR contract, a CSO, etc. Briefly outline your current plan to unlock that next opportunity and/or share the biggest risks you see post this SBIR award. |
| | SBIR MILESTONE SCHEDULE | Please share with us a thoughtful execution plan. Strike a balance between giving us a sense of the detailed thinking behind the scenes and the need for your contracting officer to manage a reasonably small number of milestones during your period of performance. |
| FIRM CASH FLOW | FIRM SURVIVAL RISK | SBIR funds are meant to fuel growth rather than stave off a firm's impending financial failure. Demonstrate that your company will survive financially as a going concern through the early stages of a Phase III contract, sometimes referred to as "transitioning" into use by Army personnel. |
| | OTHER PEOPLE'S MONEY | Make the case that non-Army and/or non-DoD dollars will continue to fund improvements to your solution from which the Army will benefit in the future. Companies who cannot demonstrate non-Army and/or non-DoD funding sources for future solution enhancements are less attractive to the Applied SBIR program. |
| | FINANCIAL PROFIT POTENTIAL | Through the Applied SBIR program, the Army wants to take advantage of the speed and scalability of dual-use companies. Make your best case that your product is or will be profitable. If you have more than one product, please focus your argument on the product / solution presented for this SBIR program. |
| TEAM ABILITY | <i>weight 10%</i> | Prove your team has executed well as a group. Please draw clear distinctions between private sector, DoD and civilian government work. What milestones have you accomplished as a group in this company? |
| SUBMISSION QUALITY | QUALITY OF PROSE | Prove you write clearly. Prove you argue convincingly. |
| | DATA QUALITY & ATTRIBUTION | Support your arguments with relevant, properly attributed data to enhance your credibility. |

Appendix B Direct to Phase II Evaluation Criteria

Applied SBIR D2P2 Proposal Review v2-0-4 Evaluation Criteria Defined



| | | DEFINITION |
|----------------------------------|---|--|
| INTRODUCTION | <i>weight 2%</i> | Write a clear, concise description of what your innovation does or will do, and where you are in your evolution. Make clear its intended impact on the Army. Evaluators should "get it" after reading this. |
| POTENTIAL FOR ARMY IMPACT | OPERATIONAL IMPACT | At the scale of a single Army end-user, argue that their jobs or lives will be significantly improved if your solution is adopted. What is the impact of your solution for a soldier/Army civilian vs. today's solutions? |
| | POTENTIAL SCALE OF IMPACT | Here, we're looking for an idea of how broad the impact you described above could be. Look into the future to a time when your solution is both technically mature and actively in use by Army personnel. Describe the scale and scope of your impact within the context of the Army. |
| TECHNICAL FEASIBILITY | SCIENTIFIC FEASIBILITY | Is the science behind the solution sound? Convince readers who don't have deep expertise in your field that your innovation is built atop sound scientific and engineering principles. |
| | ENABLING TECHNOLOGIES | Point to the foundational technologies that you rely on to deliver your solution. Do the required enabling technologies introduce added risk? Using proven (and ideally Army-fielded) underlying technologies and techniques helps to lower technical risk. |
| | ALTERNATIVE TECHNICAL APPROACHES | From a technologist's perspective, why is your proposed solution the best choice for the Army? Refute the alternative engineering approaches others are using. Why does your technology win? |
| | TECHNICAL RISK MITIGATION | No matter your current technology readiness level, technical risks remain. Identify those risks. Present a credible plan to tackle those risks. |
| TRANSITION | ARMY TRANSITION PATHWAY | Planning for success, what's next for you after this SBIR award? Describe the next type of deal you aim to make with the Army, e.g. a CRADA, a different SBIR contract, a CSO, etc. Briefly outline your current plan to unlock that next opportunity and/or share the biggest risks you see post this SBIR award. |
| | SBIR MILESTONE SCHEDULE | Please share with us a thoughtful execution plan. Strike a balance between giving us a sense of the detailed thinking behind the scenes and the need for your contracting officer to manage a reasonably small number of milestones during your period of performance. |
| FIRM CASH FLOW | FIRM SURVIVAL RISK | SBIR funds are meant to fuel growth rather than stave off a firm's impending financial failure. Demonstrate that your company will survive financially as a going concern through the early stages of a Phase III contract, sometimes referred to as "transitioning" into use by Army personnel. |
| | OTHER PEOPLE'S MONEY | Make the case that non-Army and/or non-DoD dollars will continue to fund improvements to your solution from which the Army will benefit in the future. Companies who cannot demonstrate non-Army and/or non-DoD funding sources for future solution enhancements are less attractive to the Applied SBIR program. |
| | FINANCIAL PROFIT POTENTIAL | Through the Applied SBIR program, the Army wants to take advantage of the speed and scalability of dual-use companies. Make your best case that your product is or will be profitable. If you have more than one product, please focus your argument on the product / solution presented for this SBIR program. |
| TEAM ABILITY | <i>weight 10%</i> | Prove your team has executed well as a group. Please draw clear distinctions between private sector, DoD and civilian government work. What milestones have you accomplished as a group in this company? |
| SUBMISSION QUALITY | QUALITY OF PROSE | Prove you write clearly. Prove you argue convincingly. |
| | DATA QUALITY & ATTRIBUTION | Support your arguments with relevant, properly attributed data to enhance your credibility. |

Appendix C Phase II Evaluation Criteria

Applied SBIR Phase II Proposal Review v2-0-3 Evaluation Criteria Defined



| | | DEFINITION |
|----------------------------------|---|--|
| INTRODUCTION | <i>weight 2%</i> | Write a clear, concise description of what your innovation does or will do, and where you are in your evolution. Make clear its intended impact on the Army. Evaluators should "get it" after reading this. |
| POTENTIAL FOR ARMY IMPACT | OPERATIONAL IMPACT | At the scale of a single Army end-user, argue that their jobs or lives will be significantly improved if your solution is adopted. What is the impact of your solution for a soldier/Army civilian vs. today's solutions? |
| | POTENTIAL SCALE OF IMPACT | Here, we're looking for an idea of how broad the impact you described above could be. Look into the future to a time when your solution is both technically mature and actively in use by Army personnel. Describe the scale and scope of your impact within the context of the Army. |
| TECHNICAL FEASIBILITY | SCIENTIFIC FEASIBILITY | Is the science behind the solution sound? Convince readers who don't have deep expertise in your field that your innovation is built atop sound scientific and engineering principles. |
| | ENABLING TECHNOLOGIES | Point to the foundational technologies that you rely on to deliver your solution. Do the required enabling technologies introduce added risk? Using proven (and ideally Army-fielded) underlying technologies and techniques helps to lower technical risk. |
| | ALTERNATIVE TECHNICAL APPROACHES | From a technologist's perspective, why is your proposed solution the best choice for the Army? Refute the alternative engineering approaches others are using. Why does your technology win? |
| | TECHNICAL RISK MITIGATION | No matter your current technology readiness level, technical risks remain. Identify those risks. Present a credible plan to tackle those risks. |
| TRANSITION | ARMY TRANSITION PATHWAY | Planning for success, what's next for you after this SBIR award? Describe the next type of deal you aim to make with the Army, e.g. a CRADA, a different SBIR contract, a CSO, etc. Briefly outline your current plan to unlock that next opportunity and/or share the biggest risks you see post this SBIR award. |
| | SBIR MILESTONE SCHEDULE | Please share with us a thoughtful execution plan. Strike a balance between giving us a sense of the detailed thinking behind the scenes and the need for your contracting officer to manage a reasonably small number of milestones during your period of performance. |
| FIRM CASH FLOW | FIRM SURVIVAL RISK | SBIR funds are meant to fuel growth rather than stave off a firm's impending financial failure. Demonstrate that your company will survive financially as a going concern through the early stages of a Phase III contract, sometimes referred to as "transitioning" into use by Army personnel. |
| | OTHER PEOPLE'S MONEY | Make the case that non-Army and/or non-DoD dollars will continue to fund improvements to your solution from which the Army will benefit in the future. Companies who cannot demonstrate non-Army and/or non-DoD funding sources for future solution enhancements are less attractive to the Applied SBIR program. |
| | FINANCIAL PROFIT POTENTIAL | Through the Applied SBIR program, the Army wants to take advantage of the speed and scalability of dual-use companies. Make your best case that your product is or will be profitable. If you have more than one product, please focus your argument on the product / solution presented for this SBIR program. |
| TEAM ABILITY | <i>weight 5%</i> | Prove your team has executed well as a group. Please draw clear distinctions between private sector, DoD and civilian government work. What milestones have you accomplished as a group in this company? |
| SUBMISSION QUALITY | QUALITY OF PROSE | Prove you write clearly. Prove you argue convincingly. |
| | DATA QUALITY & ATTRIBUTION | Support your arguments with relevant, properly attributed data to enhance your credibility. |

Appendix D

Commercialization Plan Template

General Instructions/Guidance:

1. The slide deck must be 8 slides total, per Component Instructions, and follow the formatting contained in the template. Font size shall be no smaller than 10-point font.
2. Slides should display the slide number in bottom right corner
3. All text (including tables, charts, plots, axes labels, legends, captions) must be readable without zooming and understandable without voice-over
4. For plots and charts:
 - a. Include title/bullet describing importance of plot/chart, and/or data (be specific)
 - b. Axes must be meaningfully labeled (to be understandable by non-experts) and include scale
5. Avoid jargon; define technical terms
6. Convert from slide format to a PDF file for submission to DSIP alongside the technical volume proposal
7. To insert images, capture a screenshot of the image and paste it into the slide. Please do not drag-drop a file into the presentation or use the Insert Pictures menu function.
8. Use PowerPoint's "Compress Pictures" feature to reduce file size
 - a. Select 96ppi resolution
 - b. Uncheck "For this picture only"
9. Replace the boilerplate footer below with distribution markings as appropriate
10. Do not put any company logos (Twitter, Reddit, GitHub, etc) on your slides

To be considered valid proposals, Commercialization Plan submissions must follow the number and content of each slide as contained in the attached template.

Appendix D
Commercialization Plan Template cont.

Firm Name

SBIR Project Title

Principal Investigator Name / Title
Key (or other relevant) Personnel, and
Subcontractors

.....
Insert Topic Number
Insert Proposal Number

Distribution markings as appropriate for your organization

BLUF: Bottom Line Up Front

- **BLUF:**
 - 1. Company information and background** : Core competencies, significant sales, previous funding, commercialization successes.
 - 2. Customer and Competition** : Clear description of key technology objectives, current competition, and advantages.
 - 3. Market:** Plan to obtain market share.
 - 4. Intellectual Property:** Patent status, technology lead, trade secrets or other demonstration of a plan to protect the company's technical advantage.
 - 5. Financing/Revenue:** Plans for securing necessary non -SBIR funding.
 - 6. Assistance and mentoring** : Plans for securing needed technical or business assistance.

Distribution markings as appropriate for your organization

2

Appendix D
Commercialization Plan Template cont.

Company Information and Background

- Core competencies and areas of specialization.
- Products with significant sales.
- Concise history of previous Federal and non -Federal funding/investments.
- Regulatory experience (if applicable).
- Past commercialization successes.
- Past failure and how you overcame .

Distribution markings as appropriate for your organization

3

Customer & Competition

- Description of key technology objectives.
- Current competition and/or alternative solutions.
- Advantages of company's offer compared to competing products or services.
- Hurdles to acceptance of the proposed innovation.
- Description of possible areas where your technology may be utilized or is under utilized.

Distribution markings as appropriate for your organization

4

Appendix D Commercialization Plan Template cont.

Market

- Analysis of market size and 1 and 5 year forecasted market share.
- Explanation of milestones and target dates of plan to obtain that market share.
- What experience do you have with marketing to this target market?
- What commercialization strategy appears to be the best for bringing this product to the target market?
- What experience do you have with bring products to market – either through this company or through other companies with which you have worked.
- Does the company currently market, manufacture, or license technology? Describe what you do.

Intellectual Property

- Patent status, technology lead, trade secrets or other demonstration of a plan to achieve sufficient protection to realize the commercialization stage and attain at least a temporary competitive advantage .
- Describe how you will protect the intellectual property that enables commercialization of its products while keeping competitors at bay. Note any actions you may consider to attain at least a temporary competitive advantage. Also consider your company's prior record in this area. Comment on your company's strategy to build a sustainable business through protection of intellectual property.

Appendix D Commercialization Plan Template cont.

Financing

- Plan for securing non-SBIR, private or government funding necessary to enter low rate of production of anticipated technical solution.
- Describe your revenue stream generation to include but not limited to:
 - Manufacture and direct sales
 - Sales through value added resellers or other distributors
 - Joint venture

Assistance & Mentoring

- Plans for securing needed technical or business assistance through mentoring, partnering, or arrangements with government sponsored (e.g., SBIR funded Discretionary Technical and Business Assistance (TABAs), State assistance programs, Federally-funded research laboratories, Manufacturing Extension Partnership centers), not-for-profits (e.g., Small Business Development Center (SBDC) or Small Business Technical Development Center (SBTDC)), commercial accelerators, DOD Prime Contractors, SBA Mentor - Protégé program, Procurement Technical Assistance Center (PTAC) or other assistance provider.

Army SBIR 23.4 Topic Index
Release 17

A234-023 Knowledge-Level Distributed Active Data Platforms for Ops-Log
Synchronization

A234-023 Knowledge-Level Distributed Active Data Platforms for Ops-Log
Synchronization

OUSD (R&E) CRITICAL TECHNOLOGY AREA(S): Artificial Intelligence/ Machine Learning (AI/ML)

OBJECTIVE: The purpose of this topic is to significantly extend the Army's current effort to establish a tactical-level data platform for collecting and disseminating relevant battlefield data by improving its representation and information value to the human decision-making process and provide a foundation for autonomy and automated analytic reasoning (AI/ML) through the data mesh construct. Tactical operational forces and sustainment forces prosecuting missions in contested environments, need the ability to improve understanding, synchronization, and situational awareness. This effort will expand and improve the ongoing efforts of the data-level tactical data platform which have established a number of use cases, benefits, and process flows. The topic team intends to leverage existing partnerships and experimentation to test, evaluate, and refine the concepts and usage over this effort as well.

DESCRIPTION: This capability should fold into the ongoing PEO C3T Tactical Data Platform effort, adding technology for hybrid knowledge graph technology, richer knowledge-based representations, and facilitating more advanced decision support and reasoning capabilities utilizing AI/ML. This would be fielded as part of the C3T Tactical Data Platform across the full spectrum of tactical level operational and sustainment units, leveraging the computing infrastructure and communications channels already defined for the current Tactical Data Platform capabilities. The expectation is that companies can solve several problems with one solution; therefore, the request has identified five (5) areas of improvement: Automated Transformation of Data to Knowledge, Knowledge-Level Representation of the Tactical Situational Awareness with embedded meaning, Representing and Continuously Reasoning over Plans, Space, Time, and Entity State, Situational pattern recognition and model projection for automated detection of potentially impacting Patterns/events, and bridging Knowledge between Operations and Logistics to ensure synchronized and orchestrated awareness and unity of effort.

PHASE I: This is a Direct to Phase II topic (DP2). The commercial market for these knowledge-level automation and reasoning enhancements are at a high enough Technology Readiness Level (TRL) for this to be a Phase II topic. As part of the submission package, the proposing company will be required to include specific tangible examples of existing capabilities within each of the sub-areas they are proposing. The existing capabilities should be described with details of demonstrated capability, screenshots and references where available, and details of the companies, organizations, or events in which they were demonstrated. The company will be asked to demonstrate each of these capabilities in an Army tactical scenario or event that will occur 9 months into the Direct-to-Phase II award. The company submissions package will also need to provide specific evidence or demonstration of the technologies ability to operate in the constraints of a tactical environment, including intermittent communications, low-bandwidth, noisy data, and limited computational power.

(DIRECT TO) PHASE II: As a Direct to Phase II proposal, proposal submission should include a roadmap of the expected deliverables:

- 3MAC: Design and Model Review
- 6MAC: Phase I validation of Key Technologies
- 9MAC: Build 1 Demonstration of Base Knowledge-level capabilities
- 12MAC: Build 2 Integration with current Tactical Data Platform
- 15MAC: Build 3 Experimentation/First Evaluation Release
- 18MAC: Build 4 Exp Revision / Ops-Log Sync
- 22MAC: Build 5 Final Release / Second Evaluation Release
- 24MAC: Final Report

PHASE III DUAL USE APPLICATIONS: There is high dual-use potential for automated data platforms. They can help companies make better decisions and improve efficiency. As businesses grow, they will need the ability to manage and analyze large sets of data. These platforms will allow them to make informed decisions from the results of these analyses. Complete the maturation of the company's technology developed in Phase II and produce prototypes to support further development and commercialization.

KEYWORDS: AI/ML; Autonomy; Data-driven; Decision-making; Data Platforms; Knowledge; Pattern Recognition

REFERENCES:

1. Tactical Ammunition Management Micro-services, contact Al Santucci, alan.santucci2.civ@army.mil for slides cleared for public release.
2. AI Reference Architecture, contact Dan Stroka, daniel.g.stroka.civ@army.mil for slides cleared for public release.
3. Tactical Analytics Architecture, contact Dan Stroka, daniel.g.stroka.civ@army.mil for slides cleared for public release.

DEPARTMENT OF THE ARMY
DoD 23.4 Small Business Innovation Research (SBIR)
Annual Broad Agency Announcement (BAA)
Component-Specific Proposal Instructions
Release 18

August 8, 2023: Topics issued for pre-release

August 24, 2023: Army begins accepting proposals via DSIP

September 19, 2023: DSIP Topic Q&A closes to new questions at 12:00 p.m. ET

September 26, 2023: Deadline for receipt of proposals no later than 12:00 p.m. ET

INTRODUCTION

The future Army must be capable of conducting Multi-Domain Operations (MDO) as part of an integrated Joint Force across an array of situations in multiple theaters by 2035. The MDO concept describes how the Army will support the Joint Force in the rapid and continuous integration of all domains of warfare – land, sea, air, and cyberspace – to deter and prevail as we compete short of conflict, and fight and win if deterrence fail. The Army must provide game-changing capabilities to our Soldiers. To capitalize on small business innovation, the Army has implemented an approach to advertise SBIR funding opportunities through the Department of Defense (DoD) Annual BAA process, outside of the three pre-determined BAA cycles. This approach also strives to create a more rapid award time from solicitation to closing.

Proposers are encouraged to thoroughly review the DoD Program BAA and register for the DSIP Listserv to remain apprised of important programmatic and contractual changes.

- The DoD Program BAA is located at: <https://www.defensesbirstr.mil/SBIR-STTR/Opportunities/#announcements>. Be sure to select the tab for the appropriate BAA cycle.
- Register for the DSIP Listserv at: <https://www.dodsbirstr.mil/submissions/login>.

CONTACT INFORMATION

Direct specific questions pertaining to the administration of the Department of the Army SBIR Program and proposal preparation instructions to the Point of Contact identified in the Topic announcement.

General questions can be directed to the following:

Email: usarmy.pentagon.hqda-asa-alt.mbx.army-applied-sbir-program@army.mil

Website: <https://www.armysbir.army.mil/>

Mailing Address:

Army Applied SBIR Office 2530 Crystal Dr.; Ste 11192

Arlington, VA 22202

RESPONSIVENESS AND TIMELINESS

All proposals will be evaluated and judged on a competitive basis. Proposals will only be evaluated in response to an active, corresponding Army topic. Proposals will be initially screened to determine responsiveness and timeliness. Proposals passing this initial screening will be technically evaluated by engineers or scientists to determine the most promising technical and scientific approaches. Assessment of responsiveness may continue during technical evaluation and after selection. If at any point the proposal is deemed untimely, unresponsive, ineligible, or non-responsible, the proposal will be rejected / the contract action will be cancelled.

Interested firms shall follow the DoD Program BAA instructions as well as the Army's component-specific proposal instructions herein, when preparing and submitting proposals. The DoD 23.4 SBIR Program BAA can be found here: <https://www.defensesbirsttr.mil/SBIR-STTR/Opportunities/>.

The Government reserves the right to disqualify proposals for failing to meet any of the requirements of the SBA SBIR/STTR Policy Directive, the DoD Program BAA instructions, the Army's component-specific proposal instructions herein, and/or in the topic itself. The following include, but are not limited to, the common reasons for which proposals are disqualified:

- System for Award Management is not properly updated at time of proposal submission.
- The proposal is missing required number of signatures and/or content.
- Minimum Performance Percentage of Work is not allocated properly.
- Work as proposed does not meet the definition of Research and Development required for funding.
- Proposal submitted beyond deadline.
- Price exceeds the maximum funding amount.
- Firm is NOT an eligible small business.
- Firm does NOT meet the ownership and control requirements.
- Firm is 50% or more owned or managed by a corporate entity that is not a small business.
- Firm will NOT perform the prescribed percentage of the research and/or analytical work.
- Primary employment of the Principal Investigator for this project is NOT with the firm.
- Firm has been convicted of a fraud-related crime.
- Principal Investigator or Corporate Official has been convicted of a fraud-related crime.
- Firm and affiliates have employed, on average over the last 24 months, more than 500 employees.
- Firm has been awarded a contract from the US Government for essentially equivalent work.
- Claiming data rights assertions without including a Data Rights Assertions Table.
- Lack of proper documentation for research utilizing human/animal subjects or recombinant DNA.
- Lack of information or negative information concerning use of foreign nationals.
- Offeror requests to award to a different firm/entity after proposal submission.
- Failure or refusal to submit certified or other than certified cost data in accordance with DFARS 252.215-7010.
- Proposal is for a topic other than that which is identified.
- Etc.

SYSTEM FOR AWARD MANAGEMENT (SAM)

Interested firms are required to be registered and active in SAM (www.sam.gov) before submitting a proposal and shall continue to be registered until time of award, during performance, and through final payment of any contract. The proper North American Industry Classification System (NAICS) code and Product and Service Code are as follows:

- NAICS: 541715, Research and Development in the Physical, Engineering, and Life Sciences (except Nanotechnology and Biotechnology)
- PSC: AC12, National Defense R&D Services; Department of Defense - Military; Applied Research

PHASE I PROPOSAL INSTRUCTIONS

The Defense SBIR/STTR Innovation Portal (DSIP) is the official portal for DoD SBIR/STTR proposal submission. Proposers (also referred to herein as "offeror(s)") are required to submit proposals via DSIP; proposals submitted by any other means will be disregarded. Detailed instructions regarding registration and proposal submission via DSIP are provided in the DoD SBIR Program BAA.

Proposal Coversheet (Volume 1)

The proposal coversheet must follow the instructions and requirements provided in the DoD SBIR Program BAA.

The offeror shall certify that to the best of its knowledge and belief, its eligibility information under the SBIR Program is accurate, complete, and current as of the date of the offer.

Technical Volume (Volume 2)

The technical volume proposal is not to exceed 5 word document pages and must follow the formatting requirements provided in the DoD SBIR Program BAA. A commercialization plan must also accompany the technical volume proposal and must be 8 slides. The required content to include within these slides are described in Appendix D. The commercialization plan must be converted from slides to pdf and attached to the end of the technical volume proposal, resulting in one pdf file to be uploaded to DSIP as Volume 2. The commercialization plan does not count towards the proposal 5-page limit. Any proposals submitted without a commercialization plan or in a format other than that provided in these Component Instructions and by the BAA will be deemed unresponsive and will not be reviewed.

Content of the Technical Volume

The content of the Technical Volume should address three key areas: the technical approach, the team carrying out the work (and the accompanied resources), and the commercialization strategy. The technical approach section shall contain details on how the proposer is going to solve the problem. It shall detail key elements of the firm's approach, any risks, relevant past work and how success is measured. The team qualifications section shall highlight the key personnel working on the project, and the resources that will be brought to bear on solving the problem. The commercialization plan should include:

- **Company information**: Focused objectives/core competencies; specialization area(s); products with significant sales; and history of previous Federal and non-Federal funding, regulatory experience, and subsequent commercialization successes.
- **Customer and Competition**: Clear description of key technology objectives, current competition, and advantages compared to competing products or services; description of hurdles to acceptance of the innovation.
- **Market**: Milestones, target dates, analyses of market size, and estimated market share after first year sales and after 5 years; explanation of plan to obtain market share.
- **Intellectual Property**: Patent status, technology lead, trade secrets or other demonstration of a plan to achieve sufficient protection to realize the commercialization stage and attain at least a temporal competitive advantage.
- **Financing**: Plans for securing necessary non-SBIR funding.
- **Assistance and mentoring**: Plans for securing needed technical or business assistance through mentoring, partnering, or through arrangements with government sponsored (e.g., State assistance programs, Federally-funded research laboratories, Manufacturing Extension Partnership centers), not-for-profits (e.g., Small Business Development Centers or Procurement Technical Assistance Centers), commercial accelerators, DOD Prime Contractors, or other assistance provider.

Proposers are free to structure each section as they like, so long as it provides sufficient detail for evaluators to understand the proposed work, who will carry it out, and how the business plans to commercialize results.

These instructions supersede those stated in section 5.3.c of the DoD Program BAA.

Cost Volume (Volume 3)

The Cost Volume must follow all instructions and requirements provided in the DoD SBIR Program BAA. Supplemental requirements are as follows:

The Phase I Base amount must not exceed \$200,000 for a 6-month period of performance, unless otherwise specified in the topic description pages. Phase I Options are not anticipated at this time. If an option is identified in the topic posting, costs for the Base and Option must be separated and clearly identified on the Proposal Cover Sheet (Volume 1) and in Volume 3. Awards for these topics will be in the form of a firm fixed price contract.

Please review the updated Percentage of Work (POW) calculation details included in section 5.3 of the DoD Program BAA. Army Applied SBIR will occasionally accept deviations from the POW requirements with written approval from the Funding Agreement officer.

For pricing purposes, offerors shall assume a contract or agreement start date of approximately ninety (90) days after submission of the proposal. For this BAA, adequate price competition (APC), as defined in FAR 15.403-1(c), is anticipated. In the event that adequate price competition is not realized (i.e. only one proposal is received for a given topic), the Government may choose to conduct additional proposal analysis, in accordance with the techniques identified at FAR 15.404-1. Additionally, offerors are to provide any current Forward Pricing Rate Agreements (FPRA) in effect at time of proposal submission.

Content of the Cost Volume (Volume 3)

ALL proposed costs should be accompanied by documentation to substantiate how the cost was derived. Substantiating documentation guidance is as follows:

LABOR:

List all key personnel by name as well as by number of hours dedicated to the project as direct labor.

Explain the basis of proposed labor hours, including required tasks, and substantiating documentation for the costs (e.g. payroll reports). Volume 5, Supporting Documents, may be used if additional space is needed.

MATERIAL/TOOLING/EQUIPMENT:

Explain the basis of proposed material and equipment costs. This support should include a consolidated priced summary of individual material and equipment quantities and substantiating documentation for the costs (e.g. vendor quotes, invoice prices, competitive bids, etc.). If your choice isn't the lowest cost available, explain the decision to choose one item or supplier over another. Volume 5, Supporting Documents, may be used if additional space is needed.

Ensure all materials are American-made to the maximum extent practicable. Offerors who propose to use a foreign-made product in its technology may be required to find an American-made equivalent.

While special tooling and test equipment and material cost may be included, it will be carefully reviewed relative to need and appropriateness for the work proposed. The purchase of special tooling and test equipment must, in the opinion of the Component Contracting Officer, be advantageous to the Government and should be related directly to the specific topic. These may include such items as innovative instrumentation or automatic test equipment. Title to property furnished by the Government or acquired with Government funds will be vested with the DoD Component, unless it is determined

that transfer of title to the contractor would be more cost effective than recovery of the equipment by the DoD Component.

TRAVEL:

Explain the basis of proposed travel, including to/from locations, number of trips, number of travelers per trip, and number of days/nights per trip. Include substantiating documentation for the costs (e.g. screenshots of flight cost comparison, rental car quotes, etc.). NOTE: Virtual meetings shall be utilized to the maximum extent practicable. Volume 5, Supporting Documents, may be used if additional space is needed.

SUBCONTRACTS: A subcontract is any agreement, other than one involving an employer-employee relationship, entered into by the prime contractor (awardee) calling for supplies or services for the performance of the contract.

All subcontractor costs and consultant costs must be detailed at the same level as prime contractor costs in regard to labor, travel, equipment, etc.

Explain the basis of proposed subcontract costs. Include documented support of the offeror's price analyses and degree of competition of all subcontractor proposals. All subcontractor costs and consultant costs, such as labor, travel, equipment, materials, must be detailed at the same level as prime contractor costs. Provide detailed substantiation of subcontractor costs in your cost proposal. Volume 5, Supporting Documents, may be used if additional space is needed.

Certify that the following requirements are met: For Phase I, the offeror must perform a minimum of two-thirds of the research and/or analytical effort. One third may be subcontracted to another firm or research organization/facility. The percentage of work is measured by both direct and indirect costs.

Offerors shall not propose to subcontract to the issuing agency, to any other Federal Government agency, or to other units of the Federal Government, except Federal Laboratories in rare circumstances. As defined in 15 U.S.C. 3703, Federal Laboratory means any laboratory, any federally funded research and development center, or any center established under 15 U.S.C. 3705 and 3707 that is owned, leased, or otherwise used by a Federal Agency and funded by the Federal Government, whether operated by the Government or by a contractor.

Offerors shall not propose to subcontract to any prohibited sources. Proposals identifying a subcontractor/vendor arrangement with a prohibited source may be rejected.

Offerors shall ensure subcontracting arrangements are with United States Small Businesses to the maximum extent practicable. Offerors proposing a subcontractor arrangement with other than a United States Small Business (such as, a large business, foreign firm, foreign government, educational institution, unit of Federal Government, etc.) may be required to submit further explanation.

INDIRECT COSTS:

Explain the basis of the proposed indirect expense rates including overhead, general and administrative, material handling, and fringe benefits.

If a Defense Contract Audit Agency (DCAA) Audit has been conducted within the last five (5) years, include the audit compliance documentation in the cost proposal documents. The documentation should also include the offeror's DCAA Point of Contact (if applicable).

If selected, failure to include the documentation with your proposal may delay contract award, as the proposer will be asked to submit the necessary documentation to the Contracting Officer to substantiate costs. It is important to respond as quickly as possible to the Contracting Officer's request for documentation. Failure or refusal to provide documentation may result in cancellation of the contract action.

Company Commercialization Report (CCR) (Volume 4)

Completion of the CCR as Volume 4 of the proposal submission in DSIP is required. Please refer to the DoD SBIR Program BAA for full details on this requirement. Information contained in the CCR will be considered by the Department of the Army during proposal evaluations.

Supporting Documents (Volume 5)

Volume 5 is provided for proposers to submit additional documentation to support the Cover Sheet (Volume 1), Technical Volume (Volume 2), and the Cost Volume (Volume 3).

All proposing small business concerns are REQUIRED to submit the following documents to Volume 5:

1. Contractor Certification Regarding Provision of Prohibition on Contracting for Certain Telecommunications and Video Surveillance Services or Equipment
2. Disclosures of Foreign Affiliations or Relationships to Foreign Countries
3. Disclosure of Funding Sources

Please refer to the DoD Program BAA for more information.

In addition to the Volume 5 requirements outlined in the DoD Program BAA, the Department of the Army may accept the following documents in Volume 5:

- Additional Cost Information
- Funding Agreement Certification
- Technical Data Rights (Assertions)
- Lifecycle Certification
- Allocation of Rights
- Other (only as specified in the topic)

Please only submit documents that are identified immediately above and in the DoD Program BAA. All other documents submitted will be disregarded.

DIRECT TO PHASE II PROPOSAL INSTRUCTIONS

The Defense SBIR/STTR Innovation Portal (DSIP) is the official portal for DoD SBIR/STTR proposal submission. Proposers (also referred to herein as "offeror(s)") are required to submit proposals via DSIP; proposals submitted by any other means will be disregarded. Detailed instructions regarding registration and proposal submission via DSIP are provided in the DoD SBIR Program BAA.

Proposers interested in submitting a DP2 proposal in response to these topics must provide documentation to substantiate that the scientific and technical merit and feasibility described in the Phase I section of the topic has been met and describes the potential commercial applications. Documentation should include all relevant information including, but not limited to: technical reports, test data, prototype designs/models, and performance goals/results. Work submitted within the feasibility documentation must have been substantially performed by the proposer and/or the Principal Investigator.

The Army will not evaluate the proposer's related Phase II proposal if it determines that the proposer has failed to demonstrate that technical merit and feasibility has been established or the proposer has failed to demonstrate that work submitted in the feasibility documentation was substantially performed by the proposer and/or the PI.

Feasibility documentation cannot be based upon any prior or ongoing federally funded SBIR or STTR work and DP2 proposals MUST NOT logically extend from any prior or ongoing federally funded SBIR or STTR work.

Proposal Coversheet (Volume 1)

The proposal coversheet must follow the instructions and requirements provided in the DoD SBIR Program BAA.

The offeror shall certify that to the best of its knowledge and belief, its eligibility information under the SBIR Program is accurate, complete, and current as of the date of the offer.

Format of Technical Volume (Volume 2)

The Technical Volume must include two parts, the Feasibility Documentation, and the Technical Proposal.

The Technical Volume must be a single Portable Document Format (PDF) file, including graphics. Perform a virus check before uploading the Technical Volume file. If a virus is detected, it may cause rejection of the proposal. Do not lock or encrypt the uploaded file. Do not include or embed active graphics such as videos, moving pictures, or other similar media in the document.

The length of the Feasibility Documentation is not to exceed 5 pages and the length of the Technical Proposal is not to exceed 10 pages. A commercialization plan must also accompany the technical proposal and should be 8 slides. Any proposals submitted in a different format or exceed the page count limits will not be reviewed.

Number all pages of your proposal consecutively. Font size should not be smaller than 10- point on standard 8-1/2" x 11" paper with one-inch margins. The header on each page of the Technical Volume should contain your company name, topic number, and proposal number assigned by DSIP when the Cover Sheet was created. The header may be included in the one-inch margin.

Content of the Technical Volume: (Volume 2)

PART ONE: Feasibility and Technical Proposal (15 pages maximum)

Content of the Feasibility Documentation (Volume 2a)

The content of the Feasibility Documentation Proposers should substantiate that the scientific and technical merit and feasibility described in the Phase I section of the topic has been met and describes the potential commercial applications. Documentation should include all relevant information including, but not limited to: technical reports, test data, prototype designs/models, and performance goals/results. Work submitted within the feasibility documentation must have been substantially performed by the proposer and/or the Principal Investigator.

If you have references, include a reference list or works cited list as the last page of the feasibility documentation. This will count towards the total page limit.

Work submitted within the feasibility documentation must have been substantially performed by the proposer and/or the Principal Investigator (PI).

If technology in the feasibility documentation is subject to Intellectual Property (IP), the proposer must either own the IP, or must have obtained license rights to such technology prior to proposal submission, to enable it and its subcontractors to legally carry out the proposed work. Documentation of IP ownership or license rights shall be included in the Technical Volume of the proposal.

At a minimum, the technical proposal should address:

- What are you trying to do? Articulate your objectives without jargon.
- How is it done today, and what are the limits of current practice?
- What is new in your approach and why do you think it will be successful?
- Who cares? If you are successful, what difference will it make?
- What are the risks?
- How much will it cost?
- How long will it take?
- How do you measure success?
- What team will accomplish your mission?
- What existing / related SBIR, STTR, or other research proposals support this technology?
- What is the commercialization strategy for the proposed technology?

Content of the Technical Proposal (Volume 2b; part 1 continued)

The content of the Technical Volume should address three key areas: the technical approach, the team carrying out the work (and the accompanied resources), and the commercialization strategy. The technical approach section shall contain details on how the proposer is going to solve the problem. It shall detail key elements of the firm's approach, any risks, relevant past work and how success is measured. The team qualifications section shall highlight the key personnel working on the project, and the resources that will be brought to bear on solving the problem. The commercialization plan should include:

- **Company information:** Focused objectives/core competencies; specialization area(s); products with significant sales; and history of previous Federal and non-Federal funding, regulatory experience, and subsequent commercialization successes.
- **Customer and Competition:** Clear description of key technology objectives, current competition, and advantages compared to competing products or services; description of hurdles to acceptance of the innovation.
- **Market:** Milestones, target dates, analyses of market size, and estimated market share after first year sales and after 5 years; explanation of plan to obtain market share.
- **Intellectual Property:** Patent status, technology lead, trade secrets or other demonstration of a plan to achieve sufficient protection to realize the commercialization stage and attain at least a temporal competitive advantage.
- **Financing:** Plans for securing necessary non-SBIR funding.
- **Assistance and mentoring:** Plans for securing needed technical or business assistance through mentoring, partnering, or through arrangements with government sponsored (e.g., State assistance programs, Federally-funded research laboratories, Manufacturing Extension Partnership centers), not-for-profits (e.g., Small Business Development

Centers or Procurement Technical Assistance Centers), commercial accelerators, DOD Prime Contractors, or other assistance provider.

Proposers are free to structure each section as they like, so long as it provides sufficient detail for evaluators to understand the proposed work, who will carry it out, and how the business plans to commercialize results.

PART TWO: Commercialization Plan (8 slides/pages maximum, saved as a PDF and attached with the Technical Proposal as part of the Technical Volume).

The Army is equally interested in dual use commercialization of SBIR/STTR projects that result in products sold to the U.S. military, the private sector market, or both. The Army expects explicit discussion of key activities to achieve this result in the commercialization strategy part of the proposal.

The commercialization strategy should include the following elements:

- A summary of transition and commercialization activities, and the Technology Readiness Level (TRL) achieved. Discuss how the preliminary transition and commercialization path or paths may evolve during the Phase II project.
- Describe key proposed technical milestones during Phase II that will advance the technology towards product such as: prototype development, laboratory and systems testing, integration, testing in operational environment, and demonstrations.
- Description of Product(s) and/or System Application(s). Identify the commercial product(s) and/or DoD system(s), or system(s) under development, or potential new system(s). Identify the potential DoD end- users, Federal customers, and/or private sector customers who would likely use the technology.
- Business Model(s)/Procurement Mechanism(s). Discuss your current business model hypothesis for bringing the technology to market. Describe plans to license, partner, or self-produce your product. How do you plan to generate revenue? Understanding the Army's goal of creating and sustaining viable small businesses that support and generate advanced Army technologies, describe how you intend to develop your product and supply chains to enable this differentiation.
- Target Market. Describe the market and customer sets you propose to target, their size, their growth rate, and their key reasons they would consider procuring the technology.
- Describe competing technologies existent today on the market as well as those being developed in the lab.
- Funding Requirements. Describe your company's funding history. How much external financing have you raised? Describe your plans for future funding sources (internal, loan, angel, venture capital, etc.).
- Commercialization Risks. Describe the major technology, market and team risks associated with achieving successful transition of the Army funded technology.
- Expertise/Qualifications of Team/Company Readiness. Describe the expertise and qualifications of your management, marketing/business development and technical team that will support the transition of the technology from the prototype to the commercial market and into government operational environments. Has this team previously taken similar products/services to market? If the present team does not have this needed expertise, how do you intend to obtain it? What is the financial history and health of your company (e.g., availability of cash, profitability, revenue growth, etc.)?
- Anticipated Commercialization Results. Include a schedule showing the anticipated quantitative commercialization results from the Phase II project at one year after the start

of Phase II, at the completion of Phase II, and after the completion of the Sequential Phase II (i.e., amount of additional investment, sales revenue, etc.). After a Phase II award, the company is required to report actual sales and investment data in its Company Commercialization Report at least annually.

These instructions supersede those stated in section 5.3.c of the DoD Program BAA.

Cost Volume (Volume 3)

Unless otherwise noted in the topic description, the Army will accept Direct to Phase II proposals for a cost up to \$1,900,000 for a 24-month period of performance. Proposers are required to use the Cost Proposal method as provided on the DSIP submission site. The Cost Volume (and supporting documentation) DOES NOT count toward the page limit of the Technical Volume.

Proposers are required to use the Cost Proposal method as provided on the DSIP submission site. The Cost Volume (and supporting documentation) DOES NOT count toward the page limit of the Technical Volume.

For pricing purposes, offerors should assume a contract or agreement start date of approximately ninety (90) days after submission of the proposal. For this BAA, adequate price competition (APC), as defined in FAR 15.403-1(c), is anticipated. In the event that adequate price competition is not realized (i.e. only one proposal is received for a given topic), the Government may choose to conduct additional proposal analysis, in accordance with the techniques identified at FAR 15.404-1. Additionally, offerors are to provide any current Forward Pricing Rate Agreements (FPRA) in effect at time of proposal submission.

Content of the Cost Volume (Volume 3, cont.)

ALL proposed costs should be accompanied by documentation to substantiate how the cost was derived. For example, if you proposed travel costs to attend a project-related meeting or conference, and used a travel website to compare flight costs, include a screenshot of the comparison. Similarly, if you proposed to purchase materials or equipment, and used the internet to search for the best source, include your market research for those items. You do not necessarily have to propose the cheapest item or supplier, but you should explain your decision to choose one item or supplier over another. It's important to provide enough information to allow contracting personnel to understand how the proposer plans to use the requested funds.

Some items in the cost breakdown may not apply to the proposed project. If that is the case, there is no need to provide information on each and every item.

Cost Breakdown Guidance:

ALL proposed costs should be accompanied by documentation to substantiate how the cost was derived. Substantiating documentation guidance is as follows:

- **LABOR:**
 - List all key personnel by name as well as by number of hours dedicated to the project as direct labor.
 - Explain the basis of proposed labor hours, including required tasks, and substantiating documentation for the costs (e.g. payroll reports). Volume 5, Supporting Documents, may be used if additional space is needed.

- MATERIAL/TOOLING/EQUIPMENT:
 - Explain the basis of proposed material and equipment costs. This support should include a consolidated priced summary of individual material and equipment quantities and substantiating documentation for the costs (e.g. vendor quotes, invoice prices, competitive bids, etc.). If your choice isn't the lowest cost available, explain the decision to choose one item or supplier over another. Volume 5, Supporting Documents, may be used if additional space is needed.
 - Ensure all materials are American-made to the maximum extent practicable. Offerors who propose to use a foreign-made product in its technology may be required to find an American-made equivalent.
 - While special tooling and test equipment and material cost may be included, it will be carefully reviewed relative to need and appropriateness for the work proposed. The purchase of special tooling and test equipment must, in the opinion of the Component Contracting Officer, be advantageous to the Government and should be related directly to the specific topic. These may include such items as innovative instrumentation or automatic test equipment. Title to property furnished by the Government or acquired with Government funds will be vested with the DoD Component, unless it is determined that transfer of title to the contractor would be more cost effective than recovery of the equipment by the DoD Component.

- TRAVEL:
 - Explain the basis of proposed travel, including to/from locations, number of trips, number of travelers per trip, and number of days/nights per trip. Include substantiating documentation for the costs (e.g. screenshots of flight cost comparison, rental car quotes, etc.). NOTE: Virtual meetings shall be utilized to the maximum extent practicable. Volume 5, Supporting Documents, may be used if additional space is needed.

- SUBCONTRACTS: A subcontract is any agreement, other than one involving an employer-employee relationship, entered into by the prime contractor (awardee) calling for supplies or services for the performance of the contract.
 - All subcontractor costs and consultant costs must be detailed at the same level as prime contractor costs in regard to labor, travel, equipment, etc.
 - Explain the basis of proposed subcontract costs. Include documented support of the offeror's price analyses and degree of competition of all subcontractor proposals. All subcontractor costs and consultant costs, such as labor, travel, equipment, materials, must be detailed at the same level as prime contractor costs. Provide detailed substantiation of subcontractor costs in your cost proposal. Volume 5, Supporting Documents, may be used if additional space is needed.

- Certify that the following requirements are met: For Phase I, the offeror must perform a minimum of two-thirds of the research and/or analytical effort. One third may be subcontracted to another firm or research organization/facility. The percentage of work is measured by both direct and indirect costs.
 - Offerors shall not propose to subcontract to the issuing agency, to any other Federal Government agency, or to other units of the Federal Government, except Federal Laboratories in rare circumstances. As defined in 15 U.S.C. 3703, Federal Laboratory means any laboratory, any federally funded research and development center, or any center established under 15 U.S.C. 3705 and 3707 that is owned, leased, or otherwise used by a Federal Agency and funded by the Federal Government, whether operated by the Government or by a contractor.
 - Offerors shall not propose to subcontract to any prohibited sources. Proposals identifying a subcontractor/vendor arrangement with a prohibited source may be rejected.
 - Offerors shall ensure subcontracting arrangements are with United States Small Businesses to the maximum extent practicable. Offerors proposing a subcontractor arrangement with other than a United States Small Business (such as, a large business, foreign firm, foreign government, educational institution, unit of Federal Government, etc.) may be required to submit further explanation.
- **INDIRECT COSTS:**
 - Explain the basis of the proposed indirect expense rates including overhead, general and administrative, material handling, and fringe benefits.
 - If a Defense Contract Audit Agency (DCAA) Audit has been conducted within the last five (5) years, include the audit compliance documentation in the cost proposal documents. The documentation should also include the offeror's DCAA Point of Contact (if applicable).

If selected, failure to include the documentation with your proposal may delay contract award, as the proposer will be asked to submit the necessary documentation to the Contracting Officer to substantiate costs. It is important to respond as quickly as possible to the Contracting Officer's request for documentation. Failure or refusal to provide documentation may result in cancellation of the contract action.

For more information about cost proposals and accounting standards, see the DCAA publication titled "Audit Process Overview – Information for Contractors" available at: <http://www.dcaa.mil>.

Company Commercialization Report (CCR) (Volume 4; no page limitations)

Completion of the CCR as Volume 4 of the proposal submission in DSIP is required. Please refer to the DoD SBIR Program BAA <https://www.dodsbirsttr.mil/submissions/baa-schedule/broad-agency-announcements> for full details on this requirement. Information contained in the CCR will be considered by the Department of the Army during proposal evaluations.

Supporting Documents (Volume 5; no page limitations)

Volume 5 is provided for proposers to submit additional documentation to support the Cover Sheet (Volume 1), Technical Volume (Volume 2), and the Cost Volume (Volume 3).

All proposing small business concerns are **REQUIRED** to submit the following documents to Volume 5:

1. Contractor Certification Regarding Provision of Prohibition on Contracting for Certain Telecommunications and Video Surveillance Services or Equipment
2. Disclosures of Foreign Affiliations or Relationships to Foreign Countries
3. Disclosure of Funding Sources

Please refer to the DoD Program BAA for more information.

In addition to the Volume 5 requirements outlined in the DoD Program BAA, the Department of the Army will accept the following documents in Volume 5:

- Additional Cost Information
- Funding Agreement Certification
- Technical Data Rights (Assertions)
- Lifecycle Certification
- Allocation of Rights
- Endorsement Letters
- Other (only as specified in the topic)

DISCRETIONARY TECHNICAL AND BUSINESS ASSISTANCE (TABA)

The Army, at its discretion, may provide Technical and Business Assistance (TABA). The Army will select a preferred vendor(s) for the Army SBIR TABA program through a competitive process. Alternately, a small business concern may, by contract or otherwise, select one or more vendors to assist the firm in meeting the TABA goals. The Applicant must request the authority to select its own TABA provider in its Army SBIR proposal and must demonstrate that the vendor is uniquely postured to provide the specific technical and business services required by providing documentation in Volume 5, Supporting Documentation. TABA funding will be denied if the offeror fails to include the cost and detailed explanation in its proposal. If you prefer to use the Army preferred vendor, you may opt for that support after selection if chosen to receive a contract award.

Participation in the Army SBIR TABA program is voluntary for each Army SBIR awardee. Services provided to Army SBIR firms under the auspices of the TABA program may include, but are not limited to:

1. Access to a network of scientists, engineers, and technologists focused on commercialization and transition considerations such as protected supply chain management, advanced manufacturing, process/product/production scaling, etc;
2. Assistance with intellectual property protections, such as legal considerations, intellectual property rights, patent filing, patent fees, licensing considerations, etc;
3. Commercialization and technology transition support such as market research, market validation, development of regulatory or manufacturing plans, brand development;

4. Regulatory support such as product domain regulatory considerations, regulatory planning, and regulatory strategy development.

The Army SBIR program sponsors participation in the TABA program. The resource limitation for each firm is as follows:

- Phase I Firms:
 - Army-Preferred Vendor: If approved, the contractor may receive up to \$6,500 worth of assistance services per project per year (in addition to the base SBIR award amount).
 - Firm-Selected Vendor: If approved, the contractor may receive up to \$6,500 in contract obligation (in addition to the base SBIR award amount) per project per year.
- Phase II Firms:
 - Army-Preferred Vendor: If approved, the contractor may receive up to \$50,000 worth of assistance services per project (in addition to the base SBIR award amount).
 - Firm-Selected Vendor: If approved, the contractor may receive up to \$50,000 in contract obligation (must be included in base SBIR award amount) per project.

EVALUATION AND SELECTION

The Army will conduct an evaluation of each responsive, timely, eligible proposal in accordance with the evaluation criteria listed in the DoD Program BAA. It is the policy of the Army to ensure equitable and comprehensive proposal evaluations based on the evaluation criteria and to select the source (or sources) whose offer meets the Government's technical, policy, and programmatic goals. Designated support contractors may review submissions for the purposes of technical evaluation. All support contractors are bound by appropriate non-disclosure agreements.

As previously stated herein, timeliness, responsiveness, and eligibility will be assessed upon initial screening, during evaluation, and after selection. Proposals that do not comply with the instructions and requirements detailed in this document, the DoD Program BAA, or the corresponding Topic posting (including the research objective(s)), will be considered ineligible, nonresponsive, untimely, or non-conforming and therefore will not be evaluated or considered for award.

Using the evaluation criteria, the Government will evaluate each responsive, timely, eligible proposal in its entirety. Proposals will not be evaluated against each other during the evaluation process, but rather evaluated on their own individual merit to determine how well the proposal meets the criteria stated in this BAA and the corresponding opportunity.

Selected proposals are those determined to be the most advantageous to the Government, consistent with instructions and evaluation criteria specified in the DoD Program BAA, the component-specific instructions herein, the corresponding Topic posting, and availability of funding.

Proposing firms will be notified via email of selection or non-selection status for a Phase I or direct to Phase II award within 90 days of the closing date of the Topic. The notification will be sent to the Corporate Official listed on the proposal cover sheet from the Army SBIR Program Office mailbox. The Army promotes transparency regarding the technical evaluation for all Army SBIR proposals. The Army will provide a technical evaluation narrative to the proposer in accordance with the SBA Policy Directive, Appendix I, paragraph 4. The selection decision notice contains instructions for retrieving the technical evaluation narrative.

Proposers must not regard the notification email (selection decision notice) as an authorization to commit or expend funds. After the Army SBIR Office has recommended a proposal for award, a Government

Contracting Officer may contact the proposer in order to discuss and request additional information required for award. This may include representations and certifications, certified or other than certified cost data, subcontracting plan for small businesses, and/or other information as applicable to the proposed award. Proposers must not regard these communications as an authorization to commit or expend funds. Unless a Government Contracting Officer signs the award document (i.e. contract), no obligations to provide funding are made. The Government may reject the proposal or cancel the contract action at any time.

If signed by the Government Contracting Officer, the award document is the official and authorizing instrument (i.e. contract). The anticipated period of performance start date will be determined at time of award. The Contracting Officer will email the signed, authorizing award instrument to the principal investigator (PI) and/or an authorized organization representative.

PROTESTS

Refer to the DoD SBIR Program BAA for procedures to protest the Announcement.


Feedback will be provided to applicants that are not selected for further consideration. A notification letter will include instructions for obtaining feedback in the form of a ValidEval Report. Offerors are entitled to no more than one feedback per proposal. NOTE: Feedback is not the same as a FAR Part 15 debriefing. Acquisitions under this solicitation are awarded via “other competitive procedures (FAR 6.102(d)(2)).” Therefore, offerors are neither entitled to nor will they be provided FAR Part 15 debriefs. As further prescribed in FAR 33.106(b), FAR 52.233-3, Protests after Award shall be submitted to the Point of Contract identified in the topic solicitation:

Email: usarmy.pentagon.hqda-asa-alt.mbx.army-applied-sbir-program@mail.mil

Mailing Address:

Army Applied SBIR Office
2530 Crystal Dr.; Ste 11192
Arlington, VA 22202

Appendix A Phase I Evaluation Criteria


| Applied SBIR Phase I Proposal Review v2-0-3 Evaluation Criteria Defined | |  |
|---|-------------------|---|
| DEFINITION | | |
| INTRODUCTION | <i>weight 5%</i> | Write a clear, concise description of what your innovation does or will do, and where you are in your evolution. Make clear its intended impact on the Army. Evaluators should "get it" after reading this. |
| POTENTIAL FOR ARMY IMPACT | <i>weight 25%</i> | <p>OPERATIONAL IMPACT At the scale of a single Army end-user, argue that their jobs or lives will be significantly improved if your solution is adopted. What is the impact of your solution for a soldier/Army civilian vs. today's solutions?</p> <hr/> <p>POTENTIAL SCALE OF IMPACT Here, we're looking for an idea of how broad the impact you described above could be. Look into the future to a time when your solution is both technically mature and actively in use by Army personnel. Describe the scale and scope of your impact within the context of the Army.</p> |
| TECHNICAL FEASIBILITY | <i>weight 25%</i> | <p>SCIENTIFIC FEASIBILITY Is the science behind the solution sound? Convince readers who don't have deep expertise in your field that your innovation is built atop sound scientific and engineering principles.</p> <hr/> <p>ENABLING TECHNOLOGIES Point to the foundational technologies that you rely on to deliver your solution. Do the required enabling technologies introduce added risk? Using proven (and ideally Army-fielded) underlying technologies and techniques helps to lower technical risk.</p> <hr/> <p>ALTERNATIVE TECHNICAL APPROACHES From a technologist's perspective, why is your proposed solution the best choice for the Army? Refute the alternative engineering approaches others are using. Why does your technology win?</p> <hr/> <p>TECHNICAL RISK MITIGATION No matter your current technology readiness level, technical risks remain. Identify those risks. Present a credible plan to tackle those risks.</p> |
| TRANSITION | <i>weight 20%</i> | <p>ARMY TRANSITION PATHWAY Planning for success, what's next for you after this SBIR award? Describe the next type of deal you aim to make with the Army, e.g. a CRADA, a different SBIR contract, a CSO, etc. Briefly outline your current plan to unlock that next opportunity and/or share the biggest risks you see post this SBIR award.</p> <hr/> <p>SBIR MILESTONE SCHEDULE Please share with us a thoughtful execution plan. Strike a balance between giving us a sense of the detailed thinking behind the scenes and the need for your contracting officer to manage a reasonably small number of milestones during your period of performance.</p> |
| FIRM CASH FLOW | <i>weight 10%</i> | <p>FIRM SURVIVAL RISK SBIR funds are meant to fuel growth rather than stave off a firm's impending financial failure. Demonstrate that your company will survive financially as a going concern through the early stages of a Phase III contract, sometimes referred to as "transitioning" into use by Army personnel.</p> <hr/> <p>OTHER PEOPLE'S MONEY Make the case that non-Army and/or non-DoD dollars will continue to fund improvements to your solution from which the Army will benefit in the future. Companies who cannot demonstrate non-Army and/or non-DoD funding sources for future solution enhancements are less attractive to the Applied SBIR program.</p> <hr/> <p>FINANCIAL PROFIT POTENTIAL Through the Applied SBIR program, the Army wants to take advantage of the speed and scalability of dual-use companies. Make your best case that your product is or will be profitable. If you have more than one product, please focus your argument on the product / solution presented for this SBIR program.</p> |
| TEAM ABILITY | <i>weight 10%</i> | Prove your team has executed well as a group. Please draw clear distinctions between private sector, DoD and civilian government work. What milestones have you accomplished as a group in this company? |
| SUBMISSION QUALITY | <i>weight 5%</i> | <p>QUALITY OF PROSE Prove you write clearly. Prove you argue convincingly.</p> <hr/> <p>DATA QUALITY & ATTRIBUTION Support your arguments with relevant, properly attributed data to enhance your credibility.</p> |

Appendix B

Direct to Phase II Evaluation Criteria

| Applied SBIR D2P2 Proposal Review v2-0-4 Evaluation Criteria Defined | | DEFINITION |
|--|---|--|
| INTRODUCTION | <i>weight 2%</i> | Write a clear, concise description of what your innovation does or will do, and where you are in your evolution. Make clear its intended impact on the Army. Evaluators should "get it" after reading this. |
| POTENTIAL FOR ARMY IMPACT | OPERATIONAL IMPACT | At the scale of a single Army end-user, argue that their jobs or lives will be significantly improved if your solution is adopted. What is the impact of your solution for a soldier/Army civilian vs. today's solutions? |
| <i>weight 20%</i> | POTENTIAL SCALE OF IMPACT | Here, we're looking for an idea of how broad the impact you described above could be. Look into the future to a time when your solution is both technically mature and actively in use by Army personnel. Describe the scale and scope of your impact within the context of the Army. |
| TECHNICAL FEASIBILITY | SCIENTIFIC FEASIBILITY | Is the science behind the solution sound? Convince readers who don't have deep expertise in your field that your innovation is built atop sound scientific and engineering principles. |
| <i>weight 30%</i> | ENABLING TECHNOLOGIES | Point to the foundational technologies that you rely on to deliver your solution. Do the required enabling technologies introduce added risk? Using proven (and ideally Army-fielded) underlying technologies and techniques helps to lower technical risk. |
| | ALTERNATIVE TECHNICAL APPROACHES | From a technologist's perspective, why is your proposed solution the best choice for the Army? Refute the alternative engineering approaches others are using. Why does your technology win? |
| | TECHNICAL RISK MITIGATION | No matter your current technology readiness level, technical risks remain. Identify those risks. Present a credible plan to tackle those risks. |
| TRANSITION | ARMY TRANSITION PATHWAY | Planning for success, what's next for you after this SBIR award? Describe the next type of deal you aim to make with the Army, e.g. a CRADA, a different SBIR contract, a CSO, etc. Briefly outline your current plan to unlock that next opportunity and/or share the biggest risks you see post this SBIR award. |
| <i>weight 20%</i> | SBIR MILESTONE SCHEDULE | Please share with us a thoughtful execution plan. Strike a balance between giving us a sense of the detailed thinking behind the scenes and the need for your contracting officer to manage a reasonably small number of milestones during your period of performance. |
| FIRM CASH FLOW | FIRM SURVIVAL RISK | SBIR funds are meant to fuel growth rather than stave off a firm's impending financial failure. Demonstrate that your company will survive financially as a going concern through the early stages of a Phase III contract, sometimes referred to as "transitioning" into use by Army personnel. |
| <i>weight 15%</i> | OTHER PEOPLE'S MONEY | Make the case that non-Army and/or non-DoD dollars will continue to fund improvements to your solution from which the Army will benefit in the future. Companies who cannot demonstrate non-Army and/or non-DoD funding sources for future solution enhancements are less attractive to the Applied SBIR program. |
| | FINANCIAL PROFIT POTENTIAL | Through the Applied SBIR program, the Army wants to take advantage of the speed and scalability of dual-use companies. Make your best case that your product is or will be profitable. If you have more than one product, please focus your argument on the product / solution presented for this SBIR program. |
| TEAM ABILITY | <i>weight 10%</i> | Prove your team has executed well as a group. Please draw clear distinctions between private sector, DoD and civilian government work. What milestones have you accomplished as a group in this company? |
| SUBMISSION QUALITY | QUALITY OF PROSE | Prove you write clearly. Prove you argue convincingly. |
| <i>weight 3%</i> | DATA QUALITY & ATTRIBUTION | Support your arguments with relevant, properly attributed data to enhance your credibility. |

Phase II Evaluation Criteria

| Applied SBIR Phase II Proposal Review v2-0-3 Evaluation Criteria Defined | |  | | | | | | | | |
|--|--|---|--------------------------------|--|---------------------------------------|---|---|---|----------------------------------|---|
| | | DEFINITION | | | | | | | | |
| INTRODUCTION | <i>weight 2%</i> | Write a clear, concise description of what your innovation does or will do, and where you are in your evolution. Make clear its intended impact on the Army. Evaluators should "get it" after reading this. | | | | | | | | |
| POTENTIAL FOR ARMY IMPACT | <i>weight 20%</i> | <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 20%;">OPERATIONAL IMPACT</td> <td>At the scale of a single Army end-user, argue that their jobs or lives will be significantly improved if your solution is adopted. What is the impact of your solution for a soldier/Army civilian vs. today's solutions?</td> </tr> <tr> <td>POTENTIAL SCALE OF IMPACT</td> <td>Here, we're looking for an idea of how broad the impact you described above could be. Look into the future to a time when your solution is both technically mature and actively in use by Army personnel. Describe the scale and scope of your impact within the context of the Army.</td> </tr> </table> | OPERATIONAL IMPACT | At the scale of a single Army end-user, argue that their jobs or lives will be significantly improved if your solution is adopted. What is the impact of your solution for a soldier/Army civilian vs. today's solutions? | POTENTIAL SCALE OF IMPACT | Here, we're looking for an idea of how broad the impact you described above could be. Look into the future to a time when your solution is both technically mature and actively in use by Army personnel. Describe the scale and scope of your impact within the context of the Army. | | | | |
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| TECHNICAL FEASIBILITY | <i>weight 25%</i> | <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 20%;">SCIENTIFIC FEASIBILITY</td> <td>Is the science behind the solution sound? Convince readers who don't have deep expertise in your field that your innovation is built atop sound scientific and engineering principles.</td> </tr> <tr> <td>ENABLING TECHNOLOGIES</td> <td>Point to the foundational technologies that you rely on to deliver your solution. Do the required enabling technologies introduce added risk? Using proven (and ideally Army-fielded) underlying technologies and techniques helps to lower technical risk.</td> </tr> <tr> <td>ALTERNATIVE TECHNICAL APPROACHES</td> <td>From a technologist's perspective, why is your proposed solution the best choice for the Army? Refute the alternative engineering approaches others are using. Why does your technology win?</td> </tr> <tr> <td>TECHNICAL RISK MITIGATION</td> <td>No matter your current technology readiness level, technical risks remain. Identify those risks. Present a credible plan to tackle those risks.</td> </tr> </table> | SCIENTIFIC FEASIBILITY | Is the science behind the solution sound? Convince readers who don't have deep expertise in your field that your innovation is built atop sound scientific and engineering principles. | ENABLING TECHNOLOGIES | Point to the foundational technologies that you rely on to deliver your solution. Do the required enabling technologies introduce added risk? Using proven (and ideally Army-fielded) underlying technologies and techniques helps to lower technical risk. | ALTERNATIVE TECHNICAL APPROACHES | From a technologist's perspective, why is your proposed solution the best choice for the Army? Refute the alternative engineering approaches others are using. Why does your technology win? | TECHNICAL RISK MITIGATION | No matter your current technology readiness level, technical risks remain. Identify those risks. Present a credible plan to tackle those risks. |
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| ENABLING TECHNOLOGIES | Point to the foundational technologies that you rely on to deliver your solution. Do the required enabling technologies introduce added risk? Using proven (and ideally Army-fielded) underlying technologies and techniques helps to lower technical risk. | | | | | | | | | |
| ALTERNATIVE TECHNICAL APPROACHES | From a technologist's perspective, why is your proposed solution the best choice for the Army? Refute the alternative engineering approaches others are using. Why does your technology win? | | | | | | | | | |
| TECHNICAL RISK MITIGATION | No matter your current technology readiness level, technical risks remain. Identify those risks. Present a credible plan to tackle those risks. | | | | | | | | | |
| TRANSITION | <i>weight 25%</i> | <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 20%;">ARMY TRANSITION PATHWAY</td> <td>Planning for success, what's next for you after this SBIR award? Describe the next type of deal you aim to make with the Army, e.g. a CRADA, a different SBIR contract, a CSO, etc. Briefly outline your current plan to unlock that next opportunity and/or share the biggest risks you see post this SBIR award.</td> </tr> <tr> <td>SBIR MILESTONE SCHEDULE</td> <td>Please share with us a thoughtful execution plan. Strike a balance between giving us a sense of the detailed thinking behind the scenes and the need for your contracting officer to manage a reasonably small number of milestones during your period of performance.</td> </tr> </table> | ARMY TRANSITION PATHWAY | Planning for success, what's next for you after this SBIR award? Describe the next type of deal you aim to make with the Army, e.g. a CRADA, a different SBIR contract, a CSO, etc. Briefly outline your current plan to unlock that next opportunity and/or share the biggest risks you see post this SBIR award. | SBIR MILESTONE SCHEDULE | Please share with us a thoughtful execution plan. Strike a balance between giving us a sense of the detailed thinking behind the scenes and the need for your contracting officer to manage a reasonably small number of milestones during your period of performance. | | | | |
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| SBIR MILESTONE SCHEDULE | Please share with us a thoughtful execution plan. Strike a balance between giving us a sense of the detailed thinking behind the scenes and the need for your contracting officer to manage a reasonably small number of milestones during your period of performance. | | | | | | | | | |
| FIRM CASH FLOW | <i>weight 20%</i> | <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 20%;">FIRM SURVIVAL RISK</td> <td>SBIR funds are meant to fuel growth rather than stave off a firm's impending financial failure. Demonstrate that your company will survive financially as a going concern through the early stages of a Phase III contract, sometimes referred to as "transitioning" into use by Army personnel.</td> </tr> <tr> <td>OTHER PEOPLE'S MONEY</td> <td>Make the case that non-Army and/or non-DoD dollars will continue to fund improvements to your solution from which the Army will benefit in the future. Companies who cannot demonstrate non-Army and/or non-DoD funding sources for future solution enhancements are less attractive to the Applied SBIR program.</td> </tr> <tr> <td>FINANCIAL PROFIT POTENTIAL</td> <td>Through the Applied SBIR program, the Army wants to take advantage of the speed and scalability of dual-use companies. Make your best case that your product is or will be profitable. If you have more than one product, please focus your argument on the product / solution presented for this SBIR program.</td> </tr> </table> | FIRM SURVIVAL RISK | SBIR funds are meant to fuel growth rather than stave off a firm's impending financial failure. Demonstrate that your company will survive financially as a going concern through the early stages of a Phase III contract, sometimes referred to as "transitioning" into use by Army personnel. | OTHER PEOPLE'S MONEY | Make the case that non-Army and/or non-DoD dollars will continue to fund improvements to your solution from which the Army will benefit in the future. Companies who cannot demonstrate non-Army and/or non-DoD funding sources for future solution enhancements are less attractive to the Applied SBIR program. | FINANCIAL PROFIT POTENTIAL | Through the Applied SBIR program, the Army wants to take advantage of the speed and scalability of dual-use companies. Make your best case that your product is or will be profitable. If you have more than one product, please focus your argument on the product / solution presented for this SBIR program. | | |
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| TEAM ABILITY | <i>weight 5%</i> | Prove your team has executed well as a group. Please draw clear distinctions between private sector, DoD and civilian government work. What milestones have you accomplished as a group in this company? | | | | | | | | |
| SUBMISSION QUALITY | <i>weight 3%</i> | <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 20%;">QUALITY OF PROSE</td> <td>Prove you write clearly. Prove you argue convincingly.</td> </tr> <tr> <td>DATA QUALITY & ATTRIBUTION</td> <td>Support your arguments with relevant, properly attributed data to enhance your credibility.</td> </tr> </table> | QUALITY OF PROSE | Prove you write clearly. Prove you argue convincingly. | DATA QUALITY & ATTRIBUTION | Support your arguments with relevant, properly attributed data to enhance your credibility. | | | | |
| QUALITY OF PROSE | Prove you write clearly. Prove you argue convincingly. | | | | | | | | | |
| DATA QUALITY & ATTRIBUTION | Support your arguments with relevant, properly attributed data to enhance your credibility. | | | | | | | | | |

Appendix D

Commercialization Plan Template

General Instructions/Guidance:

1. The slide deck must be 8 slides total, per Component Instructions, and follow the formatting contained in the template. Font size shall be no smaller than 10-point font.
2. Slides should display the slide number in bottom right corner
3. All text (including tables, charts, plots, axes labels, legends, captions) must be readable without zooming and understandable without voice-over
4. For plots and charts:
 - a. Include title/bullet describing importance of plot/chart, and/or data (be specific)
 - b. Axes must be meaningfully labeled (to be understandable by non-experts) and include scale
5. Avoid jargon; define technical terms
6. Convert from slide format to a PDF file for submission to DSIP alongside the technical volume proposal
7. To insert images, capture a screenshot of the image and paste it into the slide. Please do not drag-drop a file into the presentation or use the Insert Pictures menu function.
8. Use PowerPoint's "Compress Pictures" feature to reduce file size
 - a. Select 96ppi resolution
 - b. Uncheck "For this picture only"
9. Replace the boilerplate footer below with distribution markings as appropriate
10. Do not put any company logos (Twitter, Reddit, GitHub, etc) on your slides

To be considered valid proposals, Commercialization Plan submissions must follow the number and content of each slide as contained in the attached template.

Appendix D
Commercialization Plan Template cont.

Firm Name

SBIR Project Title

Principal Investigator Name / Title
Key (or other relevant) Personnel, and
Subcontractors

.....
Insert Topic Number
Insert Proposal Number

Distribution markings as appropriate for your organization

BLUF: Bottom Line Up Front

- **BLUF:**
 - 1. Company information and background** : Core competencies, significant sales, previous funding, commercialization successes.
 - 2. Customer and Competition** : Clear description of key technology objectives, current competition, and advantages.
 - 3. Market:** Plan to obtain market share.
 - 4. Intellectual Property:** Patent status, technology lead, trade secrets or other demonstration of a plan to protect the company's technical advantage.
 - 5. Financing/Revenue:** Plans for securing necessary non -SBIR funding.
 - 6. Assistance and mentoring** : Plans for securing needed technical or business assistance.

Distribution markings as appropriate for your organization

2

Appendix D
Commercialization Plan Template cont.

Company Information and Background

- Core competencies and areas of specialization.
- Products with significant sales.
- Concise history of previous Federal and non -Federal funding/investments.
- Regulatory experience (if applicable).
- Past commercialization successes.
- Past failure and how you overcame .

Distribution markings as appropriate for your organization

3

Customer & Competition

- Description of key technology objectives.
- Current competition and/or alternative solutions.
- Advantages of company's offer compared to competing products or services.
- Hurdles to acceptance of the proposed innovation.
- Description of possible areas where your technology may be utilized or is under utilized.

Distribution markings as appropriate for your organization

4

Appendix D Commercialization Plan Template cont.

Market

- Analysis of market size and 1 and 5 year forecasted market share.
- Explanation of milestones and target dates of plan to obtain that market share.
- What experience do you have with marketing to this target market?
- What commercialization strategy appears to be the best for bringing this product to the target market?
- What experience do you have with bring products to market – either through this company or through other companies with which you have worked.
- Does the company currently market, manufacture, or license technology? Describe what you do.

Intellectual Property

- Patent status, technology lead, trade secrets or other demonstration of a plan to achieve sufficient protection to realize the commercialization stage and attain at least a temporary competitive advantage .
- Describe how you will protect the intellectual property that enables commercialization of its products while keeping competitors at bay. Note any actions you may consider to attain at least a temporary competitive advantage. Also consider your company's prior record in this area. Comment on your company's strategy to build a sustainable business through protection of intellectual property.

Appendix D Commercialization Plan Template cont.

Financing

- Plan for securing non-SBIR, private or government funding necessary to enter low rate of production of anticipated technical solution.
- Describe your revenue stream generation to include but not limited to:
 - Manufacture and direct sales
 - Sales through value added resellers or other distributors
 - Joint venture

Assistance & Mentoring

- Plans for securing needed technical or business assistance through mentoring, partnering, or arrangements with government sponsored (e.g., SBIR funded Discretionary Technical and Business Assistance (TABAs), State assistance programs, Federally-funded research laboratories, Manufacturing Extension Partnership centers), not-for-profits (e.g., Small Business Development Center (SBDC) or Small Business Technical Development Center (SBTDC)), commercial accelerators, DOD Prime Contractors, SBA Mentor - Protégé program, Procurement Technical Assistance Center (PTAC) or other assistance provider.

Army SBIR 23.4 Topic Index
Release 18

- A234-024 Low Cost SWIR Laser Sensor
- A234-025 Medium-Format Displays for Mixed Reality (MR) Systems
- A234-026 Porting RTK to High Assurance Kernel

OUSD (R&E) CRITICAL TECHNOLOGY AREA(S): Integrated Sensing and Cyber; Microelectronics

OBJECTIVE: Develop a Short-Wave Infrared (SWIR) detector capable of asynchronously locating short laser pulses for target marking with the potential of an order of magnitude lower cost than current sensors. Utilize new detector technology to lower manufacturing cost for SWIR sensors. A lower cost laser sensor would enable integration into platforms that support Soldier Lethality and Next Generation Combat Vehicles (NGCV).

DESCRIPTION: Short Wave InfraRed (SWIR) cameras with Asynchronous Laser Pulse Detection (ALPD) are an emerging technology. This has the potential to be used as a multi-function solution for various marking and detection tasks. The major barrier to the proliferation of current SWIR ALPD cameras is cost. At high price points, these SWIR ALPD cameras are unlikely to proliferate across the armed forces. A low-cost, next-generation laser detection sensor is needed. Current detectors use Indium Gallium Arsenide (InGaAs) focal plane arrays (FPA) that are meticulously bump bonded onto a Read Out Integrated Circuit (ROIC). This process requires both expensive materials and intensive labor, thus lowering yield and driving costs up. Previous efforts to lower the cost of this technology have proven unsuccessful. This SBIR effort aims to pair a low-cost detector material, such as quantum dots or other innovations, to a ROIC with laser detection capability. A novel approach to laser detection could have significant cost implications in production. This moderate-risk, high-payoff approach to a low-cost SWIR laser detector should produce a device that can detect laser pulses at operationally relevant ranges for marking tasks.

PHASE I: This is a Direct to Phase II (DP2) topic. A DP2 award is requested because of the demonstrations we have observed during lab and field evaluations of the candidate technology. The Colloidal Quantum Dots (CQD) material and process has been successfully applied to a standard ROIC and does have sensitivity in the SWIR spectrum to detect the laser spots. Awarding a phase II SBIR would allow for the development of the CQD process on a Read Out Integrated Circuit (ROIC) designed for laser pulse detection, as well as optimizing the quantum dot sensitivity at the laser wavelength. Much of the potential in this technology has been identified and we wish to expand its application to better fit our customers' needs.

(DIRECT TO) PHASE II: Develop and demonstrate a 2D SWIR detector with asynchronous laser pulse detection. This device should use a detector material and process that has the potential to be significantly lower cost than existing solutions in production quantities. An imaging function is desired but not a requirement for this effort.

PHASE III DUAL USE APPLICATIONS: This system could be used in a broad range of military applications where laser detection is necessary. Optimize system design for size, weight and power, to include ruggedization to survive in a military environment. Recent advances in methods for synthesis and surface functionalization of CQDs have driven the commercialization of display and lighting applications and provide promising developments in the related fields of lasing and IR sensors. Current market applications, including start-up usage, for quantum dot technology embedded into semiconductors include:

- Multimedia technology provides more immersive and realistic experiences.
- Smartphone sensing recognition and augmented facial ID recognition.
- Augment solar panels energy collection capabilities, which can be leveraged for renewable energy as well as agriculture production.

- Medical usage, namely bio-imaging and modeling of protein structures as well as infrared sensing.
- Quantum computing research in the nascent and pivotal future sector.

KEYWORDS: Sensors; Short Wave InfraRed (SWIR); Lasers; Detection; Cameras; Colloidal Quantum Dots (CQD); Low Cost; Read Out Integrated Circuit (ROIC)

REFERENCES:

1. ST's Quantum Dot Sensor set for volume Swir Imaging. ST's quantum dot sensor set for volume SWIR imaging | Imaging and Machine Vision Europe. (2021, December 15). <https://www.imveurope.com/news/sts-quantum-dot-sensor-set-volume-swir-imaging>
2. Palomaki, P., & Keuleyan, S. (2022a, November 22). Move over, CMOS: Here come snapshots by Quantum Dots. IEEE Spectrum. <https://spectrum.ieee.org/move-over-cmos-here-come-snapshots-by-quantum-dots>
3. SWIR Vision Systems. (2022). SWIR Vision Systems Acuros® vs Sony® IMX990: A Closer Look at Key Metrics and Performance [White paper]. https://www.swirvisionsystems.com/wp-content/uploads/WhitePaper_SWIR-Vision-Systems-Acuros-vs-Sony.pdf

OUSD (R&E) CRITICAL TECHNOLOGY AREA(S): Microelectronics; Integrated Sensing and Cyber; Advanced Computing and Software

OBJECTIVE: Recent advances in head-mounted displays have identified an opportunity for low-cost and high-performance systems based on medium format size display panels, where the diagonal is on the order of 2.0" - 3.5" as opposed to the older techniques using small "microdisplays" with diagonal screen sizes of 1.0" or less. Likewise, the pixel pitch of the larger medium format displays is on the order of 15-80 microns, as opposed to 9-12 microns for the micro-displays. The larger scale of the medium format relieves the requirement for magnification by the eyepiece optics, and hence a lower cost system can result. The problem is in obtaining military-grade medium format display panels with sufficient pixel resolution, since the commercial market for medium formats is more focused on low-pixel resolutions devices such as the iWatch. Also, daylight readability is a requirement not currently met by commercial units. This topic involves the development of daylight readable, medium format (1.6" – 3.0" diag.) display panels for use in mixed reality (MR) head mounted display systems.

DESCRIPTION: Perform research & fabrication for a medium format (1.6" - 3.5" diag) display with at least 1280 x 720 color pixels, frame rate 60 Hz, adjustable brightness from 1 to 800 fL for daylight readability, contrast ratio of 1000:1, and AA-battery powered drive electronics to receive external video input. The display's physical size & weight shall be minimized to support packaging into a head-mounted display system. Deliverables shall include as appropriate design review materials, electrical schematics, trade study results, and functioning hardware samples & test data. This device will help solve many problems encountered by the Integrated Visual Augmentation System (IVAS). This new display component would enable the use of low-cost visor optics to complete a display system with performance compatibility.

PHASE I: This is a Direct to Phase II topic. A Direct to Phase II (DP2) is recommended because the Government has received a proof of concept monochrome version of the medium format display as well as research regarding the path to achieve full color operation using similar principles. The level of maturity that the new display device offers indicates that a Phase I can justifiably be foregone and prototyping can begin to complete the desired development timeline.

DIRECT TO PHASE II: Upon acknowledging and (potentially) utilizing the research provided in Phase I description as premises for technical approach within proposal submission, awardees will then begin Prototype Kickoff, Design Review, Fabrication, Test, Delivery/Demonstration.

PHASE III DUAL USE APPLICATIONS:

- The high-resolution display market has received attention and capital from large tech companies.
 - Google and LG completed a joint venture to create a high-resolution OLED VR headset, which leverages identical technology to OLED displays.
- Current market applications, including start-up usage, for OLED high-resolution display panels include:
 - VR/AR augmentation, especially the ability to create a more vibrant and realistic environment.
 - This especially benefits the video game industry.
 - Video games, TV, mobile phones, and computer monitors will have brighter portable displays, thereby creating a better user experience.

- Healthcare and surgery capabilities can leverage OLED displays that are less harmful because they are cooler to the touch.

KEYWORDS: Display systems; Micro-displays; Integrated Visual Augmentation System (IVAS); Visor optics; panels

REFERENCES:

1. Hamer, et. al., "High-performance OLED microdisplays made with multi-stack OLED formulations on CMOS backplanes", SPIE Proceedings Volume 11473, Organic and Hybrid Light Emitting Materials and Devices XXIV; 114730F (2020), <https://doi.org/10.1117/12.2569848>
2. Vogel, et. al., "OLED microdisplays in near-to-eye applications: challenges and solutions", SPIE Proceedings Volume 10335, Digital Optical Technologies 2017; 1033503 (2017) <https://doi.org/10.1117/12.2270224>

OUSD (R&E) CRITICAL TECHNOLOGY AREA(S): Trusted AI and Autonomy; Advanced Computing and Software

OBJECTIVE: Develop innovative techniques and tools to run the Robotic Technology Kernel (RTK) software library securely and efficiently on a high-assurance separation kernel. Demonstrate feasibility via proof-of-concept and practical prototype. Validate the new capabilities using a high-assurance separation kernel, Robot Operating System (ROS) test suite, RTK applications and a representative hardware platform under realistic concept of operations.

DESCRIPTION: This topic seeks innovative technology and demonstration that showcases the feasibility, security and performance of running the RTK and ROS software library on a high-assurance separation kernel. Supported by the DARPA High-Assurance Cyber Military Systems (HACMS) program, both seL4 and CertiKOS have made great leaps in terms of software capabilities and maturity. However, significant challenges exist to bridge the gap between research prototypes and adoption. It is critical to leverage such innovative techniques and tools and build assured systems based on appropriate techniques and tools applying sound security design and engineering principles. The ported RTK/ROS over a separation kernel should function and perform with added security and it should maintain the features of (1) cross-platform: new RTK capabilities can be leveraged by all RTK-enabled platforms; (2) cross-controller: any RTK-enabled platforms can be controlled by any RTK compatible controller; and (3) cross-effort: an effort delivers new capabilities to the RTK, which in turn is leveraged for new efforts. In addition to memory isolation, the ported RTK/ROS should be amenable to other security checks such as the concept of Monitor and Policy Enforcement, as applicable and needed in DoD use cases including Autonomy and Swarm.

PHASE I: Develop the technical approach, analyze trade-off options, and justify design choices. All design choices, including a representative hardware platform, should be made in agreement with the Government counterpart. Finalize the overall design that can securely and efficiently run RTK (and ROS) on a high-assurance separation kernel. Analyze the costs and benefits, accounting for practical implementation constraints in Army platforms and use cases. Prepare the path for a proof-of-concept demonstration. Document all lessons learned for way forward.

PHASE II: Fully develop the technology and a practical prototype. Test and evaluate the security and performance of the ported RTK (and ROS) running on a high-assurance separation kernel, under various ROS/RTK test cases as well as relevant mission scenarios. Demonstrate the capabilities using a representative hardware platform under realistic concept of operations, such as those adopted in previous Army efforts [5]. Enhance and mature the technology and prototype for transition.

PHASE III DUAL USE APPLICATIONS:

- High Assurance Kernel Technology and Robotic Technology Kernel (RTK) have medium adoption across a range of industries including autonomous vehicles, aerospace and defense, and Internet of Things (IoT). The use of this technology helps to enable security, reliability, and trustworthiness of critical systems.
- The IoT and software segment registers in highest share of revenue as well as innovation. The growing use of digital manufacturing and IoT integration in production of smart and autonomous vehicles will likely drive continued growth.
- The integration of high assurance kernel security solutions will enable companies to improve their cybersecurity stature as well as offer more security in a myriad of arenas, including the continued growth of autonomous offerings, signaling sustained demand for this technology in

future years as technology evolves and new economies accelerate digitalization and industrialization in manufacturing processes.

KEYWORDS: Robotics; Robot Operating System; Robot Technology Kernel; Cybersecurity; Software; Performance

REFERENCES:

1. M. Vai, D. Whelihan, K. Denny, R. lychev, J. Hughes, D. Kava, A. Lee, N. Evancich, R. Chark, D. Lide, K. Kwak, J. Li, D. Schafer, M. Lych, K. Tilloton, and W. Tirenin, "Agile and Resilient Embedded Systems", IEEE Conference on Military Communications, 2021.
2. D. Whelihan, M. Vai, N. Evanich, K.J. Kwak, J. H. Li, M. Britton, B. Frantz, D. Hadcock, M. Lynch, D. Schafer, J. DeMatteis, and D. Russo, "Designing Agility and Resilience into Embedded Systems," IEEE Conference on Military Communications, 2017.
3. Cynthia Irvine, "Combining ROS with seL4 for Trustworthy Autonomous Systems," Second Annual Trusted Computing Center of Excellence Summit, 2019.
4. Robot Operating System (ROS) - <https://www.ros.org/>
5. US Army – TARDEC Ground Vehicle Robotics, "Introduction to Robotic Technology Kernel (RTK)," Distribution Statement A.
6. Gerwin Klein, June Andronick, Kevin Elphinstone, Toby Murray, Thomas Sewell, Rafal Kolanski, and Gernot Heiser, "Comprehensive formal verification of an OS microkernel," ACM Trans. Comput. Syst. 32, 1, Article 2, February 2014.
7. Certified Kit Operating System (CertiKOS), <https://flint.cs.yale.edu/certikos/>
8. Trusted Computing Center of Excellence - <https://trustedcomputingcoe.org/>
9. TCCOE Summits - <https://trustedcomputingcoe.org/summits/>
10. <https://sel4.systems/Foundation/Services/home.pml>
11. Daniel Limbrick, "Performance Evaluation of ROS on an seL4-based Raspberry Pi / Jetson TK1," Second Annual Trusted Computing Center of Excellence Summit, 2019.
12. Gernot Heiser, "The seL4 Microkernel - An Introduction." White Paper. The seL4 Foundation, Revision 1.2 of 2020-06-10.

DEPARTMENT OF THE ARMY
DoD 23.4 Small Business Innovation Research (SBIR)
Annual Broad Agency Announcement (BAA)
Component-Specific Proposal Instructions
Release 19

September 14, 2023: Topics issued for pre-release
September 28, 2023: Army begins accepting proposals via DSIP
October 17, 2023: DSIP Topic Q&A closes to new questions at 12:00 p.m. ET
October 31, 2023: Deadline for receipt of proposals no later than 12:00 p.m. ET

INTRODUCTION

The future Army must be capable of conducting Multi-Domain Operations (MDO) as part of an integrated Joint Force across an array of situations in multiple theaters by 2035. The MDO concept describes how the Army will support the Joint Force in the rapid and continuous integration of all domains of warfare – land, sea, air, and cyberspace – to deter and prevail as we compete short of conflict, and fight and win if deterrence fail. The Army must provide game-changing capabilities to our Soldiers. To capitalize on small business innovation, the Army has implemented an approach to advertise SBIR funding opportunities through the Department of Defense (DoD) Annual BAA process, outside of the three pre-determined BAA cycles. This approach also strives to create a more rapid award time from solicitation to closing.

CONTACT INFORMATION

Direct specific questions pertaining to the administration of the Department of the Army SBIR Program and proposal preparation instructions to the Point of Contact identified in the Topic announcement. General questions can be directed to the following:

Email: usarmy.pentagon.hqda-asa-alt.mbx.army-applied-sbir-program@army.mil

Website: <https://www.armysbir.army.mil/>

Mailing Address:

Army Applied SBIR Office 2530 Crystal Dr.; Ste 11192
Arlington, VA 22202

RESPONSIVENESS AND TIMELINESS

All proposals will be evaluated and judged on a competitive basis. Proposals will only be evaluated in response to an active, corresponding Army topic. Proposals will be initially screened to determine responsiveness and timeliness. Proposals passing this initial screening will be technically evaluated by engineers or scientists to determine the most promising technical and scientific approaches. Assessment of responsiveness may continue during technical evaluation and after selection. If at any point the proposal is deemed untimely, unresponsive, ineligible, or non-responsible, the proposal will be rejected / the contract action will be cancelled.

Interested firms shall follow the DoD Program BAA instructions as well as the Army's component-specific proposal instructions herein, when preparing and submitting proposals.

Proposers are encouraged to thoroughly review the DoD Program BAA and register for the DSIP Listserv to remain apprised of important programmatic and contractual changes.

- The DoD Program BAA is located at: <https://www.defensesbirsttr.mil/SBIR-STTR/Opportunities/#announcements>. Be sure to select the tab for the appropriate BAA cycle.

- Register for the DSIP Listserv at: <https://www.dodsbirsttr.mil/submissions/login>.

The Government reserves the right to disqualify proposals for failing to meet any of the requirements of the SBA SBIR/STTR Policy Directive, the DoD Program BAA instructions, the Army's component-specific proposal instructions herein, and/or in the topic itself. The following include, but are not limited to, the common reasons for which proposals are disqualified:

System for Award Management is not properly updated at time of proposal submission.
The proposal is missing required number of signatures and/or content.
Minimum Performance Percentage of Work is not allocated properly.
Work as proposed does not meet the definition of Research and Development required for funding.
Proposal submitted beyond deadline.
Price exceeds the maximum funding amount.
Firm is NOT an eligible small business.
Firm does NOT meet the ownership and control requirements.
Firm is 50% or more owned or managed by a corporate entity that is not a small business.
Firm will NOT perform the prescribed percentage of the research and/or analytical work.
Primary employment of the Principal Investigator for this project is NOT with the firm.
Firm has been convicted of a fraud-related crime.
Principal Investigator or Corporate Official has been convicted of a fraud-related crime.
Firm and affiliates have employed, on average over the last 24 months, more than 500 employees.
Firm has been awarded a contract from the US Government for essentially equivalent work.
Claiming data rights assertions without including a Data Rights Assertions Table.
Lack of proper documentation for research utilizing human/animal subjects or recombinant DNA.
Lack of information or negative information concerning use of foreign nationals.
Offeror requests to award to a different firm/entity after proposal submission.
Failure or refusal to submit certified or other than certified cost data in accordance with DFARS 252.215-7010.
Proposal is for a topic other than that which is identified.
Etc.

This release contains an open topic. As outlined in section 7 of the SBIR and STTR Extension Act of 2022, innovation open topic activities—

- (A) Increase the transition of commercial technology to the Department of Defense;
- (B) Expand the small business nontraditional industrial base;
- (C) Increase commercialization derived from investments of the Department of Defense; and
- (D) Expand the ability for qualifying small business concerns to propose technology solutions to meet the needs of the Department of Defense.

Unlike conventional topics, which specify the desired technical objective and output, open topics can use generalized mission requirements or specific technology areas to adapt commercial products or solutions to close capability gaps, improve performance, or provide technological advancements in existing capabilities.

A small business concern may only submit one (1) proposal to each open topic. If more than one proposal from a small business concern is received for a single open topic, only the most recent proposal to be certified and submitted prior to the submission deadline will receive an evaluation. All prior proposals submitted by the small business concern for the same open topic will be marked as nonresponsive and will not receive an evaluation.

SYSTEM FOR AWARD MANAGEMENT (SAM)

Interested firms are required to be registered and active in SAM (www.sam.gov) before submitting a proposal and shall continue to be registered until time of award, during performance, and through final payment of any contract. The proper North American Industry Classification System (NAICS) code and Product and Service Code are as follows:

NAICS: 541715, Research and Development in the Physical, Engineering, and Life Sciences (except Nanotechnology and Biotechnology)
PSC: AC12, National Defense R&D Services; Department of Defense - Military; Applied Research

PHASE I PROPOSAL INSTRUCTIONS

The Defense SBIR/STTR Innovation Portal (DSIP) is the official portal for DoD SBIR/STTR proposal submission. Proposers (also referred to herein as “offeror(s)”) are required to submit proposals via DSIP; proposals submitted by any other means will be disregarded. Detailed instructions regarding registration and proposal submission via DSIP are provided in the DoD SBIR Program BAA.

Proposal Coversheet (Volume 1)

The proposal coversheet must follow the instructions and requirements provided in the DoD SBIR Program BAA.

The offeror shall certify that to the best of its knowledge and belief, its eligibility information under the SBIR Program is accurate, complete, and current as of the date of the offer.

Technical Volume (Volume 2)

The Technical Volume must be a single Portable Document Format (PDF) file, including graphics. The length of the technical volume is not to exceed 5 pages and must follow the formatting requirements provided in the DoD SBIR Program BAA. A commercialization plan must also accompany the technical volume proposal and must be 8 slides. The required content to include within these slides are described in Appendix D. The commercialization plan must be converted from slides to pdf and attached to the end of the technical volume proposal, resulting in one pdf file to be uploaded to DSIP as Volume 2. The commercialization plan does not count towards the proposal 5-page limit. Any proposals submitted without a commercialization plan or in a format other than that provided in these Component Instructions and by the BAA will be deemed unresponsive and will not be reviewed.

Content of the Technical Volume

The content of the Technical Volume should address three key areas: the technical approach, the team carrying out the work (and the accompanied resources), and the commercialization strategy. The technical approach section shall contain details on how the proposer is going to solve the problem. It shall detail key elements of the firm’s approach, any risks, relevant past work and how success is measured. The team qualifications section shall highlight the key personnel working on the project, and the resources that will be brought to bear on solving the problem. The commercialization plan should include:

- Company information: Focused objectives/core competencies; specialization area(s); products with significant sales; and history of previous Federal and non-Federal funding, regulatory experience, and subsequent commercialization successes.
- Customer and Competition: Clear description of key technology objectives, current competition, and advantages compared to competing products or services; description of hurdles to acceptance of the innovation.

- **Market:** Milestones, target dates, analyses of market size, and estimated market share after first year sales and after 5 years; explanation of plan to obtain market share.
- **Intellectual Property:** Patent status, technology lead, trade secrets or other demonstration of a plan to achieve sufficient protection to realize the commercialization stage and attain at least a temporal competitive advantage.
- **Financing:** Plans for securing necessary non-SBIR funding.
- **Assistance and mentoring:** Plans for securing needed technical or business assistance through mentoring, partnering, or through arrangements with government sponsored (e.g., State assistance programs, Federally-funded research laboratories, Manufacturing Extension Partnership centers), not-for-profits (e.g., Small Business Development Centers or Procurement Technical Assistance Centers), commercial accelerators, DOD Prime Contractors, or other assistance provider.

Proposers are free to structure each section as they like, so long as it provides sufficient detail for evaluators to understand the proposed work, who will carry it out, and how the business plans to commercialize results.

These instructions supersede those stated in section 5.3.c of the DoD Program BAA.

Cost Volume (Volume 3)

The Cost Volume must follow all instructions and requirements provided in the DoD SBIR Program BAA. Supplemental requirements are as follows:

The Phase I Base amount must not exceed \$250,000 for a 6-month period of performance, unless otherwise specified in the topic description pages. Phase I Options are not anticipated at this time. If an option is identified in the topic posting, costs for the Base and Option must be separated and clearly identified on the Proposal Cover Sheet (Volume 1) and in Volume 3. Awards for these topics will be in the form of a firm fixed price contract.

Please review the updated Percentage of Work (POW) calculation details included in section 5.3 of the DoD Program BAA. Army Applied SBIR will occasionally accept deviations from the POW requirements with written approval from the Funding Agreement officer.

For pricing purposes, offerors shall assume a contract or agreement start date of approximately ninety (90) days after submission of the proposal. For this BAA, adequate price competition (APC), as defined in FAR 15.403-1(c), is anticipated. In the event that adequate price competition is not realized (i.e. only one proposal is received for a given topic), the Government may choose to conduct additional proposal analysis, in accordance with the techniques identified at FAR 15.404-1. Additionally, offerors are to provide any current Forward Pricing Rate Agreements (FPRA) in effect at time of proposal submission.

Content of the Cost Volume (Volume 3)

ALL proposed costs should be accompanied by documentation to substantiate how the cost was derived. Substantiating documentation guidance is as follows:

LABOR:

List all key personnel by name as well as by number of hours dedicated to the project as direct labor.

Explain the basis of proposed labor hours, including required tasks, and substantiating documentation for the costs (e.g. payroll reports). Volume 5, Supporting Documents, may be used if additional space is

needed.

MATERIAL/TOOLING/EQUIPMENT:

Explain the basis of proposed material and equipment costs. This support should include a consolidated priced summary of individual material and equipment quantities and substantiating documentation for the costs (e.g. vendor quotes, invoice prices, competitive bids, etc.). If your choice isn't the lowest cost available, explain the decision to choose one item or supplier over another. Volume 5, Supporting Documents, may be used if additional space is needed.

Ensure all materials are American-made to the maximum extent practicable. Offerors who propose to use a foreign-made product in its technology may be required to find an American-made equivalent.

While special tooling and test equipment and material cost may be included, it will be carefully reviewed relative to need and appropriateness for the work proposed. The purchase of special tooling and test equipment must, in the opinion of the Component Contracting Officer, be advantageous to the Government and should be related directly to the specific topic. These may include such items as innovative instrumentation or automatic test equipment. Title to property furnished by the Government or acquired with Government funds will be vested with the DoD Component, unless it is determined that transfer of title to the contractor would be more cost effective than recovery of the equipment by the DoD Component.

TRAVEL:

Explain the basis of proposed travel, including to/from locations, number of trips, number of travelers per trip, and number of days/nights per trip. Include substantiating documentation for the costs (e.g. screenshots of flight cost comparison, rental car quotes, etc.). NOTE: Virtual meetings shall be utilized to the maximum extent practicable. Volume 5, Supporting Documents, may be used if additional space is needed.

SUBCONTRACTS: A subcontract is any agreement, other than one involving an employer-employee relationship, entered into by the prime contractor (awardee) calling for supplies or services for the performance of the contract.

All subcontractor costs and consultant costs must be detailed at the same level as prime contractor costs in regard to labor, travel, equipment, etc.

Explain the basis of proposed subcontract costs. Include documented support of the offeror's price analyses and degree of competition of all subcontractor proposals. All subcontractor costs and consultant costs, such as labor, travel, equipment, materials, must be detailed at the same level as prime contractor costs. Provide detailed substantiation of subcontractor costs in your cost proposal. Volume 5, Supporting Documents, may be used if additional space is needed.

Certify that the following requirements are met: For Phase I, the offeror must perform a minimum of two-thirds of the research and/or analytical effort. One third may be subcontracted to another firm or research organization/facility. The percentage of work is measured by both direct and indirect costs.

Offerors shall not propose to subcontract to the issuing agency, to any other Federal Government agency, or to other units of the Federal Government, except Federal Laboratories in rare circumstances. As defined in 15 U.S.C. 3703, Federal Laboratory means any laboratory, any federally funded research and development center, or any center established under 15 U.S.C. 3705 and 3707 that is owned, leased,

or otherwise used by a Federal Agency and funded by the Federal Government, whether operated by the Government or by a contractor.

Offerors shall not propose to subcontract to any prohibited sources. Proposals identifying a subcontractor/vendor arrangement with a prohibited source may be rejected.

Offerors shall ensure subcontracting arrangements are with United States Small Businesses to the maximum extent practicable. Offerors proposing a subcontractor arrangement with other than a United States Small Business (such as, a large business, foreign firm, foreign government, educational institution, unit of Federal Government, etc.) may be required to submit further explanation.

INDIRECT COSTS:

Explain the basis of the proposed indirect expense rates including overhead, general and administrative, material handling, and fringe benefits.

If a Defense Contract Audit Agency (DCAA) Audit has been conducted within the last five (5) years, include the audit compliance documentation in the cost proposal documents. The documentation should also include the offeror's DCAA Point of Contact (if applicable).

If selected, failure to include the documentation with your proposal may delay contract award, as the proposer will be asked to submit the necessary documentation to the Contracting Officer to substantiate costs. It is important to respond as quickly as possible to the Contracting Officer's request for documentation. Failure or refusal to provide documentation may result in cancellation of the contract action.

Company Commercialization Report (CCR) (Volume 4)

Completion of the CCR as Volume 4 of the proposal submission in DSIP is required. Please refer to the DoD SBIR Program BAA for full details on this requirement. Information contained in the CCR will be considered by the Department of the Army during proposal evaluations.

Supporting Documents (Volume 5)

Volume 5 is provided for proposers to submit additional documentation to support the Cover Sheet (Volume 1), Technical Volume (Volume 2), and the Cost Volume (Volume 3).

All proposing small business concerns are REQUIRED to submit the following documents to Volume 5:

1. Contractor Certification Regarding Provision of Prohibition on Contracting for Certain Telecommunications and Video Surveillance Services or Equipment
2. Disclosures of Foreign Affiliations or Relationships to Foreign Countries
3. Disclosure of Funding Sources

Please refer to the DoD Program BAA for more information.

In addition to the Volume 5 requirements outlined in the DoD Program BAA, the Department of the Army may accept the following documents in Volume 5:

- Additional Cost Information
- Funding Agreement Certification
- Technical Data Rights (Assertions)

- Lifecycle Certification
- Allocation of Rights
- Other (only as specified in the topic)

Please only submit documents that are identified immediately above and in the DoD Program BAA. All other documents submitted will be disregarded.

DIRECT TO PHASE II PROPOSAL INSTRUCTIONS

The Defense SBIR/STTR Innovation Portal (DSIP) is the official portal for DoD SBIR/STTR proposal submission. Proposers (also referred to herein as “offeror(s)”) are required to submit proposals via DSIP; proposals submitted by any other means will be disregarded. Detailed instructions regarding registration and proposal submission via DSIP are provided in the DoD SBIR Program BAA.

Proposers interested in submitting a DP2 proposal in response to these topics must provide documentation to substantiate that the scientific and technical merit and feasibility described in the Phase I section of the topic has been met and describes the potential commercial applications. Documentation should include all relevant information including, but not limited to: technical reports, test data, prototype designs/models, and performance goals/results. Work submitted within the feasibility documentation must have been substantially performed by the proposer and/or the Principal Investigator.

The Army will not evaluate the proposer’s related Phase II proposal if it determines that the proposer has failed to demonstrate that technical merit and feasibility has been established or the proposer has failed to demonstrate that work submitted in the feasibility documentation was substantially performed by the proposer and/or the PI.

Feasibility documentation cannot be based upon any prior or ongoing federally funded SBIR or STTR work and DP2 proposals **MUST NOT** logically extend from any prior or ongoing federally funded SBIR or STTR work.

Proposal Coversheet (Volume 1)

The proposal coversheet must follow the instructions and requirements provided in the DoD SBIR Program BAA.

The offeror shall certify that to the best of its knowledge and belief, its eligibility information under the SBIR Program is accurate, complete, and current as of the date of the offer.

Format of Technical Volume (Volume 2)

The Technical Volume must include two parts, the Feasibility Documentation, and the Technical Proposal.

The Technical Volume must be a single Portable Document Format (PDF) file, including graphics. Perform a virus check before uploading the Technical Volume file. If a virus is detected, it may cause rejection of the proposal. Do not lock or encrypt the uploaded file. Do not include or embed active graphics such as videos, moving pictures, or other similar media in the document.

The length of the Feasibility Documentation is not to exceed 5 pages and the length of the Technical Proposal is not to exceed 10 pages. A commercialization plan must also accompany the technical proposal and should be 8 slides. Any proposals submitted in a different format or exceed the page count limits will not be reviewed.

Number all pages of your proposal consecutively. Font size should not be smaller than 10- point on standard 8-1/2" x 11" paper with one-inch margins. The header on each page of the Technical Volume should contain your company name, topic number, and proposal number assigned by DSIP when the Cover Sheet was created. The header may be included in the one-inch margin.

Content of the Technical Volume: (Volume 2)

PART ONE: Feasibility and Technical Proposal (15 pages maximum)

Content of the Feasibility Documentation (Volume 2a)

The content of the Feasibility Documentation Proposers should substantiate that the scientific and technical merit and feasibility described in the Phase I section of the topic has been met and describes the potential commercial applications. Documentation should include all relevant information including, but not limited to: technical reports, test data, prototype designs/models, and performance goals/results. Work submitted within the feasibility documentation must have been substantially performed by the proposer and/or the Principal Investigator.

If you have references, include a reference list or works cited list as the last page of the feasibility documentation. This will count towards the total page limit.

Work submitted within the feasibility documentation must have been substantially performed by the proposer and/or the Principal Investigator (PI).

If technology in the feasibility documentation is subject to Intellectual Property (IP), the proposer must either own the IP, or must have obtained license rights to such technology prior to proposal submission, to enable it and its subcontractors to legally carry out the proposed work. Documentation of IP ownership or license rights shall be included in the Technical Volume of the proposal.

At a minimum, the technical proposal should address:

- What are you trying to do? Articulate your objectives without jargon.
- How is it done today, and what are the limits of current practice?
- What is new in your approach and why do you think it will be successful?
- Who cares? If you are successful, what difference will it make?
- What are the risks?
- How much will it cost?
- How long will it take?
- How do you measure success?
- What team will accomplish your mission?
- What existing / related SBIR, STTR, or other research proposals support this technology?
- What is the commercialization strategy for the proposed technology?

Content of the Technical Proposal (Volume 2b; part 1 continued)

The content of the Technical Volume should address three key areas: the technical approach, the team carrying out the work (and the accompanied resources), and the commercialization strategy. The technical approach section shall contain details on how the proposer is going to solve the problem. It shall detail key elements of the firm's approach, any risks, relevant past work and how success is measured. The team qualifications section shall highlight the key

personnel working on the project, and the resources that will be brought to bear on solving the problem. The commercialization plan should include:

- **Company information:** Focused objectives/core competencies; specialization area(s); products with significant sales; and history of previous Federal and non-Federal funding, regulatory experience, and subsequent commercialization successes.
- **Customer and Competition:** Clear description of key technology objectives, current competition, and advantages compared to competing products or services; description of hurdles to acceptance of the innovation.
- **Market:** Milestones, target dates, analyses of market size, and estimated market share after first year sales and after 5 years; explanation of plan to obtain market share.
- **Intellectual Property:** Patent status, technology lead, trade secrets or other demonstration of a plan to achieve sufficient protection to realize the commercialization stage and attain at least a temporal competitive advantage.
- **Financing:** Plans for securing necessary non-SBIR funding.
- **Assistance and mentoring:** Plans for securing needed technical or business assistance through mentoring, partnering, or through arrangements with government sponsored (e.g., State assistance programs, Federally-funded research laboratories, Manufacturing Extension Partnership centers), not-for-profits (e.g., Small Business Development Centers or Procurement Technical Assistance Centers), commercial accelerators, DOD Prime Contractors, or other assistance provider.

Proposers are free to structure each section as they like, so long as it provides sufficient detail for evaluators to understand the proposed work, who will carry it out, and how the business plans to commercialize results.

PART TWO: Commercialization Plan (8 slides/pages maximum, saved as a PDF and attached with the Technical Proposal as part of the Technical Volume).

The Army is equally interested in dual use commercialization of SBIR/STTR projects that result in products sold to the U.S. military, the private sector market, or both. The Army expects explicit discussion of key activities to achieve this result in the commercialization strategy part of the proposal.

The commercialization strategy should include the following elements:

- A summary of transition and commercialization activities, and the Technology Readiness Level (TRL) achieved. Discuss how the preliminary transition and commercialization path or paths may evolve during the Phase II project.
- Describe key proposed technical milestones during Phase II that will advance the technology towards product such as: prototype development, laboratory and systems testing, integration, testing in operational environment, and demonstrations.
- Description of Product(s) and/or System Application(s). Identify the commercial product(s) and/or DoD system(s), or system(s) under development, or potential new system(s). Identify the potential DoD end- users, Federal customers, and/or private sector customers who would likely use the technology.
- Business Model(s)/Procurement Mechanism(s). Discuss your current business model hypothesis for bringing the technology to market. Describe plans to license, partner, or self-produce your product. How do you plan to generate revenue? Understanding the Army's goal of creating and sustaining viable small businesses that support and generate advanced Army technologies, describe how you intend to develop your product and supply chains to enable this differentiation.

- **Target Market.** Describe the market and customer sets you propose to target, their size, their growth rate, and their key reasons they would consider procuring the technology.
- **Describe competing technologies** existent today on the market as well as those being developed in the lab.
- **Funding Requirements.** Describe your company's funding history. How much external financing have you raised? Describe your plans for future funding sources (internal, loan, angel, venture capital, etc.).
- **Commercialization Risks.** Describe the major technology, market and team risks associated with achieving successful transition of the Army funded technology.
- **Expertise/Qualifications of Team/Company Readiness.** Describe the expertise and qualifications of your management, marketing/business development and technical team that will support the transition of the technology from the prototype to the commercial market and into government operational environments. Has this team previously taken similar products/services to market? If the present team does not have this needed expertise, how do you intend to obtain it? What is the financial history and health of your company (e.g., availability of cash, profitability, revenue growth, etc.)?
- **Anticipated Commercialization Results.** Include a schedule showing the anticipated quantitative commercialization results from the Phase II project at one year after the start of Phase II, at the completion of Phase II, and after the completion of the Sequential Phase II (i.e., amount of additional investment, sales revenue, etc.). After a Phase II award, the company is required to report actual sales and investment data in its Company Commercialization Report at least annually.

These instructions supersede those stated in section 5.3.c of the DoD Program BAA.

Cost Volume (Volume 3)

Unless otherwise noted in the topic description, the Army will accept Direct to Phase II proposals for a cost up to \$1,900,000 for an 18-month period of performance. Proposers are required to use the Cost Proposal method as provided on the DSIP submission site. The Cost Volume (and supporting documentation) DOES NOT count toward the page limit of the Technical Volume.

For pricing purposes, offerors should assume a contract or agreement start date of approximately ninety (90) days after submission of the proposal. For this BAA, adequate price competition (APC), as defined in FAR 15.403-1(c), is anticipated. In the event that adequate price competition is not realized (i.e. only one proposal is received for a given topic), the Government may choose to conduct additional proposal analysis, in accordance with the techniques identified at FAR 15.404-1. Additionally, offerors are to provide any current Forward Pricing Rate Agreements (FPRA) in effect at time of proposal submission.

Content of the Cost Volume (Volume 3, cont.)

ALL proposed costs should be accompanied by documentation to substantiate how the cost was derived. For example, if you proposed travel costs to attend a project-related meeting or conference, and used a travel website to compare flight costs, include a screenshot of the comparison. Similarly, if you proposed to purchase materials or equipment, and used the internet to search for the best source, include your market research for those items. You do not necessarily have to propose the cheapest item or supplier, but you should explain your decision to choose one item or supplier over another. It's important to provide enough information to allow contracting personnel to understand how the proposer plans to use the requested funds.

Some items in the cost breakdown may not apply to the proposed project. If that is the case, there is no need to provide information on each and every item.

Cost Breakdown Guidance:

ALL proposed costs should be accompanied by documentation to substantiate how the cost was derived. Substantiating documentation guidance is as follows:

- **LABOR:**
 - List all key personnel by name as well as by number of hours dedicated to the project as direct labor.
 - Explain the basis of proposed labor hours, including required tasks, and substantiating documentation for the costs (e.g. payroll reports). Volume 5, Supporting Documents, may be used if additional space is needed.

- **MATERIAL/TOOLING/EQUIPMENT:**
 - Explain the basis of proposed material and equipment costs. This support should include a consolidated priced summary of individual material and equipment quantities and substantiating documentation for the costs (e.g. vendor quotes, invoice prices, competitive bids, etc.). If your choice isn't the lowest cost available, explain the decision to choose one item or supplier over another. Volume 5, Supporting Documents, may be used if additional space is needed.
 - Ensure all materials are American-made to the maximum extent practicable. Offerors who propose to use a foreign-made product in its technology may be required to find an American-made equivalent.
 - While special tooling and test equipment and material cost may be included, it will be carefully reviewed relative to need and appropriateness for the work proposed. The purchase of special tooling and test equipment must, in the opinion of the Component Contracting Officer, be advantageous to the Government and should be related directly to the specific topic. These may include such items as innovative instrumentation or automatic test equipment. Title to property furnished by the Government or acquired with Government funds will be vested with the DoD Component, unless it is determined that transfer of title to the contractor would be more cost effective than recovery of the equipment by the DoD Component.

- **TRAVEL:**
 - Explain the basis of proposed travel, including to/from locations, number of trips, number of travelers per trip, and number of days/nights per trip. Include substantiating documentation for the costs (e.g. screenshots of flight cost comparison, rental car quotes, etc.). NOTE: Virtual meetings shall be utilized to the maximum extent practicable. Volume 5, Supporting Documents, may be used if additional space is needed.

- **SUBCONTRACTS:** A subcontract is any agreement, other than one involving an employer-employee relationship, entered into by the prime contractor (awardee) calling for supplies or services for the performance of the contract.
 - All subcontractor costs and consultant costs must be detailed at the same level as prime contractor costs in regard to labor, travel, equipment, etc.
 - Explain the basis of proposed subcontract costs. Include documented support of the offeror's price analyses and degree of competition of all subcontractor proposals. All subcontractor costs and consultant costs, such as labor, travel, equipment, materials, must be detailed at the same level as prime contractor costs. Provide detailed substantiation of subcontractor costs in your cost proposal. Volume 5, Supporting Documents, may be used if additional space is needed.
 - Certify that the following requirements are met: For Phase I, the offeror must perform a minimum of two-thirds of the research and/or analytical effort. One third may be subcontracted to another firm or research organization/facility. The percentage of work is measured by both direct and indirect costs.
 - Offerors shall not propose to subcontract to the issuing agency, to any other Federal Government agency, or to other units of the Federal Government, except Federal Laboratories in rare circumstances. As defined in 15 U.S.C. 3703, Federal Laboratory means any laboratory, any federally funded research and development center, or any center established under 15 U.S.C. 3705 and 3707 that is owned, leased, or otherwise used by a Federal Agency and funded by the Federal Government, whether operated by the Government or by a contractor.
 - Offerors shall not propose to subcontract to any prohibited sources. Proposals identifying a subcontractor/vendor arrangement with a prohibited source may be rejected.
 - Offerors shall ensure subcontracting arrangements are with United States Small Businesses to the maximum extent practicable. Offerors proposing a subcontractor arrangement with other than a United States Small Business (such as, a large business, foreign firm, foreign government, educational institution, unit of Federal Government, etc.) may be required to submit further explanation.

- **INDIRECT COSTS:**
 - Explain the basis of the proposed indirect expense rates including overhead, general and administrative, material handling, and fringe benefits.
 - If a Defense Contract Audit Agency (DCAA) Audit has been conducted within the last five (5) years, include the audit compliance documentation in the cost proposal documents. The documentation should also include the offeror's DCAA Point of Contact (if applicable).

If selected, failure to include the documentation with your proposal may delay contract award, as the proposer will be asked to submit the necessary documentation to the Contracting Officer to substantiate costs. It is important to respond as quickly as possible to the Contracting Officer's request for documentation. Failure or refusal to provide documentation may result in cancellation of the contract action.

For more information about cost proposals and accounting standards, see the DCAA publication titled "Audit Process Overview – Information for Contractors" available at: <http://www.dcaa.mil>.

Company Commercialization Report (CCR) (Volume 4; no page limitations)

Completion of the CCR as Volume 4 of the proposal submission in DSIP is required. Please refer to the DoD SBIR Program BAA <https://www.dodsbirsttr.mil/submissions/baa-schedule/broad-agency-announcements> for full details on this requirement. Information contained in the CCR will be considered by the Department of the Army during proposal evaluations.

Supporting Documents (Volume 5; no page limitations)

Volume 5 is provided for proposers to submit additional documentation to support the Cover Sheet (Volume 1), Technical Volume (Volume 2), and the Cost Volume (Volume 3). In addition to the Volume 5 requirements outlined in the DoD Program BAA, the Department of the Army will accept the following documents in Volume 5:

- Additional Cost Information
- Funding Agreement Certification
- Technical Data Rights (Assertions)
- Lifecycle Certification
- Allocation of Rights
- Endorsement Letters
- Other (only as specified in the topic)

DISCRETIONARY TECHNICAL AND BUSINESS ASSISTANCE (TAB A)

The Army, at its discretion, may provide Technical and Business Assistance (TAB A). The Army will select a preferred vendor(s) for the Army SBIR TAB A program through a competitive process. Alternately, a small business concern may, by contract or otherwise, select one or more vendors to assist the firm in meeting the TAB A goals. The Applicant must request the authority to select its own TAB A provider in its Army SBIR proposal and must demonstrate that the vendor is uniquely postured to provide the specific technical and business services required by providing documentation in Volume 5, Supporting Documentation. TAB A funding will be denied if the offeror fails to include the cost and detailed explanation in its proposal. If you prefer to use the Army preferred vendor, you may opt for that support after selection if chosen to receive a contract award.

Participation in the Army SBIR TAB A program is voluntary for each Army SBIR awardee. Services provided to Army SBIR firms under the auspices of the TAB A program may include, but are not limited to:

1. Access to a network of scientists, engineers, and technologists focused on commercialization and transition considerations such as protected supply chain management, advanced manufacturing, process/product/production scaling, etc;

2. Assistance with intellectual property protections, such as legal considerations, intellectual property rights, patent filing, patent fees, licensing considerations, etc;
3. Commercialization and technology transition support such as market research, market validation, development of regulatory or manufacturing plans, brand development;
4. Regulatory support such as product domain regulatory considerations, regulatory planning, and regulatory strategy development.

The Army SBIR program sponsors participation in the TABA program. The resource limitation for each firm is as follows:

- Phase I Firms:
 - Army-Preferred Vendor: If approved, the contractor may receive up to \$6,500 worth of assistance services per project per year (in addition to the base SBIR award amount).
 - Firm-Selected Vendor: If approved, the contractor may receive up to \$6,500 in contract obligation (in addition to the base SBIR award amount) per project per year.
- Phase II Firms:
 - Army-Preferred Vendor: If approved, the contractor may receive up to \$50,000 worth of assistance services per project (in addition to the base SBIR award amount).
 - Firm-Selected Vendor: If approved, the contractor may receive up to \$50,000 in contract obligation (must be included in base SBIR award amount) per project.

EVALUATION AND SELECTION

The Army will conduct an evaluation of each responsive, timely, eligible proposal in accordance with the evaluation criteria listed in the DoD Program BAA. It is the policy of the Army to ensure equitable and comprehensive proposal evaluations based on the evaluation criteria and to select the source (or sources) whose offer meets the Government's technical, policy, and programmatic goals. Designated support contractors may review submissions for the purposes of technical evaluation. All support contractors are bound by appropriate non-disclosure agreements.

As previously stated herein, timeliness, responsiveness, and eligibility will be assessed upon initial screening, during evaluation, and after selection. Proposals that do not comply with the instructions and requirements detailed in this document, the DoD Program BAA, or the corresponding Topic posting (including the research objective(s)), will be considered ineligible, nonresponsive, untimely, or non-conforming and therefore will not be evaluated or considered for award.

Using the evaluation criteria, the Government will evaluate each responsive, timely, eligible proposal in its entirety. Proposals will not be evaluated against each other during the evaluation process, but rather evaluated on their own individual merit to determine how well the proposal meets the criteria stated in this BAA and the corresponding opportunity.

Selected proposals are those determined to be the most advantageous to the Government, consistent with instructions and evaluation criteria specified in the DoD Program BAA, the component-specific instructions herein, the corresponding Topic posting, and availability of funding.

Proposing firms will be notified via email of selection or non-selection status for a Phase I or direct to Phase II award within 90 days of the closing date of the Topic. The notification will be sent to the Corporate Official listed on the proposal cover sheet from the Army SBIR Program Office mailbox. The Army promotes transparency regarding the technical evaluation for all Army SBIR proposals. The Army will provide a technical evaluation narrative to the proposer in accordance with the SBA Policy Directive,

Appendix I, paragraph 4. The selection decision notice contains instructions for retrieving the technical evaluation narrative.

Proposers must not regard the notification email (selection decision notice) as an authorization to commit or expend funds. After the Army SBIR Office has recommended a proposal for award, a Government Contracting Officer may contact the proposer in order to discuss and request additional information required for award. This may include representations and certifications, certified or other than certified cost data, subcontracting plan for small businesses, and/or other information as applicable to the proposed award. Proposers must not regard these communications as an authorization to commit or expend funds. Unless a Government Contracting Officer signs the award document (i.e. contract), no obligations to provide funding are made. The Government may reject the proposal or cancel the contract action at any time.

If signed by the Government Contracting Officer, the award document is the official and authorizing instrument (i.e. contract). The anticipated period of performance start date will be determined at time of award. The Contracting Officer will email the signed, authorizing award instrument to the principal investigator (PI) and/or an authorized organization representative.

PROTESTS

Refer to the DoD SBIR Program BAA for procedures to protest the Announcement.


Feedback will be provided to applicants that are not selected for further consideration. A notification letter will include instructions for obtaining feedback in the form of a ValidEval Report. Offerors are entitled to no more than one feedback per proposal. NOTE: Feedback is not the same as a FAR Part 15 debriefing. Acquisitions under this solicitation are awarded via “other competitive procedures (FAR 6.102(d)(2)).” Therefore, offerors are neither entitled to nor will they be provided FAR Part 15 debriefs. As further prescribed in FAR 33.106(b), FAR 52.233-3, Protests after Award shall be submitted to the Point of Contract identified in the topic solicitation:

Email: usarmy.pentagon.hqda-asa-alt.mbx.army-applied-sbir-program@mail.mil


Mailing Address:

Army Applied SBIR Office
2530 Crystal Dr.; Ste 11192
Arlington, VA 22202

Appendix A Phase I Evaluation Criteria

| Applied SBIR Phase I Proposal Review v2-0-3 Evaluation Criteria Defined | |  |
|---|---|--|
| | | DEFINITION |
| INTRODUCTION | weight 5% | Write a clear, concise description of what your innovation does or will do, and where you are in your evolution. Make clear its intended impact on the Army. Evaluators should "get it" after reading this. |
| POTENTIAL FOR ARMY IMPACT | OPERATIONAL IMPACT | At the scale of a single Army end-user, argue that their jobs or lives will be significantly improved if your solution is adopted. What is the impact of your solution for a soldier/Army civilian vs. today's solutions? |
| | weight 25% | POTENTIAL SCALE OF IMPACT Here, we're looking for an idea of how broad the impact you described above could be. Look into the future to a time when your solution is both technically mature and actively in use by Army personnel. Describe the scale and scope of your impact within the context of the Army. |
| TECHNICAL FEASIBILITY | SCIENTIFIC FEASIBILITY | Is the science behind the solution sound? Convince readers who don't have deep expertise in your field that your innovation is built atop sound scientific and engineering principles. |
| | ENABLING TECHNOLOGIES | Point to the foundational technologies that you rely on to deliver your solution. Do the required enabling technologies introduce added risk? Using proven (and ideally Army fielded) underlying technologies and techniques helps to lower technical risk. |
| | ALTERNATIVE TECHNICAL APPROACHES | From a technologist's perspective, why is your proposed solution the best choice for the Army? Refute the alternative engineering approaches others are using. Why does your technology win? |
| | weight 25% | TECHNICAL RISK MITIGATION No matter your current technology readiness level, technical risks remain. Identify those risks. Present a credible plan to tackle those risks. |
| TRANSITION | ARMY TRANSITION PATHWAY | Planning for success, what's next for you after this SBIR award? Describe the next type of deal you aim to make with the Army, e.g. a CRADA, a different SBIR contract, a CSO, etc. Briefly outline your current plan to unlock that next opportunity and/or share the biggest risks you see post this SBIR award. |
| | weight 20% | SBIR MILESTONE SCHEDULE Please share with us a thoughtful execution plan. Strike a balance between giving us a sense of the detailed thinking behind the scenes and the need for your contracting officer to manage a reasonably small number of milestones during your period of performance. |
| FIRM CASH FLOW | FIRM SURVIVAL RISK | SBIR funds are meant to fuel growth rather than stave off a firm's impending financial failure. Demonstrate that your company will survive financially as a going concern through the early stages of a Phase III contract, sometimes referred to as "transitioning" into use by Army personnel. |
| | OTHER PEOPLE'S MONEY | Make the case that non-Army and/or non-DoD dollars will continue to fund improvements to your solution from which the Army will benefit in the future. Companies who cannot demonstrate non-Army and/or non-DoD funding sources for future solution enhancements are less attractive to the Applied SBIR program. |
| | weight 10% | FINANCIAL PROFIT POTENTIAL Through the Applied SBIR program, the Army wants to take advantage of the speed and scalability of dual-use companies. Make your best case that your product is or will be profitable. If you have more than one product, please focus your argument on the product / solution presented for this SBIR program. |
| TEAM ABILITY | weight 10% | Prove your team has executed well as a group. Please draw clear distinctions between private sector, DoD and civilian government work. What milestones have you accomplished as a group in this company? |
| SUBMISSION QUALITY | QUALITY OF PROSE | Prove you write clearly. Prove you argue convincingly. |
| | weight 5% | DATA QUALITY & ATTRIBUTION Support your arguments with relevant, properly attributed data to enhance your credibility. |

Appendix B Direct to Phase II Evaluation Criteria

| Applied SBIR D2P2 Proposal Review v2-0-4 Evaluation Criteria Defined | |  |
|--|------------|---|
| | | DEFINITION |
| INTRODUCTION | weight 2% | Write a clear, concise description of what your innovation does or will do, and where you are in your evolution. Make clear its intended impact on the Army. Evaluators should "get it" after reading this. |
| POTENTIAL FOR ARMY IMPACT | weight 20% | <p>OPERATIONAL IMPACT At the scale of a single Army end-user, argue that their jobs or lives will be significantly improved if your solution is adopted. What is the impact of your solution for a soldier/Army civilian vs. today's solutions?</p> <p>POTENTIAL SCALE OF IMPACT Here, we're looking for an idea of how broad the impact you described above could be. Look into the future to a time when your solution is both technically mature and actively in use by Army personnel. Describe the scale and scope of your impact within the context of the Army.</p> |
| TECHNICAL FEASIBILITY | weight 30% | <p>SCIENTIFIC FEASIBILITY Is the science behind the solution sound? Convince readers who don't have deep expertise in your field that your innovation is built atop sound scientific and engineering principles.</p> <p>ENABLING TECHNOLOGIES Point to the foundational technologies that you rely on to deliver your solution. Do the required enabling technologies introduce added risk? Using proven (and ideally Army-feldd) underlying technologies and techniques helps to lower technical risk.</p> <p>ALTERNATIVE TECHNICAL APPROACHES From a technologist's perspective, why is your proposed solution the best choice for the Army? Refute the alternative engineering approaches others are using. Why does your technology win?</p> <p>TECHNICAL RISK MITIGATION No matter your current technology readiness level, technical risks remain. Identify those risks. Present a credible plan to tackle those risks.</p> |
| TRANSITION | weight 20% | <p>ARMY TRANSITION PATHWAY Planning for success, what's next for you after this SBIR award? Describe the next type of deal you aim to make with the Army, e.g. a CRADA, a different SBIR contract, a CSO, etc. Briefly outline your current plan to unlock that next opportunity and/or share the biggest risks you see post this SBIR award.</p> <p>SBIR MILESTONE SCHEDULE Please share with us a thoughtful execution plan. Strike a balance between giving us a sense of the detailed thinking behind the scenes and the need for your contracting officer to manage a reasonably small number of milestones during your period of performance.</p> |
| FIRM CASH FLOW | weight 15% | <p>FIRM SURVIVAL RISK SBIR funds are meant to fuel growth rather than stave off a firm's impending financial failure. Demonstrate that your company will survive financially as a going concern through the early stages of a Phase III contract, sometimes referred to as "transitioning" into use by Army personnel.</p> <p>OTHER PEOPLE'S MONEY Make the case that non-Army and/or non-DoD dollars will continue to fund improvements to your solution from which the Army will benefit in the future. Companies who cannot demonstrate non-Army and/or non-DoD funding sources for future solution enhancements are less attractive to the Applied SBIR program.</p> <p>FINANCIAL PROFIT POTENTIAL Through the Applied SBIR program, the Army wants to take advantage of the speed and scalability of dual-use companies. Make your best case that your product is or will be profitable. If you have more than one product, please focus your argument on the product / solution presented for this SBIR program.</p> |
| TEAM ABILITY | weight 10% | Prove your team has executed well as a group. Please draw clear distinctions between private sector, DoD and civilian government work. What milestones have you accomplished as a group in this company? |
| SUBMISSION QUALITY | weight 3% | <p>QUALITY OF PROSE Prove you write clearly. Prove you argue convincingly.</p> <p>DATA QUALITY & ATTRIBUTION Support your arguments with relevant, properly attributed data to enhance your credibility.</p> |

Appendix C Phase II Evaluation Criteria

| Applied SBIR Phase II Proposal Review v2-0-3 Evaluation Criteria Defined | |  |
|--|--|--|
| | | DEFINITION |
| INTRODUCTION | weight 2% | Write a clear, concise description of what your innovation does or will do, and where you are in your evolution. Make clear its intended impact on the Army. Evaluators should "get it" after reading this. |
| POTENTIAL FOR ARMY IMPACT | OPERATIONAL IMPACT | At the scale of a single Army end-user, argue that their jobs or lives will be significantly improved if your solution is adopted. What is the impact of your solution for a soldier/Army civilian vs. today's solutions? |
| | weight 20% POTENTIAL SCALE OF IMPACT | Here, we're looking for an idea of how broad the impact you described above could be. Look into the future to a time when your solution is both technically mature and actively in use by Army personnel. Describe the scale and scope of your impact within the context of the Army. |
| TECHNICAL FEASIBILITY | SCIENTIFIC FEASIBILITY | Is the science behind the solution sound? Convince readers who don't have deep expertise in your field that your innovation is built atop sound scientific and engineering principles. |
| | ENABLING TECHNOLOGIES | Point to the foundational technologies that you rely on to deliver your solution. Do the required enabling technologies introduce added risk? Using proven (and ideally Army-fielded) underlying technologies and techniques helps to lower technical risk. |
| | ALTERNATIVE TECHNICAL APPROACHES | From a technologist's perspective, why is your proposed solution the best choice for the Army? Refute the alternative engineering approaches others are using. Why does your technology win? |
| | weight 25% TECHNICAL RISK MITIGATION | No matter your current technology readiness level, technical risks remain. Identify those risks. Present a credible plan to tackle those risks. |
| TRANSITION | ARMY TRANSITION PATHWAY | Planning for success, what's next for you after this SBIR award? Describe the next type of deal you aim to make with the Army, e.g. a CRADA, a different SBIR contract, a CSO, etc. Briefly outline your current plan to unlock that next opportunity and/or share the biggest risks you see post this SBIR award. |
| | weight 25% SBIR MILESTONE SCHEDULE | Please share with us a thoughtful execution plan. Strike a balance between giving us a sense of the detailed thinking behind the scenes and the need for your contracting officer to manage a reasonably small number of milestones during your period of performance. |
| FIRM CASH FLOW | FIRM SURVIVAL RISK | SBIR funds are meant to fuel growth rather than stave off a firm's impending financial failure. Demonstrate that your company will survive financially as a going concern through the early stages of a Phase III contract, sometimes referred to as "transitioning" into use by Army personnel. |
| | OTHER PEOPLE'S MONEY | Make the case that non-Army and/or non-DoD dollars will continue to fund improvements to your solution from which the Army will benefit in the future. Companies who cannot demonstrate non-Army and/or non-DoD funding sources for future solution enhancements are less attractive to the Applied SBIR program. |
| | weight 20% FINANCIAL PROFIT POTENTIAL | Through the Applied SBIR program, the Army wants to take advantage of the speed and scalability of dual-use companies. Make your best case that your product is or will be profitable. If you have more than one product, please focus your argument on the product / solution presented for this SBIR program. |
| TEAM ABILITY | weight 5% | Prove your team has executed well as a group. Please draw clear distinctions between private sector, DoD and civilian government work. What milestones have you accomplished as a group in this company? |
| SUBMISSION QUALITY | QUALITY OF PROSE | Prove you write clearly. Prove you argue convincingly. |
| | weight 2% DATA QUALITY & ATTRIBUTION | Support your arguments with relevant, properly attributed data to enhance your credibility. |

Appendix D

Commercialization Plan Template

General Instructions/Guidance:

1. The slide deck must be 8 slides total, per Component Instructions, and follow the formatting contained in the template. Font size shall be no smaller than 10-point font.
2. Slides should display the slide number in bottom right corner
3. All text (including tables, charts, plots, axes labels, legends, captions) must be readable without zooming and understandable without voice-over
4. For plots and charts:
 - a. Include title/bullet describing importance of plot/chart, and/or data (be specific)
 - b. Axes must be meaningfully labeled (to be understandable by non-experts) and include scale
5. Avoid jargon; define technical terms
6. Convert from slide format to a PDF file for submission to DSIP alongside the technical volume proposal
7. To insert images, capture a screenshot of the image and paste it into the slide. Please do not drag-drop a file into the presentation or use the Insert Pictures menu function.
8. Use PowerPoint's "Compress Pictures" feature to reduce file size
 - a. Select 96ppi resolution
 - b. Uncheck "For this picture only"
9. Replace the boilerplate footer below with distribution markings as appropriate
10. Do not put any company logos (Twitter, Reddit, GitHub, etc) on your slides

To be considered valid proposals, Commercialization Plan submissions must follow the number and content of each slide as contained in the attached template.

Appendix D
Commercialization Plan Template cont.

Firm Name

SBIR Project Title

Principal Investigator Name / Title
Key (or other relevant) Personnel, and
Subcontractors

.....
Insert Topic Number
Insert Proposal Number

Distribution markings as appropriate for your organization

BLUF: Bottom Line Up Front

- **BLUF:**
 - 1. Company information and background** : Core competencies, significant sales, previous funding, commercialization successes.
 - 2. Customer and Competition** : Clear description of key technology objectives, current competition, and advantages.
 - 3. Market:** Plan to obtain market share.
 - 4. Intellectual Property:** Patent status, technology lead, trade secrets or other demonstration of a plan to protect the company's technical advantage.
 - 5. Financing/Revenue:** Plans for securing necessary non -SBIR funding.
 - 6. Assistance and mentoring** : Plans for securing needed technical or business assistance.

Distribution markings as appropriate for your organization

Appendix D

Commercialization Plan Template cont.

Company Information and Background

- Core competencies and areas of specialization.
- Products with significant sales.
- Concise history of previous Federal and non -Federal funding/investments.
- Regulatory experience (if applicable).
- Past commercialization successes.
- Past failure and how you overcame .

Distribution markings as appropriate for your organization

3

Customer & Competition

- Description of key technology objectives.
- Current competition and/or alternative solutions.
- Advantages of company's offer compared to competing products or services.
- Hurdles to acceptance of the proposed innovation.
- Description of possible areas where your technology may be utilized or is under utilized.

Distribution markings as appropriate for your organization

4

Appendix D Commercialization Plan Template cont.

Market

- Analysis of market size and 1 and 5 year forecasted market share.
- Explanation of milestones and target dates of plan to obtain that market share.
- What experience do you have with marketing to this target market?
- What commercialization strategy appears to be the best for bringing this product to the target market?
- What experience do you have with bring products to market – either through this company or though other companies with which you have worked.
- Does the company currently market, manufacture, or license technology? Describe what you do.

Intellectual Property

- Patent status, technology lead, trade secrets or other demonstration of a plan to achieve sufficient protection to realize the commercialization stage and attain at least a temporary competitive advantage .
- Describe how you will protect the intellectual property that enables commercialization of its products while keeping competitors at bay. Note any actions you may consider to attain at least a temporary competitive advantage. Also consider your company's prior record in this area. Comment on your company's strategy to build a sustainable business through protection of intellectual property .

Appendix D

Commercialization Plan Template cont.

Financing

- Plan for securing non-SBIR, private or government funding necessary to enter low rate of production of anticipated technical solution.
- Describe your revenue stream generation to include but not limited to:
 - Manufacture and direct sales
 - Sales through value added resellers or other distributors
 - Joint venture

Assistance & Mentoring

- Plans for securing needed technical or business assistance through mentoring, partnering, or arrangements with government sponsored (e.g., SBIR funded Discretionary Technical and Business Assistance (TABAs), State assistance programs, Federally-funded research laboratories, Manufacturing Extension Partnership centers), not-for-profits (e.g., Small Business Development Center (SBDC) or Small Business Technical Development Center (SBTDC)), commercial accelerators, DOD Prime Contractors, SBA Mentor - Protégé program, Procurement Technical Assistance Center (PTAC) or other assistance provider.

Army SBIR 23.4 Topic Index
Release 19

A234-P027 Energy Demand Reduction and Clean Energy Tech Open Topic

OUSD (R&E) CRITICAL TECHNOLOGY AREA(S): Renewable Energy Generation and Storage;

OBJECTIVE: The purpose of the Energy Demand Reduction and Clean Energy Tech Open Topic is to bring potentially valuable small business innovations to the Army and create an opportunity to expand the relevance of the Army SBIR program to firms who do not normally compete for SBIR awards.

DESCRIPTION: While the Energy Demand Reduction and Clean Energy Tech Open Topic will accept proposals on any technical challenge requiring the application of Energy Demand Reduction and clean energy technologies, submissions addressing the following core technical areas will be prioritized for award:

1. Energy Storage (man-portable, ground vehicle and support equipment applications, and airborne vehicle solutions)
2. Clean Energy Generation (primary but not exclusive range of 1kW-200kW and 20-1,000 energy consumption endpoints)
3. Micro-grid components compatible with the DoD's Tactical Microgrid Standard
4. Electric and Hybrid Electric Transportation (ground vehicles, ground support equipment, UAV, helicopter, and small-fixed wing aircraft solutions)
5. Charging of electrified transportation in austere environments

PHASE I:

The purpose of Phase I is to demonstrate or determine the scientific, technical, and commercial merit and feasibility of the concept. The Phase I period of performance will be 6 months. Small businesses shall deliver a proof of technical feasibility at the end of the Period of Performance.

Phase I Submission Materials:

- 5-page technical volume for down-select.
- 8-slide commercialization plan; template provided in announcement.

Post-Phase I Deliverables:

- **Small Business:** A feasibility study to demonstrate the technical and commercial practicality of the concept to include an assessment of its technical readiness and potential applicability to military and commercial markets.
- **Technical POC and Transition Partner:** Commitment secured from TPOC and Transition Partner to associate with potential Phase II work. (Transition Partner is defined as an Army organization planning to integrate and fund the technology after SBIR funding has expired).

(DIRECT TO) PHASE II:

Proposers interested in submitting a Direct to Phase II (DP2) proposal must provide documentation to substantiate that the scientific and technical merit and feasibility described above has been met and describes the potential military and/or commercial applications. Documentation should include all relevant information including, but not limited to: technical reports, test data, prototype designs/models, and performance goals/results.

DP2 Submission Materials:

- 10-page technical volume for down-select.
- 5 pages showing how technical feasibility has already been achieved.
- 8-slide commercialization plan; template provided in announcement.

PHASE II: Produce prototype solutions that will be practical and feasible to operate in edge and austere environments. Companies will provide a technology transition and commercialization plan for DOD and commercial markets. The Army will evaluate each product in a realistic field environment and provide solutions to stakeholders for further evaluation. Based on Soldier field evaluations, companies will be requested to update the previously delivered prototypes to meet final design configuration.

PHASE III DUAL USE APPLICATIONS:

- The renewable energy sector can use energy storage technologies to store excess energy that is generated during periods of low demand or high production.
- The transportation industry can utilize energy storage technologies in electric vehicles. Batteries with new storage capabilities can enable longer driving ranges and shorter charging times for the vehicles.
- By integrating clean energy into their grids, electric utilities can reduce their reliance on fossil fuels and lower their greenhouse gas emissions.
- The manufacturing industry consumes significant amounts of energy. By adopting alternative methods of energy generation, manufacturers can reduce their carbon footprint and the operational costs that they currently have.
- There are countless opportunities to apply the use of the technologies that come out of this effort into a wide variety of industries.

KEYWORDS: Energy Storage; Clean Energy Generation; Clean Micro-Grid; Electric Transportation; Clean Industry Technology

REFERENCES:

- <https://www.armysbir.army.mil/topics/>;
- https://www.army.mil/e2/downloads/rv7/about/2022_army_climate_strategy.pdf;
- https://www.army.mil/e2/downloads/rv7/about/2022_Army_Climate_Strategy_Implementation_Plan_FY23-FY27.pdf;
- https://www.army.mil/article/259086/u_s_army_awards_prizes_for_clean_tech_solutions_aligned_to_its_climate_strategy

DEPARTMENT OF THE ARMY
DoD 23.4 Small Business Innovation Research (SBIR) Annual BAA
Release 20
Proposal Submission Instructions

INTRODUCTION

Where big ideas come to life, the Army SBIR and STTR programs align innovative small businesses with critical U.S. Army priorities to turnover game-changing solutions to our most critical customer – the soldier.

Proposers responding to a topic in this BAA must follow all general instructions provided in the Department of Defense (DoD) SBIR 23.4 Annual Program BAA, Amendment 2.

Proposers are encouraged to thoroughly review the DoD Program BAA and register for the DSIP Listserv to remain apprised of important programmatic and contractual changes.

- The DoD Program BAA is located at: <https://www.defensesbirsttr.mil/SBIR-STTR/Opportunities/#announcements>. Be sure to select the tab for the appropriate BAA cycle.
- Register for the DSIP Listserv at: <https://www.dodsbirsttr.mil/submissions/login>.

The DoD 23.4 SBIR Annual Program BAA can be found here: <https://www.defensesbirsttr.mil/SBIR-STTR/Opportunities/>. Army requirements in addition to or deviating from the DoD Program BAA are provided in the instructions below.

Specific questions pertaining to the administration of the Army SBIR Program and these proposal preparation instructions should be directed to: Mr. Michael Borzcik at michael.borzcik.civ@aal.army.

September 28, 2023: Topic issued for pre-release

October 24, 2023: Army begins accepting proposals via DSIP

October 31, 2023: DSIP Topic Q&A closes to new questions at 12:00 p.m. ET

November 14, 2023: Deadline for receipt of proposals no later than 12:00 p.m. ET

From **September 28, 2023 to October 24, 2023**, this topic is issued for Pre-Release with the names of the topic authors. During the pre-release period, proposing firms have an opportunity to contact topic authors through <https://calendly.com/michael-borzcik-aal/remote-breaching> to schedule a time to ask technical questions about the topic. Questions should be limited to specific information related to improving the understanding of the topic's requirements. Proposing firms may not ask for advice or guidance on solution approach and you may not submit additional material to the topic author. If information provided during an exchange with the topic author is deemed necessary for proposal preparation, that information will be made available to all parties through the DSIP Topic Q&A module.

Once the Army begins accepting proposals on **October 24, 2023**, no further direct contact between proposers and topic authors is allowed unless the Topic Author is responding to a question submitted during the pre-release period. However, proposers may submit written questions through the DSIP Topic Q&A module at <https://www.dodsbirsttr.mil/submissions/login>. The DSIP Topic Q&A for this topic opens on **September 28, 2023**, and closes to new questions on **October 31, 2023, at 12:00PM ET**. Once the BAA closes to proposal submission, no communication of any kind with the topic author or through Topic Q&A regarding your submitted proposal is allowed.

Deadline for Receipt: Proposals must be **completely** submitted no later than **12:00 p.m.** ET, on **November 14, 2023.** Proposals submitted after 12:00 p.m. ET will not be evaluated. The final proposal submission includes successful completion of all firm level forms, all required volumes, and electronic corporate official certification.

PHASE I PROPOSAL GUIDELINES

The Defense SBIR/STTR Innovation Portal (DSIP) is the official portal for DoD SBIR/STTR proposal submission. Proposers are required to submit proposals via DSIP; proposals submitted by any other means will be disregarded. Detailed instructions regarding registration and proposal submission via DSIP are provided in the DoD SBIR Program BAA.

Technical Volume (Volume 2)

The technical volume is not to exceed 10 pages and an optional 10-slide deck and must follow the formatting requirements provided in the DoD SBIR Program BAA.

Content of the Technical Volume

Detailed Phase I proposal instructions can be found at: <http://aal.army/assets/files/pdf/sbir-phase-1-template.pdf>.

Cost Volume (Volume 3)

The Phase I Base amount must not exceed \$200,000 for a 3 month period of performance (PoP) and the Phase I Option amount must not exceed \$50,000 for a 2 month extension. Costs for the Base and Option must be separated and clearly identified on the Proposal Cover Sheet (Volume 1) and in Volume 3.

Company Commercialization Report (CCR) (Volume 4)

Completion of the CCR as Volume 4 of the proposal submission in DSIP is required. Please refer to the DoD SBIR Program BAA for full details on this requirement. Information contained in the CCR will be considered during proposal evaluations.

Supporting Documents (Volume 5)

All proposing small business concerns are REQUIRED to submit the following documents to Volume 5:

1. Contractor Certification Regarding Provision of Prohibition on Contracting for Certain Telecommunications and Video Surveillance Services or Equipment
2. Disclosures of Foreign Affiliations or Relationships to Foreign Countries
3. Disclosure of Funding Sources

Please refer to the DoD Program BAA for more information.

Proposers can submit an optional slide deck of 10 slides in Volume 5: Supporting Documents. The slide deck can contain information on the technical approach, the team, commercialization plans, or relevant technology/research the proposers have developed, and it should contain additional/complementary information to the technical volume. If a proposer elects to submit a slide deck, its information will be used in the evaluation process. A sample Slide Deck template is located here: <http://aal.army/assets/files/pdf/sbir-optional-slide-template.pdf>.

PHASE II PROPOSAL GUIDELINES

Phase II proposals may only be submitted by Phase I awardees. Phase II proposal submission window,

notification process, expected budget/duration structure and additional instructions will be provided in the Phase I contract or by subsequent notification.

DISCRETIONARY TECHNICAL AND BUSINESS ASSISTANCE (TABA)

Discretionary Technical and Business Assistance (TABA) will not be offered for this Army topic.

EVALUATION AND SELECTION

The Army will conduct an evaluation of each responsive, timely, eligible proposal in accordance with the evaluation criteria listed in the DoD Program BAA. It is the policy of the Army to ensure equitable and comprehensive proposal evaluations based on the evaluation criteria and to select the source (or sources) whose offer meets the Government's technical, policy, and programmatic goals.

As previously stated herein, timeliness, responsiveness, and eligibility will be assessed upon initial screening, during evaluation, and after selection. Proposals that do not comply with the instructions and requirements detailed in this document, the DoD Program BAA, or the corresponding Topic posting (including the research objective(s)), will be considered ineligible, nonresponsive, untimely, or non-conforming and therefore will not be evaluated or considered for award.

Using the evaluation criteria, the Government will evaluate each responsive, timely, eligible proposal in its entirety, documenting the strengths and weaknesses relative to each evaluation criterion. Proposals will not be evaluated against each other during the evaluation process, but rather evaluated on their own individual merit to determine how well the proposal meets the criteria stated in this BAA and the corresponding opportunity.

Selected proposals are those determined to be the most advantageous to the Government, consistent with instructions and evaluation criteria specified in the DoD Program BAA, the component-specific instructions herein, the corresponding Topic posting, and availability of funding.

Proposing firms will be notified via email of selection or non-selection status for a Phase I award within 90 days of the closing date of the Topic. The notification will be sent to the Corporate Official listed on the proposal cover sheet from the Army SBIR Program Office mailbox. The Army promotes transparency regarding the technical evaluation for all Army SBIR proposals. The Army will provide a technical evaluation narrative to the proposer in accordance with the SBA Policy Directive, Appendix I, paragraph 4. The selection decision notice contains instructions for retrieving the technical evaluation narrative.

Proposers must not regard the notification email (selection decision notice) as an authorization to commit or expend funds. After the Army SBIR Office has recommended a proposal for award, a Government Contracting Officer may contact the proposer in order to discuss and request additional information required for award. This may include representations and certifications, certified or other than certified cost data, subcontracting plan for small businesses, and/or other information as applicable to the proposed award. Proposers must not regard these communications as an authorization to commit or expend funds. Unless a Government Contracting Officer signs the award document (i.e. contract), no obligations to provide funding are made. The Government may reject the proposal or cancel the contract action at any time.

If signed by the Government Contracting Officer, the award document is the official and authorizing instrument (i.e. contract). The anticipated period of performance start date will be determined at time of award. The Contracting Officer will email the signed, authorizing award instrument to the principal investigator (PI) and/or an authorized organization representative.

Refer to the DoD SBIR Program BAA for procedures to protest the Announcement.

AWARD AND CONTRACT INFORMATION

Please refer to the DoD Program BAA for detailed information regarding SBIR/STTR phase structure and flexibility.

Army SBIR 23.4 Topic Index
Release 20

A234-028 Remote Breaching of Obstacles

OUSD (R&E) CRITICAL TECHNOLOGY AREA(S): Human-Machine Interfaces, Directed Energy, Integrated Sensing and Cyber, Trusted AI and Autonomy

The technology within this topic is restricted under the International Traffic in Arms Regulation (ITAR), 22 CFR Parts 120-130, which controls the export and import of defense-related material and services, including export of sensitive technical data, or the Export Administration Regulation (EAR), 15 CFR Parts 730-774, which controls dual use items. Offerors must disclose any proposed use of foreign nationals (FNs), their country(ies) of origin, the type of visa or work permit possessed, and the statement of work (SOW) tasks intended for accomplishment by the FN(s) in accordance with the Announcement. Offerors are advised foreign nationals proposed to perform on this topic may be restricted due to the technical data under US Export Control Laws.

OBJECTIVE:

Develop and demonstrate solutions or components of solutions for remote breaching of obstacles to decrease risk by removing Soldiers from the point of breach.

DESCRIPTION:

Breaching is a key task performed by Army forces in order to move through enemy-emplaced obstacles intended to block, disrupt, turn, or fix friendly forces. Mined wire obstacles consist of anti-vehicle and/or anti-personnel mines or other explosive hazards that may be surface-laid or buried, with trigger mechanisms to include pressure plate, magnetic, vibration, radar, and others. Mines and explosive hazards can be manually emplaced or scattered by quick-delivery mechanisms such as aircraft or artillery. Mined obstacles are often accompanied by concertina wire, anti-tank ditches, berms, and physical barriers such as “tetrahedrons” to slow vehicle and personnel movement. Obstacles are usually overwatched by enemy forces to engage friendly forces attempting to breach the obstacle.

The Army’s current breaching methods require Soldiers at the point of breach, introducing the possibility of catastrophic loss of personnel and equipment and creating a risk to mission accomplishment. To conduct a breaching operation, Soldiers must locate the obstacle and decide where to breach a lane through the obstacle. Then they use an explosive device such as a Mine Clearing Line Charge (MICLIC) or mechanical means such as a plow or flail to detonate mines or move them out of the breach lane. Soldiers then “proof” the lane to verify that the obstacle has been neutralized, often using a mine roller to detonate any remaining mines. Finally, they mark the breach lane to guide passage of friendly forces through the lane.

The Army is seeking solutions for remote breaching to decrease risk by removing Soldiers from the point of breach. We are particularly seeking technologies that contribute to one or more tasks associated with breaching mine and wire obstacles, to include but not limited to:

- Detecting mines and other surface or subsurface explosive hazards and communicating or marking their locations
- Detecting physical obstacles such as wire, anti-tank ditches, berms, tetrahedrons, or other types of barriers
- Neutralizing mines, explosive hazards, and physical barriers through explosive, mechanical, kinetic, electromagnetic, directed energy, or other means
- Verifying (proofing) the breach lane to ensure the obstacle has been neutralized
- Marking the breach lane to guide safe passage of vehicular or personnel traffic
- Command and control of the breaching operation

Solutions should allow Soldiers to conduct breaching from a safe distance of approximately 1000 meters or more from the point of breach. This may include technologies that can be employed by air or ground uncrewed systems or launched from a safe distance.

Solutions should be capable of integrating as part of a larger breaching concept and may be employed alongside other systems either fielded or in development, such as a remotely controlled Assault Breacher Vehicle or other technologies resulting from this solicitation. The Army is open to solutions in the form of modular mission payloads that integrate with existing or planned robotic platforms such as the Robotic Combat Vehicle (RCV) or other ground or air platforms.

The Army desires speed and flexibility in remote breaching methods. Solutions should be employable quickly in response to a hastily-employed enemy obstacle, such as air-delivered scatterable mines, or as part of a deliberate breaching operation against a larger, more complex obstacle. Ideally, solutions should be scalable for use against obstacles with greater depth.

There is likely to be significant technology overlap with solutions that can be used for non-combat operations such as locating and clearing legacy minefields. However, the focus of this solicitation is on technologies for creating a breach lane in an enemy-emplaced obstacle in the context of a fast-paced, contested combat environment.

PHASE I:

Design a proof-of-concept solution or component(s) of a solution for remote breaching of obstacles to remove Soldiers from the point of breach. Solutions may include technologies for detecting or neutralizing mines, explosive hazards, or barriers, verifying that the obstacle has been neutralized, marking the breach lane, controlling the breaching operation, or other components that contribute to a successful breaching operation. Proposals will be evaluated based on the contributions they can provide to the overall breaching effort and the likelihood of the technology providing an effective solution. The objective of Phase I is to establish the technical merit, feasibility, and commercial potential of the proposed effort, and to determine the quality of performance of the awarded companies prior to providing further support in Phase II. Final deliverable will be a concept design presentation, optional proof of technology demonstration, and plans for follow-on Phase II work.

Companies selected for a Phase I award may voluntarily participate in the Army Applications Laboratory (AAL) 12-week cohort program. The AAL cohort program is designed to solve specific Army modernization challenges on a compressed timeline. The cohort program matches qualified companies with Army problem owners to speed capability development, accelerate transition, and de-risk or inform requirements. This program is designed for businesses that have unique, applicable technology and are interested in growing a new line of business through the DoD.

The cohort program will enhance technology development through rapid exposure to Army stakeholders and the Army maneuver support community. Planned activities include a problem topic deep dive, in-person exposure to current breaching techniques, and stakeholder engagement with requirements writers, acquisitions managers, and end users. An example cohort program for this topic is:

| | |
|------------------------|--|
| Week 1 (15 Jan 2024) | Orientation and problem deep-dive (in-person: Ft. Stewart, GA) |
| Week 2 (22 Jan 2024) | Concept research and planning |
| Week 3 (29 Jan 2024) | Concept confirmation brief (virtual) |
| Week 4-6 (5 Feb 2024) | Concept research and planning |
| Week 7 (26 Feb 2024) | Mid-point concept refinement brief (in-person: Ft. Leonard Wood, MO) |
| Week 8-11 (4 Mar 2024) | Concept design refinement |

Week 12 (1 Apr 2024)

Final concept design brief (in-person: Austin, TX)

Cohort programming will be provided free of charge. Proposers who plan to participate in the cohort (if awarded a Phase I) are encouraged to include travel costs for three cohort trips, within the continental US, for five days each (including travel days) for in-person programming. Details will be provided to awardees under this topic at Phase I award.

PHASE II:

Develop, build, and demonstrate a prototype of the concept advanced during Phase I. Prototypes should be capable of integration with existing Army systems and/or newly developed systems from other awardees. They should also showcase modularity and prove effective during simulated or operational demonstrations. Phase II deliverables include a demonstration and delivery of a Technology Readiness Level (TRL) 6 prototype for further Army evaluation, as well as quarterly and final reports detailing design and performance analysis of the prototype. Phase II proposals will be evaluated, in part, on cost reasonableness and speed to delivery of a TRL 6 prototype.

Awardees may also be eligible for Phase IIb award after completion of Phase II period of performance. Phase IIb can extend the period of performance with additional funding and additional matching opportunities to finish building out solutions with the stakeholders' discretion.

PHASE III:

The objective of Phase III, where appropriate, is for the small business to pursue commercialization objectives through the effort. Companies may develop a manufacturing-ready product design, capable of integration with the existing or future system, and demonstrate technology integration. Low-rate production will occur as required. Companies will engage in laboratory or operational testing as required. Phase III deliverables include system-level integration technical data package, installation documentation, and system-level prototype for demonstration and government-sponsored testing.

WEBINAR DATE:

A Webinar will be conducted for this solicitation on Wednesday, October 11, at 10:00am CST. Please register at: <https://remotebreachingwebinar.eventbrite.com>.

KEYWORDS:

Obstacle, Barrier, Mine, Wire, Ditch, Breach, Reduce, Clear, Remote, Robotic, Autonomous, Unmanned, Uncrewed

REFERENCES:

1. Combined Arms Breach. TRADOC G2 G&V. https://www.youtube.com/watch?v=ZZ-sCT_maAQ
2. US Army digs deep to develop robot minefield 'breachers'. C4ISRNET. <https://www.c4isrnet.com/newsletters/unmanned-systems/2022/11/03/us-army-digs-deep-to-develop-robot-minefield-breachers/>

DEPARTMENT OF THE NAVY (DON)
23.4 Small Business Innovation Research (SBIR)
Open Topics - Proposal Submission Instructions

IMPORTANT

- The following dates apply to topics N234-P01 through N234-P08:
 - 15 June 2023: Topics issued for pre-release
 - 13 July 2023: DON begins accepting proposals
 - 1 August 2023: Topic Q&A closes to new questions
 - 15 August 2023: Full proposals due no later than 12:00 p.m. ET
- Information on virtual Listening Sessions and Ask Me Anything events for the topics in this BAA can be found at https://navysbir.com/open_topic.htm.
- Submitting small business concerns are encouraged to thoroughly review the DoD Program BAA and register for the DSIP Listserv to remain apprised of important programmatic changes.
 - The DoD Program BAA is located at: <https://www.defensesbirstr.mil/SBIR-STTR/Opportunities/#announcements>. Select the tab for the appropriate BAA cycle.
 - Register for the DSIP Listserv at: <https://www.dodsbirstr.mil/submissions/login>.
- The information provided in the DON Proposal Submission Instructions document takes precedence over the DoD Instructions posted for this Broad Agency Announcement (BAA).
- A proposing small business concern:
 - is required to submit proposals via the DoD SBIR/STTR Innovation Portal (DSIP) <https://www.dodsbirstr.mil/submissions/login>.
 - is required to use the Open Topic Phase I proposal template for Volume 2. This template is specific to DON Open Topics to meet Phase I requirements. The Open Topic Phase I template can be found at https://navysbir.com/links_forms.htm
 - should note that DON is not seeking or funding proposals for commercial items or non-developmental items (NDIs) for testing and operational evaluation that do not require RDT&E engineering, design or integration effort under this announcement (see Additional Submission Considerations).
 - may only submit one (1) proposal to each Open Topic. If more than one proposal from a small business concern is received for a single Open Topic, only the most recent proposal to be certified and submitted prior to the submission deadline will receive an evaluation. All prior proposals submitted by the small business concern for the same Open Topic will be marked as nonresponsive and will not receive an evaluation.
 - that is more than 50% owned by multiple venture capital operating companies (VCO), hedge funds (HF), private equity firms (PEF) or any combination of these are eligible to submit proposals in response to DON topics advertised in this BAA. Information on Majority Ownership in Part and certification requirements at time of submission for these proposing small business concerns are detailed in the section titled ADDITIONAL SUBMISSION CONSIDERATIONS.

- The DON provides notice that Basic Ordering Agreements (BOAs) may be used for Phase I awards, and BOAs or Other Transaction Agreements (OTAs) may be used for Phase II awards.
- This BAA is issued under regulations set forth in Federal Acquisition Regulation (FAR) 35.016 and awards will be made under “other competitive procedures”. The policies and procedures of FAR Subpart 15.3 shall not apply to this BAA, except as specifically referenced in it. All procedures are at the sole discretion of the Government as set forth in this BAA. Submission of a proposal in response to this BAA constitutes the express acknowledgement to that effect by the proposing small business concern.

INTRODUCTION

The DON SBIR/STTR Programs are mission-oriented programs that integrate the needs and requirements of the DON’s Fleet through research and development (R&D) topics that have dual-use potential, but primarily address the needs of the DON. **Through this BAA, DON intends to leverage open topics to solicit proposals to adapt commercial products to fill a capability gap, improve performance, or modernize existing capability for the DON in various mission critical areas.** More information on the programs can be found on the DON SBIR/STTR website at www.navysbir.com. Additional information on DON’s mission can be found on the DON website at www.navy.mil.

The Director of the DON SBIR/STTR Programs is Mr. Robert Smith. For questions regarding this BAA, use the information in Table 1 to determine who to contact for what types of questions.

TABLE 1: POINTS OF CONTACT FOR QUESTIONS REGARDING THIS BAA

| Type of Question | When | Contact Information |
|---|-----------------|---|
| Program and administrative | Always | Navy SBIR/STTR Program Management Office usn.pentagon.cnr-arlington-va.mbx.navy-sbir-sttr@us.navy.mil or appropriate Program Manager listed in Table 2 (below) |
| Topic-specific technical questions | BAA Pre-release | Technical Point of Contact (TPOC) listed in each topic. Refer to the Proposal Fundamentals section of the DoD SBIR/STTR Program BAA for details. |
| | BAA Open | DoD SBIR/STTR Topic Q&A platform (https://www.dodsbirsttr.mil/submissions) Refer to the Proposal Fundamentals section of the DoD SBIR/STTR Program BAA for details. |
| Electronic submission to the DoD SBIR/STTR Innovation Portal (DSIP) | Always | DSIP Support via email at dodsbirsupport@reisystems.com |
| Navy-specific BAA instructions and forms | Always | DON SBIR/STTR Program Management Office usn.pentagon.cnr-arlington-va.mbx.navy-sbir-sttr@us.navy.mil |

TABLE 2: DON SYSTEMS COMMANDS (SYSCOM) SBIR PROGRAM MANAGERS

| <u>Topic Numbers</u> | <u>Point of Contact</u> | <u>SYSCOM</u> | <u>Email</u> |
|----------------------|-------------------------|--|--|
| N234-P01 | Mr. Jeffrey Kent | Marine Corps Systems Command (MCSC) | sbir.admin@usmc.mil |
| N234-P02 | Ms. Kristi DePriest | Naval Air Systems Command (NAVAIR) | usn.patuxent.comnavairsyscompax.mbx.navair-sbir@us.navy.mil |
| N234-P03 to N234-P06 | Mr. Jason Schroepfer | Naval Sea Systems Command (NAVSEA) | NSSC_SBIR.fct@navy.mil |
| N234-P07 to N234-P08 | Mr. Shadi Azoum | Naval Information Warfare Systems Command (NAVWAR) | info@navwarsbir.com |

PHASE I SUBMISSION INSTRUCTIONS

The following section details requirements for submitting a compliant Phase I proposal to the DoD SBIR/STTR Programs.

(NOTE: Proposing small business concerns are advised that support contract personnel will be used to carry out administrative functions and may have access to proposals, contract award documents, contract deliverables, and reports. All support contract personnel are bound by appropriate non-disclosure agreements.)

DoD SBIR/STTR Innovation Portal (DSIP). Proposing small business concerns are required to submit proposals via the DoD SBIR/STTR Innovation Portal (DSIP); follow proposal submission instructions in the DoD SBIR/STTR Program BAA on the DSIP at <https://www.dodsbirsttr.mil/submissions>. Proposals submitted by any other means will be disregarded. Proposing small business concerns submitting through DSIP for the first time will be asked to register. It is recommended that small business concerns register as soon as possible upon identification of a proposal opportunity to avoid delays in the proposal submission process. Proposals that are not successfully certified electronically in DSIP by the Corporate Official prior to BAA Close will NOT be considered submitted and will not be evaluated by DON. Please refer to the DoD SBIR/STTR Program BAA for further information.

A small business concern may only submit one (1) proposal to each Open Topic. If more than one proposal from a small business concern is received for a single Open Topic, only the most recent proposal to be certified and submitted in DSIP prior to the submission deadline will receive an evaluation. All prior proposals submitted by the small business concern for the same Open Topic will be marked as nonresponsive and will not receive an evaluation.

Proposal Volumes. The following six volumes are required.

- **Proposal Cover Sheet (Volume 1).** As specified in DoD SBIR/STTR Program BAA.
- **Technical Proposal (Volume 2)**
 - Technical Proposal (Volume 2) must meet the following requirements or the proposal will be REJECTED:

- Proposing small business concerns are required to use the Open Topic Phase I proposal template for Volume 2. This template is specific to DON Open Topics to meet Phase I requirements. The Open Topic Phase I template can be found at https://navysbir.com/links_forms.htm
 - Not to exceed ten (10) pages, regardless of page content
 - Single column format, single-spaced typed lines
 - Standard 8 ½” x 11” paper
 - Page margins one inch on all sides. A header and footer may be included in the one-inch margin.
 - No font size smaller than 10-point
 - Include, within the ten-page limit of Volume 2, an Option that furthers the effort in preparation for Phase II and will bridge the funding gap between the end of Phase I and the start of Phase II. Tasks for both the Phase I Base and the Phase I Option must be clearly identified. Phase I Options are exercised upon selection for Phase II.
 - Work proposed for the Phase I Base must be exactly four (4) months.
 - Work proposed for the Phase I Option must be exactly six (6) months.
- Additional information:
 - A font size smaller than 10-point is allowable for headers, footers, imbedded tables, figures, images, or graphics that include text. However, proposing small business concerns are cautioned that if the text is too small to be legible it will not be evaluated.
- **Cost Volume (Volume 3).**
 - Cost Volume (Volume 3) must meet the following requirements or the proposal will be REJECTED:
 - The Phase I Base amount must not exceed \$75,000.
 - Phase I Option amount must not exceed \$100,000.
 - Costs for the Base and Option must be separated and clearly identified on the Proposal Cover Sheet (Volume 1) and in Volume 3.
 - For Phase I, a minimum of two-thirds of the work is performed by the proposing small business concern. The two-thirds percentage of work requirement must be met in the Base costs as well as in the Option costs. DON will not accept deviations from the minimum percentage of work requirements for Phase I. The percentage of work is measured by both direct and indirect costs. To calculate the minimum percentage of work for the proposing small business concern the sum of all direct and indirect costs attributable to the proposing small business concern represent the numerator and the total cost of the proposal (i.e., Total Cost before Profit Rate is applied) is the denominator. The subcontractor percentage is calculated by taking the sum of all costs attributable to the subcontractor (Total Subcontractor Costs (TSC)) as the numerator and the total cost of the proposal (i.e., Total Cost before Profit Rate is applied) as the denominator.
 - Proposing Small Business Concern Costs (included in numerator for calculation of the small business concern):
 - Total Direct Labor (TDL)
 - Total Direct Material Costs (TDM)
 - Total Direct Supplies Costs (TDS)
 - Total Direct Equipment Costs (TDE)
 - Total Direct Travel Costs (TDT)
 - Total Other Direct Costs (TODC)
 - General & Administrative Cost (G&A)

NOTE: G&A, if proposed, will only be attributed to the proposing small business concern.

- Subcontractor Costs (numerator for subcontractor calculation):
 - Total Subcontractor Costs (TSC)
 - Total Cost (i.e., Total Cost before Profit Rate is applied, denominator for either calculation)
- o Additional information:
- Provide sufficient detail for subcontractor, material, and travel costs. Subcontractor costs must be detailed to the same level as the prime contractor. Material costs must include a listing of items and cost per item. Travel costs must include the purpose of the trip, number of trips, location, length of trip, and number of personnel.
 - The “Additional Cost Information” of Supporting Documents (Volume 5) may be used to provide supporting cost details for Volume 3. When a proposal is selected for award, be prepared to submit further documentation to the SYSCOM Contracting Officer to substantiate costs (e.g., an explanation of cost estimates for equipment, materials, and consultants or subcontractors).
- **Company Commercialization Report (Volume 4).** DoD collects and uses Volume 4 and DSIP requires Volume 4 for proposal submission. Please refer to the Phase I Proposal section of the DoD SBIR/STTR Program BAA for details to ensure compliance with DSIP Volume 4 requirements.
 - **Supporting Documents (Volume 5).** Volume 5 is for the submission of administrative material that DON may or will require to process a proposal, if selected, for contract award. All proposing small business concerns must review and submit the following items, as applicable:
 - **Telecommunications Equipment Certification.** Required for all proposing small business concerns. The DoD must comply with Section 889(a)(1)(B) of the FY2019 National Defense Authorization Act (NDAA) and is working to reduce or eliminate contracts, or extending or renewing a contract with an entity that uses any equipment, system, or service that uses covered telecommunications equipment or services as a substantial or essential component of any system, or as critical technology as part of any system. As such, all proposing small business concerns must include as a part of their submission a written certification in response to the clauses (DFAR clauses 252.204-7016, 252.204-7018, and subpart 204.21). The written certification can be found in Attachment 1 of the DoD SBIR/STTR Program BAA. This certification must be signed by the authorized company representative and is to be uploaded as a separate PDF file in Volume 5. Failure to submit the required certification as a part of the proposal submission process will be cause for rejection of the proposal submission without evaluation. Please refer to the instructions provided in the Phase I Proposal section of the DoD SBIR/STTR Program BAA.
 - **Disclosures of Foreign Affiliations or Relationships to Foreign Countries.** Each proposing small business concern is required to complete Attachment 2 of this BAA, “Disclosures of Foreign Affiliations or Relationships to Foreign Countries” and upload the form to Volume 5, Supporting Documents. Please refer to the following sections of the DoD SBIR/STTR Program BAA for details:
 - Program Description
 - Proposal Fundamentals
 - Phase I Proposal
 - Attachment 2

- **Certification Regarding Disclosure of Funding Sources.** Each proposing small business concern must comply with Section 223(a) of the William M. (Mac) Thornberry National Defense Authorization Act for Fiscal Year 2021. The disclosure and certification must be made by completing Attachment 4, Disclosure of Funding Sources, and uploading to Volume 5, Supporting Documents. Please refer to the following sections of the DoD SBIR/STTR Program BAA for details:
 - Phase I Proposal
 - Attachment 4
 - **Majority Ownership in Part.** Proposing small business concerns which are more than 50% owned by multiple venture capital operating companies (VCOC), hedge funds (HF), private equity firms (PEF), or any combination of these as set forth in 13 C.F.R. § 121.702, are eligible to submit proposals in response to DON topics advertised within this BAA. Complete certification as detailed under ADDITIONAL SUBMISSION CONSIDERATIONS.
- Additional information:
 - Proposing small business concerns may include the following administrative materials in Supporting Documents (Volume 5); a template is available at https://navysbir.com/links_forms.htm to provide guidance on optional material the proposing small business concern may want to include in Volume 5:
 - Additional Cost Information to support the Cost Volume (Volume 3)
 - SBIR/STTR Funding Agreement Certification
 - Data Rights Assertion
 - Allocation of Rights between Prime and Subcontractor
 - Disclosure of Information (DFARS 252.204-7000)
 - Prior, Current, or Pending Support of Similar Proposals or Awards
 - Foreign Citizens
 - Do not include documents or information to substantiate the Technical Volume (Volume 2) in Volume 5 (e.g., resumes, test data, technical reports, or publications). Such documents or information will not be considered.
 - A font size smaller than 10-point is allowable for documents in Volume 5; however, proposing small business concerns are cautioned that the text may be unreadable.
- **Fraud, Waste and Abuse Training Certification (Volume 6).** DoD requires Volume 6 for submission. Please refer to the Phase I Proposal section of the DoD SBIR/STTR Program BAA for details.

PHASE I EVALUATION AND SELECTION

The following section details how the DON SBIR/STTR Programs will evaluate Open Topic Phase I proposals.

Proposals meeting DSIP submission requirements will be forwarded to the DON SBIR/STTR Programs. Prior to evaluation, all proposals will undergo a compliance review to verify compliance with DoD and DON SBIR/STTR proposal eligibility requirements. Proposals not meeting submission requirements will be REJECTED and not evaluated.

- **Proposal Cover Sheet (Volume 1).** The Proposal Cover Sheet (Volume 1) will undergo a compliance review to verify the proposing small business concern has met eligibility requirements

and followed the instructions for the Proposal Cover Sheet as specified in the DoD SBIR/STTR Program BAA.

- **Technical Volume (Volume 2).** The DON will evaluate and select Open Topic Phase I proposals using the evaluation criteria specified in the Phase I Proposal Evaluation Criteria section of the DoD SBIR/STTR Program BAA, with technical merit being most important, followed by qualifications of key personnel and commercialization potential of equal importance. The information considered for this decision will come from Volume 2. This is not a FAR Part 15 evaluation and proposals will not be compared to one another. Cost is not an evaluation criteria and will not be considered during the evaluation process; the DON will only do a compliance review of Volume 3. Due to limited funding, the DON reserves the right to limit the number of awards under any topic.

The Technical Volume (Volume 2) will undergo a compliance review (prior to evaluation) to verify the proposing small business concern has met the following requirements or the proposal will be REJECTED:

- Proposing small business concerns are required to use the Open Topic Phase I proposal template for Volume 2. This template is specific to DON Open Topics to meet Phase I requirements. The Open Topic Phase I template can be found at https://navysbir.com/links_forms.htm
 - Not to exceed ten (10) pages, regardless of page content
 - Single column format, single-spaced typed lines
 - Standard 8 ½” x 11” paper
 - Page margins one inch on all sides. A header and footer may be included in the one-inch margin.
 - No font size smaller than 10-point, except as permitted in the instructions above.
 - Include, within the 10-page limit of Volume 2, an Option that furthers the effort in preparation for Phase II and will bridge the funding gap between the end of Phase I and the start of Phase II. Tasks for both the Phase I Base and the Phase I Option must be clearly identified.
 - Work proposed for the Phase I Base must be exactly four (4) months.
 - Work proposed for the Phase I Option must be exactly six (6) months.
- **Cost Volume (Volume 3).** The Cost Volume (Volume 3) will not be considered in the selection process and will only undergo a compliance review to verify the proposing small business concern has met the following requirements or the proposal will be REJECTED:
 - Must not exceed values for the Base (\$75,000) and Option (\$100,000).
 - Must meet minimum percentage of work; a minimum of two-thirds of the work is performed by the proposing small business concern. The two-thirds percentage of work requirement must be met in the Base costs as well as in the Option costs. DON will not accept deviations from the minimum percentage of work requirements for Phase I.
 - **Company Commercialization Report (CCR) (Volume 4).** The CCR (Volume 4) will not be evaluated by the Navy nor will it be considered in the Navy’s award decision. However, all proposing small business concerns must refer to the DoD SBIR/STTR Program BAA to ensure compliance with DSIP Volume 4 requirements.
 - **Supporting Documents (Volume 5).** Supporting Documents (Volume 5) will not be considered in the selection process and will only undergo a compliance review to ensure the proposing small

business concern has included items in accordance with the PHASE I SUBMISSION INSTRUCTIONS section above.

- **Fraud, Waste, and Abuse Training Certificate (Volume 6).** Not evaluated.

ADDITIONAL SUBMISSION CONSIDERATIONS

This section details additional items for proposing small business concerns to consider during proposal preparation and submission process.

Due Diligence Program to Assess Security Risks. The SBIR and STTR Extension Act of 2022 (Pub. L. 117-183) requires the Department of Defense, in coordination with the Small Business Administration, to establish and implement a due diligence program to assess security risks presented by small business concerns seeking a Federally-funded award. Please review the Program Description section of the DoD SBIR/STTR Program BAA for details on how DoD will assess security risks presented by small business concerns.

Discretionary Technical and Business Assistance (TABAs). Due to the shorter period of performance proposed under the Open Topic Phase I TABAs may **NOT** be proposed. Guidance for submitting TABAs in Phase II will be included in Initial Phase II proposal instructions provided to Phase I awardees.

Disclosure of Information (DFARS 252.204-7000). In order to eliminate the requirements for prior approval of public disclosure of information (in accordance with DFARS 252.204-7000) under this award, the proposing small business concern shall identify and describe all fundamental research to be performed under its proposal, including subcontracted work, with sufficient specificity to demonstrate that the work qualifies as fundamental research. Fundamental research means basic and applied research in science and engineering, the results of which ordinarily are published and shared broadly within the scientific community, as distinguished from proprietary research and from industrial development, design, production, and product utilization, the results of which ordinarily are restricted for proprietary or national security reasons (defined by National Security Decision Directive 189). A small business concern whose proposed work will include fundamental research and requests to eliminate the requirement for prior approval of public disclosure of information must complete the DON Fundamental Research Disclosure and upload as a separate PDF file to the Supporting Documents (Volume 5) in DSIP as part of their proposal submission. The DON Fundamental Research Disclosure is available on https://navysbir.com/links_forms.htm and includes instructions on how to complete and upload the completed Disclosure. Simply identifying fundamental research in the Disclosure does **NOT** constitute acceptance of the exclusion. All exclusions will be reviewed and, if approved by the government Contracting Officer, noted in the contract.

Majority Ownership in Part. Proposing small business concerns that are more than 50% owned by multiple venture capital operating companies (VCOC), hedge funds (HF), private equity firms (PEF), or any combination of these as set forth in 13 C.F.R. § 121.702, **are eligible** to submit proposals in response to DON topics advertised within this BAA.

For proposing small business concerns that are a member of this ownership class the following must be satisfied for proposals to be accepted and evaluated:

- a. Prior to submitting a proposal, small business concerns must register with the SBA Company Registry Database.
- b. The proposing small business concern within its submission must submit the Majority-Owned VCOC, HF, and PEF Certification. A copy of the SBIR VC Certification can be found on

https://navysbir.com/links_forms.htm. Include the SBIR VC Certification in the Supporting Documents (Volume 5).

- c. Should a proposing small business concern become a member of this ownership class after submitting its proposal and prior to any receipt of a funding agreement, the proposing small business concern must immediately notify the Contracting Officer, register in the appropriate SBA database, and submit the required certification which can be found on https://navysbir.com/links_forms.htm.

System for Award Management (SAM). It is strongly encouraged that proposing small business concerns register in SAM, <https://sam.gov>, by the Close date of this BAA, or verify their registrations are still active and will not expire within 60 days of BAA Close. Additionally, proposing small business concerns should confirm that they are registered to receive contracts (not just grants) and the address in SAM matches the address on the proposal.

Treatment of Commercial Off-the-Shelf (COTS) and Non-Developmental Items (NDIs) COTS/NDIs. The DON is not seeking or funding proposals for commercial items or non-developmental items (NDIs) for testing and operational evaluation that do not require RDT&E engineering, design or integration effort under this announcement. If an end item requires design and development to accept the COTS or NDI, funding for design and development effort could be funded by SBIR/STTR funds. If a COTS or NDI is required for RDT&E test purposes, the cost could be funded by SBIR/STTR funds. Items purchased directly from a commercial source that can be utilized without alteration through design and development, or without modification, are classified as COTS or NDI. This includes, for example, ready-to-use products, training services, and software licenses for ready-to-use software to satisfy service needs (including Software as a Service (SaaS)). Purchases of COTS and NDIs for use, including the first article and associated first article acceptance testing and related minor adjustments are not suitable for SBIR/STTR funding.

Modified COTS/Modified NDIs: Commercially available items that must be modified to satisfy user requirements are classified as "modified COTS" or "modified NDI" articles. In this instance, the first article, modification of the first article, and first article testing could be funded by SBIR/STTR funds. Follow-on purchases will not be funded by SBIR/STTR funds. The number of "modified" first articles bought with SBIR/STTR funds will not exceed the quantity needed to conduct the RDT&E acceptance tests. Modification is technology refreshment significantly changing the end item's performance envelope. If the commercially available item is modified and requires testing prior to approval for service use or inventory, it may be funded by SBIR/STTR funds, as all developmental items. In contrast to modification, continuous technology refreshment is the intentional insertion of newer technology to improve reliability, improve maintainability, reduce cost, and/or add minor performance enhancement, typically in conjunction with depot or field level maintenance. The insertion of such technology into end items as part of maintenance is not funded by SBIR/STTR funds.

Notice of NIST SP 800-171 Assessment Database Requirement. The purpose of the National Institute of Standards and Technology (NIST) Special Publication (SP) 800-171 is to protect Controlled Unclassified Information (CUI) in Nonfederal Systems and Organizations. As prescribed by DFARS 252.204-7019, in order to be considered for award, a small business concern is required to implement NIST SP 800-171 and shall have a current assessment uploaded to the Supplier Performance Risk System (SPRS) which provides storage and retrieval capabilities for this assessment. The platform Procurement Integrated Enterprise Environment (PIEE) will be used for secure login and verification to access SPRS. For brief instructions on NIST SP 800-171 assessment, SPRS, and PIEE please visit <https://www.sprs.csd.disa.mil/nistsp.htm>. For in-depth tutorials on these items please visit <https://www.sprs.csd.disa.mil/webtrain.htm>.

Human Subjects, Animal Testing, and Recombinant DNA. Due to the short timeframe associated with Phase I of the SBIR/STTR process, the DON does **not** recommend the submission of Phase I proposals that require the use of Human Subjects, Animal Testing, or Recombinant DNA. For example, the ability to obtain Institutional Review Board (IRB) approval for proposals that involve human subjects can take 6-12 months, and that lengthy process can be at odds with the Phase I goal for time-to-award. Before the DON makes any award that involves an IRB or similar approval requirement, the proposing small business concern must demonstrate compliance with relevant regulatory approval requirements that pertain to proposals involving human, animal, or recombinant DNA protocols. It will not impact the DON's evaluation, but requiring IRB approval may delay the start time of the Phase I award and if approvals are not obtained within two months of notification of selection, the decision to award may be terminated. If the use of human, animal, and recombinant DNA is included under a Phase I or Phase II proposal, please carefully review the requirements at: <https://www.nre.navy.mil/work-with-us/how-to-apply/compliance-and-protections/research-protections>. This webpage provides guidance and lists approvals that may be required before contract/work can begin.

Government Furnished Equipment (GFE). GFE will not be available in Open Topic Phase I. If GFE is proposed, it may be considered a weakness in the technical merit of the proposal.

International Traffic in Arms Regulation (ITAR). For topics indicating ITAR restrictions or the potential for classified work, limitations are generally placed on disclosure of information involving topics of a classified nature or those involving export control restrictions, which may curtail or preclude the involvement of universities and certain non-profit institutions beyond the basic research level. Small businesses must structure their proposals to clearly identify the work that will be performed that is of a basic research nature and how it can be segregated from work that falls under the classification and export control restrictions. As a result, information must also be provided on how efforts can be performed in later phases if the university/research institution is the source of critical knowledge, effort, or infrastructure (facilities and equipment).

SELECTION, AWARD, AND POST-AWARD INFORMATION

Notifications. Email notifications for proposal receipt (approximately one week after the Phase I BAA Close) and selection are sent based on the information received on the proposal Cover Sheet (Volume 1). Consequently, the e-mail address on the proposal Cover Sheet must be correct.

Debriefs. Requests for a debrief must be made within 15 calendar days of select/non-select notification via email as specified in the select/non-select notification. Please note debriefs are typically provided in writing via email to the Corporate Official identified in the proposal of the proposing small business concern within 60 days of receipt of the request. Requests for oral debriefs may not be accommodated. If contact information for the Corporate Official has changed since proposal submission, a notice of the change on company letterhead signed by the Corporate Official must accompany the debrief request.

Protests. Interested parties have the right to protest in accordance with the procedures in FAR Subpart 33.1.

Pre-award agency protests related to the terms of the BAA must be served to: osd.ncr.ousd-r-e.mbx.SBIR-STTR-Protest@mail.mil. A copy of a pre-award Government Accountability Office (GAO) protest must also be filed with the aforementioned email address within one day of filing with the GAO.

Protests related to a selection or award decision should be filed with the appropriate Contracting Officer for an Agency Level Protest or with the GAO. Contracting Officer contact information for specific DON Topics may be obtained from the DON SYSCOM Program Managers listed in Table 2 above. For

protests filed with the GAO, a copy of the protest must be submitted to the appropriate DON SYSCOM Program Manager and the appropriate Contracting Officer within one day of filing with the GAO.

Awards. Due to limited funding, the DON reserves the right to limit the number of awards under any topic. Any notification received from the DON that indicates the proposal has been selected does not ultimately guarantee an award will be made. This notification indicates that the proposal has been selected in accordance with the evaluation criteria and has been sent to the Contracting Officer to conduct compliance review of Volume 3 to confirm eligibility of the proposing small business concern, and to take other relevant steps necessary prior to making an award.

Contract Types. The DON typically awards a Firm Fixed Price (FFP) contract or a small purchase agreement for Phase I. In addition to the negotiated contract award types listed in the section of the DoD SBIR/STTR Program BAA titled Proposal Fundamentals, for Phase II awards the DON may (under appropriate circumstances) propose the use of an Other Transaction Agreement (OTA) as specified in 10 U.S.C. 2371/10 U.S.C. 2371b and related implementing policies and regulations. The DON may choose to use a Basic Ordering Agreement (BOA) for Phase I and Phase II awards.

Funding Limitations. In accordance with the SBIR and STTR Policy Directive section 4(b)(5), there is a limit of one sequential Phase II award per small business concern per topic. The maximum Phase I proposal/award amount including all options is \$175,000. The Phase I Base amount must not exceed \$75,000 and the Phase I Option amount must not exceed \$100,000. The maximum Phase II proposal/award amount including all options (including TABA) is \$1,800,000 (unless non-SBIR/STTR funding is being added). Individual SYSCOMs may award amounts, including Base and all Options, of less than \$1,800,000 based on available funding or more than \$1,800,000 if justified for the effort and with appropriate funding waiver approvals from the Small Business Administration. The structure of the Phase II proposal/award, including maximum amounts as well as breakdown between Base and Option amounts will be provided to all Phase I awardees either in their Phase I award or a minimum of 30 days prior to the due date for submission of their Initial Phase II proposal.

Contract Deliverables. Contract deliverables for Open Topic Phase I Base will be a kick-off brief (due day 15) and a final report (due day 120). Contract deliverables for Open Topic Phase I Option, if exercised, will be an Option period kick-off brief, progress reports, and a final report. Required contract deliverables (as stated in the contract) must be uploaded to <https://www.navysbirprogram.com/navydeliverables/>.

Payments. The DON will make two payments from the start of the Open Topic Phase I Base period, and three payments from the start of the Open Topic Phase I Option period, if exercised. Payment amounts represent a set percentage of the Base or Option value as follows:

| Days From Start of Base | Payment Amount |
|---------------------------|---------------------|
| 15 Days | 50% of Total Base |
| 120 Days | 50% of Total Base |
| | |
| Days From Start of Option | Payment Amount |
| 15 Days | 50% of Total Option |
| 90 Days | 35% of Total Option |
| 180 Days | 15% of Total Option |

Transfer Between SBIR and STTR Programs. Section 4(b)(1)(i) of the SBIR and STTR Policy Directive provides that, at the agency's discretion, projects awarded a Phase I under a BAA for SBIR may transition in Phase II to STTR and vice versa.

PHASE II GUIDELINES

Evaluation and Selection. All Phase I awardees may submit an **Initial** Phase II proposal for evaluation and selection. The evaluation criteria for Phase II is the same as Phase I (as stated in this BAA). The Phase I Final Report and Initial Phase II Proposal will be used to evaluate the small business concern's potential to adapt commercial products to fill a capability gap, improve performance, or modernize an existing capability for DON and transition the technology to Phase III. Details on the due date, content, and submission requirements of the Initial Phase II Proposal will be provided by the awarding SYSCOM either in the Phase I contract or by subsequent notification.

NOTE: All SBIR/STTR Phase II awards made on topics from BAAs prior to FY13 will be conducted in accordance with the procedures specified in those BAAs (for all DON topics, this means by invitation only).

Awards. The DON typically awards a Cost Plus Fixed Fee contract for Phase II; but, may consider other types of agreement vehicles. Phase II awards can be structured in a way that allows for increased funding levels based on the project's transition potential. To accelerate the transition of SBIR/STTR-funded technologies to Phase III, especially those that lead to Programs of Record and fielded systems, the Commercialization Readiness Program was authorized and created as part of section 5122 of the National Defense Authorization Act of Fiscal Year 2012. The statute set-aside is 1% of the available SBIR/STTR funding to be used for administrative support to accelerate transition of SBIR/STTR-developed technologies and provide non-financial resources for the small business concerns (e.g., the Navy STP).

PHASE III GUIDELINES

A Phase III SBIR/STTR award is any work that derives from, extends, or completes effort(s) performed under prior SBIR/STTR funding agreements, but is funded by sources other than the SBIR/STTR programs. This covers any contract, grant, or agreement issued as a follow-on Phase III award or any contract, grant, or agreement award issued as a result of a competitive process where the awardee was an SBIR/STTR firm that developed the technology as a result of a Phase I or Phase II award. The DON will give Phase III status to any award that falls within the above-mentioned description. Consequently, DON will assign SBIR/STTR Data Rights to any noncommercial technical data and noncommercial computer software delivered in Phase III that were developed under SBIR/STTR Phase I/II effort(s). Government prime contractors and their subcontractors must follow the same guidelines as above and ensure that companies operating on behalf of the DON protect the rights of the SBIR/STTR firm.

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N234-P01

TITLE: MCSC Open Topic for Logistics in a Contested Environment

OUSD (R&E) CRITICAL TECHNOLOGY AREA(S): Renewable Energy Generation and Storage; Sustainment; Trusted AI and Autonomy

OBJECTIVE: DEPARTMENT OF THE NAVY OPEN TOPIC - DON is seeking proposals for enhancing existing prototypes or concepts to improve operations in contested environments for extended periods of time through heightened tensions and conflict by significantly reducing or eliminating the need for replenishment or sustainment.

DESCRIPTION: A contested logistics environment means an environment in which armed forces engage in conflict with an adversary that presents challenges in all domains and directly targets logistics operations, facilities, and activities in the United States, abroad, or in transit from one location to the other. State and non-state actors employ space, cyberspace, and electromagnetic spectrum (EMS) capabilities, as well as information operations, against friendly naval forces. Adversaries may use these capabilities in attempts to deny, degrade, and exploit our use of our historic command, control, communications, computer, intelligence, surveillance, and reconnaissance (C4ISR) strengths. Resilient logistics connects the foundry to the Fleet, is enabled by secure communications and information technology, and includes all activities and technologies needed to refuel, rearm, resupply, repair, and revive distributed naval forces down to the last tactical mile.

The Department of the Navy requests proposals for existing technology demonstration platforms, prototypes, and commercial products to assess their relevance to Naval missions through operational experimentation. Proposers should have an existing solution, either hardware and/or software, which can be evaluated through military utility assessments with end users.

The areas of interest for the Marine Corps are improved fuel efficiency and/or methods to utilize fossil fuel alternatives, such as hydrogen, for: Marine Corps Tactical Vehicles, Mobile Power Systems, Batteries, and energy storage systems for human portable devices such as radios. Examples of current Marine Corps systems are provided in the references.

Proposal for this topic shall address one or more of the following:

- generation
- storage
- distribution

PHASE I: Phase I feasibility will describe the existing proposed technology, existing DON system(s) to improve, modifications required, anticipated improvements to existing capabilities, impacts to current logistics if any (i.e., transportation, storage, maintenance, safety, etc.) and transition approach to the DON system. Results of Phase I Base will be detailed in a final technical report (Final Report). The Results of Phase I Option (if exercised) will further refine the final technical report.

Phase I deliverables include:

- Kick-Off Briefing, due 15 days from start of Base award
- Final Report, due 120 days from start of Base award
- Initial Phase II Proposal, due 120 days from start of Base award
- Report of Inventions and subcontractors, due 120 days from start of Base award

Phase I Option (if exercised) deliverables include:

- Kick-Off Briefing, due 15 days from start of Option award
- Final Report, due 180 days from start of Option award

- Updated Report of Inventions and subcontractors, due 180 days from start of Option

PHASE II: All Phase I awardees may submit an Initial Phase II proposal for evaluation and selection. The evaluation criteria for Phase II is the same as Phase I (as stated in this BAA). The Phase I Final Report and Initial Phase II Proposal will be used to evaluate the small business concern's potential to adapt commercial products to fill a capability gap, improve performance, or modernize an existing capability for DON and transition the technology to Phase III. Details on the due date, content, and submission requirements of the Initial Phase II Proposal will be provided by the awarding SYSCOM either in the Phase I contract or by subsequent notification.

Develop and deliver a functional prototype(s) which can be tested, evaluated through a military utility assessments with end users, and/or certified (as appropriate), develop transition plan including production and fielding approach (including updated logistics and safety consideration) and further commercialization (non-DoD).

PHASE III DUAL USE APPLICATIONS: Improve the technology per the Phase II guidance and transition to a fielding activity. Dual-Use applications may include commercially available trucks, generators, batteries, and energy storage systems.

REFERENCES:

1. Marine Corps Portfolios, Logistics Combat Element Systems, Light Tactical Vehicles: <https://www.marcorsyscom.marines.mil/Portfolios/Logistics-Combat-Element-Systems/Light-Tactical-Vehicles/>
2. Marine Corps Portfolios, Logistics Combat Element Systems, Medium and Heavy Tactical Vehicles: <https://www.marcorsyscom.marines.mil/LCES/Medium-Heavy-Tactical-Vehicles/>
3. Marine Corps Portfolios, Logistics Combat Element Systems, Mobile Power: <https://www.marcorsyscom.marines.mil/Portfolios/Logistics-Combat-Element-Systems/Engineer-Systems/Power-Team/Mobile-Power/>
4. Marine Corps Portfolios, Logistics Combat Element Systems, Advanced Power Systems: <https://www.marcorsyscom.marines.mil/Portfolios/Logistics-Combat-Element-Systems/Engineer-Systems/Power-Team/Advanced-Power-Systems/>

KEYWORDS: Contested Logistics Environment; Marine Corps Tactical Vehicles; Mobile Power Systems; Batteries; Energy Storage Systems; Fuel Efficiency; Fossil Fuel Alternatives

OUSD (R&E) CRITICAL TECHNOLOGY AREA(S) - Advanced Computing and Software; Integrated Sensing and Cyber; Trusted AI and Autonomy

The technology within this topic is restricted under the International Traffic in Arms Regulation (ITAR), 22 CFR Parts 120-130, which controls the export and import of defense-related material and services, including export of sensitive technical data, or the Export Administration Regulation (EAR), 15 CFR Parts 730-774, which controls dual use items. Offerors must disclose any proposed use of foreign nationals (FNs), their country(ies) of origin, the type of visa or work permit possessed, and the statement of work (SOW) tasks intended for accomplishment by the FN(s) in accordance with the Announcement. Offerors are advised foreign nationals proposed to perform on this topic may be restricted due to the technical data under US Export Control Laws.

OBJECTIVE: DEPARTMENT OF THE NAVY OPEN TOPIC: DON is seeking proposals for enhancing existing prototypes or concepts to improve operations in contested environments for extended periods of time through heightened tensions and conflict by significantly enhancing or reducing or eliminating the need for replenishment or sustainment.

DESCRIPTION: A contested logistics environment means an environment in which armed forces engage in conflict with an adversary that presents challenges in all domains and directly targets logistics operations, facilities, and activities in the United States, abroad, or in transit from one location to the other. State and non-state actors employ space, cyberspace, and electromagnetic spectrum (EMS) capabilities, as well as information operations, against friendly naval forces. Adversaries may use these capabilities in attempts to deny, degrade, and exploit our use of our historic command, control, communications, computer, intelligence, surveillance, and reconnaissance (C4ISR) strengths. Resilient logistics connects the foundry to the Fleet, is enabled by secure communications and information technology, and includes all activities and technologies needed to refuel, rearm, resupply, repair, and revive distributed naval forces down to the last tactical mile. Please indicate the technology area of interest within the Abstract section of the Cover Sheet, Volume 1. The technology areas of interest are:

- **NEXT-GENERATION LOGISTICS AIRCRAFT.** Design refinement/experimentation of tactical unmanned resupply aircraft that are attritable and/or offer reduced detectability (last-tactical mile delivery); large capacity, intra-theater, cargo and medevac aircraft which are not reliant upon large airfields. Short takeoff and landing (STOL), vertical takeoff and landing (VTOL), novel shipboard launch and recovery and automated cargo handling systems. Air to Air refueling capability.
- **AIRCRAFT BATTLE-DAMAGE REPAIR.** Non-destructive inspection methods; expedient battle-damage analysis and safe flight envelope modification; composite and low-observable materiel repairs; fiber-optic repairs; damage tolerant/resistant structures and systems; access to maintenance data with limited or no reachback to home station.
- **REDUCED FUEL/SUPPLY DEMAND.** Increased energy efficiency and/or methods to generate energy or fuel substitutes for aircraft and support equipment. Electric or Hybrid-Electronic STOL/ VTOL systems. Reliable engines for UAVs that utilize common, existing aviation fuels. Reduced consumable usage and/or ability to manufacture consumables and limited-life parts in austere locations.
- **LOGISTICS C3 IMPROVEMENTS.** Sense and avoid systems for UAS. Increased autonomy for unmanned resupply aircraft. Alternative PNT systems, including optical ship-relative navigation. Reduced data-exchange requirements. Low Probability of Intercept/Detection (LPI/D) communications methods. Innovative air traffic control and/ or space de-confliction systems.

PHASE I: The DON is planning to issue multiple Phase I awards for this topic but reserves the right to issue no awards. Each Phase I proposal must include a Base and Option period of performance. The Phase I Base must have a period of performance of four (4) months at a cost not to exceed \$75,000. The Phase I Option must have a period of performance of six (6) months at a cost not to exceed \$100,000.

Phase I feasibility will describe the existing proposed technology, existing DON system(s) to improve, modifications required, anticipated improvements to existing capabilities, impacts to current logistics if any (i.e., transportation, storage, maintenance, safety, etc.) and transition approach to the DON system. Results of Phase I will be detailed in a final technical report (Final Report).

Phase I deliverables include:

- Kick-Off Briefing, due 15 days from start of Base award
- Final Report, due 120 days from start of Base award
- Initial Phase II Proposal, due 120 days from start of Base award

PHASE II: All Phase I awardees may submit an Initial Phase II proposal for evaluation and selection. The evaluation criteria for Phase II is the same as Phase I (as stated in this BAA). The Phase I Final Report and Initial Phase II Proposal will be used to evaluate the small business concern's potential to adapt commercial products to fill a capability gap, improve performance, or modernize an existing capability for DON and transition the technology to Phase III. Details on the due date, content, and submission requirements of the Initial Phase II Proposal will be provided by the awarding SYSCOM either in the Phase I contract or by subsequent notification.

The scope of the Phase II effort will be specific to each project but is generally expected to harden, ruggedize, and/or marinize the technology for integration into an operational environment. The outcome to be a working prototype that can be tested and/or certified, including a fielding approach (including updated logistics and safety consideration) and further commercialization (non-DoD), if appropriate.

PHASE III DUAL USE APPLICATIONS: Field capability and logistics support.

REFERENCES:

1. Chief of Naval Operations (CNO) Navigation Plan. Released January 2021, Updated 2022. https://media.defense.gov/2022/Jul/26/2003042389/-1/-1/1/NAVIGATION%20PLAN%202022_SIGNED.PDF
2. Force Design 2030. Strategic guidance for surviving and thriving inside contested spaces. Integrated planning teams study and analyze the concepts for validation and refinement. <https://www.marines.mil/Force-Design-2030/>
3. O'Rourke, Brian. "Prepare for Contested Logistics." US Naval Institute. Vol. 148/4/1,430. April 2022 <https://www.usni.org/magazines/proceedings/2022/april/prepare-contested-logistics>

KEYWORDS: contested logistics; next-generation logistics aircraft; battle-damage repair; reduced fuel/supply demand; logistics C3 improvement

N234-P03 TITLE: NAVSEA Open Topic for Operations and Logistics in a Contested Environment: Improve/Manage Energy Efficiency for the DON's Non-nuclear Deployable Power Generators

OUSD (R&E) CRITICAL TECHNOLOGY AREA(S): Renewable Energy Generation and Storage; Sustainment; Trusted AI and Autonomy

OBJECTIVE: DEPARTMENT OF THE NAVY OPEN TOPIC - NAVSEA is seeking proposals for commercial technology to ensure resilient logistics and technology in a contested environment.

DESCRIPTION: NAVSEA requests proposals for existing technology demonstration platforms, prototypes, and commercial products in a contested environment to assess their relevance to Naval missions through operational experimentation. For Phase I awardees, NAVSEA will provide an operational context which technologies will be assessed against and provide feedback and guidance on enhancements to align with the Fleet's warfighting objectives. The proposing small business concern should have an existing solution, either hardware and/or software, which can be evaluated through operational experimentation with end users.

A contested environment means an environment in which armed forces engage in conflict with an adversary that presents challenges in all domains and directly targets operations, facilities, and activities in the United States, abroad, or in transit from one location to the other. State and non-state actors employ space, cyberspace, and electromagnetic spectrum (EMS) capabilities, as well as information operations, against friendly naval forces. Adversaries may use these capabilities in attempts to deny, degrade, and exploit our use of our historic command, control, communications, computer, intelligence, surveillance, and reconnaissance (C4ISR) strengths.

As stated in the instruction, only one proposal from a single small business concern will be accepted for this topic. The proposed capability will address:

Commercial technology (Technology Readiness Level TRL 8/9) to improve/manage energy efficiency for the Department of the Navy's non-nuclear deployable power generators (ground vehicle engines, aircraft engines, ship main and auxiliary engine, free standing portable generators, batteries). These may include alternate fuel sources such as hydrogen. Increased fuel efficiency and/or methods to generate fuel or fuel substitutes. Deployable power generator that utilize alternate fuel sources such as hydrogen. Improved batteries and energy storage systems for human transportable devices such as radios.

PHASE I: The DON is planning to issue multiple Phase I awards for this topic but reserves the right to issue. Each Phase I proposal must include a Base and Option period of performance. The Phase I Base must have a period of performance of four (4) months at a cost not to exceed \$75,000. The Phase I Option must have a period of performance of six (6) months at a cost not to exceed \$100,000.

Phase I feasibility will describe the existing proposed technology, existing DON system(s) to improve, modifications required, anticipated improvements to existing capabilities, impacts to current logistics if any (i.e. transportation, storage, maintenance, safety, etc.) and transition approach to the DON system. Results of Phase I will be detailed in a final technical report (Final Report).

The Phase I Option, if exercised, will include the initial design specifications and capabilities description to build a prototype solution in Phase II.

Phase I deliverables include:

- Kick-Off Briefing, due 15 days from start of Base award
- Final Report, due 120 days from start of Base award

- Initial Phase II Proposal, due 120 days from start of Base award

PHASE II: All Phase I awardees may submit an Initial Phase II proposal for evaluation and selection. The evaluation criteria for Phase II is the same as Phase I (as stated in this BAA). The Phase I Final Report and Initial Phase II Proposal will be used to evaluate the small business concern's potential to adapt commercial products to fill a capability gap, improve performance, or modernize an existing capability for DON and transition the technology to Phase III. Details on the due date, content, and submission requirements of the Initial Phase II Proposal will be provided by the awarding SYSCOM either in the Phase I contract or by subsequent notification.

The scope of the Phase II effort will be specific to each project but is generally expected to develop a functional prototype to demonstrate the capability, develop transition plan including production and fielding approach (including updated logistics and safety consideration) and further commercialization (non-DoD).

PHASE III DUAL USE APPLICATIONS: Field capability and logistics support. Since the Navy is seeking commercial technologies, these technologies already have commercial applications.

REFERENCES:

1. GAO Report GAO-23-105608; "CONTESTED INFORMATION ENVIRONMENT: Actions Needed to Strengthen Education and Training for DOD Leaders"; <https://www.gao.gov/assets/gao-23-105608.pdf>
2. Marine Corp Association; "Littoral Operations in a Contested Environment"; [https://www.marines.mil/News/News-Display/Article/2708135/littoral-operations-in-a-contested-environment-loce/#:~:text=Littoral%20Operations%20in%20a%20Contested%20Environment%20\(LOCE\)%20is%20a%20concept,depth%2C%20complexity%2C%20and%20lethality](https://www.marines.mil/News/News-Display/Article/2708135/littoral-operations-in-a-contested-environment-loce/#:~:text=Littoral%20Operations%20in%20a%20Contested%20Environment%20(LOCE)%20is%20a%20concept,depth%2C%20complexity%2C%20and%20lethality).

KEYWORDS: Contested Logistics; Contested Environment; UUV and USV; Energy efficiency; Launch and recovery; Maritime mining and MCM

N234-P04 TITLE: NAVSEA Open Topic for Operations and Logistics in a Contested Environment: Improve Launch and Recovery of Air, Sea Surface, and UUV from Naval Vessels

OUSD (R&E) CRITICAL TECHNOLOGY AREA(S): Renewable Energy Generation and Storage; Sustainment; Trusted AI and Autonomy

OBJECTIVE: DEPARTMENT OF THE NAVY OPEN TOPIC - NAVSEA is seeking proposals for commercial technology to ensure resilient logistics and technology in a contested environment.

DESCRIPTION: NAVSEA requests proposals for existing technology demonstration platforms, prototypes, and commercial products in a contested environment to assess their relevance to Naval missions through operational experimentation. For Phase I awardees, NAVSEA will provide an operational context which technologies will be assessed against and provide feedback and guidance on enhancements to align with the Fleet's warfighting objectives. The proposing small business concern should have an existing solution, either hardware and/or software, which can be evaluated through operational experimentation with end users.

A contested environment means an environment in which armed forces engage in conflict with an adversary that presents challenges in all domains and directly targets operations, facilities, and activities in the United States, abroad, or in transit from one location to the other. State and non-state actors employ space, cyberspace, and electromagnetic spectrum (EMS) capabilities, as well as information operations, against friendly naval forces. Adversaries may use these capabilities in attempts to deny, degrade, and exploit our use of our historic command, control, communications, computer, intelligence, surveillance, and reconnaissance (C4ISR) strengths.

As stated in the instruction, only one proposal from a single small business concern will be accepted for this topic. The proposed capability will address:

Commercial technology (TRL 8/9) to improve launch and recovery of air, sea surface, and undersea unmanned vehicles from Naval Vessels (architecture, artificial Intelligence applications, automated guidance).

PHASE I: The DON is planning to issue multiple Phase I awards for this topic but reserves the right to issue. Each Phase I proposal must include a Base and Option period of performance. The Phase I Base must have a period of performance of four (4) months at a cost not to exceed \$75,000. The Phase I Option must have a period of performance of six (6) months at a cost not to exceed \$100,000.

Phase I feasibility will describe the existing proposed technology, existing DON system(s) to improve, modifications required, anticipated improvements to existing capabilities, impacts to current logistics if any (i.e., transportation, storage, maintenance, safety, etc.) and transition approach to the DON system. Results of Phase I will be detailed in a final technical report (Final Report).

The Phase I Option, if exercised, will include the initial design specifications and capabilities description to build a prototype solution in Phase II.

Phase I deliverables include:

- Kick-Off Briefing, due 15 days from start of Base award
- Final Report, due 120 days from start of Base award
- Initial Phase II Proposal, due 120 days from start of Base award

PHASE II: All Phase I awardees may submit an Initial Phase II proposal for evaluation and selection. The evaluation criteria for Phase II is the same as Phase I (as stated in this BAA). The Phase I Final Report and Initial Phase II Proposal will be used to evaluate the small business concern's potential to adapt commercial products to fill a capability gap, improve performance, or modernize an existing capability for DON and transition the technology to Phase III. Details on the due date, content, and submission requirements of the Initial Phase II Proposal will be provided by the awarding SYSCOM either in the Phase I contract or by subsequent notification.

The scope of the Phase II effort will be specific to each project but is generally expected to develop a functional prototype to demonstrate the capability, develop transition plan including production and fielding approach (including updated logistics and safety consideration) and further commercialization (non-DoD).

PHASE III DUAL USE APPLICATIONS: Field capability and logistics support. Since the Navy is seeking commercial technologies, these technologies already have commercial applications.

REFERENCES:

1. GAO Report GAO-23-105608; "CONTESTED INFORMATION ENVIRONMENT: Actions Needed to Strengthen Education and Training for DOD Leaders"; <https://www.gao.gov/assets/gao-23-105608.pdf>
2. Marine Corp Association; "Littoral Operations in a Contested Environment"; [https://www.marines.mil/News/News-Display/Article/2708135/littoral-operations-in-a-contested-environment-loce/#:~:text=Littoral%20Operations%20in%20a%20Contested%20Environment%20\(LOCE\)%20is%20a%20concept,depth%2C%20complexity%2C%20and%20lethality](https://www.marines.mil/News/News-Display/Article/2708135/littoral-operations-in-a-contested-environment-loce/#:~:text=Littoral%20Operations%20in%20a%20Contested%20Environment%20(LOCE)%20is%20a%20concept,depth%2C%20complexity%2C%20and%20lethality).

KEYWORDS: Contested Logistics; Contested Environment; UUV and USV; Energy efficiency; Launch and recovery; Maritime mining and MCM

N234-P05

TITLE: NAVSEA Open Topic for Operations and Logistics in a Contested Environment: Enhance Mission Capabilities of USV/UUV and Systems

OUSD (R&E) CRITICAL TECHNOLOGY AREA(S): Renewable Energy Generation and Storage; Sustainment; Trusted AI and Autonomy

OBJECTIVE: DEPARTMENT OF THE NAVY OPEN TOPIC - NAVSEA is seeking proposals for commercial technology to ensure resilient logistics and technology in a contested environment.

DESCRIPTION: NAVSEA requests proposals for existing technology demonstration platforms, prototypes, and commercial products in a contested environment to assess their relevance to Naval missions through operational experimentation. For Phase I awardees, NAVSEA will provide an operational context which technologies will be assessed against and provide feedback and guidance on enhancements to align with the Fleet's warfighting objectives. The proposing small business concern should have an existing solution, either hardware and/or software, which can be evaluated through operational experimentation with end users.

A contested environment means an environment in which armed forces engage in conflict with an adversary that presents challenges in all domains and directly targets operations, facilities, and activities in the United States, abroad, or in transit from one location to the other. State and non-state actors employ space, cyberspace, and electromagnetic spectrum (EMS) capabilities, as well as information operations, against friendly naval forces. Adversaries may use these capabilities in attempts to deny, degrade, and exploit our use of our historic command, control, communications, computer, intelligence, surveillance, and reconnaissance (C4ISR) strengths.

As stated in the instruction, only one proposal from a single small business concern will be accepted for this topic. The proposed capability will address:

Commercial technology (TRL 8/9) to enhance mission capabilities of unmanned surface and subsurface vessels (USV/UUV) and systems. Global Positioning System (GPS) denied navigation, small unmanned underwater vehicles and bottom crawlers, improved C3 (Command, Control and Communications), resilient communications paths, high throughput data exfiltration/infiltration paths, replenishment, and monitoring, sustainment, repair and maintenance of unmanned systems. Sense and avoid systems for small UUVs. Increased autonomy for unmanned resupply USV. Alternative Position Navigation and Timing (PNT) systems, including optical ship-relative navigation. Reduced data-exchange requirements. Low Probability of Intercept/Detection (LPI/D) communications methods.

PHASE I: The DON is planning to issue multiple Phase I awards for this topic but reserves the right to issue. Each Phase I proposal must include a Base and Option period of performance. The Phase I Base must have a period of performance of four (4) months at a cost not to exceed \$75,000. The Phase I Option must have a period of performance of six (6) months at a cost not to exceed \$100,000.

Phase I feasibility will describe the existing proposed technology, existing DON system(s) to improve, modifications required, anticipated improvements to existing capabilities, impacts to current logistics if any (i.e., transportation, storage, maintenance, safety, etc.) and transition approach to the DON system. Results of Phase I will be detailed in a final technical report (Final Report).

The Phase I Option, if exercised, will include the initial design specifications and capabilities description to build a prototype solution in Phase II.

Phase I deliverables include:

- Kick-Off Briefing, due 15 days from start of Base award

- Final Report, due 120 days from start of Base award
- Initial Phase II Proposal, due 120 days from start of Base award

PHASE II: All Phase I awardees may submit an Initial Phase II proposal for evaluation and selection. The evaluation criteria for Phase II is the same as Phase I (as stated in this BAA). The Phase I Final Report and Initial Phase II Proposal will be used to evaluate the small business concern's potential to adapt commercial products to fill a capability gap, improve performance, or modernize an existing capability for DON and transition the technology to Phase III. Details on the due date, content, and submission requirements of the Initial Phase II Proposal will be provided by the awarding SYSCOM either in the Phase I contract or by subsequent notification.

The scope of the Phase II effort will be specific to each project but is generally expected to develop a functional prototype to demonstrate the capability, develop transition plan including production and fielding approach (including updated logistics and safety consideration) and further commercialization (non-DoD).

PHASE III DUAL USE APPLICATIONS: Field capability and logistics support. Since the Navy is seeking commercial technologies, these technologies already have commercial applications.

REFERENCES:

1. GAO Report GAO-23-105608; "CONTESTED INFORMATION ENVIRONMENT: Actions Needed to Strengthen Education and Training for DOD Leaders"; <https://www.gao.gov/assets/gao-23-105608.pdf>
2. Marine Corp Association; "Littoral Operations in a Contested Environment"; [https://www.marines.mil/News/News-Display/Article/2708135/littoral-operations-in-a-contested-environment-loce/#:~:text=Littoral%20Operations%20in%20a%20Contested%20Environment%20\(LOCE\)%20is%20a%20concept,depth%2C%20complexity%2C%20and%20lethality.](https://www.marines.mil/News/News-Display/Article/2708135/littoral-operations-in-a-contested-environment-loce/#:~:text=Littoral%20Operations%20in%20a%20Contested%20Environment%20(LOCE)%20is%20a%20concept,depth%2C%20complexity%2C%20and%20lethality.)

KEYWORDS: Contested Logistics; Contested Environment; UUV and USV; Energy efficiency; Launch and recovery; Maritime mining and MCM

N234-P06

TITLE: NAVSEA Open Topic for Operations and Logistics in a Contested Environment: Expand Lethality of Technologies of Maritime Mining and Mine Countermeasures

OUSD (R&E) CRITICAL TECHNOLOGY AREA(S): Renewable Energy Generation and Storage; Sustainment; Trusted AI and Autonomy

OBJECTIVE: DEPARTMENT OF THE NAVY OPEN TOPIC - NAVSEA is seeking proposals for commercial technology to ensure resilient logistics and technology in a contested environment.

DESCRIPTION: NAVSEA requests proposals for existing technology demonstration platforms, prototypes, and commercial products in a contested environment to assess their relevance to Naval missions through operational experimentation. For Phase I awardees, NAVSEA will provide an operational context which technologies will be assessed against and provide feedback and guidance on enhancements to align with the Fleet's warfighting objectives. Proposing small business concern's should have an existing solution, either hardware and/or software, which can be evaluated through operational experimentation with end users.

A contested environment means an environment in which armed forces engage in conflict with an adversary that presents challenges in all domains and directly targets operations, facilities, and activities in the United States, abroad, or in transit from one location to the other. State and non-state actors employ space, cyberspace, and electromagnetic spectrum (EMS) capabilities, as well as information operations, against friendly naval forces. Adversaries may use these capabilities in attempts to deny, degrade, and exploit our use of our historic command, control, communications, computer, intelligence, surveillance, and reconnaissance (C4ISR) strengths.

As stated in the instruction, only one proposal from a single small business concern will be accepted for this topic. The proposed capability will address:

Commercial technology (TRL 8/9) to expand the lethality of technologies that enhance ability of both maritime mining and mine countermeasures (MCM) systems to detect, classify, identify, neutralize, and assess battle damage. Additional interest in technologies supporting maritime mining operations, minefield management, and associated enabling technologies such as, but not limited to, data exfiltration from expeditionary assets.

PHASE I: The DON is planning to issue multiple Phase I awards for this topic but reserves the right to issue. Each Phase I proposal must include a Base and Option period of performance. The Phase I Base must have a period of performance of four (4) months at a cost not to exceed \$75,000. The Phase I Option must have a period of performance of six (6) months at a cost not to exceed \$100,000.

Phase I feasibility will describe the existing proposed technology, existing DON system(s) to improve, modifications required, anticipated improvements to existing capabilities, impacts to current logistics if any (i.e., transportation, storage, maintenance, safety, etc.) and transition approach to the DON system. Results of Phase I will be detailed in a final technical report (Final Report).

The Phase I Option, if exercised, will include the initial design specifications and capabilities description to build a prototype solution in Phase II.

Phase I deliverables include:

- Kick-Off Briefing, due 15 days from start of Base award
- Final Report, due 120 days from start of Base award
- Initial Phase II Proposal, due 120 days from start of Base award

PHASE II: All Phase I awardees may submit an Initial Phase II proposal for evaluation and selection. The evaluation criteria for Phase II is the same as Phase I (as stated in this BAA). The Phase I Final Report and Initial Phase II Proposal will be used to evaluate the small business concern's potential to adapt commercial products to fill a capability gap, improve performance, or modernize an existing capability for DON and transition the technology to Phase III. Details on the due date, content, and submission requirements of the Initial Phase II Proposal will be provided by the awarding SYSCOM either in the Phase I contract or by subsequent notification.

The scope of the Phase II effort will be specific to each project but is generally expected to develop a functional prototype to demonstrate the capability, develop transition plan including production and fielding approach (including updated logistics and safety consideration) and further commercialization (non-DoD).

PHASE III DUAL USE APPLICATIONS: Field capability and logistics support. Since the Navy is seeking commercial technologies, these technologies already have commercial applications.

REFERENCES:

1. GAO Report GAO-23-105608; "CONTESTED INFORMATION ENVIRONMENT: Actions Needed to Strengthen Education and Training for DOD Leaders"; <https://www.gao.gov/assets/gao-23-105608.pdf>
2. Marine Corp Association; "Littoral Operations in a Contested Environment"; [https://www.marines.mil/News/News-Display/Article/2708135/littoral-operations-in-a-contested-environment-loce/#:~:text=Littoral%20Operations%20in%20a%20Contested%20Environment%20\(LOCE\)%20is%20a%20concept,depth%2C%20complexity%2C%20and%20lethality.](https://www.marines.mil/News/News-Display/Article/2708135/littoral-operations-in-a-contested-environment-loce/#:~:text=Littoral%20Operations%20in%20a%20Contested%20Environment%20(LOCE)%20is%20a%20concept,depth%2C%20complexity%2C%20and%20lethality.)

KEYWORDS: Contested Logistics; Contested Environment; UUV and USV; Energy efficiency; Launch and recovery; Maritime mining and MCM

N234-P07

TITLE: NAVWAR Open Topic for Holistic Common Operational Picture (COP):
PMW 170

OUSD (R&E) CRITICAL TECHNOLOGY AREA(S): Advanced Computing and Software; Trusted AI and Autonomy

OBJECTIVE: DEPARTMENT OF THE NAVY OPEN TOPIC - The resultant capability will provide a DEVSECOPS environment to mature efforts that feed the Maritime Tactical Command and Control production. It will also provide an AI tool that will sift data and identify potential Global Positioning System (GPS) threats in near real-time.

DESCRIPTION: The Department of Navy is seeking proposals to improve the quality and speed of decision making for operational and tactical commanders through advanced technology. These technologies may include, but not limited to, solutions that support force maneuver, effects and data synchronization, and course of action (COA) decision making. Specifically, PEO C4I (PMW 170) requires a software (SW)-based Navigation Warfare Situational Awareness (SA) tool that uses Artificial Intelligence (AI) to sift data and identify potential GPS threats in near real-time. The solution should go beyond training neural networks or other machine learning (ML) methodologies.

The benefit to the warfighter will be a solution to provide real-time GPS threats and can integrate into the Navigation Warfare COP, which can be used by operational commanders at the Combatant Command (COCOM) level down to individual platform/units to make informed decisions with a better understanding of warfighting capability.

Work produced in Phase II may become classified. The prospective contractor(s) must be U.S. owned and operated with no foreign influence as defined by DoD 5220.22-M, National Industrial Security Program Operating Manual, unless acceptable mitigating procedures have been implemented and approved by the Defense Counterintelligence Security Agency (DCSA). The selected contractor must be able to acquire and maintain an appropriate security-level facility and Personnel Security Clearances to perform on advanced phases of this project as set forth by DCSA and NAVWAR to gain access to classified information about the national defense of the United States and its allies. This will be an inherent requirement. The selected company will be required to safeguard classified material IAW DoD 5220.22-M during the advanced phases of this contract.

PHASE I: The DON is planning to issue multiple Phase I awards for this topic but reserves the right to issue no awards. Each Phase I proposal must include a Base and Option period of performance. The Phase I Base must have a period of performance of four (4) months at a cost not to exceed \$75,000. The Phase I Option must have a period of performance of six (6) months at a cost not to exceed \$100,000.

Phase I feasibility will describe the existing proposed technology, existing DON system(s) to improve, modifications required, anticipated improvements to existing capabilities, impacts to current logistics if any (i.e., transportation, storage, maintenance, safety, etc.) and transition approach to the DON system. Results of Phase I will be detailed in a final technical report (Final Report).

Phase I deliverables include:

- Kick-Off Briefing, due 15 days from start of Base award
- Final Report, due 120 days from start of Base award
- Initial Phase II Proposal, due 120 days from start of Base award

Deliverables specific to this topic and in addition to those listed above: A study describing research and results of potential algorithms, taking into account the GPS-Based Positioning, Navigation and Timing

Services (GPNTS) architecture and interfaces. Phase I should also include Modeling & Simulation (M&S) to support outcome/recommendations.

PHASE II: All Phase I awardees may submit an Initial Phase II proposal for evaluation and selection. The evaluation criteria for Phase II is the same as Phase I (as stated in this BAA). The Phase I Final Report and Initial Phase II Proposal will be used to evaluate the small business concern's potential to adapt commercial products to fill a capability gap, improve performance, or modernize an existing capability for DON and transition the technology to Phase III. Details on the due date, content, and submission requirements of the Initial Phase II Proposal will be provided by the awarding SYSCOM either in the Phase I contract or by subsequent notification.

Develop software that will be integrated into GPNTS and performance validation in a fleet experimentation/demonstration, or relevant environment. Develop transition plan including production and fielding approach (including updated logistics and safety consideration) and further commercialization (non-DoD).

It is highly likely that the work, prototyping, test, simulation, and validation may become classified in Phase II (see Description for details). However, the proposal for Phase II will be UNCLASSIFIED.

PHASE III DUAL USE APPLICATIONS: Field capability and logistics support.

REFERENCES:

1. P. Bethi, S. Pathipati and A. P, "Stealthy GPS Spoofing: Spoofer Systems, Spoofing Techniques and Strategies," 2020 IEEE 17th India Council International Conference (INDICON), New Delhi, India, 2020, pp. 1-7, doi:10.1109/INDICON49873.2020.9342317.
2. Keller, John, "The growing problem of jamming and spoofing of GPS satellite navigation signals just keeps getting worse." Military Aerospace Electronics, July 20, 2021
<https://www.militaryaerospace.com/rf-analog/article/14207023/gps-signals-jamming>

KEYWORDS: Maritime; Tactical; Command; Control; Positioning; Navigation; Timing

N234-P08

TITLE: NAVWAR Open Topic for Holistic Common Operational Picture (COP):
PMW 150

OUSD (R&E) CRITICAL TECHNOLOGY AREA(S): Advanced Computing and Software; Trusted AI and Autonomy

OBJECTIVE: DEPARTMENT OF THE NAVY OPEN TOPIC - The resultant capability will provide a DEVSECOPS environment to mature efforts that feed the Maritime Tactical Command and Control production. It will also provide an AI tool that will sift data and identify potential Global Positioning System (GPS) threats in near real-time.

DESCRIPTION: The Department of Navy is seeking proposals to improve the quality and speed of decision making for operational and tactical commanders through advanced technology. These technologies may include, but not limited to, solutions that support force maneuver, effects and data synchronization, and course of action (COA) decision making. Specifically, PEO C4I (PMW 150) requires a resultant capability that will provide a DEVSECOPS environment to mature efforts that feed the Maritime Tactical Command and Control (MTC2) production process.

The benefit to the warfighter is to enable rapid COA response options to continuously assess and hold at risk dynamic maritime threats.

Work produced in Phase II may become classified. The prospective contractor(s) must be U.S. owned and operated with no foreign influence as defined by DoD 5220.22-M, National Industrial Security Program Operating Manual, unless acceptable mitigating procedures have been implemented and approved by the Defense Counterintelligence Security Agency (DCSA). The selected contractor must be able to acquire and maintain an appropriate security-level facility and Personnel Security Clearances to perform on advanced phases of this project as set forth by DCSA and NAVWAR to gain access to classified information about the national defense of the United States and its allies. This will be an inherent requirement. The selected company will be required to safeguard classified material IAW DoD 5220.22-M during the advanced phases of this contract.

PHASE I: The DON is planning to issue multiple Phase I awards for this topic but reserves the right to issue no awards. Each Phase I proposal must include a Base and Option period of performance. The Phase I Base must have a period of performance of four (4) months at a cost not to exceed \$75,000. The Phase I Option must have a period of performance of six (6) months at a cost not to exceed \$100,000.

Phase I feasibility will describe the existing proposed technology, existing DON system(s) to improve, modifications required, anticipated improvements to existing capabilities, impacts to current logistics if any (i.e., transportation, storage, maintenance, safety, etc.) and transition approach to the DON system. Results of Phase I will be detailed in a final technical report (Final Report).

Phase I deliverables include:

- Kick-Off Briefing, due 15 days from start of Base award
- Final Report, due 120 days from start of Base award
- Initial Phase II Proposal, due 120 days from start of Base award

PHASE II: All Phase I awardees may submit an Initial Phase II proposal for evaluation and selection. The evaluation criteria for Phase II is the same as Phase I (as stated in this BAA). The Phase I Final Report and Initial Phase II Proposal will be used to evaluate the small business concern's potential to adapt commercial products to fill a capability gap, improve performance, or modernize an existing capability for DON and transition the technology to Phase III. Details on the due date, content, and submission

requirements of the Initial Phase II Proposal will be provided by the awarding SYSCOM either in the Phase I contract or by subsequent notification.

The scope of the Phase II effort will be specific to each project but is generally expected to develop a functional prototype to demonstrate the capability, develop transition plan including production and fielding approach (including updated logistics and safety consideration) and further commercialization (non-DoD).

Deliverables include all software, scripts, architecture models, system/software design artifacts, user and transition assessment documentation, and fleet experimentation (FLEX) reports.

It is highly likely that the work, prototyping, test, simulation, and validation may become classified in Phase II (see Description for details). However, the proposal for Phase II will be UNCLASSIFIED.

PHASE III DUAL USE APPLICATIONS: Field capability and logistics support.

REFERENCES:

1. SBIR@Connect Spotlight: Meet NAVWAR's Program Offices. Information on PEO C4I and Space Systems. Better understand the needs of the government, specifically NAVWAR
<https://vimeo.com/569585983>
2. Official U.S. Navy Web site for Naval Information Warfare Systems Command (NAVWAR)
<https://www.navwar.navy.mil/>

KEYWORDS: Maritime; Tactical; Command; Control; Positioning; Navigation; Timing

**CHEMICAL AND BIOLOGICAL DEFENSE PROGRAM
FY23.4 Small Business Innovation Research (SBIR)
Proposal Submission Instructions**

September 28, 2023: Topic issued for pre-release

October 12, 2023: CBD begins accepting proposals in DSIP

October 31, 2023: Topic Q&A closes to new questions at 12:00 p.m. ET

November 14, 2023: Deadline for receipt of proposals no later than 12:00 p.m. ET

The approved FY23.4 topics included in the Chemical and Biological Defense (CBD) Small Business Innovation Research (SBIR) Program is provided in this document. Offerors responding to this Announcement must follow all general instructions provided in the Department of Defense (DoD) Program Announcement. Instructions detailing the CBD SBIR program requirements are provided below.

Proposers are encouraged to thoroughly review the DoD Program BAA and register for the DSIP Listserv to remain apprised of important programmatic and contractual changes.

- The DoD Program BAA is located at: <https://www.defensesbirsttr.mil/SBIR-STTR/Opportunities/#announcements>. Be sure to select the tab for the appropriate BAA cycle.
- Register for the DSIP Listserv at: <https://www.dodsirsttr.mil/submissions/login>.

Please read the entire DoD Announcement and these CBD SBIR instructions carefully prior to submitting your proposal. Important programmatic changes have been incorporated as required by the SBIR and STTR Extension Act of 2022 (Pub. L. 117-183). Also, go to <https://www.sbir.gov/about/about-sbir#sbir-policy-directive> to read the SBIR/STTR Policy Directive issued by the U. S. Small Business Administration (SBA).

This release contains an open topic. As outlined in section 7 of the SBIR and STTR Extension Act of 2022, innovation open topic activities—

- (A) Increase the transition of commercial technology to the Department of Defense;
- (B) Expand the small business nontraditional industrial base;
- (C) Increase commercialization derived from investments of the Department of Defense; and
- (D) Expand the ability for qualifying small business concerns to propose technology solutions to meet the needs of the Department of Defense.

Unlike conventional topics, which specify the desired technical objective and output, open topics can use generalized mission requirements or specific technology areas to adapt commercial products or solutions to close capability gaps, improve performance, or provide technological advancements in existing capabilities.

A small business concern may only submit one (1) proposal to each open topic. If more than one proposal from a small business concern is received for a single open topic, only the most recent proposal to be certified and submitted prior to the submission deadline will receive an evaluation. All prior proposals submitted by the small business concern for the same open topic will be marked as nonresponsive and will not receive an evaluation.

INTRODUCTION

In response to Congressional interest in the readiness and effectiveness of U.S. Nuclear, Biological and Chemical (NBC) warfare defenses, Title XVII of the National Defense Authorization Act for Fiscal Year 1994 (Public Law 103-160) requires the Department of Defense (DoD) to consolidate management and

oversight of the Chemical and Biological Defense (CBD) Program into a single office – Office of the Assistant Secretary of Defense for Nuclear, Chemical and Biological Defense Programs. The Joint Science and Technology Office for Chemical and Biological Defense (JSTO-CBD), located at the Defense Threat Reduction Agency (DTRA), provides the management for the Science and Technology component of the Chemical and Biological Defense Program. Technologies developed under the Small Business Technology Transfer (STTR) Program have the potential to transition to the Joint Program Executive Office for Chemical Biological Radiological and Nuclear Defense (JPEO-CBRND) if the appropriate level of technology maturity is demonstrated. The JSTO-CBD Science & Technology programs and initiatives improve defensive capabilities against Chemical and Biological Weapons of Mass Destruction. The SBIR portion of the CBD Program is managed by the JSTO-CBD.

The mission of the Chemical and Biological Defense Program is to ensure that the U.S. Military has the capability to operate effectively and decisively in the face of chemical or biological warfare threats at home or abroad. Numerous factors continually influence the program and its technology development priorities. Improved defensive capabilities are essential in order to mitigate the overall impact of chemical and biological threats. The U.S. military requires the finest state-of-the-art equipment and instrumentation available to permit our warfighters to ‘detect to warn’ and avoid contamination, if possible – and to be able to sustain operations in a potentially contaminated environment. Further information is available at the Office of the Assistant Secretary of Defense for Nuclear, Chemical, and Biological Defense Programs homepage at <https://www.acq.osd.mil/ncbdp/cbd/>

The overall objective of the CBD SBIR Program is to improve the transition or transfer of innovative Chem-Bio technologies to the end user – the warfighter – in addition to commercializing technologies within the private sector for mutual benefit. The CBD SBIR Program targets those technology efforts that maximize a strong defensive posture in a biological or chemical environment using passive and active means as deterrents. These technologies include chemical and biological detection for both point and stand-off capabilities; individual and collective protection; hazard mitigation (decontamination); medical pre-treatments (e.g., vaccine development and delivery); medical therapeutics (chemical countermeasures and biological countermeasures); medical diagnostics; Digital Battlespace Management (aka information systems technology) to include but not limited to modeling and simulation (e.g., meteorological dispersion), disease surveillance, data fusion, and health & human effects to include wearable technologies.

All proposals submitted to the CBD SBIR program must comply to the terms of this Announcement. CBD SBIR reserves the right to limit awards under any topic, and only those proposals of superior scientific and technical quality, as determined by Technical Evaluation Team and the CBD SBIR program office will be funded. CBD SBIR reserves the right to withdraw from negotiations at any time prior to contract award. The Government may withdraw from negotiations at any time for any reason to include matters of national security (foreign persons, foreign influence or ownership, or other related issues).

Use of Foreign Nationals (also known as Foreign Persons), Green Card Holders, and Dual Citizens

See the “Foreign Nationals” section of the DoD SBIR Program Announcement for the definition of a Foreign National (also known as Foreign Persons).

It is the responsibility of ALL offerors proposing to use foreign nationals, green-card holders, or dual citizens, to disclose this information regardless of whether the topic is subject to export control restrictions. Offerors MUST identify any foreign nationals or individuals holding dual citizenship expected to be involved on this project as a direct employee, subcontractor, or consultant. For these individuals, please specify their country of origin, the type of visa or work permit under which they are performing and an explanation of their anticipated level of involvement on the project. You may be asked

to provide additional information during contract negotiations in order to verify the foreign citizen's eligibility to participate on a SBIR contract. Supplemental information provided in response to this paragraph will be protected in accordance with the Privacy Act (5 U.S.C. 552a), if applicable, and the Freedom of Information Act (5 U.S.C. 552(b)(6)).

Proposers responding to this Open Topic BAA must follow all general instructions provided in the Department of Defense (DoD) SBIR Program BAA, paying special attention to the new requirements under the SBIR and STTR Extension Act of 2022 (Pub. L. 117-183). The Chemical and Biological Defense SBIR Program requirements in addition to or deviating from the DoD Program BAA are provided in the instructions below.

Specific questions pertaining to the administration of the Chemical and Biological Defense SBIR Program and these proposal preparation instructions should be directed to: Ms. Abigail L. Roots, Chemical and Biological Defense SBIR/STTR Program Manager, JSTO-CBD, at dtra.belvoir.rd.mbx.jsto-cbd-chem-bio-defense-sbir@mail.mil.

PHASE I PROPOSAL GUIDELINES

The Defense SBIR/STTR Innovation Portal (DSIP) is the official portal for DoD SBIR/STTR proposal submission. Firms are required to submit proposals via DSIP; proposals submitted by any other means will be disregarded. Detailed instructions regarding registration and proposal submission via DSIP are provided in the DoD SBIR Program BAA.

Proposal Coversheet (Volume 1)

The proposal coversheet must follow the instructions and requirements provided in the DoD SBIR Program BAA.

The offeror shall certify that to the best of its knowledge and belief, its eligibility information under the SBIR Program is accurate, complete, and current as of the date of the offer.

Technical Volume (Volume 2)

The technical volume is not to exceed 5-pages and must follow the formatting requirements provided in the DoD SBIR Program BAA. No other information included in the other proposal volumes counts against the 5-page Proposal Technical Volume page limit. Pages provided in excess of this length will not be evaluated or considered for review. The proposal must not contain any type smaller than 10-point font size (except as legend on reduced drawings, but not tables).

The maximum dollar amount for a Phase I proof-of-concept/feasibility study is \$197,283.00 for a period of performance (PoP) of up to six (6) months. The CBD SBIR Program will not accept proposals exceeding \$197,283.00 for the Phase I effort.

Your entire proposal submission must only be submitted electronically through the Defense SBIR/STTR Innovation Portal (DSIP) located at: <https://www.dodsbirsttr.mil>. Any questions pertaining to the DoD SBIR/STTR submission system should be directed to DSIP Support: DoDSBIRSupport@reisystems.com

Selection of Phase I proposals will be based upon the three (3) evaluation criteria discussed in this Program Announcement. The CBD SBIR Program reserves the right to limit awards under any topic, and only those proposals of superior scientific and technical quality in the judgment of the technical evaluation team will be funded. All SBIR contract awards, both Phase I and Phase II, are subject to availability of funding.

Cleared for Public Release

Companies should plan carefully for any research involving animal or human subjects, chemical agents, biological agents, etc. The brief PoP available for a Phase I project precludes plans that include these elements, as all DoD requirements and necessary approvals associated with animal and/or human use must be strictly adhered to, and require considerable coordination and significant time for final protocol approvals. See “Additional Information” below for further information regarding all research that will include animal and/or human subjects.

Proposals not conforming to the terms of this Announcement, and any unsolicited proposals, will not be considered. All awards are subject to the availability of funding and successful completion of contract negotiations. The Chemical and Biological Defense Program is not responsible for any funds expended by the proposer prior to contract award.

Cost Volume (Volume 3)

The Cost Volume must follow all instructions and requirements provided in the DoD SBIR Program BAA. The Phase I Base amount must not exceed \$197,283.00. Total Base cost for Phase I must be clearly identified on the Proposal Cover Sheet (Volume 1) and in Volume 3.

Company Commercialization Report (CCR) (Volume 4)

Completion of the CCR as Volume 4 of the proposal submission in DSIP is required. Please refer to the DoD SBIR Program BAA for full details on this requirement. Information contained in the CCR will not be considered by the Chemical and Biological Defense Program during proposal evaluations.

Supporting Documents (Volume 5)

Offerors are welcome to provide Supporting Documents in this section, however these documents will not be considered by the Chemical and Biological Defense Program during proposal evaluations.

All proposing Small Business Concerns (SBC) are REQUIRED to submit the following documents to Volume 5:

1. Contractor Certification Regarding Provision of Prohibition on Contracting for Certain Telecommunications and Video Surveillance Services or Equipment
2. Disclosures of Foreign Affiliations or Relationships to Foreign Countries
3. Disclosure of Funding Sources

Please note, under the SBIR and STTR Extension Act of 2022 and the SBA SBIR/STTR Policy Directive, proposals are required to include additional forms, to include the SBA-approved “Disclosures of Foreign Affiliations or Relationships to Foreign Countries” and “Disclosure of Funding Sources” forms.

NOTE: Failure to submit the above mentioned disclosure forms along with the proposal will automatically disqualify a SBC from receiving a SBIR award for that proposal.

Refer to the DoD Program BAA for more information.

DIRECT TO PHASE II PROPOSAL GUIDELINES

The Chemical and Biological Defense SBIR Program is not currently participating in any Direct to Phase II topics.

PHASE II PROPOSAL GUIDELINES

Phase II proposals may only be submitted by Phase I awardees.

Phase II is the demonstration of the technology that was found feasible in Phase I. Phase I awardees may submit a Phase II proposal without invitation; however, it is strongly encouraged that a Phase II proposal

not be submitted until sufficient Phase I progress can be evaluated and assessed based on results of the Phase I proof-of-concept/feasibility study. Therefore, Phase II proposal may be submitted no sooner than five (5) months from date of Phase I contract award. **All Phase II proposal submissions must be submitted electronically through DSIP system: <https://www.dodsbirsttr.mil>**

At the DSIP website, Phase II proposals MUST be submitted to ‘CBD SBIR’ regardless of which DoD contracting office negotiated and awarded the Phase I contract. Additional instructions regarding the Phase II proposal submission process including submission key dates will be provided to Phase I awardees after the Phase I contract is awarded.

The Phase II proposal must include a concise summary of the Phase I project including the specific technical problem or opportunity addressed and its importance, the objective of the Phase I project, the type of research conducted, findings or results of this research, and technical feasibility of the proposed technology. Due to limited funding, the CBD SBIR program reserves the right to limit awards under any topic and only proposals considered to be of superior quality will be funded.

All proposers are required to develop and submit a commercialization plan describing feasible approaches for marketing and manufacturing the developed technology. Proposers are required to submit a budget for the entire 24-month Phase II Period of Performance. During contract negotiation, the Contracting Officer may require a Cost Volume for a base year and an option year; thus, proposers are advised to be aware of this possibility. These costs must be submitted using the Cost Volume format (accessible electronically on the DoD SBIR/STTR submission site). The total proposed amount should be indicated on the Proposal Cover Sheet as the Proposed Cost. At the Contracting Officer’s discretion, Phase II projects may be evaluated for technical progress prior to the end of the base year, prior to extending funding for the option (second) year.

The CBD SBIR Program is committed to minimizing the funding gap between Phase I and Phase II activities. The CBD SBIR Program typically funds a cost plus fixed fee Phase II award at the discretion of the Contracting Officer, but may award a firm fixed price contract.

It is recommended that Phase II awardees have a Defense Contract Audit Agency (DCAA) approved accounting system. If you do not have a DCAA approved accounting system, this could delay/prevent a Phase II contract award. Visit <https://www.dcaa.mil/Customers/Small-Business> for more information on DCAA approved accounting systems.

DISCRETIONARY TECHNICAL AND BUSINESS ASSISTANCE (TABA)

At this time, the CBD SBIR Program is not participating in the Technical and Business Assistance (TABA) Program.

EVALUATION AND SELECTION

All proposals will be evaluated in accordance with the evaluation criteria listed in the DoD SBIR Program BAA.

Proposing firms will be notified of selection or non-selection status for a Phase I award within 90 days of the closing date of the BAA. Notification will be provided via e-mail to the small business offeror – specifically to the Corporate Official (Business Point of Contact) and the Principal Investigator, as listed on the Cover Page (Volume I) of the proposal.

Upon written request via e-mail sent to dtra.belvoir.rd.mbx.jsto-cbd-chem-bio-defense-sbir@mail.mil, and within 30-days of non-selection, debriefing statements will be provided by the CBD SBIR Program

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Office. The debriefing statement will be provided only via reply e-mail to the Corporate Official and the Principal Investigator, as listed on the Cover Page (Volume I) of the proposal. Requests from the offeror for further information after the debriefing statement will not be provided.

Refer to the DoD SBIR Program BAA for procedures to protest the Announcement.

As further prescribed in FAR 33.106(b), FAR 52.233-3, Protests after Award should be submitted to Abigail L. Roots, Chemical and Biological Defense (CBD) SBIR Program Manager, Joint Science and Technology Office for Chemical and Biological Defense (JSTO-CBD), dtra.belvoir.rd.mbx.jsto-cbd-chem-bio-defense-sbir@mail.mil.

ADDITIONAL INFORMATION

Fraud, Waste and Abuse

All offerors must complete the Fraud, Waste, and Abuse training (Volume 6) that is located on DSIP (<https://www.dodsbirsttr.mil>). Please follow guidance provided on DSIP to complete the required training prior to submitting proposals.

To Report Fraud, Waste, or Abuse, Please Contact:
DoD Inspector General (IG) Fraud, Waste & Abuse
Hotline: (800) 424-9098
hotline@dodig.mil

Additional information on Fraud, Waste and Abuse may be found in the DoD Instructions of this Announcement.

CBD SBIR Projects Requiring Animal Subjects

Refer to the DoD SBIR Program BAA for Research Involving Animal Subjects.

Companies should plan carefully for any research involving animal subjects, in addition to the use of any chemical or biological warfare agents, and use of any agents associated with “Dual Use Research of Concern (DURC)”. The mandatory DoD level review of this research is typically a period of no greater than four (4) months.

Written authorization to begin animal research under the applicable protocol(s) proposed as part of the CBD SBIR program will be issued after the contract award in the form of an approval memo from the U.S. Army Medical Research and Development Command (MRDC), Animal Care and Use Review Office (ACURO), and the Research Oversight Board (ROB) of the Defense Threat Reduction Agency (DTRA), both of which provide DoD compliance oversight to the CBD SBIR program office.

The offeror is expressly forbidden from using or subcontracting for the use of animals in any manner prior to these approvals. Furthermore, modifications to approved protocols require review and approval by the ACURO prior to implementation.

Non-compliance with these terms and conditions may result in withholding of funds and/or the termination of the award. The ACURO and DTRA ROB reviews are separate from, and in addition to, the responsible Institutional Animal Care and Use Committee (IACUC) review(s). Further information may be required if the proposal is successful.

CBD SBIR Projects Requiring Human Subjects, Human Anatomical Substances, and/or Human Data

Refer to the DoD SBIR Program BAA for Research Involving Human Subjects and Recombinant DNA Molecules.

Companies should plan carefully for any research involving human subjects, human data, and/or human biospecimens (human anatomical substances; e.g., blood, saliva, tissue), to include cadaveric specimens, hereafter referred to as “research”, in addition to the use of any chemical or biological warfare agents, and use of any agents associated with “Dual Use Research of Concern (DURC)”. The mandatory DoD level review of this research is typically no greater than four (4) months.

Projects under CBD SBIR awards involving the use of human subjects shall not be proposed for any Phase I Period of Performance, but may be proposed during the Phase II Period of Performance.

Written authorization to begin the research under the applicable protocol(s) proposed as part of the CBD SBIR program will be issued after the contract award in the form of an approval memo from the U.S. Army Medical Research and Development Command (MRDC), Office of Human Research Oversight (OHRO), and the Research Oversight Board (ROB) of the Defense Threat Reduction Agency (DTRA), both of which provide DoD compliance oversight to the CBD SBIR program office.

The offeror is expressly forbidden from beginning the research in any manner prior to these approvals. Furthermore, modifications to approved protocols require review and approval by the OHRO prior to implementation.

Non-compliance with these terms and conditions may result in withholding of funds and/or the termination of the award. The OHRO and DTRA ROB reviews are separate from, and in addition to, the responsible Institutional Review Board (IRB) review(s). Further information may be required if the proposal is successful.

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**CBD SBIR 23.4 Topic Index
Release 1**

CBD234-P001 Decontamination of Open Wounds – Open Topic

CBD234-P001 TITLE: Decontamination of Open Wounds – Open Topic

OUSD (R&E) CRITICAL TECHNOLOGY AREA(S): Biotechnology

OBJECTIVE: The purpose of developing an effective man-portable capability that will rapidly remove chemical warfare agents (CWAs) and other toxic industrial chemicals (TICs) of interest to the U.S. Department of Defense from both intact and wounded human skin, under austere conditions is to bring potentially valuable small business innovations to the Chemical and Biological Defense Program portfolio to discover and develop chemical medical countermeasures (cMCMs) capable of neutralizing CWAs in wounds and on the skin for the treatment of the Warfighter.

DESCRIPTION: Although decontamination issues have been studied since the onset of chemical warfare, decontamination of chemical warfare agents (CWAs) from the skin remains a thorny problem for a variety of reasons.

These include, first and foremost, the ability to rapidly and effectively remove a diversity of toxic chemicals that currently are, or could be, CWAs, without harming or damaging the contaminated skin or wound. Prompt and rapid post-exposure decontamination is critical to reduce the post-exposure effects of CWAs.

In addition, a practical decontamination product needs to satisfy a plethora of secondary requirements, which include but are not limited to:

- Being simple to use in the field under harsh and likely confusing situations.
- Be light weight, compact, and easily stowed in a soldier's pack.
- Be fast acting and effective under a wide range of environmental conditions.
- Meet and satisfy Federal Drug Agency (FDA) requirements.
- Meet and satisfy major DoD logistical requirements, i.e., long shelf-life, ease of transportation, manufacturability, and cost-effectiveness.
- Last, but not least, in addition to removing the toxic agents from skin, the product should be able to detoxify these chemical agents, both while it is being applied on the skin and after its removal. Rapid agent detoxification and decontamination effectiveness are intricately linked because in-situ detoxification is an effective method of reducing agent concentration on the skin before the agent has time to diffuse into the sub-dermal region. Detoxification of the agent also attenuates or prevents secondary contamination of medical or other personnel, and of the environment.

Chemical warfare agents (CWAs) are among the most lethal and sinister substances manufactured by man (1). They are designed to kill, maim, immobilize, or psychologically threaten enemy troops. CWAs can attack the skin which is not only the body's interface with the outside environment, but also the largest organ of the body, with a surface area of roughly 1.6 m² for women and 1.8 m² for men (6). Skin exposure to warfare agents is also a major problem during non- conventional war (5), or terrorist attack. Over the eons, a wide variety of materials in gas, liquid or solid form have been mobilized for this purpose. At present, CWAs of greatest concern in military operations are relatively low volatility organic liquids that attack the skin (vesicants) or attack the nervous system (nerve agents) (2-4).

Human skin, the largest human organ, developed as a physical barrier to the environment (to keep things out) but also maintains the aqueous nature of the human body (to keep things in). Mammalian skin consists of three major layers: stratum corneum, epidermis, and dermis. The stratum corneum, the thin outer layer of keratin-filled dead cells (corneocytes) bounded by densely crosslinked protein and embedded in crystalline lamellar lipids, represents the major barrier protecting the body from loss of internal components and entry of undesirable external materials. The stratum corneum, composed of

keratinized dead cells that are continually being replaced, is the first major barrier to chemical agents. The layer underneath the stratum corneum, the epidermis, contains cells that differentiate from viable keratinocytes to corneocytes during their migration from the dermis to the stratum corneum. It also contains a large number of specialized cells. The dermis is the main component of living skin.

The purpose of decontamination is to reduce an initial amount of harmful material deposited on the surface of a person or object from the environment to a level that is low enough allow it to continue to safely function. It should be noted that permeability of the contaminant through the surface of the person or object is a complicating issue for any surface decontamination process. Contaminant permeability renders decontamination more difficult to perform, places time limitations on the window of opportunity for its performance.

The alternative to decontamination is discarding the object, which in the case of living beings, is not an option.

Current skin decontamination methods rely heavily on “wet” decontamination practices, which include washing the body with water, or soap and water (Roul et al., 2017). Alternatively, rapid decontamination makes extensive use of “dry” decontamination, which is based on adsorptive properties of powders, such as activated carbon or Fuller’s Earth (FE) (Roul et al., 2017).

Improved personal decontamination methods/products should consider:

- The effects on both intact skin and open wounds.
- Impacts on the subsequent wound healing process.
- Agent variable decontamination efficiency.
- Post-decontamination CWA detoxification capability. Rapid agent detoxification and decontamination effectiveness are intricately linked because in-situ detoxification is an effective method of reducing agent concentration on the skin before the agent has time to diffuse into the sub-dermal region. Post-decontamination detoxification of the contaminant(s) will also attenuate or prevent secondary contamination of medical or other personnel, and of the environment.

There is a clear need to develop an effective man-portable capability that will rapidly remove chemical warfare agents (CWAs) and other toxic industrial chemicals (TICs) of interest to the U.S. Department of Defense from human skin, both intact and wounded, under austere conditions.

PHASE I: A feasibility study to demonstrate the technical and commercial practicality of the concept to include an assessment of its technical readiness and potential applicability to military and commercial markets.

PHASE II: Businesses will produce practical and feasible prototype solutions that can operate in edge and austere environments. Companies will provide a technology transition and commercialization plan for Department of Defense and commercial markets. The DoD will evaluate each product in a realistic field environment and provide solutions to stakeholders for further evaluation. Based on Soldier field assessment, the DoD will request companies to update the previously delivered prototypes to meet final design configuration.

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KEYWORDS:

Decontamination; Chemical Warfare Agents; Personnel Decontamination; Casualty Decontamination; Skin Decontamination; Open Wound Decontamination; Chemical Agent Detoxification

TPOC-1: Dr. Stephen Lee

AMENDMENT 2

The purpose of Amendment 2 to DARPA Release 1 is to update Phase I language in Topic HR0011SB20234-03, page 19 (text change highlighted)

Defense Advanced Research Projects Agency (DARPA) DoD 23.4 Small Business Innovation Research (SBIR) Annual BAA Proposal Submission Instructions Release 1

INTRODUCTION

DARPA's mission is to make strategic, early investments in science and technology that will have long-term positive impacts on our national security. As part of this mission, DARPA makes high-risk, high-reward investments in science and technology that have the potential to disrupt current understandings and/or approaches. The pace of discovery in both science and technology is accelerating worldwide, resulting in new fields of study and the identification of scientific areas ripe for small business utilization through the SBIR and STTR programs. Small businesses are critical for developing technology to support national security. Proposers are encouraged to consider whether the R/R&D being proposed to DoD Components also has private sector potential, either for the proposed application or as a base for other applications. The topics below focus on technical domains important to DARPA's mission pursuing innovative research concepts that fall within one of its technology offices. More information about DARPA's technical domains and research topics of interest may be found at: <http://www.darpa.mil/about-us/offices>.

Proposers responding to a topic in this BAA must follow all general instructions provided in the Department of Defense (DoD) SBIR Program BAA. DARPA requirements in addition to or deviating from the DoD Program BAA are provided in the instructions below.

Specific questions pertaining to the administration of the DARPA Program and these proposal preparation instructions should be directed to: DARPA Small Business Programs Office at SBIR_BAA@darpa.mil. DSIP Topic Q&A will NOT be available for these DARPA topics. Technical questions related to improving the understanding of a topic's requirements must be submitted to SBIR_BAA@darpa.mil by the deadline listed below.

The following dates apply to this DARPA Topic release:

- January 18, 2023:** Topics issued for pre-release
- February 02, 2023:** Topics open; DARPA begins accepting proposals via DSIP
- February 28, 2023:** Deadline for technical question submission
- March 07, 2023:** Deadline for receipt of proposals no later than **12:00 pm ET**

DIRECT TO PHASE II PROPOSAL GUIDELINES

Proposers should refer to the DARPA Direct to Phase II Proposal Instructions, provided in Appendix A.

Current Release Award Structure by Topic

Standard Format

| Topic Number | Direct to Phase II | | | | |
|------------------|--------------------|--------------|-----------------------------|---------------|------------|
| | Tech Volume* | Award Amount | Period of Performance (PoP) | Option Amount | Option PoP |
| HR0011SB20234-02 | 35 pages | \$1,200,000 | 24 months | \$600,000 | 12 months |

Technical Volume (Volume 2) – Abbreviated Standard Format (35-page)

If a proposer can provide adequate documentation to substantiate that the scientific and technical merit and feasibility described in the Phase I section of the topic has been met and describes the potential commercial applications, the Direct to Phase II (DP2) authority allows the Department of Defense (DoD) to make an award to a small business concern under Phase II of the SBIR program without regard to whether the small business concern was provided an award under Phase I of an SBIR program. This topic is accepting DP2 proposal submissions.

DP2 Feasibility Documentation shall not exceed 10 pages. DP2 Technical Proposal shall not exceed 20 pages. Phase II commercialization strategy shall not exceed 5 pages. This should be the last section of the Technical Volume and will not count against the 30-page limit.

White Paper & Slide Deck Proposal

| Topic Number | Direct to Phase II | | | | | |
|------------------|--------------------|------------|--------------|-----------------------------|---------------|---------------|
| | Technical Volume | | Award Amount | Period of Performance (PoP) | Option Amount | Option Period |
| | White Paper | Slide Deck | | | | |
| HR0011SB20234-01 | 20 pages | 15 pages | \$750,000 | 9 months | \$750,000 | 12 months |
| HR0011SB20234-03 | 20 pages | 15 pages | \$1,000,000 | 12 months | \$800,000 | 12 months |

Note: Please see Appendix A, section III (d) for complete instructions on the White Paper/Slide Deck technical volume format.

Technical Volume (Volume 2) – White Paper & Slide Deck Format

If a proposer can provide adequate documentation to substantiate that the scientific and technical merit and feasibility described in the Phase I section of the topic has been met and describes the potential commercial applications, the Direct to Phase II (DP2) authority allows the Department of Defense (DoD) to make an award to a small business concern under Phase II of the SBIR program without regard to whether the small business concern was provided an award under Phase I of an SBIR program. This topic is accepting DP2 proposal submissions.

The white paper shall not exceed 20 pages, and the slide deck shall not exceed 15 pages. For information on the content of these elements of the technical proposal and the commercialization strategy, please see Attachment B: DARPA Direct to Phase II (DP2) Instructions.

Content of the Technical Volume

Proposers should refer to the DARPA DP2 Proposal Instructions, provided in Appendix A and on the DARPA Small Business site (<https://www.darpa.mil/work-with-us/for-small-businesses/participate-sbir-sttr-program>).

Cost Volume (Volume 3)

Please see the chart above for award amounts listed by topic. Proposers are required to use the Direct to Phase II – Volume 3: Cost Proposal Template (Excel Spreadsheet) provided on the DARPA Small Business site (<https://www.darpa.mil/work-with-us/for-small-businesses/participate-sbir-sttr-program>). Subcontractors may also submit unsanitized costs using this template directly to DARPA at SBIR-BAA@darpa.mil.

Please review the updated Percentage of Work (POW) calculation details included in the DoD Program BAA. DARPA will occasionally accept deviations from the POW requirements with a letter of explanation or approval from the Funding Agreement officer.

Company Commercialization Report (CCR) (Volume 4)

Completion of the CCR as Volume 4 of the proposal submission in DSIP is required. Please refer to the DoD SBIR Program BAA for full details on this requirement. Information contained in the CCR will not be considered by DARPA during proposal evaluations.

Supporting Documents (Volume 5)

In addition to the documents required by DoD, small businesses may also submit additional documentation to support the Technical Volume (Volume 2) and the Cost Volume (Volume 3) in Volume 5.

DISCRETIONARY TECHNICAL AND BUSINESS ASSISTANCE (TAB A)

DARPA does not offer TAB A funding.

EVALUATION AND SELECTION

All proposals will be evaluated in accordance with the evaluation criteria listed in the DoD SBIR 2023.4 BAA. DARPA will conduct an evaluation of each conforming proposal. Proposals that do not comply with the requirements detailed in this BAA and the research objective(s) of the corresponding topic are considered non-conforming and therefore are not evaluated nor considered for award.

Using the evaluation criteria, the Government will evaluate each proposal in its entirety, documenting the strengths and weaknesses relative to each evaluation criterion, and, based on these identified strengths and weaknesses, determine the proposal's overall selectability. Proposals will not be evaluated against each other during the evaluation process, but rather evaluated on their own individual merit to determine how well the proposal meets the criteria stated in this BAA and the corresponding DARPA topic.

Awards will be made to proposers whose proposals are determined to be the most advantageous to the Government, consistent with instructions and evaluation criteria specified in the DoD SBIR 2023.4 BAA and availability of funding. Given the limited funding available for each topic released, not all proposals considered selectable will be selected for funding.

For the purposes of this proposal evaluation process, a selectable proposal is defined as follows:

Selectable: A selectable proposal is a proposal that has been evaluated by the Government against the evaluation criteria listed in the DoD SBIR 2023.4 BAA and DARPA topic, and the strengths of the overall proposal outweighs its weaknesses. Additionally, there are no accumulated weaknesses that would require extensive negotiations and/or a resubmitted proposal.

For the purposes of this proposal evaluation process, a non-selectable proposal is defined as follows:

Non-Selectable: A proposal is considered non-selectable when the proposal has been evaluated by the Government against the evaluation criteria listed in the DoD SBIR 2023.4 BAA and DARPA topic, and the strengths of the overall proposal do not outweigh its weaknesses.

Proposing firms will be notified of selection or non-selection status for a Phase I award within 90 days of the closing date of the DoD SBIR 2023.4 BAA. It is the policy of DARPA to treat all proposals as source selection information and to disclose their contents only for the purpose of evaluation. Restrictive notices notwithstanding, during the evaluation process, submissions may be handled by support contractors for administrative purposes and/or to assist with technical evaluation. All DARPA support contractors are expressly prohibited from performing DARPA-sponsored technical research and are bound by appropriate nondisclosure agreements. Input on technical aspects of the proposals may be solicited by DARPA from other Government and/or non-Government consultants/experts who are strictly bound by the appropriate non-disclosure requirements. No submissions will be returned. Upon completion of the evaluation and selection process, an electronic copy of each proposal received will be retained at DARPA.

Proposal titles, abstracts, anticipated benefits, and keywords of proposals that are selected for contract award will undergo a DARPA Policy and Security Review. Proposal titles, abstracts, anticipated benefits, and keywords are subject to revision and/or redaction by DARPA. Final approved versions of proposal titles, abstracts, anticipated benefits, and keywords may appear on the DoD SBIR/STTR awards website and/or the SBA's SBIR/STTR award website (<https://www.sbir.gov/sbirsearch/award/all>).

Refer to the DoD SBIR 2023.4 Program BAA for procedures to protest the Announcement. As further prescribed in FAR 33.106(b), FAR 52.233-3, Protests regarding the selection decision should be submitted to:

DARPA
Contracts Management Office (CMO)
675 N. Randolph Street
Arlington, VA 22203
E-mail: scott.ulrey@darpa.mil and sbir@darpa.mil

AWARD AND CONTRACT INFORMATION

1. General Award Information

Multiple awards are anticipated. DARPA may award FAR-based government contracts (Firm- Fixed Price or Cost-Plus Reimbursement) or Other Transactions for Prototypes agreement (under the authority of 10 U.S.C. § 4022) subject to approval of the Contracting Officer. The amount of resources made available for each topic issued under this BAA will depend on the quality of the proposals received and the availability of funds.

Majority Ownership in Part. Proposers that are more than 50% owned by multiple venture capital operating companies (VCOC), hedge funds (HF), private equity firms (PEF), or any combination of these as set forth in 13 C.F.R. § 121.702, are eligible to submit proposals in response to DARPA topics advertised within this BAA.

For proposers that are a member of this ownership class the following must be satisfied for proposals to be accepted and evaluated:

- a. Prior to submitting a proposal, firms must register with the SBA Company Registry Database.
- b. The proposer within its submission must submit the Majority-Owned VCOC, HF, and PEF Certification. A copy of the SBIR VC Certification can be found on

<https://www.darpa.mil/work-with-us/for-small-businesses/participate-sbir-sttr-program>, under SBIR/STTR BAA Forms. Include the SBIR VC Certification in the Supporting Documents (Volume 5).

c. Should a proposer become a member of this ownership class after submitting its proposal and prior to any receipt of a funding agreement, the proposer must immediately notify the Contracting Officer, register in the appropriate SBA database, and submit the required certification which can be found under SBIR/STTR BAA Forms and Templates on <https://www.darpa.mil/work-with-us/for-small-businesses/participate-sbir-sttr-program>.

The Government reserves the right to select for negotiation all, some, one, or none of the proposals received in response to this announcement and to make awards with or without communications with proposers. Additionally, the Government reserves the right to award all, some, one, or none of the options on the contract(s)/agreement(s) of the performers based on available funding and technical performance. If warranted, portions of resulting awards may be segregated into pre-priced options. Additionally, DARPA reserves the right to accept proposals in their entirety or to select only portions of proposals for award. In the event that DARPA desires to award only portions of a proposal, negotiations may be opened with that proposer. The Government reserves the right to fund proposals in phases with options for continued work, as applicable.

The Government reserves the right to request any additional, necessary documentation once it makes the award instrument determination. The Government reserves the right to remove a proposal from award consideration should the parties fail to reach agreement on award terms, conditions, and price within a reasonable time, and/or the proposer fails to provide requested additional information within three business days.

In all cases, the Government Contracting Officer reserves the right to select award instrument type, regardless of instrument type proposed, and to negotiate all instrument terms and conditions with selectees. DARPA will apply publication or other restrictions, as necessary, if it determines that the research resulting from the proposed effort will present a high likelihood of disclosing performance characteristics of military systems or manufacturing technologies that are unique and critical to defense. Any award resulting from such a determination will include a requirement for DARPA permission before publishing any information or results on the program. For more information on publication restrictions, see the DoD SBIR 2023.4 BAA.

Because of the desire to streamline the award negotiation and program execution process, proposals identified for negotiation will result in negotiating a type of instrument for award that is in the best interest of the Government. In the case of an OT for Prototype agreement under DARPA's authority to award OTs for prototype projects, 10 U.S.C. § 4022, use of an OT provides significant opportunities for flexible execution to assist in meeting DARPA's aggressive SBIR/STTR program goals.

All proposers that wish to consider an OT award should carefully read the following:

The flexibility of the OT award instrument is beneficial to the program because the Performer will be able to apply its best practices as required to carry out the research project that may be outside of the Federal Acquisition Regulation (FAR) process-driven requirements. Streamlined practices will be used, such as milestone-driven performance, intended to reduce time and effort on award administration tasks and permit performers to focus on the research effort and rapid prototyping. Because of this ability, OTs provide the Agreements Officer the flexibility to create an award instrument that contains terms and conditions that promote commercial transition, reduce some administratively burdensome acquisition regulations, and meet SBIR/STTR program goals.

Proposers must only propose an OT agreement with fixed payable milestones. Fixed payable milestones are fixed payments based on successful completion of the milestone accomplishments agreed to in the milestone plan. Refer to the Other Transactions for Prototypes Fact Sheet and Other Transaction for Prototype Agreement, available at <https://www.darpa.mil/work-with-us/for-small-businesses/participate-sbir-sttr-program>. Specific milestones will be based upon the research objectives detailed in the topic.

Please see <https://www.darpa.mil/work-with-us/for-small-businesses/participate-sbir-sttr-program> for more information on OTs.

2. Transition and Commercialization Support Program (TCSP)

DARPA will provide services to Phase II or DP2 awardees upon contract execution through the Transition and Commercialization Support Program (TCSP) at no cost to awardees. The TCSP goal is to maximize the potential for SBIR/STTR companies to move their technology beyond Phase II and into other research and development programs for further maturity or into solutions or products for DoD acquisition programs, other Federal programs, and/or the commercial market. Please visit <https://www.darpa.mil/work-with-us/for-small-businesses/commercialization-continued> for more information on DARPA TCSP.

3. Embedded Entrepreneurship Initiative

Awardees of SBIR funding pursuant to this BAA may be eligible to participate in the DARPA Embedded Entrepreneurship Initiative (EEI) during the Period of Performance. Invitation to participate in EEI is at the sole discretion of the Government based on evaluation of technical and commercial factors and subject to program balance and the availability of funding. EEI is a limited scope program offered by DARPA, at DARPA's discretion, to a small subset of awardees. The goal of DARPA's EEI is to increase the likelihood that DARPA-funded technologies take root in the U.S. and provide new capabilities for national defense. EEI supports DARPA's mission "to make pivotal investments in breakthrough technologies and capabilities for national security" by accelerating the transition of innovations out of the lab and into new capabilities for the Department of Defense (DoD). EEI investment supports development of a robust and deliberate Go-to-Market strategy for selling technology product to the government and commercial markets and positions DARPA awardees to attract U.S. investment. The following is for informational and planning purposes only and does not constitute solicitation of proposals to the EEI.

There are three elements to DARPA's EEI: (1) A Senior Commercialization Advisor (SCA) from DARPA who works with the Program Manager (PM) to examine the business case for the awardee's technology and uses commercial methodologies to identify steps toward achieving a successful transition of technology to the government and commercial markets; (2) Connections to potential industry and investor partners via EEI's Investor Working Groups; and (3) Additional funding on an awardee's contract for the awardee to hire an embedded entrepreneur to achieve specific milestones in a Go-to-Market strategy for transitioning the technology to products that serve both defense and commercial markets. This embedded entrepreneur's qualifications should include business experience within the target industries of interest, experience in commercializing early stage technology, and the ability to communicate and interact with technical and non-technical stakeholders. Funding for EEI is typically no more than \$250,000 per awardee over the duration of the award. An awardee may apportion EEI funding to hire more than one embedded entrepreneur, if achieving the milestones requires different expertise that can be obtained without exceeding the awardee's total EEI funding. The EEI effort is intended to be conducted concurrent with the research program without extending the period of performance.

EEI Application Process:

After receiving an award under the solicitation, awardees interested in being considered for EEI should notify their DARPA Program Manager (PM) during the period of performance. Timing of such notification should ideally allow sufficient time for DARPA and the awardee to review the awardee's

initial transition plan, identify milestones to achieve under EEI, modify the award, and conduct the work required to achieve such milestones within the original award period of performance. These steps may take 9-18 months to complete, depending on the technology. If the DARPA PM determines that EEI could be of benefit to transition the technology to product(s) the Government needs, the PM will refer the performer to DARPA Commercial Strategy.

DARPA Commercial Strategy will then contact the performer, assess fitness for EEI, and in consultation with the DARPA technical office, determine whether to invite the performer to participate in the EEI. Factors that are considered in determining fitness for EEI include DoD/Government need for the technology; competitive approaches to enable a similar capability or product; risks and impact of the Government's being unable to access the technology from a sustainable source; Government and commercial markets for the technology; cost and affordability; manufacturability and scalability; supply chain requirements and barriers; regulatory requirements and timelines; Intellectual Property and Government Use Rights, and available funding.

Invitation to participate in EEI is at the sole discretion of DARPA and subject to program balance and the availability of funding. EEI participants' awards may be subsequently modified bilaterally to amend the Statement of Work to add negotiated EEI tasks, provide funding, and specify a milestone schedule which will include measurable steps necessary to build, refine, and execute a Go-to-Market technology transition plan aimed at delivering new capabilities for national defense. Milestone examples are available at: <https://www.darpa.mil/work-with-us/contract-management>.

Awardees under this solicitation are eligible to be considered for participation in EEI, but selection for award under this solicitation does not imply or guarantee participation in EEI.

For more information please refer to the EEI website <https://eei.darpa.mil/>.

4. DARPA Toolbox Initiative

DARPA Toolbox is an Agency-wide effort to provide open licensing opportunities with commercial technology vendors to the researchers behind DARPA programs. DARPA Toolbox provides easy, low-cost, scalable access to state-of-the-art tools and intellectual property (IP) under predictable legal terms and streamlined acquisition procedures. The goal is to reduce performer reliance on low-quality, low-cost tools and IP that increase execution risks and complicate post-DARPA transitions.

Through this initiative, DARPA performers are granted access to select vendor tools and technologies throughout the life of their contractual relationship with the Agency. The Toolbox suppliers bring to the table proven technologies commonly used in state-of-the-art commercial microelectronics or system design methodologies.

DARPA Toolbox program information and a full list of participating suppliers can be found at <https://www.darpa.mil/work-with-us/darpa-toolbox-initiative>. If there are tool or technologies of interest, contact the Supplier POC listed for the product, referencing the DARPA Toolbox Initiative. The Supplier POC will provide advice on products and pricing information. Include any non-production pricing quotes in your proposal. Products and pricing are between you and the suppliers – *do not* contact DARPA directly.

ADDITIONAL INFORMATION

DARPA intends to use electronic mail for all correspondence regarding these topics. Questions related to the technical aspect of the research objectives and awards specifically related to a topic should be emailed to SBIR_BAA@darpa.mil. Please reference the topic number in the subject line. All questions must be in English and must include the name, email address, and the telephone number of a point of contact.

DARPA will attempt to answer questions in a timely manner; however, questions submitted within seven (7) calendar days of the proposal due date listed herein may not be answered. DARPA will post a consolidated Frequently Asked Questions (FAQ) document. To access the posting please visit: <http://www.darpa.mil/work-with-us/opportunities>. Under the topic number summary, there will be a link to the FAQ. The FAQ will be updated on an ongoing basis until one week prior to the proposal due date.

Technical support for the Defense SBIR/STTR Innovation Portal (DSIP) is available Monday through Friday, 9:00 a.m. – 5:00 p.m. ET. Requests for technical support must be emailed to DoDSBIRSupport@reisystems.com with a copy to SBIR_BAA@darpa.mil.

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| HR0011SB20234-01 | Vibe: Innovation in Commodity Coherence |
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| HR0011SB20234-03 | Space Metamaterial Electronically Scanned Array (Space-MESA) |

OUSD (R&E) CRITICAL TECHNOLOGY AREA(S): Integrated Network Systems-of-Systems

The technology within this topic is restricted under the International Traffic in Arms Regulation (ITAR), 22 CFR Parts 120-130, which controls the export and import of defense-related material and services, including export of sensitive technical data, or the Export Administration Regulation (EAR), 15 CFR Parts 730-774, which controls dual use items. Offerors must disclose any proposed use of foreign nationals (FNs), their country(ies) of origin, the type of visa or work permit possessed, and the statement of work (SOW) tasks intended for accomplishment by the FN(s) in accordance with the Announcement. Offerors are advised foreign nationals proposed to perform on this topic may be restricted due to the technical data under US Export Control Laws.

OBJECTIVE: Beamforming is utilized in numerous applications from wireless communications, acoustics, radar, and sonar as a means to direct a specific signal towards a particular receiver. Such applications typically require computing power to perform the signal processing and a sensor array to send or receive signals. These requirements are tailored to the specific application and may cause significant impact to the overall resources available for operations. Given the ubiquity of Commercial Off-the-Shelf (COTS) compute, sensors, and sensor platforms, there are multiple applications that could benefit from utilizing commodity hardware in lieu of requiring application-specific technologies. Beamforming requires relative time synchronization between nodes within an array and the ability to establish range metrics between senders prior to being able to beamform to a specific receiver. Typically, arrays are custom built where such information is already known or can easily be calculated. However, the creation of an array from heterogeneous commodity hardware requires such calculations to be performed on-the-fly and repeatedly as there could be modifications to the array during signal emissions. This Defense Advanced Research Projects Agency (DARPA) topic is seeking technologies for achieving time synchronization and coherence from a cooperating set of commodity devices. Vibe performers will explore novel approaches and develop prototypes for establishing distributed frequency coherence between a set of commodity devices to be able to achieve beamforming to a known receiver. Vibe is interested in any hardware/software methods that can achieve beamforming while also minimizing customized hardware solutions, maintaining a small form factor, and leaving the hardware inconspicuous.

DESCRIPTION: Performers will develop novel approaches for utilizing commodity hardware for achieving distributed coherence and beamforming. Vibe prototypes should be able to demonstrate the ability to establish and maintain time synchronization necessary for coherent beamforming of a given frequency and waveform to a receiver. This can range from audible acoustic, ultrasonic, GSM, LTE, Bluetooth, WiFi, or other frequencies and waveforms of commercial/military interest and value. This receiver will also be controlled by the performer, but must also utilize COTS technologies to validate the transmitted signal.

PHASE I: This topic is soliciting Direct to Phase II (DP2) proposals only. Therefore, Phase I proposals will not be accepted or reviewed. Phase I feasibility will be demonstrated through evidence of: a completed feasibility study or a basic prototype system; definition and characterization of properties desirable for both Department of Defense (DoD) and civilian use; and comparisons with alternative state-of-the-art methodologies (competing approaches). This includes determining, insofar as possible, the scientific and technical merit and feasibility of ideas appearing to have application to the core objective of achieving coherence between a cooperating set of commodity devices. Proposers interested in submitting a DP2 proposal must provide documentation to substantiate that the scientific and technical merit and feasibility described above have been met and describe the potential military or commercial applications. DP2 documentation should include:

- technical reports describing results and conclusions of existing work, particularly regarding the commercial opportunity or DoD insertion opportunity, and risks/mitigations, assessments;
- presentation materials and/or white papers;
- technical papers;
- test and measurement data;
- prototype designs/models;
- performance projections, goals, or results in different use cases

This collection of material will verify mastery of the required content for DP2 consideration. DP2 proposers must also demonstrate knowledge, skills, and ability in computer science, mathematics, physics, electrical engineering, and software engineering. For detailed information on DP2 requirements and eligibility, please refer to the DoD BAA and the DARPA Instructions for this topic.

PHASE II: The goal of Vibe is to design and evaluate an array to achieve coherent signal transmission and beamforming utilizing commodity hardware. Proposals should include development, installation, integration, demonstration and/or test and evaluation of the proposed prototype system. These activities should focus specifically on:

1. Evaluating the adapted solution against the proposed objectives.
2. Describing in detail how the installed solution differs from the non-defense commercial offering to solve DoD need(s) as well as how it can be scaled for wide adoption, i.e., modified for scale and broader signals.
3. Identifying the proposed solution's clear transition path considering input from affected stakeholders, including but not limited to, end users, engineering, sustainment, contracting, finance, legal, and cyber. Specifying the solution's integration with other current and potential future solutions.
4. Describing the solution's sustainability, i.e., supportability. Identifying other specific DoD or Governmental customers for the solution.

Phase II will culminate in a system demonstration using one or more compelling use case(s) consistent with commercial opportunities, DoD opportunities, and/or insertion into a DARPA program. The below schedule of milestones and deliverables is provided to establish expectations and desired results for the Phase II effort.

Schedule/Milestones/Deliverables: Proposers will execute Research and Development (R&D) plan as described in their proposal. Proposers will also complete a commercialization plan that addresses relevant material costs and potential material/equipment suppliers.

- Month 1: Phase II Kickoff briefing (with annotated slides) to the DARPA Program Manager (PM) (in person or virtual, as needed) including: any updates to the proposed plan and technical approach, risks/mitigations, schedule (inclusive of dependencies) with planned capability milestones and deliverables, proposed metrics, and plan for prototype demonstration/validation.
- Months 3, 5, 7: Technical progress reports detailing technical progress made, tasks accomplished, major risks/mitigations, a technical plan for the remainder of Phase II (while this will normally report progress against the plan detailed in the proposal or presented at the Kickoff briefing, it is understood that scientific discoveries, competition, and regulatory changes may all have impacts on the planned work and DARPA must be made aware of any revisions that result), planned activities, trip summaries, and any potential issues or problem areas that require the attention of the DARPA PM.
- Month 9: Interim technical progress briefing (live system demo with annotated slides) to the DARPA PM (in-person or virtual as needed) detailing progress made (include quantitative assessment of capability developed to date), tasks accomplished, major risks/mitigations, planned activities, and technical plan for the remainder of Phase II, the demonstration/verification plan for the end of Phase II, trip summaries, and any potential issues or problem areas that require the attention of the DARPA PM.

- Month 12, 15, 18: Quarterly technical progress reports detailing technical progress made, tasks accomplished, major risks/mitigations, a technical plan for the remainder of Phase II (with necessary updates as in the parenthetical remark for Months 3, 5, and 7), planned activities, trip summaries, and any potential issues or problem areas that require the attention of the DARPA PM.
- Month 21/Final Phase II Deliverables: Final architecture demonstration with documented details, demonstrating the establishment of an array using commodity hardware with sufficient timing and ranging capabilities; demonstrating beamforming to a designated receiver, documented application programming interfaces; any other necessary documentation (including, at a minimum, user manuals and a detailed system design document; and the end of phase commercialization plan).

Proposers must demonstrate in their proposal the ability to apply for and obtain a Facility Clearance Letter (FCL) with secret safeguarding, or already possess an FCL with secret safeguarding by Phase III. Proposals must outline the proposer's security plan for conducting prototyping, software development and testing of DoD applications at the collateral secret level by Phase III. All proposals must be unclassified, but proposers may submit classified annexes with prior approval of the DARPA Information Innovation Office Program Security Officer (I2O PSO); for instructions on classified annex submittals, contact I2Osecurity@DARPA.mil. Security Classification Guides governing potential classified Vibe applications may be provided to authorized U.S. contractor proposers upon request.

PHASE III DUAL USE APPLICATIONS: Phase III work will be oriented towards transition and commercialization of the developed Vibe technologies. Phase III refers to work that derives from, extends, or completes an effort made under prior SBIR funding agreements, but is funded by sources other than the SBIR Program.

Primary Vibe support will be to national efforts in both commercial and military applications for novel signal delivery and resilient communications. Such technology can be used for protecting transmitters, localizing specific receivers, and providing signal in non-traditional environments.

REFERENCES:

1. K. Alemdar, D. Varshey, S. Mohanti, U. Muncuk, K. Chowdhury, "RFClock: Timing, Phase and Frequency Synchronization for Distributed Wireless Networks," ACM International Conference on Mobile Computing and Networking (MobiCom 2021), New Orleans, LA, USA, 2021.
2. F. Quitin, M. M. U. Rahman, R. Mudumbai and U. Madhow, "A Scalable Architecture for Distributed Transmit Beamforming with Commodity Radios: Design and Proof of Concept," in IEEE Transactions on Wireless Communications, vol. 12, no. 3, pp. 1418-1428, March 2013, doi: 10.1109/TWC.2013.012513.121029.

KEYWORDS: coherence, ranging, distributed coordination, beamforming

HR0011SB20234-02 TITLE: Synthetic User Personas (SUP)

OUSD (R&E) CRITICAL TECHNOLOGY AREA(S): Integrated Sensing and Cyber

OBJECTIVE: The objective of Synthetic User Personas (SUP) is to generate labeled, synthetic cyber data suitable for enabling machine learning algorithms that support holistic cyber defenses.

DESCRIPTION: Currently there is little to no labeled unified host and network data available to the cyber research community to facilitate the development and testing of machine learning algorithms for cyber defenses. Both network data, that captures network connections and packet flows, and host or endpoint data, that captures the use of applications and other activities on a machine, are necessary to build comprehensive cyber defenses.

There are two categories of existing datasets. The first is anonymized data from networks with human users such as that provided by the Los Alamos National Laboratory [1]. The second is synthetic data generated and collected from a cyber exercise [2]. The data generated using each approach has significant problems that prevent its use in developing and testing machine learning algorithms.

One strength of anonymized data is that none of the events are synthetic. The data represents the actual activity on the network from which it was collected. What anonymized data typically lacks, however, is any sense of ground truth. Anonymized data usually contains limited events, preventing more realistic enrichments and limiting the scope of detection algorithms that can be trained. Using anonymized data from a real network also raises the question of whether there was a malicious actor active when collecting the data, and as a result, there is malicious activity represented in the dataset. If there was a malicious actor, there is no reliable or practical way to identify the specific events that were produced by the actor's activity. As a result, such datasets are not suitable for training machine learning algorithms. Further, elements of anonymized datasets may not be consistent amongst each other since there may be correlations in the actual collected data that are not recognized and preserved by the anonymization process.

Alternatively, synthetic data can be easily and automatically annotated with ground truth (e.g., accurately identify and label benign and malicious events). However, to date, synthetic datasets lack the realism required to fully support development, training, and testing of machine learning algorithms. Synthetic datasets also typically contain unwanted artifacts that reduce or eliminate their value (e.g., artificial artifacts introduce biases when training machine learning algorithms).

The existence of unified endpoint and network data is rare because of several issues. First, the anonymization of endpoint data and network data both present unique challenges. Notably, the limitless variations of potential endpoint data makes anonymizing it impossible for arbitrary use cases. Preserving correlations among data elements in both types of data is also incredibly challenging, and again impossible for generalized cases. Second, the collection of endpoint data for research purposes typically requires Institutional Review Board approval. Third, the configuration management of and policies governing the endpoints may prohibit the deployment of a collection agent. Finally, most commercial agents do not make collected endpoint telemetry available for local analysis, instead sending it for centralized (e.g., cloud) processing.

SUP will implement synthetic agents designed to generate user activity without creating spurious network or host artifacts. SUP will not create a self-hosted agent that generates activity and filters out its own events from the event stream. Rather, SUP will passively and remotely interpret data (e.g., from a computer screen) to understand the machine state, and then interact with the machine using external input sources (e.g., keyboard and mouse), thus emulating human users. All of the generation activity is "off

box” so that no generational artifacts contaminate the collected data. This is a key factor in ensuring that the collected data is free of any spurious artifacts that may incorrectly bias machine learning algorithms generated from the synthetic data.

The “off box” synthetic agents implemented by SUP will be capable of scaling to at least five hundred (500) hosts within an enterprise test network. Additionally, SUP will provide for the ability to generate and record user activity and associated data without the addition of software on the subject hosts and without relying on remote logins to the subject hosts. Ideally, the lightweight “off box” synthetic agents will be built with a language that natively supports concurrency, enabling straightforward scaling well beyond the 500-host requirement.

SUP will be able to respond correctly and continue proper operation after unexpected pop-ups and other operating system notifications occur. This will be implemented without reliance on timeouts or waiting periods to avoid unknown dialogs; and SUP will not make any assumptions as to when dialogs may or may not appear.

SUP will continue to operate properly when the screen resolution changes unexpectedly (i.e., dependencies on image matching should work at any resolution without the need for code changes or a collection of images at every possible resolution).

Within an enterprise environment, typically there are many different types of employees and departments that need to be protected, each of which may represent different types of user behavior, with communications closely matching organizational groups and software use differing as well. SUP will enable the emulation of multiple user profiles to provide a variety of realistic user behaviors across the environment. User modeling efforts may span multiple levels of complexity. For example, activities may be performed at random, quickly changing from web browsing tasks to e-mail. Alternatively, a specific workflow may be defined, providing scripts or playbooks from which to draw on actions. Finally, complex emergent behaviors may be built on models of real human behavior.

Previous work has explored many approaches to user behavior modeling. Amirkhanyan et al. [3] looked at modeling user behavior using graphical methods called user behavior state graphs. Drawing on human factors research, Garg et al. [4] included features such as nervousness, typing speed, and mouse movement behaviors into user behavior patterns that could then be replicated in a testbed environment. Blythe et. al [5] explored using the Belief-Desire-Intention model for creating intelligent agents that were capable of using planning and reaction to achieve preset goals. These methods were demonstrated as part of the Deter Agents Simulating Human-Behavior module that is a part of DeterLab [6]. Additionally, the GHOSTS-SPECTRE project has also demonstrated use of machine learning methods to drive web browsing behavior in support of data generation while modeling changing user preferences [7]. Traditionally, user data generation has used an agent “on box.” The agent creates artifacts as a result of its activity and those artifacts must be filtered out if possible; otherwise, they may introduce biases into any learned algorithm.

PHASE I: This topic is soliciting Direct to Phase II (DP2) proposals only. Phase I feasibility will be demonstrated through evidence of: a completed feasibility study or a basic prototype system; definition and characterization of properties desirable for both Department of Defense (DoD) and civilian use; and comparisons with alternative state-of-the-art methodologies (competing approaches).

Proposers interested in submitting a DP2 proposal must provide documentation to substantiate that the scientific and technical merit and feasibility described above have been met and describe the potential commercial applications. DP2 documentation should include:

- technical reports describing results and conclusions of existing work, particularly regarding the commercial opportunity or DoD insertion opportunity, and risks/mitigations, and assessments;

- presentation materials and/or white papers;
- technical papers;
- test and measurement data;
- prototype designs/models;
- performance projections, goals, or results in different use cases; and,
- documentation of related topics such as how the proposed SUP solution can enable more realistic cyber training.

This collection of material will verify mastery of the required content for DP2 consideration. DP2 proposers must also demonstrate knowledge, skills, and ability in networking, computer science, mathematics, and software engineering. For detailed information on DP2 requirements and eligibility, please refer to the DoD BAA and the DARPA Instructions for this topic.

PHASE II: The goal of SUP is to generate realistic synthetic data that is void of artifacts and capable of scaling. An average cyber operator should not be able to determine that the data is synthetic by looking at the generated data, even when the operator has knowledge of typical human activity that was modeled when generating the synthetic data. The operator's view of user behavior is limited to the event activity of the user; the operator will not have visibility of the actual content created by the user. The SUP prototype should easily scale as a result of its architecture and implementation language.

DP2 proposals should present systems that:

- generate realistic synthetic data without artifacts such that an average operator cannot determine that the event data is synthetic; and
- scale to at least five hundred (500) end user machines.
- Phase II will culminate in a system demonstration using one or more compelling use cases consistent with commercial opportunities and/or insertion into a DARPA program. The below schedule of milestones and deliverables is provided to establish expectations and desired results/end products for the Phase II effort.

Deliverables must include:

- a software implementation of SUP for a virtualized test environment; and
- an example dataset generated by SUP suitable for machine learning research.

The Phase II Option period will further mature the technology for insertion into a larger DARPA Program, DoD/Intelligence Community (IC) Acquisition Program, another Federal agency; or commercialization into the private sector.

Schedule/Milestones/Deliverables: Proposers will execute the research and development (R&D) plan as described in the proposal.

- Month 1: Phase I Kickoff briefing (with annotated slides) to the DARPA Program Manager (PM) including: any updates to the proposed plan and technical approach, risks/mitigations, schedule (inclusive of dependencies) with planned capability milestones and deliverables, proposed metrics, and plan for prototype demonstration/validation.
- Months 4, 7, 10: Quarterly technical progress reports detailing technical progress made, tasks accomplished, major risks/mitigations, a technical plan for the remainder of Phase II (while this will normally report progress against the plan detailed in the proposal or presented at the Kickoff briefing, it is understood that scientific discoveries, competition, and regulatory changes may all have impacts on the planned work and DARPA must be made aware of any revisions that result), planned activities, trip summaries, and any potential issues or problem areas that require the attention of the DARPA PM.

- Month 12: Interim technical progress briefing (with annotated slides) to the DARPA PM detailing progress made (include quantitative assessment of capabilities developed to date), tasks accomplished, major risks/mitigations, planned activities, technical plan for the second half of Phase II, the demonstration/verification plan for the end of Phase II, trip summaries, and any potential issues or problem areas that require the attention of the DARPA PM.
- Month 15, 18, 21: Quarterly technical progress reports detailing technical progress made, tasks accomplished, major risks/mitigations, a technical plan for the remainder of Phase II (with necessary updates as in the parenthetical remark for Months 4, 7, and 10), planned activities, trip summaries, and any potential issues or problem areas that require the attention of the DARPA PM.
- Month 24 (Final Phase II Deliverables): Final technical progress briefing (with annotated slides) to the DARPA PM. Final architecture with documented details; a demonstration of the ability to generate artifact-free data at scale; documented application programming interfaces; and any other necessary documentation (including, at a minimum, user manuals and a detailed system design document; and the end-of-phase commercialization plan). Month 30 (Phase II Option period): Interim Option period technical progress briefing (with annotated slides) to the DARPA PM. Interim report of prototype performance against existing state-of-the-art technologies documenting key technical gaps towards productization.
- Month 36 (Phase II Option period): Final Option period technical progress briefing (with annotated slides) to the DARPA PM. Final Phase II Option period report of prototype performance against existing state-of-the-art technologies, including quantitative metrics for scalability, assessments of realism, and costs, risks, and schedule for implementation of the full prototype capability into a government-chosen test facility.

PHASE III DUAL USE APPLICATIONS: SUP has potential applicability across DoD, IC, U.S. Government (USG), and commercial entities. For DoD/IC/USG, SUP is extremely well-suited for large-scale cyber exercises, smaller-scale operator training, weapon system software testing, and automation of rote tasks. SUP has the same applicability as DoD/IC/USG for the commercial sector.

The Phase III work will be oriented towards transition and commercialization of the developed SUP technologies. The proposer is required to obtain funding from either the private sector, a non-SBIR Government source, or both, to develop the prototype into a viable product or non-R&D service for sale in military or private sector markets. Phase III refers to work that derives from, extends, or completes an effort made under prior SBIR funding agreements, but is funded by sources other than the SBIR Program. Primary SUP support will be to national efforts to explore application of artificial intelligence (AI) to improve generation of realistic user events captured during cyber-security testing on synthetic ranges. AI technologies will provide the foundation for developing sophisticated user behavior models that can be used in cyber range exercises. In particular, it is important that these models are realistic and do not bias machine learning approaches because of predictable artifacts. Results of SUP are intended to improve the quality of cyber ranges used across academia, industry, and government

REFERENCES:

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2. DARPA (2020) Operationally Transparent Cyber Data Release [Data Set]. Available at: <https://github.com/FiveDirections/OpTC-data>
3. Amirkhanyan, A., Sapegin, A., Gawron, M., Cheng, F., & Meinel, C. (2015, September). Simulation user behavior on a security testbed using user behavior states graph. In Proceedings of the 8th International Conference on Security of Information and Networks (pp. 217-223). Available at:

https://www.researchgate.net/publication/279535149_Simulation_User_Behavior_on_A_Security_Testbed_Using_User_Behavior_States_Graph

4. Garg, A., Vidyaraman, S., Upadhyaya, S., & Kwiat, K. (2006, April). USim: a user behavior simulation framework for training and testing IDSeS in GUI based systems. In 39th Annual Simulation Symposium (ANSS'06) (pp. 8-pp). IEEE. Available at: <https://cse.buffalo.edu/~shambhu/documents/pdf/USim.pdf>
5. Blythe, J., Botello, A., Sutton, J., Mazzocco, D., Lin, J., Spraragen, M., & Zyda, M. (2011, August). Testing cyber security with simulated humans. In Twenty-Third IAAI Conference. Available at: https://www.researchgate.net/publication/221016543_Testing_Cyber_Security_with_Simulated_Humans
6. University of Southern California Information Sciences Institute (USC-ISI). “The cyber DEfense Technology Experimental Research (DETER) Lab Capabilities.” The DETER Project, USC-ISI, https://deter-project.org/deterlab_capabilities#dash. July 5, 2022.
7. Carnegie Mellon University Software Engineering Institute (2020) GHOSTS-SPECTRE [Source Code] Available at: <https://github.com/cmu-sei/GHOSTS-SPECTRE>

KEYWORDS: Machine Learning, Cyber, Artificial Intelligence, Automation, Data, Analytics

OUSD (R&E) CRITICAL TECHNOLOGY AREA(S): Space Technology

The technology within this topic is restricted under the International Traffic in Arms Regulation (ITAR), 22 CFR Parts 120-130, which controls the export and import of defense-related material and services, including export of sensitive technical data, or the Export Administration Regulation (EAR), 15 CFR Parts 730-774, which controls dual use items. Offerors must disclose any proposed use of foreign nationals (FNs), their country(ies) of origin, the type of visa or work permit possessed, and the statement of work (SOW) tasks intended for accomplishment by the FN(s) in accordance with the Announcement. Offerors are advised foreign nationals proposed to perform on this topic may be restricted due to the technical data under US Export Control Laws.

OBJECTIVE: Develop a proof of concept metamaterial antenna specifically designed to provide space-based detection, tracking, and imaging of moving targets. The prototype should include fabrication of a metasurface aperture (sub tile) that can support wide angle, high-speed beamsteering, as well as any testing capabilities needed for capturing full antenna patterns from the prototype.

DESCRIPTION: Providing persistent, global, space-based detection, tracking, and imaging requires high-capacity and low-cost sensors. This cost is most acutely felt in the new low-cost “proliferated” space domain where space vehicle costs have been plummeting. The most suitable type of sensor for performance is a synthetic aperture radar (SAR) due to its ability to provide fast, wide field of regard to detect, track, and image multiple moving objects of interest regardless of weather. However, SARs are not cost effective to deploy aboard spacecraft in the numbers necessary to provide a persistent, global capability. Another option could be lower-cost fixed mesh-reflectors or planar arrays as they are capable of generating adequate antenna gain, but they lack the ability to electronically steer a beam, and can only image one or two targets per pass. Due to the lack of capability offered by fixed-beam systems and the prohibitive cost of using traditional SAR-equipped satellites for global coverage, DARPA is looking for cost-effective, fully-steerable track-while-scan radars that can be deployed in low earth orbit (LEO). To provide the cost-effective capability DARPA is looking for, metamaterial electronically scanned array (MESA) radars are of particular interest due to their ability to offer similar performance to traditional Active Electronically Scanned Arrays (AESAs), but at an order of magnitude less cost due to their simpler design. While MESAs technology has been developed for both ground and air applications, it has not yet been developed for deployment to and usage in space environments.

To detect and track objects over large areas (100s of square kilometers), the MESA would need to be constructed of coherent, digital tiles. A super-array of digital tiles though would require new means to solve coherence and calibration challenges, while also burdened with the extreme temperature variations and high orbital velocities experienced in a space environment.

In this effort, proposers will design and develop an operational electronically-steerable metamaterial antenna sub tile prototype, as well as:

- Design and develop a near-field probe antenna test system to capture full antenna patterns out of the antenna prototype
- Document manufacturing development steps necessary for the metamaterial antenna
- Develop all hardware and software to control drive electronics of active components of sub-tile to electronically steer a beam.

PHASE I: This topic is soliciting Direct to Phase II (DP2) proposals only. Previous Phase 1 qualified efforts should have demonstrated that they can design and produce an electronically steerable antenna

capable of achieving the metrics listed below. Results should be supported by prior demonstration or laboratory testing.

- Steerable to $\pm 60^\circ$ in azimuth and elevation with sub 1° steps
- Ability to survive high peak radiofrequency powers from 800W to 1200W for apertures 1m² and greater Efficiency data of 40% or greater at broadside
- Peak sidelobe levels of 15dB or greater at broadside
- Ability to steer large apertures ($150\frac{2\pi}{\lambda}$ Lambda or greater) in 10us or less

PHASE II: The Phase II effort consists of a Phase II base of 12 months and a Phase II option of 12 months. Phase II fixed payable milestones for this program should include:

- Month 2: Initial report on architecture and program plan
- Month 6: Interim report on system trade study and architecture, antenna design, and system requirements
- Month 12: Phase II report documenting status of X-band antenna design and development, antenna test platform, antenna manufacturing process development, and hardware/software to control drive electronics progress
- Month 18: Interim report documenting X-band antenna design and fabrication, antenna test platform design, antenna manufacturing results, and hardware/software to control drive electronics progress
- Month 24: Final Phase II report documenting X-band antenna design and test results, antenna test platform design and specifications, antenna manufacturing process, and verification results of hardware and software to control drive electronics

PHASE III DUAL USE APPLICATIONS: Metasurface Electronically Scanned Array (MESA) radars are currently high technology readiness level and in full-rate production, providing high-performance at low cost for both air and ground usage, for military and commercial applications. Further developing this metamaterial antenna technology to be operable in space while providing the performance needed for wide-area moving target indication would attract significant interest from space-focused agencies within the Department of Defense, and potentially commercial partners as well.

REFERENCES:

1. https://en.wikipedia.org/wiki/Active_electronically_scanned_array
2. https://en.wikipedia.org/wiki/Metamaterial_antenna
3. <https://www.microwavejournal.com/articles/27373-metamaterial-advances-for-radar-and-communications>

KEYWORDS: Metamaterials, Synthetic Aperture Radar, Electronical Scanned Arrays

APPENDIX A: DARPA DIRECT TO PHASE II (DP2) PROPOSAL INSTRUCTIONS

I. Introduction

A complete proposal submission consists of:

Volume 1: Proposal Cover Sheet

Volume 2: Technical Volume (feasibility documentation and technical proposal)

Volume 3: Cost Volume

Volume 4: Company Commercialization Report

Volume 5: Supporting Documents

Volume 6: Fraud, Waste and Abuse Training

The Defense SBIR/STTR Innovation Portal (DSIP) provides a structure for building the proposal volumes and submitting a consolidated proposal package. If this is your first time submitting an SBIR or STTR proposal using DSIP, please review detailed training guides at <https://www.dodsbirsttr.mil/submissions/learning-support/training-materials>. It is the responsibility of the proposing firm to ensure that a complete proposal package is certified and submitted by the close date listed in the topic to which they are responding.

To assist in proposal development, templates for Volume 2: Technical Volume and Volume 3: Cost Volume have been provided as attachments to the announcement posted at <https://www.dodsbirsttr.mil/submissions/login>. Use of these templates is mandatory.

NOTE: All proposers are required to submit Volume 4: Company Commercialization Report (CCR).

II. Proprietary Information

Proposers that include in their proposals data that they do not want disclosed to the public for any purpose, or used by the Government except for evaluation purposes, shall follow instructions in section 4.5 regarding marking propriety proposal information.

III. DP2 Proposal Instructions

a. Proposal Cover Sheet (Volume 1)

The Cover Sheet must include a brief technical abstract of no more than 3000 characters that describes the proposed R&D project with a discussion of anticipated benefits and potential commercial applications. Do not include proprietary or classified information in the Proposal Cover Sheet. If your proposal is selected for award, the technical abstract and discussion of anticipated benefits may be publicly released.

b. Format of Technical Volume (Volume 2) – standard format

1. The Technical Volume must include two parts, PART ONE: Feasibility Documentation and PART TWO: Technical Proposal.
2. Type of file: The Technical Volume must be a single Portable Document Format (PDF) file, including graphics. Perform a virus check before uploading the Technical Volume file. If a virus is detected, it may cause rejection of the proposal. Do not lock or encrypt the uploaded file. Do not

include or embed active graphics such as videos, moving pictures, or other similar media in the document.

3. Length: The length of each part of the technical volume (Feasibility Documentation and Technical Proposal) will be specified by the corresponding topic. The Government will not consider pages in excess of the page count limitations.
4. Layout: Number all pages of your proposal consecutively. Font size should not be smaller than 10-point on standard 8-1/2" x 11" paper with one-inch margins. The header on each page of the Technical Volume should contain your company name, topic number, and proposal number assigned by DSIP when the Cover Sheet was created. The header may be included in the one-inch margin.

c. Content of the Technical Volume (Volume 2) – Standard Format

PART ONE: Feasibility Documentation

1. Provide documentation to substantiate that the scientific and technical merit and feasibility described in the Phase I section of the topic has been met and describe the potential commercial applications. Documentation should include all relevant information including, but not limited to: technical reports, test data, prototype designs/models, and performance goals/results.
2. Maximum page length for feasibility documentation will be specified by the topic. If you have references, include a reference list or works cited list as the last page of the feasibility documentation. This will count towards the page limit.
3. Work submitted within the feasibility documentation must have been substantially performed by the proposer and/or the PI.
4. If technology in the feasibility documentation is subject to Intellectual Property (IP), the proposer must either own the IP, or must have obtained license rights to such technology prior to proposal submission, to enable it and its subcontractors to legally carry out the proposed work. Documentation of IP ownership or license rights shall be included in the Technical Volume of the proposal.
5. Include a one-page summary on Commercialization Potential addressing the following:
 - i. Does the company contain marketing expertise and, if not, how will that expertise be brought into the company?
 - ii. Describe the potential for commercial (Government or private sector) application and the benefits expected to accrue from this commercialization.

DO NOT INCLUDE marketing material. Marketing material will NOT be evaluated.

PART TWO: Standard Technical Proposal (applies to both 65 and 35-page volumes)

1. Significance of the Problem. Define the specific technical problem or opportunity addressed and its importance.
2. Phase II Technical Objectives. Enumerate the specific objectives of the Phase II work, and describe the technical approach and methods to be used in meeting these objectives.
3. Phase II Statement of Work. The statement of work should provide an explicit, detailed description of the Phase II approach, indicate what is planned, how and where the work will be carried out, a schedule of major events and the final product to be delivered. The methods planned to achieve each objective or task should be discussed explicitly and in detail. This section should be a substantial portion of the total proposal.
 - a. Human/Animal Use: Proposers proposing research involving human and/or animal use are encouraged to separate these tasks in the technical proposal and cost proposal in order to avoid potential delay of contract award.

- b. Phase II Option Statement of Work (if applicable, specified in the corresponding TOPIC). The statement of work should provide an explicit, detailed description of the activities planned during the Phase II Option, if exercised. Include how and where the work will be carried out, a schedule of major events and the final product to be delivered. The methods planned to achieve each objective or task should be discussed explicitly and in detail.
4. Related Work. Describe significant activities directly related to the proposed effort, including any conducted by the PI, the proposer, consultants or others. Describe how these activities interface with the proposed project and discuss any planned coordination with outside sources. The proposal must persuade reviewers of the proposer's awareness of the state of the art in the specific topic. Describe previous work not directly related to the proposed effort but similar. Provide the following: (1) short description, (2) client for which work was performed (including individual to be contacted and phone number) and (3) date of completion.
5. Relationship with Future Research or Research and Development.
 - i. State the anticipated results of the proposed approach if the project is successful.
 - ii. Discuss the significance of the Phase II effort in providing a foundation for Phase III research and development or commercialization effort.
6. Key Personnel. Identify key personnel who will be involved in the Phase II effort including information on directly related education and experience. A concise resume of the PI, including a list of relevant publications (if any), must be included. All resumes count toward the page limitation. Identify any foreign nationals you expect to be involved on this project.
7. Foreign Citizens. Identify any foreign citizens or individuals holding dual citizenship expected to be involved on this project as a direct employee, subcontractor, or consultant. For these individuals, please specify their country of origin, the type of visa or work permit under which they are performing and an explanation of their anticipated level of involvement on this project. Refer to section 3.2 of this BAA for more information. Supplemental information provided in response to this paragraph will be protected in accordance with the Privacy Act (5 U.S.C. 552a), if applicable, and the Freedom of Information Act (5 U.S.C. 552(b)(6)).
8. Facilities/Equipment. Describe available instrumentation and physical facilities necessary to carry out the Phase II effort. Items of equipment to be purchased (as detailed in the cost proposal) shall be justified under this section. Also state whether or not the facilities where the proposed work will be performed meet environmental laws and regulations of federal, state (name) and local Governments for, but not limited to, the following groupings: airborne emissions, waterborne effluents, external radiation levels, outdoor noise, solid and bulk waste disposal practices and handling and storage of toxic and hazardous materials.
9. Subcontractors/Consultants. Involvement of a university or other subcontractors or consultants in the project may be appropriate. If such involvement is intended, it should be identified and described according to the Cost Breakdown Guidance. Please refer to section 3 of this BAA for detailed eligibility requirements as it pertains to the use of subcontractors/consultants.
10. Prior, Current or Pending Support of Similar Proposals or Awards. If a proposal submitted in response to this topic is substantially the same as another proposal that was funded, is now being funded, or is pending with another Federal Agency, or another or the same DoD Component, you must reveal this on the Proposal Cover Sheet and provide the following information:
 - a. Name and address of the Federal Agency(s) or DoD Component to which a proposal was submitted, will be submitted, or from which an award is expected or has been received.

- b. Date of proposal submission or date of award.
- c. Title of proposal.
- d. Name and title of the PI for each proposal submitted or award received.
- e. Title, number, and date of BAA(s) or solicitation(s) under which the proposal was submitted, will be submitted, or under which award is expected or has been received.
- f. If award was received, state contract number.
- g. Specify the applicable topics for each proposal submitted or award received.

Note: If this does not apply, state in the proposal "No prior, current, or pending support for proposed work."

11. Transition and Commercialization Strategy. DARPA is equally interested in dual use commercialization of SBIR/STTR projects that result in products sold to the U.S. military, the private sector market, or both. DARPA expects explicit discussion of key activities to achieve this result in the transition and commercialization strategy part of the proposal. The Technical Volume of each Direct to Phase II proposal must include a transition and commercialization strategy section. The Phase II transition and commercialization strategy shall not exceed 5 pages, and will NOT count against the proposal page limit.

Information contained in the commercialization strategy section will be used to determine suitability for participation in EEI. Selection for participation in EEI will be made independently following selection for SBIR/STTR award. Please refer to section 3 of the Instructions for more information on the DARPA EEI and additional proposal requirements.

The transition and commercialization strategy should include the following elements:

- a. A summary of transition and commercialization activities conducted during Phase I, and the Technology Readiness Level (TRL) achieved. Discuss the market, competitive landscape, potential stakeholders and end-users, and how the preliminary transition and commercialization path or paths may evolve during the Phase II project. Describe key proposed technical milestones during Phase II that will advance the technology towards product such as: prototype development, laboratory and systems testing, integration, testing in operational environment, and demonstrations.
- b. Problem or Need Statement. Briefly describe what you know of the problem, need, or requirement, and its significance relevant to a Department of Defense application and/or a private sector application that the SBIR/STTR project results would address. Is there a broader societal need you are trying to address? Please describe.
- c. Description of Product(s) and/or System Application(s). Identify the commercial product(s) and/or DoD system(s), or system(s) under development, or potential new system(s). Identify the potential DoD end- users, Federal customers, and/or private sector customers who would likely use the technology.
- d. Business Model(s)/Procurement Mechanism(s). Discuss your current business model hypothesis for bringing the technology to market. Describe plans to license, partner, or self-produce your product. How do you plan to generate revenue? Describe the resources you expect will be needed to implement your business models. Discuss your plan and expected timeline to secure these resources. Understanding DARPA's goal of creating and sustaining a U.S. military advantage, describe how you intend to develop your product and supply chains to enable this differentiation.
- e. Target Market. Describe the market and addressable market for the innovation. Describe the customer sets you propose to target, their size, their growth rate, and the key reasons they would consider procuring the technology. Discuss the business economics and market drivers in the target industry. Describe competing technologies existent today on

- the market as well as those being developed in the lab. How has the market opportunity been validated? Describe the competition. How do you expect the competitive landscape may change by the time your product/service enters the market?
- f. Funding Requirements. Describe your company's funding history. How much external financing have you raised? Describe your plans for future funding sources (internal, loan, angel, venture capital, etc.).
 - g. Transition and Commercialization Risks. Describe the major technology, market and team risks associated with achieving successful transition of the DARPA funded technology. DARPA is not afraid to take risks but we want to ensure that our awardees clearly understand the risks in front of them. What are the key risks in bringing your innovation to market? What are actions you plan to undertake to mitigate these risks?
 - h. Expertise/Qualifications of Team/Company Readiness. Describe the expertise and qualifications of your management, marketing/business development and technical team that will support the transition of the technology from the prototype to the commercial market and into government operational environments. Has this team previously taken similar products/services to market? If the present team does not have this needed expertise, how do you intend to obtain it? What is the financial history and health of your company (e.g., availability of cash, profitability, revenue growth, etc.)?
 - i. Anticipated Transition and Commercialization Results. Include a schedule showing the anticipated quantitative transition and commercialization results from the Phase II project at one year after the start of Phase II, at the completion of Phase II, and after the completion of Phase II (i.e., amount of additional investment, sales revenue, etc.). After Phase II award, the company is required to report actual sales and investment data in its Company Commercialization Report at least annually.

Advocacy Letters (OPTIONAL)* Feedback received from potential Commercial and/or DoD customers and other end-users regarding their interest in the technology to support their capability gaps. Advocacy letters that are faxed or e-mailed separately will NOT be accepted.

Letters of Intent/Commitment (OPTIONAL)* Relationships established, feedback received, support and commitment for the technology with one or more of the following: Commercial customer, DoD PM/PEO, a Defense Prime, or vendor/supplier to the Primes and/or other vendors/suppliers identified as having a potential role in the integration of the technology into fielded systems/products or those under development. Letters of Intent/Commitment that are faxed or e- mailed separately will NOT be accepted.

*Advocacy Letters and Letters of Intent/Commitment are optional, and should ONLY be submitted to substantiate any transition or commercialization claims made in the commercialization strategy. Please DO NOT submit these letters just for the sake of including them in your proposal. These letters DO NOT count against any page limit.

In accordance with section 3-209 of DOD 5500.7-R, Joint Ethics Regulation, letters from government personnel will NOT be considered during the evaluation process.

d. Format of the Technical Volume (Volume 2) – White Paper & Slide Deck

1. The Technical Volume must include two parts, PART ONE: white paper and PART TWO: slide deck.
2. Type of file: The Technical Volume must be a single Portable Document Format (PDF) file, including graphics. Perform a virus check before uploading the Technical Volume file. If a virus

is detected, it may cause rejection of the proposal. Do not lock or encrypt the uploaded file. Do not include or embed active graphics such as videos, moving pictures, or other similar media in the document.

3. Length: The length of each part of the technical volume (white paper and side deck) will be specified by the corresponding TOPIC. The Government will not consider pages in excess of the page count limitations.
 4. Layout: Number all pages of your proposal consecutively. Font size should not be smaller than 10-point on standard 8-1/2" x 11" paper with one-inch margins. The header on each page of the Technical Volume should contain your company name, topic number, and proposal number assigned by DSIP when the Cover Sheet was created. The header may be included in the one-inch margin.
- e. Content of the Technical Volume (Volume 2) – White Paper & Slide Deck

White Paper (NTE 20 pages). Provide the following information:

Goals and Impact: Clearly describe what is being proposed and what difference it will make (qualitatively and quantitatively), including a brief discussion on how this directly relates to the topic.

1. Phase I Feasibility: This topic is accepting Direct to Phase II proposals ONLY. To be eligible, proposers must demonstrate that the feasibility requirements outlined in the topic have been met, and achieved outside of the SBIR program.
2. Technical Plan: Outline and address all technical areas and challenges inherent in the approach and possible solutions for overcoming potential problems. Provide specific objectives, metrics, and milestones at intermediate stages to demonstrate a plan for accomplishment of the project objectives. Propose additional appropriate qualitative and quantitative metrics specific to the approach, as needed. Intermediary milestones should occur at no greater than 1-month increments.
3. Management and Capabilities: Designate key personnel who will be involved in the Phase II effort. Provide a brief summary of expertise of the team, including subcontractors and key personnel. Describe the organizational experience in this technology area, previous work not directly related to the proposed effort but similar, existing intellectual property required to complete the project, and any specialized facilities to be used as part of the project. List Government-furnished materials or data assumed to be available. Describe any specialized facilities to be used as part of the project, the extent of access to these facilities, and any biological containment, biosafety, and certification requirements.
4. Transition and Commercialization Plan:
 - a. Describe the commercial product or DoD system to be developed.
 - b. Discuss the potential end users – DoD, Federal, and/or private sector customers. Discuss your business model for this technology (i.e., how to you anticipate generating revenue with this technology?). Who are you selling to directly or indirectly, a supplier, an integrator, or an end user?
 - c. Describe your company's funding history. Discuss how much additional funding above this proposed effort (include additional required technology development, staffing requirements, infrastructure requirements, IP strategy costs, etc.) that will be required to bring this technology to market and how you anticipate going about getting that funding (e.g., Govt S&T contracts, investment).

- d. Describe the timeline to maturity for sales or transition to an end user. Describe your IP strategy.
- e. Describe the technology, market, team and business risks associated with this proposed effort and your plan to mitigate these risks.

Slide Deck (NTE 20 slides). Provide the following information (convert the completed deck to a pdf and attach it to the white paper):

1. What are you trying to do and how does this directly relate to the topic?
2. Technology and commercial product: Specifically, what are you proposing to produce – software, system, application? Be specific on what your proposed technology development is targeting as an end state.
3. How is the technology approached today? Who is doing the research, development and delivering products/services? What are the current limitations in the technology and commercial marketplaces?
4. Technical and commercial value proposition: How have you substantiated the feasibility of your approach? What is innovative in your approach and how does it compare to the state-of-the-art? Why do you think it will be successful both from a technical and commercial perspective? If you are successful what difference will it make? Discuss your proposed business model – how do you expect to generate revenue from your technology?
5. Technical and commercial risks: What are the key technical and commercial challenges and how do you plan to address/overcome these?
6. Technical and commercial market analysis: Who will care and what will the impact be if you are successful? What/who are the markets/industries/integrators/stakeholders that would/should care?
7. Cost, schedule and milestones: Provide a summary of your cost volume. Provide a summary of your schedule and milestones. How much will your proposed effort cost in total? How long will it take? What are your technical milestones for achieving the proposed efforts? What are your transition and commercialization plan milestones? Discuss how much funding will be required to bring your proposed technology to market and execute on your proposed transition and commercialization plan. Include any funding raised to date and expected plans for raising any additional required funding (government contracting revenue, product sales, internal R&D investment, loan, angel or Venture Capital investment, etc.). Describe timeline to maturity for operational use or commercial sales.
8. Management: Overview of team, facilities and qualifications.
9. Technical summary quad chart: Use template provided at <https://www.darpa.mil/work-with-us/for-small-businesses/participate-sbir-sttr-program>.
10. Commercialization summary quad chart: Use the DARPA Transition and Commercialization Strategy Plan (TCSP) template, located at <https://www.darpa.mil/work-with-us/for-small-businesses/commercialization-continued>.

NOTE: All letters of recommendation and CVs can be loaded in Volume 5: Supporting Documents.

f. Format of Cost Volume (Volume 3)

Proposers are required to use the Direct to Phase II – Volume 3: Cost Proposal Template (Excel Spreadsheet) provided as an attachment to this announcement. The Cost Volume (and supporting documentation) DOES NOT count toward the page limit of the Technical Volume.

g. Content of the Cost Volume (Volume 3)

Some items in the Cost Breakdown Guidance below may not apply to the proposed project. If such is the case, there is no need to provide information on each and every item.

ALL proposed costs should be accompanied by documentation to substantiate how the cost was derived. For example, if you proposed travel cost to attend a project-related meeting or conference, and used a travel website to compare flight costs, include a screen shot of the comparison. Similarly, if you proposed to purchase materials or equipment, and used the internet to search for the best source, include your market research for those items. You do not necessarily have to propose the cheapest item or supplier, but you should explain your decision to choose one item or supplier over another. It's important to provide enough information to allow contracting personnel to understand how the proposer plans to use the requested funds. If selected for award, failure to include the documentation with your proposal will delay contract negotiation, and the proposer will be asked to submit the necessary documentation to the Contracting Officer to substantiate costs (e.g., cost estimates for equipment, materials, and consultants or subcontractors). It is important to respond as quickly as possible to the Contracting Officer's request for documentation.

Cost Breakdown Guidance:

1. List all key personnel by name as well as by number of hours dedicated to the project as direct labor. Special tooling and test equipment and material cost may be included. The inclusion of equipment and material will be carefully reviewed relative to need and appropriateness for the work proposed. The purchase of special tooling and test equipment must, in the opinion of the Contracting Officer, be advantageous to the Government and should be related directly to the specific topic. These may include such items as innovative instrumentation and/or automatic test equipment. Title to property furnished by the Government or acquired with Government funds will be vested with DARPA; unless it is determined that transfer of title to the contractor would be more cost effective than recovery of the equipment by the DARPA.
2. Cost for travel funds must be justified and related to the needs of the project.
3. Cost sharing is permitted for proposals under this announcement; however, cost sharing is not required nor will it be an evaluation factor in the consideration of a proposal.
4. All subcontractor costs and consultant costs must be detailed at the same level as prime contractor costs in regard to labor, travel, equipment, etc. Provide detailed substantiation of subcontractor costs in your cost proposal. Enter this information in the Explanatory Material section of the on-line cost proposal form. The Supporting Documents Volume (Volume 5) may be used if additional space is needed.

For more information about cost proposals and accounting standards, see the DCAA publication titled "Audit Process Overview – Information for Contractors" available at: <http://www.dcaa.mil>.

h. Company Commercialization Report (Volume 4)

The Company Commercialization Report (CCR) allows companies to report funding outcomes resulting from prior SBIR and STTR awards. The Company Commercialization Report (CCR) is required for

Phase I and Direct to Phase II proposals. Please refer to the DoD STTR Program BAA for full details on this requirement. Information contained in the CCR will not be considered by DARPA during proposal evaluations.

i. Supporting Documents (Volume 5)

In addition to required DoD documentation and certifications, small businesses may also submit additional documentation to support the Technical Volume (Volume 2) and the Cost Volume (Volume 3) in Volume 5.

j. Fraud Waste and Abuse (Volume 6)

The Fraud, Waste and Abuse (FWA) training is required for Phase I and Direct to Phase II proposals. FWA training provides information on what represents FWA in the SBIR/STTR program, the most common mistakes that lead to FWA, as well as the penalties and ways to prevent FWA in your firm. This training material must be thoroughly reviewed once per year. Plan ahead and leave ample time to complete this training based on the proposal submission deadline. Knowingly and willfully making any false, fictitious, or fraudulent statements or representations may be a felony under the Federal Criminal False Statement Act (18 U.S.C. Sec 1001), punishable by a fine of up to \$10,000, up to five years in prison, or both. Understanding the indicators and types of fraud, waste, and abuse that can occur is critical for the SBIR/STTR awardees' role in preventing the loss of research dollars.

**Defense Advanced Research Projects Agency (DARPA)
DoD 23.4 Small Business Innovation Research (SBIR) Annual BAA
Proposal Submission Instructions Release 2**

INTRODUCTION

DARPA’s mission is to make strategic, early investments in science and technology that will have long-term positive impacts on our national security. As part of this mission, DARPA makes high-risk, high-reward investments in science and technology that have the potential to disrupt current understandings and/or approaches. The pace of discovery in both science and technology is accelerating worldwide, resulting in new fields of study and the identification of scientific areas ripe for small business utilization through the SBIR and STTR programs. Small businesses are critical for developing technology to support national security. Proposers are encouraged to consider whether the R/R&D being proposed to DoD Components also has private sector potential, either for the proposed application or as a base for other applications. The topics below focus on technical domains important to DARPA’s mission pursuing innovative research concepts that fall within one of its technology offices. More information about DARPA’s technical domains and research topics of interest may be found at: <http://www.darpa.mil/about-us/offices>.

Proposers responding to a topic in this BAA must follow all general instructions provided in the Department of Defense (DoD) SBIR Program BAA. DARPA requirements in addition to or deviating from the DoD Program BAA are provided in the instructions below.

Specific questions pertaining to the administration of the DARPA Program and these proposal preparation instructions should be directed to: DARPA Small Business Programs Office at SBIR_BAA@darpa.mil. DSIP Topic Q&A will NOT be available for these DARPA topics. Technical questions related to improving the understanding of a topic’s requirements must be submitted to SBIR_BAA@darpa.mil by the deadline listed below.

The following dates apply to this DARPA Topic release:

- February 16, 2023:** Topics issued for pre-release
- March 07, 2023:** Topics open; DARPA begins accepting proposals via DSIP
- March 30, 2023:** Deadline for technical question submission
- April 06, 2023:** Deadline for receipt of proposals no later than **12:00 pm ET**

DIRECT TO PHASE II PROPOSAL GUIDELINES

Proposers should refer to the DARPA Direct to Phase II Proposal Instructions, provided in Appendix A.

Current Release Award Structure by Topic

| Topic Number | Direct to Phase II | | | | |
|------------------|--------------------|-------------|-----------------------------|---------------|------------|
| | Tech Volume* | Base Amount | Period of Performance (PoP) | Option Amount | Option PoP |
| HR0011SB20234-04 | 35 pages | \$1,400,000 | 18 months | \$600,000 | 6 months |
| HR0011SB20234-05 | 35 pages | \$1,200,000 | 24 months | \$600,000 | 12 months |
| HR0011SB20234-06 | 35 pages | \$750,000 | 12 months | \$500,000 | 12 months |

Technical Volume (Volume 2) – Abbreviated Standard Format (35-page)

If a proposer can provide adequate documentation to substantiate that the scientific and technical merit and feasibility described in the Phase I section of the topic has been met and describes the potential commercial applications, the Direct to Phase II (DP2) authority allows the Department of Defense (DoD) to make an award to a small business concern under Phase II of the SBIR program without regard to whether the small business concern was provided an award under Phase I of an SBIR program. This topic is accepting DP2 proposal submissions.

DP2 Feasibility Documentation shall not exceed 10 pages. DP2 Technical Proposal shall not exceed 20 pages. Phase II commercialization strategy shall not exceed 5 pages. This should be the last section of the Technical Volume and will not count against the 30-page limit.

Note: Please see Appendix A, section III (d) for complete instructions on the White Paper/Slide Deck technical volume format.

Content of the Technical Volume

Proposers should refer to the DARPA DP2 Proposal Instructions, provided in Appendix A and on the DARPA Small Business site (<https://www.darpa.mil/work-with-us/for-small-businesses/participate-sbir-sttr-program>).

Cost Volume (Volume 3)

Please see the chart above for award amounts listed by topic. Proposers are required to use the Direct to Phase II – Volume 3: Cost Proposal Template (Excel Spreadsheet) provided on the DARPA Small Business site (<https://www.darpa.mil/work-with-us/for-small-businesses/participate-sbir-sttr-program>). Subcontractors may also submit unsanitized costs using this template directly to DARPA at SBIR-BAA@darpa.mil.

Please review the updated Percentage of Work (POW) calculation details included in the DoD Program BAA. DARPA will occasionally accept deviations from the POW requirements with a letter of explanation or approval from the Funding Agreement officer.

Company Commercialization Report (CCR) (Volume 4)

Completion of the CCR as Volume 4 of the proposal submission in DSIP is required. Please refer to the DoD SBIR Program BAA for full details on this requirement. Information contained in the CCR will not be considered by DARPA during proposal evaluations.

Supporting Documents (Volume 5)

In addition to the documents required by DoD, small businesses may also submit additional documentation to support the Technical Volume (Volume 2) and the Cost Volume (Volume 3) in Volume 5.

DISCRETIONARY TECHNICAL AND BUSINESS ASSISTANCE (TAB A)

DARPA does not offer TAB A funding.

EVALUATION AND SELECTION

All proposals will be evaluated in accordance with the evaluation criteria listed in the DoD SBIR 2023.4 BAA. DARPA will conduct an evaluation of each conforming proposal. Proposals that do not comply with the requirements detailed in this BAA and the research objective(s) of the corresponding topic are considered non-conforming and therefore are not evaluated nor considered for award.

Using the evaluation criteria, the Government will evaluate each proposal in its entirety, documenting the strengths and weaknesses relative to each evaluation criterion, and, based on these identified strengths and weaknesses, determine the proposal's overall selectability. Proposals will not be evaluated against each other during the evaluation process, but rather evaluated on their own individual merit to determine how well the proposal meets the criteria stated in this BAA and the corresponding DARPA topic.

Awards will be made to proposers whose proposals are determined to be the most advantageous to the Government, consistent with instructions and evaluation criteria specified in the DoD SBIR 2023.4 BAA and availability of funding. Given the limited funding available for each topic released, not all proposals considered selectable will be selected for funding.

For the purposes of this proposal evaluation process, a selectable proposal is defined as follows:

Selectable: A selectable proposal is a proposal that has been evaluated by the Government against the evaluation criteria listed in the DoD SBIR 2023.4 BAA and DARPA topic, and the strengths of the overall proposal outweighs its weaknesses. Additionally, there are no accumulated weaknesses that would require extensive negotiations and/or a resubmitted proposal.

For the purposes of this proposal evaluation process, a non-selectable proposal is defined as follows:

Non-Selectable: A proposal is considered non-selectable when the proposal has been evaluated by the Government against the evaluation criteria listed in the DoD SBIR 2023.4 BAA and DARPA topic, and the strengths of the overall proposal do not outweigh its weaknesses.

Proposing firms will be notified of selection or non-selection status for a Phase I award within 90 days of the closing date of the DoD SBIR 2023.4 BAA. It is the policy of DARPA to treat all proposals as source selection information and to disclose their contents only for the purpose of evaluation. Restrictive notices notwithstanding, during the evaluation process, submissions may be handled by support contractors for administrative purposes and/or to assist with technical evaluation. All DARPA support contractors are expressly prohibited from performing DARPA-sponsored technical research and are bound by appropriate nondisclosure agreements. Input on technical aspects of the proposals may be solicited by DARPA from other Government and/or non-Government consultants/experts who are strictly bound by the appropriate non-disclosure requirements. No submissions will be returned. Upon completion of the evaluation and selection process, an electronic copy of each proposal received will be retained at DARPA.

Proposal titles, abstracts, anticipated benefits, and keywords of proposals that are selected for contract award will undergo a DARPA Policy and Security Review. Proposal titles, abstracts, anticipated benefits, and keywords are subject to revision and/or redaction by DARPA. Final approved versions of proposal titles, abstracts, anticipated benefits, and keywords may appear on the DoD SBIR/STTR awards website and/or the SBA's SBIR/STTR award website (<https://www.sbir.gov/sbirsearch/award/all>).

Refer to the DoD SBIR 2023.4 Program BAA for procedures to protest the Announcement. As further prescribed in FAR 33.106(b), FAR 52.233-3, Protests regarding the selection decision should be submitted to:

DARPA
Contracts Management Office (CMO)
675 N. Randolph Street
Arlington, VA 22203
E-mail: scott.ulrey@arpa.mil and sbir@arpa.mil

AWARD AND CONTRACT INFORMATION

1. General Award Information

Multiple awards are anticipated. DARPA may award FAR-based government contracts (Firm- Fixed Price or Cost-Plus Reimbursement) or Other Transactions for Prototypes agreement (under the authority of 10 U.S.C. § 4022) subject to approval of the Contracting Officer. The amount of resources made available for each topic issued under this BAA will depend on the quality of the proposals received and the availability of funds.

Majority Ownership in Part. Proposers that are more than 50% owned by multiple venture capital operating companies (VCOC), hedge funds (HF), private equity firms (PEF), or any combination of these as set forth in 13 C.F.R. § 121.702, are eligible to submit proposals in response to DARPA topics advertised within this BAA.

For proposers that are a member of this ownership class the following must be satisfied for proposals to be accepted and evaluated:

- a. Prior to submitting a proposal, firms must register with the SBA Company Registry Database.
- b. The proposer within its submission must submit the Majority-Owned VCOC, HF, and PEF Certification. A copy of the SBIR VC Certification can be found on <https://www.darpa.mil/work-with-us/for-small-businesses/participate-sbir-sttr-program>, under SBIR/STTR BAA Forms. Include the SBIR VC Certification in the Supporting Documents (Volume 5).
- c. Should a proposer become a member of this ownership class after submitting its proposal and prior to any receipt of a funding agreement, the proposer must immediately notify the Contracting Officer, register in the appropriate SBA database, and submit the required certification which can be found under SBIR/STTR BAA Forms and Templates on <https://www.darpa.mil/work-with-us/for-small-businesses/participate-sbir-sttr-program>.

The Government reserves the right to select for negotiation all, some, one, or none of the proposals received in response to this announcement and to make awards with or without communications with proposers. Additionally, the Government reserves the right to award all, some, one, or none of the options on the contract(s)/agreement(s) of the performers based on available funding and technical performance. If warranted, portions of resulting awards may be segregated into pre-priced options. Additionally, DARPA reserves the right to accept proposals in their entirety or to select only portions of proposals for award. In the event that DARPA desires to award only portions of a proposal, negotiations may be opened with that proposer. The Government reserves the right to fund proposals in phases with options for continued work, as applicable.

The Government reserves the right to request any additional, necessary documentation once it makes the award instrument determination. The Government reserves the right to remove a proposal from award consideration should the parties fail to reach agreement on award terms, conditions, and price within a reasonable time, and/or the proposer fails to provide requested additional information within three business days.

In all cases, the Government Contracting Officer reserves the right to select award instrument type, regardless of instrument type proposed, and to negotiate all instrument terms and conditions with selectees. DARPA will apply publication or other restrictions, as necessary, if it determines that the research resulting from the proposed effort will present a high likelihood of disclosing performance characteristics of military systems or manufacturing technologies that are unique and critical to defense. Any award resulting from such a determination will include a requirement for DARPA permission before

publishing any information or results on the program. For more information on publication restrictions, see the DoD SBIR 2023.4 BAA.

Because of the desire to streamline the award negotiation and program execution process, proposals identified for negotiation will result in negotiating a type of instrument for award that is in the best interest of the Government. In the case of an OT for Prototype agreement under DARPA's authority to award OTs for prototype projects, 10 U.S.C. § 4022, use of an OT provides significant opportunities for flexible execution to assist in meeting DARPA's aggressive SBIR/STTR program goals.

All proposers that wish to consider an OT award should carefully read the following:

The flexibility of the OT award instrument is beneficial to the program because the Performer will be able to apply its best practices as required to carry out the research project that may be outside of the Federal Acquisition Regulation (FAR) process-driven requirements. Streamlined practices will be used, such as milestone-driven performance, intended to reduce time and effort on award administration tasks and permit performers to focus on the research effort and rapid prototyping. Because of this ability, OTs provide the Agreements Officer the flexibility to create an award instrument that contains terms and conditions that promote commercial transition, reduce some administratively burdensome acquisition regulations, and meet SBIR/STTR program goals.

Proposers must only propose an OT agreement with fixed payable milestones. Fixed payable milestones are fixed payments based on successful completion of the milestone accomplishments agreed to in the milestone plan. Refer to the Other Transactions for Prototypes Fact Sheet and Other Transaction for Prototype Agreement, available at <https://www.darpa.mil/work-with-us/for-small-businesses/participate-sbir-sttr-program>. Specific milestones will be based upon the research objectives detailed in the topic.

Please see <https://www.darpa.mil/work-with-us/for-small-businesses/participate-sbir-sttr-program> for more information on OTs.

2. Transition and Commercialization Support Program (TCSP)

DARPA will provide services to Phase II or DP2 awardees upon contract execution through the Transition and Commercialization Support Program (TCSP) at no cost to awardees. The TCSP goal is to maximize the potential for SBIR/STTR companies to move their technology beyond Phase II and into other research and development programs for further maturity or into solutions or products for DoD acquisition programs, other Federal programs, and/or the commercial market. Please visit <https://www.darpa.mil/work-with-us/for-small-businesses/commercialization-continued> for more information on DARPA TCSP.

3. Embedded Entrepreneurship Initiative

Awardees of SBIR funding pursuant to this BAA may be eligible to participate in the DARPA Embedded Entrepreneurship Initiative (EEI) during the Period of Performance. Invitation to participate in EEI is at the sole discretion of the Government based on evaluation of technical and commercial factors and subject to program balance and the availability of funding. EEI is a limited scope program offered by DARPA, at DARPA's discretion, to a small subset of awardees. The goal of DARPA's EEI is to increase the likelihood that DARPA-funded technologies take root in the U.S. and provide new capabilities for national defense. EEI supports DARPA's mission "to make pivotal investments in breakthrough technologies and capabilities for national security" by accelerating the transition of innovations out of the lab and into new capabilities for the Department of Defense (DoD). EEI investment supports development of a robust and deliberate Go-to-Market strategy for selling technology product to the government and commercial markets and positions DARPA awardees to attract U.S. investment. The following is for informational and planning purposes only and does not constitute solicitation of proposals to the EEI.

There are three elements to DARPA's EEI: (1) A Senior Commercialization Advisor (SCA) from DARPA who works with the Program Manager (PM) to examine the business case for the awardee's technology and uses commercial methodologies to identify steps toward achieving a successful transition of technology to the government and commercial markets; (2) Connections to potential industry and investor partners via EEI's Investor Working Groups; and (3) Additional funding on an awardee's contract for the awardee to hire an embedded entrepreneur to achieve specific milestones in a Go-to-Market strategy for transitioning the technology to products that serve both defense and commercial markets. This embedded entrepreneur's qualifications should include business experience within the target industries of interest, experience in commercializing early stage technology, and the ability to communicate and interact with technical and non-technical stakeholders. Funding for EEI is typically no more than \$250,000 per awardee over the duration of the award. An awardee may apportion EEI funding to hire more than one embedded entrepreneur, if achieving the milestones requires different expertise that can be obtained without exceeding the awardee's total EEI funding. The EEI effort is intended to be conducted concurrent with the research program without extending the period of performance.

EEI Application Process:

After receiving an award under the solicitation, awardees interested in being considered for EEI should notify their DARPA Program Manager (PM) during the period of performance. Timing of such notification should ideally allow sufficient time for DARPA and the awardee to review the awardee's initial transition plan, identify milestones to achieve under EEI, modify the award, and conduct the work required to achieve such milestones within the original award period of performance. These steps may take 9-18 months to complete, depending on the technology. If the DARPA PM determines that EEI could be of benefit to transition the technology to product(s) the Government needs, the PM will refer the performer to DARPA Commercial Strategy.

DARPA Commercial Strategy will then contact the performer, assess fitness for EEI, and in consultation with the DARPA technical office, determine whether to invite the performer to participate in the EEI. Factors that are considered in determining fitness for EEI include DoD/Government need for the technology; competitive approaches to enable a similar capability or product; risks and impact of the Government's being unable to access the technology from a sustainable source; Government and commercial markets for the technology; cost and affordability; manufacturability and scalability; supply chain requirements and barriers; regulatory requirements and timelines; Intellectual Property and Government Use Rights, and available funding.

Invitation to participate in EEI is at the sole discretion of DARPA and subject to program balance and the availability of funding. EEI participants' awards may be subsequently modified bilaterally to amend the Statement of Work to add negotiated EEI tasks, provide funding, and specify a milestone schedule which will include measurable steps necessary to build, refine, and execute a Go-to-Market technology transition plan aimed at delivering new capabilities for national defense. Milestone examples are available at: <https://www.darpa.mil/work-with-us/contract-management>.

Awardees under this solicitation are eligible to be considered for participation in EEI, but selection for award under this solicitation does not imply or guarantee participation in EEI.

For more information please refer to the EEI website <https://eei.darpa.mil/>.

4. DARPA Toolbox Initiative

DARPA Toolbox is an Agency-wide effort to provide open licensing opportunities with commercial technology vendors to the researchers behind DARPA programs. DARPA Toolbox provides easy, low-cost, scalable access to state-of-the-art tools and intellectual property (IP) under predictable legal terms

and streamlined acquisition procedures. The goal is to reduce performer reliance on low-quality, low-cost tools and IP that increase execution risks and complicate post-DARPA transitions.

Through this initiative, DARPA performers are granted access to select vendor tools and technologies throughout the life of their contractual relationship with the Agency. The Toolbox suppliers bring to the table proven technologies commonly used in state-of-the art commercial microelectronics or system design methodologies.

DARPA Toolbox program information and a full list of participating suppliers can be found at <https://www.darpa.mil/work-with-us/darpa-toolbox-initiative>. If there are tool or technologies of interest, contact the Supplier POC listed for the product, referencing the DARPA Toolbox Initiative. The Supplier POC will provide advice on products and pricing information. Include any non-production pricing quotes in your proposal. Products and pricing are between you and the suppliers – *do not* contact DARPA directly.

ADDITIONAL INFORMATION

DARPA intends to use electronic mail for all correspondence regarding these topics. Questions related to the technical aspect of the research objectives and awards specifically related to a topic should be emailed to SBIR_BAA@darpa.mil. Please reference the topic number in the subject line. All questions must be in English and must include the name, email address, and the telephone number of a point of contact.

DARPA will attempt to answer questions in a timely manner; however, questions submitted within seven (7) calendar days of the proposal due date listed herein may not be answered. DARPA will post a consolidated Frequently Asked Questions (FAQ) document. To access the posting please visit: <http://www.darpa.mil/work-with-us/opportunities>. Under the topic number summary, there will be a link to the FAQ. The FAQ will be updated on an ongoing basis until one week prior to the proposal due date.

Technical support for the Defense SBIR/STTR Innovation Portal (DSIP) is available Monday through Friday, 9:00 a.m. – 5:00 p.m. ET. Requests for technical support must be emailed to DoDSBIRSupport@reisystems.com with a copy to SBIR_BAA@darpa.mil.

DARPA SBIR 23.4 Topic Index
Release 2

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| HR0011SB20234-04 | Super-resolution Thermal Metrology for High Power Density Devices |
| HR0011SB20234-05 | Wearables at the Edge to Augment Readiness (WEAR) |
| HR0011SB20234-06 | Exploiting Sparsity in Python (ESPy) |

HR0011SB20234-04 TITLE: Super-resolution Thermal Metrology for High Power Density Devices

OUSD (R&E) CRITICAL TECHNOLOGY AREA(S): Microelectronics

OBJECTIVE: This topic seeks to develop a super-resolution thermal metrology tool to enable accurate characterization of semiconductor materials and devices, and wide bandgap and ultra-wide bandgap materials and devices, in particular, at nanometer length scale.

DESCRIPTION: Radar and communication systems are ubiquitous in both military and commercial applications. In these platforms, system performance can be improved by increasing the radio frequency (RF) output power of the transmitter power amplifier (PA), which is directly proportional to the output power density of the PA transistor. However, the operating output power densities achieved in today's wide bandgap transistors are thermally limited to values substantially below theoretical electronic limits. The government has an interest in developing technologies to overcome these thermal limitations and realize robust, high-power density transistors that operate near their fundamental electronic limit of RF output power, with a focus on achieving high power density through reduction in transistor thermal resistance [1]. Success requires metrology that can accurately measure thermal resistance and interfacial thermal resistance of a variety of material and device structures. Furthermore, these measurements are required to verify that performer high-power transistors meet program metrics.

Existing thermal metrology tools often use pump-probe laser-based techniques, such as time-domain thermoreflectance (TDTR), frequency-domain thermoreflectance (FDTR), and recent variants such as steady state thermoreflectance (SSTR)[2] . While these techniques are useful for the measurement of thermal resistance in thin films and interfaces, they are limited in spatial resolution [2,3], and cannot measure thermal resistance and thermal resistance gradients in submicron devices. The ability to measure thermal resistance beyond the surface film (i.e., in the buried channel layer of a heterojunction device) and also characterize at both nanoscale and microscale dimensions, is critical to the development of high power density devices. The purpose of this direct to Phase II (DP2) SBIR topic is to develop a super-resolution thermal metrology tool that enables accurate characterization of the thermal resistance of semiconductor materials, heterostructures and devices, particularly wide bandgap and ultra-wide bandgap materials and devices at nanometer length scale. The tool must be capable of measuring both epilayers and operating devices with a thermal resolution less than 0.25 °C, thermal precision of 1 °C, spatial resolution below 50 nm, accuracy above 90%, and reproducibility and repeatability less than 2%. Specific measurement capabilities include thermal resistance, thermal boundary resistance of interfaces, and temperature of an operating device and, in particular, buried channel layers. The device-scale measurements must characterize both the surface and cross-section of a multi-finger, submicron GaN high-electron-mobility transistor (HEMT) and an ultra-wide bandgap AlGaIn HEMT. In addition, a comprehensive validation plan should be provided. For example, the plan should include device-relevant material structures, such as GaN transistor layers, that are compared to other thermal measurement techniques for verification of results. The plan may also incorporate National Institute of Standards and Technology (NIST) standards. The final Phase II base deliverable will be a laboratory demonstration of the thermal metrology tool, along with a plan for construction of tool and delivery to a U.S. government organization. The Phase II option of this topic will address the development of this thermal metrology tool into an automated, turnkey system that will be delivered to a U.S. government laboratory. The deliverables of the Phase II option will include both the tool, calibration standards, and any necessary software for demonstrating material and device thermal characterization. Finally, on-site support will be required to ensure proper installation and operation at the U.S. government organization.

PHASE I: This topic is soliciting Direct to Phase II (DP2) proposals only. This DP2 SBIR requires documentation of existing thermal metrology capabilities and a proposed plan with supporting analysis showing that achieving 50 nm spatial resolution with high precision and accuracy is feasible. The

documentation must include measured data, including thermal resistance, from existing thermal metrology techniques demonstrating less than 2 μm spatial resolution and the ability to resolve interfaces beyond the surface film. In addition, validation data from the existing thermal metrology tool should be provided.

PHASE II: The proposed plan must describe the path towards a successful final DP2 SBIR deliverable which meets the requirements listed below. This DP2 SBIR will have an 18-month duration in which the super-resolution thermal metrology tool will be designed, developed, validated, and tested for performance goals. The requirements of the thermal metrology tool are:

1. Capable of measuring thermal resistance, thermal boundary resistance, and temperature of operating multi-finger, submicron GaN HEMT and ultra-wide bandgap AlGaIn HEMT with the following specifications:
 - a. Spatial resolution < 50 nm
 - b. Thermal resolution < 0.25 $^{\circ}\text{C}$
 - c. Thermal precision: 1 $^{\circ}\text{C}$
 - d. Accuracy > 90%
 - e. Reproducibility and repeatability < 2%
2. Tool validation using a comparison of measured results of device relevant structures to other thermal metrology techniques. In addition, validation may use available NIST standards.

Phase II (base) fixed milestones include:

- Month 1: Detailed report on super-resolution thermal metrology tool design, including documentation of path towards achieving in-situ device testing and meeting DP2 SBIR goals.
- Month 3: Report on progress towards final design and demonstration of thermal metrology tool.
- Month 6: Report on progress towards final design and demonstration of thermal metrology tool.
- Month 9: Report on progress towards final design and demonstration of thermal metrology tool.
- Month 12: Initial prototype demonstration of super-resolution thermal metrology tool. Detailed report should include validation data as well as thermal resistance, temperature, and thermal resolution of the surface and cross-section of GaN and AlGaIn transistors with less than 100 nm spatial resolution. Documentation should also describe the path towards the final DP2 SBIR deliverable.
- Month 15: Detailed report on progress towards final design and demonstration of the thermal metrology tool, including validation data and transistor thermal characterization.
- Month 18: Final demonstration of a prototype thermal metrology tool that meets requirements listed above. Detailed data report containing final validation measurements and thermal characterization of surface and cross-section of GaN and AlGaIn transistors with less than 50 nm spatial resolution. Plan for construction of tool and delivery to a U.S. government organization.

Phase II (option) This DP2 SBIR will have a 6-month option in which the super-resolution thermal metrology tool demonstrated in Phase II will be developed into a turn-key, push-button, automated system. A Phase II option final report will detail the successful demonstration of a fully-automated measurement of the thermal resistance, thermal boundary resistance, temperature, and thermal resolution of an operating multi-finger, submicron GaN HEMT and ultra-wide bandgap AlGaIn HEMT. The DP2 option will also include:

1. Delivery of prototype automated, turnkey thermal metrology tool to a designated U.S. government organization.
2. Support for installation and operation at the U.S. government laboratory.
3. Demonstration of thermal characterization of GaN HEMT and ultra-wide bandgap AlGaIn HEMT on-site at the U.S. government organization.

Phase II (option) fixed milestones include:

- Month 1: Detailed report on automated, push-button thermal metrology tool design and path toward achieving DP2 Option goals. Coordinate with the designated U.S. government organization to provide a preliminary plan for delivery and installation.
- Month 3: Report on thermal metrology tool development progress.
- Month 6: Delivery of final prototype thermal metrology tool, including calibration standards and any necessary software for demonstrating material and device thermal characterization. Detailed report containing final validation measurements and thermal characterization of surface and cross-section of GaN and AlGaIn transistors with less than 50 nm spatial resolution.

PHASE III DUAL USE APPLICATIONS: This SBIR will enable a commercially available, automated thermal metrology tool for use by academia, semiconductor foundries (commercial and defense), and material vendors. Specifically, this technology will provide high resolution thermal metrology so that transistor developers can accurately characterize the thermal resistance and temperature of a wide variety of films, material structures, devices, and packages. This thermal characterization data can be incorporated into device modeling and design, enabling devices with higher power density and improved robustness for a wide range of defense and commercial radar and communication applications.

REFERENCES:

- [1] DARPA Broad Agency Announcement, Technologies for Heat Removal in Electronics at the Device Scale (THREADS), Microsystems Technology Office, HR001123S0013, November 18, 2022.
- [2] Olson, David, et al., "Spatially resolved thermoreflectance techniques for thermal conductivity measurements from the nanoscale to the mesoscale", *Journal of Applied Physics* 126, 2019.
- [3] Yuan, Chao, et al., "A review of thermoreflectance techniques for characterizing wide bandgap semiconductors' thermal properties and devices' temperatures," *Journal of Applied Physics* 132, 2022.

KEYWORDS: Microelectronics, thermal metrology, thermoreflectance, thermal resistance, temperature, transistor, wide bandgap, ultra-wide bandgap

HR0011SB20234-05 TITLE: Wearables at the Edge to Augment Readiness (WEAR)

OUSD (R&E) CRITICAL TECHNOLOGY AREA(S): Advanced Materials, Microelectronics

OBJECTIVE: The objective of the Wearables at the Edge to Augment Readiness (WEAR) SBIR topic is to develop a secure and lightweight framework for real-time analysis of sensory data from wearables to monitor warfighter health and readiness at the edge.

DESCRIPTION: Wearable technology is now fundamental to all areas of the human ecosystem. The term wearable technology refers to small electronic and mobile devices, or computers with wireless communications capability that are incorporated into gadgets, accessories, or clothes, which can be worn on the human body [1]; for the purposes of this SBIR topic, it does not apply to invasive versions such as micro-chips or smart tattoos. Wearable technology can provide invaluable physiological and environmental data that can potentially be used to assess a warfighters' physical/mental wellness and readiness.

Modern edge devices, like smartphones and smart watches, are equipped with an ever-increasing set of sensors, such as accelerometers, magnetometers, gyroscopes, etc., that can continuously record users' movements and motion [2]. The observed patterns can be an effective tool for seamless Human Activity Recognition which is the process of identifying and labeling human activities by applying Artificial Intelligence (AI)/Machine Learning (ML) to sensor data generated by smart devices both in isolation and in combination [3, 4].

However, smartphone and wearable sensor signals are typically noisy and can lack context/causality due to inaccurate timestamps when the device sleeps, goes into low-power mode, or experiences high resource utilization. Thus, it can be challenging to fuse any of the various raw sensor data to achieve positive or negative assessment in wellness areas such as personal healthcare, injuries, fall detection, as well as monitoring functional/behavioral health. For instance, sensor data can be processed into feature data related to sleep or different physical activities that potentially correlate to effects on an individual's health [5, 6].

The objective of WEAR is to develop a secure and lightweight framework for real-time analysis of sensory data from wearables to monitor warfighter health and readiness at the edge. Importantly, WEAR will achieve this goal while consuming less than 5% of the wearable battery over 10 days, assuming an initial full battery charge. The battery consumption metric is of particular interest to WEAR as warfighters at the edge (e.g., expeditionary forces deployed to remote locations or Special Operations Forces units) may not be able to recharge wearable batteries due to mission constraints limiting access to power sources for re-charging. Equally important is the need for all processing to occur at the edge because of security concerns [8]. Existing commercial efforts require cloud and off-premises server resources to analyze sensor data.

PHASE I: This topic is soliciting Direct to Phase 2 (DP2) proposals only. Phase I feasibility will be demonstrated through evidence of: a completed proof of concept/principal or basic prototype system; definition and characterization of framework properties/technology capabilities desirable for both Department of Defense (DoD)/government and civilian/commercial use; and capability/performance comparisons with existing state-of-the-art technologies/methodologies (competing approaches). Entities interested in submitting a DP2 proposal must provide documentation to substantiate that the scientific/technical merit and feasibility described above has been achieved and also describe the potential commercial applications. DP2 Phase I feasibility documentation should include:

- technical reports describing results and conclusions of existing work, particularly regarding the commercial opportunity or DoD insertion opportunity, risks/mitigations, and technology assessments;
- presentation materials and/or white papers;
- technical papers;
- test and measurement data;
- prototype designs/models;
- performance projections, goals, or results in different use cases; and,
- documentation of related topics such as how the proposed WEAR solution can enable accurate and reliable analysis of sensory data at the edge.

This collection of material will verify mastery of the required content for DP2 consideration. DP2 proposers must also demonstrate knowledge, skills, and abilities in AI/ML, data analytics, edge technologies, software development/engineering, and mobile security/privacy. For detailed information on DP2 requirements and eligibility, please refer to the DoD Broad Agency Announcement and the DARPA Instructions for this topic.

PHASE II: The Personal Health Determinations (WEAR) SBIR topic seeks to develop a secure and lightweight framework that can perform real-time analysis of sensory data from wearables to monitor warfighter operational health and readiness at the edge, while consuming less than 5% of the wearable battery over 10 days, assuming an initial full battery charge (i.e., WEAR component overhead can be no more than 5% of the wearable battery over 10 days).

One potential direction to achieve this goal is to leverage advances in low-power sensing at the chipset level present in modern mobile and wearable devices, including but not limited to “always-on sensing.” The primary interest is in commercial-off-the-shelf hardware paired with novel sensor drivers and algorithms developed to operate at low power. A secondary objective is to offer modular application programming interfaces (APIs) to access sensor data and edge ML models/algorithms that can fit into the resource-constrained environments of commercial wearables. The end goal is the capability to monitor and accurately assess warfighter operational health and readiness by using the sensory information on the edge devices without transporting information outside of the wearable or smartphone devices. Any custom hardware or sensors are out of scope for this solicitation.

DP2 proposals should:

- describe a proposed framework design/architecture to achieve the above stated goals;
- present a plan for maturation of the framework to a demonstrable prototype system; and
- detail a test plan, complete with proposed metrics and scope, for verification and validation of the prototype system performance.

Phase II will culminate in a prototype system demonstration using one or more compelling use cases consistent with commercial opportunities and/or insertion into a DARPA program (e.g., Warfighter Analytics using Smartphones for Health (WASH [7]), which seeks to use data collected from cellphone sensors to enable novel algorithms that conduct passive, continuous, real-time assessment of the warfighter).

The Phase II Option period will further mature the technology for insertion into a DoD/Intelligence Community (IC) Acquisition Program, another Federal agency; or commercialization into the private sector.

The below schedule of milestones and deliverables is provided to establish expectations and desired results/end products for the Phase II and Phase II Option period efforts.

Schedule/Milestones/Deliverables: Proposers will execute the research and development (R&D) plan as described in the proposal, including the below:

- Month 1: Phase I Kickoff briefing (with annotated slides) to the DARPA Program Manager (PM) including: any updates to the proposed plan and technical approach, risks/mitigations, schedule (inclusive of dependencies) with planned capability milestones and deliverables, proposed metrics, and plan for prototype demonstration/validation.
- Months 4, 7, 10: Quarterly technical progress reports detailing technical progress to date, tasks accomplished, risks/mitigations, a technical plan for the remainder of Phase II (while this would normally report progress against the plan detailed in the proposal or presented at the Kickoff briefing, it is understood that scientific discoveries, competition, and regulatory changes may all have impacts on the planned work and DARPA must be made aware of any revisions that result), planned activities, trip summaries, and any potential issues or problem areas that require the attention of the DARPA PM.
- Month 12: Interim technical progress briefing (with annotated slides) to the DARPA PM detailing progress made (including quantitative assessment of capabilities developed to date), tasks accomplished, risks/mitigations, planned activities, technical plan for the second half of Phase II, the demonstration/verification plan for the end of Phase II, trip summaries, and any potential issues or problem areas that require the attention of the DARPA PM.
- Month 15, 18, 21: Quarterly technical progress reports detailing technical progress made, tasks accomplished, risks/mitigations, a technical plan for the remainder of Phase II (with necessary updates as in the parenthetical remark for Months 4, 7, and 10), planned activities, trip summaries, and any potential issues or problem areas that require the attention of the DARPA PM.
- Month 24: Final technical progress briefing (with annotated slides) to the DARPA PM. Final architecture with documented details; a demonstration of the ability to perform real-time analysis of sensory data at the edge while consuming less than 5% of the wearable battery over 10 days; documented APIs; and any other necessary documentation (including, at a minimum, user manuals and a detailed system design document; and the commercialization plan).
- Month 30 (Phase II Option period): Interim report of matured prototype performance against existing state-of-the-art technologies, documenting key technical gaps towards productization.
- Month 36 (Phase II Option period): Final Phase II Option period technical progress briefing (with annotated slides) to the DARPA PM including prototype performance against existing state-of-the-art technologies, including quantitative metrics for battery consumption and assessment of monitoring/assessment capabilities to support determinations of warfighter health status.

PHASE III DUAL USE APPLICATIONS: Phase III Dual use applications (Commercial DoD/Military): WEAR has potential applicability across DoD and commercial entities. For DoD, WEAR is extremely well-suited for continuous, low-cost, opportunistic monitoring of warfighter health in the field, where specialized equipment and medical experts are not necessarily available. WEAR has the same applicability for the commercial sector and has the potential to provide doctors and physicians with invaluable historical patient health data that can be correlated to their activities, environment, and physiological responses.

Phase III refers to work that derives from, extends, or completes an effort made under prior SBIR funding agreements, but is funded by sources other than the SBIR Program. The Phase III work will be oriented towards transition and commercialization of the developed WEAR technologies. The proposer is required to obtain funding from either the private sector, a non-SBIR Government source, or both, to develop the prototype into a viable product or non-R&D service for sale in military or private sector markets. Primary WEAR support will be to national efforts to explore the ability to collect and fuse sensor data and apply ML algorithms at the edge to that data in a manner that does not drain device battery. Results of

WEAR are intended to improve healthcare monitoring and assessment at the edge, across government and industry.

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KEYWORDS: Wearable Technology, Health Monitoring, Health Assessment, Data Analytics, Edge Technology, Activity Recognition, Machine Learning

HR0011SB20234-06 TITLE: Exploiting Sparsity in Python (ESPy)

OUSD (R&E) CRITICAL TECHNOLOGY AREA(S): Advanced Computing and Software

OBJECTIVE: Extend the scientific Python programming ecosystem to incorporate a rich set of matrix and tensor operations supported by a compilation system capable of automatic efficient code generation for execution on a range of run-time hardware architectures, including hardware with features that optimize or accelerate operations on sparse data.

DESCRIPTION: Of the nearly 44 zettabytes of data humans have gathered to date, most of it is collected, processed and stored as multi-dimensional arrays or tensors. From the earliest computer and the first FORTRAN compiler, we have perfected how to store and compute dense tensor data. However, a large portion of the data, either obtained from nature or generated by humans, is sparse. The Python programming environment is increasingly the tool of choice for scientific processing, but it has poor support for sparsity; current practice is to ignore the sparsity and treat the data as dense, incurring unnecessary overhead, or to transform the data into unnatural dense formats, making the programs much more complicated. Capitalizing on sparsity can greatly increase the efficiency of scientific computations, but the challenge is that there are a large number of sparse data formats, each of which takes advantage of particular features of the data; the algorithms that operate on these different data formats are then specialized to exploit the advantages of the specific data formats. An additional challenge is that there are a variety of hardware accelerators for matrix and tensor computations, ranging from features in conventional CPUs and GPUs to new hardware capabilities that have been developed to accelerate computations on sparse data. Dealing with this complexity is a challenge that is not within the reach of most programmers. The objective of this effort is to make the processing of sparse data as accessible and efficient as working with dense data. Specifically, to make the Python APIs for array processing (in NumPy, SciPy, PyTorch, and scikit-learn used by 10s of millions of people) work seamlessly with sparse data. ESPy will build on the current Python scientific library approach (e.g. NumPy and SciPy), to minimize source code changes and encourage community take-up, and add sparsity awareness and the ability to target multiple hardware architectures, including at least one architecture with features aimed at accelerating computation on sparse data. A framework or domain-specific language approach can be used to encapsulate the Python application, or the Python environment can be extended with an array/tensor algebra compiler; the selected approach should require minimal source-code changes. A compilation intermediate representation should be devised or adapted that incorporates sparse semantics, such as degree of sparsity and data formatting, and that can be efficiently targeted at multiple run-time hardware architectures. Data formatting transformations should be minimized.

PHASE I: This topic is soliciting Direct to Phase II (DP2) proposals only. Selected performers will have an established and documented background and experience with most or all of the following: the design and implementation of Python-based libraries, frameworks, domain-specific-languages, compilers, compilation intermediate representations, code generation and optimization, and a range of target computer architectures including CPUs, GPUs, and hardware accelerators. Performers should also be able to document familiarity with sparse and dense tensor algebra, including comprehensive coverage of the many sparse and dense data structures and formats.

PHASE II: The goal of ESPy is to establish an efficient and easy-to-use sparse tensor algebra capability in the Python scientific ecosystem. The facility can be based on a library approach, or use a domain-specific language or a framework to facilitate the capability, as long as there are minimal code changes for the Python programmer. There are a multitude of sparse object data structures and formats, and ESPy should support as many of these as possible, and be capable of extension to additional sparse data formats as needed or required. ESPy should also support multiple target architectures including at least one architecture implementation with features that can be exploited to accelerate sparse vector or matrix

processing. ESPy's support of tensor algebra shall be more than just addition and multiplication by providing a rich set of operators and functions, such as convolutions and semi-rings. Expected Phase II metrics:

- At least 100X faster performance on a sparse array- and tensor-processing benchmark vs generic Python processing using scientific libraries with <5% lines of code changed
- Benchmark composition to be proposed and implemented by the proposer with DARPA's agreement
- Two or more target hardware architectures in Phase II (base)
- Three or more target architectures, including at least one with hardware support for sparse data processing, in Phase II (option)

Schedule/Milestones/Deliverables

- Month 1: Kick-Off meeting; technical approach report that outlines the Python user interface (library/framework/DSL), intermediate representation, and target architecture code generation strategy; proposed tensor-processing benchmark review
- Month 3: PI meeting with PowerPoint presentations of accomplishments since the previous review and plans for the next period
- Month 6: PI meeting with PowerPoint presentations of accomplishments since the previous review and plans for the next period; demonstrations of work so far
- Month 9: PI review, including final design review, demonstration plans, and projected metrics achievements
- Month 12: Final PI review and final report, including quantitative metrics regarding performance and usability (percentage code changes need); demonstrate support for multiple sparse data formats; demonstrate support for multiple target architectures; proposal for Phase II option including additional target architecture and demonstration application (based on transition party requirements); the final report shall also document any scientific advances that have been achieved under the program (A brief statement of claims supplemented by publication material will meet this requirement); delivery of software executables, source code (if applicable), and documentation (publishing as open source is acceptable as delivery)

Phase II Option Phase II option activities should include the addition of a target architecture and a real-world demonstration in collaboration with a transition partner.

Schedule/Milestones/Deliverables

- Month 1: Kick-Off meeting; technical approach report outlining demonstration application based on transition partner requirements and additional target architecture(s)
- Month 3: PI meeting with PowerPoint presentations of accomplishments since the previous review and plans for the next period
- Month 6: PI meeting with PowerPoint presentations of accomplishments since the previous review and plans for the next period; demonstrations of work so far
- Month 9: PI review, including final design review, demonstration plans, and projected metrics
- Month 12: Final review/report including demonstration with transition partner and demonstration of additional target architecture; delivery of software executables, source code (if applicable), and documentation (publishing as open source is acceptable as delivery)

PHASE III DUAL USE APPLICATIONS: Sparse arrays are used extensively in commercial, scientific, and DoD/Military applications, such as social media, financial transactions, network traffic analysis, partial differential equations, optimizations, and Machine Learning applications. A likely pathway forward for the developers is to publish the software as open-source, thereby encouraging uptake and recruiting additional developers, and then to offer support and consulting services based on intimate understanding of the ESPy design and implementation.

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- [7] <http://tensor-compiler.org/> - a fast and versatile compiler-based library for sparse linear and tensor algebra.

KEYWORDS: Sparse; Dense; Python; Array; Matrix; Tensor

APPENDIX A: DARPA DIRECT TO PHASE II (DP2) PROPOSAL INSTRUCTIONS

I. Introduction

A complete proposal submission consists of:

- Volume 1: Proposal Cover Sheet
- Volume 2: Technical Volume (feasibility documentation and technical proposal)
- Volume 3: Cost Volume
- Volume 4: Company Commercialization Report
- Volume 5: Supporting Documents
- Volume 6: Fraud, Waste and Abuse Training

The Defense SBIR/STTR Innovation Portal (DSIP) provides a structure for building the proposal volumes and submitting a consolidated proposal package. If this is your first time submitting an SBIR or STTR proposal using DSIP, please review detailed training guides at <https://www.dodsbirsttr.mil/submissions/learning-support/training-materials>. It is the responsibility of the proposing firm to ensure that a complete proposal package is certified and submitted by the close date listed in the topic to which they are responding.

To assist in proposal development, templates for Volume 2: Technical Volume and Volume 3: Cost Volume have been provided as attachments to the announcement posted at <https://www.dodsbirsttr.mil/submissions/login>. Use of these templates is mandatory.

NOTE: All proposers are required to submit Volume 4: Company Commercialization Report (CCR).

II. Proprietary Information

Proposers that include in their proposals data that they do not want disclosed to the public for any purpose, or used by the Government except for evaluation purposes, shall follow instructions in section 4.5 regarding marking propriety proposal information.

III. DP2 Proposal Instructions

a. Proposal Cover Sheet (Volume 1)

The Cover Sheet must include a brief technical abstract of no more than 3000 characters that describes the proposed R&D project with a discussion of anticipated benefits and potential commercial applications. Do not include proprietary or classified information in the Proposal Cover Sheet. If your proposal is selected for award, the technical abstract and discussion of anticipated benefits may be publicly released.

b. Format of Technical Volume (Volume 2) – standard format

1. The Technical Volume must include two parts, PART ONE: Feasibility Documentation and PART TWO: Technical Proposal.
2. Type of file: The Technical Volume must be a single Portable Document Format (PDF) file, including graphics. Perform a virus check before uploading the Technical Volume file. If a virus is detected, it may cause rejection of the proposal. Do not lock or encrypt the uploaded file. Do not include or embed active graphics such as videos, moving pictures, or other similar media in the document.

3. Length: The length of each part of the technical volume (Feasibility Documentation and Technical Proposal) will be specified by the corresponding topic. The Government will not consider pages in excess of the page count limitations.
4. Layout: Number all pages of your proposal consecutively. Font size should not be smaller than 10-point on standard 8-1/2" x 11" paper with one-inch margins. The header on each page of the Technical Volume should contain your company name, topic number, and proposal number assigned by DSIP when the Cover Sheet was created. The header may be included in the one-inch margin.

c. Content of the Technical Volume (Volume 2) – Standard Format

PART ONE: Feasibility Documentation

1. Provide documentation to substantiate that the scientific and technical merit and feasibility described in the Phase I section of the topic has been met and describe the potential commercial applications. To be eligible, proposers must demonstrate that the feasibility requirements outlined in the topic have been met, and achieved outside of the SBIR program. Documentation should include all relevant information including, but not limited to: technical reports, test data, prototype designs/models, and performance goals/results.
2. Maximum page length for feasibility documentation will be specified by the topic. If you have references, include a reference list or works cited list as the last page of the feasibility documentation. This will count towards the page limit.
3. Work submitted within the feasibility documentation must have been substantially performed by the proposer and/or the PI.
4. If technology in the feasibility documentation is subject to Intellectual Property (IP), the proposer must either own the IP, or must have obtained license rights to such technology prior to proposal submission, to enable it and its subcontractors to legally carry out the proposed work. Documentation of IP ownership or license rights shall be included in the Technical Volume of the proposal.
5. Include a one-page summary on Commercialization Potential addressing the following:
 - i. Does the company contain marketing expertise and, if not, how will that expertise be brought into the company?
 - ii. Describe the potential for commercial (Government or private sector) application and the benefits expected to accrue from this commercialization.

DO NOT INCLUDE marketing material. Marketing material will NOT be evaluated.

PART TWO: Standard Technical Proposal (applies to both 65 and 35-page volumes)

1. Significance of the Problem. Define the specific technical problem or opportunity addressed and its importance.
2. Phase II Technical Objectives. Enumerate the specific objectives of the Phase II work, and describe the technical approach and methods to be used in meeting these objectives.
3. Phase II Statement of Work. The statement of work should provide an explicit, detailed description of the Phase II approach, indicate what is planned, how and where the work will be carried out, a schedule of major events and the final product to be delivered. The methods planned to achieve each objective or task should be discussed explicitly and in detail. This section should be a substantial portion of the total proposal.
 - a. Human/Animal Use: Proposers proposing research involving human and/or animal use are encouraged to separate these tasks in the technical proposal and cost proposal in order to avoid potential delay of contract award.

- b. Phase II Option Statement of Work (if applicable, specified in the corresponding TOPIC). The statement of work should provide an explicit, detailed description of the activities planned during the Phase II Option, if exercised. Include how and where the work will be carried out, a schedule of major events and the final product to be delivered. The methods planned to achieve each objective or task should be discussed explicitly and in detail.
4. Related Work. Describe significant activities directly related to the proposed effort, including any conducted by the PI, the proposer, consultants or others. Describe how these activities interface with the proposed project and discuss any planned coordination with outside sources. The proposal must persuade reviewers of the proposer's awareness of the state of the art in the specific topic. Describe previous work not directly related to the proposed effort but similar. Provide the following: (1) short description, (2) client for which work was performed (including individual to be contacted and phone number) and (3) date of completion.
5. Relationship with Future Research or Research and Development.
 - i. State the anticipated results of the proposed approach if the project is successful.
 - ii. Discuss the significance of the Phase II effort in providing a foundation for Phase III research and development or commercialization effort.
6. Key Personnel. Identify key personnel who will be involved in the Phase II effort including information on directly related education and experience. A concise resume of the PI, including a list of relevant publications (if any), must be included. All resumes count toward the page limitation. Identify any foreign nationals you expect to be involved on this project.
7. Foreign Citizens. Identify any foreign citizens or individuals holding dual citizenship expected to be involved on this project as a direct employee, subcontractor, or consultant. For these individuals, please specify their country of origin, the type of visa or work permit under which they are performing and an explanation of their anticipated level of involvement on this project. Refer to section 3.2 of this BAA for more information. Supplemental information provided in response to this paragraph will be protected in accordance with the Privacy Act (5 U.S.C. 552a), if applicable, and the Freedom of Information Act (5 U.S.C. 552(b)(6)).
8. Facilities/Equipment. Describe available instrumentation and physical facilities necessary to carry out the Phase II effort. Items of equipment to be purchased (as detailed in the cost proposal) shall be justified under this section. Also state whether or not the facilities where the proposed work will be performed meet environmental laws and regulations of federal, state (name) and local Governments for, but not limited to, the following groupings: airborne emissions, waterborne effluents, external radiation levels, outdoor noise, solid and bulk waste disposal practices and handling and storage of toxic and hazardous materials.
9. Subcontractors/Consultants. Involvement of a university or other subcontractors or consultants in the project may be appropriate. If such involvement is intended, it should be identified and described according to the Cost Breakdown Guidance. Please refer to section 3 of this BAA for detailed eligibility requirements as it pertains to the use of subcontractors/consultants.
10. Prior, Current or Pending Support of Similar Proposals or Awards. If a proposal submitted in response to this topic is substantially the same as another proposal that was funded, is now being funded, or is pending with another Federal Agency, or another or the same DoD Component, you must reveal this on the Proposal Cover Sheet and provide the following information:
 - a. Name and address of the Federal Agency(s) or DoD Component to which a proposal was submitted, will be submitted, or from which an award is expected or has been received.

- b. Date of proposal submission or date of award.
- c. Title of proposal.
- d. Name and title of the PI for each proposal submitted or award received.
- e. Title, number, and date of BAA(s) or solicitation(s) under which the proposal was submitted, will be submitted, or under which award is expected or has been received.
- f. If award was received, state contract number.
- g. Specify the applicable topics for each proposal submitted or award received.

Note: If this does not apply, state in the proposal "No prior, current, or pending support for proposed work."

- 11. Transition and Commercialization Strategy. DARPA is equally interested in dual use commercialization of SBIR/STTR projects that result in products sold to the U.S. military, the private sector market, or both. DARPA expects explicit discussion of key activities to achieve this result in the transition and commercialization strategy part of the proposal. The Technical Volume of each Direct to Phase II proposal must include a transition and commercialization strategy section. The Phase II transition and commercialization strategy shall not exceed 5 pages, and will NOT count against the proposal page limit.

Information contained in the commercialization strategy section will be used to determine suitability for participation in EEI. Selection for participation in EEI will be made independently following selection for SBIR/STTR award. Please refer to section 3 of the Instructions for more information on the DARPA EEI and additional proposal requirements.

The transition and commercialization strategy should include the following elements:

- a. A summary of transition and commercialization activities conducted during Phase I, and the Technology Readiness Level (TRL) achieved. Discuss the market, competitive landscape, potential stakeholders and end-users, and how the preliminary transition and commercialization path or paths may evolve during the Phase II project. Describe key proposed technical milestones during Phase II that will advance the technology towards product such as: prototype development, laboratory and systems testing, integration, testing in operational environment, and demonstrations.
- b. Problem or Need Statement. Briefly describe what you know of the problem, need, or requirement, and its significance relevant to a Department of Defense application and/or a private sector application that the SBIR/STTR project results would address. Is there a broader societal need you are trying to address? Please describe.
- c. Description of Product(s) and/or System Application(s). Identify the commercial product(s) and/or DoD system(s), or system(s) under development, or potential new system(s). Identify the potential DoD end- users, Federal customers, and/or private sector customers who would likely use the technology.
- d. Business Model(s)/Procurement Mechanism(s). Discuss your current business model hypothesis for bringing the technology to market. Describe plans to license, partner, or self-produce your product. How do you plan to generate revenue? Describe the resources you expect will be needed to implement your business models. Discuss your plan and expected timeline to secure these resources. Understanding DARPA's goal of creating and sustaining a U.S. military advantage, describe how you intend to develop your product and supply chains to enable this differentiation.
- e. Target Market. Describe the market and addressable market for the innovation. Describe the customer sets you propose to target, their size, their growth rate, and the key reasons they would consider procuring the technology. Discuss the business economics and market drivers in the target industry. Describe competing technologies existent today on

- the market as well as those being developed in the lab. How has the market opportunity been validated? Describe the competition. How do you expect the competitive landscape may change by the time your product/service enters the market?
- f. Funding Requirements. Describe your company's funding history. How much external financing have you raised? Describe your plans for future funding sources (internal, loan, angel, venture capital, etc.).
 - g. Transition and Commercialization Risks. Describe the major technology, market and team risks associated with achieving successful transition of the DARPA funded technology. DARPA is not afraid to take risks but we want to ensure that our awardees clearly understand the risks in front of them. What are the key risks in bringing your innovation to market? What are actions you plan to undertake to mitigate these risks?
 - h. Expertise/Qualifications of Team/Company Readiness. Describe the expertise and qualifications of your management, marketing/business development and technical team that will support the transition of the technology from the prototype to the commercial market and into government operational environments. Has this team previously taken similar products/services to market? If the present team does not have this needed expertise, how do you intend to obtain it? What is the financial history and health of your company (e.g., availability of cash, profitability, revenue growth, etc.)?
 - i. Anticipated Transition and Commercialization Results. Include a schedule showing the anticipated quantitative transition and commercialization results from the Phase II project at one year after the start of Phase II, at the completion of Phase II, and after the completion of Phase II (i.e., amount of additional investment, sales revenue, etc.). After Phase II award, the company is required to report actual sales and investment data in its Company Commercialization Report at least annually.

Advocacy Letters (OPTIONAL)* Feedback received from potential Commercial and/or DoD customers and other end-users regarding their interest in the technology to support their capability gaps. Advocacy letters that are faxed or e-mailed separately will NOT be accepted.

Letters of Intent/Commitment (OPTIONAL)* Relationships established, feedback received, support and commitment for the technology with one or more of the following: Commercial customer, DoD PM/PEO, a Defense Prime, or vendor/supplier to the Primes and/or other vendors/suppliers identified as having a potential role in the integration of the technology into fielded systems/products or those under development. Letters of Intent/Commitment that are faxed or e- mailed separately will NOT be accepted.

*Advocacy Letters and Letters of Intent/Commitment are optional, and should ONLY be submitted to substantiate any transition or commercialization claims made in the commercialization strategy. Please DO NOT submit these letters just for the sake of including them in your proposal. These letters DO NOT count against any page limit.

In accordance with section 3-209 of DOD 5500.7-R, Joint Ethics Regulation, letters from government personnel will NOT be considered during the evaluation process.

d. Format of Cost Volume (Volume 3)

Proposers are required to use the Direct to Phase II – Volume 3: Cost Proposal Template (Excel Spreadsheet) provided as an attachment to this announcement. The Cost Volume (and supporting documentation) DOES NOT count toward the page limit of the Technical Volume.

e. Content of the Cost Volume (Volume 3)

Some items in the Cost Breakdown Guidance below may not apply to the proposed project. If such is the case, there is no need to provide information on each and every item.

ALL proposed costs should be accompanied by documentation to substantiate how the cost was derived. For example, if you proposed travel cost to attend a project-related meeting or conference, and used a travel website to compare flight costs, include a screen shot of the comparison. Similarly, if you proposed to purchase materials or equipment, and used the internet to search for the best source, include your market research for those items. You do not necessarily have to propose the cheapest item or supplier, but you should explain your decision to choose one item or supplier over another. It's important to provide enough information to allow contracting personnel to understand how the proposer plans to use the requested funds. If selected for award, failure to include the documentation with your proposal will delay contract negotiation, and the proposer will be asked to submit the necessary documentation to the Contracting Officer to substantiate costs (e.g., cost estimates for equipment, materials, and consultants or subcontractors). It is important to respond as quickly as possible to the Contracting Officer's request for documentation.

Cost Breakdown Guidance:

1. List all key personnel by name as well as by number of hours dedicated to the project as direct labor. Special tooling and test equipment and material cost may be included. The inclusion of equipment and material will be carefully reviewed relative to need and appropriateness for the work proposed. The purchase of special tooling and test equipment must, in the opinion of the Contracting Officer, be advantageous to the Government and should be related directly to the specific topic. These may include such items as innovative instrumentation and/or automatic test equipment. Title to property furnished by the Government or acquired with Government funds will be vested with DARPA; unless it is determined that transfer of title to the contractor would be more cost effective than recovery of the equipment by the DARPA.
2. Cost for travel funds must be justified and related to the needs of the project.
3. Cost sharing is permitted for proposals under this announcement; however, cost sharing is not required nor will it be an evaluation factor in the consideration of a proposal.
4. All subcontractor costs and consultant costs must be detailed at the same level as prime contractor costs in regard to labor, travel, equipment, etc. Provide detailed substantiation of subcontractor costs in your cost proposal. Enter this information in the Explanatory Material section of the on-line cost proposal form. The Supporting Documents Volume (Volume 5) may be used if additional space is needed.

For more information about cost proposals and accounting standards, see the DCAA publication titled "Audit Process Overview – Information for Contractors" available at: <http://www.dcaa.mil>.

f. Company Commercialization Report (Volume 4)

The Company Commercialization Report (CCR) allows companies to report funding outcomes resulting from prior SBIR and STTR awards. The Company Commercialization Report (CCR) is required for Phase I and Direct to Phase II proposals. Please refer to the DoD STTR Program BAA for full details on this requirement. Information contained in the CCR will not be considered by DARPA during proposal evaluations.

g. Supporting Documents (Volume 5)

In addition to required DoD documentation and certifications, small businesses may also submit additional documentation to support the Technical Volume (Volume 2) and the Cost Volume (Volume 3) in Volume 5.

h. Fraud Waste and Abuse (Volume 6)

The Fraud, Waste and Abuse (FWA) training is required for Phase I and Direct to Phase II proposals. FWA training provides information on what represents FWA in the SBIR/STTR program, the most common mistakes that lead to FWA, as well as the penalties and ways to prevent FWA in your firm. This training material must be thoroughly reviewed once per year. Plan ahead and leave ample time to complete this training based on the proposal submission deadline. Knowingly and willfully making any false, fictitious, or fraudulent statements or representations may be a felony under the Federal Criminal False Statement Act (18 U.S.C. Sec 1001), punishable by a fine of up to \$10,000, up to five years in prison, or both. Understanding the indicators and types of fraud, waste, and abuse that can occur is critical for the SBIR/STTR awardees' role in preventing the loss of research dollars.

AMENDMENT 2

The purpose of Amendment 2 to DARPA Release 3 is to update the information on the award structure on page 2 (changes highlighted)

Defense Advanced Research Projects Agency (DARPA) DoD 23.4 Small Business Innovation Research (SBIR) Annual BAA Proposal Submission Instructions Release 3

INTRODUCTION

To achieve DARPA's mission to create technological surprise, the agency makes strategic, early investments in science and technology that will have long-term positive impacts on our national security. The pace of discovery in both science and technology is accelerating worldwide, resulting in new fields of study and the identification of scientific areas ripe for small business utilization through the SBIR and STTR programs. Small businesses are critical for developing technology to support national security. Proposers are encouraged to consider whether the R/R&D being proposed to DoD Components also has private sector potential, either for the proposed application or as a base for other applications. The topics below focus on technical domains important to DARPA's mission pursuing innovative research concepts that fall within one of its technology offices. More information about DARPA's technical domains and research topics of interest may be found at: <http://www.darpa.mil/about-us/offices>.

Proposers responding to a topic in this BAA must follow all general instructions provided in the Department of Defense (DoD) SBIR Program BAA. DARPA requirements in addition to or deviating from the DoD Program BAA are provided in the instructions below.

Specific questions pertaining to the administration of the DARPA Program and these proposal preparation instructions should be directed to: DARPA Small Business Programs Office at SBIR_BAA@darpa.mil. DSIP Topic Q&A will NOT be available for these DARPA topics. Technical questions related to improving the understanding of a topic's requirements must be submitted to SBIR_BAA@darpa.mil by the deadline listed below.

The following dates apply to this DARPA Topic release:

- March 14, 2023:** Topic issued for pre-release
- March 29, 2023:** Topic opens; DARPA begins accepting proposals via DSIP
- April 25, 2023:** Deadline for technical question submission
- May 02, 2023:** Deadline for receipt of proposals no later than **12:00 pm ET**

DIRECT TO PHASE II PROPOSAL GUIDELINES

Proposers should refer to the DARPA Direct to Phase II SBIR XL Proposal Instructions, provided in Appendix A.

Current Release Award Structure by Topic

| Topics | Period of Performance | Amount |
|-----------------------------------|------------------------------|---------------|
| HR0011SB20234XL-01 Subtopic 1* | Base: 12-months | \$ 1,500,000 |
| | Option 1: 12-months | \$ 1,000,000 |
| | Option 2: 12 months | \$ 1,500,000 |
| HR0011SB20234XL-01 Subtopic 2* | Base: 12-months | \$ 750,000 |
| | Option 1: 12-months | \$ 1,000,000 |
| | Option 2: 12 months | \$ 2,250,000 |

*For sub-topic 1 DARPA will accept DP2 proposals with a total maximum cost/price of \$4,000,000. This maximum cost/price includes a 12-month base period not to exceed \$1,500,000, a 12-month Option of \$1,000,000, and a second 12-month Option minimum of \$500,000. The base period and the minimum funding for the Options (if exercised) are funded entirely by DARPA. Additionally, if the second Option is exercised, DARPA is encouraging the performer to arrange additional program funding with a commercial or government (non-DARPA) partner of up to \$500,000. Any proposed non-DARPA funding agreement must be written, signed, and received by DARPA 60 calendar days before the last day of the period of performance of the base period to permit DARPA sufficient time to access as part of the determination to award the Option effort. DARPA will match up to \$500,000 of non-DARPA funds under a written, signed, and timely submitted agreement. Securing a non-DARPA funding agreement does not obligate DARPA to exercise the Option effort, nor will the lack of a written funding agreement prevent the performer from receiving an Option. DARPA will make option award decisions based on performance and funding availability.

For sub-topic 2 DARPA will accept DP2 proposals with a total maximum cost/price of \$4,000,000. This maximum cost/price includes a 12-month base period not to exceed \$750,000, a 12-month Option of \$1,000,000, and a second 12-month Option minimum of \$1,250,000. The base period and the minimum funding for the Option (if exercised) are funded entirely by DARPA. Additionally, if the second Option is exercised, DARPA is encouraging the performer to arrange additional program funding with a commercial or government (non-DARPA) partner of up to \$500,000. Any proposed non-DARPA funding agreement must be written, signed, and received by DARPA 60 calendar days before the last day of the period of performance of the base period to permit DARPA sufficient time to access as part of the determination to award the Option effort. DARPA will match up to \$500,000 of non-DARPA funds under a written, signed, and timely submitted agreement. Securing a non-DARPA funding agreement does not obligate DARPA to exercise the Option effort, nor will the lack of a written funding agreement prevent the performer from receiving an Option. DARPA will make option award decisions based on performance and funding availability.

Note that the information in the chart above includes matching funds for Option 2; firms may obtain matching funding at any time during performance of the effort.

Note: Please see Appendix A, section III (d) for complete instructions on the White Paper/Slide Deck technical volume format.

Content of the Technical Volume

Proposers should refer to the DARPA DP2 Proposal Instructions, provided in Appendix A and on the DARPA Small Business site (<https://www.darpa.mil/work-with-us/for-small-businesses/participate-sbir-sttr-program>).

Cost Volume (Volume 3)

Please see the chart above for award amounts listed by topic. Proposers are required to use the Direct to Phase II – Volume 3: Cost Proposal Template (Excel Spreadsheet) provided on the DARPA Small Business site (<https://www.darpa.mil/work-with-us/for-small-businesses/participate-sbir-sttr-program>). Subcontractors may also submit unsanitized costs using this template directly to DARPA at SBIR-BAA@darpa.mil.

Please review the updated Percentage of Work (POW) calculation details included in the DoD Program BAA. DARPA will occasionally accept deviations from the POW requirements with a letter of explanation or approval from the Funding Agreement officer.

Company Commercialization Report (CCR) (Volume 4)

Completion of the CCR as Volume 4 of the proposal submission in DSIP is required. Please refer to the DoD SBIR Program BAA for full details on this requirement. Information contained in the CCR will not be considered by DARPA during proposal evaluations.

Supporting Documents (Volume 5)

In addition to the documents required by DoD, small businesses may also submit additional documentation to support the Technical Volume (Volume 2) and the Cost Volume (Volume 3) in Volume 5.

DISCRETIONARY TECHNICAL AND BUSINESS ASSISTANCE (TABA)

DARPA does not offer TABA funding.

EVALUATION AND SELECTION

All proposals will be evaluated in accordance with the evaluation criteria listed in the DoD SBIR 2023.4 BAA. DARPA will conduct an evaluation of each conforming proposal. Proposals that do not comply with the requirements detailed in this BAA and the research objective(s) of the corresponding topic are considered non-conforming and therefore are not evaluated nor considered for award.

Using the evaluation criteria, the Government will evaluate each proposal in its entirety, documenting the strengths and weaknesses relative to each evaluation criterion, and, based on these identified strengths and weaknesses, determine the proposal's overall selectability. Proposals will not be evaluated against each other during the evaluation process, but rather evaluated on their own individual merit to determine how well the proposal meets the criteria stated in this BAA and the corresponding DARPA topic.

Awards will be made to proposers whose proposals are determined to be the most advantageous to the Government, consistent with instructions and evaluation criteria specified in the DoD SBIR 2023.4 BAA and availability of funding. Given the limited funding available for each topic released, not all proposals considered selectable will be selected for funding.

For the purposes of this proposal evaluation process, a selectable proposal is defined as follows:

Selectable: A selectable proposal is a proposal that has been evaluated by the Government against the evaluation criteria listed in the DoD SBIR 2023.4 BAA and DARPA topic, and the strengths of the

overall proposal outweighs its weaknesses. Additionally, there are no accumulated weaknesses that would require extensive negotiations and/or a resubmitted proposal.

For the purposes of this proposal evaluation process, a non-selectable proposal is defined as follows:

Non-Selectable: A proposal is considered non-selectable when the proposal has been evaluated by the Government against the evaluation criteria listed in the DoD SBIR 2023.4 BAA and DARPA topic, and the strengths of the overall proposal do not outweigh its weaknesses.

Proposing firms will be notified of selection or non-selection status for a Phase I award within 90 days of the closing date of the DoD SBIR 2023.4 BAA. It is the policy of DARPA to treat all proposals as source selection information and to disclose their contents only for the purpose of evaluation. Restrictive notices notwithstanding, during the evaluation process, submissions may be handled by support contractors for administrative purposes and/or to assist with technical evaluation. All DARPA support contractors are expressly prohibited from performing DARPA-sponsored technical research and are bound by appropriate nondisclosure agreements. Input on technical aspects of the proposals may be solicited by DARPA from other Government and/or non-Government consultants/experts who are strictly bound by the appropriate non-disclosure requirements. No submissions will be returned. Upon completion of the evaluation and selection process, an electronic copy of each proposal received will be retained at DARPA.

Proposal titles, abstracts, anticipated benefits, and keywords of proposals that are selected for contract award will undergo a DARPA Policy and Security Review. Proposal titles, abstracts, anticipated benefits, and keywords are subject to revision and/or redaction by DARPA. Final approved versions of proposal titles, abstracts, anticipated benefits, and keywords may appear on the DoD SBIR/STTR awards website and/or the SBA's SBIR/STTR award website (<https://www.sbir.gov/sbirsearch/award/all>).

Refer to the DoD SBIR 2023.4 Program BAA for procedures to protest the Announcement. As further prescribed in FAR 33.106(b), FAR 52.233-3, Protests regarding the selection decision should be submitted to:

DARPA
Contracts Management Office (CMO)
675 N. Randolph Street
Arlington, VA 22203
E-mail: scott.ulrey@darpa.mil and sbir@darpa.mil

AWARD AND CONTRACT INFORMATION

1. General Award Information

Multiple awards are anticipated. DARPA may award FAR-based government contracts (Firm- Fixed Price or Cost-Plus Reimbursement) or Other Transactions for Prototypes agreement (under the authority of 10 U.S.C. § 4022) subject to approval of the Contracting Officer. The amount of resources made available for each topic issued under this BAA will depend on the quality of the proposals received and the availability of funds.

Majority Ownership in Part. Proposers that are more than 50% owned by multiple venture capital operating companies (VCOC), hedge funds (HF), private equity firms (PEF), or any combination of these as set forth in 13 C.F.R. § 121.702, are eligible to submit proposals in response to DARPA topics advertised within this BAA.

For proposers that are a member of this ownership class the following must be satisfied for proposals to

be accepted and evaluated:

- a. Prior to submitting a proposal, firms must register with the SBA Company Registry Database.
- b. The proposer within its submission must submit the Majority-Owned VCOC, HF, and PEF Certification. A copy of the SBIR VC Certification can be found on <https://www.darpa.mil/work-with-us/for-small-businesses/participate-sbir-sttr-program>, under SBIR/STTR BAA Forms. Include the SBIR VC Certification in the Supporting Documents (Volume 5).
- c. Should a proposer become a member of this ownership class after submitting its proposal and prior to any receipt of a funding agreement, the proposer must immediately notify the Contracting Officer, register in the appropriate SBA database, and submit the required certification which can be found under SBIR/STTR BAA Forms and Templates on <https://www.darpa.mil/work-with-us/for-small-businesses/participate-sbir-sttr-program>.

The Government reserves the right to select for negotiation all, some, one, or none of the proposals received in response to this announcement and to make awards with or without communications with proposers. Additionally, the Government reserves the right to award all, some, one, or none of the options on the contract(s)/agreement(s) of the performers based on available funding and technical performance. If warranted, portions of resulting awards may be segregated into pre-priced options. Additionally, DARPA reserves the right to accept proposals in their entirety or to select only portions of proposals for award. In the event that DARPA desires to award only portions of a proposal, negotiations may be opened with that proposer. The Government reserves the right to fund proposals in phases with options for continued work, as applicable.

The Government reserves the right to request any additional, necessary documentation once it makes the award instrument determination. The Government reserves the right to remove a proposal from award consideration should the parties fail to reach agreement on award terms, conditions, and price within a reasonable time, and/or the proposer fails to provide requested additional information within three business days.

In all cases, the Government Contracting Officer reserves the right to select award instrument type, regardless of instrument type proposed, and to negotiate all instrument terms and conditions with selectees. DARPA will apply publication or other restrictions, as necessary, if it determines that the research resulting from the proposed effort will present a high likelihood of disclosing performance characteristics of military systems or manufacturing technologies that are unique and critical to defense. Any award resulting from such a determination will include a requirement for DARPA permission before publishing any information or results on the program. For more information on publication restrictions, see the DoD SBIR 2023.4 BAA.

Because of the desire to streamline the award negotiation and program execution process, proposals identified for negotiation will result in negotiating a type of instrument for award that is in the best interest of the Government. In the case of an OT for Prototype agreement under DARPA's authority to award OTs for prototype projects, 10 U.S.C. § 4022, use of an OT provides significant opportunities for flexible execution to assist in meeting DARPA's aggressive SBIR/STTR program goals.

All proposers that wish to consider an OT award should carefully read the following:

The flexibility of the OT award instrument is beneficial to the program because the Performer will be able to apply its best practices as required to carry out the research project that may be outside of the Federal Acquisition Regulation (FAR) process-driven requirements. Streamlined practices will be used, such as milestone-driven performance, intended to reduce time and effort on award administration tasks and permit performers to focus on the research effort and rapid prototyping. Because of this ability, OTs

provide the Agreements Officer the flexibility to create an award instrument that contains terms and conditions that promote commercial transition, reduce some administratively burdensome acquisition regulations, and meet SBIR/STTR program goals.

Proposers must only propose an OT agreement with fixed payable milestones. Fixed payable milestones are fixed payments based on successful completion of the milestone accomplishments agreed to in the milestone plan. Refer to the Other Transactions for Prototypes Fact Sheet and Other Transaction for Prototype Agreement, available at <https://www.darpa.mil/work-with-us/for-small-businesses/participate-sbir-sttr-program>. Specific milestones will be based upon the research objectives detailed in the topic.

Please see <https://www.darpa.mil/work-with-us/for-small-businesses/participate-sbir-sttr-program> for more information on OTs.

2. Transition and Commercialization Support Program (TCSP)

DARPA will provide services to Phase II or DP2 awardees upon contract execution through the Transition and Commercialization Support Program (TCSP) at no cost to awardees. The TCSP goal is to maximize the potential for SBIR/STTR companies to move their technology beyond Phase II and into other research and development programs for further maturity or into solutions or products for DoD acquisition programs, other Federal programs, and/or the commercial market. Please visit <https://www.darpa.mil/work-with-us/for-small-businesses/commercialization-continued> for more information on DARPA TCSP.

3. Embedded Entrepreneurship Initiative

Awardees of SBIR funding pursuant to this BAA may be eligible to participate in the DARPA Embedded Entrepreneurship Initiative (EEI) during the Period of Performance. Invitation to participate in EEI is at the sole discretion of the Government based on evaluation of technical and commercial factors and subject to program balance and the availability of funding. EEI is a limited scope program offered by DARPA, at DARPA's discretion, to a small subset of awardees. The goal of DARPA's EEI is to increase the likelihood that DARPA-funded technologies take root in the U.S. and provide new capabilities for national defense. EEI supports DARPA's mission "to make pivotal investments in breakthrough technologies and capabilities for national security" by accelerating the transition of innovations out of the lab and into new capabilities for the Department of Defense (DoD). EEI investment supports development of a robust and deliberate Go-to-Market strategy for selling technology product to the government and commercial markets and positions DARPA awardees to attract U.S. investment. The following is for informational and planning purposes only and does not constitute solicitation of proposals to the EEI.

There are three elements to DARPA's EEI: (1) A Senior Commercialization Advisor (SCA) from DARPA who works with the Program Manager (PM) to examine the business case for the awardee's technology and uses commercial methodologies to identify steps toward achieving a successful transition of technology to the government and commercial markets; (2) Connections to potential industry and investor partners via EEI's Investor Working Groups; and (3) Additional funding on an awardee's contract for the awardee to hire an embedded entrepreneur to achieve specific milestones in a Go-to-Market strategy for transitioning the technology to products that serve both defense and commercial markets. This embedded entrepreneur's qualifications should include business experience within the target industries of interest, experience in commercializing early stage technology, and the ability to communicate and interact with technical and non-technical stakeholders. Funding for EEI is typically no more than \$250,000 per awardee over the duration of the award. An awardee may apportion EEI funding to hire more than one embedded entrepreneur, if achieving the milestones requires different expertise that can be obtained without exceeding the awardee's total EEI funding. The EEI effort is intended to be conducted concurrent with the research program without extending the period of performance.

EEI Application Process:

After receiving an award under the solicitation, awardees interested in being considered for EEI should notify their DARPA Program Manager (PM) during the period of performance. Timing of such notification should ideally allow sufficient time for DARPA and the awardee to review the awardee's initial transition plan, identify milestones to achieve under EEI, modify the award, and conduct the work required to achieve such milestones within the original award period of performance. These steps may take 9-18 months to complete, depending on the technology. If the DARPA PM determines that EEI could be of benefit to transition the technology to product(s) the Government needs, the PM will refer the performer to DARPA Commercial Strategy.

DARPA Commercial Strategy will then contact the performer, assess fitness for EEI, and in consultation with the DARPA technical office, determine whether to invite the performer to participate in the EEI. Factors that are considered in determining fitness for EEI include DoD/Government need for the technology; competitive approaches to enable a similar capability or product; risks and impact of the Government's being unable to access the technology from a sustainable source; Government and commercial markets for the technology; cost and affordability; manufacturability and scalability; supply chain requirements and barriers; regulatory requirements and timelines; Intellectual Property and Government Use Rights, and available funding.

Invitation to participate in EEI is at the sole discretion of DARPA and subject to program balance and the availability of funding. EEI participants' awards may be subsequently modified bilaterally to amend the Statement of Work to add negotiated EEI tasks, provide funding, and specify a milestone schedule which will include measurable steps necessary to build, refine, and execute a Go-to-Market technology transition plan aimed at delivering new capabilities for national defense. Milestone examples are available at: <https://www.darpa.mil/work-with-us/contract-management>.

Awardees under this solicitation are eligible to be considered for participation in EEI, but selection for award under this solicitation does not imply or guarantee participation in EEI.

For more information please refer to the EEI website <https://eei.darpa.mil/>.

4. DARPA Toolbox Initiative

DARPA Toolbox is an Agency-wide effort to provide open licensing opportunities with commercial technology vendors to the researchers behind DARPA programs. DARPA Toolbox provides easy, low-cost, scalable access to state-of-the-art tools and intellectual property (IP) under predictable legal terms and streamlined acquisition procedures. The goal is to reduce performer reliance on low-quality, low-cost tools and IP that increase execution risks and complicate post-DARPA transitions.

Through this initiative, DARPA performers are granted access to select vendor tools and technologies throughout the life of their contractual relationship with the Agency. The Toolbox suppliers bring to the table proven technologies commonly used in state-of-the-art commercial microelectronics or system design methodologies.

DARPA Toolbox program information and a full list of participating suppliers can be found at <https://www.darpa.mil/work-with-us/darpa-toolbox-initiative>. If there are tool or technologies of interest, contact the Supplier POC listed for the product, referencing the DARPA Toolbox Initiative. The Supplier POC will provide advice on products and pricing information. Include any non-production pricing quotes in your proposal. Products and pricing are between you and the suppliers – *do not* contact DARPA directly.

ADDITIONAL INFORMATION

DARPA intends to use electronic mail for all correspondence regarding these topics. Questions related to the technical aspect of the research objectives and awards specifically related to a topic should be emailed to SBIR_BAA@darpa.mil. Please reference the topic number in the subject line. All questions must be in English and must include the name, email address, and the telephone number of a point of contact.

DARPA will attempt to answer questions in a timely manner; however, questions submitted within seven (7) calendar days of the proposal due date listed herein may not be answered. DARPA will post a consolidated Frequently Asked Questions (FAQ) document. To access the posting please visit: <http://www.darpa.mil/work-with-us/opportunities>. Under the topic number summary, there will be a link to the FAQ. The FAQ will be updated on an ongoing basis until one week prior to the proposal due date.

Technical support for the Defense SBIR/STTR Innovation Portal (DSIP) is available Monday through Friday, 9:00 a.m. – 5:00 p.m. ET. Requests for technical support must be emailed to DoDSBIRSupport@reisystems.com with a copy to SBIR_BAA@darpa.mil.

DARPA SBIR 23.4 Topic Index
Release 3

HR0011SB20234XL-01

Safe Food for Everyone (SaFE) - SBIR XL

HR0011SB20234XL-01 TITLE: Safe Food for Everyone (SaFE) - SBIR XL

OUSD (R&E) CRITICAL TECHNOLOGY AREA(S): Weapons, Information Systems

OBJECTIVE: The goal of SaFE is to develop practical; low-cost; small size, weight, and power; non-isotopic sources for food irradiation and other applications requiring pathogen sterilization, supporting ubiquitous treatment at points of production and points of distribution, particularly in austere or compromised environments (e.g., expeditionary operations, humanitarian relief, or disaster response).

DESCRIPTION: This SBIR XL topic will focus on the development of compact, low-cost, high efficiency, and economically viable electron accelerator systems. The topic is composed of two linked subtopics: Subtopic 1 will develop accelerator technology, and Subtopic 2 will focus on distributed system designs and pilot demonstrations.

Accelerators developed as part of the first subtopic will be capable of generating continuous, high current electron beams at 2 to 10 MeV energies using 10 kW electric sources. 10 kW generators are commonly used in deployed support operations such as those found in containerized kitchens. Specifically, this subtopic will explore recent innovations resulting in accelerator designs that can be produced for tens of thousands of dollars compared to millions of dollars for traditional high power accelerators such as Rhodotrons and S-band LINACs, while being suitable for new distributed system architectures. High-gradient direct current (DC) accelerator structures, novel voltage multiplier designs, and new innovations in dielectric materials may provide viable technical approaches. Further, new solid state amplifiers could provide a potential path for radiofrequency (RF) approaches. Such configurations could present the highest potential for compact, low-cost, high wall-plug efficiency accelerator designs.

The second subtopic, system studies, will initially focus on two use cases: (1) a single 10 kW system for deployed or austere environments and (2) multiple distributed 10 kW systems for point of packaging applications. Subtopic 2 performers will conduct detailed economic analysis including capital costs and operations and maintenance costs. The analysis will define minimum viable product and systems characteristics that can be economically produced and address the maximum number of applications for wide-spread use while still achieving treatment and throughput requirements. Further, practical issues such as radiation shielding, automation, and regulatory concerns will be addressed. These analyses will be informed by strong food industry, U.S. Army Natick Soldier Center, Food and Drug Administration (FDA), and U.S. Department of Agriculture (USDA) engagements. Systems work will culminate in a proof-of-concept pilot demonstration of the specific subtopic accelerator technology. Such a demonstration aims to establish broader adoption of food irradiation and enhance food safety and security for both deployed and domestic applications. In addition, secondary applications such as sterilization and remediation will be examined.

It is envisioned that between the two subtopics, technical, economic, and regulatory hurdles currently hindering food irradiation adoption will be fully addressed. This, in turn, will jumpstart commercial activity in this sector leading to viable products, new industrial development, and overall greater food safety and security.

PHASE I: This topic is soliciting Direct to Phase II (DP2) proposals only. There is no Phase I; however, proposers must provide evidence of approach feasibility with results at a level commensurate with the conclusion of a Phase I effort. Examples of such evidence are included below for each subtopic.

Proposers to Subtopic 1 are required to provide documentation outlining success in high efficiency accelerator component technologies. Achievements must be substantial. For example, a key component

for a DC accelerator could be a Cockcroft-Walton voltage ladder. Such a ladder showing 1 MV and an efficiency of >70% into a representative load would be considered sufficient.

Proposers to Subtopic 2 are required to provide documentation outlining success in prior end-to-end system design, demonstration of hands-on work with analogous technologies (including core competencies with accelerator technologies), and experience working with regulatory agencies – specifically the FDA and state regulatory bodies for machine-produced radiation sources.

PHASE II: SaFE is composed of two linked subtopics over an anticipated 3-year period of performance. The period of performance is divided into a 12-month base and two 12-month option periods. Proposers may apply to one or both subtopics.

Subtopic 1: Accelerator technology development. The overall goal of Subtopic 1 is to produce and demonstrate a turn-key high efficiency, low cost, reasonably compact, irradiation accelerator prototype at technology readiness level 6 with the following characteristics:

| Parameter | Threshold | Objective |
|-------------------------------------|-------------|------------|
| Tunable electron energy range (MeV) | 2-5 | 2-10 |
| Max x-ray energy (MeV) | 5 | 7.5 |
| Wall plug efficiency (Pbeam/Pwall) | > 0.3 | > 0.7 |
| Unit cost (\$) | < \$100,000 | < \$50,000 |

The accelerator must make use of 10 kW electric generator output such as 120V@100A or 208V@50A. The complete, turn-key system including controls, accelerator, RF generation (if appropriate), shielding, beam steering, and target must be compatible with a single 463L pallet. Additional suitability metrics include a removable x-ray converter (such as tantalum) to support x-ray production, continuous or near continuous operation, and targets compatible with conveyer-based operations.

The 12-month base period will focus on accelerator design, modeling, and component development. The design will progress through typical processes including a system requirements review, preliminary design review, and a critical design review. Components will be developed and tested supporting the overall accelerator design.

Base period (12 month) milestones:

- Month 1: Kickoff materials. Slide deck summarizing technical approach to meet overall goals, risks, and risk mitigations and quantified milestone schedule
- Month 3: System Requirements Review
- Month 6: Preliminary Design Review
- Month 12: Critical Design Review

During the 12-month Option 1 period, components will be refined and integrated into a prototype system. This system will be tested to verify performance and ultimately used in Subtopic 2's pilot system demonstration.

Option 1 period (12 month) milestones:

- Month 6: Complete Accelerator Prototype
- Month 9: Test and Eval of Prototype
- Month 10: X-ray Target Assessment
- Month 12: Integrated T&E of Prototype

During the 12-month Option 2 period, support will be provided to Subtopic 2's pilot system demonstration and the accelerator will be further refined to a minimum viable product using feedback from Subtopic 2.

Option 2 period (12 month) milestones:

- Month 6: Accelerator Integration Report
- Month 12: Final Accelerator and System Design

Monthly written technical progress reports will supplement the above milestones (see template under SBIR/STTR BAA DOCUMENTS at <https://www.darpa.mil/work-with-us/for-small-businesses/participate-sbir-sttr-program>).

Subtopic 1 performers are expected to collaborate with subtopic 2 performers in this program.

Subtopic 2: Irradiation system design and proof-of-concept pilot demonstration

Subtopic 2 will complete system studies for two use cases using the accelerator technology of Subtopic 1. As mentioned above, the first use case will examine operation in deployed or austere environments. Food-based logistical support aims to feed 300 troops from mobilized trailers or 800 troops from containerized kitchens. About 32 lbs. of food supplies (including packaging) are needed per troop per week. This is about 2 kg/day at an average density of ~0.5 g/cc. Detailed modeling and analysis will be carried out on various objects and package configurations, and optimization studies will be conducted to provide effective treatment per object at maximum throughput. In addition, Monte Carlo analysis will be used to study radiation shielding. Such shielding could make use of supplied or indigenous materials or combinations of both to minimize size and weight. Handling systems will also be developed and included in the design studies. Metrics for this use case are described in the table below.

| Parameter | Threshold | Objective |
|--------------------------------|------------------|------------------|
| Size and weight (463L pallets) | < 2 | < 1 |
| Throughput (kg/hr) | > 50 | > 180 |
| Dose/item (kGy) | > 0.4 | > 1 |
| Dose uniformity ratio | < 2.5 | < 1.4 |

Size and weight metrics include the full accelerator of Subtopic 1. Object and packaging details as well as feedback on aspects of practical system suitability are anticipated through discussions with performer(s) and DoD stakeholders during the base period.

The second system study will examine using the accelerator of Subtopic 1 in a distributed architecture at the point of packaging. Perishable food such as lettuce or ground beef and associated packaging will be analyzed. Detailed technical analysis, economic analysis, and commercialization plans for the system will be completed with the goal of minimizing overall system costs. The specific use case will be proposed by the performer. Metrics for this use case are described in the table below.

| Parameter | Threshold | Objective |
|-----------------------|------------------|------------------|
| Throughput (kg/hr) | > 1,000 | > 3,600 |
| Dose (kGy) | > 0.4 | > 1 |
| Dose uniformity ratio | < 2.5 | < 1.4 |

In addition to system studies, Subtopic 2 will develop and demonstrate a proof of concept pilot for both of the use cases described above. This includes addressing all regulatory requirements and potentially crafting petitions to regulatory bodies describing the specific needs of distributed systems.

The 12-month base period will focus on separate design studies for the use cases described above and progress through typical design review elements, including a system requirements review and preliminary design review. In addition, all relevant regulations will be identified.

Base period (12 month) milestones:

- Month 1: Kickoff materials. Slide deck summarizing approaches to meet overall goals, risks, and risk mitigations and quantified milestone schedule
- Month 3: System Requirements Review
- Month 9: Preliminary Design Review
- Month 12: Final base period report and design update

During the 12-month Option 1 period, systems will be refined through a critical design review. A minimum viable product will be defined for the accelerator system of Subtopic 1. Pilot plans will be progressed and address all regulations.

Option 1 period (12 month) milestones:

- Month 3: 1) Critical Design Review, including summary of minimum viable product findings for accelerator technology, and 2) Preliminary pilot plan
- Month 6: Interim pilot plan
- Month 12: Final pilot plan

During the 12-month Option 2 period, the accelerator from Subtopic 1 will be used to complete a concept pilot demonstration.

Option 2 period (12 month) milestones:

- Month 3: Initial pilot operation report
- Month 6: Interim pilot operation report
- Month 12: Final pilot operation report

Monthly written technical progress reports will supplement the above milestones (see template under SBIR/STTR BAA DOCUMENTS at <https://www.darpa.mil/work-with-us/for-small-businesses/participate-sbir-sttr-program>).

Subtopic 1 and 2 are linked. Monthly coordination meetings between the teams are anticipated to facilitate communication and successful completion of overall program goals.

PHASE III DUAL USE APPLICATIONS: While the U.S. food supply is among the safest in the world, the FDA estimates that there are about 48 million cases of foodborne illness annually—the equivalent of sickening 1 in 6 Americans each year. And each year these illnesses result in an estimated 128,000 hospitalizations and 3,000 deaths. More significantly, the USDA estimates that food waste is between 30 and 40 percent of the U.S. food supply, with spoilage being a significant contributor. Based on estimates from USDA's Economic Research Service of 31 percent food loss at the retail and consumer levels, this corresponded to approximately 133 billion pounds and \$161 billion worth of food in 2010. Globally, about 1.4 billion tons of food is wasted every year. From a food security perspective, the U.S. imports 94% of its seafood, 55% of fruit, and 32% of vegetables, while the FDA is only able to inspect 1-2% of these foodstuffs. Lastly, there is a need to treat food for improved safety and stability during expeditionary operations or in environments where food quality may be compromised, such as in disaster

response or humanitarian relief operations. Development of “in-house,” port-of-entry, or expeditionary irradiation capabilities would provide a new means to avoid or significantly improve these food safety and waste issues. For food safety applications, the availability of in-house technologies will help reduce and control costs, provide greater flexibility in managing inventory, facilitate new product formulations, protect against supply chain disruption, and decrease the impact of waste management. Being able to cold pasteurize food at points of production, import, or distribution and in austere environments could present a transformational ability to improve food safety and security and reduce the threat from natural, accidental, or intentional food contamination. Further, these sources could also be used for a range of other applications. For example, low-cost e-beam technology can be employed to remediate urgently needed capabilities to degrade per- and polyfluoroalkyl substances (PFAS) in groundwater and soils. In-situ sterilization of medical devices is a further need for such sources. Overall, advancement in improving food safety, availability, and security could have global impacts and significantly advance U.S. national security agendas. By enabling safe and secure food supplies in underdeveloped countries, there are new opportunities for the U.S. to provide additional stability in these regimes.

Successful proposals for this SBIR offering must make significant arguments supporting the commercial viability of their approach. Hence, proposals to Subtopic 1 must provide initial evidence that their technical approach will allow accelerator structures that are much lower cost to produce (>10-100x) and operate (>10x) than traditional accelerator systems such as S-band LINACs and rhodotrons, while still achieving required beam powers for high throughput food treatment. Proposals for Subtopic 2 must make arguments that, should the above accelerator technology be available, it would enable highly economic treatment of foodstuffs at points of production/packaging and ports of entry. Transition and commercialization (T-C) milestones have been added as part of the option phases to aid in assuring commercial viability.

REFERENCES:

1. <https://www.aiche.org/resources/publications/cep/2016/november/introduction-electron-beam-food-irradiation>
2. <https://www.armytimes.com/news/your-army/2019/10/07/the-plan-to-give-soldiers-a-days-worth-of-mres-in-one-ration-seven-days-of-food-weighing-less-than-10-pounds/>
3. <https://www.fda.gov/food/consumers/what-you-need-know-about-foodborne-illnesses#>
4. <https://www.usda.gov/foodwaste/faqs#>
5. <https://www.rts.com/resources/guides/food-waste-america/>
6. <https://www.ers.usda.gov/amber-waves/2022/february/india-and-mexico-top-sources-of-pathogen-based-u-s-food-import-refusals/>
7. <https://doi.org/10.1016/j.radphyschem.2021.109705>
8. <https://www.osti.gov/servlets/purl/1774110>

KEYWORDS: Food irradiation, cold pasteurization, medical sterilization, x-rays, linear accelerators, radiation dose

TPOC-1: DARPA BAA Help Desk
Email: SBIR_BAA@darpa.mil

APPENDIX A: DARPA DIRECT TO PHASE II (DP2) PROPOSAL INSTRUCTIONS

I. Introduction

A complete proposal submission consists of:

- Volume 1: Proposal Cover Sheet
- Volume 2: Technical Volume (feasibility documentation and technical proposal)
- Volume 3: Cost Volume
- Volume 4: Company Commercialization Report
- Volume 5: Supporting Documents
- Volume 6: Fraud, Waste and Abuse Training

The Defense SBIR/STTR Innovation Portal (DSIP) provides a structure for building the proposal volumes and submitting a consolidated proposal package. If this is your first time submitting an SBIR or STTR proposal using DSIP, please review detailed training guides at <https://www.dodsbirsttr.mil/submissions/learning-support/training-materials>. It is the responsibility of the proposing firm to ensure that a complete proposal package is certified and submitted by the close date listed in the topic to which they are responding.

To assist in proposal development, templates for Volume 2: Technical Volume and Volume 3: Cost Volume have been provided as attachments to the announcement posted at <https://www.dodsbirsttr.mil/submissions/login>. Use of these templates is mandatory.

NOTE: All proposers are required to submit Volume 4: Company Commercialization Report (CCR).

II. Proprietary Information

Proposers that include in their proposals data that they do not want disclosed to the public for any purpose, or used by the Government except for evaluation purposes, shall follow instructions in section 4.5 regarding marking propriety proposal information.

III. DP2 Proposal Instructions

a. Proposal Cover Sheet (Volume 1)

The Cover Sheet must include a brief technical abstract of no more than 3000 characters that describes the proposed R&D project with a discussion of anticipated benefits and potential commercial applications. Do not include proprietary or classified information in the Proposal Cover Sheet. If your proposal is selected for award, the technical abstract and discussion of anticipated benefits may be publicly released.

b. Content of the Technical Volume (Volume 2) – White Paper & Slide Deck

White Paper (NTE 20 pages). Provide the following information:

Goals and Impact: Clearly describe what is being proposed and what difference it will make (qualitatively and quantitatively), including a brief discussion on how this directly relates to the topic.

1. Phase I Feasibility: This topic is accepting Direct to Phase II proposals ONLY. To be eligible, proposers must demonstrate that the feasibility requirements outlined in the topic have been met, and achieved outside of the SBIR program.

2. **Technical Plan:** Outline and address all technical areas and challenges inherent in the approach and possible solutions for overcoming potential problems. Provide specific objectives, metrics, and milestones at intermediate stages to demonstrate a plan for accomplishment of the project objectives. Propose additional appropriate qualitative and quantitative metrics specific to the approach, as needed. Intermediary milestones should occur at no greater than 1-month increments.
3. **Management and Capabilities:** Designate key personnel who will be involved in the Phase II effort. Provide a brief summary of expertise of the team, including subcontractors and key personnel. Describe the organizational experience in this technology area, previous work not directly related to the proposed effort but similar, existing intellectual property required to complete the project, and any specialized facilities to be used as part of the project. List Government-furnished materials or data assumed to be available. Describe any specialized facilities to be used as part of the project, the extent of access to these facilities, and any biological containment, biosafety, and certification requirements.
4. **Transition and Commercialization Plan:**
 - a. Describe the commercial product or DoD system to be developed.
 - b. Discuss the potential end users – DoD, Federal, and/or private sector customers. Discuss your business model for this technology (i.e., how do you anticipate generating revenue with this technology?). Who are you selling to directly or indirectly, a supplier, an integrator, or an end user?
 - c. Describe your company’s funding history. Discuss how much additional funding above this proposed effort (include additional required technology development, staffing requirements, infrastructure requirements, IP strategy costs, etc.) that will be required to bring this technology to market and how you anticipate going about getting that funding (e.g., Govt S&T contracts, investment).
 - d. Describe the timeline to maturity for sales or transition to an end user. Describe your IP strategy.
 - e. Describe the technology, market, team and business risks associated with this proposed effort and your plan to mitigate these risks.

Slide Deck (NTE 15 slides). Provide the following information (convert the completed deck to a pdf and attach it to the white paper):

1. What are you trying to do and how does this directly relate to the topic?
2. **Technology and commercial product:** Specifically, what are you proposing to produce – software, system, application? Be specific on what your proposed technology development is targeting as an end state.
3. How is the technology approached today? Who is doing the research, development and delivering products/services? What are the current limitations in the technology and commercial marketplaces?
4. **Technical and commercial value proposition:** How have you substantiated the feasibility of your approach? What is innovative in your approach and how does it compare to the state-of-the-art? Why do you think it will be successful both from a technical and commercial perspective? If you are successful what difference will it make? Discuss your proposed business model – how do you expect to generate revenue from your technology?

5. Technical and commercial risks: What are the key technical and commercial challenges and how do you plan to address/overcome these?
6. Technical and commercial market analysis: Who will care and what will the impact be if you are successful? What/who are the markets/industries/integrators/stakeholders that would/should care?
7. Cost, schedule and milestones: Provide a summary of your cost volume. Provide a summary of your schedule and milestones. How much will your proposed effort cost in total? How long will it take? What are your technical milestones for achieving the proposed efforts? What are your transition and commercialization plan milestones? Discuss how much funding will be required to bring your proposed technology to market and execute on your proposed transition and commercialization plan. Include any funding raised to date and expected plans for raising any additional required funding (government contracting revenue, product sales, internal R&D investment, loan, angel or Venture Capital investment, etc.). Describe timeline to maturity for operational use or commercial sales.
8. Management: Overview of team, facilities and qualifications.
9. Technical summary quad chart: Use template provided at <https://www.darpa.mil/work-with-us/for-small-businesses/participate-sbir-sttr-program>.
10. Commercialization summary quad chart: Use the DARPA Transition and Commercialization Strategy Plan (TCSP) template, located at <https://www.darpa.mil/work-with-us/for-small-businesses/commercialization-continued>.

NOTE: All letters of recommendation and CVs can be loaded in Volume 5: Supporting Documents.

c. Format of Cost Volume (Volume 3)

Proposers are required to use the Direct to Phase II – Volume 3: Cost Proposal Template (Excel Spreadsheet) provided as an attachment to this announcement. The Cost Volume (and supporting documentation) DOES NOT count toward the page limit of the Technical Volume.

d. Content of the Cost Volume (Volume 3)

Some items in the Cost Breakdown Guidance below may not apply to the proposed project. If such is the case, there is no need to provide information on each and every item.

ALL proposed costs should be accompanied by documentation to substantiate how the cost was derived. For example, if you proposed travel cost to attend a project-related meeting or conference, and used a travel website to compare flight costs, include a screen shot of the comparison. Similarly, if you proposed to purchase materials or equipment, and used the internet to search for the best source, include your market research for those items. You do not necessarily have to propose the cheapest item or supplier, but you should explain your decision to choose one item or supplier over another. It's important to provide enough information to allow contracting personnel to understand how the proposer plans to use the requested funds. If selected for award, failure to include the documentation with your proposal will delay contract negotiation, and the proposer will be asked to submit the necessary documentation to the Contracting Officer to substantiate costs (e.g., cost estimates for equipment, materials, and consultants or subcontractors). It is important to respond as quickly as possible to the Contracting Officer's request for documentation.

Cost Breakdown Guidance:

1. List all key personnel by name as well as by number of hours dedicated to the project as direct labor. Special tooling and test equipment and material cost may be included. The inclusion of equipment and material will be carefully reviewed relative to need and appropriateness for the work proposed. The purchase of special tooling and test equipment must, in the opinion of the Contracting Officer, be advantageous to the Government and should be related directly to the specific topic. These may include such items as innovative instrumentation and/or automatic test equipment. Title to property furnished by the Government or acquired with Government funds will be vested with DARPA; unless it is determined that transfer of title to the contractor would be more cost effective than recovery of the equipment by the DARPA.
2. Cost for travel funds must be justified and related to the needs of the project.
3. Cost sharing is permitted for proposals under this announcement; however, cost sharing is not required nor will it be an evaluation factor in the consideration of a proposal.
4. All subcontractor costs and consultant costs must be detailed at the same level as prime contractor costs in regard to labor, travel, equipment, etc. Provide detailed substantiation of subcontractor costs in your cost proposal. Enter this information in the Explanatory Material section of the on-line cost proposal form. The Supporting Documents Volume (Volume 5) may be used if additional space is needed.

For more information about cost proposals and accounting standards, see the DCAA publication titled “Audit Process Overview – Information for Contractors” available at: <http://www.dcaa.mil>.

e. Company Commercialization Report (Volume 4)

The Company Commercialization Report (CCR) allows companies to report funding outcomes resulting from prior SBIR and STTR awards. The Company Commercialization Report (CCR) is required for Phase I and Direct to Phase II proposals. Please refer to the DoD STTR Program BAA for full details on this requirement. Information contained in the CCR will not be considered by DARPA during proposal evaluations.

f. Supporting Documents (Volume 5)

In addition to required DoD documentation and certifications, small businesses may also submit additional documentation to support the Technical Volume (Volume 2) and the Cost Volume (Volume 3) in Volume 5.

g. Fraud Waste and Abuse (Volume 6)

The Fraud, Waste and Abuse (FWA) training is required for Phase I and Direct to Phase II proposals. FWA training provides information on what represents FWA in the SBIR/STTR program, the most common mistakes that lead to FWA, as well as the penalties and ways to prevent FWA in your firm. This training material must be thoroughly reviewed once per year. Plan ahead and leave ample time to complete this training based on the proposal submission deadline. Knowingly and willfully making any false, fictitious, or fraudulent statements or representations may be a felony under the Federal Criminal False Statement Act (18 U.S.C. Sec 1001), punishable by a fine of up to \$10,000, up to five years in prison, or both. Understanding the indicators and types of fraud, waste, and abuse that can occur is critical for the SBIR/STTR awardees’ role in preventing the loss of research dollars.

AMENDMENT 1

The purpose of Amendment 1 to DARPA Release 1 is to update the feasibility instructions in Sec III (c) 1 on page 13 (updates highlighted).

**Defense Advanced Research Projects Agency (DARPA)
DoD 23.4 Small Business Innovation Research (SBIR) Annual BAA
Proposal Submission Instructions Release 4**

INTRODUCTION

To achieve DARPA’s mission to create technological surprise, the agency makes strategic, early investments in science and technology that will have long-term positive impacts on our national security. The pace of discovery in both science and technology is accelerating worldwide, resulting in new fields of study and the identification of scientific areas ripe for small business utilization through the SBIR and STTR programs. Small businesses are critical for developing technology to support national security. Proposers are encouraged to consider whether the R/R&D being proposed to DoD Components also has private sector potential, either for the proposed application or as a base for other applications. The topics below focus on technical domains important to DARPA’s mission pursuing innovative research concepts that fall within one of its technology offices. More information about DARPA’s technical domains and research topics of interest may be found at: <http://www.darpa.mil/about-us/offices>.

Proposers responding to a topic in this BAA must follow all general instructions provided in the Department of Defense (DoD) SBIR Program BAA. DARPA requirements in addition to or deviating from the DoD Program BAA are provided in the instructions below.

Specific questions pertaining to the administration of the DARPA Program and these proposal preparation instructions should be directed to: DARPA Small Business Programs Office at SBIR_BAA@darpa.mil. DSIP Topic Q&A will NOT be available for these DARPA topics. Technical questions related to improving the understanding of a topic’s requirements must be submitted to SBIR_BAA@darpa.mil by the deadline listed below.

The following dates apply to this DARPA Topic release:

- April 11, 2023:** Topics issued for pre-release
- April 26, 2023:** Topics open; DARPA begins accepting proposals via DSIP
- May 24, 2023:** Deadline for technical question submission
- May 31, 2023:** Deadline for receipt of proposals no later than **12:00 pm ET**

DIRECT TO PHASE II PROPOSAL GUIDELINES

Proposers should refer to the DARPA Direct to Phase II Proposal Instructions, provided in Appendix A.

Award Structure by Topic

White Paper & Slide Deck Proposal

| Topic Number | Direct to Phase II | | | | | |
|------------------|--------------------|------------|--------------|-----------------------------|---------------|---------------|
| | Technical Volume | | Award Amount | Period of Performance (PoP) | Option Amount | Option Period |
| | White Paper | Slide Deck | | | | |
| HR0011SB20234-07 | 20 pages | 15 pages | \$1,200,000 | 10 months | \$600,000 | 6 months |

Note: Please see Appendix A, section III (d) for complete instructions on the White Paper/Slide Deck technical volume format.

Technical Volume (Volume 2) – White Paper & Slide Deck Format

If a proposer can provide adequate documentation to substantiate that the scientific and technical merit and feasibility described in the Phase I section of the topic has been met and describes the potential commercial applications, the Direct to Phase II (DP2) authority allows the Department of Defense (DoD) to make an award to a small business concern under Phase II of the SBIR program without regard to whether the small business concern was provided an award under Phase I of an SBIR program. This topic is accepting DP2 proposal submissions.

The white paper shall not exceed 20 pages, and the slide deck shall not exceed 15 pages. For information on the content of these elements of the technical proposal and the commercialization strategy, please see Attachment B: DARPA Direct to Phase II (DP2) Instructions.

Content of the Technical Volume

Proposers should refer to the DARPA DP2 Proposal Instructions, provided in Appendix A.

Cost Volume (Volume 3)

Please see the chart above for award amounts listed by topic. Proposers are required to use the Direct to Phase II – Volume 3: Cost Proposal Template (Excel Spreadsheet) provided on the DARPA Small Business site (<https://www.darpa.mil/work-with-us/for-small-businesses/participate-sbir-sttr-program>). Subcontractors may also submit unsanitized costs using this template directly to DARPA at SBIR-BAA@darpa.mil.

Please review the updated Percentage of Work (POW) calculation details included in the DoD Program BAA. DARPA will occasionally accept deviations from the POW requirements with a letter of explanation or approval from the Funding Agreement officer.

Company Commercialization Report (CCR) (Volume 4)

Completion of the CCR as Volume 4 of the proposal submission in DSIP is required. Please refer to the DoD SBIR Program BAA for full details on this requirement. Information contained in the CCR will not be considered by DARPA during proposal evaluations.

Supporting Documents (Volume 5)

In addition to the documents required by DoD, small businesses may also submit additional documentation to support the Technical Volume (Volume 2) and the Cost Volume (Volume 3) in Volume 5.

DISCRETIONARY TECHNICAL AND BUSINESS ASSISTANCE (TAB A)

DARPA does not offer TAB A funding.

EVALUATION AND SELECTION

All proposals will be evaluated in accordance with the evaluation criteria listed in the DoD SBIR 2023.4 BAA. DARPA will conduct an evaluation of each conforming proposal. Proposals that do not comply with the requirements detailed in this BAA and the research objective(s) of the corresponding topic are considered non-conforming and therefore are not evaluated nor considered for award.

Using the evaluation criteria, the Government will evaluate each proposal in its entirety, documenting the strengths and weaknesses relative to each evaluation criterion, and, based on these identified strengths and

weaknesses, determine the proposal's overall selectability. Proposals will not be evaluated against each other during the evaluation process, but rather evaluated on their own individual merit to determine how well the proposal meets the criteria stated in this BAA and the corresponding DARPA topic.

Awards will be made to proposers whose proposals are determined to be the most advantageous to the Government, consistent with instructions and evaluation criteria specified in the DoD SBIR 2023.4 BAA and availability of funding. Given the limited funding available for each topic released, not all proposals considered selectable will be selected for funding.

For the purposes of this proposal evaluation process, a selectable proposal is defined as follows:

Selectable: A selectable proposal is a proposal that has been evaluated by the Government against the evaluation criteria listed in the DoD SBIR 2023.4 BAA and DARPA topic, and the strengths of the overall proposal outweighs its weaknesses. Additionally, there are no accumulated weaknesses that would require extensive negotiations and/or a resubmitted proposal.

For the purposes of this proposal evaluation process, a non-selectable proposal is defined as follows:

Non-Selectable: A proposal is considered non-selectable when the proposal has been evaluated by the Government against the evaluation criteria listed in the DoD SBIR 2023.4 BAA and DARPA topic, and the strengths of the overall proposal do not outweigh its weaknesses.

Proposing firms will be notified of selection or non-selection status for a Phase I award within 90 days of the closing date of the DoD SBIR 2023.4 BAA. It is the policy of DARPA to treat all proposals as source selection information and to disclose their contents only for the purpose of evaluation. Restrictive notices notwithstanding, during the evaluation process, submissions may be handled by support contractors for administrative purposes and/or to assist with technical evaluation. All DARPA support contractors are expressly prohibited from performing DARPA-sponsored technical research and are bound by appropriate nondisclosure agreements. Input on technical aspects of the proposals may be solicited by DARPA from other Government and/or non-Government consultants/experts who are strictly bound by the appropriate non-disclosure requirements. No submissions will be returned. Upon completion of the evaluation and selection process, an electronic copy of each proposal received will be retained at DARPA.

Proposal titles, abstracts, anticipated benefits, and keywords of proposals that are selected for contract award will undergo a DARPA Policy and Security Review. Proposal titles, abstracts, anticipated benefits, and keywords are subject to revision and/or redaction by DARPA. Final approved versions of proposal titles, abstracts, anticipated benefits, and keywords may appear on the DoD SBIR/STTR awards website and/or the SBA's SBIR/STTR award website (<https://www.sbir.gov/sbirsearch/award/all>).

Refer to the DoD SBIR 2023.4 Program BAA for procedures to protest the Announcement. As further prescribed in FAR 33.106(b), FAR 52.233-3, Protests regarding the selection decision should be submitted to:

DARPA
Contracts Management Office (CMO)
675 N. Randolph Street
Arlington, VA 22203
E-mail: scott.ulrey@darpa.mil and sbir@darpa.mil

AWARD AND CONTRACT INFORMATION

1. General Award Information

Multiple awards are anticipated. DARPA may award FAR-based government contracts (Firm- Fixed Price or Cost-Plus Reimbursement) or Other Transactions for Prototypes agreement (under the authority of 10 U.S.C. § 4022) subject to approval of the Contracting Officer. The amount of resources made available for each topic issued under this BAA will depend on the quality of the proposals received and the availability of funds.

Majority Ownership in Part. Proposers that are more than 50% owned by multiple venture capital operating companies (VCOC), hedge funds (HF), private equity firms (PEF), or any combination of these as set forth in 13 C.F.R. § 121.702, are eligible to submit proposals in response to DARPA topics advertised within this BAA.

For proposers that are a member of this ownership class the following must be satisfied for proposals to be accepted and evaluated:

- a. Prior to submitting a proposal, firms must register with the SBA Company Registry Database.
- b. The proposer within its submission must submit the Majority-Owned VCOC, HF, and PEF Certification. A copy of the SBIR VC Certification can be found on <https://www.darpa.mil/work-with-us/for-small-businesses/participate-sbir-sttr-program>, under SBIR/STTR BAA Forms. Include the SBIR VC Certification in the Supporting Documents (Volume 5).
- c. Should a proposer become a member of this ownership class after submitting its proposal and prior to any receipt of a funding agreement, the proposer must immediately notify the Contracting Officer, register in the appropriate SBA database, and submit the required certification which can be found under SBIR/STTR BAA Forms and Templates on <https://www.darpa.mil/work-with-us/for-small-businesses/participate-sbir-sttr-program>.

The Government reserves the right to select for negotiation all, some, one, or none of the proposals received in response to this announcement and to make awards with or without communications with proposers. Additionally, the Government reserves the right to award all, some, one, or none of the options on the contract(s)/agreement(s) of the performers based on available funding and technical performance. If warranted, portions of resulting awards may be segregated into pre-priced options. Additionally, DARPA reserves the right to accept proposals in their entirety or to select only portions of proposals for award. In the event that DARPA desires to award only portions of a proposal, negotiations may be opened with that proposer. The Government reserves the right to fund proposals in phases with options for continued work, as applicable.

The Government reserves the right to request any additional, necessary documentation once it makes the award instrument determination. The Government reserves the right to remove a proposal from award consideration should the parties fail to reach agreement on award terms, conditions, and price within a reasonable time, and/or the proposer fails to provide requested additional information within three business days.

In all cases, the Government Contracting Officer reserves the right to select award instrument type, regardless of instrument type proposed, and to negotiate all instrument terms and conditions with selectees. DARPA will apply publication or other restrictions, as necessary, if it determines that the research resulting from the proposed effort will present a high likelihood of disclosing performance characteristics of military systems or manufacturing technologies that are unique and critical to defense. Any award resulting from such a determination will include a requirement for DARPA permission before publishing any information or results on the program. For more information on publication restrictions, see the DoD SBIR 2023.4 BAA.

Because of the desire to streamline the award negotiation and program execution process, proposals identified for negotiation will result in negotiating a type of instrument for award that is in the best interest of the Government. In the case of an OT for Prototype agreement under DARPA's authority to award OTs for prototype projects, 10 U.S.C. § 4022, use of an OT provides significant opportunities for flexible execution to assist in meeting DARPA's aggressive SBIR/STTR program goals.

All proposers that wish to consider an OT award should carefully read the following:

The flexibility of the OT award instrument is beneficial to the program because the Performer will be able to apply its best practices as required to carry out the research project that may be outside of the Federal Acquisition Regulation (FAR) process-driven requirements. Streamlined practices will be used, such as milestone-driven performance, intended to reduce time and effort on award administration tasks and permit performers to focus on the research effort and rapid prototyping. Because of this ability, OTs provide the Agreements Officer the flexibility to create an award instrument that contains terms and conditions that promote commercial transition, reduce some administratively burdensome acquisition regulations, and meet SBIR/STTR program goals.

Proposers must only propose an OT agreement with fixed payable milestones. Fixed payable milestones are fixed payments based on successful completion of the milestone accomplishments agreed to in the milestone plan. Refer to the Other Transactions for Prototypes Fact Sheet and Other Transaction for Prototype Agreement, available at <https://www.darpa.mil/work-with-us/for-small-businesses/participate-sbir-sttr-program>. Specific milestones will be based upon the research objectives detailed in the topic.

Please see <https://www.darpa.mil/work-with-us/for-small-businesses/participate-sbir-sttr-program> for more information on OTs.

2. Transition and Commercialization Support Program (TCSP)

DARPA will provide services to Phase II or DP2 awardees upon contract execution through the Transition and Commercialization Support Program (TCSP) at no cost to awardees. The TCSP goal is to maximize the potential for SBIR/STTR companies to move their technology beyond Phase II and into other research and development programs for further maturity or into solutions or products for DoD acquisition programs, other Federal programs, and/or the commercial market. Please visit <https://www.darpa.mil/work-with-us/for-small-businesses/commercialization-continued> for more information on DARPA TCSP.

3. Embedded Entrepreneurship Initiative

Awardees of SBIR funding pursuant to this BAA may be eligible to participate in the DARPA Embedded Entrepreneurship Initiative (EEI) during the Period of Performance. Invitation to participate in EEI is at the sole discretion of the Government based on evaluation of technical and commercial factors and subject to program balance and the availability of funding. EEI is a limited scope program offered by DARPA, at DARPA's discretion, to a small subset of awardees. The goal of DARPA's EEI is to increase the likelihood that DARPA-funded technologies take root in the U.S. and provide new capabilities for national defense. EEI supports DARPA's mission "to make pivotal investments in breakthrough technologies and capabilities for national security" by accelerating the transition of innovations out of the lab and into new capabilities for the Department of Defense (DoD). EEI investment supports development of a robust and deliberate Go-to-Market strategy for selling technology product to the government and commercial markets and positions DARPA awardees to attract U.S. investment. The following is for informational and planning purposes only and does not constitute solicitation of proposals to the EEI.

There are three elements to DARPA's EEI: (1) A Senior Commercialization Advisor (SCA) from DARPA who works with the Program Manager (PM) to examine the business case for the awardee's

technology and uses commercial methodologies to identify steps toward achieving a successful transition of technology to the government and commercial markets; (2) Connections to potential industry and investor partners via EEI's Investor Working Groups; and (3) Additional funding on an awardee's contract for the awardee to hire an embedded entrepreneur to achieve specific milestones in a Go-to-Market strategy for transitioning the technology to products that serve both defense and commercial markets. This embedded entrepreneur's qualifications should include business experience within the target industries of interest, experience in commercializing early stage technology, and the ability to communicate and interact with technical and non-technical stakeholders. Funding for EEI is typically no more than \$250,000 per awardee over the duration of the award. An awardee may apportion EEI funding to hire more than one embedded entrepreneur, if achieving the milestones requires different expertise that can be obtained without exceeding the awardee's total EEI funding. The EEI effort is intended to be conducted concurrent with the research program without extending the period of performance.

EEI Application Process:

After receiving an award under the solicitation, awardees interested in being considered for EEI should notify their DARPA Program Manager (PM) during the period of performance. Timing of such notification should ideally allow sufficient time for DARPA and the awardee to review the awardee's initial transition plan, identify milestones to achieve under EEI, modify the award, and conduct the work required to achieve such milestones within the original award period of performance. These steps may take 9-18 months to complete, depending on the technology. If the DARPA PM determines that EEI could be of benefit to transition the technology to product(s) the Government needs, the PM will refer the performer to DARPA Commercial Strategy.

DARPA Commercial Strategy will then contact the performer, assess fitness for EEI, and in consultation with the DARPA technical office, determine whether to invite the performer to participate in the EEI. Factors that are considered in determining fitness for EEI include DoD/Government need for the technology; competitive approaches to enable a similar capability or product; risks and impact of the Government's being unable to access the technology from a sustainable source; Government and commercial markets for the technology; cost and affordability; manufacturability and scalability; supply chain requirements and barriers; regulatory requirements and timelines; Intellectual Property and Government Use Rights, and available funding.

Invitation to participate in EEI is at the sole discretion of DARPA and subject to program balance and the availability of funding. EEI participants' awards may be subsequently modified bilaterally to amend the Statement of Work to add negotiated EEI tasks, provide funding, and specify a milestone schedule which will include measurable steps necessary to build, refine, and execute a Go-to-Market technology transition plan aimed at delivering new capabilities for national defense. Milestone examples are available at: <https://www.darpa.mil/work-with-us/contract-management>.

Awardees under this solicitation are eligible to be considered for participation in EEI, but selection for award under this solicitation does not imply or guarantee participation in EEI.

For more information please refer to the EEI website <https://eei.darpa.mil/>.

4. DARPA Toolbox Initiative

DARPA Toolbox is an Agency-wide effort to provide open licensing opportunities with commercial technology vendors to the researchers behind DARPA programs. DARPA Toolbox provides easy, low-cost, scalable access to state-of-the-art tools and intellectual property (IP) under predictable legal terms and streamlined acquisition procedures. The goal is to reduce performer reliance on low-quality, low-cost tools and IP that increase execution risks and complicate post-DARPA transitions.

Through this initiative, DARPA performers are granted access to select vendor tools and technologies throughout the life of their contractual relationship with the Agency. The Toolbox suppliers bring to the table proven technologies commonly used in state-of-the art commercial microelectronics or system design methodologies.

DARPA Toolbox program information and a full list of participating suppliers can be found at <https://www.darpa.mil/work-with-us/darpa-toolbox-initiative>. If there are tool or technologies of interest, contact the Supplier POC listed for the product, referencing the DARPA Toolbox Initiative. The Supplier POC will provide advice on products and pricing information. Include any non-production pricing quotes in your proposal. Products and pricing are between you and the suppliers – *do not* contact DARPA directly.

ADDITIONAL INFORMATION

DARPA intends to use electronic mail for all correspondence regarding these topics. Questions related to the technical aspect of the research objectives and awards specifically related to a topic should be emailed to SBIR_BAA@darpa.mil. Please reference the topic number in the subject line. All questions must be in English and must include the name, email address, and the telephone number of a point of contact.

DARPA will attempt to answer questions in a timely manner; however, questions submitted within seven (7) calendar days of the proposal due date listed herein may not be answered. DARPA will post a consolidated Frequently Asked Questions (FAQ) document. To access the posting please visit: <http://www.darpa.mil/work-with-us/opportunities>. Under the topic number summary, there will be a link to the FAQ. The FAQ will be updated on an ongoing basis until one week prior to the proposal due date.

Technical support for the Defense SBIR/STTR Innovation Portal (DSIP) is available Monday through Friday, 9:00 a.m. – 5:00 p.m. ET. Requests for technical support must be emailed to DoDSBIRSupport@reisystems.com with a copy to SBIR_BAA@darpa.mil.

DARPA SBIR 23.4 Topic Index
Release 4

HR0011SB20234-07

TITLE: Deuce Coupe

HR0011SB20234-07 TITLE: Deuce Coupe

OUSD (R&E) CRITICAL TECHNOLOGY AREA(S): Integrated Sensing & Cyber, Trusted AI & Autonomy

OBJECTIVE: To address supply chain shortages by providing a fast, reliable, and widely-available capability to identify, appraise, and extract valuable mechanical and electronic components from scrapped or damaged systems, for reuse in functioning systems [1-3].

DESCRIPTION: Mechanical parts recycling, and electronic waste (e-waste) reuse falls into two broad categories. The first is the recovery of valuable materials such as aluminum, steel, gold, rare earths, and lithium. This is a high-volume bulk process where the high-value manufactured components are systematically reduced to raw material [4].

The second broad category is ad-hoc recovery through junkyards and scrap-picking. In this case, experts look through the scrap and select the parts needed—a labor-intensive process that does not scale. The experts have (1) the skills to understand which parts are needed [5], (2) an encyclopedic knowledge of which systems have the needed part and where it is in the system, (3) the ability to assess whether the scrapped part appears to be functional, and (4) the expertise to safely extract the needed part [6].

Today, each of these steps requires substantial knowledge of potential donor systems. Given the plethora of donor systems (cars, trucks, phones, computers, printers) now available, and the broad understanding of available components and means of extraction, the potential utility of harvesting this vast pool of high-value resources is far above what can be done today by human experts [7].

Note: please see DARPA SBIR 23.4 - Release 4 under the DoD STTR 23.4 Annual BAA at <https://www.defensesbirsttr.mil/SBIR-STTR/Opportunities/> for DARPA proposal instructions, to include duration and funding information for this topic.

PHASE I: This topic is soliciting Direct to Phase II (DP2) proposals only. In a Deuce Coupe environment, operators equipped with high-end cell phones would be given search lists and then cued to look for the sources of needed components. Based on information from service manuals, shop manuals, disassembly information, and related sources [8], Deuce Coupe-developed software would use image-feature extraction, natural language processing, and knowledge of physical dynamics to identify systems containing the necessary components [9]. When a candidate donor system is identified, the operator is then cued as to where to find the material within the system [10, 11].

Feasibility requirements firms must meet to be considered for a Phase II award:

- Ability to create the models and structures needed to identify embedded material
- Capability to capture information from sensors to feed the inventory of material

Success criteria for Phase I: Identification of the components needed. In Phase I, the identification will not require a pass/fail for the component [12].

PHASE II: During Phase II, Deuce Coupe will use the sensors on the phone to evaluate the state of the identified components or sub-assemblies [3, 13]. A highly-skilled mechanic or technician can examine the appearance, color, and shape of parts and subsystems and then rapidly assess the part's condition and suitability for reuse [2, 14].

Phase II Milestones (Base):

- Month 4: Demonstration of an automated, functioning workflow to take an operator from parts ingestion through populating a design system component library
- Month 7: Capability to ingest and identify junked systems (e.g. car, truck) and provide sufficient metadata to be able to access the parts database systems
- Month 10: Capability to provide information on the available parts from the junked systems based on sensor input and synthesis of the metadata on the system (e.g. shop manual)

Phase II Milestones (Option):

- Month 5: Ability to assess the utility of a part based on sensor data and evaluate its capacity for reuse
- Month 6: Capability to advise on preferential reuse of parts based on assessed utility of the part and information in available metadata

Success criteria for Phase II: the components are to be identified with a reliability indicator that is accurate 80% of the time for P(working) and 90% of the time for P(failure).

PHASE III DUAL USE APPLICATIONS: Scale up to provide efficient and local resupply, measuring the ability to keep a greater quantity of systems in the field for longer periods of time, while simultaneously increasing confidence levels for systems' operational capabilities. Expand the range of sourcing possibilities for parts and subsystems, thus allowing otherwise-incapacitated systems to be made available for operation.

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KEYWORDS: Supply Chain, Sustainability, Resilience, Machine Reasoning, Automatic decomposition of system-of-systems, Automatic assessment of system wear, Part reuse, Machine vision, Mobile applications

APPENDIX A: DARPA DIRECT TO PHASE II (DP2) PROPOSAL INSTRUCTIONS

I. Introduction

A complete proposal submission consists of:

- Volume 1: Proposal Cover Sheet
- Volume 2: Technical Volume (feasibility documentation and technical proposal)
- Volume 3: Cost Volume
- Volume 4: Company Commercialization Report
- Volume 5: Supporting Documents
- Volume 6: Fraud, Waste and Abuse Training

The Defense SBIR/STTR Innovation Portal (DSIP) provides a structure for building the proposal volumes and submitting a consolidated proposal package. If this is your first time submitting an SBIR or STTR proposal using DSIP, please review detailed training guides at <https://www.dodsbirsttr.mil/submissions/learning-support/training-materials>. It is the responsibility of the proposing firm to ensure that a complete proposal package is certified and submitted by the close date listed in the topic to which they are responding.

To assist in proposal development, the template for Volume 3: DARPA SBIR Direct to Phase II Cost Proposal is available on the DARPA Small Business website under SBIR/STTR BAA FORMS & TEMPLATES at <https://www.darpa.mil/work-with-us/for-small-businesses/participate-sbir-sttr-program>. Use of this template is mandatory.

NOTE: All proposers are required to submit Volume 4: Company Commercialization Report (CCR).

II. Proprietary Information

Proposers that include in their proposals data that they do not want disclosed to the public for any purpose, or used by the Government except for evaluation purposes, shall follow instructions in section 4.5 regarding marking propriety proposal information.

III. DP2 Proposal Instructions

a. Proposal Cover Sheet (Volume 1)

The Cover Sheet must include a brief technical abstract of no more than 3000 characters that describes the proposed R&D project with a discussion of anticipated benefits and potential commercial applications. Do not include proprietary or classified information in the Proposal Cover Sheet. If your proposal is selected for award, the technical abstract and discussion of anticipated benefits may be publicly released.

b. Format of the Technical Volume (Volume 2) – White Paper & Slide Deck

1. The Technical Volume must include two parts, PART ONE: white paper and PART TWO: slide deck.
2. Type of file: The Technical Volume must be a single Portable Document Format (PDF) file, including graphics. Perform a virus check before uploading the Technical Volume file. If a virus is detected, it may cause rejection of the proposal. Do not lock or encrypt the uploaded file. Do

not include or embed active graphics such as videos, moving pictures, or other similar media in the document.

3. Length: The length of each part of the technical volume (white paper and side deck) will be specified by the corresponding TOPIC. The Government will not consider pages in excess of the page count limitations.
4. Layout: Number all pages of your proposal consecutively. Font size should not be smaller than 10-point on standard 8-1/2" x 11" paper with one-inch margins. The header on each page of the Technical Volume should contain your company name, topic number, and proposal number assigned by DSIP when the Cover Sheet was created. The header may be included in the one-inch margin.

c. Content of the Technical Volume (Volume 2) – White Paper & Slide Deck

White Paper (NTE 20 pages). Provide the following information:

Goals and Impact: Clearly describe what is being proposed and what difference it will make (qualitatively and quantitatively), including a brief discussion on how this directly relates to the topic.

1. Phase I Feasibility: This topic is accepting Direct to Phase II proposals ONLY. To be eligible, proposers must demonstrate that the documented feasibility work as required in the topic has been achieved outside of the SBIR program.
2. Technical Plan: Outline and address all technical areas and challenges inherent in the approach and possible solutions for overcoming potential problems. Provide specific objectives, metrics, and milestones at intermediate stages to demonstrate a plan for accomplishment of the project objectives. Propose additional appropriate qualitative and quantitative metrics specific to the approach, as needed. Intermediary milestones should occur at no greater than 1-month increments.
3. Management and Capabilities: Designate key personnel who will be involved in the Phase II effort. Provide a brief summary of expertise of the team, including subcontractors and key personnel. Describe the organizational experience in this technology area, previous work not directly related to the proposed effort but similar, existing intellectual property required to complete the project, and any specialized facilities to be used as part of the project. List Government-furnished materials or data assumed to be available. Describe any specialized facilities to be used as part of the project, the extent of access to these facilities, and any biological containment, biosafety, and certification requirements.
4. Transition and Commercialization Plan:
 - a. Describe the commercial product or DoD system to be developed.
 - b. Discuss the potential end users – DoD, Federal, and/or private sector customers. Discuss your business model for this technology (i.e., how to you anticipate generating revenue with this technology?). Who are you selling to directly or indirectly, a supplier, an integrator, or an end user?
 - c. Describe your company's funding history. Discuss how much additional funding above this proposed effort (include additional required technology development, staffing requirements, infrastructure requirements, IP strategy costs, etc.) that will be required to bring this technology to market and how you anticipate going about getting that funding (e.g., Govt S&T contracts, investment).

- d. Describe the timeline to maturity for sales or transition to an end user. Describe your IP strategy.
- e. Describe the technology, market, team and business risks associated with this proposed effort and your plan to mitigate these risks.

Slide Deck (NTE 15 slides). Provide the following information (convert the completed deck to a pdf and attach it to the white paper):

1. What are you trying to do and how does this directly relate to the topic?
2. Technology and commercial product: Specifically, what are you proposing to produce – software, system, application? Be specific on what your proposed technology development is targeting as an end state.
3. How is the technology approached today? Who is doing the research, development and delivering products/services? What are the current limitations in the technology and commercial marketplaces?
4. Technical and commercial value proposition: How have you substantiated the feasibility of your approach? What is innovative in your approach and how does it compare to the state-of-the-art? Why do you think it will be successful both from a technical and commercial perspective? If you are successful what difference will it make? Discuss your proposed business model – how do you expect to generate revenue from your technology?
5. Technical and commercial risks: What are the key technical and commercial challenges and how do you plan to address/overcome these?
6. Technical and commercial market analysis: Who will care and what will the impact be if you are successful? What/who are the markets/industries/integrators/stakeholders that would/should care?
7. Cost, schedule and milestones: Provide a summary of your cost volume. Provide a summary of your schedule and milestones. How much will your proposed effort cost in total? How long will it take? What are your technical milestones for achieving the proposed efforts? What are your transition and commercialization plan milestones? Discuss how much funding will be required to bring your proposed technology to market and execute on your proposed transition and commercialization plan. Include any funding raised to date and expected plans for raising any additional required funding (government contracting revenue, product sales, internal R&D investment, loan, angel or Venture Capital investment, etc.). Describe timeline to maturity for operational use or commercial sales.
8. Management: Overview of team, facilities and qualifications.
9. Technical summary quad chart: Use template provided at <https://www.darpa.mil/work-with-us/for-small-businesses/participate-sbir-sttr-program>.
10. Commercialization summary quad chart: Use the DARPA Transition and Commercialization Strategy Plan (TCSP) template, located at <https://www.darpa.mil/work-with-us/for-small-businesses/commercialization-continued>.

NOTE: All letters of recommendation and CVs can be loaded in Volume 5: Supporting Documents.

d. Format of Cost Volume (Volume 3)

Proposers are required to use the Direct to Phase II – Volume 3: Cost Proposal Template (Excel Spreadsheet) provided as an attachment to this announcement. The Cost Volume (and supporting documentation) DOES NOT count toward the page limit of the Technical Volume.

e. Content of the Cost Volume (Volume 3)

Some items in the Cost Breakdown Guidance below may not apply to the proposed project. If such is the case, there is no need to provide information on each and every item.

ALL proposed costs should be accompanied by documentation to substantiate how the cost was derived. For example, if you proposed travel cost to attend a project-related meeting or conference, and used a travel website to compare flight costs, include a screen shot of the comparison. Similarly, if you proposed to purchase materials or equipment, and used the internet to search for the best source, include your market research for those items. You do not necessarily have to propose the cheapest item or supplier, but you should explain your decision to choose one item or supplier over another. It's important to provide enough information to allow contracting personnel to understand how the proposer plans to use the requested funds. If selected for award, failure to include the documentation with your proposal will delay contract negotiation, and the proposer will be asked to submit the necessary documentation to the Contracting Officer to substantiate costs (e.g., cost estimates for equipment, materials, and consultants or subcontractors). It is important to respond as quickly as possible to the Contracting Officer's request for documentation.

Cost Breakdown Guidance:

1. List all key personnel by name as well as by number of hours dedicated to the project as direct labor. Special tooling and test equipment and material cost may be included. The inclusion of equipment and material will be carefully reviewed relative to need and appropriateness for the work proposed. The purchase of special tooling and test equipment must, in the opinion of the Contracting Officer, be advantageous to the Government and should be related directly to the specific topic. These may include such items as innovative instrumentation and/or automatic test equipment. Title to property furnished by the Government or acquired with Government funds will be vested with DARPA; unless it is determined that transfer of title to the contractor would be more cost effective than recovery of the equipment by the DARPA.
2. Cost for travel funds must be justified and related to the needs of the project.
3. Cost sharing is permitted for proposals under this announcement; however, cost sharing is not required nor will it be an evaluation factor in the consideration of a proposal.
4. All subcontractor costs and consultant costs must be detailed at the same level as prime contractor costs in regard to labor, travel, equipment, etc. Provide detailed substantiation of subcontractor costs in your cost proposal. Enter this information in the Explanatory Material section of the on-line cost proposal form. The Supporting Documents Volume (Volume 5) may be used if additional space is needed.

For more information about cost proposals and accounting standards, see the DCAA publication titled "Audit Process Overview – Information for Contractors" available at: <http://www.dcaa.mil>.

f. Company Commercialization Report (Volume 4)

The Company Commercialization Report (CCR) allows companies to report funding outcomes resulting from prior SBIR and STTR awards. The Company Commercialization Report (CCR) is required for Phase I and Direct to Phase II proposals. Please refer to the DoD STTR Program BAA for full details on

this requirement. Information contained in the CCR will not be considered by DARPA during proposal evaluations.

g. Supporting Documents (Volume 5)

In addition to required DoD documentation and certifications, small businesses may also submit additional documentation to support the Technical Volume (Volume 2) and the Cost Volume (Volume 3) in Volume 5.

h. Fraud Waste and Abuse (Volume 6)

The Fraud, Waste and Abuse (FWA) training is required for Phase I and Direct to Phase II proposals. FWA training provides information on what represents FWA in the SBIR/STTR program, the most common mistakes that lead to FWA, as well as the penalties and ways to prevent FWA in your firm. This training material must be thoroughly reviewed once per year. Plan ahead and leave ample time to complete this training based on the proposal submission deadline. Knowingly and willfully making any false, fictitious, or fraudulent statements or representations may be a felony under the Federal Criminal False Statement Act (18 U.S.C. Sec 1001), punishable by a fine of up to \$10,000, up to five years in prison, or both. Understanding the indicators and types of fraud, waste, and abuse that can occur is critical for the SBIR/STTR awardees' role in preventing the loss of research dollars.

AMENDMENT 2

**Defense Advanced Research Projects Agency (DARPA)
DoD 23.4 Small Business Innovation Research (SBIR) Annual BAA
Proposal Submission Instructions
Release 5**

The purpose of Amendment 2 to DARPA Release 5 is to correct the closing date for proposal submission (change highlighted)

INTRODUCTION

DARPA's mission is to make strategic, early investments in science and technology that will have long-term positive impacts on our national security. As part of this mission, DARPA makes high-risk, high-reward investments in science and technology that have the potential to disrupt current understandings and/or approaches. The pace of discovery in both science and technology is accelerating worldwide, resulting in new fields of study and the identification of scientific areas ripe for small business utilization through the SBIR and STTR programs. Small businesses are critical for developing technology to support national security. Proposers are encouraged to consider whether the R/R&D being proposed to DoD Components also has private sector potential, either for the proposed application or as a base for other applications. The topics below focus on technical domains important to DARPA's mission pursuing innovative research concepts that fall within one of its technology offices. More information about DARPA's technical domains and research topics of interest may be found at: <http://www.darpa.mil/about-us/offices>.

Proposers responding to a topic in this BAA must follow all general instructions provided in the Department of Defense (DoD) SBIR Program BAA. DARPA requirements in addition to or deviating from the DoD Program BAA are provided in the instructions below.

Proposers are encouraged to thoroughly review the DoD Program BAA and register for the DSIP Listserv to remain apprised of important programmatic and contractual changes.

- The DoD Program BAA is located at: <https://www.defensesbirstr.mil/SBIR-STTR/Opportunities/#announcements>. Be sure to select the tab for the appropriate BAA cycle.
- Register for the DSIP Listserv at: <https://www.dodsbirstr.mil/submissions/login>.

Specific questions pertaining to the administration of the DARPA Program and these proposal preparation instructions should be directed to: DARPA Small Business Programs Office at SBIR_BAA@darpa.mil.

DSIP Topic Q&A will NOT be available for these DARPA topics. Technical questions related to improving the understanding of a topic's requirements must be submitted to SBIR_BAA@darpa.mil by the deadline listed below.

The following dates apply to this DARPA Topic release:

April 27, 2023: Topics issued for pre-release

May 18, 2023: Topics open; DARPA begins accepting proposals via DSIP

June 08, 2023: Deadline for technical question submission

June 15, 2023: Deadline for receipt of proposals no later than **12:00 pm ET**

DIRECT TO PHASE II PROPOSAL GUIDELINES

Proposers should refer to the DARPA Direct to Phase II Proposal Instructions, provided in Appendix A. **Current Release Award Structure by Topic**

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| Topic Number | Direct to Phase II | | | | |
|------------------|--------------------|--------------|-----------------------------|---------------|------------|
| | Tech Volume* | Award Amount | Period of Performance (PoP) | Option Amount | Option PoP |
| HR0011SB20234-08 | 35 pages | \$600,000 | 10 months | N/A | N/A |
| HR0011SB20234-09 | 35 pages | \$1,200,000 | 24 months | \$600,000 | 12 months |
| HR0011SB20234-10 | 35 pages | \$1,200,000 | 24 months | \$600,000 | 12 months |
| HR0011SB20234-11 | 35 pages | \$1,200,000 | 24 months | \$600,000 | 12 months |
| HR0011SB20234-12 | 35 pages | \$1,200,000 | 24 months | \$600,000 | 12 months |
| HR0011SB20234-13 | 35 pages | \$1,200,000 | 24 months | \$600,000 | 12 months |

Technical Volume (Volume 2) – Abbreviated Standard Format (35-page)

If a proposer can provide adequate documentation to substantiate that the scientific and technical merit and feasibility described in the Phase I section of the topic has been met and describes the potential commercial applications, the Direct to Phase II (DP2) authority allows the Department of Defense (DoD) to make an award to a small business concern under Phase II of the SBIR program without regard to whether the small business concern was provided an award under Phase I of an SBIR program. This topic is accepting DP2 proposal submissions.

DP2 Feasibility Documentation shall not exceed 10 pages. DP2 Technical Proposal shall not exceed 20 pages. Phase II commercialization strategy shall not exceed 5 pages. This should be the last section of the Technical Volume and will not count against the 30-page limit.

Content of the Technical Volume

Proposers should refer to the DARPA DP2 Proposal Instructions, provided in Appendix A and on the DARPA Small Business site (<https://www.darpa.mil/work-with-us/for-small-businesses/participate-sbir-sttr-program>).

Cost Volume (Volume 3)

Please see the chart above for award amounts listed by topic. Proposers are required to use the Direct to Phase II – Volume 3: Cost Proposal Template (Excel Spreadsheet) provided on the DARPA Small Business site (<https://www.darpa.mil/work-with-us/for-small-businesses/participate-sbir-sttr-program>).

NOTE: Subcontractors may also submit unsanitized cost proposals using this template directly to DARPA at SBIR-BAA@darpa.mil.

Please review the updated Percentage of Work (POW) calculation details included in the DoD Program BAA. DARPA will occasionally accept deviations from the POW requirements with a letter of explanation or approval from the Funding Agreement officer.

Company Commercialization Report (CCR) (Volume 4)

Completion of the CCR as Volume 4 of the proposal submission in DSIP is required. Please refer to the DoD SBIR Program BAA for full details on this requirement. Information contained in the CCR will not be considered by DARPA during proposal evaluations.

Supporting Documents (Volume 5)

In addition to the documents required by DoD, small businesses may also submit additional documentation to support the Technical Volume (Volume 2) and the Cost Volume (Volume 3) in

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Volume 5. See Appendix A for **required** certifications that must be included in Volume 5. For additional information, see the SBIR 23.4 Annual Program Broad Agency Announcement (BAA) at <https://www.defensesbirsttr.mil/SBIR-STTR/Opportunities/>.

DISCRETIONARY TECHNICAL AND BUSINESS ASSISTANCE (TABA)

DARPA does not offer TABA funding.

EVALUATION AND SELECTION

All proposals will be evaluated in accordance with the evaluation criteria listed in the DoD SBIR 2023.4 BAA. DARPA will conduct an evaluation of each conforming proposal. Proposals that do not comply with the requirements detailed in this BAA and the research objective(s) of the corresponding topic are considered non-conforming and therefore are not evaluated nor considered for award.

Using the evaluation criteria, the Government will evaluate each proposal in its entirety, documenting the strengths and weaknesses relative to each evaluation criterion, and, based on these identified strengths and weaknesses, determine the proposal's overall selectability. Proposals will not be evaluated against each other during the evaluation process, but rather evaluated on their own individual merit to determine how well the proposal meets the criteria stated in this BAA and the corresponding DARPA topic.

Awards will be made to proposers whose proposals are determined to be the most advantageous to the Government, consistent with instructions and evaluation criteria specified in the DoD SBIR 2023.4 BAA and availability of funding. Given the limited funding available for each topic released, not all proposals considered selectable will be selected for funding.

For the purposes of this proposal evaluation process, a selectable proposal is defined as follows:

Selectable: A selectable proposal is a proposal that has been evaluated by the Government against the evaluation criteria listed in the DoD SBIR 2023.4 BAA and DARPA topic, and the strengths of the overall proposal outweighs its weaknesses. Additionally, there are no accumulated weaknesses that would require extensive negotiations and/or a resubmitted proposal.

For the purposes of this proposal evaluation process, a non-selectable proposal is defined as follows:

Non-Selectable: A proposal is considered non-selectable when the proposal has been evaluated by the Government against the evaluation criteria listed in the DoD SBIR 2023.4 BAA and DARPA topic, and the strengths of the overall proposal do not outweigh its weaknesses.

Proposing firms will be notified of selection or non-selection status for a Phase I award within 90 days of the closing date of the topic. It is the policy of DARPA to treat all proposals as source selection information and to disclose their contents only for the purpose of evaluation. Restrictive notices notwithstanding, during the evaluation process, submissions may be handled by support contractors for administrative purposes and/or to assist with technical evaluation. All DARPA support contractors are expressly prohibited from performing DARPA-sponsored technical research and are bound by appropriate nondisclosure agreements. Input on technical aspects of the proposals may be solicited by DARPA from other Government and/or non-Government consultants/experts who are strictly bound by the appropriate non-disclosure requirements. No submissions will be returned. Upon completion of the evaluation and selection process, an electronic copy of each proposal received will be retained at DARPA.

Proposal titles, abstracts, anticipated benefits, and keywords of proposals that are selected for contract award will undergo a DARPA Policy and Security Review. Proposal titles, abstracts, anticipated benefits, and keywords are subject to revision and/or redaction by DARPA. Final approved versions of proposal

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titles, abstracts, anticipated benefits, and keywords may appear on the DoD SBIR/STTR awards website and/or the SBA's SBIR/STTR award website (<https://www.sbir.gov/sbirsearch/award/all>).

Refer to the DoD SBIR 2023.4 Program BAA for procedures to protest the Announcement. As further prescribed in FAR 33.106(b), FAR 52.233-3, Protests regarding the selection decision should be submitted to:

DARPA
Contracts Management Office (CMO)
675 N. Randolph Street
Arlington, VA 22203
E-mail: scott.ulrey@darpa.mil and sbir@darpa.mil

AWARD AND CONTRACT INFORMATION

1. General Award Information

Multiple awards are anticipated. DARPA may award FAR-based government contracts (Firm- Fixed Price or Cost-Plus Reimbursement) or Other Transactions for Prototypes agreement (under the authority of 10 U.S.C. § 4022) subject to approval of the Contracting Officer. The amount of resources made available for each topic issued under this BAA will depend on the quality of the proposals received and the availability of funds.

Majority Ownership in Part. Proposers that are more than 50% owned by multiple venture capital operating companies (VCOC), hedge funds (HF), private equity firms (PEF), or any combination of these as set forth in 13 C.F.R. § 121.702, are eligible to submit proposals in response to DARPA topics advertised within this BAA.

For proposers that are a member of this ownership class the following must be satisfied for proposals to be accepted and evaluated:

- a. Prior to submitting a proposal, firms must register with the SBA Company Registry Database.
- b. The proposer within its submission must submit the Majority-Owned VCOC, HF, and PEF Certification. A copy of the SBIR VC Certification can be found on <https://www.darpa.mil/work-with-us/for-small-businesses/participate-sbir-sttr-program>, under SBIR/STTR BAA Forms. Include the SBIR VC Certification in the Supporting Documents (Volume 5).
- c. Should a proposer become a member of this ownership class after submitting its proposal and prior to any receipt of a funding agreement, the proposer must immediately notify the Contracting Officer, register in the appropriate SBA database, and submit the required certification which can be found under SBIR/STTR BAA Forms and Templates on <https://www.darpa.mil/work-with-us/for-small-businesses/participate-sbir-sttr-program>.

The Government reserves the right to select for negotiation all, some, one, or none of the proposals received in response to this announcement and to make awards with or without communications with proposers. Additionally, the Government reserves the right to award all, some, one, or none of the options on the contract(s)/agreement(s) of the performers based on available funding and technical performance. If warranted, portions of resulting awards may be segregated into pre-priced options. Additionally, DARPA reserves the right to accept proposals in their entirety or to select only portions of proposals for award. In the event that DARPA desires to award only portions of a proposal, negotiations may be opened with that proposer. The Government reserves the right to fund proposals in phases with options for continued work, as applicable.

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The Government reserves the right to request any additional, necessary documentation once it makes the award instrument determination. The Government reserves the right to remove a proposal from award consideration should the parties fail to reach agreement on award terms, conditions, and price within a reasonable time, and/or the proposer fails to provide requested additional information within three business days.

In all cases, the Government Contracting Officer reserves the right to select award instrument type, regardless of instrument type proposed, and to negotiate all instrument terms and conditions with selectees. DARPA will apply publication or other restrictions, as necessary, if it determines that the research resulting from the proposed effort will present a high likelihood of disclosing performance characteristics of military systems or manufacturing technologies that are unique and critical to defense. Any award resulting from such a determination will include a requirement for DARPA permission before publishing any information or results on the program. For more information on publication restrictions, see the DoD SBIR 2023.4 BAA.

Because of the desire to streamline the award negotiation and program execution process, proposals identified for negotiation will result in negotiating a type of instrument for award that is in the best interest of the Government. In the case of an OT for Prototype agreement under DARPA's authority to award OTs for prototype projects, 10 U.S.C. § 4022, use of an OT provides significant opportunities for flexible execution to assist in meeting DARPA's aggressive SBIR/STTR program goals.

All proposers that wish to consider an OT award should carefully read the following:

The flexibility of the OT award instrument is beneficial to the program because the Performer will be able to apply its best practices as required to carry out the research project that may be outside of the Federal Acquisition Regulation (FAR) process-driven requirements. Streamlined practices will be used, such as milestone-driven performance, intended to reduce time and effort on award administration tasks and permit performers to focus on the research effort and rapid prototyping. Because of this ability, OTs provide the Agreements Officer the flexibility to create an award instrument that contains terms and conditions that promote commercial transition, reduce some administratively burdensome acquisition regulations, and meet SBIR/STTR program goals.

Proposers must only propose an OT agreement with fixed payable milestones. Fixed payable milestones are fixed payments based on successful completion of the milestone accomplishments agreed to in the milestone plan. Refer to the Other Transactions for Prototypes Fact Sheet and Other Transaction for Prototype Agreement, available at <https://www.darpa.mil/work-with-us/for-small-businesses/participate-sbir-sttr-program>. Specific milestones will be based upon the research objectives detailed in the topic.

Please see <https://www.darpa.mil/work-with-us/for-small-businesses/participate-sbir-sttr-program> for more information on OTs.

2. Transition and Commercialization Support Program (TCSP)

DARPA will provide services to Phase II or DP2 awardees upon contract execution through the Transition and Commercialization Support Program (TCSP) at no cost to awardees. The TCSP goal is to maximize the potential for SBIR/STTR companies to move their technology beyond Phase II and into other research and development programs for further maturity or into solutions or products for DoD acquisition programs, other Federal programs, and/or the commercial market. Please visit <https://www.darpa.mil/work-with-us/for-small-businesses/commercialization-continued> for more information on DARPA TCSP.

3. Embedded Entrepreneurship Initiative

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Awardees of SBIR funding pursuant to this BAA may be eligible to participate in the DARPA Embedded Entrepreneurship Initiative (EEI) during the Period of Performance. Invitation to participate in EEI is at the sole discretion of the Government based on evaluation of technical and commercial factors and subject to program balance and the availability of funding. EEI is a limited scope program offered by DARPA, at DARPA's discretion, to a small subset of awardees. The goal of DARPA's EEI is to increase the likelihood that DARPA-funded technologies take root in the U.S. and provide new capabilities for national defense. EEI supports DARPA's mission "to make pivotal investments in breakthrough technologies and capabilities for national security" by accelerating the transition of innovations out of the lab and into new capabilities for the Department of Defense (DoD). EEI investment supports development of a robust and deliberate Go-to-Market strategy for selling technology product to the government and commercial markets and positions DARPA awardees to attract U.S. investment. The following is for informational and planning purposes only and does not constitute solicitation of proposals to the EEI.

There are three elements to DARPA's EEI: (1) A Senior Commercialization Advisor (SCA) from DARPA who works with the Program Manager (PM) to examine the business case for the awardee's technology and uses commercial methodologies to identify steps toward achieving a successful transition of technology to the government and commercial markets; (2) Connections to potential industry and investor partners via EEI's Investor Working Groups; and (3) Additional funding on an awardee's contract for the awardee to hire an embedded entrepreneur to achieve specific milestones in a Go-to-Market strategy for transitioning the technology to products that serve both defense and commercial markets. This embedded entrepreneur's qualifications should include business experience within the target industries of interest, experience in commercializing early stage technology, and the ability to communicate and interact with technical and non-technical stakeholders. Funding for EEI is typically no more than \$250,000 per awardee over the duration of the award. An awardee may apportion EEI funding to hire more than one embedded entrepreneur, if achieving the milestones requires different expertise that can be obtained without exceeding the awardee's total EEI funding. The EEI effort is intended to be conducted concurrent with the research program without extending the period of performance.

EEI Application Process:

After receiving an award under the solicitation, awardees interested in being considered for EEI should notify their DARPA Program Manager (PM) during the period of performance. Timing of such notification should ideally allow sufficient time for DARPA and the awardee to review the awardee's initial transition plan, identify milestones to achieve under EEI, modify the award, and conduct the work required to achieve such milestones within the original award period of performance. These steps may take 9-18 months to complete, depending on the technology. If the DARPA PM determines that EEI could be of benefit to transition the technology to product(s) the Government needs, the PM will refer the performer to DARPA Commercial Strategy.

DARPA Commercial Strategy will then contact the performer, assess fitness for EEI, and in consultation with the DARPA technical office, determine whether to invite the performer to participate in the EEI. Factors that are considered in determining fitness for EEI include DoD/Government need for the technology; competitive approaches to enable a similar capability or product; risks and impact of the Government's being unable to access the technology from a sustainable source; Government and commercial markets for the technology; cost and affordability; manufacturability and scalability; supply chain requirements and barriers; regulatory requirements and timelines; Intellectual Property and Government Use Rights, and available funding.

Invitation to participate in EEI is at the sole discretion of DARPA and subject to program balance and the availability of funding. EEI participants' awards may be subsequently modified bilaterally to amend the Statement of Work to add negotiated EEI tasks, provide funding, and specify a milestone schedule which will include measurable steps necessary to build, refine, and execute a Go-to-Market technology

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transition plan aimed at delivering new capabilities for national defense. Milestone examples are available at: <https://www.darpa.mil/work-with-us/contract-management>.

Awardees under this solicitation are eligible to be considered for participation in EEI, but selection for award under this solicitation does not imply or guarantee participation in EEI.

For more information please refer to the EEI website <https://eei.darpa.mil/>.

4. DARPA Toolbox Initiative

DARPA Toolbox is an Agency-wide effort to provide open licensing opportunities with commercial technology vendors to the researchers behind DARPA programs. DARPA Toolbox provides easy, low-cost, scalable access to state-of-the-art tools and intellectual property (IP) under predictable legal terms and streamlined acquisition procedures. The goal is to reduce performer reliance on low-quality, low-cost tools and IP that increase execution risks and complicate post-DARPA transitions.

Through this initiative, DARPA performers are granted access to select vendor tools and technologies throughout the life of their contractual relationship with the Agency. The Toolbox suppliers bring to the table proven technologies commonly used in state-of-the-art commercial microelectronics or system design methodologies.

DARPA Toolbox program information and a full list of participating suppliers can be found at <https://www.darpa.mil/work-with-us/darpa-toolbox-initiative>. If there are tool or technologies of interest, contact the Supplier POC listed for the product, referencing the DARPA Toolbox Initiative. The Supplier POC will provide advice on products and pricing information. Include any non-production pricing quotes in your proposal. Products and pricing are between you and the suppliers – *do not* contact DARPA directly.

ADDITIONAL INFORMATION

DARPA intends to use electronic mail for all correspondence regarding these topics. Questions related to the technical aspect of the research objectives and awards specifically related to a topic should be emailed to SBIR_BAA@darpa.mil. Please reference the topic number in the subject line. All questions must be in English and must include the name, email address, and the telephone number of a point of contact.

DARPA will attempt to answer questions in a timely manner; however, questions submitted within seven (7) calendar days of the proposal due date listed herein may not be answered. DARPA will post a consolidated Frequently Asked Questions (FAQ) document. To access the posting please visit: <http://www.darpa.mil/work-with-us/opportunities>. Under the topic number summary, there will be a link to the FAQ. The FAQ will be updated on an ongoing basis until one week prior to the proposal due date.

Technical support for the Defense SBIR/STTR Innovation Portal (DSIP) is available Monday through Friday, 9:00 a.m. – 5:00 p.m. ET. Requests for technical support must be emailed to DoDSBIRSupport@reisystems.com with a copy to SBIR_BAA@darpa.mil.

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APPENDIX A: DARPA DIRECT TO PHASE II (DP2) PROPOSAL INSTRUCTIONS

I. Introduction

A complete proposal submission consists of:

Volume 1: Proposal Cover Sheet

Volume 2: Technical Volume (feasibility documentation and technical proposal)

Volume 3: Cost Volume

Volume 4: Company Commercialization Report

Volume 5: Supporting Documents

a. Contractor Certification Regarding Provision of Prohibition on Contracting for Certain Telecommunications and Video Surveillance Services or Equipment (Attachment 1)

MANDATORY

b. Disclosures of Foreign Affiliations or Relationships to Foreign Countries (Attachment 2)

MANDATORY

c. Verification of Eligibility of Small Business Joint Ventures (Attachment 3), if applicable

d. Disclosure of Funding Sources (Attachment 4) **MANDATORY**

e. Other supporting documentation

A completed proposal submission in DSIP does NOT indicate that the mandatory supporting documents have been uploaded. It is the responsibility of the proposing small business concern to ensure that the mandatory documents listed above have been uploaded and included with the proposal submission.

Volume 6: Fraud, Waste and Abuse Training

The Defense SBIR/STTR Innovation Portal (DSIP) provides a structure for building the proposal volumes and submitting a consolidated proposal package. If this is your first time submitting an SBIR or STTR proposal using DSIP, please review detailed training guides at

<https://www.dodsbirsttr.mil/submissions/learning-support/training-materials>. It is the responsibility of the proposing firm to ensure that a complete proposal package is certified and submitted by the close date listed in the topic to which they are responding.

To assist in proposal development, templates for Volume 2: Technical Volume and Volume 3: Cost Volume have been provided as attachments to the announcement posted at

<https://www.dodsbirsttr.mil/submissions/login> Use of these templates is mandatory.

NOTE: All proposers are required to submit Volume 4: Company Commercialization Report (CCR).

II. Proprietary Information

Proposers that include in their proposals data that they do not want disclosed to the public for any purpose, or used by the Government except for evaluation purposes, shall follow instructions in section 4.5 regarding marking propriety proposal information.

III. DP2 Proposal Instructions

a. Proposal Cover Sheet (Volume 1)

The Cover Sheet must include a brief technical abstract of no more than 3000 characters that describes the proposed R&D project with a discussion of anticipated benefits and potential commercial applications.

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Do not include proprietary or classified information in the Proposal Cover Sheet. If your proposal is selected for award, the technical abstract and discussion of anticipated benefits may be publicly released.

b. Format of Technical Volume (Volume 2) – standard format

1. The Technical Volume must include two parts, PART ONE: Feasibility Documentation (10 pages) and PART TWO: Technical Proposal (20 pages).
2. Type of file: The Technical Volume must be a single Portable Document Format (PDF) file, including graphics. Perform a virus check before uploading the Technical Volume file. If a virus is detected, it may cause rejection of the proposal. Do not lock or encrypt the uploaded file. Do not include or embed active graphics such as videos, moving pictures, or other similar media in the document.
3. Length: The length of each part of the technical volume (Feasibility Documentation and Technical Proposal) will be specified by the corresponding topic. The Government will not consider pages in excess of the page count limitations.
4. Layout: Number all pages of your proposal consecutively. Font size should not be smaller than 10-point on standard 8-1/2" x 11" paper with one-inch margins. The header on each page of the Technical Volume should contain your company name, topic number, and proposal number assigned by DSIP when the Cover Sheet was created. The header may be included in the one-inch margin.

c. Content of the Technical Volume (Volume 2) – Standard Format

PART ONE: Feasibility Documentation

1. Provide documentation to substantiate that the scientific and technical merit and feasibility described in the Phase I section of the topic has been met and describe the potential commercial applications. To be eligible, proposers must demonstrate that the feasibility requirements outlined in the topic have been met, and achieved outside of the SBIR program. Documentation should include all relevant information including, but not limited to: technical reports, test data, prototype designs/models, and performance goals/results.
2. Maximum page length for feasibility documentation will be specified by the topic. If you have references, include a reference list or works cited list as the last page of the feasibility documentation. This will count towards the page limit.
3. Work submitted within the feasibility documentation must have been substantially performed by the proposer and/or the PI.
4. If technology in the feasibility documentation is subject to Intellectual Property (IP), the proposer must either own the IP, or must have obtained license rights to such technology prior to proposal submission, to enable it and its subcontractors to legally carry out the proposed work. Documentation of IP ownership or license rights shall be included in the Technical Volume of the proposal.
5. Include a one-page summary on Commercialization Potential addressing the following:
 - i. Does the company contain marketing expertise and, if not, how will that expertise be brought into the company?
 - ii. Describe the potential for commercial (Government or private sector) application and the benefits expected to accrue from this commercialization.

DO NOT INCLUDE marketing material. Marketing material will NOT be evaluated.

PART TWO: Standard Technical Proposal

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Significance of the Problem. Define the specific technical problem or opportunity addressed and its importance.

1. Phase II Technical Objectives. Enumerate the specific objectives of the Phase II work, and describe the technical approach and methods to be used in meeting these objectives.
2. Phase II Statement of Work. The statement of work should provide an explicit, detailed description of the Phase II approach, indicate what is planned, how and where the work will be carried out, a schedule of major events and the final product to be delivered. The methods planned to achieve each objective or task should be discussed explicitly and in detail. This section should be a substantial portion of the total proposal.
 - a. Human/Animal Use: Proposers proposing research involving human and/or animal use are encouraged to separate these tasks in the technical proposal and cost proposal in order to avoid potential delay of contract award.
 - b. Phase II Option Statement of Work (if applicable, specified in the corresponding TOPIC). The statement of work should provide an explicit, detailed description of the activities planned during the Phase II Option, if exercised. Include how and where the work will be carried out, a schedule of major events and the final product to be delivered. The methods planned to achieve each objective or task should be discussed explicitly and in detail.
3. Related Work. Describe significant activities directly related to the proposed effort, including any conducted by the PI, the proposer, consultants or others. Describe how these activities interface with the proposed project and discuss any planned coordination with outside sources. The proposal must persuade reviewers of the proposer's awareness of the state of the art in the specific topic. Describe previous work not directly related to the proposed effort but similar. Provide the following: (1) short description, (2) client for which work was performed (including individual to be contacted and phone number) and (3) date of completion.
5. Relationship with Future Research or Research and Development.
 - i. State the anticipated results of the proposed approach if the project is successful.
 - ii. Discuss the significance of the Phase II effort in providing a foundation for Phase III research and development or commercialization effort.
6. Key Personnel. Identify key personnel who will be involved in the Phase II effort including information on directly related education and experience. A concise resume of the PI, including a list of relevant publications (if any), must be included. All resumes count toward the page limitation. Identify any foreign nationals you expect to be involved on this project.
7. Foreign Citizens. Identify any foreign citizens or individuals holding dual citizenship expected to be involved on this project as a direct employee, subcontractor, or consultant. For these individuals, please specify their country of origin, the type of visa or work permit under which they are performing and an explanation of their anticipated level of involvement on this project. Refer to section 3.2 of this BAA for more information. Supplemental information provided in response to this paragraph will be protected in accordance with the Privacy Act (5 U.S.C. 552a), if applicable, and the Freedom of Information Act (5 U.S.C. 552(b)(6)).
8. Facilities/Equipment. Describe available instrumentation and physical facilities necessary to carry out the Phase II effort. Items of equipment to be purchased (as detailed in the cost proposal) shall be justified under this section. Also state whether or not the facilities where the proposed work will be performed meet environmental laws and regulations of federal, state (name) and local Governments for, but not limited to, the following groupings: airborne emissions, waterborne effluents, external radiation levels, outdoor noise, solid and bulk waste disposal practices and handling and storage of toxic and hazardous materials.

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9. Subcontractors/Consultants. Involvement of a university or other subcontractors or consultants in the project may be appropriate. If such involvement is intended, it should be identified and described according to the Cost Breakdown Guidance. Please refer to section 3 of this BAA for detailed eligibility requirements as it pertains to the use of subcontractors/consultants.
10. Prior, Current or Pending Support of Similar Proposals or Awards. If a proposal submitted in response to this topic is substantially the same as another proposal that was funded, is now being funded, or is pending with another Federal Agency, or another or the same DoD Component, you must reveal this on the Proposal Cover Sheet and provide the following information:
 - a. Name and address of the Federal Agency(s) or DoD Component to which a proposal was submitted, will be submitted, or from which an award is expected or has been received.
 - b. Date of proposal submission or date of award.
 - c. Title of proposal.
 - d. Name and title of the PI for each proposal submitted or award received.
 - e. Title, number, and date of BAA(s) or solicitation(s) under which the proposal was submitted, will be submitted, or under which award is expected or has been received.
 - f. If award was received, state contract number.
 - g. Specify the applicable topics for each proposal submitted or award received.

Note: If this does not apply, state in the proposal "No prior, current, or pending support for proposed work."

11. Transition and Commercialization Strategy (5 pages). DARPA is equally interested in dual use commercialization of SBIR/STTR projects that result in products sold to the U.S. military, the private sector market, or both. DARPA expects explicit discussion of key activities to achieve this result in the transition and commercialization strategy part of the proposal. The Technical Volume of each Direct to Phase II proposal must include a transition and commercialization strategy section. The Phase II transition and commercialization strategy shall not exceed 5 pages, and will NOT count against the proposal page limit.

Information contained in the commercialization strategy section will be used to determine suitability for participation in EEI. Selection for participation in EEI will be made independently following selection for SBIR/STTR award. Please refer to section 3 of the Instructions for more information on the DARPA EEI and additional proposal requirements.

The transition and commercialization strategy should include the following elements:

- a. A summary of transition and commercialization activities conducted during Phase I, and the Technology Readiness Level (TRL) achieved. Discuss the market, competitive landscape, potential stakeholders and end-users, and how the preliminary transition and commercialization path or paths may evolve during the Phase II project. Describe key proposed technical milestones during Phase II that will advance the technology towards product such as: prototype development, laboratory and systems testing, integration, testing in operational environment, and demonstrations.
- b. Problem or Need Statement. Briefly describe what you know of the problem, need, or requirement, and its significance relevant to a Department of Defense application and/or a private sector application that the SBIR/STTR project results would address. Is there a broader societal need you are trying to address? Please describe.
- c. Description of Product(s) and/or System Application(s). Identify the commercial product(s) and/or DoD system(s), or system(s) under development, or potential new

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- system(s). Identify the potential DoD end- users, Federal customers, and/or private sector customers who would likely use the technology.
- d. Business Model(s)/Procurement Mechanism(s). Discuss your current business model hypothesis for bringing the technology to market. Describe plans to license, partner, or self-produce your product. How do you plan to generate revenue? Describe the resources you expect will be needed to implement your business models. Discuss your plan and expected timeline to secure these resources. Understanding DARPA's goal of creating and sustaining a U.S. military advantage, describe how you intend to develop your product and supply chains to enable this differentiation.
 - e. Target Market. Describe the market and addressable market for the innovation. Describe the customer sets you propose to target, their size, their growth rate, and the key reasons they would consider procuring the technology. Discuss the business economics and market drivers in the target industry. Describe competing technologies existent today on the market as well as those being developed in the lab. How has the market opportunity been validated? Describe the competition. How do you expect the competitive landscape may change by the time your product/service enters the market?
 - f. Funding Requirements. Describe your company's funding history. How much external financing have you raised? Describe your plans for future funding sources (internal, loan, angel, venture capital, etc.).
 - g. Transition and Commercialization Risks. Describe the major technology, market and team risks associated with achieving successful transition of the DARPA funded technology. DARPA is not afraid to take risks but we want to ensure that our awardees clearly understand the risks in front of them. What are the key risks in bringing your innovation to market? What are actions you plan to undertake to mitigate these risks?
 - h. Expertise/Qualifications of Team/Company Readiness. Describe the expertise and qualifications of your management, marketing/business development and technical team that will support the transition of the technology from the prototype to the commercial market and into government operational environments. Has this team previously taken similar products/services to market? If the present team does not have this needed expertise, how do you intend to obtain it? What is the financial history and health of your company (e.g., availability of cash, profitability, revenue growth, etc.)?
 - i. Anticipated Transition and Commercialization Results. Include a schedule showing the anticipated quantitative transition and commercialization results from the Phase II project at one year after the start of Phase II, at the completion of Phase II, and after the completion of Phase II (i.e., amount of additional investment, sales revenue, etc.). After Phase II award, the company is required to report actual sales and investment data in its Company Commercialization Report at least annually.

Advocacy Letters (OPTIONAL)* Feedback received from potential Commercial and/or DoD customers and other end-users regarding their interest in the technology to support their capability gaps. Advocacy letters that are faxed or e-mailed separately will NOT be accepted.

Letters of Intent/Commitment (OPTIONAL)* Relationships established, feedback received, support and commitment for the technology with one or more of the following: Commercial customer, DoD PM/PEO, a Defense Prime, or vendor/supplier to the Primes and/or other vendors/suppliers identified as having a potential role in the integration of the technology into fielded systems/products or those under development. Letters of Intent/Commitment that are faxed or e- mailed separately will NOT be accepted.

*Advocacy Letters and Letters of Intent/Commitment are optional, and should ONLY be submitted to substantiate any transition or commercialization claims made in the commercialization strategy. Please

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DO NOT submit these letters just for the sake of including them in your proposal. These letters DO NOT count against any page limit.

In accordance with section 3-209 of DOD 5500.7-R, Joint Ethics Regulation, letters from government personnel will NOT be considered during the evaluation process.

d. Format of Cost Volume (Volume 3)

Proposers are required to use the Direct to Phase II – Volume 3: Cost Proposal Template (Excel Spreadsheet) provided under SBIR/STTR BAA FORMS & TEMPLATES at <https://www.darpa.mil/work-with-us/for-small-businesses/participate-sbir-sttr-program>. The Cost Volume (and supporting documentation) DOES NOT count toward the page limit of the Technical Volume.

e. Content of the Cost Volume (Volume 3)

Some items in the Cost Breakdown Guidance below may not apply to the proposed project. If such is the case, there is no need to provide information on each and every item.

ALL proposed costs should be accompanied by documentation to substantiate how the cost was derived. For example, if you proposed travel cost to attend a project-related meeting or conference, and used a travel website to compare flight costs, include a screen shot of the comparison. Similarly, if you proposed to purchase materials or equipment, and used the internet to search for the best source, include your market research for those items. You do not necessarily have to propose the cheapest item or supplier, but you should explain your decision to choose one item or supplier over another. It's important to provide enough information to allow contracting personnel to understand how the proposer plans to use the requested funds. If selected for award, failure to include the documentation with your proposal will delay contract negotiation, and the proposer will be asked to submit the necessary documentation to the Contracting Officer to substantiate costs (e.g., cost estimates for equipment, materials, and consultants or subcontractors). It is important to respond as quickly as possible to the Contracting Officer's request for documentation.

Cost Breakdown Guidance:

1. List all key personnel by name as well as by number of hours dedicated to the project as direct labor. Special tooling and test equipment and material cost may be included. The inclusion of equipment and material will be carefully reviewed relative to need and appropriateness for the work proposed. The purchase of special tooling and test equipment must, in the opinion of the Contracting Officer, be advantageous to the Government and should be related directly to the specific topic. These may include such items as innovative instrumentation and/or automatic test equipment. Title to property furnished by the Government or acquired with Government funds will be vested with DARPA; unless it is determined that transfer of title to the contractor would be more cost effective than recovery of the equipment by the DARPA.
2. Cost for travel funds must be justified and related to the needs of the project.
3. Cost sharing is permitted for proposals under this announcement; however, cost sharing is not required nor will it be an evaluation factor in the consideration of a proposal.
4. All subcontractor costs and consultant costs must be detailed at the same level as prime contractor costs in regard to labor, travel, equipment, etc. Provide detailed substantiation of subcontractor costs in your cost proposal. Enter this information in the Explanatory Material section of the on-line cost proposal form. The Supporting Documents Volume (Volume 5) may be used if additional space is needed.

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For more information about cost proposals and accounting standards, see the DCAA publication titled “Audit Process Overview – Information for Contractors” available at: <http://www.dcaa.mil>.

f. Company Commercialization Report (Volume 4)

The Company Commercialization Report (CCR) allows companies to report funding outcomes resulting from prior SBIR and STTR awards. The Company Commercialization Report (CCR) is required for Phase I and Direct to Phase II proposals. Please refer to the DoD STTR Program BAA for full details on this requirement. Information contained in the CCR will not be considered by DARPA during proposal evaluations.

g. Supporting Documents (Volume 5)

In addition to required DoD documentation and certifications, small businesses may also submit additional documentation to support the Technical Volume (Volume 2) and the Cost Volume (Volume 3) in Volume 5. See Appendix A Introduction for **required** certifications that must be included in Volume 5. For additional information, see the SBIR 23.4 Annual Program Broad Agency Announcement (BAA) at <https://www.defensesbirstr.mil/SBIR-STTR/Opportunities/>.

h. Fraud Waste and Abuse (Volume 6)

The Fraud, Waste and Abuse (FWA) training is required for Phase I and Direct to Phase II proposals. FWA training provides information on what represents FWA in the SBIR/STTR program, the most common mistakes that lead to FWA, as well as the penalties and ways to prevent FWA in your firm. This training material must be thoroughly reviewed once per year. Plan ahead and leave ample time to complete this training based on the proposal submission deadline. Knowingly and willfully making any false, fictitious, or fraudulent statements or representations may be a felony under the Federal Criminal False Statement Act (18 U.S.C. Sec 1001), punishable by a fine of up to \$10,000, up to five years in prison, or both. Understanding the indicators and types of fraud, waste, and abuse that can occur is critical for the SBIR/STTR awardees’ role in preventing the loss of research dollars.

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HR0011SB20234-08 TITLE: 2D Polyglots

OUSD (R&E) CRITICAL TECHNOLOGY AREA(S): Advanced computing and software

The technology within this topic is restricted under the International Traffic in Arms Regulation (ITAR), 22 CFR Parts 120-130, which controls the export and import of defense-related material and services, including export of sensitive technical data, or the Export Administration Regulation (EAR), 15 CFR Parts 730-774, which controls dual use items. Offerors must disclose any proposed use of foreign nationals (FNs), their country(ies) of origin, the type of visa or work permit possessed, and the statement of work (SOW) tasks intended for accomplishment by the FN(s) in accordance with the Announcement. Offerors are advised foreign nationals proposed to perform on this topic may be restricted due to the technical data under US Export Control Laws.

OBJECTIVE: Develop polyglots (dual embedded formats) for existing 2-dimensional codes (e.g., QR codes) that enable high-bandwidth, secure data transfer. Assess potential security vulnerabilities in polyglot approaches.

DESCRIPTION: DoD employees are interacting with physical-cyber data transfers at an ever-increasing rate; simply walking through an airport might require scanning 2-dimensional (2D) codes numerous times to receive basic goods and services, such as food menus and flight boarding passes. One of the most prevalent types of 2D codes is Quick Response (QR) code originating in 1994 from a Japanese automotive company. With the widespread adoption of mobile phones, QR codes have become a standard to store and transfer data in a physical format. The convenience that QR codes provide comes with certain limitations, such as the amount of data it can store and a balance between usability and security. 2D codes (e.g., QR codes, Data Matrix, MaxiCode, PDF417) are designed and optimized for a specific task; for example, data matrix codes used by shipping are fast to scan, however they only store 1.55kb of data as compared to 3kb for QR v4. 2D codes are often represented pictographically as part of printed media, such as a menu in a restaurant. They have low data density as a result of error correction and robustness to environmental effects (e.g., scratches). To increase the data density, preserve the inherent optimizations of each format, and ensure backwards compatibility, this study will investigate combining formats into 2D polyglots. In this context, a polyglot is a format that is valid in multiple computer programs. Polyglots are possible by combining two or more formats, each of which are able to be interpreted by multiple programs as having a valid format, for example, a file which is both a picture and a PowerPoint presentation.

This study will investigate the effects that 2D polyglots have in QR codes and their potential to reduce the attack surface and increase data density. A basis of confidence that polyglots can exist in 2D codes is the known, trivial case of a 2D code imbedded in another 2D code [D14]. For more than a decade it has been widely known that current 2D codes have inherent vulnerabilities [D15, F19, K10]. Usability was heavily favored over security in the design of these codes. This imbalance led to a widely adopted standard with pervasive vulnerabilities. Attacks can take advantage of error correction algorithms and data sparsity to exploit 2D formatting assumptions and the inconsistencies which software makes when interpreting a 2D code. For example, standard QR codes have orientation markers and data is only parsed in one direction; polyglot QR codes can contain multiple, non-conflicting formats that can be read independently based on approach direction. Finally, to ensure current systems and software can still be used, any enhancements to the SOTA must also be backwards compatible. Introducing new software and standards would inevitably have new and possibly unintended effects on security and efficiency.

PHASE I: This topic is soliciting Direct to Phase II (DP2) proposals only. Proposers interested in submitting a DP2 proposal must provide documentation to substantiate that the scientific and technical

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merit and feasibility described above have been met and describe the potential commercial applications. DP2 documentation should include:

- Technical reports describing results and conclusions of existing work, particularly regarding the commercial opportunity or DoD insertion opportunity, and risks/mitigations, and assessments;
- Presentation materials and/or white papers;
- Technical papers;
- Test and measurement data;
- Prototype designs/models;
- Performance projections, goals, or results in different use cases; and,
- Documentation of related topics such as how the proposed SUP solution can enable more realistic cyber training.

This collection of material will verify mastery of the required content for DP2 consideration. DP2 proposers must also demonstrate knowledge, skills, and ability in networking, computer science, mathematics, and software engineering. For detailed information on DP2 requirements and eligibility, please refer to the DoD BAA and the DARPA Instructions for this topic.

PHASE II: The goal of 2D Polyglots is to develop a QR code that can hold more data while maintaining backwards compatibility and to identify vulnerabilities present in current 2D codes. DP2 proposals should propose a research design to achieve the following goals:

- Develop a prototype system to demonstrate feasibility for producing 2D polyglots in a platform independent language (e.g., python 3.0, Golang);
- Identify vulnerabilities and possible mitigations in 2D and 2D polyglot codes;
- Detail a test plan, complete with proposed metrics and scope, for verification and validation of the system performance.

Phase II will culminate in a system demonstration using one or more compelling use cases consistent with commercial opportunities and/or insertion into a DARPA program. The below schedule of milestones and deliverables is provided to establish expectations and desired results/end products for the Phase II effort.

- Month 1: Phase I Kickoff briefing (with annotated slides) to the DARPA Program Manager (PM) (in person or virtual, as needed) including: any updates to the proposed plan and technical approach, risks/mitigations, schedule (inclusive of dependencies) with planned capability milestones and deliverables, proposed metrics, and plan for prototype demonstration/validation.
- Months 3, 4, 5: Quarterly technical progress reports detailing technical progress made, tasks accomplished, major risks/mitigations, a technical plan for the remainder of Phase II (while this will normally report progress against the plan detailed in the proposal or presented at the Kickoff briefing, it is understood that scientific discoveries, competition, and regulatory changes may all have impacts on the planned work and DARPA must be made aware of any revisions that result), planned activities, trip summaries, and any potential issues or problem areas that require the attention of the DARPA PM.
- Month 6: Interim technical progress briefing (with annotated slides) to the DARPA PM (in-person or virtual as needed) detailing progress made (include quantitative assessment of capability developed to date), tasks accomplished, major risks/mitigations, planned activities, and technical plan for the second half of Phase II, the demonstration/verification plan for the end of Phase II, trip summaries, and any potential issues or problem areas that require the attention of the DARPA PM.
- Month 7, 8, 9: Quarterly technical progress reports detailing technical progress made, tasks accomplished, major risks/mitigations, a technical plan for the remainder of Phase II (with necessary updates as in the parenthetical remark for Months 4, 7, and 10), planned activities, trip summaries, and any potential issues or problem areas that require the attention of the DARPA PM.

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- Month 10/Final Phase II Deliverables: Final architecture with documented details, demonstrating diagnosing a malicious activity and unauthorized modification on software/hardware; documented application programming interfaces; any other necessary documentation (including, at a minimum, user manuals and a detailed system design document; and the end of phase commercialization plan).

PHASE III DUAL USE APPLICATIONS: The Phase III work will be oriented towards transition and commercialization of the developed 2-D Polyglots technologies. The proposer is required to obtain funding from either the private sector, a non-SBIR Government source, or both, to develop the prototype software into a viable product or non-R&D service for sale in military or private sector markets. Phase III refers to work that derives from, extends, or completes an effort made under prior SBIR funding agreements, but is funded by sources other than the SBIR Program. Outcomes have the potential to significantly benefit the DoD and numerous commercial entities by improving knowledge of 2D codes including capabilities and vulnerabilities. Specifically, in the DoD space, 2D Polyglots technologies will be able to provide new data transfer methods utilizing 2D codes and highlight any potential vulnerabilities in current 2D codes used across the DoD enterprise. The development of polyglot technologies will have security benefits across the defense industrial base (DIB).

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KEYWORDS: Information assurance, computing and software technology, electro-optical sensors, cybersecurity, authentication, confidentiality, QR codes, Data Matrix, PDF417, MaxiCode, and 2D codes.

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HR0011SB20234-09 TITLE: Passive Analytics for Remote Quantification of External Resources (PARQER)

OUSD (R&E) CRITICAL TECHNOLOGY AREA(S): Integrated Sensing and Cyber, Advanced computing and Software

OBJECTIVE: The Passive Analytics for Remote Quantification of External Resources (PARQER) SBIR topic seeks to develop and demonstrate novel techniques to passively assess the security posture of remote networks/subnetworks, without requiring any special network accesses.

DESCRIPTION: The near-constant stream of news reports on the compromise of systems and networks across government and commercial sectors reveals the challenges of securing large networks of systems with complicated topologies [1] [2] [3] [4]. The inherent asymmetry of effort required to defend an asset vs. effort to gain illicit access to an asset favors attackers that can spend as much time as necessary to locate vulnerable targets (e.g., a server that administrators neglected to patch [5], or a network configured with overly permissive firewall policies [6]). In such an environment where the attacker is advantaged, network administrators and security officers practice defense in depth [7] [8] by reducing the network attack surface and deploying an array of security mechanisms and technologies such as firewalls and intrusion detection/ prevention systems. The extent of an organization's efforts to minimize network attack surfaces and deploy defensive mechanisms can be largely unknown (e.g., due to poor documentation), even to the organization itself [9]. Often and unfortunately, details about the deployed security mechanisms (or the lack thereof) are only made available after an organization's network is compromised, and when forensic analysts conduct a postmortem of the attack [10] [11]. For the Department of Defense (DoD) and Intelligence Community (IC), the same problem exists and is compounded by the distinction between, and respective operational responsibilities of, network owners/operators and defenders such as Cybersecurity Service Provider (CSSPs) and Cyber Protection Teams (CPTs). Within the DoD/IC, CPTs are tasked with defending critical military networks; whereas CSSPs are responsible for the continuous monitoring and vulnerability patching of networks, and conducting threat-oriented missions to defeat cyber adversaries. [12] Similar to commercial organizations, critical details of network topology, configuration [13], and security posture [14] are often poorly documented and not immediately available to external responders (such as CPTs). An additional complicating factor of having network knowledge spread among different organizations and individuals (CPTs and CSSPs) is that it makes it difficult to have an accurate holistic picture of the security posture of lower-tier networks at any given time. It is therefore of critical importance for the DoD/IC and large commercial network owners to be able to quickly and passively assess the defensive posture of a remote network/subnetwork in a way that does not require any special access to the network.

PHASE I: The PARQER SBIR topic is soliciting Direct to Phase II (DP2) proposals only, which must include supporting documentation of Phase I feasibility. Phase I feasibility must be demonstrated through evidence of: a completed proof of concept/principal or basic prototype system; definition and characterization of system properties/technology capabilities desirable for DoD/IC/Government and civilian/commercial use; and capability/performance comparisons with existing state-of-the-art technologies/methodologies (competing approaches). Entities interested in submitting a DP2 proposal must provide documentation to substantiate that the scientific/technical merit and feasibility described above has been achieved and also describe the potential commercial applications. DP2 Phase I feasibility documentation should include, at a minimum:

- technical reports describing results and conclusions of existing work, particularly regarding the commercial opportunity or DoD/IC insertion opportunity, risks/mitigations, and technology assessments;
- presentation materials and/or white papers;
- technical papers;

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- test and measurement data;
- prototype designs/models;
- performance projections, goals, or results in different use cases; and,
- documentation of related topics such as how the proposed PARQER solution can enable passive, remote assessment of network/subnetwork security posture.

The collection of Phase I feasibility material will verify mastery of the required content for DP2 consideration. DP2 proposers must also demonstrate knowledge, skills, and abilities in the technical areas of software engineering, data analytics, network security, and cybersecurity. For detailed information on DP2 requirements and eligibility, please refer to the DoD Broad Agency Announcement and the DARPA Instructions for this topic.

PHASE II: The PARQER DP2 SBIR topic seeks to develop and demonstrate novel techniques to enable passive assessment of the security posture of remote networks/subnetworks, without requiring any special access to the network. Most current tools and techniques employed by security operations centers are based on active interrogation. The tools and techniques are often too noisy (e.g., high volumes of alerts and high false positive rates), do not generalize across security mechanisms (i.e., the tools are siloed), and have significant blind spots (e.g., false negatives). Ideal PARQER solutions would overcome such limitations of active techniques, as well as be resistant to intentional misdirection and evasion. PARQER solutions must have the ability to provably scale yet provide fine resolution of the analyzed network. Successful PARQER proposals should clearly describe how proposed combinations of data and analytic techniques will provide high accuracy results in a landscape of ever-evolving security products. Phase II will culminate in a prototype system demonstration using one or more compelling use cases consistent with commercial opportunities and/or insertion into a DARPA program (e.g., Signature Management using Operational Knowledge and Environments (SMOKE), which seeks to develop data-driven tools to automate the planning and execution of threat-emulated cyber infrastructure needed for network security assessments). The Phase II Option period will further mature the technology for insertion into a DoD/Intelligence Community (IC) Acquisition Program, another Federal agency; or commercialization into the private sector. The below schedule of milestones and deliverables is provided to establish expectations and desired results/end products for the Phase II and Phase II Option period efforts.

Schedule/Milestones/Deliverables: Proposers will execute the research and development (R&D) plan as described in the proposal, including the below:

- Month 1: Phase I Kickoff briefing (with annotated slides) to the DARPA Program Manager (PM) including: any updates to the proposed plan and technical approach, risks/mitigations, schedule (inclusive of dependencies) with planned capability milestones and deliverables, proposed metrics, and plan for prototype demonstration/validation;
- Months 4, 7, 10: Quarterly technical progress reports detailing technical progress to date, tasks accomplished, risks/mitigations, a technical plan for the remainder of Phase II (while this would normally report progress against the plan detailed in the proposal or presented at the Kickoff briefing, it is understood that scientific discoveries, competition, and regulatory changes may all have impacts on the planned work and DARPA must be made aware of any revisions that result), planned activities, trip summaries, and any potential issues or problem areas that require the attention of the DARPA PM;
- Month 12: Interim technical progress briefing (with annotated slides) to the DARPA PM detailing progress made (including quantitative assessment of capabilities developed to date), tasks accomplished, risks/mitigations, planned activities, technical plan for the second half of Phase II, the demonstration/verification plan for the end of Phase II, trip summaries, and any potential issues or problem areas that require the attention of the DARPA PM;
- Months 15, 18, 21: Quarterly technical progress reports detailing technical progress made, tasks accomplished, risks/mitigations, a technical plan for the remainder of Phase II (with necessary

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updates as in the parenthetical remark for Months 4, 7, and 10), planned activities, trip summaries, and any potential issues or problem areas that require the attention of the DARPA PM;

- Month 24: Final technical progress briefing (with annotated slides) to the DARPA PM. Final architecture with documented details; a demonstration of the passive assessment of the security posture of remote networks/subnetworks; documented APIs; and any other necessary documentation (including, at a minimum, user manuals and a detailed system design document; and the commercialization plan);
- Month 30 (Phase II Option period): Interim report of matured prototype performance against existing state-of-the-art technologies, documenting key technical gaps towards productization; and,
- Month 36 (Phase II Option period): Final Phase II Option period demonstration and technical progress briefing (with annotated slides) to the DARPA PM including prototype performance against existing state-of-the-art technologies, including quantitative metrics of system performance.

PHASE III DUAL USE APPLICATIONS: Phase III Dual use applications (Commercial DoD/Military): PARQER has potential applicability across DoD/IC/Government and commercial entities. For DoD/IC/Government, PARQER is extremely well-suited to address one of the biggest issues in government information security today by providing the ability to quickly and passively assess the defensive posture of a remote network/subnetwork. PARQER has the same applicability for the commercial sector. Phase III refers to work that derives from, extends, or completes an effort made under prior SBIR funding agreements, but is funded by sources other than the SBIR Program. The Phase III work will be oriented towards transition and commercialization of the developed PARQER technologies. For Phase III, the proposer is required to obtain funding from either the private sector, a non-SBIR Government source, or both, to develop the prototype into a viable product or non-R&D service for sale in government or private sector markets. Primary PARQER support will be to national efforts to help secure government and commercial networks. Results of PARQER are intended to improve the ability of network owners across government and industry to quickly find the root causes of network compromise incidents, and rapidly mitigate the situation, ultimately improving the security posture of their networks.

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KEYWORDS: network security, cybersecurity, defense in depth, passive network analytics

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HR0011SB20234-10 TITLE: Assessing Virtual Private Network (VPN) Networthiness (AVN)

OUSD (R&E) CRITICAL TECHNOLOGY AREA(S): Integrated Sensing and Cyber, Advanced computing and Software

OBJECTIVE: The Assessing Virtual Private Network (VPN) Networthiness (AVN) SBIR topic seeks to develop and demonstrate techniques and systems for automatically analyzing third-party commercial VPN solutions to determine the actual operational privacy profile/performance of such services.

DESCRIPTION: Following the COVID-19 pandemic, and the concomitant increase in remote work, organizations and teleworkers sought solutions to keep their connections private and their workplace communications confidential. In other scenarios around the world, populations have sought private and secure solutions to circumvent restrictions on internet access placed on them by authoritarian regimes. It is therefore unsurprising that commercial VPN services have experienced substantial increases in demand over recent years [1, 2, 3]. The surge in VPN service demand has caused an increase in supply to the extent that (for example) the Google Play Store houses several hundred different apps that offer free (for examples, see [4]) and paid VPN services advertising increased privacy, high-speed bandwidth, large numbers of egress servers, access to censored websites, etc. [5] Even though users may be able to easily differentiate between fast and slow VPN services by merely using the service, unfortunately there are no outward signs they can use to quantify the privacy provided by VPN services. As such, users who employ such services to increase their privacy, may in fact be revealing their data to remote networks of less trustworthiness than their own local networks [6, 7]. It is therefore important to be able to proactively and continuously evaluate the properties and quality of protection that a commercial VPN solution offers. With rare exception [8], existing reviews of VPN services are typically conducted by technology journalists and are therefore limited to assessments of the VPN performance (e.g., speed), price, user friendliness (e.g., ease-of-use), features and supported protocols (e.g., see [9]). The AVN SBIR topic seeks to address this shortfall by developing and demonstrating techniques and systems for automatically analyzing third-party commercial VPN solutions to determine their networthiness, where networthiness considerations align with those of the Department of Defense (DoD) and Intelligence Community (IC) [10].

PHASE I: The AVN SBIR topic is soliciting Direct to Phase 2 (DP2) proposals only, which must include supporting documentation of Phase I feasibility. Phase I feasibility must be demonstrated through evidence of: a completed proof of concept/principal or basic prototype system; definition and characterization of system properties/technology capabilities desirable for DoD/IC/government and civilian/commercial use; and capability/performance comparisons with existing state-of-the-art technologies/methodologies (competing approaches). Entities interested in submitting a DP2 proposal must provide documentation to substantiate that the scientific/technical merit and feasibility described above has been achieved and also describe the potential commercial applications. DP2 Phase I feasibility documentation should include, at a minimum:

- technical reports describing results and conclusions of existing work, particularly regarding the commercial opportunity or DoD/IC insertion opportunity, risks/mitigations, and technology assessments;
- presentation materials and/or white papers;
- technical papers;
- test and measurement data;
- prototype designs/models;
- performance projections, goals, or results in different use cases; and,
- documentation of related topics such as how the proposed AVN solution can enable accurate and reliable analysis of third- party VPN solutions.

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The collection of Phase 1 feasibility material will verify mastery of the required content for DP2 consideration. DP2 proposers must also demonstrate knowledge, skills, and abilities in the technical areas of software engineering, network security, privacy, analytics, and machine learning. For detailed information on DP2 requirements and eligibility, please refer to the DoD Broad Agency Announcement and the DARPA Instructions for this topic.

PHASE II: The AVN DP2 SBIR topic seeks to develop and demonstrate techniques and systems for automatically analyzing third-party commercial VPN solutions to determine the actual operational privacy profile/performance of such services. AVN solutions will provide an objective quantification of the privacy-related performance of third-party VPN services across platforms (e.g., Android, iPhone, PC, MAC, Ubuntu, etc.). Ideal solutions would require limited manual intervention and not rely on information elicited by the VPN service provider. AVN approaches will need to provably scale with the large number of available and future commercial VPN services. Ideally, AVN solutions would enable a user to tailor analyses to specific requirements as VPNs offer varying privacy protections that are not uniformly valuable to every user. DP2 proposals should:

- describe a proposed framework design/architecture to achieve the above stated goals;
- present a plan for maturation of the framework to a demonstrable prototype system; and
- detail a test plan, complete with proposed quantitative metrics for privacy, and for verification and validation of the prototype system performance.

Phase II will culminate in a prototype system demonstration using one or more compelling use cases consistent with commercial opportunities and/or insertion into a DARPA program, for example, the Signature Management using Operational Knowledge and Environments (SMOKE) [11] program, which seeks to develop data-driven tools to automate the planning and execution of threat-emulated cyber infrastructure needed for network security assessments.

The Phase II Option period will further mature the technology for insertion into a DoD/ IC Acquisition Program, another Federal agency, or commercialization into the private sector.

The below schedule of milestones and deliverables is provided to establish expectations and desired results/end products for the Phase II and Phase II Option period efforts.

Schedule/Milestones/Deliverables: Proposers will execute the research and development (R&D) plan as described in the proposal, including the below:

- Month 1: Phase I Kickoff briefing (with annotated slides) to the DARPA Program Manager (PM) including: any updates to the proposed plan and technical approach, risks/mitigations, schedule (inclusive of dependencies) with planned capability milestones and deliverables, proposed metrics, and plan for prototype demonstration/validation.
- Months 4, 7, 10: Quarterly technical progress reports detailing technical progress to date, tasks accomplished, risks/mitigations, a technical plan for the remainder of Phase II (while this would normally report progress against the plan detailed in the proposal or presented at the Kickoff briefing, it is understood that scientific discoveries, competition, and regulatory changes may all have impacts on the planned work and DARPA must be made aware of any revisions that result), planned activities, trip summaries, and any potential issues or problem areas that require the attention of the DARPA PM.
- Month 12: Interim technical progress briefing (with annotated slides) to the DARPA PM detailing progress made (including quantitative assessment of capabilities developed to date), tasks accomplished, risks/mitigations, planned activities, technical plan for the second half of Phase II, the demonstration/verification plan for the end of Phase II, trip summaries, and any potential issues or problem areas that require the attention of the DARPA PM.

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- Month 15, 18, 21: Quarterly technical progress reports detailing technical progress made, tasks accomplished, risks/mitigations, a technical plan for the remainder of Phase II (with necessary updates as in the parenthetical remark for Months 4, 7, and 10), planned activities, trip summaries, and any potential issues or problem areas that require the attention of the DARPA PM.
- Month 24: Final technical progress briefing (with annotated slides) to the DARPA PM. Final architecture with documented details; a demonstration of the ability to automatically analyze third-party commercial VPN solutions; documented application programming interfaces; and any other necessary documentation (including, at a minimum, user manuals and a detailed system design document; and the commercialization plan).
- Month 30 (Phase II Option period): Interim report of matured prototype performance against existing state-of-the-art technologies, documenting key technical gaps towards productization.
- Month 36 (Phase II Option period): Final Phase II Option period technical progress briefing (with annotated slides) to the DARPA PM including prototype performance against existing state-of-the-art technologies, including quantitative metrics for assessment of privacy features/capabilities.

PHASE III DUAL USE APPLICATIONS: AVN has potential applicability across DoD/IC/government and commercial entities. For DoD/IC/government, AVN is extremely well-suited for proactive and continuous assessment of privacy features/performance of various VPN services. AVN has the same applicability for the commercial sector and has the potential to provide individuals worldwide with reliable private connections and communications. Phase III refers to work that derives from, extends, or completes an effort made under prior SBIR funding agreements, but is funded by sources other than the SBIR Program. The Phase III work will be oriented towards transition and commercialization of the developed AVN technologies. For Phase III, the proposer is required to obtain funding from either the private sector, a non-SBIR Government source, or both, to develop the prototype into a viable product or non-R&D service for sale in government or private sector markets. Primary AVN support will be to national efforts to help secure government, commercial, and personal networks and devices against advanced persistent threats that target vulnerable VPN devices. Results of AVN are intended to improve understanding of the risks associated with VPNs, across government and industry.

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KEYWORDS: custom analytics, network security, privacy, virtual private network

AMENDMENT 2

HR0011SB20234-11 TITLE: Electronic Control Unit Authentication in Autonomous Vehicles (ECU2A)

OUSD (R&E) CRITICAL TECHNOLOGY AREA(S): FutureG, Trusted AI and Autonomy, Advanced Computing and Software, Integrated Sensing and Cyber

OBJECTIVE: The objective of the Electronic Control Unit Authentication in Autonomous Vehicles (ECU2A) Direct to Phase 2 (DP2) SBIR topic is to develop prototype systems to authenticate, monitor, and detect malicious activities in Electronic Control Units (ECUs) of modern intelligent military and civilian vehicles.

DESCRIPTION: ECUs are one of the most critical embedded systems that control many subsystems in a vehicle [1]. A vehicle's distributed network of ECUs is responsible for the control/functionality of the engine and transmission system, as well as for the control/functionality of the vehicle's comfort and entertainment systems. Due to the extensive and growing use of ECUs in modern vehicles, and the associated increased costs and complexities they bring (e.g., due to multiple manufacturers, system integration requirements) [2], many vehicle manufacturers have adapted their manufacturing models and design flows to use the intellectual property of third-party ECU manufacturers, and outsource the fabrication of ECU hardware to offshore foundries to reduce the cost and time-to-market for their vehicles. Unfortunately, outsourcing ECU fabrication raises important security concerns [3, 4] for intelligent vehicles used by the civilian sector as well as US expeditionary forces abroad. The various Internet-of-Things (IoT) networks (e.g., Cellular, Local and Personal Area Networks, Low Power Wide Area Networks, and Mesh networks [5]) and the continuing increases in the scale of networked systems offers unprecedented interconnectivity of electronic devices, to include ECUs. Because of the ubiquitous nature and large attack surfaces of IoT networks, threats such as man-in-the-middle attacks, denial of service attacks, and hijacking of services attacks [6] can be successfully executed through bypassing the authentication process of ECUs. The consequences of such attacks can increase in severity if the ECUs are tampered with during production [7, 8, 9], prior to installation in the vehicle. Therefore, it is critical to have the ability to securely authenticate vehicular ECUs and to continuously monitor them for detection of malicious activity.

PHASE I: The ECU2A SBIR topic is soliciting DP2 proposals only, which must include supporting documentation of Phase I feasibility. Phase I feasibility must be demonstrated through evidence of: a completed proof of concept/principal or basic prototype system; definition and characterization of system properties/technology capabilities desirable for DoD/IC/government and civilian/commercial use; and capability/performance comparisons with existing state-of-the-art technologies/methodologies (competing approaches). Entities interested in submitting a DP2 proposal must provide documentation to substantiate that the scientific/technical merit and feasibility described above has been achieved and also describe the potential commercial applications. DP2 Phase I feasibility documentation should include, at a minimum:

- technical reports describing results and conclusions of existing work, particularly regarding the commercial opportunity or DoD/IC insertion opportunity, risks/mitigations, and technology assessments;
- presentation materials and/or white papers;
- technical papers;
- test and measurement data;
- prototype designs/models;
- performance projections, goals, or results in different use cases; and,
- documentation of related topics such as how the proposed ECU2A solution can enable secure authentication and continuous monitoring of ECUs in modern intelligent vehicles.

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The collection of Phase I feasibility material will verify mastery of the required content for DP2 consideration. DP2 proposers must also demonstrate knowledge, skills, and abilities in the technical areas of software engineering, network security, cyber security, analytics, and machine learning. For detailed information on DP2 requirements and eligibility, please refer to the DoD Broad Agency Announcement and the DARPA Instructions for this topic.

PHASE II: The objective of the ECU2A DP2 SBIR topic is to develop prototype systems to authenticate, monitor, and detect malicious activities in ECUs of modern intelligent military and civilian vehicles. ECU2A will develop new hardware/software/component verification methods, algorithms, and machine learning models to improve vehicular ECU security. Strong ECU2A proposals should address several technical challenges, such as:

- effective tools and algorithms for one-time ECU authentication and continuous ECU monitoring schemes;
- models capable of rapidly identifying compromised ECUs;
- ECU software/hardware validation techniques, prior to and after installment;
- zero-overhead, non-intrusive monitoring schemes, that do not require direct ECU access, for easy and secure deployment;
- techniques to rapidly minimize the connection/communication between the source of malicious activity and a targeted ECU;
- capabilities to detect hardware/software trojans with no reverse-engineering techniques;
- monitoring methods for devices operating on a broad range of ECU components, and which have an air-gapped nature.

Phase II will culminate in a demonstration of the application and validation of ECU2A-developed technologies for detecting malicious activity against one or more concrete technological use cases of integrated software systems. Schedule/Milestones/Deliverables: Proposers will execute the research and development (R&D) plan as described in the proposal, including the below:

- Month 1: Phase I Kickoff briefing (with annotated slides) to the DARPA Program Manager (PM) including: any updates to the proposed plan and technical approach, risks/mitigations, schedule (inclusive of dependencies) with planned capability milestones and deliverables, proposed metrics, and plan for prototype demonstration/validation.
- Months 4, 7, 10: Quarterly technical progress reports detailing technical progress to date, tasks accomplished, risks/mitigations, a technical plan for the remainder of Phase II (while this would normally report progress against the plan detailed in the proposal or presented at the Kickoff briefing, it is understood that scientific discoveries, competition, and regulatory changes may all have impacts on the planned work and DARPA must be made aware of any revisions that result), planned activities, trip summaries, and any potential issues or problem areas that require the attention of the DARPA PM.
- Month 12: Interim technical progress briefing (with annotated slides) to the DARPA PM detailing progress made (including quantitative assessment of capabilities developed to date), tasks accomplished, risks/mitigations, planned activities, technical plan for the second half of Phase II, the demonstration/verification plan for the end of Phase II, trip summaries, and any potential issues or problem areas that require the attention of the DARPA PM.
- Month 15, 18, 21: Quarterly technical progress reports detailing technical progress made, tasks accomplished, risks/mitigations, a technical plan for the remainder of Phase II (with necessary updates as in the parenthetical remark for Months 4, 7, and 10), planned activities, trip summaries, and any potential issues or problem areas that require the attention of the DARPA PM.
- Month 24: Final technical progress briefing (with annotated slides) to the DARPA PM. Final architecture with documented details; a demonstration of the ability to authenticate, monitor, and

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detect malicious activities in ECUs; documented application programming interfaces; and any other necessary documentation (including, at a minimum, user manuals and a detailed system design document; and the commercialization plan).

- Month 30 (Phase II Option period): Interim report of matured prototype performance against existing state-of-the-art technologies, documenting key technical gaps towards productization.
- Month 36 (Phase II Option period): Final Phase II Option period technical progress briefing (with annotated slides) to the DARPA PM including prototype performance against existing state-of-the-art technologies, including quantitative metrics for assessment of prototype features/capabilities.

PHASE III DUAL USE APPLICATIONS: ECU2A has potential applicability across DoD/IC/government and commercial entities. For DoD/IC/government, ECU2A is extremely well-suited for improving the security of intelligent vehicles used by US expeditionary forces abroad. ECU2A has the same applicability for the commercial sector. Phase III refers to work that derives from, extends, or completes an effort made under prior SBIR funding agreements, but is funded by sources other than the SBIR Program. The Phase III work will be oriented towards transition and commercialization of the developed ECU2A technologies. For Phase III, the proposer is required to obtain funding from either the private sector, a non-SBIR Government source, or both, to develop the prototype into a viable product or non-R&D service for sale in government or private sector markets. Primary ECU2A support will be to national efforts to help secure military and commercial intelligent vehicle ECUs against threats that target vulnerabilities. Results of ECU2A are intended to improve understanding of the threats and vulnerabilities associated with the increasing use of intelligent vehicles, across government and industry.

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KEYWORDS: Electronic Control Units, Cyber Security, Intrusion Detection, Intelligent Vehicles

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HR0011SB20234-12 TITLE: Network Black Box (NBB)

OUSD (R&E) CRITICAL TECHNOLOGY AREA(S): Integrated Sensing and Cyber, Advanced computing and Software

OBJECTIVE: The Network Black Box Direct to Phase 2 (DP2) SBIR topic seeks to develop and demonstrate a system prototype capable of automatically retaining, retrieving, and analyzing network data to support threat detection and response efforts by cyber security operations teams.

DESCRIPTION: Today's enterprise networks are challenged by a myriad of cyber threats that can jeopardize the confidentiality, integrity, and availability of a network. An organization's enterprise security controls aim to protect the organization's networks against threats from hackers, malicious software, and attempts to steal sensitive information [1]. Threat hunting and incident response tactics, techniques, and procedures (TTPs) employed by an organization's cyber security operations teams help protect the networks by continuously monitoring for threats in progress that evade security controls and breach the network [2]. Despite significant investment in enterprise security controls, and the collection and use of diverse and voluminous datasets for threat hunting and incident response, many organizations lack the infrastructure capacity and resources to store key enterprise network security data in a reliable, efficient, and cost-effective way, for durations comparable to the average dwell time [3] of cyber attackers (i.e., the amount of time an attacker spends on a target network before being detected). Dwell times, which vary based on region and other factors, can average up to two months, giving attackers plenty of time to wreak havoc on the target network [4]. In addition, shortfalls in infrastructure capacity and resources adversely impacts an organization's ability to efficiently and effectively conduct incident response forensics on the network security data, once intrusion is detected. Organizations across government and industry would benefit from a simple, yet powerful, reliable, efficient, and cost-effective mechanism to support automated retention, retrieval, and analysis of key enterprise network data for security operations teams to conduct incident response forensics, such as root cause analysis [5] and lateral movement [6] detection, ex post facto.

PHASE I: The Network Black Box SBIR topic is soliciting Direct to Phase 2 (DP2) proposals only, which must include supporting documentation of Phase 1 feasibility. Phase I feasibility must be demonstrated through evidence of: a completed proof of concept/principal or basic prototype system; definition and characterization of system properties/technology capabilities desirable for DoD/IC/government and civilian/commercial use; and capability/performance comparisons with existing state-of-the-art technologies/methodologies (competing approaches). Entities interested in submitting a DP2 proposal must provide documentation to substantiate that the scientific/technical merit and feasibility described above has been achieved and also describe the potential commercial applications. DP2 Phase I feasibility documentation should include, at a minimum:

- technical reports describing results and conclusions of existing work, particularly regarding the commercial opportunity or DoD/IC insertion opportunity, risks/mitigations, and technology assessments;
- presentation materials and/or white papers;
- technical papers;
- test and measurement data;
- prototype designs/models;
- performance projections, goals, or results in different use cases; and,
- documentation of related topics such as how the proposed Network Black Box solution can enable the retention, retrieval, and analysis of network data to support threat detection and response efforts by security operations teams.

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The collection of Phase 1 feasibility material will verify mastery of the required content for DP2 consideration. DP2 proposers must also demonstrate knowledge, skills, and abilities in the technical areas of cyber operations, software engineering, network security, data analytics, artificial intelligence, and machine learning. For detailed information on DP2 requirements and eligibility, please refer to the DoD Broad Agency Announcement and the DARPA Instructions for this topic.

PHASE II: The Network Black Box DP2 SBIR topic seeks to develop and demonstrate a system prototype capable of automatically retaining, retrieving, and analyzing network data to support threat detection and response efforts by security operations teams. It is envisioned that Network Black Box approaches will take the form of a physical or virtual appliance with an intuitive user interface supporting at least the two use cases stated previously, namely root cause analysis and lateral movement detection. Proposed solutions should enable organizations to retain and analyze enterprise network data for at least one year for a network consisting of at least 10,000 hosts. Strong Network Black Box proposals will provide experimental evidence and a quantitative analysis on the cost, capacity, and scalability of such a capability, and present preliminary evidence on the usefulness of the retained data for root cause analysis, lateral movement detection, and any additional use cases.

DP2 proposals should:

- describe a proposed framework design/architecture to achieve the above stated goals;
- present a plan for maturation of the framework to a demonstrable prototype system; and
- detail a test plan, complete with proposed quantitative metrics for verification and validation of the prototype system performance.

Phase II will culminate in a prototype system demonstration using compelling use cases consistent with commercial opportunities and/or insertion into a DARPA program (e.g., the Cyber Agents for Security Testing and Learning Environments (CASTLE) [7] program which seeks to generate data-driven, machine-readable descriptions of how attacker tools behave, how attack paths unfold, and how to label observable attack behavior; and the Signature Management using Operational Knowledge and Environments (SMOKE) [8] program which seeks to assist red teams with planning with deploying TTPs to evade network defenders in order to achieve assessment objectives (e.g., lateral movement in networks) and assess how networks perform against malicious cyber actors (MCAs)).

The Phase II Option period will further mature the technology for insertion into a DoD/ IC Acquisition Program, another Federal agency, or commercialization into the private sector. The below schedule of milestones and deliverables is provided to establish expectations and desired results/end products for the Phase II and Phase II Option period efforts.

Schedule/Milestones/Deliverables: Proposers will execute the research and development (R&D) plan as described in the proposal, including the below:

- Month 1: Phase I Kickoff briefing (with annotated slides) to the DARPA Program Manager (PM) including: any updates to the proposed plan and technical approach, risks/mitigations, schedule (inclusive of dependencies) with planned capability milestones and deliverables, proposed metrics, and plan for prototype demonstration/validation.
- Months 4, 7, 10: Quarterly technical progress reports detailing technical progress to date, tasks accomplished, risks/mitigations, a technical plan for the remainder of Phase II (while this would normally report progress against the plan detailed in the proposal or presented at the Kickoff briefing, it is understood that scientific discoveries, competition, and regulatory changes may all have impacts on the planned work and DARPA must be made aware of any revisions that result), planned activities, trip summaries, and any potential issues or problem areas that require the attention of the DARPA PM.

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- Month 12: Interim technical progress briefing (with annotated slides) to the DARPA PM detailing progress made (including quantitative assessment of capabilities developed to date), tasks accomplished, risks/mitigations, planned activities, technical plan for the second half of Phase II, the demonstration/verification plan for the end of Phase II, trip summaries, and any potential issues or problem areas that require the attention of the DARPA PM.
- Month 15, 18, 21: Quarterly technical progress reports detailing technical progress made, tasks accomplished, risks/mitigations, a technical plan for the remainder of Phase II (with necessary updates as in the parenthetical remark for Months 4, 7, and 10), planned activities, trip summaries, and any potential issues or problem areas that require the attention of the DARPA PM.
- Month 24: Final technical progress briefing (with annotated slides) to the DARPA PM. Final architecture with documented details; a demonstration of the ability to automatically retain, retrieve, and analyze network data to support threat detection and response efforts by security operations teams; documented application programming interfaces; and any other necessary documentation (including, at a minimum, user manuals and a detailed system design document; and the commercialization plan).
- Month 30 (Phase II Option period): Interim report of matured prototype performance against existing state-of-the-art technologies, documenting key technical gaps towards productization.
- Month 36 (Phase II Option period): Final Phase II Option period technical progress briefing (with annotated slides) to the DARPA PM including prototype performance against existing state-of-the-art technologies, including quantitative metrics for assessment of privacy features/capabilities.

PHASE III DUAL USE APPLICATIONS: Network Black Box has potential applicability across DoD/IC/government and commercial entities. For DoD/IC/government, Network Black Box is extremely well-suited for forensic analysts tasked with conducting postmortems after an organization's network is compromised. Network Black Box has the same applicability for the commercial sector. Phase III refers to work that derives from, extends, or completes an effort made under prior SBIR funding agreements, but is funded by sources other than the SBIR Program. The Phase III work will be oriented towards transition and commercialization of the developed Network Black Box technologies. For Phase III, the proposer is required to obtain funding from either the private sector, a non-SBIR Government source, or both, to develop the prototype into a viable product or non-R&D service for sale in government or private sector markets. Primary Network Black Box support will be to national efforts to help secure government and commercial networks against MCAs that target critical networks. Results of Network Black Box are intended to improve understanding of MCA threats and improve detection and response actions across government and industry.

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KEYWORDS: Network Security, Cybersecurity, Incident Response, Threat Hunting, Artificial Intelligence, Machine Learning, Automation, Data Analytics

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R0011SB20234-13 TITLE: 5G Test Environment (5GTE)

OUSD (R&E) CRITICAL TECHNOLOGY AREA(S): Integrated Sensing and Cyber, Advanced computing and Software

OBJECTIVE: The objective of the 5GTE Direct to Phase 2 (DP2) SBIR topic is to develop a scalable, open-source Internet of Things (IoT) fifth generation (5G) test environment capability to support research and development of nascent 5G technologies.

DESCRIPTION: 5GTE seeks to develop a 5G test environment for IoT devices to enable research, development, and experimentation with a broad range of 5G-capable devices, both static and mobile. The focus of 5GTE is to provide an open-source, realistic 5G radio access network to enable rapid prototyping of wireless protocols and applications including, but not limited to: cyber security, artificial intelligence, and edge-computing.

A key requirement of 5GTE is the ability to rapidly and accurately scale as new technologies and devices are introduced/become available. 5GTE must also provide remote access and device update capabilities. To broaden the range of supported devices and to facilitate development, 5GTE should have the ability to support different wireless communication technologies (e.g., fourth generation, wireless fidelity). 5GTE's network access should support high-fidelity quality of service for experimentation with different 3rd Generation Partnership (3GPP) [1] Project Release 17 [2] use cases.

While open-source 5G testbed architectures do exist [3], they do not fully support remote accessibility and management to allow for multiple experiments and tests to co-exist simultaneously.

PHASE I: The 5GTE SBIR topic is soliciting DP2 proposals only, which must include supporting documentation of Phase I feasibility. Phase I feasibility must be demonstrated through evidence of: a completed proof of concept/principal or basic prototype system; definition and characterization of system properties/technology capabilities desirable for DoD/IC/government and civilian/commercial use; and capability/performance comparisons with existing state-of-the-art technologies/methodologies (competing approaches).

Entities interested in submitting a DP2 proposal must provide documentation to substantiate that the scientific/technical merit and feasibility described above has been achieved and also describe the potential commercial applications. DP2 Phase I feasibility documentation should include, at a minimum:

- technical reports describing results and conclusions of existing work, particularly regarding the commercial opportunity or DoD/IC insertion opportunity, risks/mitigations, and technology assessments;
- presentation materials and/or white papers;
- technical papers;
- test and measurement data;
- prototype designs/models;
- performance projections, goals, or results in different use cases; and,
- documentation of related topics such as how the proposed 5GTE solution can enable research and development of nascent 5G technologies.

The collection of Phase I feasibility material will verify mastery of the required content for DP2 consideration. DP2 proposers must also demonstrate knowledge, skills, and abilities in the technical areas of: mobile communications, software engineering, network security, cyber security, programmable

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networking, and artificial intelligence. For detailed information on DP2 requirements and eligibility, please refer to the DoD Broad Agency Announcement and the DARPA Instructions for this topic.

PHASE II: The objective of the 5GTE DP2 SBIR topic is to develop a scalable, open-source IoT 5G test environment capability to support research and development of nascent 5G technologies.

5GTE DP2 proposals should:

1. describe a proposed design/architecture to achieve the 5GTE goals, along with application programming interfaces that allow for an open IoT testbed infrastructure;
2. present a plan for maturation of the architecture to a prototype testbed to demonstrate accurate and scalable experimentation capabilities; and,
3. detail a test plan, complete with proposed metrics and scope (e.g., testbed structure, types/numbers of devices, etc.) for verification and validation of the testbed capabilities.

5GTE should have the ability to support multiple isolated environments to enable testing in parallel with security guarantees. Each isolated environment would support full standards compliant user authentication on the 5G core side, where the end devices can use programmable subscriber identity module cards; and the core would support network slicing capabilities.

Strong 5GTE proposals would include:

- additional scaling capabilities enabled via emulation of various end devices;
- solutions based on components with strong open-source development and community support, such as the technology projects that reside within the Linux Foundation [5]; and,
- a commercialization plan for the proposed 5GTE which articulates a clear vision for the potential business opportunities as 5G capabilities and standards evolve.

Phase II will culminate in a testbed demonstration using one or more compelling IoT use cases consistent with commercial opportunities and/or insertion into the DARPA/I2O Open, Programmable, Secure 5G (OPS-5G) program [4]. The below schedule of milestones and deliverables is provided to establish expectations and desired results/end product for the DP2 effort.

Schedule/Milestones/Deliverables: Proposers will execute the research and development (R&D) plan as described in the proposal, including the below:

- Month 1: Phase I Kickoff briefing (with annotated slides) to the DARPA Program Manager (PM) including: any updates to the proposed plan and technical approach, risks/mitigations, schedule (inclusive of dependencies) with planned capability milestones and deliverables, proposed metrics, and plan for prototype demonstration/validation.
- Months 4, 7, 10: Quarterly technical progress reports detailing technical progress to date, tasks accomplished, risks/mitigations, a technical plan for the remainder of Phase II (while this would normally report progress against the plan detailed in the proposal or presented at the Kickoff briefing, it is understood that scientific discoveries, competition, and regulatory changes may all have impacts on the planned work and DARPA must be made aware of any revisions that result), planned activities, trip summaries, and any potential issues or problem areas that require the attention of the DARPA PM.
- Month 12: Interim technical progress briefing (with annotated slides) to the DARPA PM detailing progress made (including quantitative assessment of capabilities developed to date), tasks accomplished, risks/mitigations, planned activities, technical plan for the second half of Phase II, the demonstration/verification plan for the end of Phase II, trip summaries, and any potential issues or problem areas that require the attention of the DARPA PM.
- Month 15, 18, 21: Quarterly technical progress reports detailing technical progress made, tasks accomplished, risks/mitigations, a technical plan for the remainder of Phase II (with necessary updates as in the parenthetical remark for Months 4, 7, and 10), planned activities, trip summaries, and any potential issues or problem areas that require the attention of the DARPA PM.

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- Month 24: Final technical progress briefing (with annotated slides) to the DARPA PM. Final architecture with documented details; a demonstration of the ability to authenticate, monitor, and detect malicious activities in ECUs; documented application programming interfaces; and any other necessary documentation (including, at a minimum, user manuals and a detailed system design document; and the commercialization plan).
- Month 30 (Phase II Option period): Interim report of matured prototype performance against existing state-of-the-art technologies, documenting key technical gaps towards productization.
- Month 36 (Phase II Option period): Final Phase II Option period technical progress briefing (with annotated slides) to the DARPA PM including prototype performance against existing state-of-the-art technologies, including quantitative metrics for assessment of test environment features/capabilities.

PHASE III DUAL USE APPLICATIONS: 5GTE has potential applicability across DoD/IC/government and commercial entities. For DoD/IC/government, 5GTE is extremely well-suited for supporting research to investigate 5G capability enhancements and cyber risks. 5GTE has the same applicability for the commercial sector.

Phase III refers to work that derives from, extends, or completes an effort made under prior SBIR funding agreements, but is funded by sources other than the SBIR Program. The Phase III work will be oriented towards transition and commercialization of the developed 5GTE technologies. For Phase III, the proposer is required to obtain funding from either the private sector, a non-SBIR Government source, or both, to develop the prototype into a viable product or non-R&D service for sale in government or private sector markets.

Primary 5GTE support will be to national efforts to advance US 5G capabilities and to promote awareness of 5G risks to national security. Results of 5GTE are intended to enable accurate test and evaluation of nascent 5G technologies at scale, across government and industry.

REFERENCES:

1. 3GPP. 3GPP - A Global Initiative. <https://www.3gpp.org/>
2. 3GPP. 3GPP – The 5G Standard. <https://www.3gpp.org/specifications-technologies/releases/release-17>
3. Institute for the Wireless Internet of Things at Northeastern University. Testbeds to develop and experiment with open, programmable, 5G networks. <https://open5g.info/testbeds/>
4. DARPA Broad Agency Announcement: Open Programmable Secure 5G (OPS-5G), HR001120S0026, January 30, 2020. Available at <https://beta.sam.gov/opp/6ee795ad86a044d1a64f441ef713a476/view>
5. The Linux Foundation. The Linux Foundation. <https://www.linuxfoundation.org/>

KEYWORDS: Fifth Generation (5G), Internet of Things (IoT), Test Environment, Scalability, Open-source, Security, Cyber Security, Artificial Intelligence, and Edge-computing

AMENDMENT 1

The purpose of Amendment 1 to DARPA Release 6 is to include programmatic changes as required by the SBIR and STTR Extension Act of 2022 (Pub. L. 117-183). Additional disclosure requirements are outlined in Appendix A, Supporting Documents (Volume 5).

**Defense Advanced Research Projects Agency (DARPA)
DoD 23.4 Small Business Innovation Research (SBIR) Annual BAA
Proposal Submission Instructions Release 6**

INTRODUCTION

To achieve DARPA’s mission to create technological surprise, the agency makes strategic, early investments in science and technology that will have long-term positive impacts on our national security. The pace of discovery in both science and technology is accelerating worldwide, resulting in new fields of study and the identification of scientific areas ripe for small business utilization through the SBIR and STTR programs. Small businesses are critical for developing technology to support national security. Proposers are encouraged to consider whether the R/R&D being proposed to DoD Components also has private sector potential, either for the proposed application or as a base for other applications. The topics below focus on technical domains important to DARPA’s mission pursuing innovative research concepts that fall within one of its technology offices. More information about DARPA’s technical domains and research topics of interest may be found at: <http://www.darpa.mil/about-us/offices>.

Proposers responding to a topic in this BAA must follow all general instructions provided in the Department of Defense (DoD) SBIR Program BAA. DARPA requirements in addition to or deviating from the DoD Program BAA are provided in the instructions below.

Specific questions pertaining to the administration of the DARPA Program and these proposal preparation instructions should be directed to: DARPA Small Business Programs Office at SBIR_BAA@darpa.mil. DSIP Topic Q&A will NOT be available for these DARPA topics. Technical questions related to improving the understanding of a topic’s requirements must be submitted to SBIR_BAA@darpa.mil by the deadline listed below.

The following dates apply to this DARPA Topic release:

- April 27 2023:** Topic issued for pre-release
- May 16, 2023:** Topic opens; DARPA begins accepting proposals via DSIP
- June 08, 2023:** Deadline for technical question submission
- June 15, 2023:** Deadline for receipt of proposals no later than **12:00 pm ET**

DIRECT TO PHASE II PROPOSAL GUIDELINES

Proposers should refer to the DARPA Direct to Phase II SBIR XL Proposal Instructions, provided in Appendix A.

Current Release Award Structure by Topic

| Topic Number | Direct to Phase II | | | | | |
|--------------|--------------------|------------|--------------|-----------------------------|---------------|---------------|
| | Technical Volume | | Award Amount | Period of Performance (PoP) | Option Amount | Option Period |
| | White Paper | Slide Deck | | | | |
| | 20 pages | 15 slides | \$2,000,000 | 24 months | \$2,000,000* | 12 months |

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*For this topic DARPA will accept DP2 proposals with a total maximum cost/price of \$4,000,000. This maximum cost/price includes a 24-month base period not to exceed \$2,000,000 and a 12-month Option minimum of \$1,000,000. The base period and the minimum funding for the Option (if exercised) are funded entirely by DARPA. Additionally, if the Option is exercised, DARPA is encouraging the performer to arrange additional program funding with a commercial or government (non-DARPA) partner of up to \$500,000. Any proposed non-DARPA funding agreement must be written, signed, and received by DARPA 60 calendar days before the last day of the period of performance of the base period to permit DARPA sufficient time to access as part of the determination to award the Option effort. DARPA will match up to \$500,000 of non-DARPA funds under a written, signed, and timely submitted agreement. Securing a non-DARPA funding agreement does not obligate DARPA to exercise the Option effort, nor will the lack of a written funding agreement prevent the performer from receiving an Option. DARPA will make option award decisions based on performance and funding availability.

Note: Please see Appendix A, section III (d) for complete instructions on the White Paper/Slide Deck technical volume format.

Content of the Technical Volume

Proposers should refer to the DARPA DP2 Proposal Instructions, provided in Appendix A and on the DARPA Small Business site (<https://www.darpa.mil/work-with-us/for-small-businesses/participate-sbir-sttr-program>).

Cost Volume (Volume 3)

Please see the chart above for award amounts listed by topic. Proposers are required to use the Direct to Phase II – Volume 3: Cost Proposal Template (Excel Spreadsheet) provided on the DARPA Small Business site (<https://www.darpa.mil/work-with-us/for-small-businesses/participate-sbir-sttr-program>). Subcontractors may also submit unsanitized costs using this template directly to DARPA at SBIR-BAA@darpa.mil.

Please review the updated Percentage of Work (POW) calculation details included in the DoD Program BAA. DARPA will occasionally accept deviations from the POW requirements with a letter of explanation or approval from the Funding Agreement officer.

Company Commercialization Report (CCR) (Volume 4)

Completion of the CCR as Volume 4 of the proposal submission in DSIP is required. Please refer to the DoD SBIR Program BAA for full details on this requirement. Information contained in the CCR will not be considered by DARPA during proposal evaluations.

Supporting Documents (Volume 5)

In addition to the documents required by DoD, small businesses may also submit additional documentation to support the Technical Volume (Volume 2) and the Cost Volume (Volume 3) in Volume 5. See Appendix A for required certifications that must be included in Volume 5. For additional information, see the SBIR 23.4 Annual Program Broad Agency Announcement (BAA) at <https://www.defensesbirstr.mil/SBIR-STTR/Opportunities/>.

DISCRETIONARY TECHNICAL AND BUSINESS ASSISTANCE (TAB A)

DARPA does not offer TAB A funding.

EVALUATION AND SELECTION

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All proposals will be evaluated in accordance with the evaluation criteria listed in the DoD SBIR 2023.4 BAA. DARPA will conduct an evaluation of each conforming proposal. Proposals that do not comply with the requirements detailed in this BAA and the research objective(s) of the corresponding topic are considered non-conforming and therefore are not evaluated nor considered for award.

Using the evaluation criteria, the Government will evaluate each proposal in its entirety, documenting the strengths and weaknesses relative to each evaluation criterion, and, based on these identified strengths and weaknesses, determine the proposal's overall selectability. Proposals will not be evaluated against each other during the evaluation process, but rather evaluated on their own individual merit to determine how well the proposal meets the criteria stated in this BAA and the corresponding DARPA topic.

Awards will be made to proposers whose proposals are determined to be the most advantageous to the Government, consistent with instructions and evaluation criteria specified in the DoD SBIR 2023.4 BAA and availability of funding. Given the limited funding available for each topic released, not all proposals considered selectable will be selected for funding.

For the purposes of this proposal evaluation process, a selectable proposal is defined as follows:

Selectable: A selectable proposal is a proposal that has been evaluated by the Government against the evaluation criteria listed in the DoD SBIR 2023.4 BAA and DARPA topic, and the strengths of the overall proposal outweighs its weaknesses. Additionally, there are no accumulated weaknesses that would require extensive negotiations and/or a resubmitted proposal.

For the purposes of this proposal evaluation process, a non-selectable proposal is defined as follows:

Non-Selectable: A proposal is considered non-selectable when the proposal has been evaluated by the Government against the evaluation criteria listed in the DoD SBIR 2023.4 BAA and DARPA topic, and the strengths of the overall proposal do not outweigh its weaknesses.

Proposing firms will be notified of selection or non-selection status for a Phase I award within 90 days of the closing date of the DoD SBIR 2023.4 BAA. It is the policy of DARPA to treat all proposals as source selection information and to disclose their contents only for the purpose of evaluation. Restrictive notices notwithstanding, during the evaluation process, submissions may be handled by support contractors for administrative purposes and/or to assist with technical evaluation. All DARPA support contractors are expressly prohibited from performing DARPA-sponsored technical research and are bound by appropriate nondisclosure agreements. Input on technical aspects of the proposals may be solicited by DARPA from other Government and/or non-Government consultants/experts who are strictly bound by the appropriate non-disclosure requirements. No submissions will be returned. Upon completion of the evaluation and selection process, an electronic copy of each proposal received will be retained at DARPA.

Proposal titles, abstracts, anticipated benefits, and keywords of proposals that are selected for contract award will undergo a DARPA Policy and Security Review. Proposal titles, abstracts, anticipated benefits, and keywords are subject to revision and/or redaction by DARPA. Final approved versions of proposal titles, abstracts, anticipated benefits, and keywords may appear on the DoD SBIR/STTR awards website and/or the SBA's SBIR/STTR award website (<https://www.sbir.gov/sbirsearch/award/all>).

Refer to the DoD SBIR 2023.4 Program BAA for procedures to protest the Announcement. As further prescribed in FAR 33.106(b), FAR 52.233-3, Protests regarding the selection decision should be submitted to:

DARPA

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Contracts Management Office (CMO)
675 N. Randolph Street
Arlington, VA 22203
E-mail: scott.ulrey@darpa.mil and sbir@darpa.mil

AWARD AND CONTRACT INFORMATION

1. General Award Information

Multiple awards are anticipated. DARPA may award FAR-based government contracts (Firm- Fixed Price or Cost-Plus Reimbursement) or Other Transactions for Prototypes agreement (under the authority of 10 U.S.C. § 4022) subject to approval of the Contracting Officer. The amount of resources made available for each topic issued under this BAA will depend on the quality of the proposals received and the availability of funds.

Majority Ownership in Part. Proposers that are more than 50% owned by multiple venture capital operating companies (VCOC), hedge funds (HF), private equity firms (PEF), or any combination of these as set forth in 13 C.F.R. § 121.702, are eligible to submit proposals in response to DARPA topics advertised within this BAA.

For proposers that are a member of this ownership class the following must be satisfied for proposals to be accepted and evaluated:

- a. Prior to submitting a proposal, firms must register with the SBA Company Registry Database.
- b. The proposer within its submission must submit the Majority-Owned VCOC, HF, and PEF Certification. A copy of the SBIR VC Certification can be found on <https://www.darpa.mil/work-with-us/for-small-businesses/participate-sbir-sttr-program>, under SBIR/STTR BAA Forms. Include the SBIR VC Certification in the Supporting Documents (Volume 5).
- c. Should a proposer become a member of this ownership class after submitting its proposal and prior to any receipt of a funding agreement, the proposer must immediately notify the Contracting Officer, register in the appropriate SBA database, and submit the required certification which can be found under SBIR/STTR BAA Forms and Templates on <https://www.darpa.mil/work-with-us/for-small-businesses/participate-sbir-sttr-program>.

The Government reserves the right to select for negotiation all, some, one, or none of the proposals received in response to this announcement and to make awards with or without communications with proposers. Additionally, the Government reserves the right to award all, some, one, or none of the options on the contract(s)/agreement(s) of the performers based on available funding and technical performance. If warranted, portions of resulting awards may be segregated into pre-priced options. Additionally, DARPA reserves the right to accept proposals in their entirety or to select only portions of proposals for award. In the event that DARPA desires to award only portions of a proposal, negotiations may be opened with that proposer. The Government reserves the right to fund proposals in phases with options for continued work, as applicable.

The Government reserves the right to request any additional, necessary documentation once it makes the award instrument determination. The Government reserves the right to remove a proposal from award consideration should the parties fail to reach agreement on award terms, conditions, and price within a reasonable time, and/or the proposer fails to provide requested additional information within three business days.

In all cases, the Government Contracting Officer reserves the right to select award instrument type, regardless of instrument type proposed, and to negotiate all instrument terms and conditions with

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selectees. DARPA will apply publication or other restrictions, as necessary, if it determines that the research resulting from the proposed effort will present a high likelihood of disclosing performance characteristics of military systems or manufacturing technologies that are unique and critical to defense. Any award resulting from such a determination will include a requirement for DARPA permission before publishing any information or results on the program. For more information on publication restrictions, see the DoD SBIR 2023.4 BAA.

Because of the desire to streamline the award negotiation and program execution process, proposals identified for negotiation will result in negotiating a type of instrument for award that is in the best interest of the Government. In the case of an OT for Prototype agreement under DARPA's authority to award OTs for prototype projects, 10 U.S.C. § 4022, use of an OT provides significant opportunities for flexible execution to assist in meeting DARPA's aggressive SBIR/STTR program goals.

All proposers that wish to consider an OT award should carefully read the following:

The flexibility of the OT award instrument is beneficial to the program because the Performer will be able to apply its best practices as required to carry out the research project that may be outside of the Federal Acquisition Regulation (FAR) process-driven requirements. Streamlined practices will be used, such as milestone-driven performance, intended to reduce time and effort on award administration tasks and permit performers to focus on the research effort and rapid prototyping. Because of this ability, OTs provide the Agreements Officer the flexibility to create an award instrument that contains terms and conditions that promote commercial transition, reduce some administratively burdensome acquisition regulations, and meet SBIR/STTR program goals.

Proposers must only propose an OT agreement with fixed payable milestones. Fixed payable milestones are fixed payments based on successful completion of the milestone accomplishments agreed to in the milestone plan. Refer to the Other Transactions for Prototypes Fact Sheet and Other Transaction for Prototype Agreement, available at <https://www.darpa.mil/work-with-us/for-small-businesses/participate-sbir-sttr-program>. Specific milestones will be based upon the research objectives detailed in the topic.

Please see <https://www.darpa.mil/work-with-us/for-small-businesses/participate-sbir-sttr-program> for more information on OTs.

2. Transition and Commercialization Support Program (TCSP)

DARPA will provide services to Phase II or DP2 awardees upon contract execution through the Transition and Commercialization Support Program (TCSP) at no cost to awardees. The TCSP goal is to maximize the potential for SBIR/STTR companies to move their technology beyond Phase II and into other research and development programs for further maturity or into solutions or products for DoD acquisition programs, other Federal programs, and/or the commercial market. Please visit <https://www.darpa.mil/work-with-us/for-small-businesses/commercialization-continued> for more information on DARPA TCSP.

3. Embedded Entrepreneurship Initiative

Awardees of SBIR funding pursuant to this BAA may be eligible to participate in the DARPA Embedded Entrepreneurship Initiative (EEI) during the Period of Performance. Invitation to participate in EEI is at the sole discretion of the Government based on evaluation of technical and commercial factors and subject to program balance and the availability of funding. EEI is a limited scope program offered by DARPA, at DARPA's discretion, to a small subset of awardees. The goal of DARPA's EEI is to increase the likelihood that DARPA-funded technologies take root in the U.S. and provide new capabilities for national defense. EEI supports DARPA's mission "to make pivotal investments in breakthrough technologies and capabilities for national security" by accelerating the transition of innovations out of the

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lab and into new capabilities for the Department of Defense (DoD). EEI investment supports development of a robust and deliberate Go-to-Market strategy for selling technology product to the government and commercial markets and positions DARPA awardees to attract U.S. investment. The following is for informational and planning purposes only and does not constitute solicitation of proposals to the EEI.

There are three elements to DARPA's EEI: (1) A Senior Commercialization Advisor (SCA) from DARPA who works with the Program Manager (PM) to examine the business case for the awardee's technology and uses commercial methodologies to identify steps toward achieving a successful transition of technology to the government and commercial markets; (2) Connections to potential industry and investor partners via EEI's Investor Working Groups; and (3) Additional funding on an awardee's contract for the awardee to hire an embedded entrepreneur to achieve specific milestones in a Go-to-Market strategy for transitioning the technology to products that serve both defense and commercial markets. This embedded entrepreneur's qualifications should include business experience within the target industries of interest, experience in commercializing early-stage technology, and the ability to communicate and interact with technical and non-technical stakeholders. Funding for EEI is typically no more than \$250,000 per awardee over the duration of the award. An awardee may apportion EEI funding to hire more than one embedded entrepreneur, if achieving the milestones requires different expertise that can be obtained without exceeding the awardee's total EEI funding. The EEI effort is intended to be conducted concurrent with the research program without extending the period of performance.

EEI Application Process:

After receiving an award under the solicitation, awardees interested in being considered for EEI should notify their DARPA Program Manager (PM) during the period of performance. Timing of such notification should ideally allow sufficient time for DARPA and the awardee to review the awardee's initial transition plan, identify milestones to achieve under EEI, modify the award, and conduct the work required to achieve such milestones within the original award period of performance. These steps may take 9-18 months to complete, depending on the technology. If the DARPA PM determines that EEI could be of benefit to transition the technology to product(s) the Government needs, the PM will refer the performer to DARPA Commercial Strategy.

DARPA Commercial Strategy will then contact the performer, assess fitness for EEI, and in consultation with the DARPA technical office, determine whether to invite the performer to participate in the EEI. Factors that are considered in determining fitness for EEI include DoD/Government need for the technology; competitive approaches to enable a similar capability or product; risks and impact of the Government's being unable to access the technology from a sustainable source; Government and commercial markets for the technology; cost and affordability; manufacturability and scalability; supply chain requirements and barriers; regulatory requirements and timelines; Intellectual Property and Government Use Rights, and available funding.

Invitation to participate in EEI is at the sole discretion of DARPA and subject to program balance and the availability of funding. EEI participants' awards may be subsequently modified bilaterally to amend the Statement of Work to add negotiated EEI tasks, provide funding, and specify a milestone schedule which will include measurable steps necessary to build, refine, and execute a Go-to-Market technology transition plan aimed at delivering new capabilities for national defense. Milestone examples are available at: <https://www.darpa.mil/work-with-us/contract-management>.

Awardees under this solicitation are eligible to be considered for participation in EEI, but selection for award under this solicitation does not imply or guarantee participation in EEI.

For more information, please refer to the EEI website <https://eei.darpa.mil/>.

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4. DARPA Toolbox Initiative

DARPA Toolbox is an Agency-wide effort to provide open licensing opportunities with commercial technology vendors to the researchers behind DARPA programs. DARPA Toolbox provides easy, low-cost, scalable access to state-of-the-art tools and intellectual property (IP) under predictable legal terms and streamlined acquisition procedures. The goal is to reduce performer reliance on low-quality, low-cost tools and IP that increase execution risks and complicate post-DARPA transitions.

Through this initiative, DARPA performers are granted access to select vendor tools and technologies throughout the life of their contractual relationship with the Agency. The Toolbox suppliers bring to the table proven technologies commonly used in state-of-the-art commercial microelectronics or system design methodologies.

DARPA Toolbox program information and a full list of participating suppliers can be found at <https://www.darpa.mil/work-with-us/darpa-toolbox-initiative>. If there are tool or technologies of interest, contact the Supplier POC listed for the product, referencing the DARPA Toolbox Initiative. The Supplier POC will provide advice on products and pricing information. Include any non-production pricing quotes in your proposal. Products and pricing are between you and the suppliers – *do not* contact DARPA directly.

ADDITIONAL INFORMATION

DARPA intends to use electronic mail for all correspondence regarding these topics. Questions related to the technical aspect of the research objectives and awards specifically related to a topic should be emailed to SBIR_BAA@darpa.mil. Please reference the topic number in the subject line. All questions must be in English and must include the name, email address, and the telephone number of a point of contact.

DARPA will attempt to answer questions in a timely manner; however, questions submitted within seven (7) calendar days of the proposal due date listed herein may not be answered. DARPA will post a consolidated Frequently Asked Questions (FAQ) document. To access the posting please visit: <http://www.darpa.mil/work-with-us/opportunities>. Under the topic number summary, there will be a link to the FAQ. The FAQ will be updated on an ongoing basis until one week prior to the proposal due date.

Technical support for the Defense SBIR/STTR Innovation Portal (DSIP) is available Monday through Friday, 9:00 a.m. – 5:00 p.m. ET. Requests for technical support must be emailed to DoDSBIRSupport@reisystems.com with a copy to SBIR_BAA@darpa.mil.

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APPENDIX A: DARPA DIRECT TO PHASE II (DP2) PROPOSAL INSTRUCTIONS

I. Introduction

A complete proposal submission consists of:

Volume 1: Proposal Cover Sheet

Volume 2: Technical Volume (feasibility documentation and technical proposal)

Volume 3: Cost Volume

Volume 4: Company Commercialization Report

Volume 5: Supporting Documents

a. Contractor Certification Regarding Provision of Prohibition on Contracting for Certain Telecommunications and Video Surveillance Services or Equipment (Attachment 1)

MANDATORY

b. Disclosures of Foreign Affiliations or Relationships to Foreign Countries (Attachment 2)

MANDATORY

c. Verification of Eligibility of Small Business Joint Ventures (Attachment 3), if applicable

d. Disclosure of Funding Sources (Attachment 4) MANDATORY

e. Other supporting documentation

A completed proposal submission in DSIP does NOT indicate that the mandatory supporting documents have been uploaded. It is the responsibility of the proposing small business concern to ensure that the mandatory documents listed above have been uploaded and included with the proposal submission.

Volume 6: Fraud, Waste and Abuse Training

The Defense SBIR/STTR Innovation Portal (DSIP) provides a structure for building the proposal volumes and submitting a consolidated proposal package. If this is your first time submitting an SBIR or STTR proposal using DSIP, please review detailed training guides at <https://www.dodsbirsttr.mil/submissions/learning-support/training-materials>. It is the responsibility of the proposing firm to ensure that a complete proposal package is certified and submitted by the close date listed in the topic to which they are responding.

To assist in proposal development, templates for Volume 2: Technical Volume and Volume 3: Cost Volume have been provided as attachments to the announcement posted at <https://www.dodsbirsttr.mil/submissions/login>. Use of these templates is mandatory.

NOTE: All proposers are required to submit Volume 4: Company Commercialization Report (CCR).

II. Proprietary Information

Proposers that include in their proposals data that they do not want disclosed to the public for any purpose, or used by the Government except for evaluation purposes, shall follow instructions in section 4.5 regarding marking propriety proposal information.

III. DP2 Proposal Instructions

a. Proposal Cover Sheet (Volume 1)

The Cover Sheet must include a brief technical abstract of no more than 3000 characters that describes the proposed R&D project with a discussion of anticipated benefits and potential commercial applications.

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Do not include proprietary or classified information in the Proposal Cover Sheet. If your proposal is selected for award, the technical abstract and discussion of anticipated benefits may be publicly released.

b. Content of the Technical Volume (Volume 2) – White Paper & Slide Deck

White Paper (NTE 20 pages). Provide the following information:

Goals and Impact: Clearly describe what is being proposed and what difference it will make (qualitatively and quantitatively), including a brief discussion on how this directly relates to the topic.

1. **Phase I Feasibility:** This topic is accepting Direct to Phase II proposals ONLY. To be eligible, proposers must demonstrate that the feasibility requirements outlined in the topic have been met, and achieved outside of the SBIR program.
2. **Technical Plan:** Outline and address all technical areas and challenges inherent in the approach and possible solutions for overcoming potential problems. Provide specific objectives, metrics, and milestones at intermediate stages to demonstrate a plan for accomplishment of the project objectives. Propose additional appropriate qualitative and quantitative metrics specific to the approach, as needed. Intermediary milestones should occur at no greater than 1-month increments.
3. **Management and Capabilities:** Designate key personnel who will be involved in the Phase II effort. Provide a brief summary of expertise of the team, including subcontractors and key personnel. Describe the organizational experience in this technology area, previous work not directly related to the proposed effort but similar, existing intellectual property required to complete the project, and any specialized facilities to be used as part of the project. List Government-furnished materials or data assumed to be available. Describe any specialized facilities to be used as part of the project, the extent of access to these facilities, and any biological containment, biosafety, and certification requirements.
4. **Transition and Commercialization Plan:**
 - a. Describe the commercial product or DoD system to be developed.
 - b. Discuss the potential end users – DoD, Federal, and/or private sector customers. Discuss your business model for this technology (i.e., how do you anticipate generating revenue with this technology?). Who are you selling to directly or indirectly, a supplier, an integrator, or an end user?
 - c. Describe your company's funding history. Discuss how much additional funding above this proposed effort (include additional required technology development, staffing requirements, infrastructure requirements, IP strategy costs, etc.) that will be required to bring this technology to market and how you anticipate going about getting that funding (e.g., Govt S&T contracts, investment).
 - d. Describe the timeline to maturity for sales or transition to an end user. Describe your IP strategy.
 - e. Describe the technology, market, team and business risks associated with this proposed effort and your plan to mitigate these risks.

Slide Deck (NTE 15 slides). Provide the following information (convert the completed deck to a pdf and attach it to the white paper):

1. What are you trying to do and how does this directly relate to the topic?

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2. Technology and commercial product: Specifically, what are you proposing to produce – software, system, application? Be specific on what your proposed technology development is targeting as an end state.
3. How is the technology approached today? Who is doing the research, development and delivering products/services? What are the current limitations in the technology and commercial marketplaces?
4. Technical and commercial value proposition: How have you substantiated the feasibility of your approach? What is innovative in your approach and how does it compare to the state-of-the-art? Why do you think it will be successful both from a technical and commercial perspective? If you are successful, what difference will it make? Discuss your proposed business model – how do you expect to generate revenue from your technology?
5. Technical and commercial risks: What are the key technical and commercial challenges and how do you plan to address/overcome these?
6. Technical and commercial market analysis: Who will care and what will the impact be if you are successful? What/who are the markets/industries/integrators/stakeholders that would/should care?
7. Cost, schedule and milestones: Provide a summary of your cost volume. Provide a summary of your schedule and milestones. How much will your proposed effort cost in total? How long will it take? What are your technical milestones for achieving the proposed efforts? What are your transition and commercialization plan milestones? Discuss how much funding will be required to bring your proposed technology to market and execute on your proposed transition and commercialization plan. Include any funding raised to date and expected plans for raising any additional required funding (government contracting revenue, product sales, internal R&D investment, loan, angel or Venture Capital investment, etc.). Describe timeline to maturity for operational use or commercial sales.
8. Management: Overview of team, facilities and qualifications.
9. Technical summary quad chart: Use template provided at <https://www.darpa.mil/work-with-us/for-small-businesses/participate-sbir-str-program>.
10. Commercialization summary quad chart: Use the DARPA Transition and Commercialization Strategy Plan (TCSP) template, located at <https://www.darpa.mil/work-with-us/for-small-businesses/commercialization-continued>.

NOTE: All letters of recommendation and CVs can be loaded in Volume 5: Supporting Documents.

c. Format of Cost Volume (Volume 3)

Proposers are required to use the Direct to Phase II – Volume 3: Cost Proposal Template (Excel Spreadsheet) provided as an attachment to this announcement. The Cost Volume (and supporting documentation) DOES NOT count toward the page limit of the Technical Volume.

d. Content of the Cost Volume (Volume 3)

Some items in the Cost Breakdown Guidance below may not apply to the proposed project. If such is the case, there is no need to provide information on each and every item.

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ALL proposed costs should be accompanied by documentation to substantiate how the cost was derived. For example, if you proposed travel cost to attend a project-related meeting or conference, and used a travel website to compare flight costs, include a screen shot of the comparison. Similarly, if you proposed to purchase materials or equipment, and used the internet to search for the best source, include your market research for those items. You do not necessarily have to propose the cheapest item or supplier, but you should explain your decision to choose one item or supplier over another. It's important to provide enough information to allow contracting personnel to understand how the proposer plans to use the requested funds. If selected for award, failure to include the documentation with your proposal will delay contract negotiation, and the proposer will be asked to submit the necessary documentation to the Contracting Officer to substantiate costs (e.g., cost estimates for equipment, materials, and consultants or subcontractors). It is important to respond as quickly as possible to the Contracting Officer's request for documentation.

Cost Breakdown Guidance:

1. List all key personnel by name as well as by number of hours dedicated to the project as direct labor. Special tooling and test equipment and material cost may be included. The inclusion of equipment and material will be carefully reviewed relative to need and appropriateness for the work proposed. The purchase of special tooling and test equipment must, in the opinion of the Contracting Officer, be advantageous to the Government and should be related directly to the specific topic. These may include such items as innovative instrumentation and/or automatic test equipment. Title to property furnished by the Government or acquired with Government funds will be vested with DARPA; unless it is determined that transfer of title to the contractor would be more cost effective than recovery of the equipment by the DARPA.
2. Cost for travel funds must be justified and related to the needs of the project.
3. Cost sharing is permitted for proposals under this announcement; however, cost sharing is not required nor will it be an evaluation factor in the consideration of a proposal.
4. All subcontractor costs and consultant costs must be detailed at the same level as prime contractor costs in regard to labor, travel, equipment, etc. Provide detailed substantiation of subcontractor costs in your cost proposal. Enter this information in the Explanatory Material section of the on-line cost proposal form. The Supporting Documents Volume (Volume 5) may be used if additional space is needed.

For more information about cost proposals and accounting standards, see the DCAA publication titled "Audit Process Overview – Information for Contractors" available at: <http://www.dcaa.mil>.

e. Company Commercialization Report (Volume 4)

The Company Commercialization Report (CCR) allows companies to report funding outcomes resulting from prior SBIR and STTR awards. The Company Commercialization Report (CCR) is required for Phase I and Direct to Phase II proposals. Please refer to the DoD STTR Program BAA for full details on this requirement. Information contained in the CCR will not be considered by DARPA during proposal evaluations.

f. Supporting Documents (Volume 5)

In addition to required DoD documentation and certifications, small businesses may also submit additional documentation to support the Technical Volume (Volume 2) and the Cost Volume (Volume 3) in Volume 5. See Appendix A Introduction for required certifications that must be included in Volume 5. For additional information, see the SBIR 23.4 Annual Program Broad Agency Announcement (BAA) at <https://www.defensesbirsttr.mil/SBIR-STTR/Opportunities/>.

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g. Fraud Waste and Abuse (Volume 6)

The Fraud, Waste and Abuse (FWA) training is required for Phase I and Direct to Phase II proposals. FWA training provides information on what represents FWA in the SBIR/STTR program, the most common mistakes that lead to FWA, as well as the penalties and ways to prevent FWA in your firm. This training material must be thoroughly reviewed once per year. Plan ahead and leave ample time to complete this training based on the proposal submission deadline. Knowingly and willfully making any false, fictitious, or fraudulent statements or representations may be a felony under the Federal Criminal False Statement Act (18 U.S.C. Sec 1001), punishable by a fine of up to \$10,000, up to five years in prison, or both. Understanding the indicators and types of fraud, waste, and abuse that can occur is critical for the SBIR/STTR awardees' role in preventing the loss of research dollars.

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**DARPA SBIR 23.4 Topic Index
Release 6**

HR0011SB20234XL-02

Empirical Proving Ground for Cryptographic Engineering Challenges in
Large-scale Deployments (EPiC EagLe) – SBIR XL

AMENDMENT 1

HR0011SB20234XL-02

TITLE: Empirical Proving Ground for Cryptographic Engineering Challenges in Large-scale Deployments (EPiC EagLe) – SBIR XL

OUSD (R&E) CRITICAL TECHNOLOGY AREA(S): Advanced Computing and Software, Integrated Network Systems-of-Systems, Quantum Science

The technology within this topic is restricted under the International Traffic in Arms Regulation (ITAR), 22 CFR Parts 120-130, which controls the export and import of defense-related material and services, including export of sensitive technical data, or the Export Administration Regulation (EAR), 15 CFR Parts 730-774, which controls dual use items. Offerors must disclose any proposed use of foreign nationals (FNs), their country(ies) of origin, the type of visa or work permit possessed, and the statement of work (SOW) tasks intended for accomplishment by the FN(s) in accordance with the Announcement. Offerors are advised foreign nationals proposed to perform on this topic may be restricted due to the technical data under US Export Control Laws.

OBJECTIVE: The Empirical Proving Ground for Cryptographic Engineering Challenges in Large-scale Deployments (EPiC EagLe) effort will develop sound state-of-the-art experimental methodologies and operational benchmarks for evaluating distributed trust solutions such as: 1) modifications of existing Public Key Infrastructures (PKIs) and Key Management Infrastructures (KMIs) to recover from loss-of-trust events at Internet scale, 2) hybrid PKIs that add novel delegation and transient trust protocols, and 3) novel designs of PKIs and KMIs for networks with special link, bandwidth, and latency requirements and constraints, such as connected battlespaces. This effort will demonstrate the capability to evaluate such solutions, at scale, exceeding traditional methodologies' ability to assess the Internet's commercial PKI's and Internet-of-Things (IoT) scales.

DESCRIPTION: This effort will develop sound state-of-the-art experimental methodologies and operational benchmarks for evaluating distributed trust solutions and demonstrate the capability of evaluating such solutions, at scale, exceeding traditional methodologies' ability to assess the Internet's commercial PKI's and IoT's scales. Innovative approaches should address the experimental methodology for evaluating implementations of distributed trust schemes—or modifications of existing schemes, such as those focused on recovery—at large scales, under realistic connectivity (or intermittent connectivity) constraints, along with the required simulation framework, metrics of success, assessment methods, and integration of solutions into robust, real-time cyber defense capabilities of interest to the DoD.

PHASE I: This topic is soliciting Direct to Phase II (DP2) proposals only. The Phase I feasibility study shall include the documentation of a basic distributed trust evaluation prototype consisting of the software code and hardware capabilities that are capable of experimenting with Research & Development (R&D) concepts of Tactical Certificate Authorities (CAs) that employ flexible policies, extensions, and protocols for battlefield use.

Proposers interested in submitting a Direct to Phase II (DP2) proposal must provide documentation to substantiate that the scientific and technical merit and feasibility described above has been met and supports relevant military and/or commercial applications. Documentation should include all relevant information including, but not limited to: technical reports, test data, prototype designs/models, and performance goals/results. For detailed information on DP2 requirements and eligibility, please refer to Appendix B of the DARPA Instructions for DoD BAA 2023.4.

PHASE II: Phase II shall produce system design, implementation, and maintenance capabilities to significantly advance the state of the art in PKI scaling challenges for IoT and IoT-like battlespace uses. In today's Internet PKIs, simple loss-of-trust events such as an expiring PKI certificate led to massive outages of national telecom providers, major cloud computing services, and even critical transportation

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systems, with no effective automated means of timely recovery [1, 4-7]. Such outages, although indirect to the DoD, are likely to create major challenges for DoD operations.

There currently are limited scalable capabilities for recovering from loss-of-trust events such as expiration of trusted certificates, expiry of root-of-trust certificates, or compromises of such certificates or PKI subsystems. Despite the “impending doom” of multiple Internet Root-of-Trust certificates approaching their expiry dates [2], the Internet PKI and IoT trust technologies lack well-designed technological fallbacks for recovery. When proposed, such technological fallbacks cannot be comprehensively evaluated without creating major deployments at representative scales, which are cost-prohibitive. Today, the DoD lacks the capability to experimentally test proposed distributed trust solutions at DoD-relevant scales. Although simulation technologies such as OPNET facilitate introductory training in DoD encryption protocols (e.g., [8]) and limited experimentation with proposed replacements of inefficient key management systems (e.g., [9]), these systems are limited in scale, and cannot be extended to simulate the behaviors of millions or hundreds of millions of nodes. This stymies the Government’s abilities to pose cryptographic engineering challenges and to evaluate proposed solutions.

Today, our understanding of (rare) successful recovery derives from a few actual loss-of-trust events such as expiration of the trusted intermediate CA certificate of the Mozilla Firefox browser, which lead to worldwide deactivation of Firefox plugins (including critical security plugins). Mozilla recovered from this near-catastrophic event via an ad hoc manipulation of the certificates’ trust paths, made possible by a serendipitous feature of the browser’s trust chain validation implementation and ad hoc manipulation of the browser key store [1]. The two features that serendipitously enabled this recovery effort were used in ways not intended by their original design and not considered before the outage.

Today, there exists no rigorous sets of metrics, models, or simulations to discuss scalability requirements of trust management solutions such as hierarchical PKIs or any hybrid schemes. There is strong anecdotal evidence from industry that PKI and key management problems at scale create non-trivial operational surprises. However, lack of a common framework for evaluating research in distributed trust solutions at scale stymies progress. In particular, the challenges of recovering from loss-of-trust events or of migrating authority on a large scale have not been formalized at all, despite their increasing practical importance.

Phase II will create an experimental methodology for evaluating implementations of distributed trust schemes - or modifications of existing schemes, such as those focused on recovery - at large scales, under realistic connectivity (or intermittent connectivity) constraints. This methodology shall employ novel lightweight virtualization approaches to create simulation approaches that allow simulating relevant behaviors of up to hundreds of millions of nodes, with realistic link topologies and models. The new architectural approach to simulation shall faithfully emulate small relevant code segments of implementations under test, while aggressively aggregating non-relevant aspects of node and network behaviors.

These methodologies and simulation tools will help pose and answer operational questions about distributed trust, including introduction of new features into PKIs and KMIs, and allow creation of meaningful operational benchmarks for trust engineering. For example, they will create the capability to experimentally test in simulation whether a trust scheme is likely to perform a given mix of operations on a given scale, under given connectivity constraints, and to pose challenges for cryptographic engineering in terms of such scale benchmarks.

The methodology shall enable the study of principled loss-of-trust recovery methods based on distributed graph algorithms, such as trust path manipulations generalizing the ad hoc Firefox recovery example. Furthermore, the methodology will allow exploration of scenarios that involve migration of the root-of-trust, which become increasingly important with the ageing of IoT roots of trust, and threats of wide-

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spread compromises of trusted boot chains (cf. [3]). Finally, a principled simulation framework will enable not only stochastic simulation experiments but, with modifications, will support sound reasoning about protocol properties under probabilistic network models.

EPiC EagLe will leverage formal reasoning, simulation, and modern cryptographic primitives to develop the first of its kind PKI frameworks that can recover from emergent loss of trust events. Successful offerors in their proposals will demonstrate a strong understanding of the technology area and they will articulate a compelling necessity for S&T funding to support their respective proposed technology approaches over existing capabilities.

Schedule/Milestones/Deliverables Phase II fixed payable milestones for this program shall include:

- Month 2: New Capabilities Report, that identifies additions and modifications that will be researched, developed, and customized for incorporation in the pilot demonstration.
- Month 4: PI meeting presentation material, including demonstration of progress to date, PowerPoint presentations of accomplishments and plans.
- Month 6: Demonstration Plan that identifies schedule, location, computing resources, and any other requirements for the pilot demonstration.
- Month 9: Initial demonstration of stand-alone pilot application to DARPA; identification of military transition partner(s) and other interested DoD organizations
- Month 12: PI meeting presentation material, including demonstration of progress to date, PowerPoint presentations of accomplishments and plans.
- Month 15: Demonstration to military transition partners (s) and other DoD organizations.
- Month 18: PI meeting presentation material, including demonstration of progress to date, PowerPoint presentations of accomplishments and plans.
- Month 21: PI meeting presentation material, including demonstration of progress to date, PowerPoint presentations of accomplishments and plans.
- Month 24: Final software and/or hardware delivery, both object and source code, for operation by DARPA or other Government personnel for additional demonstrations, with suitable documentation in a contractor proposed format. Deliver a Final Report, including quantitative metrics on decision making benefits, costs, risks, and schedule for implementation of a full prototype capability based on the pilot demonstration, along with the novel designs of PKIs and KMIs for networks with special link, bandwidth, and latency requirements and constraints. This report shall include an identification of estimated level of effort to integrate the pilot capability into an operational environment, addressing computing infrastructure and environment, decision making processes, real-time and archival data sources, maintenance and updating needs; reliability, sensitivity, and uncertainty quantification; and transferability to other military users and problems. The report shall also document any scientific advances that have been achieved under the program. (A brief statement of claims supplemented by publication material will meet this requirement.) Provide Final PI meeting presentation material.

Phase II Option: The option shall address preliminary steps toward the certification, accreditation and/or verification of the resulting base effort's sound experimental methodologies and operational benchmarks for evaluating distributed trust solutions. Proposed solutions shall include a summary of how the methodologies are likely to succeed on DoD and IoT scales and under link, bandwidth, and latency constraints specific to DoD environments and missions.

Schedule/Milestones/Deliverables for Phase II Option: Phase II fixed payable milestones for this program option shall include:

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- Month 2: Plan that identifies the schedule, location, computing resources and/or any other requirements for the experimental methodologies and operational benchmarks and infrastructure for evaluating distributed trust solutions required for transition to the DoD.
- Month 4: Presentation on the detailed software and hardware plan for the technical capability.
- Month 7: Interim report on progress toward certification, accreditation and/or verification of the technical capability for DoD use.
- Month 10: Review and/or demonstration of the prototype capability with the documentation supporting certification, accreditation and/or verification.
- Month 12: Final Phase II option report summarizing the certification, accreditation and/or verification approach, architecture and algorithms; data sets; results; performance characterization and quantification of robustness.

PHASE III DUAL USE APPLICATIONS: The DoD and the commercial world have similar challenges with respect to maintaining the cyber integrity of their computing and communications infrastructure. The Phase III effort will see the developed methodology and testbed transitioned into a DoD cyber environment capable of testing large-scale software deployments (including distributed trust software) in simulations consisting of virtual machines (VMs), up to tens of thousands of emulated nodes. Government ranges and commercial systems such as national telecom providers, major cloud computing services, and critical transportation systems have similar challenges in their PKI and KMI infrastructures and face severe scaling challenges for IoT and IoT-like battlespace uses. Thus, the resulting methodology and operational benchmarks are directly transitionable to both the DoD and the commercial sectors: military and commercial air, sea, space and ground communication systems; commercial hardening of critical industrial plant (i.e. control systems, manufacturing lines, chemical processes, etc.) through PKI and KMI infrastructures; securing cloud infrastructure associated with optimization of industrial processes and condition-based maintenance of air, sea, space and ground networked communication systems.

As part of Phase III, the developed capability should be transitioned into an enterprise level system that can be used to test large-scale software deployments (including distributed trust software) in simulations consisting of virtual machines (VMs), up to tens of thousands of emulated nodes. The resulting capability is directly transitionable to the Army, the Air Force, the Navy, and the National Security Agency for experimenting with Research & Development (R&D) concepts of Tactical Certificate Authorities (CAs) that employ flexible policies, extensions, and protocols for battlefield use. This is a dual-use technology that applies to both military and commercial software environments affected by cyber adversaries.

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KEYWORDS: Battlespace Environments, Information Systems Technology, Public Key Infrastructures

**Defense Advanced Research Projects Agency (DARPA)
DoD 23.4 Small Business Innovation Research (SBIR) Annual BAA
Proposal Submission Instructions Release 7**

INTRODUCTION

To achieve DARPA’s mission to create technological surprise, the agency makes strategic, early investments in science and technology that will have long-term positive impacts on our national security. The pace of discovery in both science and technology is accelerating worldwide, resulting in new fields of study and the identification of scientific areas ripe for small business utilization through the SBIR and STTR programs. Small businesses are critical for developing technology to support national security. Proposers are encouraged to consider whether the R/R&D being proposed to DoD Components also has private sector potential, either for the proposed application or as a base for other applications. The topics below focus on technical domains important to DARPA’s mission pursuing innovative research concepts that fall within one of its technology offices. More information about DARPA’s technical domains and research topics of interest may be found at: <http://www.darpa.mil/about-us/offices>.

Proposers responding to a topic in this BAA must follow all general instructions provided in the Department of Defense (DoD) SBIR Program BAA. DARPA requirements in addition to or deviating from the DoD Program BAA are provided in the instructions below.

Proposers are encouraged to thoroughly review the DoD Program BAA and register for the DSIP Listserv to remain apprised of important programmatic and contractual changes.

- The DoD Program BAA is located at: <https://www.defensesbirsttr.mil/SBIR-STTR/Opportunities/#announcements>. Be sure to select the tab for the appropriate BAA cycle.
- Register for the DSIP Listserv at: <https://www.dodsbirsttr.mil/submissions/login>.

Specific questions pertaining to the administration of the DARPA Program and these proposal preparation instructions should be directed to: DARPA Small Business Programs Office at SBIR_BAA@darpa.mil. DSIP Topic Q&A will NOT be available for these DARPA topics. Technical questions related to improving the understanding of a topic’s requirements must be submitted to SBIR_BAA@darpa.mil by the deadline listed below.

The following dates apply to this DARPA Topic release:

- May 23, 2023:** Topic issued for pre-release
- June 07, 2023:** Topic opens; DARPA begins accepting proposals via DSIP
- July 03, 2023:** Deadline for technical question submission
- July 11, 2023:** Deadline for receipt of proposals no later than **12:00 pm ET**

DIRECT TO PHASE II PROPOSAL GUIDELINES

Proposers should refer to the DARPA Direct to Phase II SBIR XL Proposal Instructions, provided in Appendix A.

Current Release Award Structure by Topic

| Topics | Period of Performance | Amount |
|-----------------------------------|------------------------------|---------------|
| HR0011SB20234XL-03 Subtopic 1* | Base: 6-months | \$ 1,500,000 |
| | Option 1: 6-months | \$ 1,000,000 |

| | | | |
|-----------------------------------|--------------------|----|-----------|
| | Option 2: 6 months | \$ | 500,000 |
| HR0011SB20234XL-03 Subtopic 2* | Base: 6-months | \$ | 1,500,000 |
| | Option 1: 6-months | \$ | 1,000,000 |
| | Option 2: 6 months | \$ | 500,000 |

*For sub-topic 1 DARPA will accept DP2 proposals with a total maximum cost/price of \$4,000,000. This maximum cost/price includes a 6-month base period not to exceed \$1,500,000, a 6-month Option of \$1,000,000, and a second 6-month Option minimum of \$500,000. The base period and the minimum funding for the Options (if exercised) are funded entirely by DARPA. Additionally, if the second Option is exercised, DARPA is encouraging the performer to arrange additional program funding with a commercial or government (non-DARPA) partner of up to \$500,000. Any proposed non-DARPA funding agreement must be written, signed, and received by DARPA 60 calendar days before the last day of the period of performance of the base period to permit DARPA sufficient time to access as part of the determination to award the Option effort. DARPA will match up to \$500,000 of non-DARPA funds under a written, signed, and timely submitted agreement. Securing a non-DARPA funding agreement does not obligate DARPA to exercise the Option effort, nor will the lack of a written funding agreement prevent the performer from receiving an Option. DARPA will make option award decisions based on performance and funding availability.

For sub-topic 2 DARPA will accept DP2 proposals with a total maximum cost/price of \$4,000,000. This maximum cost/price includes a 6-month base period not to exceed \$1,500,000, a 6-month Option of \$1,000,000, and a second 6-month Option minimum of \$500,000. The base period and the minimum funding for the Option (if exercised) are funded entirely by DARPA. Additionally, if the second Option is exercised, DARPA is encouraging the performer to arrange additional program funding with a commercial or government (non-DARPA) partner of up to \$500,000. Any proposed non-DARPA funding agreement must be written, signed, and received by DARPA 60 calendar days before the last day of the period of performance of the base period to permit DARPA sufficient time to access as part of the determination to award the Option effort. DARPA will match up to \$500,000 of non-DARPA funds under a written, signed, and timely submitted agreement. Securing a non-DARPA funding agreement does not obligate DARPA to exercise the Option effort, nor will the lack of a written funding agreement prevent the performer from receiving an Option. DARPA will make option award decisions based on performance and funding availability.

Note that the information in the chart above includes matching funds for Option 2; firms may obtain matching funding at any time during performance of the effort.

Note: Please see Appendix A, section III (d) for complete instructions on the White Paper/Slide Deck technical volume format.

Content of the Technical Volume

Proposers should refer to the DARPA DP2 Proposal Instructions, provided in Appendix A and on the DARPA Small Business site (<https://www.darpa.mil/work-with-us/for-small-businesses/participate-sbir-sttr-program>).

Cost Volume (Volume 3)

Please see the chart above for award amounts listed by topic. Proposers are required to use the Direct to Phase II – Volume 3: Cost Proposal Template (Excel Spreadsheet) provided on the

DARPA Small Business site (<https://www.darpa.mil/work-with-us/for-small-businesses/participate-sbir-sttr-program>). Subcontractors may also submit unsanitized costs using this template directly to DARPA at SBIR-BAA@darpa.mil.

Please review the updated Percentage of Work (POW) calculation details included in the DoD Program BAA. DARPA will occasionally accept deviations from the POW requirements with a letter of explanation or approval from the Funding Agreement officer.

Company Commercialization Report (CCR) (Volume 4)

Completion of the CCR as Volume 4 of the proposal submission in DSIP is required. Please refer to the DoD SBIR Program BAA for full details on this requirement. Information contained in the CCR will not be considered by DARPA during proposal evaluations.

Supporting Documents (Volume 5)

In addition to the documents required by DoD, small businesses may also submit additional documentation to support the Technical Volume (Volume 2) and the Cost Volume (Volume 3) in Volume 5. Firms should fill out and upload the DARPA SBIR XL Milestones Template found on the DARPA Small Business website under SBIR/STTR BAA FORMS & TEMPLATES at <https://www.darpa.mil/work-with-us/for-small-businesses/participate-sbir-sttr-program>.

DISCRETIONARY TECHNICAL AND BUSINESS ASSISTANCE (TABA)

DARPA does not offer TABA funding.

EVALUATION AND SELECTION

All proposals will be evaluated in accordance with the evaluation criteria listed in the DoD SBIR 2023.4 BAA. DARPA will conduct an evaluation of each conforming proposal. Proposals that do not comply with the requirements detailed in this BAA and the research objective(s) of the corresponding topic are considered non-conforming and therefore are not evaluated nor considered for award.

Using the evaluation criteria, the Government will evaluate each proposal in its entirety, documenting the strengths and weaknesses relative to each evaluation criterion, and, based on these identified strengths and weaknesses, determine the proposal's overall selectability. Proposals will not be evaluated against each other during the evaluation process, but rather evaluated on their own individual merit to determine how well the proposal meets the criteria stated in this BAA and the corresponding DARPA topic.

Awards will be made to proposers whose proposals are determined to be the most advantageous to the Government, consistent with instructions and evaluation criteria specified in the DoD SBIR 2023.4 BAA and availability of funding. Given the limited funding available for each topic released, not all proposals considered selectable will be selected for funding.

For the purposes of this proposal evaluation process, a selectable proposal is defined as follows:

Selectable: A selectable proposal is a proposal that has been evaluated by the Government against the evaluation criteria listed in the DoD SBIR 2023.4 BAA and DARPA topic, and the strengths of the overall proposal outweighs its weaknesses. Additionally, there are no accumulated weaknesses that would require extensive negotiations and/or a resubmitted proposal.

For the purposes of this proposal evaluation process, a non-selectable proposal is defined as follows:

Non-Selectable: A proposal is considered non-selectable when the proposal has been evaluated by the Government against the evaluation criteria listed in the DoD SBIR 2023.4 BAA and DARPA topic, and the strengths of the overall proposal do not outweigh its weaknesses.

Proposing firms will be notified of selection or non-selection status for a Phase I award within 90 days of the closing date of the DoD SBIR 2023.4 BAA. It is the policy of DARPA to treat all proposals as source selection information and to disclose their contents only for the purpose of evaluation. Restrictive notices notwithstanding, during the evaluation process, submissions may be handled by support contractors for administrative purposes and/or to assist with technical evaluation. All DARPA support contractors are expressly prohibited from performing DARPA-sponsored technical research and are bound by appropriate nondisclosure agreements. Input on technical aspects of the proposals may be solicited by DARPA from other Government and/or non-Government consultants/experts who are strictly bound by the appropriate non-disclosure requirements. No submissions will be returned. Upon completion of the evaluation and selection process, an electronic copy of each proposal received will be retained at DARPA.

Proposal titles, abstracts, anticipated benefits, and keywords of proposals that are selected for contract award will undergo a DARPA Policy and Security Review. Proposal titles, abstracts, anticipated benefits, and keywords are subject to revision and/or redaction by DARPA. Final approved versions of proposal titles, abstracts, anticipated benefits, and keywords may appear on the DoD SBIR/STTR awards website and/or the SBA's SBIR/STTR award website (<https://www.sbir.gov/sbirsearch/award/all>).

Refer to the DoD SBIR 2023.4 Program BAA for procedures to protest the Announcement. As further prescribed in FAR 33.106(b), FAR 52.233-3, Protests regarding the selection decision should be submitted to:

DARPA
Contracts Management Office (CMO)
675 N. Randolph Street
Arlington, VA 22203
E-mail: scott.ulrey@darpa.mil and sbir@darpa.mil

AWARD AND CONTRACT INFORMATION

1. General Award Information

Multiple awards are anticipated. DARPA may award FAR-based government contracts (Firm- Fixed Price or Cost-Plus Reimbursement) or Other Transactions for Prototypes agreement (under the authority of 10 U.S.C. § 4022) subject to approval of the Contracting Officer. The amount of resources made available for each topic issued under this BAA will depend on the quality of the proposals received and the availability of funds.

Majority Ownership in Part. Proposers that are more than 50% owned by multiple venture capital operating companies (VCOC), hedge funds (HF), private equity firms (PEF), or any combination of these as set forth in 13 C.F.R. § 121.702, are eligible to submit proposals in response to DARPA topics advertised within this BAA.

For proposers that are a member of this ownership class the following must be satisfied for proposals to be accepted and evaluated:

- a. Prior to submitting a proposal, firms must register with the SBA Company Registry Database.
- b. The proposer within its submission must submit the Majority-Owned VCOC, HF, and PEF Certification. A copy of the SBIR VC Certification can be found on

<https://www.darpa.mil/work-with-us/for-small-businesses/participate-sbir-sttr-program>, under SBIR/STTR BAA Forms. Include the SBIR VC Certification in the Supporting Documents (Volume 5).

c. Should a proposer become a member of this ownership class after submitting its proposal and prior to any receipt of a funding agreement, the proposer must immediately notify the Contracting Officer, register in the appropriate SBA database, and submit the required certification which can be found under SBIR/STTR BAA Forms and Templates on <https://www.darpa.mil/work-with-us/for-small-businesses/participate-sbir-sttr-program>.

The Government reserves the right to select for negotiation all, some, one, or none of the proposals received in response to this announcement and to make awards with or without communications with proposers. Additionally, the Government reserves the right to award all, some, one, or none of the options on the contract(s)/agreement(s) of the performers based on available funding and technical performance. If warranted, portions of resulting awards may be segregated into pre-priced options. Additionally, DARPA reserves the right to accept proposals in their entirety or to select only portions of proposals for award. In the event that DARPA desires to award only portions of a proposal, negotiations may be opened with that proposer. The Government reserves the right to fund proposals in phases with options for continued work, as applicable.

The Government reserves the right to request any additional, necessary documentation once it makes the award instrument determination. The Government reserves the right to remove a proposal from award consideration should the parties fail to reach agreement on award terms, conditions, and price within a reasonable time, and/or the proposer fails to provide requested additional information within three business days.

In all cases, the Government Contracting Officer reserves the right to select award instrument type, regardless of instrument type proposed, and to negotiate all instrument terms and conditions with selectees. DARPA will apply publication or other restrictions, as necessary, if it determines that the research resulting from the proposed effort will present a high likelihood of disclosing performance characteristics of military systems or manufacturing technologies that are unique and critical to defense. Any award resulting from such a determination will include a requirement for DARPA permission before publishing any information or results on the program. For more information on publication restrictions, see the DoD SBIR 2023.4 BAA.

Because of the desire to streamline the award negotiation and program execution process, proposals identified for negotiation will result in negotiating a type of instrument for award that is in the best interest of the Government. In the case of an OT for Prototype agreement under DARPA's authority to award OTs for prototype projects, 10 U.S.C. § 4022, use of an OT provides significant opportunities for flexible execution to assist in meeting DARPA's aggressive SBIR/STTR program goals.

All proposers that wish to consider an OT award should carefully read the following:

The flexibility of the OT award instrument is beneficial to the program because the Performer will be able to apply its best practices as required to carry out the research project that may be outside of the Federal Acquisition Regulation (FAR) process-driven requirements. Streamlined practices will be used, such as milestone-driven performance, intended to reduce time and effort on award administration tasks and permit performers to focus on the research effort and rapid prototyping. Because of this ability, OTs provide the Agreements Officer the flexibility to create an award instrument that contains terms and conditions that promote commercial transition, reduce some administratively burdensome acquisition regulations, and meet SBIR/STTR program goals.

Proposers must only propose an OT agreement with fixed payable milestones. Fixed payable milestones are fixed payments based on successful completion of the milestone accomplishments agreed to in the milestone plan. Refer to the Other Transactions for Prototypes Fact Sheet and Other Transaction for Prototype Agreement, available at <https://www.darpa.mil/work-with-us/for-small-businesses/participate-sbir-sttr-program>. Specific milestones will be based upon the research objectives detailed in the topic.

Please see <https://www.darpa.mil/work-with-us/for-small-businesses/participate-sbir-sttr-program> for more information on OTs.

2. Transition and Commercialization Support Program (TCSP)

DARPA will provide services to Phase II or DP2 awardees upon contract execution through the Transition and Commercialization Support Program (TCSP) at no cost to awardees. The TCSP goal is to maximize the potential for SBIR/STTR companies to move their technology beyond Phase II and into other research and development programs for further maturity or into solutions or products for DoD acquisition programs, other Federal programs, and/or the commercial market. Please visit <https://www.darpa.mil/work-with-us/for-small-businesses/commercialization-continued> for more information on DARPA TCSP.

3. Embedded Entrepreneurship Initiative

Awardees of SBIR funding pursuant to this BAA may be eligible to participate in the DARPA Embedded Entrepreneurship Initiative (EEI) during the Period of Performance. Invitation to participate in EEI is at the sole discretion of the Government based on evaluation of technical and commercial factors and subject to program balance and the availability of funding. EEI is a limited scope program offered by DARPA, at DARPA's discretion, to a small subset of awardees. The goal of DARPA's EEI is to increase the likelihood that DARPA-funded technologies take root in the U.S. and provide new capabilities for national defense. EEI supports DARPA's mission "to make pivotal investments in breakthrough technologies and capabilities for national security" by accelerating the transition of innovations out of the lab and into new capabilities for the Department of Defense (DoD). EEI investment supports development of a robust and deliberate Go-to-Market strategy for selling technology product to the government and commercial markets and positions DARPA awardees to attract U.S. investment. The following is for informational and planning purposes only and does not constitute solicitation of proposals to the EEI.

There are three elements to DARPA's EEI: (1) A Senior Commercialization Advisor (SCA) from DARPA who works with the Program Manager (PM) to examine the business case for the awardee's technology and uses commercial methodologies to identify steps toward achieving a successful transition of technology to the government and commercial markets; (2) Connections to potential industry and investor partners via EEI's Investor Working Groups; and (3) Additional funding on an awardee's contract for the awardee to hire an embedded entrepreneur to achieve specific milestones in a Go-to-Market strategy for transitioning the technology to products that serve both defense and commercial markets. This embedded entrepreneur's qualifications should include business experience within the target industries of interest, experience in commercializing early stage technology, and the ability to communicate and interact with technical and non-technical stakeholders. Funding for EEI is typically no more than \$250,000 per awardee over the duration of the award. An awardee may apportion EEI funding to hire more than one embedded entrepreneur, if achieving the milestones requires different expertise that can be obtained without exceeding the awardee's total EEI funding. The EEI effort is intended to be conducted concurrent with the research program without extending the period of performance.

EEI Application Process:

After receiving an award under the solicitation, awardees interested in being considered for EEI should notify their DARPA Program Manager (PM) during the period of performance. Timing of such notification should ideally allow sufficient time for DARPA and the awardee to review the awardee's

initial transition plan, identify milestones to achieve under EEI, modify the award, and conduct the work required to achieve such milestones within the original award period of performance. These steps may take 9-18 months to complete, depending on the technology. If the DARPA PM determines that EEI could be of benefit to transition the technology to product(s) the Government needs, the PM will refer the performer to DARPA Commercial Strategy.

DARPA Commercial Strategy will then contact the performer, assess fitness for EEI, and in consultation with the DARPA technical office, determine whether to invite the performer to participate in the EEI. Factors that are considered in determining fitness for EEI include DoD/Government need for the technology; competitive approaches to enable a similar capability or product; risks and impact of the Government's being unable to access the technology from a sustainable source; Government and commercial markets for the technology; cost and affordability; manufacturability and scalability; supply chain requirements and barriers; regulatory requirements and timelines; Intellectual Property and Government Use Rights, and available funding.

Invitation to participate in EEI is at the sole discretion of DARPA and subject to program balance and the availability of funding. EEI participants' awards may be subsequently modified bilaterally to amend the Statement of Work to add negotiated EEI tasks, provide funding, and specify a milestone schedule which will include measurable steps necessary to build, refine, and execute a Go-to-Market technology transition plan aimed at delivering new capabilities for national defense. Milestone examples are available at: <https://www.darpa.mil/work-with-us/contract-management>.

Awardees under this solicitation are eligible to be considered for participation in EEI, but selection for award under this solicitation does not imply or guarantee participation in EEI.

For more information please refer to the EEI website <https://eei.darpa.mil/>.

4. DARPA Toolbox Initiative

DARPA Toolbox is an Agency-wide effort to provide open licensing opportunities with commercial technology vendors to the researchers behind DARPA programs. DARPA Toolbox provides easy, low-cost, scalable access to state-of-the-art tools and intellectual property (IP) under predictable legal terms and streamlined acquisition procedures. The goal is to reduce performer reliance on low-quality, low-cost tools and IP that increase execution risks and complicate post-DARPA transitions.

Through this initiative, DARPA performers are granted access to select vendor tools and technologies throughout the life of their contractual relationship with the Agency. The Toolbox suppliers bring to the table proven technologies commonly used in state-of-the-art commercial microelectronics or system design methodologies.

DARPA Toolbox program information and a full list of participating suppliers can be found at <https://www.darpa.mil/work-with-us/darpa-toolbox-initiative>. If there are tool or technologies of interest, contact the Supplier POC listed for the product, referencing the DARPA Toolbox Initiative. The Supplier POC will provide advice on products and pricing information. Include any non-production pricing quotes in your proposal. Products and pricing are between you and the suppliers – *do not* contact DARPA directly.

ADDITIONAL INFORMATION

DARPA intends to use electronic mail for all correspondence regarding these topics. Questions related to the technical aspect of the research objectives and awards specifically related to a topic should be emailed to SBIR_BAA@darpa.mil. Please reference the topic number in the subject line. All questions must be in English and must include the name, email address, and the telephone number of a point of contact.

DARPA will attempt to answer questions in a timely manner; however, questions submitted within seven (7) calendar days of the proposal due date listed herein may not be answered. DARPA will post a consolidated Frequently Asked Questions (FAQ) document. To access the posting please visit: <http://www.darpa.mil/work-with-us/opportunities>. Under the topic number summary, there will be a link to the FAQ. The FAQ will be updated on an ongoing basis until one week prior to the proposal due date.

Technical support for the Defense SBIR/STTR Innovation Portal (DSIP) is available Monday through Friday, 9:00 a.m. – 5:00 p.m. ET. Requests for technical support must be emailed to DoDSBIRSupport@reisystems.com with a copy to SBIR_BAA@darpa.mil.

APPENDIX A: DARPA DIRECT TO PHASE II (DP2) PROPOSAL INSTRUCTIONS

I. Introduction

A complete proposal submission consists of:

- Volume 1: Proposal Cover Sheet
- Volume 2: Technical Volume (feasibility documentation and technical proposal)
- Volume 3: Cost Volume
- Volume 4: Company Commercialization Report
- Volume 5: Supporting Documents
- Volume 6: Fraud, Waste and Abuse Training

The Defense SBIR/STTR Innovation Portal (DSIP) provides a structure for building the proposal volumes and submitting a consolidated proposal package. If this is your first time submitting an SBIR or STTR proposal using DSIP, please review detailed training guides at <https://www.dodsbirsttr.mil/submissions/learning-support/training-materials>. It is the responsibility of the proposing firm to ensure that a complete proposal package is certified and submitted by the close date listed in the topic to which they are responding.

To assist in proposal development, templates Volume 3: Cost Volume have been provided as attachments to the announcement posted at <https://www.darpa.mil/work-with-us/for-small-businesses/participate-sbir-sttr-program>. Use of this template is mandatory.

NOTE: All proposers are required to submit Volume 4: Company Commercialization Report (CCR).

II. Proprietary Information

Proposers that include in their proposals data that they do not want disclosed to the public for any purpose, or used by the Government except for evaluation purposes, shall follow instructions in section 4.5 regarding marking propriety proposal information.

III. DP2 Proposal Instructions

a. Proposal Cover Sheet (Volume 1)

The Cover Sheet must include a brief technical abstract of no more than 3000 characters that describes the proposed R&D project with a discussion of anticipated benefits and potential commercial applications. Do not include proprietary or classified information in the Proposal Cover Sheet. If your proposal is selected for award, the technical abstract and discussion of anticipated benefits may be publicly released.

b. Content of the Technical Volume (Volume 2) – White Paper & Slide Deck

White Paper (NTE 20 pages). Provide the following information:

Goals and Impact: Clearly describe what is being proposed and what difference it will make (qualitatively and quantitatively), including a brief discussion on how this directly relates to the topic.

1. Phase I Feasibility: This topic is accepting Direct to Phase II proposals ONLY. To be eligible, proposers must demonstrate that the feasibility requirements outlined in the topic have been met, and achieved outside of the SBIR program.

2. **Technical Plan:** Outline and address all technical areas and challenges inherent in the approach and possible solutions for overcoming potential problems. Provide specific objectives, metrics, and milestones at intermediate stages to demonstrate a plan for accomplishment of the project objectives. Propose additional appropriate qualitative and quantitative metrics specific to the approach, as needed. Intermediary milestones should occur at no greater than 1-month increments.
3. **Management and Capabilities:** Designate key personnel who will be involved in the Phase II effort. Provide a brief summary of expertise of the team, including subcontractors and key personnel. Describe the organizational experience in this technology area, previous work not directly related to the proposed effort but similar, existing intellectual property required to complete the project, and any specialized facilities to be used as part of the project. List Government-furnished materials or data assumed to be available. Describe any specialized facilities to be used as part of the project, the extent of access to these facilities, and any biological containment, biosafety, and certification requirements.
4. **Transition and Commercialization Plan (limit to 5 pages):**
 - a. Describe the commercial product or DoD system to be developed.
 - b. Discuss the potential end users – DoD, Federal, and/or private sector customers. Discuss your business model for this technology (i.e., how do you anticipate generating revenue with this technology?). Who are you selling to directly or indirectly, a supplier, an integrator, or an end user?
 - c. Describe your company’s funding history. Discuss how much additional funding above this proposed effort (include additional required technology development, staffing requirements, infrastructure requirements, IP strategy costs, etc.) that will be required to bring this technology to market and how you anticipate going about getting that funding (e.g., Govt S&T contracts, investment).
 - d. Describe the timeline to maturity for sales or transition to an end user. Describe your IP strategy.
 - e. Describe the technology, market, team and business risks associated with this proposed effort and your plan to mitigate these risks.

Slide Deck (NTE 15 slides). Provide the following information (convert the completed deck to a pdf and attach it to the white paper):

1. What are you trying to do and how does this directly relate to the topic?
2. **Technology and commercial product:** Specifically, what are you proposing to produce – software, system, application? Be specific on what your proposed technology development is targeting as an end state.
3. How is the technology approached today? Who is doing the research, development and delivering products/services? What are the current limitations in the technology and commercial marketplaces?
4. **Technical and commercial value proposition:** How have you substantiated the feasibility of your approach? What is innovative in your approach and how does it compare to the state-of-the-art? Why do you think it will be successful both from a technical and commercial perspective? If you are successful what difference will it make? Discuss your proposed business model – how do you expect to generate revenue from your technology?

5. Technical and commercial risks: What are the key technical and commercial challenges and how do you plan to address/overcome these?
6. Technical and commercial market analysis: Who will care and what will the impact be if you are successful? What/who are the markets/industries/integrators/stakeholders that would/should care?
7. Cost, schedule and milestones: Provide a summary of your cost volume. Provide a summary of your schedule and milestones. How much will your proposed effort cost in total? How long will it take? What are your technical milestones for achieving the proposed efforts? What are your transition and commercialization plan milestones? Discuss how much funding will be required to bring your proposed technology to market and execute on your proposed transition and commercialization plan. Include any funding raised to date and expected plans for raising any additional required funding (government contracting revenue, product sales, internal R&D investment, loan, angel or Venture Capital investment, etc.). Describe timeline to maturity for operational use or commercial sales.
8. Management: Overview of team, facilities and qualifications.
9. Technical summary quad chart: Use template provided at <https://www.darpa.mil/work-with-us/for-small-businesses/participate-sbir-sttr-program>.
10. Commercialization summary quad chart: Use the DARPA Transition and Commercialization Strategy Plan (TCSP) template, located at <https://www.darpa.mil/work-with-us/for-small-businesses/commercialization-continued>.

NOTE: All letters of recommendation and CVs can be loaded in Volume 5: Supporting Documents.

c. Format of Cost Volume (Volume 3)

Proposers are required to use the Direct to Phase II – Volume 3: Cost Proposal Template (Excel Spreadsheet) provided as an attachment to this announcement. The Cost Volume (and supporting documentation) DOES NOT count toward the page limit of the Technical Volume.

d. Content of the Cost Volume (Volume 3)

Some items in the Cost Breakdown Guidance below may not apply to the proposed project. If such is the case, there is no need to provide information on each and every item.

ALL proposed costs should be accompanied by documentation to substantiate how the cost was derived. For example, if you proposed travel cost to attend a project-related meeting or conference, and used a travel website to compare flight costs, include a screen shot of the comparison. Similarly, if you proposed to purchase materials or equipment, and used the internet to search for the best source, include your market research for those items. You do not necessarily have to propose the cheapest item or supplier, but you should explain your decision to choose one item or supplier over another. It's important to provide enough information to allow contracting personnel to understand how the proposer plans to use the requested funds. If selected for award, failure to include the documentation with your proposal will delay contract negotiation, and the proposer will be asked to submit the necessary documentation to the Contracting Officer to substantiate costs (e.g., cost estimates for equipment, materials, and consultants or subcontractors). It is important to respond as quickly as possible to the Contracting Officer's request for documentation.

Cost Breakdown Guidance:

1. List all key personnel by name as well as by number of hours dedicated to the project as direct labor. Special tooling and test equipment and material cost may be included. The inclusion of equipment and material will be carefully reviewed relative to need and appropriateness for the work proposed. The purchase of special tooling and test equipment must, in the opinion of the Contracting Officer, be advantageous to the Government and should be related directly to the specific topic. These may include such items as innovative instrumentation and/or automatic test equipment. Title to property furnished by the Government or acquired with Government funds will be vested with DARPA; unless it is determined that transfer of title to the contractor would be more cost effective than recovery of the equipment by the DARPA.
2. Cost for travel funds must be justified and related to the needs of the project.
3. Cost sharing is permitted for proposals under this announcement; however, cost sharing is not required nor will it be an evaluation factor in the consideration of a proposal.
4. All subcontractor costs and consultant costs must be detailed at the same level as prime contractor costs in regard to labor, travel, equipment, etc. Provide detailed substantiation of subcontractor costs in your cost proposal. Enter this information in the Explanatory Material section of the on-line cost proposal form. The Supporting Documents Volume (Volume 5) may be used if additional space is needed.

For more information about cost proposals and accounting standards, see the DCAA publication titled “Audit Process Overview – Information for Contractors” available at: <http://www.dcaa.mil>.

e. Company Commercialization Report (Volume 4)

The Company Commercialization Report (CCR) allows companies to report funding outcomes resulting from prior SBIR and STTR awards. The Company Commercialization Report (CCR) is required for Phase I and Direct to Phase II proposals. Please refer to the DoD STTR Program BAA for full details on this requirement. Information contained in the CCR will not be considered by DARPA during proposal evaluations.

f. Supporting Documents (Volume 5)

In addition to required DoD documentation and certifications, small businesses may also submit additional documentation to support the Technical Volume (Volume 2) and the Cost Volume (Volume 3) in Volume 5. Firms should fill out and upload the DARPA SBIR XL Milestones Template found on the DARPA Small Business website under SBIR/STTR BAA FORMS & TEMPLATES at <https://www.darpa.mil/work-with-us/for-small-businesses/participate-sbir-sttr-program>.

g. Fraud Waste and Abuse (Volume 6)

The Fraud, Waste and Abuse (FWA) training is required for Phase I and Direct to Phase II proposals. FWA training provides information on what represents FWA in the SBIR/STTR program, the most common mistakes that lead to FWA, as well as the penalties and ways to prevent FWA in your firm. This training material must be thoroughly reviewed once per year. Plan ahead and leave ample time to complete this training based on the proposal submission deadline. Knowingly and willfully making any false, fictitious, or fraudulent statements or representations may be a felony under the Federal Criminal False Statement Act (18 U.S.C. Sec 1001), punishable by a fine of up to \$10,000, up to five years in prison, or both. Understanding the indicators and types of fraud, waste, and abuse that can occur is critical for the SBIR/STTR awardees’ role in preventing the loss of research dollars.

DARPA SBIR 23.4 Topic Index
Release 7

HR0011SB20234XL-03

Bright ELectron and Light Sources (BELLS) - SBIR XL

OUSD (R&E) CRITICAL TECHNOLOGY AREA(S): Biomedical

OBJECTIVE: The goal of BELLS is to demonstrate and commercialize practical sources of intense, tunable electrons and monochromatic hard x-rays. These sources would support transformative capabilities for applications such as non-destructive inspection, medical diagnostics, and treatments.

DESCRIPTION: BELLS will develop compact sources of monoenergetic electrons and photons suitable for demonstrating a range of transformative medical and non-destructive inspection applications with the overall goal of defining a minimum viable product (MVP) for commercialization. BELLS contains two subtopics that will be executed in parallel. Subtopic 1 focuses on maturing existing laboratory scale systems to demonstrate application feasibility and further productization. Subtopic 2 seeks to mature specific component technologies to be integrated into Subtopic 1 laboratory-scale systems that provide brightness enhancements enabling additional applications and productization opportunities.

Subtopic 1: Demonstration and Productization. High-quality electron and photon sources are of broad interest for a range of security, industrial, and medical applications. Recent advances in photoinjectors[1], linear accelerators[2], high power lasers[3], and a range of ancillary technologies have resulted in several prototype systems that provide novel, compact testbeds for investigating these applications. However, further maturation and demonstration of these technologies is needed to realize systems with commercialization potential. The purpose of this subtopic is to mature testbed system(s) demonstrating one or more applications and to define minimum viable commercial product(s).

High-quality electrons produced from photoinjectors and linear accelerators offer utility by themselves as well as the ability to produce bright monoenergetic x-rays through laser-Compton interactions[4]. Controlling the accelerator power allows the energy of electrons and x-rays to be tuned. For x-rays, it is possible to achieve synchrotron-like performance while achieving higher energies (100s of keV to MeV energies) in highly compact form factors.

Very high-energy electron beams (100s of MeV) and bright light sources enable a range of applications including, but not limited to:

- Medical imaging, including phase contrast
- Medical radiotherapy, including FLASH and theranostics
- Nondestructive test and evaluation, including high resolution tomography and semiconductor metrology.

The effort will not just explore the technical applications of these sources, but also the business cases, economic impacts, and regulatory requirements for such technologies to be broadly employed. These studies will support jump-starting medical and industrial activity in this sector, leading to commercially viable system designs.

Subtopic 2: Brightness Enhancements. Application performance can often be improved with increased source brightness, i.e. intensity and purity. This subtopic seeks to enhance the testbed(s)/prototype(s) of Subtopic 1 by advancing and integrating new component technology. Examples of such technology could include improvements in laser systems, electron systems, spot size reduction strategies, Fabry-Perot cavities, pulse stacking, and pulse recirculation.

PHASE I: BELLS is a direct to Phase II SBIR XL program only; there is no Phase I. Proposers must provide experimental evidence of their approach concept commensurate to a Phase I effort that achieves significant performance. Specifically, proposers must provide evidence of existing performance in the three technology areas described below:

- Photoinjector
 - o C-band or higher frequency
 - o Support microamp or greater average currents
 - o Support micropulse structures at RF frequencies at macro system repetition rates of 100 Hz or greater
 - o > 10 pC of charge produced per incident laser pulse
 - o Support electron energy of 5 MeV or greater
 - o Normalized emittance of 1 μm or better
- Electron accelerator
 - o C-band or higher frequency
 - o Acceleration gradients 50 MV/m or greater
 - o Support electron energy of 50 MeV or greater
 - o Support 10 micron or smaller laser-Compton interaction spot sizes
- Interaction laser
 - o Support 10 micron or smaller laser-Compton interaction spot sizes
 - o Sufficient energy to support laser-Compton applications generating > 30 keV photons

PHASE II: Subtopic 1: Demonstrations and Productization

Proposers must apply to Subtopic 1 to be eligible to apply to Subtopic 2. Subtopic 2 will run concurrently with Subtopic 1.

The purpose of this subtopic is to mature existing laboratory scale systems into platforms demonstrating one or more applications, and defining a minimum viable commercial product for supporting those applications.

Proposers must clearly and quantitatively describe the existing laboratory system that can support laser-Compton x-ray generation. This includes key subsystems such as photoinjector, linear electron accelerator, interaction laser, and precision subsystem synchronization.

Proposers must also choose at least one application (preferably more) and describe in detail how the existing laboratory scale system can be used to develop and mature a testbed enabling productization. This must include both a technical description and an economic analysis supporting commercial viability of the approach. This analysis must also include participation by one or more relevant stakeholders able to employ this product for the described application(s).

In addition, the system must support the performance metrics in the table below for photon production.

| | Parameter | Threshold | Objective |
|------------------|-----------------------|------------------|------------------|
| Intensity | Intensity (photons/s) | > 10^9 | > 10^{10} |
| | Repetition Rate (Hz) | > 100 | > 1000 |
| Energy | Minimum (keV) | > 100 | > 300 |
| Purity | Bandwidth (dE/E) | < 10% | < 0.1% |

Here, “threshold” indicates the minimum acceptable performance levels while “objective” levels are highly desired.

The base period will focus on completing a BELLS testbed capable of producing relevant levels of electrons and laser-Compton photons for the chosen application(s). Performers will conduct outreach to customers, stakeholders, industrial partners, and regulators to engage in testbed use.

Option period 1 will focus on testbed demonstration and characterization activities, and develop system requirements for a minimum viable product. System characterization supporting the laser-Compton performance metrics above is expected. Option period 2 continues testbed activities while further developing the minimum viable product through a critical design review. Active participation of customers, stakeholders, industrial partners, and regulators (as appropriate) is required throughout both option periods.

Base period (6 months) milestones:

- Month 1: Kickoff slide deck summarizing technical approach to meet overall goals, risks, and risk mitigations, and quantified milestone schedule
- Month 3: Testbed build interim report
- Month 6: Testbed build final report

Option period 1 (6 months) milestones:

- Month 1: Testbed demonstration kickoff materials, with stakeholder participation
- Month 3: Testbed characterization report
- Month 6: Testbed demonstration interim report, MVP system requirements review report

Option period 2 (6 months) milestones:

- Month 1: Testbed stakeholder engagement and transition report
- Month 3: MVP preliminary design review report
- Month 6: Testbed demonstration final report, MVP critical design review report

Monthly written technical progress reports will supplement the above milestones (see template under SBIR/STTR BAA DOCUMENTS at <https://www.darpa.mil/work-with-us/for-small-businesses/participate-sbir-sttr-program>).

Subtopic 2: Brightness Enhancements

Proposers can propose to Subtopic 2 within their Subtopic 1 proposal.

This subtopic seeks to enhance the testbed(s) of subtopic 1 by advancing and integrating component technology – specifically, laser-Compton performance to improve brightness, supporting commercially-relevant applications.

Proposers must clearly describe the new component technology and anticipated testbed performance increases. Increases in performance must enable an additional application or improve the commercial prospects of the minimum viable product.

Development timelines must align to integration into the testbed by the end of the option period 1. The Base period will focus on developing component technology to enhance brightness. During the option period 1, components will be refined and integrated into the testbed. During the option period 2, the enhanced testbed will be tested to verify performance, assess improvements in testbed capabilities, and enable further minimum viable product definition.

Base period (6 months) milestones:

- Month 1: Kickoff slide deck summarizing technical approach to meet overall goals, risks, and risk mitigations, and quantified milestone schedule
- Month 3: Testbed enhancement preliminary design review report
- Month 6: Testbed enhancement critical design review report

Option period 1 (6 months) milestones:

- Month 1: Testbed enhancement integration readiness report
- Month 3: Testbed enhancement interim report
- Month 6: Testbed enhancement final report

Option period 2 (6 months) milestones:

- Month 1: Enhanced testbed stakeholder engagement and transition report
- Month 3: Enhanced testbed characterization report
- Month 6: Final system performance report

Monthly written technical progress reports will supplement the above milestones (see template under SBIR/STTR BAA DOCUMENTS at <https://www.darpa.mil/work-with-us/for-small-businesses/participate-sbir-sttr-program>).

PHASE III DUAL USE APPLICATIONS: The successful development of such electron and x-ray sources supports a range of medical and non-destructive inspection applications. These include microbeam radiation diagnostic procedures, FLASH e-beam/x-ray radiotherapy, and innovations in theranostics. These sources would also be of high interest to the semiconductor industry for nanometrology and in-line inspection at semiconductor foundries, to include fraud detection.

Successful proposals for this SBIR offering must make significant arguments supporting the commercial viability of their approach. Hence, proposals must provide initial evidence that their laboratory scale systems have sufficient technical maturity and performance characteristics that would support economically viable applications with development into a minimally viable product. Proposals for Subtopic 2 must make arguments that the proposed enhancement(s) could significantly advance the economics of productization of their system concepts. Transition and commercialization (T-C) milestones have been added as part of the option periods to aid in assuring commercial viability

REFERENCES:

1. Performance of a second generation X-band rf photoinjector, Marsh et al., Phys. Rev. Accel. Beams 21, 073401, 2018
2. Design and demonstration of a distributed-coupling linear accelerator structure, Tantawi et al., Phys. Rev. Accel. Beams 23, 092001, 2020
3. 1 kHz repetition rate 1.1 J picosecond laser, Wang et al., Laser Congress AM2A.4, 2021
4. Photon flux and spectrum of γ -rays Compton sources, V. Petrillo et al., Nucl. Instrum. Methods Phys. Res A, 693, 109-116, 2012

KEYWORDS: Monochromatic hard x-rays, tunable electrons.

**Defense Advanced Research Projects Agency (DARPA)
DoD 23.4 Small Business Innovation Research (SBIR) Annual BAA
Release 8 - Open Topic Proposal Submission Instructions**

INTRODUCTION

To achieve DARPA's mission to create technological surprise, the agency makes strategic, early investments in science and technology that will have long-term positive impacts on our national security. The pace of discovery in both science and technology is accelerating worldwide, resulting in new fields of study and the identification of scientific areas ripe for small business utilization through the SBIR and STTR programs. Small businesses are critical for developing technology to support national security. Proposers are encouraged to consider whether the R/R&D being proposed to DoD Components also has private sector potential, either for the proposed application or as a base for other applications. The topics below focus on technical domains important to DARPA's mission pursuing innovative research concepts that fall within one of its technology offices. More information about DARPA's technical domains and research topics of interest may be found at: <http://www.darpa.mil/about-us/offices>.

Proposers responding to a topic in this BAA must follow all general instructions provided in the Department of Defense (DoD) SBIR Program BAA. DARPA requirements in addition to or deviating from the DoD Program BAA are provided in the instructions below.

Proposers are encouraged to thoroughly review the DoD Program BAA and register for the DSIP Listserv to remain apprised of important programmatic and contractual changes.

- The DoD Program BAA is located at: <https://www.defensesbirsttr.mil/SBIR-STTR/Opportunities/#announcements>. Be sure to select the tab for the appropriate BAA cycle.
- Register for the DSIP Listserv at: <https://www.dodsirsttr.mil/submissions/login>.

Specific questions pertaining to the administration of the DARPA Program and these proposal preparation instructions should be directed to: DARPA Small Business Programs Office at SBIR_BAA@darpa.mil. DSIP Topic Q&A will NOT be available for these DARPA topics. Technical questions related to improving the understanding of a topic's requirements must be submitted to SBIR_BAA@darpa.mil by the deadline listed below.

The following dates apply to this DARPA Open Topic release:

- June 27, 2023:** Topic issued for pre-release
- July 12, 2023:** Topic opens; DARPA begins accepting white papers via DSIP
- August 10, 2023:** Deadline for receipt of white papers no later than **12:00 pm ET**

This release contains an open topic. As outlined in section 7 of the SBIR and STTR Extension Act of 2022, innovation open topic activities—

- (A) Increase the transition of commercial technology to the Department of Defense;
- (B) Expand the small business nontraditional industrial base;
- (C) Increase commercialization derived from investments of the Department of Defense; and
- (D) Expand the ability for qualifying small business concerns to propose technology solutions to meet the needs of the Department of Defense.

Unlike conventional topics, which specify the desired technical objective and output, open topics can use generalized mission requirements or specific technology areas to adapt commercial products or solutions to close capability gaps, improve performance, or provide technological advancements in existing capabilities.

A small business concern may submit up to three (3) whitepapers to this open topic. If more than three whitepapers from a small business concern are received for this open topic, only the three most recent whitepapers to be certified and submitted prior to the submission deadline will receive an evaluation. All prior whitepapers submitted by the small business concern for this open topic will be marked as nonresponsive and will not receive an evaluation.

Proposals submitted in response to this topic will follow a two-step submission process.

STEP ONE- White paper submission: Proposing small business concerns must certify and submit, by the deadline listed above, the following proposal volumes in DSIP:

1. **All Firm-level Forms.** On the Defense SBIR/STTR Innovation Portal (DSIP) at <https://www.dodsbirsttr.mil/submissions/>, prepare the Firm-level Forms – Firm Certifications, Audit Information, and Company Commercialization Report (CCR).
2. **Supporting Documents (Volume 5).** A white paper must be uploaded to Volume 5 outlining the proposed effort. The white paper must not exceed 3 pages in length. The header on each page of the white paper should contain your company name, topic number, and proposal number assigned by DSIP when the proposal was created. The header may be included in the one-inch margin. Content requirements of the white paper are provided in the topic.

NOTE: At step one of this process, proposers will NOT complete Volume 1 (Proposal Coversheet), Volume 2 (Technical Volume), Volume 3 (Cost Volume), or Volume 6 (Fraud, Waste and Abuse training). The Company Commercialization Report will be required in the Firm-level Forms but will not be provided in Volume 4.

White papers will be screened by DARPA to determine suitability for full proposal submission, based on responsiveness to the requirements outlined in the Description section of the topic, and an understanding of the capability gap.

STEP TWO: Firms that have submitted white papers will be notified of recommendation for a full Phase I proposal submission within 30 days of the deadline for white papers. Full Phase I proposals will follow the guidelines provided in the DoD Program BAA, with additional details and deviations below.

PHASE I PROPOSAL GUIDELINES

The Defense SBIR/STTR Innovation Portal (DSIP) is the official portal for DoD SBIR/STTR proposal submission. Proposers are required to submit proposals via DSIP; proposals submitted by any other means will be disregarded. Detailed instructions regarding registration and proposal submission via DSIP are provided in Appendix A.

Open Topic Phase I Award Structure

| Topic Number | Phase I | | |
|-------------------|------------------|--------------|-----------------------------|
| | Technical Volume | Award Amount | Period of Performance (PoP) |
| HR0011SB20234-P01 | 25 pages | \$275,000 | 9 months |

Technical Volume (Volume 2)

The technical volume is not to exceed 20 pages and must follow the formatting requirements provided in the DoD SBIR 2023.4 Program BAA. Phase I commercialization strategy shall not

exceed 5 pages. This should be the last section of the Technical Volume and will not count against the 20-page limit.

Content of the Technical Volume

Proposers should refer to the DARPA Phase I Proposal Instructions, provided on the DARPA Small Business site (<https://www.darpa.mil/work-with-us/for-small-businesses/participate-sbir-sttr-program>).

Cost Volume (Volume 3)

Please see the chart above for award amounts listed by topic. Proposers are required to use the Phase I – Volume 3: Cost Proposal Template (Excel Spreadsheet) provided on the DARPA Small Business site (<https://www.darpa.mil/work-with-us/for-small-businesses/participate-sbir-sttr-program>). Subcontractors may also submit unsanitized costs using this template directly to DARPA at SBIR-BAA@darpa.mil.

Please review the updated Percentage of Work (POW) calculation details included in the DoD Program BAA.

Company Commercialization Report (CCR) (Volume 4)

Completion of the CCR as Volume 4 of the proposal submission in DSIP is required. Please refer to the DoD SBIR Program BAA for full details on this requirement. Information contained in the CCR will not be considered by DARPA during proposal evaluations.

Supporting Documents (Volume 5)

In addition to the documents required by DoD, small businesses may also submit additional documentation to support the Technical Volume (Volume 2) and the Cost Volume (Volume 3) in Volume 5. See Appendix A for required certifications that must be included in Volume 5. For additional information, see the SBIR 23.4 Annual Program Broad Agency Announcement (BAA) at <https://www.defensesbirstr.mil/SBIR-STTR/Opportunities/>.

PHASE II PROPOSAL GUIDELINES

Phase II proposals may only be submitted by Phase I awardees. Should DARPA have funding available and decide to proceed with a Phase II, proposers awarded a Phase I contract will be eligible to submit a proposal for Phase II and will be contacted by the DARPA Small Business Programs Office at the appropriate time during their Phase I period of performance. Phase II proposals will be evaluated in accordance with the applicable DoD or DARPA SBIR/STTR BAA. Phase II selection(s) are at the sole discretion of the government and are subject to funding availability and Phase I performance. Phase II Instructions are available at <https://www.darpa.mil/work-with-us/for-small-businesses/participate-sbir-sttr-program>.

| Topic Number | Phase II | | | | |
|-------------------|-------------|--------------|-----------------------------|---------------|------------|
| | Tech Volume | Award Amount | Period of Performance (PoP) | Option Amount | Option PoP |
| HR0011SB20234-P01 | 45 pages | \$1,200,000 | 18 months | \$600,000 | 9 months |

DISCRETIONARY TECHNICAL AND BUSINESS ASSISTANCE (TAB A)

DARPA does not offer TABA funding.

EVALUATION AND SELECTION

All proposals will be evaluated in accordance with the evaluation criteria listed in the DoD SBIR 2023.4 BAA. DARPA will conduct an evaluation of each conforming proposal. Proposals that do not comply with the requirements detailed in this BAA and the research objective(s) of the corresponding topic are considered non-conforming and therefore are not evaluated nor considered for award.

Using the evaluation criteria, the Government will evaluate each proposal in its entirety, documenting the strengths and weaknesses relative to each evaluation criterion, and, based on these identified strengths and weaknesses, determine the proposal's overall selectability. Proposals will not be evaluated against each other during the evaluation process, but rather evaluated on their own individual merit to determine how well the proposal meets the criteria stated in this BAA and the corresponding topic.

Awards will be made to proposers whose proposals are determined to be the most advantageous to the Government, consistent with instructions and evaluation criteria specified in the DoD SBIR 2023.4 BAA and availability of funding.

For the purposes of this proposal evaluation process, a selectable proposal is defined as follows:

Selectable: A selectable proposal is a proposal that has been evaluated by the Government against the evaluation criteria listed in the BAA and topic, and the strengths of the overall proposal outweighs its weaknesses. Additionally, there are no accumulated weaknesses that would require extensive negotiations and/or a resubmitted proposal.

For the purposes of this proposal evaluation process, a non-selectable proposal is defined as follows:

Non-Selectable: A proposal is considered non-selectable when the proposal has been evaluated by the Government against the evaluation criteria listed in the BAA and topic, and the strengths of the overall proposal do not outweigh its weaknesses.

Proposing firms will be notified of selection or non-selection status for a Phase I award within 90 days of the closing date of the BAA. It is the policy of DARPA to treat all proposals as source selection information and to disclose their contents only for the purpose of evaluation. Restrictive notices notwithstanding, during the evaluation process, submissions may be handled by support contractors for administrative purposes and/or to assist with technical evaluation. All DARPA support contractors are expressly prohibited from performing DARPA-sponsored technical research and are bound by appropriate nondisclosure agreements. Input on technical aspects of the proposals may be solicited by DARPA from other Government and/or non-Government consultants/experts who are strictly bound by the appropriate non-disclosure requirements. No submissions will be returned. Upon completion of the evaluation and selection process, an electronic copy of each proposal received will be retained at DARPA.

Proposal titles, abstracts, anticipated benefits, and keywords of proposals that are selected for contract award will undergo a DARPA Policy and Security Review. Proposal titles, abstracts, anticipated benefits, and keywords are subject to revision and/or redaction by DARPA. Final approved versions of proposal titles, abstracts, anticipated benefits, and keywords may appear on the DoD SBIR/STTR awards website and/or the SBA's SBIR/STTR award website (<https://www.sbir.gov/sbirsearch/award/all>).

Refer to the DoD SBIR 2023.4 Program BAA for procedures to protest the Announcement. As further prescribed in FAR 33.106(b), FAR 52.233-3, Protests regarding the selection decision should be submitted to:

DARPA

Contracts Management Office (CMO)
675 N. Randolph Street
Arlington, VA 22203
E-mail: CMO_SBIRProtests@darpa.mil and sbir@darpa.mil

AWARD AND CONTRACT INFORMATION

1. General Award Information

Multiple awards are anticipated. DARPA may award FAR-based government contracts (Firm- Fixed Price or Cost-Plus Reimbursement) or Other Transactions for Prototypes agreement (under the authority of 10 U.S.C. § 4022) subject to approval of the Contracting Officer or Agreements Officer, respectively. The amount of resources made available under each topic issued under this BAA will depend on the quality of the proposals received and the availability of funds.

The Government reserves the right to select for negotiation all, some, one, or none of the proposals received in response to this announcement and to make awards with or without communications with proposers. Additionally, the Government reserves the right to award all, some, one, or none of the options on the contract(s)/agreement(s) of the performers based on available funding and technical performance. If warranted, portions of resulting awards may be segregated into pre-priced options. Additionally, DARPA reserves the right to accept proposals in their entirety or to select only portions of proposals for award. In the event that DARPA desires to award only portions of a proposal, negotiations may be opened with that proposer. The Government reserves the right to fund proposals in phases with options for continued work, as applicable.

The Government reserves the right to request any additional, necessary documentation once it makes the award instrument determination. The Government reserves the right to remove a proposal from award consideration should the parties fail to reach agreement on award terms, conditions, and price within a reasonable time, and/or the proposer fails to provide requested additional information within three business days.

In all cases, the Government Contracting Officer reserves the right to select award instrument type, regardless of instrument type proposed, and to negotiate all instrument terms and conditions with selectees. DARPA will apply publication or other restrictions, as necessary, if it determines that the research resulting from the proposed effort will present a high likelihood of disclosing performance characteristics of military systems or manufacturing technologies that are unique and critical to defense. Any award resulting from such a determination will include a requirement for DARPA permission before publishing any information or results on the program. For more information on publication restrictions, see the DoD SBIR 2023.4 Program BAA.

Because of the desire to streamline the award negotiation and program execution process, proposals identified for negotiation will result in negotiating a type of instrument for award that is in the best interest of the Government. In the case of an OT for Prototype agreement under DARPA's authority to award OTs for prototype projects, 10 U.S.C. § 4022, use of an OT provides significant opportunities for flexible execution to assist in meeting DARPA's aggressive SBIR/STTR program goals.

All proposers that wish to consider an OT award should carefully read the following:

The flexibility of the OT award instrument can be beneficial to the program because the Performer will be able to apply its best practices as required to carry out the research project that may be outside of the Federal Acquisition Regulation (FAR) process-driven requirements. Streamlined practices will be used, such as milestone-driven performance, intended to reduce time and effort on award administration tasks

and permit performers to focus on the research effort and rapid prototyping. Because of this ability, OTs provide the Agreements Officer the flexibility to create an award instrument that contains terms and conditions that promote commercial transition, reduce some administratively burdensome acquisition regulations, and meet SBIR/STTR program goals.

Proposers may only propose an OT agreement with fixed payable milestones. Fixed payable milestones are fixed payments based on successful completion of the milestone accomplishments agreed to in the milestone plan. Refer to the Other Transactions for Prototypes Fact Sheet and Other Transaction for Prototype Agreement, available at <https://www.darpa.mil/work-with-us/for-small-businesses/participate-sbir-sttr-program>. Specific milestones will be based upon the research objectives detailed in the SBO.

Please see <https://www.darpa.mil/work-with-us/for-small-businesses/participate-sbir-sttr-program> for more information on OTs.

2. Transition and Commercialization Support Program (TCSP)

DARPA will provide services to Phase II or DP2 awardees upon contract execution through the Transition and Commercialization Support Program (TCSP) at no cost to awardees. The TCSP goal is to maximize the potential for SBIR/STTR companies to move their technology beyond Phase II and into other research and development programs for further maturity or into solutions or products for DoD acquisition programs, other Federal programs, and/or the commercial market. Please visit <https://www.darpa.mil/work-with-us/for-small-businesses/commercialization-continued> for more information on DARPA TCSP.

3. Embedded Entrepreneurship Initiative

Awardees of SBIR funding pursuant to this BAA may be eligible to participate in the DARPA Embedded Entrepreneurship Initiative (EEI) during the Period of Performance. Invitation to participate in EEI is at the sole discretion of the Government based on evaluation of technical and commercial factors and subject to program balance and the availability of funding. EEI is a limited scope program offered by DARPA, at DARPA's discretion, to a small subset of awardees. The goal of DARPA's EEI is to increase the likelihood that DARPA-funded technologies take root in the U.S. and provide new capabilities for national defense. EEI supports DARPA's mission "to make pivotal investments in breakthrough technologies and capabilities for national security" by accelerating the transition of innovations out of the lab and into new capabilities for the Department of Defense (DoD). EEI investment supports development of a robust and deliberate Go-to-Market strategy for selling technology product to the government and commercial markets and positions DARPA awardees to attract U.S. investment. The following is for informational and planning purposes only and does not constitute solicitation of proposals to the EEI.

There are three elements to DARPA's EEI: (1) A Senior Commercialization Advisor (SCA) from DARPA who works with the Program Manager (PM) to examine the business case for the awardee's technology and uses commercial methodologies to identify steps toward achieving a successful transition of technology to the government and commercial markets; (2) Connections to potential industry and investor partners via EEI's Investor Working Groups; and (3) Additional funding on an awardee's contract for the awardee to hire an embedded entrepreneur to achieve specific milestones in a Go-to-Market strategy for transitioning the technology to products that serve both defense and commercial markets. This embedded entrepreneur's qualifications should include business experience within the target industries of interest, experience in commercializing early-stage technology, and the ability to communicate and interact with technical and non-technical stakeholders. Funding for EEI is typically no more than \$250,000 per awardee over the duration of the award. An awardee may apportion EEI funding to hire more than one embedded entrepreneur, if achieving the milestones requires different expertise that can be obtained without exceeding the awardee's total EEI funding. The EEI effort is intended to be conducted concurrent with the research program without extending the period of performance.

EEI Application Process:

After receiving an award under the solicitation, awardees interested in being considered for EEI should notify their DARPA Program Manager (PM) during the period of performance. Timing of such notification should ideally allow sufficient time for DARPA and the awardee to review the awardee's initial transition plan, identify milestones to achieve under EEI, modify the award, and conduct the work required to achieve such milestones within the original award period of performance. These steps may take 9-18 months to complete, depending on the technology. If the DARPA PM determines that EEI could be of benefit to transition the technology to product(s) the Government needs, the PM will refer the performer to DARPA Commercial Strategy.

DARPA Commercial Strategy will then contact the performer, assess fitness for EEI, and in consultation with the DARPA technical office, determine whether to invite the performer to participate in the EEI. Factors that are considered in determining fitness for EEI include DoD/Government need for the technology; competitive approaches to enable a similar capability or product; risks and impact of the Government's being unable to access the technology from a sustainable source; Government and commercial markets for the technology; cost and affordability; manufacturability and scalability; supply chain requirements and barriers; regulatory requirements and timelines; Intellectual Property and Government Use Rights, and available funding.

Invitation to participate in EEI is at the sole discretion of DARPA and subject to program balance and the availability of funding. EEI participants' awards may be subsequently modified bilaterally to amend the Statement of Work to add negotiated EEI tasks, provide funding, and specify a milestone schedule which will include measurable steps necessary to build, refine, and execute a Go-to-Market technology transition plan aimed at delivering new capabilities for national defense. Milestone examples are available at: <https://www.darpa.mil/work-with-us/contract-management>.

Awardees under this solicitation are eligible to be considered for participation in EEI, but selection for award under this solicitation does not imply or guarantee participation in EEI.

For more information please refer to the EEI website <https://eei.darpa.mil/>.

4. DARPA Toolbox Initiative

DARPA Toolbox is an Agency-wide effort to provide open licensing opportunities with commercial technology vendors to the researchers behind DARPA programs. DARPA Toolbox provides easy, low-cost, scalable access to state-of-the-art tools and intellectual property (IP) under predictable legal terms and streamlined acquisition procedures. The goal is to reduce performer reliance on low-quality, low-cost tools and IP that increase execution risks and complicate post-DARPA transitions.

Through this initiative, DARPA performers are granted access to select vendor tools and technologies throughout the life of their contractual relationship with the Agency. The Toolbox suppliers bring to the table proven technologies commonly used in state-of-the-art commercial microelectronics or system design methodologies.

DARPA Toolbox program information and a full list of participating suppliers can be found at <https://www.darpa.mil/work-with-us/darpa-toolbox-initiative>. If there are tool or technologies of interest, contact the Supplier POC listed for the product, referencing the DARPA Toolbox Initiative. The Supplier POC will provide advice on products and pricing information. Include any non-production pricing quotes in your proposal. Products and pricing are between you and the suppliers – *do not* contact DARPA directly.

ADDITIONAL INFORMATION

DARPA intends to use electronic mail for all correspondence regarding these topics. Questions related to the technical aspect of the research objectives and awards specifically related to a topic should be emailed to SBIR_BAA@darpa.mil. Please reference the topic number in the subject line. All questions must be in English and must include the name, email address, and the telephone number of a point of contact.

DARPA will attempt to answer questions in a timely manner; however, questions submitted within seven (7) calendar days of the proposal due date listed herein may not be answered. DARPA will post a consolidated Frequently Asked Questions (FAQ) document. To access the posting please visit: <http://www.darpa.mil/work-with-us/opportunities>. Under the topic number summary, there will be a link to the FAQ. The FAQ will be updated on an ongoing basis until one week prior to the proposal due date.

Technical support for the Defense SBIR/STTR Innovation Portal (DSIP) is available Monday through Friday, 9:00 a.m. – 5:00 p.m. ET. Requests for technical support must be emailed to DoDSBIRSupport@reisystems.com with a copy to SBIR_BAA@darpa.mil.

DARPA SBIR 23.4 Topic Index
Release 8

HR0011SB20234-P01

Autonomous Systems at Scale - Open Topic

HR0011SB20234-P01 TITLE: Autonomous Systems at Scale - Open Topic

OUSD (R&E) CRITICAL TECHNOLOGY AREA(S): Advanced Computing and Software, Human-Machine Interfaces, Microelectronics, Trusted AI and Autonomy

OBJECTIVE: The objective of the Autonomous Systems at Scale Open SBIR topic is to develop autonomous systems that remove service members from dangerous environments and speed manual-labor tasks to enable paradigm-shifting tactics.

DESCRIPTION: The DoD's ability to maintain a global presence currently requires intensive manpower focused on well-defined and sometimes monotonous tasks. Autonomous solutions can be powerful force multipliers, reallocating the burden of these tasks to machines and decreasing risks to personnel. For example, Explosive Ordnance Disposal (EOD) operations often involve a human technician following written instructions to execute procedures on well-understood ordnance, either by hand or by remotely operating Unmanned Systems (UxS). Removing humans from the blast radius will not only decrease risk but also allow personnel to prioritize novel first-seen threats.

Developing autonomous solutions for well-defined problems comes with a range of challenges that differ by domain. For example, ground-based systems can encounter environmental obstacles while interacting with clutter, aerial vehicle utility is often limited by power capacity, and unmanned underwater vehicles suffer from communications limitations. Additionally, fielded systems often do not have interoperable architectures.

DARPA solicits technologies to address the critical limitations of creating autonomous solutions for well-defined problems. Examples of technologies of interest include but are not limited to systems that:

1. Build or repair damaged infrastructure (e.g., repairing many blast craters in parallel and with minimal human oversight).
2. Decrease the operator-to-robot ratio in UxS response operations (e.g., allowing a single operator to quickly neutralize large numbers of explosive threats in a near-peer conflict).
3. Reduce the manpower requirements of physical burdens (e.g, unloading cargo at an expeditionary base).

Strong proposals will identify a critical limitation to scalable autonomy, then design a system and/or component that overcomes the problem. Proposers should identify metrics that compare the proposed concept with the deployed state of the art. The aim of the solicitation is to create an unclassified prototype that is ready for field testing at the end of Phase II. Submissions solely focused on software or solely focused on hardware without significant autonomy are not of interest, nor are proposed solutions in the areas of kinetic effects or intelligence, surveillance, and reconnaissance. Systems developed should be robust and maximize operational availability.

An initial white paper describing the technical approach is required and will be screened for responsiveness to the topic. The technical white paper should include an overview of the proposed concept with details to support feasibility. The overview should address the bullets below listed in order of importance:

- Proposed system: Describe the proposed system. Outline the design and operation of the main hardware and software components that are being proposed for development and if applicable, which parts of the system are COTS.
- Concept of Employment: Identify how the proposed system could be employed. Provide details on the problem the autonomous system is addressing and the prevalence of this problem. What metric does the proposed solution improve, and by how much?

- Scalability: Provide a brief analysis of the feasibility of scaling the system across the DoD and industry. Are the production costs low enough to merit widespread adoption? Is the system sufficiently autonomous that large-scale deployment wouldn't require significant training or human labor? What are the projected maintenance requirements, operational availabilities, and service lifetimes?

PHASE I: Companies will complete a feasibility study that demonstrates the firm's competitive technical advantage relative to other commercial products (if other products exist) and develop concept plans for how the company's technology can be applied to more efficiently scale autonomous capability. Studies should clearly detail and identify a firm's technology at both the individual component and system levels, provide supporting literature for technical feasibility, highlight existing performance data, showcase the technology's application opportunities to a broad base of customers outside the defense space, a market strategy for the commercial space, how the technology directly increases the prevalence of autonomous capability as well as include a technology development roadmap to demonstrate scientific and engineering viability. Proposers should recommend quarterly technical milestones that will be used to demonstrate their progress to DARPA throughout Phase I. These milestones will also be accompanied by monthly financial and technical summary reports.

At the end of Phase I, the company will be required to provide a formal proposal in writing, to include quarterly milestones, defining how their technology would be developed and implemented into relevant concepts of operation. A commercialization roadmap will also be required to demonstrate a high probability that continued design and development will result in a Phase II mature product. For example, a proposal that addresses infrastructure repair might describe how the solution(s) would be employed in expeditionary military construction operations, how it nests into a broader commercial need, and specify what performance metrics (threshold and objective) would demonstrate system viability.

PHASE II: Produce prototype solutions that enable mission essential tasks. These products will be provided to select DoD units for further evaluation by personnel. In addition, companies will provide a technology transition and commercialization plan for DOD and commercial markets.

PHASE III DUAL USE APPLICATIONS: Components and/or systems could be applied to scale autonomy in multiple industries, including but not limited to, those within the energy and construction sectors that leverage UxS in survey or infrastructure development tasks. These same technologies have DOD application in the air, ground, and underwater domains. The business will transition the solution to provide expanded mission capability for a broad range or potential Government and civilian users and alternate mission applications.

REFERENCES:

1. B.N. Diggs et al., "Automated Construction of Expeditionary Structures (ACES)" US Army Corps of Engineers Engineer Research and Development Center/Construction Engineering Research Laboratory (ERDC/CERL TR-21-6). February 2021.
2. K. Song and P.C. Chu. "Conceptual Design of Future Undersea Unmanned Vehicle (UUV) System for Mine Disposal." IEEE Systems Journal, Vol 6, 2012

KEYWORDS: Unmanned Systems; Autonomy; Robotics; Logistics; Artificial Intelligence, Autonomous Logistics; Autonomous Construction; Infrastructure Survivability

Appendix A: DARPA PHASE I PROPOSAL INSTRUCTIONS

I. Introduction

A complete proposal submission consists of:

Volume 1: Proposal Cover Sheet

Volume 2: Technical Volume

Volume 3: Cost Volume

Volume 4: Company Commercialization Report

Volume 5: Supporting Documents

a. Contractor Certification Regarding Provision of Prohibition on Contracting for Certain Telecommunications and Video Surveillance Services or Equipment (Attachment 1)

MANDATORY

b. Disclosures of Foreign Affiliations or Relationships to Foreign Countries (Attachment 2)

MANDATORY

c. Verification of Eligibility of Small Business Joint Ventures (Attachment 3), if applicable

d. Disclosure of Funding Sources (Attachment 4) **MANDATORY**

e. Other supporting documentation

A completed proposal submission in DSIP does NOT indicate that the mandatory supporting documents have been uploaded. It is the responsibility of the proposing small business concern to ensure that the mandatory documents listed above have been uploaded and included with the proposal submission.

Volume 6: Fraud, Waste and Abuse Training

Volume 6: Fraud, Waste and Abuse Training

The Defense SBIR/STTR Innovation Portal (DSIP) provides a structure for building the proposal volumes and submitting a consolidated proposal package. If this is your first time submitting an SBIR or STTR proposal using DSIP, please review detailed training guides at <https://www.dodsbirsttr.mil/submissions/learning-support/training-materials>. It is the responsibility of the proposing firm to ensure that a complete proposal package is certified and submitted by the close date listed in the TOPIC to which they are responding.

To assist in proposal development, templates for Volume 2: Technical Volume and Volume 3: Cost Volume have been provided as attachments on the DARPA Small Business website, under SBIR/STTR Forms and Templates at <https://www.darpa.mil/work-with-us/for-small-businesses/participate-sbir-sttr-program>. Use of the DARPA Cost Proposal template is mandatory.

II. Proprietary Information

Proposers that include in their proposals data that they do not want disclosed to the public for any purpose, or used by the Government except for evaluation purposes, shall follow instructions in the DoD SBIR 2023.4 BAA regarding marking proprietary proposal information.

III. Phase I Proposal Instructions

a. Proposal Cover Sheet (Volume 1)

The Cover Sheet must include a brief technical abstract of no more than 3000 characters that

describes the proposed R&D project with a discussion of anticipated benefits and potential commercial applications. **Do not include proprietary or classified information in the Proposal Cover Sheet.** If your proposal is selected for award, the technical abstract and discussion of anticipated benefits may be publicly released.

b. Format of Technical Volume (Volume 2)

1. Type of file: The Technical Volume must be a single Portable Document Format (PDF) file, including graphics. Perform a virus check before uploading the Technical Volume file. If a virus is detected, it may cause rejection of the proposal. **Do not lock or encrypt the uploaded file. Do not include or embed active graphics such as videos, moving pictures, or other similar media in the document.**
2. Length: The Phase I technical volume should consist of a 20-page technical proposal and a 5-page commercialization plan. The Government will not consider pages in excess of the page count limitations.
3. Layout: Number all pages of your proposal consecutively. Font size should not be smaller than 10-point on standard 8-1/2" x 11" paper with one-inch margins. The header on each page of the Technical Volume should contain your company name, topic number, and proposal number assigned by DSIP when the Cover Sheet was created. The header may be included in the one-inch margin. Please refer to the document titled Phase I Template – Volume 2: Technical Volume at <https://www.darpa.mil/work-with-us/for-small-businesses/participate-sbir-sttr-program> for additional details.

c. Content of the Technical Volume (Volume 2)

The Technical Volume should cover the following items in the order given below:

1. **Identification and Significance of the Problem or Opportunity.** Define the specific technical problem or opportunity addressed and its importance.
2. **Phase I Technical Objectives.** Enumerate the specific objectives of the Phase I work, including the questions the research and development effort will try to answer to determine the feasibility of the proposed approach.
3. **Phase I Statement of Work (including Subcontractors' Efforts)**
 - a) Provide an explicit, detailed description of the Phase I approach. The Statement of Work should indicate what tasks are planned, how and where the work will be conducted, a schedule of major events, and the final product(s) to be delivered. The Phase I effort should attempt to determine the technical feasibility of the proposed concept. The methods planned to achieve each objective or task should be discussed explicitly and in detail. This section should be a substantial portion of the Technical Volume section.
 - b) The topic may have been identified by the Program Manager as research or activities involving Human/Animal Subjects and/or Recombinant DNA. In the event that Phase I performance includes performance of these kinds of research or activities, please identify the applicable protocols and how those protocols will be followed during Phase

I. Please note that funds cannot be released or used on any portion of the project involving human/animal subjects or recombinant DNA research or activities until all of the proper approvals have been obtained (see DoD SBIR 2023.4 BAA).

4. **Related Work.** Describe significant activities directly related to the proposed effort, including any conducted by the Principal Investigator (PI), the proposing firm, consultants, or others. Describe how these activities interface with the proposed project and discuss any planned coordination with outside sources. The technical volume must persuade reviewers of the proposer's awareness of the state-of-the-art in the specific topic. Describe previous work not directly related to the proposed effort but similar. Provide the following: (1) short description, (2) client for which work was performed (including individual to be contacted and phone number), and (3) date of completion.
5. **Relationship with Future Research or Research and Development**
 - a) State the anticipated results of the proposed approach if the project is successful.
 - b) Discuss the significance of the Phase I effort in providing a foundation for Phase II research or research and development effort.
 - c) Identify the applicable clearances, certifications and approvals required to conduct Phase II testing and outline the plan for ensuring timely completion of said authorizations in support of Phase II research or research and development effort.
6. **Key Personnel.** Identify key personnel who will be involved in the Phase I effort including information on directly related education and experience. A concise technical resume of the PI, including a list of relevant publications (if any), must be included (Please do not include Privacy Act Information). All resumes will count toward the page limit for Volume 2, as specified in the topic.
7. **Foreign Citizens.** Identify any foreign citizens or individuals holding dual citizenship expected to be involved on this project as a direct employee, subcontractor, or consultant. For these individuals, please specify their country of origin, the type of visa or work permit under which they are performing and an explanation of their anticipated level of involvement on this project. Refer to DoD SBIR 2023.4 BAA for more information.

Supplemental information provided in response to this paragraph will be protected in accordance with the Privacy Act (5 U.S.C. 552a), if applicable, and the Freedom of Information Act (5 U.S.C. 552(b)(6)).
8. **Facilities/Equipment.** Describe available instrumentation and physical facilities necessary to carry out the Phase I effort. Justify equipment purchases in this section and include detailed pricing information in the Cost Volume. State whether or not the facilities where the proposed work will be performed meet environmental laws and regulations of federal, state (name), and local Governments for, but not limited to, the following groupings: airborne emissions, waterborne effluents, external radiation levels, outdoor noise, solid and bulk waste disposal practices, and handling and storage of toxic and hazardous materials.
9. **Subcontractors/Consultants.** Subcontractor means any supplier, distributor, vendor, firm,

academic institution, research center, or other person or entity that furnishes supplies or services pursuant to a subcontract, at any tier. Involvement of a university or other subcontractors or consultants in the project may be appropriate. If such involvement is intended, it should be identified and described according to the Cost Breakdown Structure at <https://www.dodsbirsttr.mil/submissions/learning-support/firm-templates>. Please refer to DoD SBIR 2022.4 BAA for detailed eligibility requirements as it pertains to the use of subcontractors/consultants.

10. **Prior, Current, or Pending Support of Similar Proposals or Awards.** If a proposal submitted in response to a corresponding topic is substantially the same as another proposal that was funded, is now being funded, or is pending with another Federal Agency, or another DoD Component or DARPA, you must reveal this on the Proposal Cover Sheet and provide the following information:
- a) Name and address of the Federal Agency(s) or DoD Component to which a proposal was submitted, will be submitted, or from which an award is expected or has been received.
 - b) Date of proposal submission or date of award.
 - c) Title of proposal.
 - d) Name and title of the PI for each proposal submitted or award received.
 - e) Title, number, and date of BAA(s) or solicitation(s) under which the proposal was submitted, will be submitted, or under which award is expected or has been received.
 - f) If award was received, state contract number.
 - g) Specify the applicable topics for each proposal submitted or award received.

Note: If this does not apply, state in the proposal "No prior, current, or pending support for proposed work."

11. **Transition and Commercialization Strategy.** DARPA is equally interested in dual use commercialization of SBIR/STTR project results to the U.S. military, the private sector market, or both, and expects explicit discussion of key activities to achieve this result in the transition and commercialization strategy part of the proposal. Phase I is the time to plan for and begin transition and commercialization activities. The small business must convey an understanding of the market, competitive landscape, potential stakeholders and end-users, and preliminary transition path or paths to be established during the Phase I project. The Phase I transition and commercialization strategy shall not exceed 5 pages. It should be the last section of the technical volume and include the following elements:

- a) **A summary of transition and commercialization activities conducted during prior SBIR/STTR efforts if applicable, and the Technology Readiness Level (TRL) achieved.**
- b) **Problem or Need Statement.** Briefly describe the problem, need, or requirement, and its significance relevant to a Department of Defense application and/or a private sector application that the SBIR/STTR project results would address. Is there a broader societal need you are trying to address? Please describe.
- c) **Description of Product(s) and/or System Application(s).** Identify the commercial product(s) and/or DoD system(s), or system(s) under development, or potential new system(s). Identify the potential DoD end- users, Federal

customers, and/or private sector customers who would likely use the technology.

- d) **Business Model(s)/Procurement Mechanism(s).** Discuss your current business model hypothesis for bringing the technology to market. Describe plans to license, partner, or self-produce your product. How do you plan to generate revenue? Describe the resources you expect will be needed to implement your business models. Discuss your plan and expected timeline to secure these resources. Understanding DARPA's goal of creating and sustaining a U.S. military advantage, describe how you intend to develop your product and supply chains to enable this differentiation.
- e) **Target Market.** Describe the market and addressable market for the innovation. Describe the customer sets you propose to target, their size, their growth rate, and their key reasons they would consider procuring the technology. Discuss the business economics and market drivers in the target industry. Describe competing technologies existent today on the market as well as those being developed in the lab. How has the market opportunity been validated? Describe the competition. How do you expect the competitive landscape may change by the time your product/service enters the market?
- f) **Funding Requirements.** Describe your company's funding history. How much external financing have you raised? Describe your plans for future funding sources (internal, loan, angel, venture capital, etc.).
- g) **Transition and Commercialization Risks.** Describe the major technology, market and team risks associated with achieving successful transition and commercialization of the DARPA funded technology. DARPA is not afraid to take risks but we want to ensure that our awardees clearly understand the risks in front of them. What are the key risks in bringing your innovation to market? What are actions you plan to undertake to mitigate these risks?
- h) **Expertise/Qualifications of Team/Company Readiness.** Describe the expertise and qualifications of your management, marketing/business development and technical team that will support the transition of the technology from the prototype to the commercial market and into government operational environments. Has this team previously taken similar products/services to market? If the present team does not have this needed expertise, how do you intend to obtain it? What is the financial history and health of your company (e.g., availability of cash, profitability, revenue growth, etc.)?
- i) **Anticipated Transition and Commercialization Results.** Include a schedule showing the anticipated quantitative transition and commercialization results from the Phase II project at one year after the start of Phase II, at the completion of Phase II, and after the completion of Phase II (i.e., amount of additional investment, sales revenue, etc.). After Phase II award, the company is required to report actual sales and investment data in its Company Commercialization Report at least annually.

Advocacy Letters (OPTIONAL)* Feedback received from potential Commercial and/or DoD customers and other end-users regarding their interest in the technology to support their capability gaps. Advocacy letters that are faxed or e-mailed separately will NOT be accepted.

Letters of Intent/Commitment (OPTIONAL)* Relationships established, feedback received, support and commitment for the technology with one or more of the following: Commercial customer, DoD PM/PEO, a Defense Prime, or vendor/supplier to the Primes and/or other

vendors/suppliers identified as having a potential role in the integration of the technology into fielded systems/products or those under development. Letters of Intent/Commitment that are faxed or e-mailed separately will NOT be accepted.

*Advocacy Letters and Letters of Intent/Commitment are optional, and should ONLY be submitted to substantiate any transition or commercialization claims made in the commercialization strategy. Please DO NOT submit these letters just for the sake of including them in your proposal. These letters DO NOT count against any page limit.

In accordance with section 3-209 of DOD 5500.7-R, Joint Ethics Regulation, letters from government personnel will NOT be considered during the evaluation process.

d. Format of Cost Volume (Volume 3)

Proposers are required to use the Phase I – Volume 3: Cost Proposal Template (Excel Spreadsheet) provided at <https://www.darpa.mil/work-with-us/for-small-businesses/participate-sbir-sttr-program>.

e. Content of the Cost Volume (Volume 3)

Some items in the Cost Breakdown Guidance below may not apply to the proposed project. If such is the case, there is no need to provide information on each and every item.

ALL proposed costs should be accompanied by documentation to substantiate how the cost was derived. For example, if you proposed travel cost to attend a project-related meeting or conference, and used a travel website to compare flight costs, include a screen shot of the comparison. Similarly, if you proposed to purchase materials or equipment, and used the internet to search for the best source, include your market research for those items. You do not necessarily have to propose the cheapest item or supplier, but you should explain your decision to choose one item or supplier over another. It's important to provide enough information to allow contracting personnel to understand how the proposer plans to use the requested funds.

If selected for award, failure to include the documentation with your proposal will delay contract negotiation, and the proposer will be asked to submit the necessary documentation to the Contracting Officer to substantiate costs (e.g., cost estimates for equipment, materials, and consultants or subcontractors). It is important to respond as quickly as possible to the Contracting Officer's request for documentation.

Cost Breakdown Guidance:

- List all key personnel by name as well as by number of hours dedicated to the project as direct labor.
- Special tooling and test equipment and material cost may be included. The inclusion of equipment and material will be carefully reviewed relative to need and appropriateness for the work proposed. The purchase of special tooling and test equipment must, in the opinion of the Contracting Officer, be advantageous to the Government and should be related directly to the specific topic. These may include such items as innovative instrumentation and/or automatic test equipment. Title to property furnished by the Government or acquired with Government funds will be vested with DARPA; unless it

is determined that transfer of title to the contractor would be more cost effective than recovery of the equipment by the DARPA.

- Cost for travel funds must be justified and related to the needs of the project.
- Cost sharing is permitted for proposals under this announcement; however, cost sharing is not required nor will it be an evaluation factor in the consideration of a proposal.
- All subcontractor costs and consultant costs must be detailed at the same level as prime contractor costs in regard to labor, travel, equipment, etc. Provide detailed substantiation of subcontractor costs in your cost proposal. Enter this information in the Explanatory Material section of the on-line cost proposal form. The Supporting Documents Volume (Volume 5) may be used if additional space is needed.

For more information about cost proposals and accounting standards associated with contract awards, see the DCAA publication titled “Audit Process Overview – Information for Contractors” available at <http://www.dcaa.mil>.

f. Company Commercialization Report (Volume 4)

The Company Commercialization Report (CCR) allows companies to report funding outcomes resulting from prior SBIR and STTR awards. The Company Commercialization Report (CCR) is required for Phase I and Direct to Phase II proposals. Please refer to the DoD SBIR Program BAA for full details on this requirement. Information contained in the CCR will not be considered by DARPA during proposal evaluations.

g. Supporting Documents (Volume 5)

In addition to required DoD documentation and certifications, small businesses may also submit additional documentation to support the Technical Volume (Volume 2) and the Cost Volume (Volume 3) in Volume 5. See Appendix A Introduction for required certifications that must be included in Volume 5. For additional information, see the SBIR 23.4 Annual Program Broad Agency Announcement (BAA) at <https://www.defensesbirsttr.mil/SBIR-STTR/Opportunities/>.

f. Fraud Waste and Abuse (Volume 6)

The Fraud, Waste and Abuse (FWA) training is required for Phase I and Direct to Phase II proposals. FWA training provides information on what represents FWA in the SBIR/STTR program, the most common mistakes that lead to FWA, as well as the penalties and ways to prevent FWA in your firm. This training material must be thoroughly reviewed once per year. Plan ahead and leave ample time to complete this training based on the proposal submission deadline. Knowingly and willfully making any false, fictitious, or fraudulent statements or representations may be a felony under the Federal Criminal False Statement Act (18 U.S.C. Sec 1001), punishable by a fine of up to \$10,000, up to five years in prison, or both. Understanding the indicators and types of fraud, waste, and abuse that can occur is critical for the SBIR/STTR awardees’ role in preventing the loss of research dollars.

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The purpose of Amendment 1 to DARPA Release 9 is to update the proposal due date to 12:00 pm ET, 22 Aug 23

**Defense Advanced Research Projects Agency (DARPA)
DoD 23.4 Small Business Innovation Research (SBIR) Annual BAA
Proposal Submission Instructions Release 9**

INTRODUCTION

To achieve DARPA's mission to create technological surprise, the agency makes strategic, early investments in science and technology that will have long-term positive impacts on our national security. The pace of discovery in both science and technology is accelerating worldwide, resulting in new fields of study and the identification of scientific areas ripe for small business utilization through the SBIR and STTR programs. Small businesses are critical for developing technology to support national security. Proposers are encouraged to consider whether the R/R&D being proposed to DoD Components also has private sector potential, either for the proposed application or as a base for other applications. The topics below focus on technical domains important to DARPA's mission pursuing innovative research concepts that fall within one of its technology offices. More information about DARPA's technical domains and research topics of interest may be found at: <http://www.darpa.mil/about-us/offices>.

Proposers responding to a topic in this BAA must follow all general instructions provided in the Department of Defense (DoD) SBIR Program BAA. DARPA requirements in addition to or deviating from the DoD Program BAA are provided in the instructions below.

Proposers are encouraged to thoroughly review the DoD Program BAA and register for the DSIP Listserv to remain apprised of important programmatic and contractual changes.

- The DoD Program BAA is located at: <https://www.defensesbirsttr.mil/SBIR-STTR/Opportunities/#announcements>. Be sure to select the tab for the appropriate BAA cycle.
- Register for the DSIP Listserv at: <https://www.dodsirsttr.mil/submissions/login>.

Specific questions pertaining to the administration of the DARPA Program and these proposal preparation instructions should be directed to: DARPA Small Business Programs Office at SBIR_BAA@darpa.mil. DSIP Topic Q&A will NOT be available for these DARPA topics. Technical questions related to improving the understanding of a topic's requirements must be submitted to SBIR_BAA@darpa.mil by the deadline listed below.

The following dates apply to this DARPA Topic release:

June 29, 2023: Topic issued for pre-release

July 18, 2023: Topic opens; DARPA begins accepting proposals via DSIP

August 10, 2023: Deadline for technical question submission

August 22, 2023: Deadline for receipt of proposals no later than **12:00 pm ET**

PHASE I PROPOSAL GUIDELINES

The Defense SBIR/STTR Innovation Portal (DSIP) is the official portal for DoD SBIR/STTR proposal submission. Proposers are required to submit proposals via DSIP; proposals submitted by any other means will be disregarded. Detailed instructions regarding registration and proposal submission via DSIP are provided in Appendix A.

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Current Release Award Structure by Topic

| Topic Number | Phase I | | |
|-------------------|------------------|--------------|-----------------------------|
| | Technical Volume | Award Amount | Period of Performance (PoP) |
| HR0011SB20234- 14 | 25 pages | \$275,000 | 6 months |

Technical Volume (Volume 2)

The technical volume is not to exceed 25 pages and must follow the formatting requirements provided in the DoD SBIR Program BAA. Phase I commercialization strategy shall not exceed 5 pages. This should be the last section of the Technical Volume.

Content of the Technical Volume

Proposers should refer to the DARPA Phase I Proposal Instructions, provided in Appendix A.

Cost Volume (Volume 3)

Please see the chart above for award amounts listed by topic. Proposers are required to use the Phase I – Volume 3: Cost Proposal Template (Excel Spreadsheet) provided on the DARPA Small Business site (<https://www.darpa.mil/work-with-us/for-small-businesses/participate-sbir-sttr-program>).

Subcontractors may also submit unsanitized costs using this template directly to DARPA at SBIR-BAA@darpa.mil.

Please review the updated Percentage of Work (POW) calculation details included in the DoD Program BAA. DARPA will occasionally accept deviations from the POW requirements with a letter of explanation or approval from the Funding Agreement officer

Company Commercialization Report (CCR) (Volume 4)

Completion of the CCR as Volume 4 of the proposal submission in DSIP is required. Please refer to the DoD SBIR Program BAA for full details on this requirement. Information contained in the CCR will not be considered by DARPA during proposal evaluations.

Supporting Documents (Volume 5)

In addition to the documents required by DoD, small businesses may also submit additional documentation to support the Technical Volume (Volume 2) and the Cost Volume (Volume 3) in Volume 5. See Appendix A for required certifications that must be included in Volume 5. For additional information, see the SBIR 23.4 Annual Program Broad Agency Announcement (BAA) at <https://www.defensesbirsttr.mil/SBIR-STTR/Opportunities/>.

DIRECT TO PHASE II PROPOSAL GUIDELINES

Proposers should refer to the DARPA Direct to Phase II SBIR XL Proposal Instructions, provided in Appendix B.

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Current Release Award Structure by Topic

| Topics | Period of Performance | Amount |
|---------------------|------------------------------|---------------|
| *HR0011SB20234XL-04 | Base: 12 months | \$ 1,000,000 |
| | Option 1: 6 months | \$ 500,000 |
| | Option 2: 6 months | \$ 1,000,000 |

*For this topic DARPA will accept DP2 proposals with a total maximum cost/price of \$2,500,000. This maximum cost/price includes a 12-month base period not to exceed \$1,000,000, a 6-month Option of \$500,000, and a second 6-month Option minimum of \$500,000. The base period and the minimum funding for the Options (if exercised) are funded entirely by DARPA. Additionally, if the second Option is exercised, DARPA is encouraging the performer to arrange additional program funding with a commercial or government (non-DARPA) partner of up to \$500,000. Any proposed non-DARPA funding agreement must be written, signed, and received by DARPA 60 calendar days before the last day of the period of performance of the base period to permit DARPA sufficient time to access as part of the determination to award the Option effort. DARPA will match up to \$500,000 of non-DARPA funds under a written, signed, and timely submitted agreement. Securing a non-DARPA funding agreement does not obligate DARPA to exercise the Option effort, nor will the lack of a written funding agreement prevent the performer from receiving an Option. DARPA will make option award decisions based on performance and funding availability.

Note that the information in the chart above includes matching funds for Option 2; firms may obtain matching funding at any time during performance of the effort.

Note: Please see Appendix B, section III (d) for complete instructions on the White Paper/Slide Deck technical volume format.

Content of the Technical Volume

Proposers should refer to the DARPA DP2 Proposal Instructions, provided in Appendix A.

Cost Volume (Volume 3)

Please see the chart above for award amounts listed by topic. Proposers are required to use the Direct to Phase II – Volume 3: Cost Proposal Template (Excel Spreadsheet) provided on the DARPA Small Business site (<https://www.darpa.mil/work-with-us/for-small-businesses/participate-sbir-sttr-program>). Subcontractors may also submit unsanitized costs using this template directly to DARPA at SBIR-BAA@darpa.mil.

Please review the updated Percentage of Work (POW) calculation details included in the DoD Program BAA. DARPA will occasionally accept deviations from the POW requirements with a letter of explanation or approval from the Funding Agreement officer.

Company Commercialization Report (CCR) (Volume 4)

Completion of the CCR as Volume 4 of the proposal submission in DSIP is required. Please refer to the DoD SBIR Program BAA for full details on this requirement. Information contained in the CCR will not be considered by DARPA during proposal evaluations.

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Supporting Documents (Volume 5)

In addition to the documents required by DoD, small businesses may also submit additional documentation to support the Technical Volume (Volume 2) and the Cost Volume (Volume 3) in Volume 5. Firms should fill out and upload the DARPA SBIR XL Milestones Template found on the DARPA Small Business website under SBIR/STTR BAA FORMS & TEMPLATES at <https://www.darpa.mil/work-with-us/for-small-businesses/participate-sbir-sttr-program>. See Appendix B for required certifications that must be included in Volume 5. For additional information, see the SBIR 23.4 Annual Program Broad Agency Announcement (BAA) at <https://www.defensesbirstr.mil/SBIR-STTR/Opportunities/>.

PHASE II PROPOSAL GUIDELINES

Phase II proposals may only be submitted by Phase I awardees. Should DARPA have funding available and decide to proceed with a Phase II, proposers awarded a Phase I contract will be eligible to submit a proposal for Phase II and will be contacted to do so by the DARPA Small Business Programs Office at the appropriate time during their Phase I period of performance. Phase II proposals will be evaluated in accordance with the applicable DoD or DARPA SBIR BAA. Phase II selection(s) are at the sole discretion of the government and are subject to funding availability and Phase I performance. Phase II Instructions are available at <https://www.darpa.mil/work-with-us/for-small-businesses/participate-sbir-sttr-program>.

Current Release Award Structure by Topic

| Topic Number | Phase II | | | | |
|------------------|-------------|--------------|-----------------------------|---------------|------------|
| | Tech Volume | Award Amount | Period of Performance (PoP) | Option Amount | Option PoP |
| HR0011SB20234-14 | 45 pages | \$1,200,000 | 18 months | \$600,000 | 24 months |

Technical Proposal shall not exceed 45 pages. Phase II commercialization strategy shall not exceed 5 pages. It should be the last section of the Technical Volume.

DISCRETIONARY TECHNICAL AND BUSINESS ASSISTANCE (TAB A)

DARPA does not offer TAB A funding.

EVALUATION AND SELECTION

All proposals will be evaluated in accordance with the evaluation criteria listed in the DoD SBIR 2023.4 BAA. DARPA will conduct an evaluation of each conforming proposal. Proposals that do not comply with the requirements detailed in this BAA and the research objective(s) of the corresponding topic are considered non-conforming and therefore are not evaluated nor considered for award.

Using the evaluation criteria, the Government will evaluate each proposal in its entirety, documenting the strengths and weaknesses relative to each evaluation criterion, and, based on these identified strengths and weaknesses, determine the proposal's overall selectability. Proposals will not be evaluated against each other during the evaluation process, but rather evaluated on their own individual merit to determine how well the proposal meets the criteria stated in this BAA and the corresponding DARPA topic.

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Awards will be made to proposers whose proposals are determined to be the most advantageous to the Government, consistent with instructions and evaluation criteria specified in the DoD SBIR 2023.4 BAA and availability of funding. Given the limited funding available for each topic released, not all proposals considered selectable will be selected for funding.

For the purposes of this proposal evaluation process, a selectable proposal is defined as follows:

Selectable: A selectable proposal is a proposal that has been evaluated by the Government against the evaluation criteria listed in the DoD SBIR 2023.4 BAA and DARPA topic, and the strengths of the overall proposal outweighs its weaknesses. Additionally, there are no accumulated weaknesses that would require extensive negotiations and/or a resubmitted proposal.

For the purposes of this proposal evaluation process, a non-selectable proposal is defined as follows:

Non-Selectable: A proposal is considered non-selectable when the proposal has been evaluated by the Government against the evaluation criteria listed in the DoD SBIR 2023.4 BAA and DARPA topic, and the strengths of the overall proposal do not outweigh its weaknesses.

Proposing firms will be notified of selection or non-selection status for a Phase I award within 90 days of the closing date of the DoD SBIR 2023.4 BAA. It is the policy of DARPA to treat all proposals as source selection information and to disclose their contents only for the purpose of evaluation. Restrictive notices notwithstanding, during the evaluation process, submissions may be handled by support contractors for administrative purposes and/or to assist with technical evaluation. All DARPA support contractors are expressly prohibited from performing DARPA-sponsored technical research and are bound by appropriate nondisclosure agreements. Input on technical aspects of the proposals may be solicited by DARPA from other Government and/or non-Government consultants/experts who are strictly bound by the appropriate non-disclosure requirements. No submissions will be returned. Upon completion of the evaluation and selection process, an electronic copy of each proposal received will be retained at DARPA.

Proposal titles, abstracts, anticipated benefits, and keywords of proposals that are selected for contract award will undergo a DARPA Policy and Security Review. Proposal titles, abstracts, anticipated benefits, and keywords are subject to revision and/or redaction by DARPA. Final approved versions of proposal titles, abstracts, anticipated benefits, and keywords may appear on the DoD SBIR/STTR awards website and/or the SBA's SBIR/STTR award website (<https://www.sbir.gov/sbirsearch/award/all>).

Refer to the DoD SBIR 2023.4 Program BAA for procedures to protest the Announcement. As further prescribed in FAR 33.106(b), FAR 52.233-3, Protests regarding the selection decision should be submitted to:

DARPA
Contracts Management Office (CMO)
675 N. Randolph Street
Arlington, VA 22203
E-mail: CMO_SBIRProtests@darpa.mil and sbir@darpa.mil

AWARD AND CONTRACT INFORMATION

1. General Award Information

Multiple awards are anticipated. DARPA may award FAR-based government contracts (Firm- Fixed Price or Cost-Plus Reimbursement) or Other Transactions for Prototypes agreement (under the authority of 10 U.S.C. § 4022) subject to approval of the Contracting Officer. The amount of resources made

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available for each topic issued under this BAA will depend on the quality of the proposals received and the availability of funds.

Majority Ownership in Part. Proposers that are more than 50% owned by multiple venture capital operating companies (VCOC), hedge funds (HF), private equity firms (PEF), or any combination of these as set forth in 13 C.F.R. § 121.702, are eligible to submit proposals in response to DARPA topics advertised within this BAA.

For proposers that are a member of this ownership class the following must be satisfied for proposals to be accepted and evaluated:

- a. Prior to submitting a proposal, firms must register with the SBA Company Registry Database.
- b. The proposer within its submission must submit the Majority-Owned VCOC, HF, and PEF Certification. A copy of the SBIR VC Certification can be found on <https://www.darpa.mil/work-with-us/for-small-businesses/participate-sbir-sttr-program>, under SBIR/STTR BAA Forms. Include the SBIR VC Certification in the Supporting Documents (Volume 5).
- c. Should a proposer become a member of this ownership class after submitting its proposal and prior to any receipt of a funding agreement, the proposer must immediately notify the Contracting Officer, register in the appropriate SBA database, and submit the required certification which can be found under SBIR/STTR BAA Forms and Templates on <https://www.darpa.mil/work-with-us/for-small-businesses/participate-sbir-sttr-program>.

The Government reserves the right to select for negotiation all, some, one, or none of the proposals received in response to this announcement and to make awards with or without communications with proposers. Additionally, the Government reserves the right to award all, some, one, or none of the options on the contract(s)/agreement(s) of the performers based on available funding and technical performance. If warranted, portions of resulting awards may be segregated into pre-priced options. Additionally, DARPA reserves the right to accept proposals in their entirety or to select only portions of proposals for award. In the event that DARPA desires to award only portions of a proposal, negotiations may be opened with that proposer. The Government reserves the right to fund proposals in phases with options for continued work, as applicable.

The Government reserves the right to request any additional, necessary documentation once it makes the award instrument determination. The Government reserves the right to remove a proposal from award consideration should the parties fail to reach agreement on award terms, conditions, and price within a reasonable time, and/or the proposer fails to provide requested additional information within three business days.

In all cases, the Government Contracting Officer reserves the right to select award instrument type, regardless of instrument type proposed, and to negotiate all instrument terms and conditions with selectees. DARPA will apply publication or other restrictions, as necessary, if it determines that the research resulting from the proposed effort will present a high likelihood of disclosing performance characteristics of military systems or manufacturing technologies that are unique and critical to defense. Any award resulting from such a determination will include a requirement for DARPA permission before publishing any information or results on the program. For more information on publication restrictions, see the DoD SBIR 2023.4 BAA.

Because of the desire to streamline the award negotiation and program execution process, proposals identified for negotiation will result in negotiating a type of instrument for award that is in the best interest of the Government. In the case of an OT for Prototype agreement under DARPA's authority to

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award OTs for prototype projects, 10 U.S.C. § 4022, use of an OT provides significant opportunities for flexible execution to assist in meeting DARPA's aggressive SBIR/STTR program goals.

All proposers that wish to consider an OT award should carefully read the following:

The flexibility of the OT award instrument is beneficial to the program because the Performer will be able to apply its best practices as required to carry out the research project that may be outside of the Federal Acquisition Regulation (FAR) process-driven requirements. Streamlined practices will be used, such as milestone-driven performance, intended to reduce time and effort on award administration tasks and permit performers to focus on the research effort and rapid prototyping. Because of this ability, OTs provide the Agreements Officer the flexibility to create an award instrument that contains terms and conditions that promote commercial transition, reduce some administratively burdensome acquisition regulations, and meet SBIR/STTR program goals.

Proposers must only propose an OT agreement with fixed payable milestones. Fixed payable milestones are fixed payments based on successful completion of the milestone accomplishments agreed to in the milestone plan. Refer to the Other Transactions for Prototypes Fact Sheet and Other Transaction for Prototype Agreement, available at <https://www.darpa.mil/work-with-us/for-small-businesses/participate-sbir-sttr-program>. Specific milestones will be based upon the research objectives detailed in the topic.

Please see <https://www.darpa.mil/work-with-us/for-small-businesses/participate-sbir-sttr-program> for more information on OTs.

2. Transition and Commercialization Support Program (TCSP)

DARPA will provide services to Phase II or DP2 awardees upon contract execution through the Transition and Commercialization Support Program (TCSP) at no cost to awardees. The TCSP goal is to maximize the potential for SBIR/STTR companies to move their technology beyond Phase II and into other research and development programs for further maturity or into solutions or products for DoD acquisition programs, other Federal programs, and/or the commercial market. Please visit <https://www.darpa.mil/work-with-us/for-small-businesses/commercialization-continued> for more information on DARPA TCSP.

3. Embedded Entrepreneurship Initiative

Awardees of SBIR funding pursuant to this BAA may be eligible to participate in the DARPA Embedded Entrepreneurship Initiative (EEI) during the Period of Performance. Invitation to participate in EEI is at the sole discretion of the Government based on evaluation of technical and commercial factors and subject to program balance and the availability of funding. EEI is a limited scope program offered by DARPA, at DARPA's discretion, to a small subset of awardees. The goal of DARPA's EEI is to increase the likelihood that DARPA-funded technologies take root in the U.S. and provide new capabilities for national defense. EEI supports DARPA's mission "to make pivotal investments in breakthrough technologies and capabilities for national security" by accelerating the transition of innovations out of the lab and into new capabilities for the Department of Defense (DoD). EEI investment supports development of a robust and deliberate Go-to-Market strategy for selling technology product to the government and commercial markets and positions DARPA awardees to attract U.S. investment. The following is for informational and planning purposes only and does not constitute solicitation of proposals to the EEI.

There are three elements to DARPA's EEI: (1) A Senior Commercialization Advisor (SCA) from DARPA who works with the Program Manager (PM) to examine the business case for the awardee's technology and uses commercial methodologies to identify steps toward achieving a successful transition of technology to the government and commercial markets; (2) Connections to potential industry and investor partners via EEI's Investor Working Groups; and (3) Additional funding on an awardee's

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contract for the awardee to hire an embedded entrepreneur to achieve specific milestones in a Go-to-Market strategy for transitioning the technology to products that serve both defense and commercial markets. This embedded entrepreneur's qualifications should include business experience within the target industries of interest, experience in commercializing early-stage technology, and the ability to communicate and interact with technical and non-technical stakeholders. Funding for EEI is typically no more than \$250,000 per awardee over the duration of the award. An awardee may apportion EEI funding to hire more than one embedded entrepreneur, if achieving the milestones requires different expertise that can be obtained without exceeding the awardee's total EEI funding. The EEI effort is intended to be conducted concurrent with the research program without extending the period of performance.

EEI Application Process:

After receiving an award under the solicitation, awardees interested in being considered for EEI should notify their DARPA Program Manager (PM) during the period of performance. Timing of such notification should ideally allow sufficient time for DARPA and the awardee to review the awardee's initial transition plan, identify milestones to achieve under EEI, modify the award, and conduct the work required to achieve such milestones within the original award period of performance. These steps may take 9-18 months to complete, depending on the technology. If the DARPA PM determines that EEI could be of benefit to transition the technology to product(s) the Government needs, the PM will refer the performer to DARPA Commercial Strategy.

DARPA Commercial Strategy will then contact the performer, assess fitness for EEI, and in consultation with the DARPA technical office, determine whether to invite the performer to participate in the EEI. Factors that are considered in determining fitness for EEI include DoD/Government need for the technology; competitive approaches to enable a similar capability or product; risks and impact of the Government's being unable to access the technology from a sustainable source; Government and commercial markets for the technology; cost and affordability; manufacturability and scalability; supply chain requirements and barriers; regulatory requirements and timelines; Intellectual Property and Government Use Rights, and available funding.

Invitation to participate in EEI is at the sole discretion of DARPA and subject to program balance and the availability of funding. EEI participants' awards may be subsequently modified bilaterally to amend the Statement of Work to add negotiated EEI tasks, provide funding, and specify a milestone schedule which will include measurable steps necessary to build, refine, and execute a Go-to-Market technology transition plan aimed at delivering new capabilities for national defense. Milestone examples are available at: <https://www.darpa.mil/work-with-us/contract-management>.

Awardees under this solicitation are eligible to be considered for participation in EEI, but selection for award under this solicitation does not imply or guarantee participation in EEI.

For more information please refer to the EEI website <https://eei.darpa.mil/>.

4. DARPA Toolbox Initiative

DARPA Toolbox is an Agency-wide effort to provide open licensing opportunities with commercial technology vendors to the researchers behind DARPA programs. DARPA Toolbox provides easy, low-cost, scalable access to state-of-the-art tools and intellectual property (IP) under predictable legal terms and streamlined acquisition procedures. The goal is to reduce performer reliance on low-quality, low-cost tools and IP that increase execution risks and complicate post-DARPA transitions.

Through this initiative, DARPA performers are granted access to select vendor tools and technologies throughout the life of their contractual relationship with the Agency. The Toolbox suppliers bring to the

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table proven technologies commonly used in state-of-the art commercial microelectronics or system design methodologies.

DARPA Toolbox program information and a full list of participating suppliers can be found at <https://www.darpa.mil/work-with-us/darpa-toolbox-initiative>. If there are tool or technologies of interest, contact the Supplier POC listed for the product, referencing the DARPA Toolbox Initiative. The Supplier POC will provide advice on products and pricing information. Include any non-production pricing quotes in your proposal. Products and pricing are between you and the suppliers – *do not* contact DARPA directly.

ADDITIONAL INFORMATION

DARPA intends to use electronic mail for all correspondence regarding these topics. Questions related to the technical aspect of the research objectives and awards specifically related to a topic should be emailed to SBIR_BAA@darpa.mil. Please reference the topic number in the subject line. All questions must be in English and must include the name, email address, and the telephone number of a point of contact.

DARPA will attempt to answer questions in a timely manner; however, questions submitted within seven (7) calendar days of the proposal due date listed herein may not be answered. DARPA will post a consolidated Frequently Asked Questions (FAQ) document. To access the posting please visit: <http://www.darpa.mil/work-with-us/opportunities>. Under the topic number summary, there will be a link to the FAQ. The FAQ will be updated on an ongoing basis until one week prior to the proposal due date.

Technical support for the Defense SBIR/STTR Innovation Portal (DSIP) is available Monday through Friday, 9:00 a.m. – 5:00 p.m. ET. Requests for technical support must be emailed to DoDSBIRSupport@reisystems.com with a copy to SBIR_BAA@darpa.mil.

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DARPA SBIR 23.4 Topic Index

Release 9

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| HR0011SB20234XL-04 | Fast, Light, Airworthy, Repackable Parachute (FLARE) - SBIR XL |

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HR0011SB20234-14 TITLE: Canopies for High-speed Ultra-Long Terrain Execution (CHUTE)

OUSD (R&E) CRITICAL TECHNOLOGY AREA(S): Advanced Materials, Human-Machine Interfaces

OBJECTIVE: Design, develop and demonstrate a proof-of-concept ram-air parachute specifically capable of low-altitude (<1000 feet) and long-distance (>10 km) flight, in a parachute rig weighing <50 kg. Such parachute systems will need to be capable of forcing air into parachute cells to keep them inflated during flight over long distances, with ultimate range being a function of the capabilities of this forced air system. Proposers should include any testing capabilities needed to verify that the modified canopy is in an airworthy (jumpable) configuration, without significant impact to the probability of a successful opening.

DESCRIPTION: Parachute technology has evolved (Figure 1) since the creation of round canopies, which slow the rate of descent by creating drag. Ram-air canopies, developed in the 1970s, have inflatable parallel cells that fill with high-pressure air from vents that face forward on the leading edge of the airfoil. The fabric is shaped, and the parachute lines trimmed under load, such that the ballooning fabric inflates into a cambered airfoil shape. Air must flow faster over the top than the bottom, creating lift in addition to drag, and allowing steerability by controlled deflection of air. The use of airplane terminology is no accident; ram-air canopy designs share many features with airplane wings.

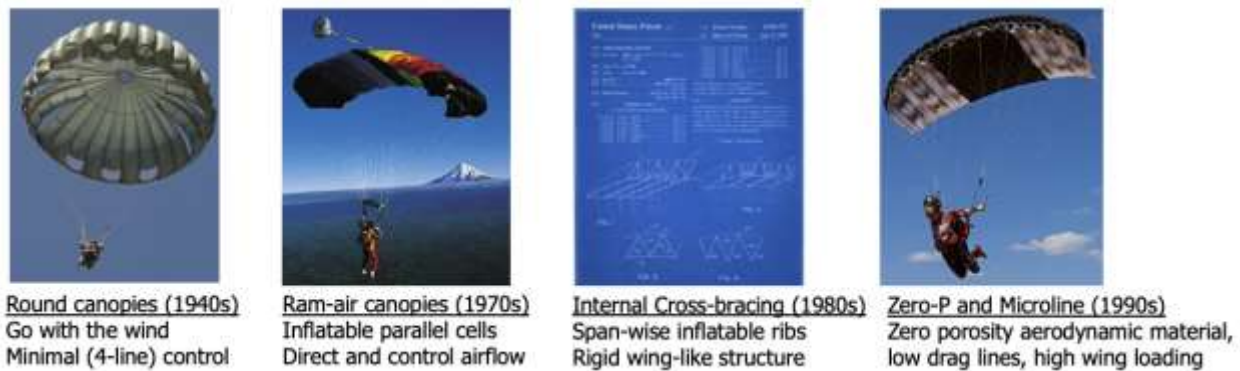


Figure 1. Evolution of parachute technology, demonstrating the steady growth toward rigid wing-like structures. CHUTE aims to redesign the canopy wing for long-distance, low-altitude flight with an airplane philosophy in mind.

In order to create a new paradigm for quiet, long-distance, low-altitude flight using parachutes, DARPA seeks to leverage recent advances in aerodynamics and materials technology to develop cost-effective ram-air parachutes that deliver a revolutionary leap in the distance that can be traversed, without significantly adding to the mass of the overall parachute rig or impacting its airworthiness (defined here as “jumpability”, the probability of a successful parachute opening).

Today’s state of the art is dynamic, maneuverable cross-braced canopies used in the competitive high-speed sport of parachute swooping. Swooping canopies can generate speeds in excess of 70 miles per hour, traverse lengths greater than a football field at one foot above ground level (AGL), change direction abruptly when flying around “gates”, and land on a specific target with accuracy. Zero porosity aerodynamic parachute material, span-wise inflatable ribs, low drag lines, a more rigid wing-like design, and high wing loading allow finer control in close proximity to the ground, sometimes simply by shifting weight in the harness. However, modern parachutes ultimately remain a prisoner to energy conservation. Swoopers generate high kinetic energy by trading for potential energy (altitude over a drop zone). When

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this kinetic energy is exhausted, they must land, placing physics limits on speed and distance they can traverse.

Powered paragliders are one way that sustained flight may be possible. However, three limitations place constraints on the use of these systems for military operations: noise, weight and speed. Powered paragliders can create in excess of 120 dB of sound, typically weigh >250 lbs, and have large parafoils with dozens of cells, resulting in parasitic drag that limits sustained speed to <30 mph. Powered paragliders are therefore out of scope for this effort. The Joint Precision Aerial Descent System (JPADS) has used winches, wires and pulleys located below the parachute to demonstrate lightweight, adjustable airflow control on round parachutes, but is ultimately constrained by the round canopy's limited maneuverability. Round canopies are therefore out of scope for this effort. Concepts that rely exclusively on powered cargo and do not add propulsion to the parachute canopy (e.g. LRPADS [2]) are out of scope. For more information on this topic, see https://www.youtube.com/watch?v=7_kqMjz94B8.

PHASE I: Phase I consists of a base period of six months that will result in the development, design, and refinement of a low-mass (<50 kg) parachute system design capable of long-distance (>10 km) flight, to create continuously inflated parachute cells at altitudes of 1000-3000 ft. AGL.

Successful proposals for this SBIR offering must make significant arguments supporting the ability to rapidly iterate and execute to meet the timelines laid out in this solicitation, while addressing three key aspects of the program goals: (1) how the method of powered propulsion or forced air will be integrated into the parachute wing and/or jumper; (2) to what degree such propulsion interacts with, or relies upon, ground effect aerodynamics and canopy wing design; (3) how the parachute and powered propulsion system will be built and tested via real-world jump operations planned for Phase II. Successful proposals will also demonstrate in-depth knowledge of aerodynamic design and parachute fabrication, and should illustrate how their method might be expected to meet the envisioned metrics.

This effort is expected to primarily center around new active airflow control and/or powered motor methods, that are conformally integrated with ram-air parachutes and allow sustained flight for as long as that control or power is provided. Methods such as adjustable inlet control, battery-powered bleed air for directional control, laminar flow injection, boundary layer control to maintain lift across long traverse distances, or other innovative methods, are suitable for investigation. Recent developments have shown that designed geometric openings can create macro-control with new wing shapes, or the opening/closing of slots or voids for air flow (e.g., ram air parachutes with controllable flaps for directional control). Additional efforts to minimize drag may be required to maximize range.

Phase I fixed payable milestones for this program should include:

Phase I Base period (required): 6 months

- Month 2: Concept Design Review (CoDR) on powered parachute design, in accordance with the metrics below.
- Month 4: Preliminary Design Review (PDR). Initial report on “do no harm” probability.
- Month 6: Critical Design Review (CDR). Interim report on “do no harm” probability, scalability, proposed cost and noise estimates. Present initial test and evaluation plan, hardware purchase plan, and safety plan for Phase II testing.

Performers may perform lab or bench-scale testing to increase design fidelity as desired, as long as this does not negatively impact the design review schedule. Performers will work with DARPA to identify potential transition partners for demonstrations in Phase II. Performers will present plans to manufacture prototype parachute(s) and test them in Phase II.

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Phase I metrics: Present the design, at a CDR level, of a parachute system that can:

- Deliver air to canopy cells, or use other innovative methods, to maintain sustained parachute canopy flight at an altitude of >500 ft. AGL and <3000 ft. AGL (<5000 ft. MSL),
- Do so for a horizontal flight distance greater than 10 km from the point of engagement,
- Do so in less than 20 seconds from a manual initiation command,
- Do so while preserving total mass of the parachute rig (to include a reserve parachute) at <50 kg,
- If weight is added to the body of the jumper, add no more than 50 lbs. to the weight of the jumper,
- Be capable of being engaged while airborne, and disengaged via manual control in order to land as needed,
- Maintain a forward speed of at least 20 mph, at an altitude of >500 ft. AGL and <3000 ft. AGL (<5000 ft. MSL),
- Determine the probability of a successful opening of the prototype, i.e., demonstrate “do no harm” with the added mechanism(s) to existing opening probability when in a rigger-approved, properly packed configuration.
- Present estimates of the noise generated by the system in flight, in decibels (dB),
- Present scalability calculations for maximum projected range, with added mass,
- Present the proposed cost of the parachute system when produced at scale, as demonstrated via techno-economic analysis of the cost of production, in dollars per parachute rig.
- Systems may use initiation energy from a parachute dive that increases velocity (e.g., a diving sloop that trades potential energy for kinetic energy), but may not use such methods when at the flight altitude.

Proposers must begin their effort with an experienced, licensed parachute rigger team, with significant practical experience in parachute packing, repair, evaluation, and modification. Additionally, by the end of Phase I, proposers should demonstrate the following:

- To show available expertise for Phase II fabrication of the proposed design: teaming with an existing commercial parachute manufacturer that has sold at least 5,000 airworthy canopy units;
- To conduct jump testing in Phase II: teaming with an existing US Parachute Association (USPA) compliant drop zone [1].

PHASE II: The Phase II effort consists of a base period of 12 months, an Option 1 period of 12 months and an Option 2 period of 12 months. The Option 2 period will follow the Option 1 period. DARPA reserves the right to release a separate Direct to Phase II (DP2) SBIR solicitation in lieu of exercising either Option.

Testing in the base period will center around design, feasibility testing and proof-of-concept. Experimental assessments of ram-air generation, and interaction with parachute cells, may also be necessary to demonstrate a proof of concept. Testing in the option periods will expand the maximum range, reduce noise, and conduct a challenge-based flyoff (Figure 2).

Phase II fixed payable milestones for this program should include:

- Base period: 12 months
 - Month 4: Bench Testing Review (BTR). First prototype ready for bench testing at parachute manufacturer facility. Deliver assessments of the degree of maneuverability and speed, and experimentally demonstrate key components that produce parachute cell inflation. Deliver interim report on trade studies, integration of hardware to canopy and canopy to rig, and system design. Present final test and evaluation plan, and safety plan for testing.

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- Month 9 (optional; dummy real-world jumps may be substituted to achieve the same end goal): Complete wind tunnel testing. Deliver interim report, describing results of wind tunnel testing, design iterations, and manufacturing results.
- Month 12: Complete first round of dummy parachute jumps to evaluate airworthiness. Test Readiness Board (TRB) and Safety Review Board (SRB) to determine criteria for human jump testing, to include safety mitigation plans. Present readiness for live test to DARPA.
- Option 1 (Initial test jumps): 12 months
 - Month 16: Complete dummy parachute jumps to evaluate airworthiness. Go/no-go for human jump testing, to include updated safety mitigation plans.
 - Month 22: Complete jump testing at USPA approved drop zone. Demonstrate steadily decreasing altitudes and steadily increasing ranges. Demonstrate at least 5 km. straight-line range at >500 ft. AGL and <2500 ft. AGL, in a parachute rig weighing <50 kg, and document real-world noise level (dB) in excess of the ambient.
 - Month 24: Update Phase II report documenting powered parachute system design and testing results, future specifications, manufacturing process, and evaluation of airworthiness. Evaluate cost of full-rate production using partner parachute manufacturer facilities.
- Option 2 (Advanced test jumps): 12 months
 - Month 27: Demonstrate ability to perform ± 50 feet of in-flight altitude adjustment by manual control. Demonstrate ability to interrupt/disengage the actuation system in order to land immediately. Test modifications to reduce sound level. Prepare expanded version of actuation system for long-range testing.
 - Month 30: Parachuting Challenge flyoff 1 (interim, home drop zone). Long-range (at least 8 km), low-altitude (maximum of 1500 ft. AGL) jump testing at USPA approved drop zone.
 - Month 33: Parachute Challenge flyoff 2 (final, DARPA-selected drop zone). Maximum feasible range, low-altitude (maximum of 1000 ft. AGL) jump testing. Measure sound addition to the ambient noise level; validate <50 kg. total rig weight.
 - Month 36: Final Phase II report documenting powered parachute system design and testing results, manufacturing process, and verifications of airworthiness. Demonstrate long-distance, low-altitude system for Department of Defense observers and customers. Present future commercialization plans.

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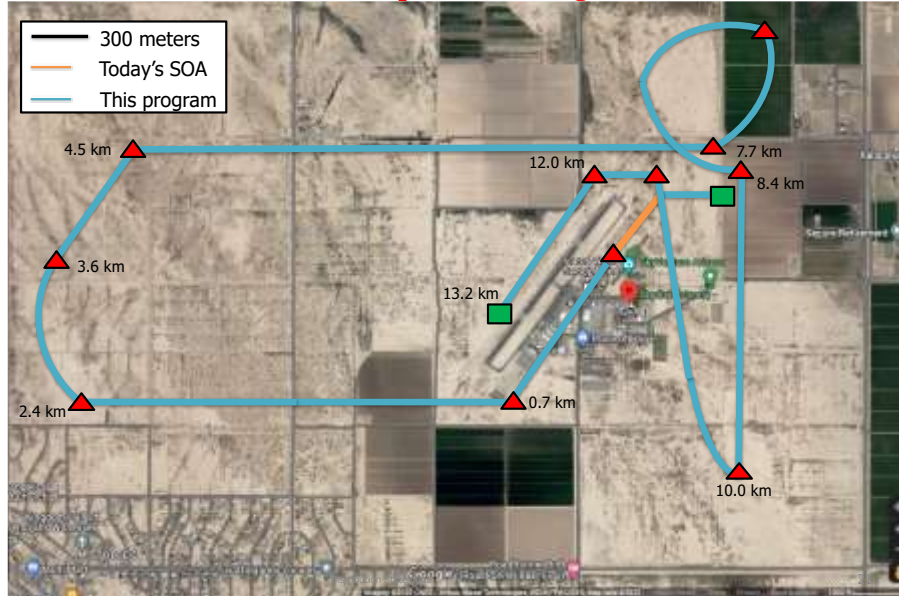


Figure 2. A notional Parachute Challenge flyoff course, demonstrating long-distance legs and steadily increasing sharpness of turns / smaller turn radius. The first challenge will occur at the performer's partner drop zone. The second challenge will occur at a drop zone of DARPA's choosing (SOA: state of the art).

PHASE III DUAL USE APPLICATIONS: Ram-air parachute technology is currently at high technology readiness level and in full-rate production for both military and civilian uses. Multiple commercial and DoD applications are envisioned after the successful demonstration of a powered parachute prototype.

1. DoD use by Special Operations Command. The ability to use designed systems for silent, low-altitude ingress is expected to have significant ramifications for pararescue jumpers and military special operators. The ability to separate landing zones (LZ) from targets by over 10 km will allow significant freedom to ingress route planning, and place less demand on helicopter aircraft to place themselves in harm's way to deliver operators to their LZs.
2. Commercial use by US Parachute Association, and other international skydiving entities. Cross-braced canopies has created the sport of parachute swooping, which today boasts national and international championships, and the creation of over 20 distinct parachute designs, each of which has sold over 5,000 units at costs of >\$4,000 USD per piece. A safe, powered parachute system is expected to revolutionize modern recreational skydiving and create a significant market for parachutes that can do more than simply land where the wind, and existing kinetic energy, dictate. The products delivered in this effort will create a new sport with significant mass-market attraction, and there is a viable business model from the skydiver audience – for example, the US Parachute Association alone has over 35,000 members.

REFERENCES:

1. [1] USPA Dropzone Locator, United States Parachute Association. <https://uspa.org/DZlocator>
2. [2] Long Range Precision Aerial Delivery System (LRPADS). <https://ombra.us/product/long-range-precision-aerial-delivery-system/>

KEYWORDS: Systems Level, Handling, Product Design, System

TPOC-1: DARPA BAA Help Desk
Email: SBIR_BAA@darpa.mil

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HR0011SB20234XL-04

TITLE: Fast, Light, Airworthy, Repackable Parachute (FLARE) - SBIR XL

OUSD (R&E) CRITICAL TECHNOLOGY AREA(S): Advanced Materials, Human-Machine Interfaces

OBJECTIVE: Develop and demonstrate a proof-of-concept ram-air parachute specifically designed to provide automated repacking of an unpacked canopy for special operations and other applications. The prototype should include fabricated hardware integrated into a commercially available parachute rig, and should support repacking on a fast timeline (<60 seconds), with the addition of no more than 20% of the mass of the parachute rig. Proposers should include any testing capabilities needed to verify that the modified canopy is in an airworthy (jumpable) configuration, without significant impact to the probability of a successful opening.

DESCRIPTION: Parachutes are used by the Department of Defense in ejection seats (e.g., the F-16 ACES II system), for special operations ingress, and advance airdrop (Figure 1).

If ejecting behind enemy lines becomes necessary, particularly in time-critical scenarios, a large open canopy on the ground can be an indicator to the location of downed aircrew. The ability to trigger an automated repack of this parachute, without impacting its airworthiness and probability of successful opening, is desired. Special operators plan parachute ingress routes to allow sufficient distance from the target to land and manually pack the parachute. The ability to trigger a time-critical repack to minimize ground footprint could significantly change route planning and allow a landing closer to a target for maximum impact. Finally, logistics airdrops from an airborne platform are capable of delivering large amounts of mass to areas of engagement, but leave a large footprint; the ability to minimize this footprint to support special operations is also of interest to the Department of Defense.



Figure 1. Three scenarios that benefit from repackable parachutes: Downed aircrew (left), special operations ingress (center), and advance logistics airdrops (right).

For more information on this topic, see <https://www.youtube.com/watch?v=YXBjhBVaxpw>.

PHASE I: This is a Direct to Phase II (DP2) topic only. In order to demonstrate that Phase I feasibility has been met, proposers should demonstrate the following:

- To show available expertise for immediate fabrication of the proposed design: teaming with an existing commercial parachute manufacturer that has sold at least 5,000 airworthy canopy units;
- An initial design with detailed descriptions of physical mechanisms that shows the ability to retract and stow parachute lines into the container;
- To conduct jump testing: teaming with an existing US Parachute Association (USPA) compliant drop zone [1];
- An experienced, licensed parachute rigger team with significant practical experience in parachute packing, repair, evaluation, and modification

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PHASE II: The Phase II effort consists of a DP2 base period of 12 months, an Option 1 (required) period of 6 months and an Option 2 (optional) period of 6 months. The Option 2 period will follow the Option 1 period. Testing in the base and Option 1 periods will be conducted on ram-air canopies, to preserve maximum aerodynamic flexibility. Testing in the Option 2 period will be conducted on round canopies, and evaluate the jumpability (defined here as the probability of a successful parachute opening, with the addition of the repacking mechanism) of repacked ram-air parachutes.

In this effort, proposers will design and develop a jumpable, repackable parachute prototype that will:

- Repack an opened parachute into its container using electromagnetic, mechanical or other mechanisms, Do so in less than 60 seconds from a manual initiation command,
- Do so while adding less than 20% mass to an existing commercially available parachute rig,
- Determine the probability of a successful opening of the prototype before automated repacking, i.e., demonstrate that the added repacking mechanism “does no harm” to existing opening probability when in a rigger-approved, properly packed configuration,
- Characterize the probability of a successful opening of the prototype after automated repacking, toward potential future commercialization opportunities.

It is expected that designed repackable parachutes will need to be test jumped in order to support the goals of this effort. Proposers should describe their ability to work with parachute test jumpers, at appropriate drop zones, in order to accomplish statistical significance on the probability of a successful parachute opening with added repacking mechanisms. The wide number of commercially available parachuting rigs for recreational skydiving, and the high reliability of belly-mounted and rig-mounted reserve parachutes, allow for a rapid cycle of design-test-fly-redesign that proposers should plan to leverage.

The minimum deliverable will be an airworthy, repackable proof-of-concept parachute prototype in a complete rig (i.e., with a container, main and reserve parachute, and other accompanying hardware).

Phase II fixed payable milestones for this program should include:

Base period (required): 12 months

- Month 2: Concept Design Review (CoDR) on repackable parachute design, with hardware purchase plan and initial test and evaluation plan;
- Month 6: Bench Testing Review (BTR). First prototype ready for bench testing at parachute manufacturer facility. Interim report on trade studies, integration of hardware to canopy and canopy to rig, and system design. Present final test and evaluation plan, and safety plan for testing.
- Month 9 (optional; dummy real-world jumps may be substituted to achieve the same end goal): Complete wind tunnel testing. Deliver interim report, describing results of wind tunnel testing, design iterations, and manufacturing results.
- Month 12: Complete first round of dummy parachute jumps to evaluate airworthiness. Test Readiness Board (TRB) and Safety Review Board (SRB) to determine go/no-go for human jump testing, to include safety mitigation plans. Present readiness for live test to DARPA.

Option 1 (Initial test jumps) (required): 6 months

- Month 15: Complete initial phase of ram-air canopy jump testing at USPA approved drop zone.
- Month 17: Complete final phase of ram-air canopy jump testing.
- Month 18: Update Phase II report documenting repackable parachute system design and testing results, future specifications, manufacturing process, and verification of airworthiness. Demonstrate repackable system for Department of Defense observers and customers. Present

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scaling plans to large canopies (airdrop size) and high-impact loading canopy (ejection seats) applications. Evaluate cost of full-rate production using partner parachute manufacturer facilities.

Option 2 (Advanced test jumps) (optional): 6 months

- Month 20: Present TRB and SRB, with results from bench testing, of large (>500 sq. ft) repackable round canopies. Present re-design for repackable and rejumpable ram-air designs.
- Month 23: Update interim report to include results of test jumps. Large round canopy jump testing at USPA approved drop zone. Dummy parachute jump testing to evaluate airworthiness of previously repacked parachutes at USPA approved drop zone.
- Month 24: Final Phase II report documenting repackable parachute system design and testing results, parachute manufacturing process, and verifications of airworthiness. Demonstrate round and ram-air repackable system for Department of Defense observers and customers. Present future commercialization plans.

Successful proposals for this SBIR offering must make significant arguments supporting the ability to rapidly iterate and execute to meet the timelines laid out in this solicitation.

PHASE III DUAL USE APPLICATIONS: Ram-air and round parachute technology are currently at high technology readiness level and in full-rate production for both military and civilian uses. Adding the capability for rapid, on-command repack while maintaining the reliability and performance of existing parachute systems, and enabling tactics centered around advance logistics airdrops to support special operations, would attract attention from US Special Operations Command (USSOCOM), Air Combat Command (ACC), and similar agencies within the Department of Defense.

It is fully anticipated that this technology would have simultaneous, broad applicability to the members of the US Parachute Association (USPA) and the international Fédération Aéronautique Internationale (World Air Sports Federation) that regulates and encourages the recreational skydiving community around the world. The products delivered in this effort are expected to be directly applicable to an existing sport with significant mass-market attraction, and a viable business model from the skydiver audience – for example, the US Parachute Association alone has over 35,000 members.

REFERENCES:

1. [1] USPA Dropzone Locator, United States Parachute Association. <https://uspa.org/DZlocator>

KEYWORDS: Systems Level, Handling, Product Design, System

TPOC-1: DARPA BAA Help Desk

Email: SBIR_BAA@darpa.mil

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Appendix A: DARPA PHASE I PROPOSAL INSTRUCTIONS

I. Introduction

A complete proposal submission consists of:

Volume 1: Proposal Cover Sheet

Volume 2: Technical Volume

Volume 3: Cost Volume

Volume 4: Company Commercialization Report

Volume 5: Supporting Documents

a. Contractor Certification Regarding Provision of Prohibition on Contracting for Certain Telecommunications and Video Surveillance Services or Equipment (Attachment 1)

MANDATORY

b. Disclosures of Foreign Affiliations or Relationships to Foreign Countries (Attachment 2)

MANDATORY

c. Verification of Eligibility of Small Business Joint Ventures (Attachment 3), if applicable

d. Disclosure of Funding Sources (Attachment 4) MANDATORY

e. Other supporting documentation

A completed proposal submission in DSIP does NOT indicate that the mandatory supporting documents have been uploaded. It is the responsibility of the proposing small business concern to ensure that the mandatory documents listed above have been uploaded and included with the proposal submission.

Volume 6: Fraud, Waste and Abuse Training

The Defense SBIR/STTR Innovation Portal (DSIP) provides a structure for building the proposal volumes and submitting a consolidated proposal package. If this is your first time submitting an SBIR or STTR proposal using DSIP, please review detailed training guides at

<https://www.dodsbirsttr.mil/submissions/learning-support/training-materials>. It is the responsibility of the proposing firm to ensure that a complete proposal package is certified and submitted by the close date listed in the TOPIC to which they are responding.

To assist in proposal development, templates for Volume 2: Technical Volume and Volume 3: Cost Volume have been provided as attachments on the DARPA Small Business website, under SBIR/STTR BAA Forms & Templates at <https://www.darpa.mil/work-with-us/for-small-businesses/participate-sbir-sttr-program>. Use of the DARPA Cost Proposal template is mandatory.

II. Proprietary Information

Proposers that include in their proposals data that they do not want disclosed to the public for any purpose, or used by the Government except for evaluation purposes, shall follow instructions in the DoD SBIR 2023.4/STTR 2023.D BAA regarding marking proprietary proposal information.

III. Phase I Proposal Instructions

a. Proposal Cover Sheet (Volume 1)

The Cover Sheet must include a brief technical abstract of no more than 3000 characters that describes the proposed R&D project with a discussion of anticipated benefits and potential commercial applications. **Do not include proprietary or classified information in the Proposal Cover Sheet.** If your proposal is selected for award, the technical abstract and

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discussion of anticipated benefits may be publicly released.

b. Format of Technical Volume (Volume 2)

1. Type of file: The Technical Volume must be a single Portable Document Format (PDF) file, including graphics. Perform a virus check before uploading the Technical Volume file. If a virus is detected, it may cause rejection of the proposal. **Do not lock or encrypt the uploaded file. Do not include or embed active graphics such as videos, moving pictures, or other similar media in the document.**
2. Length: The length of the technical volume will be specified by the corresponding topic. The Government will not consider pages in excess of the page count limitations.
3. Layout: Number all pages of your proposal consecutively. Font size should not be smaller than 10-point on standard 8-1/2" x 11" paper with one-inch margins. The header on each page of the Technical Volume should contain your company name, topic number, and proposal number assigned by DSIP when the Cover Sheet was created. The header may be included in the one-inch margin. Please refer to the attachment titled Phase I Template – Volume 2: Technical Volume at <https://www.darpa.mil/work-with-us/for-small-businesses/participate-sbir-sttr-program> for additional details.

c. Content of the Technical Volume (Volume 2)

The Technical Volume should cover the following items in the order given below:

1. **Identification and Significance of the Problem or Opportunity.** Define the specific technical problem or opportunity addressed and its importance.
2. **Phase I Technical Objectives.** Enumerate the specific objectives of the Phase I work, including the questions the research and development effort will try to answer to determine the feasibility of the proposed approach.
3. **Phase I Statement of Work (including Subcontractors' Efforts)**
 - a) Provide an explicit, detailed description of the Phase I approach. The Statement of Work should indicate what tasks are planned, how and where the work will be conducted, a schedule of major events, and the final product(s) to be delivered. The Phase I effort should attempt to determine the technical feasibility of the proposed concept. The methods planned to achieve each objective or task should be discussed explicitly and in detail. This section should be a substantial portion of the Technical Volume section.
 - b) The topic may have been identified by the Program Manager as research or activities involving Human/Animal Subjects and/or Recombinant DNA. In the event that Phase I performance includes performance of these kinds of research or activities, please identify the applicable protocols and how those protocols will be followed during Phase I. Please note that funds cannot be released or used on any portion of the project involving human/animal subjects or recombinant DNA research or activities until all of the proper approvals have been obtained (see DoD SBIR 2023.4/STTR 2023.D BAA).

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4. **Related Work.** Describe significant activities directly related to the proposed effort, including any conducted by the PI, the proposing firm, consultants, or others. Describe how these activities interface with the proposed project and discuss any planned coordination with outside sources. The technical volume must persuade reviewers of the proposer's awareness of the state-of-the-art in the specific topic. Describe previous work not directly related to the proposed effort but similar. Provide the following: (1) short description, (2) client for which work was performed (including individual to be contacted and phone number), and (3) date of completion.

5. **Relationship with Future Research or Research and Development**
 - a) State the anticipated results of the proposed approach if the project is successful.
 - b) Discuss the significance of the Phase I effort in providing a foundation for Phase II research or research and development effort.
 - c) Identify the applicable clearances, certifications and approvals required to conduct Phase II testing and outline the plan for ensuring timely completion of said authorizations in support of Phase II research or research and development effort.

6. **Key Personnel.** Identify key personnel who will be involved in the Phase I effort including information on directly related education and experience. A concise technical resume of the PI, including a list of relevant publications (if any), must be included (Please do not include Privacy Act Information). All resumes will count toward the page limit for Volume 2, as specified in the topic.

7. **Foreign Citizens.** Identify any foreign citizens or individuals holding dual citizenship expected to be involved on this project as a direct employee, subcontractor, or consultant. For these individuals, please specify their country of origin, the type of visa or work permit under which they are performing and an explanation of their anticipated level of involvement on this project. Refer to DoD SBIR 2023.4/STTR 2023.D BAA for more information.

Supplemental information provided in response to this paragraph will be protected in accordance with the Privacy Act (5 U.S.C. 552a), if applicable, and the Freedom of Information Act (5 U.S.C. 552(b)(6)).

8. **Facilities/Equipment.** Describe available instrumentation and physical facilities necessary to carry out the Phase I effort. Justify equipment purchases in this section and include detailed pricing information in the Cost Volume. State whether or not the facilities where the proposed work will be performed meet environmental laws and regulations of federal, state (name), and local Governments for, but not limited to, the following groupings: airborne emissions, waterborne effluents, external radiation levels, outdoor noise, solid and bulk waste disposal practices, and handling and storage of toxic and hazardous materials.

9. **Subcontractors/Consultants.** Subcontractor means any supplier, distributor, vendor, firm, academic institution, research center, or other person or entity that furnishes supplies or

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services pursuant to a subcontract, at any tier. Involvement of a university or other subcontractors or consultants in the project may be appropriate. If such involvement is intended, it should be identified and described according to the Cost Breakdown Structure at <https://www.dodsbirsttr.mil/submissions/learning-support/firm-templates>. Please refer to DoD SBIR 2023.4/STTR 2023.D BAA for detailed eligibility requirements as it pertains to the use of subcontractors/consultants.

10. **Prior, Current, or Pending Support of Similar Proposals or Awards.** If a proposal submitted in response to a corresponding topic is substantially the same as another proposal that was funded, is now being funded, or is pending with another Federal Agency, or another DoD Component or DARPA, you must reveal this on the Proposal Cover Sheet and provide the following information:
- a) Name and address of the Federal Agency(s) or DoD Component to which a proposal was submitted, will be submitted, or from which an award is expected or has been received.
 - b) Date of proposal submission or date of award.
 - c) Title of proposal.
 - d) Name and title of the PI for each proposal submitted or award received.
 - e) Title, number, and date of BAA(s) or solicitation(s) under which the proposal was submitted, will be submitted, or under which award is expected or has been received.
 - f) If award was received, state contract number.
 - g) Specify the applicable topics for each proposal submitted or award received.

Note: If this does not apply, state in the proposal "No prior, current, or pending support for proposed work."

11. **Transition and Commercialization Strategy.** DARPA is equally interested in dual use commercialization of SBIR/STTR project results to the U.S. military, the private sector market, or both, and expects explicit discussion of key activities to achieve this result in the transition and commercialization strategy part of the proposal. Phase I is the time to plan for and begin transition and commercialization activities. The small business must convey an understanding of the market, competitive landscape, potential stakeholders and end-users, and preliminary transition path or paths to be established during the Phase I project. The Phase I transition and commercialization strategy shall not exceed 5 pages.

It should be the last section of the technical volume and include the following elements:

- a) **A summary of transition and commercialization activities conducted during prior SBIR/STTR efforts if applicable, and the Technology Readiness Level (TRL) achieved.**
- b) **Problem or Need Statement.** Briefly describe the problem, need, or requirement, and its significance relevant to a Department of Defense application and/or a private sector application that the SBIR/STTR project results would address. Is there a broader societal need you are trying to address? Please describe.
- c) **Description of Product(s) and/or System Application(s).** Identify the commercial product(s) and/or DoD system(s), or system(s) under development, or potential new system(s). Identify the potential DoD end- users, Federal customers, and/or private sector customers who would likely use the

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- technology.
- d) **Business Model(s)/Procurement Mechanism(s).** Discuss your current business model hypothesis for bringing the technology to market. Describe plans to license, partner, or self-produce your product. How do you plan to generate revenue? Describe the resources you expect will be needed to implement your business models. Discuss your plan and expected timeline to secure these resources. Understanding DARPA's goal of creating and sustaining a U.S. military advantage, describe how you intend to develop your product and supply chains to enable this differentiation.
 - e) **Target Market.** Describe the market and addressable market for the innovation. Describe the customer sets you propose to target, their size, their growth rate, and their key reasons they would consider procuring the technology. Discuss the business economics and market drivers in the target industry. Describe competing technologies existent today on the market as well as those being developed in the lab. How has the market opportunity been validated? Describe the competition. How do you expect the competitive landscape may change by the time your product/service enters the market?
 - f) **Funding Requirements.** Describe your company's funding history. How much external financing have you raised? Describe your plans for future funding sources (internal, loan, angel, venture capital, etc.).
 - g) **Transition and Commercialization Risks.** Describe the major technology, market and team risks associated with achieving successful transition and commercialization of the DARPA funded technology. DARPA is not afraid to take risks but we want to ensure that our awardees clearly understand the risks in front of them. What are the key risks in bringing your innovation to market? What are actions you plan to undertake to mitigate these risks?
 - h) **Expertise/Qualifications of Team/Company Readiness.** Describe the expertise and qualifications of your management, marketing/business development and technical team that will support the transition of the technology from the prototype to the commercial market and into government operational environments. Has this team previously taken similar products/services to market? If the present team does not have this needed expertise, how do you intend to obtain it? What is the financial history and health of your company (e.g., availability of cash, profitability, revenue growth, etc.)?
 - i) **Anticipated Transition and Commercialization Results.** Include a schedule showing the anticipated quantitative transition and commercialization results from the Phase II project at one year after the start of Phase II, at the completion of Phase II, and after the completion of Phase II (i.e., amount of additional investment, sales revenue, etc.). After Phase II award, the company is required to report actual sales and investment data in its Company Commercialization Report at least annually.

Advocacy Letters (OPTIONAL)* Feedback received from potential Commercial and/or DoD customers and other end-users regarding their interest in the technology to support their capability gaps. Advocacy letters that are faxed or e-mailed separately will NOT be accepted.

Letters of Intent/Commitment (OPTIONAL)* Relationships established, feedback received, support and commitment for the technology with one or more of the following: Commercial customer, DoD PM/PEO, a Defense Prime, or vendor/supplier to the Primes and/or other vendors/suppliers identified as having a potential role in the integration of the technology into

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fielded systems/products or those under development. Letters of Intent/Commitment that are faxed or e-mailed separately will NOT be accepted.

*Advocacy Letters and Letters of Intent/Commitment are optional, and should ONLY be submitted to substantiate any transition or commercialization claims made in the commercialization strategy. Please DO NOT submit these letters just for the sake of including them in your proposal. These letters DO NOT count against any page limit.

In accordance with section 3-209 of DOD 5500.7-R, Joint Ethics Regulation, letters from government personnel will NOT be considered during the evaluation process.

d. Format of Cost Volume (Volume 3)

Proposers are required to use the Phase I – Volume 3: Cost Proposal Template (Excel Spreadsheet) provided at <https://www.darpa.mil/work-with-us/for-small-businesses/participate-sbir-sttr-program>.

e. Content of the Cost Volume (Volume 3)

Some items in the Cost Breakdown Guidance below may not apply to the proposed project. If such is the case, there is no need to provide information on each and every item.

ALL proposed costs should be accompanied by documentation to substantiate how the cost was derived. For example, if you proposed travel cost to attend a project-related meeting or conference, and used a travel website to compare flight costs, include a screen shot of the comparison. Similarly, if you proposed to purchase materials or equipment, and used the internet to search for the best source, include your market research for those items. You do not necessarily have to propose the cheapest item or supplier, but you should explain your decision to choose one item or supplier over another. It's important to provide enough information to allow contracting personnel to understand how the proposer plans to use the requested funds.

If selected for award, failure to include the documentation with your proposal will delay contract negotiation, and the proposer will be asked to submit the necessary documentation to the Contracting Officer to substantiate costs (e.g., cost estimates for equipment, materials, and consultants or subcontractors). It is important to respond as quickly as possible to the Contracting Officer's request for documentation.

Cost Breakdown Guidance:

- List all key personnel by name as well as by number of hours dedicated to the project as direct labor.
- Special tooling and test equipment and material cost may be included. The inclusion of equipment and material will be carefully reviewed relative to need and appropriateness for the work proposed. The purchase of special tooling and test equipment must, in the opinion of the Contracting Officer, be advantageous to the Government and should be related directly to the specific topic. These may include such items as innovative instrumentation and/or automatic test equipment. Title to property furnished by the Government or acquired with Government funds will be vested with DARPA; unless it is determined that transfer of title to the contractor would be more cost effective than

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recovery of the equipment by the DARPA.

- Cost for travel funds must be justified and related to the needs of the project.
- Cost sharing is permitted for proposals under this announcement; however, cost sharing is not required nor will it be an evaluation factor in the consideration of a proposal.
- All subcontractor costs and consultant costs must be detailed at the same level as prime contractor costs in regard to labor, travel, equipment, etc. Provide detailed substantiation of subcontractor costs in your cost proposal. Enter this information in the Explanatory Material section of the on-line cost proposal form. The Supporting Documents Volume (Volume 5) may be used if additional space is needed.

For more information about cost proposals and accounting standards associated with contract awards, see the DCAA publication titled “Audit Process Overview – Information for Contractors” available at <http://www.dcaa.mil>.

f. Company Commercialization Report (Volume 4)

The Company Commercialization Report (CCR) allows companies to report funding outcomes resulting from prior SBIR and STTR awards. The Company Commercialization Report (CCR) is required for Phase I and Direct to Phase II proposals. Please refer to the DoD STTR Program BAA for full details on this requirement. Information contained in the CCR will not be considered by DARPA during proposal evaluations.

g. Supporting Documents (Volume 5)

In addition to required DoD documentation and certifications, small businesses may also submit additional documentation to support the Technical Volume (Volume 2) and the Cost Volume (Volume 3) in Volume 5. See Appendix A Introduction for required certifications that must be included in Volume 5. For additional information, see the SBIR 23.4 Annual Program Broad Agency Announcement (BAA) at <https://www.defensesbirsttr.mil/SBIR-STTR/Opportunities/>.

h. Fraud Waste and Abuse (Volume 6)

The Fraud, Waste and Abuse (FWA) training is required for Phase I and Direct to Phase II proposals. FWA training provides information on what represents FWA in the SBIR/STTR program, the most common mistakes that lead to FWA, as well as the penalties and ways to prevent FWA in your firm. This training material must be thoroughly reviewed once per year. Plan ahead and leave ample time to complete this training based on the proposal submission deadline. Knowingly and willfully making any false, fictitious, or fraudulent statements or representations may be a felony under the Federal Criminal False Statement Act (18 U.S.C. Sec 1001), punishable by a fine of up to \$10,000, up to five years in prison, or both. Understanding the indicators and types of fraud, waste, and abuse that can occur is critical for the SBIR/STTR awardees’ role in preventing the loss of research dollars.

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APPENDIX B: DARPA DIRECT TO PHASE II (DP2) PROPOSAL INSTRUCTIONS

I. Introduction

A complete proposal submission consists of:

Volume 1: Proposal Cover Sheet

Volume 2: Technical Volume (feasibility documentation and technical proposal)

Volume 3: Cost Volume

Volume 4: Company Commercialization Report

Volume 5: Supporting Documents

a. Contractor Certification Regarding Provision of Prohibition on Contracting for Certain Telecommunications and Video Surveillance Services or Equipment (Attachment 1)

MANDATORY

b. Disclosures of Foreign Affiliations or Relationships to Foreign Countries (Attachment 2)

MANDATORY

c. Verification of Eligibility of Small Business Joint Ventures (Attachment 3), if applicable

d. Disclosure of Funding Sources (Attachment 4) **MANDATORY**

e. Other supporting documentation

A completed proposal submission in DSIP does NOT indicate that the mandatory supporting documents have been uploaded. It is the responsibility of the proposing small business concern to ensure that the mandatory documents listed above have been uploaded and included with the proposal submission.

Volume 6: Fraud, Waste and Abuse Training

The Defense SBIR/STTR Innovation Portal (DSIP) provides a structure for building the proposal volumes and submitting a consolidated proposal package. If this is your first time submitting an SBIR or STTR proposal using DSIP, please review detailed training guides at <https://www.dodsbirsttr.mil/submissions/learning-support/training-materials>. It is the responsibility of the proposing firm to ensure that a complete proposal package is certified and submitted by the close date listed in the topic to which they are responding.

To assist in proposal development, templates Volume 3: Cost Volume have been provided as attachments to the announcement posted at <https://www.darpa.mil/work-with-us/for-small-businesses/participate-sbir-sttr-program>. Use of this template is mandatory.

NOTE: All proposers are required to submit Volume 4: Company Commercialization Report (CCR).

II. Proprietary Information

Proposers that include in their proposals data that they do not want disclosed to the public for any purpose, or used by the Government except for evaluation purposes, shall follow instructions in section 4.5 regarding marking propriety proposal information.

III. DP2 Proposal Instructions

a. Proposal Cover Sheet (Volume 1)

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The Cover Sheet must include a brief technical abstract of no more than 3000 characters that describes the proposed R&D project with a discussion of anticipated benefits and potential commercial applications. Do not include proprietary or classified information in the Proposal Cover Sheet. If your proposal is selected for award, the technical abstract and discussion of anticipated benefits may be publicly released.

b. Content of the Technical Volume (Volume 2) – White Paper & Slide Deck

White Paper (NTE 20 pages). Provide the following information:

Goals and Impact: Clearly describe what is being proposed and what difference it will make (qualitatively and quantitatively), including a brief discussion on how this directly relates to the topic.

1. Phase I Feasibility: This topic is accepting Direct to Phase II proposals ONLY. To be eligible, proposers must demonstrate that the feasibility requirements outlined in the topic have been met, and achieved outside of the SBIR program.
2. Technical Plan: Outline and address all technical areas and challenges inherent in the approach and possible solutions for overcoming potential problems. Provide specific objectives, metrics, and milestones at intermediate stages to demonstrate a plan for accomplishment of the project objectives. Propose additional appropriate qualitative and quantitative metrics specific to the approach, as needed. Intermediary milestones should occur at no greater than 1-month increments.
3. Management and Capabilities: Designate key personnel who will be involved in the Phase II effort. Provide a brief summary of expertise of the team, including subcontractors and key personnel. Describe the organizational experience in this technology area, previous work not directly related to the proposed effort but similar, existing intellectual property required to complete the project, and any specialized facilities to be used as part of the project. List Government-furnished materials or data assumed to be available. Describe any specialized facilities to be used as part of the project, the extent of access to these facilities, and any biological containment, biosafety, and certification requirements.
4. Transition and Commercialization Plan:
 - a. Describe the commercial product or DoD system to be developed.
 - b. Discuss the potential end users – DoD, Federal, and/or private sector customers. Discuss your business model for this technology (i.e., how do you anticipate generating revenue with this technology?). Who are you selling to directly or indirectly, a supplier, an integrator, or an end user?
 - c. Describe your company's funding history. Discuss how much additional funding above this proposed effort (include additional required technology development, staffing requirements, infrastructure requirements, IP strategy costs, etc.) that will be required to bring this technology to market and how you anticipate going about getting that funding (e.g., Govt S&T contracts, investment).
 - d. Describe the timeline to maturity for sales or transition to an end user. Describe your IP strategy.
 - e. Describe the technology, market, team and business risks associated with this proposed effort and your plan to mitigate these risks.

Slide Deck (NTE 15 slides). Provide the following information (convert the completed deck to a pdf and attach it to the white paper):

1. What are you trying to do and how does this directly relate to the topic?

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2. Technology and commercial product: Specifically, what are you proposing to produce – software, system, application? Be specific on what your proposed technology development is targeting as an end state.
3. How is the technology approached today? Who is doing the research, development and delivering products/services? What are the current limitations in the technology and commercial marketplaces?
4. Technical and commercial value proposition: How have you substantiated the feasibility of your approach? What is innovative in your approach and how does it compare to the state-of-the-art? Why do you think it will be successful both from a technical and commercial perspective? If you are successful what difference will it make? Discuss your proposed business model – how do you expect to generate revenue from your technology?
5. Technical and commercial risks: What are the key technical and commercial challenges and how do you plan to address/overcome these?
6. Technical and commercial market analysis: Who will care and what will the impact be if you are successful? What/who are the markets/industries/integrators/stakeholders that would/should care?
7. Cost, schedule and milestones: Provide a summary of your cost volume. Provide a summary of your schedule and milestones. How much will your proposed effort cost in total? How long will it take? What are your technical milestones for achieving the proposed efforts? What are your transition and commercialization plan milestones? Discuss how much funding will be required to bring your proposed technology to market and execute on your proposed transition and commercialization plan. Include any funding raised to date and expected plans for raising any additional required funding (government contracting revenue, product sales, internal R&D investment, loan, angel or Venture Capital investment, etc.). Describe timeline to maturity for operational use or commercial sales.
8. Management: Overview of team, facilities and qualifications.
9. Technical summary quad chart: Use template provided at <https://www.darpa.mil/work-with-us/for-small-businesses/participate-sbir-sttr-program>.
10. Commercialization summary quad chart: Use the DARPA Transition and Commercialization Strategy Plan (TCSP) template, located at <https://www.darpa.mil/work-with-us/for-small-businesses/commercialization-continued>.

NOTE: All letters of recommendation and CVs can be loaded in Volume 5: Supporting Documents.

c. Format of Cost Volume (Volume 3)

Proposers are required to use the Direct to Phase II – Volume 3: Cost Proposal Template (Excel Spreadsheet) provided as an attachment to this announcement. The Cost Volume (and supporting documentation) DOES NOT count toward the page limit of the Technical Volume.

d. Content of the Cost Volume (Volume 3)

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Some items in the Cost Breakdown Guidance below may not apply to the proposed project. If such is the case, there is no need to provide information on each and every item.

ALL proposed costs should be accompanied by documentation to substantiate how the cost was derived. For example, if you proposed travel cost to attend a project-related meeting or conference, and used a travel website to compare flight costs, include a screen shot of the comparison. Similarly, if you proposed to purchase materials or equipment, and used the internet to search for the best source, include your market research for those items. You do not necessarily have to propose the cheapest item or supplier, but you should explain your decision to choose one item or supplier over another. It's important to provide enough information to allow contracting personnel to understand how the proposer plans to use the requested funds. If selected for award, failure to include the documentation with your proposal will delay contract negotiation, and the proposer will be asked to submit the necessary documentation to the Contracting Officer to substantiate costs (e.g., cost estimates for equipment, materials, and consultants or subcontractors). It is important to respond as quickly as possible to the Contracting Officer's request for documentation.

Cost Breakdown Guidance:

1. List all key personnel by name as well as by number of hours dedicated to the project as direct labor. Special tooling and test equipment and material cost may be included. The inclusion of equipment and material will be carefully reviewed relative to need and appropriateness for the work proposed. The purchase of special tooling and test equipment must, in the opinion of the Contracting Officer, be advantageous to the Government and should be related directly to the specific topic. These may include such items as innovative instrumentation and/or automatic test equipment. Title to property furnished by the Government or acquired with Government funds will be vested with DARPA; unless it is determined that transfer of title to the contractor would be more cost effective than recovery of the equipment by the DARPA.
2. Cost for travel funds must be justified and related to the needs of the project.
3. Cost sharing is permitted for proposals under this announcement; however, cost sharing is not required nor will it be an evaluation factor in the consideration of a proposal.
4. All subcontractor costs and consultant costs must be detailed at the same level as prime contractor costs in regard to labor, travel, equipment, etc. Provide detailed substantiation of subcontractor costs in your cost proposal. Enter this information in the Explanatory Material section of the on-line cost proposal form. The Supporting Documents Volume (Volume 5) may be used if additional space is needed.

For more information about cost proposals and accounting standards, see the DCAA publication titled "Audit Process Overview – Information for Contractors" available at: <http://www.dcaa.mil>.

e. Company Commercialization Report (Volume 4)

The Company Commercialization Report (CCR) allows companies to report funding outcomes resulting from prior SBIR and STTR awards. The Company Commercialization Report (CCR) is required for Phase I and Direct to Phase II proposals. Please refer to the DoD STTR Program BAA for full details on this requirement. Information contained in the CCR will not be considered by DARPA during proposal evaluations.

f. Supporting Documents (Volume 5)

In addition to required DoD documentation and certifications, small businesses may also submit additional documentation to support the Technical Volume (Volume 2) and the Cost Volume (Volume 3) in Volume 5. Firms should fill out and upload the DARPA SBIR XL Milestones Template found on the

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DARPA Small Business website under SBIR/STTR BAA FORMS & TEMPLATES at <https://www.darpa.mil/work-with-us/for-small-businesses/participate-sbir-sttr-program>. See Appendix B Introduction for **required** certifications that must be included in Volume 5. For additional information, see the SBIR 23.4 Annual Program Broad Agency Announcement (BAA) at <https://www.defensesbirstr.mil/SBIR-STTR/Opportunities/>.

g. Fraud Waste and Abuse (Volume 6)

The Fraud, Waste and Abuse (FWA) training is required for Phase I and Direct to Phase II proposals. FWA training provides information on what represents FWA in the SBIR/STTR program, the most common mistakes that lead to FWA, as well as the penalties and ways to prevent FWA in your firm. This training material must be thoroughly reviewed once per year. Plan ahead and leave ample time to complete this training based on the proposal submission deadline. Knowingly and willfully making any false, fictitious, or fraudulent statements or representations may be a felony under the Federal Criminal False Statement Act (18 U.S.C. Sec 1001), punishable by a fine of up to \$10,000, up to five years in prison, or both. Understanding the indicators and types of fraud, waste, and abuse that can occur is critical for the SBIR/STTR awardees' role in preventing the loss of research dollars.

**Defense Advanced Research Projects Agency (DARPA)
DoD 23.4 Small Business Innovation Research (SBIR) Annual BAA
Proposal Submission Instructions
Release 10**

INTRODUCTION

To achieve DARPA's mission to create technological surprise, the agency makes strategic, early investments in science and technology that will have long-term positive impacts on our national security. The pace of discovery in both science and technology is accelerating worldwide, resulting in new fields of study and the identification of scientific areas ripe for small business utilization through the SBIR and STTR programs. Small businesses are critical for developing technology to support national security. Proposers are encouraged to consider whether the R/R&D being proposed to DoD Components also has private sector potential, either for the proposed application or as a base for other applications. The topics below focus on technical domains important to DARPA's mission pursuing innovative research concepts that fall within one of its technology offices. More information about DARPA's technical domains and research topics of interest may be found at: <http://www.darpa.mil/about-us/offices>.

Proposers responding to a topic in this BAA must follow all general instructions provided in the Department of Defense (DoD) SBIR Program BAA. DARPA requirements in addition to or deviating from the DoD Program BAA are provided in the instructions below.

Proposers are encouraged to thoroughly review the DoD Program BAA and register for the DSIP Listserv to remain apprised of important programmatic and contractual changes.

- The DoD Program BAA is located at: <https://www.defensesbirsttr.mil/SBIR-STTR/Opportunities/#announcements>. Be sure to select the tab for the appropriate BAA cycle.
- Register for the DSIP Listserv at: <https://www.dodsirsttr.mil/submissions/login>.

Specific questions pertaining to the administration of the DARPA Program and these proposal preparation instructions should be directed to: DARPA Small Business Programs Office at SBIR_BAA@darpa.mil. DSIP Topic Q&A will NOT be available for these DARPA topics. Technical questions related to improving the understanding of a topic's requirements must be submitted to SBIR_BAA@darpa.mil by the deadline listed below.

The following dates apply to this DARPA Topic release:

July 06, 2023: Topic issued for pre-release

July 25, 2023: Topic opens; DARPA begins accepting proposals via DSIP

August 17, 2023: Deadline for technical question submission

August 24, 2023: Deadline for receipt of proposals no later than **12:00 pm ET**

DIRECT TO PHASE II PROPOSAL GUIDELINES

Proposers should refer to the DARPA Direct to Phase II Proposal Instructions, provided in Appendix A.

Current Release Award Structure by Topic

Standard Technical Volume Format

| Topic Number | Direct to Phase II | | | | |
|------------------|--------------------|--------------|-----------------------------|---------------|------------|
| | Tech Volume* | Award Amount | Period of Performance (PoP) | Option Amount | Option PoP |
| HR0011SB20234-15 | 35 pages | \$1,000,000 | 12 months | \$800,000 | 12 months |

Technical Volume (Volume 2) – Standard Format (35-page)

If a proposer can provide adequate documentation to substantiate that the scientific and technical merit and feasibility described in the Phase I section of the topic has been met and describes the potential commercial applications, the Direct to Phase II (DP2) authority allows the Department of Defense (DoD) to make an award to a small business concern under Phase II of the SBIR program without regard to whether the small business concern was provided an award under Phase I of an SBIR program. This topic is accepting DP2 proposal submissions.

DP2 Feasibility Documentation shall not exceed 10 pages. DP2 Technical Proposal shall not exceed 20 pages. Phase II commercialization strategy shall not exceed 5 pages. This should be the last section of the Technical Volume and will not count against the 30-page limit.

Content of the Technical Volume

Proposers should refer to the DARPA DP2 Proposal Instructions, provided in Appendix A and on the DARPA Small Business site (<https://www.darpa.mil/work-with-us/for-small-businesses/participate-sbir-sttr-program>).

White Paper & Slide Deck Proposal

| Topic Number | Direct to Phase II | | | | | |
|------------------|--------------------|------------|--------------|-----------------------------|---------------|---------------|
| | Technical Volume | | Award Amount | Period of Performance (PoP) | Option Amount | Option Period |
| | White Paper | Slide Deck | | | | |
| HR0011SB20234-16 | 20 pages | 15 pages | 850,000 | 6 months | \$950,000 | 12 months |

Technical Volume (Volume 2) – White Paper & Slide Deck Format

If a proposer can provide adequate documentation to substantiate that the scientific and technical merit and feasibility described in the Phase I section of the topic has been met and describes the potential commercial applications, the Direct to Phase II (DP2) authority allows the Department of Defense (DoD) to make an award to a small business concern under Phase II of the SBIR program without regard to whether the small business concern was provided an award under Phase I of an SBIR program. This topic is accepting DP2 proposal submissions.

The white paper shall not exceed 20 pages, and the slide deck shall not exceed 15 pages. For information on the content of these elements of the technical proposal and the commercialization strategy, please see Appendix A: DARPA Direct to Phase II (DP2) Instructions.

Content of the Technical Volume

Please see Appendix A, section III (d) for complete instructions on the White Paper/Slide Deck technical volume content.

Cost Volume (Volume 3)

Please see the chart above for award amounts listed by topic. Proposers are required to use the Direct to Phase II – Volume 3: Cost Proposal Template (Excel Spreadsheet) provided on the DARPA Small Business site (<https://www.darpa.mil/work-with-us/for-small-businesses/participate-sbir-sttr-program>). Subcontractors may also submit unsanitized costs using this template directly to DARPA at SBIR-BAA@darpa.mil.

Please review the updated Percentage of Work (POW) calculation details included in the DoD Program BAA. DARPA will occasionally accept deviations from the POW requirements with a letter of explanation or approval from the Funding Agreement officer.

Company Commercialization Report (CCR) (Volume 4)

Completion of the CCR as Volume 4 of the proposal submission in DSIP is required. Please refer to the DoD SBIR Program BAA for full details on this requirement. Information contained in the CCR will not be considered by DARPA during proposal evaluations.

Supporting Documents (Volume 5)

In addition to the documents required by DoD, small businesses may also submit additional documentation to support the Technical Volume (Volume 2) and the Cost Volume (Volume 3) in Volume 5. **See Appendix A for required certifications that must be included in Volume 5.** For additional information, see the SBIR 23.4 Annual Program Broad Agency Announcement (BAA) at <https://www.defensesbirstr.mil/SBIR-STTR/Opportunities/>.

DISCRETIONARY TECHNICAL AND BUSINESS ASSISTANCE (TAB A)

DARPA does not offer TAB A funding.

EVALUATION AND SELECTION

All proposals will be evaluated in accordance with the evaluation criteria listed in the DoD SBIR 2023.4 BAA. DARPA will conduct an evaluation of each conforming proposal. Proposals that do not comply with the requirements detailed in this BAA and the research objective(s) of the corresponding topic are considered non-conforming and therefore are not evaluated nor considered for award.

Using the evaluation criteria, the Government will evaluate each proposal in its entirety, documenting the strengths and weaknesses relative to each evaluation criterion, and, based on these identified strengths and weaknesses, determine the proposal's overall selectability. Proposals will not be evaluated against each other during the evaluation process, but rather evaluated on their own individual merit to determine how well the proposal meets the criteria stated in this BAA and the corresponding DARPA topic.

Awards will be made to proposers whose proposals are determined to be the most advantageous to the Government, consistent with instructions and evaluation criteria specified in the DoD SBIR 2023.4 BAA and availability of funding. Given the limited funding available for each topic released, not all proposals considered selectable will be selected for funding.

For the purposes of this proposal evaluation process, a selectable proposal is defined as follows:

Selectable: A selectable proposal is a proposal that has been evaluated by the Government against the evaluation criteria listed in the DoD SBIR 2023.4 BAA and DARPA topic, and the strengths of the overall proposal outweighs its weaknesses. Additionally, there are no accumulated weaknesses that would require extensive negotiations and/or a resubmitted proposal.

For the purposes of this proposal evaluation process, a non-selectable proposal is defined as follows:

Non-Selectable: A proposal is considered non-selectable when the proposal has been evaluated by the Government against the evaluation criteria listed in the DoD SBIR 2023.4 BAA and DARPA topic, and the strengths of the overall proposal do not outweigh its weaknesses.

Proposing firms will be notified of selection or non-selection status for a Phase I award within 90 days of the closing date of the DoD SBIR 2023.4 BAA. It is the policy of DARPA to treat all proposals as source selection information and to disclose their contents only for the purpose of evaluation. Restrictive notices notwithstanding, during the evaluation process, submissions may be handled by support contractors for administrative purposes and/or to assist with technical evaluation. All DARPA support contractors are expressly prohibited from performing DARPA-sponsored technical research and are bound by appropriate nondisclosure agreements. Input on technical aspects of the proposals may be solicited by DARPA from other Government and/or non-Government consultants/experts who are strictly bound by the appropriate non-disclosure requirements. No submissions will be returned. Upon completion of the evaluation and selection process, an electronic copy of each proposal received will be retained at DARPA.

Proposal titles, abstracts, anticipated benefits, and keywords of proposals that are selected for contract award will undergo a DARPA Policy and Security Review. Proposal titles, abstracts, anticipated benefits, and keywords are subject to revision and/or redaction by DARPA. Final approved versions of proposal titles, abstracts, anticipated benefits, and keywords may appear on the DoD SBIR/STTR awards website and/or the SBA's SBIR/STTR award website (<https://www.sbir.gov/sbirsearch/award/all>).

Refer to the DoD SBIR 2023.4 Program BAA for procedures to protest the Announcement. As further prescribed in FAR 33.106(b), FAR 52.233-3, Protests regarding the selection decision should be submitted to:

DARPA
Contracts Management Office (CMO)
675 N. Randolph Street
Arlington, VA 22203
E-mail: scott.ulrey@darpa.mil and sbir@darpa.mil

AWARD AND CONTRACT INFORMATION

1. General Award Information

Multiple awards are anticipated. DARPA may award FAR-based government contracts (Firm- Fixed Price or Cost-Plus Reimbursement) or Other Transactions for Prototypes agreement (under the authority of 10 U.S.C. § 4022) subject to approval of the Contracting Officer. The amount of resources made available for each topic issued under this BAA will depend on the quality of the proposals received and the availability of funds.

Majority Ownership in Part. Proposers that are more than 50% owned by multiple venture capital operating companies (VCOC), hedge funds (HF), private equity firms (PEF), or any combination of these as set forth in 13 C.F.R. § 121.702, are eligible to submit proposals in response to DARPA topics advertised within this BAA.

For proposers that are a member of this ownership class the following must be satisfied for proposals to be accepted and evaluated:

- a. Prior to submitting a proposal, firms must register with the SBA Company Registry Database.
- b. The proposer within its submission must submit the Majority-Owned VCOC, HF, and PEF Certification. A copy of the SBIR VC Certification can be found on <https://www.darpa.mil/work-with-us/for-small-businesses/participate-sbir-sttr-program>, under SBIR/STTR BAA Forms. Include the SBIR VC Certification in the Supporting Documents (Volume 5).
- c. Should a proposer become a member of this ownership class after submitting its proposal and prior to any receipt of a funding agreement, the proposer must immediately notify the Contracting Officer, register in the appropriate SBA database, and submit the required certification which can be found under SBIR/STTR BAA Forms and Templates on <https://www.darpa.mil/work-with-us/for-small-businesses/participate-sbir-sttr-program>.

The Government reserves the right to select for negotiation all, some, one, or none of the proposals received in response to this announcement and to make awards with or without communications with proposers. Additionally, the Government reserves the right to award all, some, one, or none of the options on the contract(s)/agreement(s) of the performers based on available funding and technical performance. If warranted, portions of resulting awards may be segregated into pre-priced options. Additionally, DARPA reserves the right to accept proposals in their entirety or to select only portions of proposals for award. In the event that DARPA desires to award only portions of a proposal, negotiations may be opened with that proposer. The Government reserves the right to fund proposals in phases with options for continued work, as applicable.

The Government reserves the right to request any additional, necessary documentation once it makes the award instrument determination. The Government reserves the right to remove a proposal from award consideration should the parties fail to reach agreement on award terms, conditions, and price within a reasonable time, and/or the proposer fails to provide requested additional information within three business days.

In all cases, the Government Contracting Officer reserves the right to select award instrument type, regardless of instrument type proposed, and to negotiate all instrument terms and conditions with selectees. DARPA will apply publication or other restrictions, as necessary, if it determines that the research resulting from the proposed effort will present a high likelihood of disclosing performance characteristics of military systems or manufacturing technologies that are unique and critical to defense. Any award resulting from such a determination will include a requirement for DARPA permission before publishing any information or results on the program. For more information on publication restrictions, see the DoD SBIR 2023.4 BAA.

Because of the desire to streamline the award negotiation and program execution process, proposals identified for negotiation will result in negotiating a type of instrument for award that is in the best interest of the Government. In the case of an OT for Prototype agreement under DARPA's authority to award OTs for prototype projects, 10 U.S.C. § 4022, use of an OT provides significant opportunities for flexible execution to assist in meeting DARPA's aggressive SBIR/STTR program goals.

All proposers that wish to consider an OT award should carefully read the following:

The flexibility of the OT award instrument is beneficial to the program because the Performer will be able to apply its best practices as required to carry out the research project that may be outside of the Federal Acquisition Regulation (FAR) process-driven requirements. Streamlined practices will be used, such as

milestone-driven performance, intended to reduce time and effort on award administration tasks and permit performers to focus on the research effort and rapid prototyping. Because of this ability, OTs provide the Agreements Officer the flexibility to create an award instrument that contains terms and conditions that promote commercial transition, reduce some administratively burdensome acquisition regulations, and meet SBIR/STTR program goals.

Proposers must only propose an OT agreement with fixed payable milestones. Fixed payable milestones are fixed payments based on successful completion of the milestone accomplishments agreed to in the milestone plan. Refer to the Other Transactions for Prototypes Fact Sheet and Other Transaction for Prototype Agreement, available at <https://www.darpa.mil/work-with-us/for-small-businesses/participate-sbir-sttr-program>. Specific milestones will be based upon the research objectives detailed in the topic.

Please see <https://www.darpa.mil/work-with-us/for-small-businesses/participate-sbir-sttr-program> for more information on OTs.

2. Transition and Commercialization Support Program (TCSP)

DARPA will provide services to Phase II or DP2 awardees upon contract execution through the Transition and Commercialization Support Program (TCSP) at no cost to awardees. The TCSP goal is to maximize the potential for SBIR/STTR companies to move their technology beyond Phase II and into other research and development programs for further maturity or into solutions or products for DoD acquisition programs, other Federal programs, and/or the commercial market. Please visit <https://www.darpa.mil/work-with-us/for-small-businesses/commercialization-continued> for more information on DARPA TCSP.

3. Embedded Entrepreneurship Initiative

Awardees of SBIR funding pursuant to this BAA may be eligible to participate in the DARPA Embedded Entrepreneurship Initiative (EEI) during the Period of Performance. Invitation to participate in EEI is at the sole discretion of the Government based on evaluation of technical and commercial factors and subject to program balance and the availability of funding. EEI is a limited scope program offered by DARPA, at DARPA's discretion, to a small subset of awardees. The goal of DARPA's EEI is to increase the likelihood that DARPA-funded technologies take root in the U.S. and provide new capabilities for national defense. EEI supports DARPA's mission "to make pivotal investments in breakthrough technologies and capabilities for national security" by accelerating the transition of innovations out of the lab and into new capabilities for the Department of Defense (DoD). EEI investment supports development of a robust and deliberate Go-to-Market strategy for selling technology product to the government and commercial markets and positions DARPA awardees to attract U.S. investment. The following is for informational and planning purposes only and does not constitute solicitation of proposals to the EEI.

There are three elements to DARPA's EEI: (1) A Senior Commercialization Advisor (SCA) from DARPA who works with the Program Manager (PM) to examine the business case for the awardee's technology and uses commercial methodologies to identify steps toward achieving a successful transition of technology to the government and commercial markets; (2) Connections to potential industry and investor partners via EEI's Investor Working Groups; and (3) Additional funding on an awardee's contract for the awardee to hire an embedded entrepreneur to achieve specific milestones in a Go-to-Market strategy for transitioning the technology to products that serve both defense and commercial markets. This embedded entrepreneur's qualifications should include business experience within the target industries of interest, experience in commercializing early-stage technology, and the ability to communicate and interact with technical and non-technical stakeholders. Funding for EEI is typically no more than \$250,000 per awardee over the duration of the award. An awardee may apportion EEI funding to hire more than one embedded entrepreneur, if achieving the milestones requires different expertise that

can be obtained without exceeding the awardee's total EEI funding. The EEI effort is intended to be conducted concurrent with the research program without extending the period of performance.

EEI Application Process:

After receiving an award under the solicitation, awardees interested in being considered for EEI should notify their DARPA Program Manager (PM) during the period of performance. Timing of such notification should ideally allow sufficient time for DARPA and the awardee to review the awardee's initial transition plan, identify milestones to achieve under EEI, modify the award, and conduct the work required to achieve such milestones within the original award period of performance. These steps may take 9-18 months to complete, depending on the technology. If the DARPA PM determines that EEI could be of benefit to transition the technology to product(s) the Government needs, the PM will refer the performer to DARPA Commercial Strategy.

DARPA Commercial Strategy will then contact the performer, assess fitness for EEI, and in consultation with the DARPA technical office, determine whether to invite the performer to participate in the EEI. Factors that are considered in determining fitness for EEI include DoD/Government need for the technology; competitive approaches to enable a similar capability or product; risks and impact of the Government's being unable to access the technology from a sustainable source; Government and commercial markets for the technology; cost and affordability; manufacturability and scalability; supply chain requirements and barriers; regulatory requirements and timelines; Intellectual Property and Government Use Rights, and available funding.

Invitation to participate in EEI is at the sole discretion of DARPA and subject to program balance and the availability of funding. EEI participants' awards may be subsequently modified bilaterally to amend the Statement of Work to add negotiated EEI tasks, provide funding, and specify a milestone schedule which will include measurable steps necessary to build, refine, and execute a Go-to-Market technology transition plan aimed at delivering new capabilities for national defense. Milestone examples are available at: <https://www.darpa.mil/work-with-us/contract-management>.

Awardees under this solicitation are eligible to be considered for participation in EEI, but selection for award under this solicitation does not imply or guarantee participation in EEI.

For more information, please refer to the EEI website <https://eei.darpa.mil/>.

4. DARPA Toolbox Initiative

DARPA Toolbox is an Agency-wide effort to provide open licensing opportunities with commercial technology vendors to the researchers behind DARPA programs. DARPA Toolbox provides easy, low-cost, scalable access to state-of-the-art tools and intellectual property (IP) under predictable legal terms and streamlined acquisition procedures. The goal is to reduce performer reliance on low-quality, low-cost tools and IP that increase execution risks and complicate post-DARPA transitions.

Through this initiative, DARPA performers are granted access to select vendor tools and technologies throughout the life of their contractual relationship with the Agency. The Toolbox suppliers bring to the table proven technologies commonly used in state-of-the-art commercial microelectronics or system design methodologies.

DARPA Toolbox program information and a full list of participating suppliers can be found at <https://www.darpa.mil/work-with-us/darpa-toolbox-initiative>. If there are tool or technologies of interest, contact the Supplier POC listed for the product, referencing the DARPA Toolbox Initiative. The Supplier POC will provide advice on products and pricing information. Include any non-production pricing quotes

in your proposal. Products and pricing are between you and the suppliers – *do not* contact DARPA directly.

ADDITIONAL INFORMATION

DARPA intends to use electronic mail for all correspondence regarding these topics. Questions related to the technical aspect of the research objectives and awards specifically related to a topic should be emailed to SBIR_BAA@darpa.mil. Please reference the topic number in the subject line. All questions must be in English and must include the name, email address, and the telephone number of a point of contact.

DARPA will attempt to answer questions in a timely manner; however, questions submitted within seven (7) calendar days of the proposal due date listed herein may not be answered. DARPA will post a consolidated Frequently Asked Questions (FAQ) document. To access the posting please visit: <http://www.darpa.mil/work-with-us/opportunities>. Under the topic number summary, there will be a link to the FAQ. The FAQ will be updated on an ongoing basis until one week prior to the proposal due date.

Technical support for the Defense SBIR/STTR Innovation Portal (DSIP) is available Monday through Friday, 9:00 a.m. – 5:00 p.m. ET. Requests for technical support must be emailed to DoDSBIRSupport@reisystems.com with a copy to SBIR_BAA@darpa.mil.

DARPA SBIR 23.4 Topic Index
Release 10

HR0011SB20234-15 Additive Components Enhanced for Extreme Environments (ACE3)

HR0011SB20234-16 Prospero: Modernizing Secure Facility Design, Construction, and Accreditation

HR0011SB20234-15 TITLE: Additive Components Enhanced for Extreme Environments (ACE3)

OUSD (R&E) CRITICAL TECHNOLOGY AREA(S): Advanced Materials

The technology within this topic is restricted under the International Traffic in Arms Regulation (ITAR), 22 CFR Parts 120-130, which controls the export and import of defense-related material and services, including export of sensitive technical data, or the Export Administration Regulation (EAR), 15 CFR Parts 730-774, which controls dual use items. Offerors must disclose any proposed use of foreign nationals (FNs), their country(ies) of origin, the type of visa or work permit possessed, and the statement of work (SOW) tasks intended for accomplishment by the FN(s) in accordance with the Announcement. Offerors are advised foreign nationals proposed to perform on this topic may be restricted due to the technical data under US Export Control Laws.

OBJECTIVE: The Additive Components Enhanced for Extreme Environments (ACE3) effort seeks to dramatically reduce lead times for critical components in turbine systems by enhancing the high temperature mechanical properties of additively manufactured superalloys through novel post-processing techniques. Proposals must focus on difficult to source, long lead time components that control system efficiency and lifetime; in particular, high-performance components used in the hot gas path of power and propulsion turbines. This topic is soliciting Direct to Phase II (DP2) proposals only.

DESCRIPTION: The Department of Defense (DoD) faces technical and procurement challenges with hot-section components in turbines (e.g., blades, vanes, seals, etc.) across various ground and aerospace platforms. These components operate in high temperature oxidizing environments while under extreme mechanical loads, requiring specialized materials and manufacturing techniques. Traditionally, these hot-section components are produced by casting nickel-based superalloys using a directional or single crystal solidification approach. These specialized casting techniques are costly and time-consuming, resulting in part replacement lead times averaging 18 to 36 months due to the highly specialized knowledge and equipment required to produce parts.

The objective of ACE3 is to reduce critical hot-section turbine part lead times by exploiting the supply chain advantages of additive manufacturing (AM).. Melt-based AM of nickel-based superalloys offers advantages in precision, reduced scrapage, enhanced design freedom, shorter lead times, and a potential reduction in manufacturing costs compared to conventional directional or single crystal casting operations. However, AM techniques typically impart a fine grain size (e.g., 10-100 μm), resulting in inferior high-temperature creep properties compared to those of directionally solidified or single crystal materials [1]. Therefore, while additively manufactured blades and vanes are extremely attractive for next-generation engine designs and sustainment of DoD's existing fleet, implementation is inhibited by poor high-temperature mechanical properties. To address this issue, the ACE3 project seeks to demonstrate new post-processing technologies that dramatically enhance the high-temperature mechanical behavior of hollow core or net-shaped nickel-based superalloys fabricated with laser powder bed fusion (LPBF) by transforming the as-built components from fine (<100 μm) grain structure to coarse (>1 mm) grain structure, resulting in creep performance improvement by at least an order-of-magnitude. Electron beam additive manufacturing is specifically not of interest due to inherent issues with short filament lifetimes and de-powdering of hollow core structures.

Proposals must include: (1) an effective strategy for addressing difficult to source, long lead time components that control efficiency and lifetime in the hot gas path of turbine engines; (2) the proposer's familiarity with turbine design including the basic functional and design requirements of hot-section components; and (3) alloy(s) of interest to be tested and a relevant component design to evaluate the proposed post-processing strategy. Proposals are not limited to current component designs – novel designs uniquely enabled through additive manufacturing are encouraged.

PHASE I: This topic is soliciting Direct to Phase II (DP2) proposals only. Previous efforts must have demonstrated a post-processing approach capable of achieving the milestones and metrics listed below supported by prior laboratory testing results:

- Demonstrated ability to perform post-processing on a commercially relevant nickel-based superalloy additively manufactured via laser powder bed fusion (LPBF), such as Inconel 738LC (IN738LC).
- Demonstrated at least 10x increase in grain size relative to the as-built material along the build direction following post-processing.
- Demonstrated the ability to retain at least 20% (area fraction) <100> cube texture in the build direction following post-processing.
- Demonstrated the ability to control grain structure as a function of position within a test article with cm-scale precision

PHASE II: The ACE3 DP2 project seeks to build on the accomplishments listed in the Phase I section above to: (1) fully characterize the high-temperature mechanical properties of additively manufactured superalloy test specimens with and without the demonstrated post-processing strategy; (2) apply the validated post-processing strategy to an exemplary component design fabricated by LPBF; and (3) confirm the structure and properties match those expected from baseline coupon-level testing while also demonstrating the ability to successfully process components at scale with a scrap rate <5%. Final components must be subject to proof testing in a relevant environment to verify functional performance (TRL 6). Performers must bring their own exemplar design and propose a component-level test strategy sufficient for TRL 6 justification. The Phase II effort will consist of a 12-month base period with a 12-month option period.

Schedule/Milestones/Deliverables: Phase II fixed milestones for this program must include:

- Month 1: Project kickoff meeting; all supporting positions identified in the proposal are assigned to personnel and names are provided to the Government.
- Month 3: Preliminary high-temperature mechanical test results on additively manufactured superalloy coupons in as-built and post-processed conditions using the proposed strategy. Quarterly presentation detailing results.
- Month 6: Complete mechanical test results demonstrating statistically significant improvement in high-temperature material properties. System requirements and preliminary design for processing exemplary components. Month 6 technical report and presentation detailing results.
- Month 9: Final design, development plan and preliminary results for exemplary component processing. Quarterly presentation detailing results.
- Month 12: Process demonstrated for the exemplary component, including measurements meeting the target geometry and microstructure. Process automation reduced to practice to produce sufficient parts for system-level testing. Month 12 technical report and presentation detailing results.

Option Milestones/Deliverables:

- Month 15: Quarterly presentation detailing part manufacturing progress toward system-level testing.
- Month 18: Components manufactured, post-processed, and delivered to test facility. Technical report and presentation detailing results.
- Month 21: Results of system-level testing in a relevant environment (TRL 6). Post mortem analysis completed on tested components and assessment of outcome. Quarterly presentation detailing results.

- Month 24: Final Phase II report and technical presentation summarizing all results, lessons learned, and potential transition path. Technical reports must be delivered in Microsoft Word or PDF format; presentations must be delivered in Microsoft PowerPoint or PDF format.

PHASE III DUAL USE APPLICATIONS: The novel post-processing technology developed under this effort will have widespread application in both military and commercial gas turbine engines used in power generation and propulsion. Enabling additive manufacturing of hot-section components will achieve more reliable and efficient supply chains, a decrease in overall costs, and the ability to explore novel component designs for improved thermal efficiency and fuel economy.

REFERENCES:

1. V. Kalyanasundaram, A. De Luca, R. Wróbel, J. Tang, S.R. Holdsworth, C. Leinenbach, E. Hosseini, “Tensile and creep-rupture response of additively manufactured nickel-based superalloy CM247LC”, *Additive Manufacturing Letters* 5 (2023) 100119.
<https://doi.org/10.1016/j.addlet.2022.100119>.

KEYWORDS: gas turbines, power generation, jet engine propulsion, sustainment, advanced materials, additive manufacturing, high temperature mechanical properties

HR0011SB20234-16 TITLE: Prospero: Modernizing Secure Facility Design, Construction, and Accreditation

OUSD (R&E) CRITICAL TECHNOLOGY AREA(S): Human-Machine Interfaces, Trusted AI and Autonomy

OBJECTIVE: Consolidations and acquisitions in the Defense Industrial Base (DIB) make it imperative for new small businesses to emerge to promote innovation and competition. However, strict requirements for classified program execution inhibits these new small businesses from immediately performing on programs. The major inhibitors are cost (monetary and time) and process (convoluted based on sponsor, location, and accreditor). Significant resources can be sunk into the Secure Area/Sensitive Compartmented Information Facility (SCIF)/Special Access Program Facility (SAPF) construction and accreditation process with no guarantees that the completed area would actually be usable. Several businesses have emerged that specialize in constructing such facilities, but offer their expertise as a significant markup that is cost prohibitive for small businesses. Existing research into Language Models (LMs) has been done to provide a means to both fill in the blanks within sentences based on context clues and automate an interactive knowledge base from a knowledge corpus. Additional research has leveraged Artificial Intelligence (AI) for monitoring construction progress, comparing completed construction to initial designs, and identifying materials from construction images.

This Defense Advanced Research Projects Agency (DARPA) topic is seeking technologies for automating, scaling, updating, and simplifying the process for applying, designing, constructing, and validating Secure Areas/SCIFs/SAPFs. Prospero performers will explore approaches and develop prototypes for automating paperwork, designing secure rooms, and overseeing construction. Prospero is interested in software tools that can be utilized by non-security personnel at all steps of the design and accreditation process that can also be offered at a minimal cost to the end-user.

DESCRIPTION: Performers will develop approaches for utilizing AI, Machine Learning (ML), and LMs to automate, update, and improve secure facility design, paperwork, oversight, and validation. Prospero prototypes should be able to demonstrate the ability to automate the paperwork processes, reduce the barrier to entry for secure facility design, and streamline the process for overseeing facility construction.

The program seeks breakthrough approaches to various technical challenges, including but not limited to:

- Developing efficient models and techniques for automating accreditation paperwork
- Developing efficient algorithms and techniques for monitoring secure facility construction to meet auditing requirements
- Developing tools for non-experts to be able to fulfill accreditation reporting requirements
- Understanding the accreditation process across multiple sponsors
- Streamlining disparate sponsor requirements into a single knowledge base

PHASE I: This is a Direct to Phase II (DP2) solicitation. Therefore, Phase I proposals will not be accepted or reviewed. Phase I feasibility will be demonstrated through evidence of: a completed feasibility study or a basic prototype system; definition and characterization of properties desirable for both Department of Defense (DoD) and civilian use; and comparisons with alternative state-of-the-art methodologies (competing approaches). This includes determining, insofar as possible, the scientific and technical merit and feasibility of ideas appearing to have application to the core objective of automating the design, submission, and validation of secure facilities. Proposers interested in submitting a DP2 proposal must provide documentation to substantiate that the scientific and technical merit and feasibility described above have been met and describe the potential military or commercial applications. DP2 documentation should include:

- technical reports describing results and conclusions of existing work, particularly regarding the commercial opportunity or DoD insertion opportunity, and risks/mitigations, assessments;
- presentation materials and/or white papers;
- technical papers;
- prototype designs/models;

This collection of material will verify mastery of the required content for DP2 consideration. DP2 proposers must also demonstrate knowledge, skills, and ability in computer science, physical security, electrical engineering, and software engineering. For detailed information on DP2 requirements and eligibility, please refer to the DoD BAA and the DARPA Instructions for this topic.

PHASE II: The goal of Prospero is to design and evaluate tools and techniques for automating and streamlining secure facility design, construction, and accreditation. Proposals should include development, installation, integration, demonstration and/or test and evaluation of the proposed prototype system. These activities should focus specifically on:

1. Evaluating the adapted solution against the proposed objectives
2. Describing in detail how the installed solution differs from the non-defense commercial offering to solve DOD need(s) as well as how it can be scaled for wide adoption, i.e., modified for scale across additional sponsors.
3. Identifying the proposed solution's clear transition path considering input from affected stakeholders, including but not limited to, end users, engineering, sustainment, security, contracting, finance, legal, and cyber.
4. Specifying the solution's integration with other current and potential future solutions.
5. Describing the solution's sustainability, i.e., supportability. Identifying other specific DoD or Governmental customers for the solution.

Phase II will culminate in a system demonstration using one or more compelling use cases consistent with commercial opportunities, DOD opportunities, and/or insertion into a DARPA program. The below schedule of milestones and deliverables is provided to establish expectations and desired results for the Phase II effort.

Schedule/Milestones/Deliverables:

Proposers will execute Research and Development (R&D) plan as described in their proposal. Proposers will also complete a commercialization plan that addresses relevant material costs and potential material/equipment suppliers.

- Month 1: Phase II Kickoff briefing (with annotated slides) to the DARPA Program Manager (PM) (in person or virtual, as needed) including: any updates to the proposed plan and technical approach, risks/mitigations, schedule (inclusive of dependencies) with planned capability milestones and deliverables, proposed metrics, and plan for prototype demonstration/validation.
- Months 2, 4: Technical progress reports detailing technical progress made, tasks accomplished, major risks/mitigations, a technical plan for the remainder of Phase II (while this will normally report progress against the plan detailed in the proposal or presented at the Kickoff briefing, it is understood that scientific discoveries, competition, and regulatory changes may all have impacts on the planned work and DARPA must be made aware of any revisions that result), planned activities, trip summaries, and any potential issues or problem areas that require the attention of the DARPA PM.
- Month 6: Interim technical progress briefing (live system demo with annotated slides) to the DARPA PM (in-person or virtual as needed) detailing progress made (include quantitative assessment of capability developed to date), tasks accomplished, major risks/mitigations, planned activities, and technical plan for the remainder of Phase II, the demonstration/verification plan for

the end of Phase II, trip summaries, and any potential issues or problem areas that require the attention of the DARPA PM.

- Month 9, 12, 15: Quarterly technical progress reports detailing technical progress made, tasks accomplished, major risks/mitigations, a technical plan for the remainder of Phase II (with necessary updates as in the parenthetical remark for Months 2 and 4), planned activities, trip summaries, and any potential issues or problem areas that require the attention of the DARPA PM.
- Month 18/Final Phase II Deliverables: Final demonstration with documented details, demonstrating accreditation paperwork automation; demonstrating automated SCIF/SAPF design for multiple sponsors; demonstrating construction oversight that meets auditing requirements; any other necessary documentation (including, at a minimum, user manuals and a detailed system design document; and the end of phase commercialization plan).

PHASE III DUAL USE APPLICATIONS: Phase III work will be oriented towards transition and commercialization of the developed Prospero technologies. The proposer is required to obtain funding from either the private sector, a non-SBIR Government source, or both, to develop the prototype software into a viable product or non-R&D service for sale in military or private sector markets. Phase III refers to work that derives from, extends, or completes an effort made under prior SBIR funding agreements, but is funded by sources other than the SBIR Program.

Primary Prospero support will be to national efforts for growing the DIB and improving secure facility construction processes. Such technology can be used to enable any small business to construct secure facilities while minimizing the risks associated with the current processes.

REFERENCES:

1. Donahue, Chris, Mina Lee, and Percy Liang. "Enabling language models to fill in the blanks." arXiv preprint arXiv:2005.05339 (2020).
2. Gil, Daeyoung, Ghang Lee, and Kahyun Jeon. "Classification of images from construction sites using a deep-learning algorithm." ISARC. Proceedings of the International Symposium on Automation and Robotics in Construction. Vol. 35. IAARC Publications, 2018.
3. Mahami, Hadi, et al. "Material recognition for automated progress monitoring using deep learning methods." arXiv preprint arXiv:2006.16344 (2020).
4. Petroni, Fabio, et al. "Language models as knowledge bases?." arXiv preprint arXiv:1909.01066 (2019).

KEYWORDS: physical security, construction monitoring, language models, knowledge base, accreditation

APPENDIX A: DARPA DIRECT TO PHASE II (DP2) PROPOSAL INSTRUCTIONS

I. Introduction

A complete proposal submission consists of:

Volume 1: Proposal Cover Sheet

Volume 2: Technical Volume (feasibility documentation and technical proposal)

Volume 3: Cost Volume

Volume 4: Company Commercialization Report

Volume 5: Supporting Documents

a. Contractor Certification Regarding Provision of Prohibition on Contracting for Certain Telecommunications and Video Surveillance Services or Equipment (Attachment 1)

MANDATORY

b. Disclosures of Foreign Affiliations or Relationships to Foreign Countries (Attachment 2)

MANDATORY

c. Verification of Eligibility of Small Business Joint Ventures (Attachment 3), if applicable

d. Disclosure of Funding Sources (Attachment 4) MANDATORY

e. Other supporting documentation

A completed proposal submission in DSIP does NOT indicate that the mandatory supporting documents have been uploaded. It is the responsibility of the proposing small business concern to ensure that the mandatory documents listed above have been uploaded and included with the proposal submission.

Volume 6: Fraud, Waste and Abuse Training

The Defense SBIR/STTR Innovation Portal (DSIP) provides a structure for building the proposal volumes and submitting a consolidated proposal package. If this is your first time submitting an SBIR or STTR proposal using DSIP, please review detailed training guides at <https://www.dodsbirsttr.mil/submissions/learning-support/training-materials>. It is the responsibility of the proposing firm to ensure that a complete proposal package is certified and submitted by the close date listed in the topic to which they are responding.

To assist in proposal development, templates Volume 3: Cost Volume have been provided as attachments to the announcement posted at <https://www.darpa.mil/work-with-us/for-small-businesses/participate-sbir-sttr-program>. Use of this template is mandatory.

NOTE: All proposers are required to submit Volume 4: Company Commercialization Report (CCR).

II. Proprietary Information

Proposers that include in their proposals data that they do not want disclosed to the public for any purpose, or used by the Government except for evaluation purposes, shall follow instructions in section 4.5 regarding marking propriety proposal information.

III. DP2 Proposal Instructions

a. Proposal Cover Sheet (Volume 1)

The Cover Sheet must include a brief technical abstract of no more than 3000 characters that describes the proposed R&D project with a discussion of anticipated benefits and potential commercial applications.

Do not include proprietary or classified information in the Proposal Cover Sheet. If your proposal is selected for award, the technical abstract and discussion of anticipated benefits may be publicly released.

b. Format of Technical Volume (Volume 2) – standard format

1. The Technical Volume must include two parts, PART ONE: Feasibility Documentation and PART TWO: Technical Proposal.
2. Type of file: The Technical Volume must be a single Portable Document Format (PDF) file, including graphics. Perform a virus check before uploading the Technical Volume file. If a virus is detected, it may cause rejection of the proposal. Do not lock or encrypt the uploaded file. Do not include or embed active graphics such as videos, moving pictures, or other similar media in the document.
3. Length: Feasibility Documentation must be no longer than 10 pages, while the Technical Proposal should not exceed 20 pages. The Government will not consider pages in excess of the page count limitations.
4. Layout: Number all pages of your proposal consecutively. Font size should not be smaller than 10-point on standard 8-1/2" x 11" paper with one-inch margins. The header on each page of the Technical Volume should contain your company name, topic number, and proposal number assigned by DSIP when the Cover Sheet was created. The header may be included in the one-inch margin.

c. Content of the Technical Volume (Volume 2) – Standard Format

PART ONE: Feasibility Documentation (NTE 10 pages)

1. Provide documentation to substantiate that the scientific and technical merit and feasibility described in the Phase I section of the topic has been met and describe the potential commercial applications. Documentation should include all relevant information including, but not limited to: technical reports, test data, prototype designs/models, and performance goals/results.
2. Maximum page length for feasibility documentation will be specified by the topic. If you have references, include a reference list or works cited list as the last page of the feasibility documentation. This will count towards the page limit.
3. Work submitted within the feasibility documentation must have been substantially performed by the proposer and/or the PI.
4. If technology in the feasibility documentation is subject to Intellectual Property (IP), the proposer must either own the IP, or must have obtained license rights to such technology prior to proposal submission, to enable it and its subcontractors to legally carry out the proposed work. Documentation of IP ownership or license rights shall be included in the Technical Volume of the proposal.
5. Include a one-page summary on Commercialization Potential addressing the following:
 - i. Does the company contain marketing expertise and, if not, how will that expertise be brought into the company?
 - ii. Describe the potential for commercial (Government or private sector) application and the benefits expected to accrue from this commercialization.

DO NOT INCLUDE marketing material. Marketing material will NOT be evaluated.

PART TWO: Standard Technical Proposal (NTE 20 pages)

1. Significance of the Problem. Define the specific technical problem or opportunity addressed and its importance.

2. Phase II Technical Objectives. Enumerate the specific objectives of the Phase II work, and describe the technical approach and methods to be used in meeting these objectives.
3. Phase II Statement of Work. The statement of work should provide an explicit, detailed description of the Phase II approach, indicate what is planned, how and where the work will be carried out, a schedule of major events and the final product to be delivered. The methods planned to achieve each objective or task should be discussed explicitly and in detail. This section should be a substantial portion of the total proposal.
 - a. Human/Animal Use: Proposers proposing research involving human and/or animal use are encouraged to separate these tasks in the technical proposal and cost proposal in order to avoid potential delay of contract award.
 - b. Phase II Option Statement of Work (if applicable, specified in the corresponding TOPIC). The statement of work should provide an explicit, detailed description of the activities planned during the Phase II Option, if exercised. Include how and where the work will be carried out, a schedule of major events and the final product to be delivered. The methods planned to achieve each objective or task should be discussed explicitly and in detail.
4. Related Work. Describe significant activities directly related to the proposed effort, including any conducted by the PI, the proposer, consultants or others. Describe how these activities interface with the proposed project and discuss any planned coordination with outside sources. The proposal must persuade reviewers of the proposer's awareness of the state of the art in the specific topic. Describe previous work not directly related to the proposed effort but similar. Provide the following: (1) short description, (2) client for which work was performed (including individual to be contacted and phone number) and (3) date of completion.
5. Relationship with Future Research or Research and Development.
 - i. State the anticipated results of the proposed approach if the project is successful.
 - ii. Discuss the significance of the Phase II effort in providing a foundation for Phase III research and development or commercialization effort.
6. Key Personnel. Identify key personnel who will be involved in the Phase II effort including information on directly related education and experience. A concise resume of the PI, including a list of relevant publications (if any), must be included. All resumes count toward the page limitation. Identify any foreign nationals you expect to be involved on this project.
7. Foreign Citizens. Identify any foreign citizens or individuals holding dual citizenship expected to be involved on this project as a direct employee, subcontractor, or consultant. For these individuals, please specify their country of origin, the type of visa or work permit under which they are performing and an explanation of their anticipated level of involvement on this project. Refer to section 3.2 of this BAA for more information. Supplemental information provided in response to this paragraph will be protected in accordance with the Privacy Act (5 U.S.C. 552a), if applicable, and the Freedom of Information Act (5 U.S.C. 552(b)(6)).
8. Facilities/Equipment. Describe available instrumentation and physical facilities necessary to carry out the Phase II effort. Items of equipment to be purchased (as detailed in the cost proposal) shall be justified under this section. Also state whether or not the facilities where the proposed work will be performed meet environmental laws and regulations of federal, state (name) and local Governments for, but not limited to, the following groupings: airborne emissions, waterborne effluents, external radiation levels, outdoor noise, solid and bulk waste disposal practices and handling and storage of toxic and hazardous materials.

9. Subcontractors/Consultants. Involvement of a university or other subcontractors or consultants in the project may be appropriate. If such involvement is intended, it should be identified and described according to the Cost Breakdown Guidance. Please refer to section 3 of this BAA for detailed eligibility requirements as it pertains to the use of subcontractors/consultants.
10. Prior, Current or Pending Support of Similar Proposals or Awards. If a proposal submitted in response to this topic is substantially the same as another proposal that was funded, is now being funded, or is pending with another Federal Agency, or another or the same DoD Component, you must reveal this on the Proposal Cover Sheet and provide the following information:
 - a. Name and address of the Federal Agency(s) or DoD Component to which a proposal was submitted, will be submitted, or from which an award is expected or has been received.
 - b. Date of proposal submission or date of award.
 - c. Title of proposal.
 - d. Name and title of the PI for each proposal submitted or award received.
 - e. Title, number, and date of BAA(s) or solicitation(s) under which the proposal was submitted, will be submitted, or under which award is expected or has been received.
 - f. If award was received, state contract number.
 - g. Specify the applicable topics for each proposal submitted or award received.

Note: If this does not apply, state in the proposal "No prior, current, or pending support for proposed work."

11. Transition and Commercialization Strategy (5 pages). DARPA is equally interested in dual use commercialization of SBIR/STTR projects that result in products sold to the U.S. military, the private sector market, or both. DARPA expects explicit discussion of key activities to achieve this result in the transition and commercialization strategy part of the proposal. The Technical Volume of each Direct to Phase II proposal must include a transition and commercialization strategy section. The Phase II transition and commercialization strategy shall not exceed 5 pages, and will NOT count against the proposal page limit.

Information contained in the commercialization strategy section will be used to determine suitability for participation in EEI. Selection for participation in EEI will be made independently following selection for SBIR/STTR award. Please refer to section 3 of the Instructions for more information on the DARPA EEI and additional proposal requirements.

The transition and commercialization strategy should include the following elements:

- a. A summary of transition and commercialization activities conducted during Phase I, and the Technology Readiness Level (TRL) achieved. Discuss the market, competitive landscape, potential stakeholders and end-users, and how the preliminary transition and commercialization path or paths may evolve during the Phase II project. Describe key proposed technical milestones during Phase II that will advance the technology towards product such as: prototype development, laboratory and systems testing, integration, testing in operational environment, and demonstrations.
- b. Problem or Need Statement. Briefly describe what you know of the problem, need, or requirement, and its significance relevant to a Department of Defense application and/or a private sector application that the SBIR/STTR project results would address. Is there a broader societal need you are trying to address? Please describe.
- c. Description of Product(s) and/or System Application(s). Identify the commercial product(s) and/or DoD system(s), or system(s) under development, or potential new system(s). Identify the potential DoD end- users, Federal customers, and/or private sector customers who would likely use the technology.

- d. Business Model(s)/Procurement Mechanism(s). Discuss your current business model hypothesis for bringing the technology to market. Describe plans to license, partner, or self-produce your product. How do you plan to generate revenue? Describe the resources you expect will be needed to implement your business models. Discuss your plan and expected timeline to secure these resources. Understanding DARPA's goal of creating and sustaining a U.S. military advantage, describe how you intend to develop your product and supply chains to enable this differentiation.
- e. Target Market. Describe the market and addressable market for the innovation. Describe the customer sets you propose to target, their size, their growth rate, and the key reasons they would consider procuring the technology. Discuss the business economics and market drivers in the target industry. Describe competing technologies existent today on the market as well as those being developed in the lab. How has the market opportunity been validated? Describe the competition. How do you expect the competitive landscape may change by the time your product/service enters the market?
- f. Funding Requirements. Describe your company's funding history. How much external financing have you raised? Describe your plans for future funding sources (internal, loan, angel, venture capital, etc.).
- g. Transition and Commercialization Risks. Describe the major technology, market and team risks associated with achieving successful transition of the DARPA funded technology. DARPA is not afraid to take risks but we want to ensure that our awardees clearly understand the risks in front of them. What are the key risks in bringing your innovation to market? What are actions you plan to undertake to mitigate these risks?
- h. Expertise/Qualifications of Team/Company Readiness. Describe the expertise and qualifications of your management, marketing/business development and technical team that will support the transition of the technology from the prototype to the commercial market and into government operational environments. Has this team previously taken similar products/services to market? If the present team does not have this needed expertise, how do you intend to obtain it? What is the financial history and health of your company (e.g., availability of cash, profitability, revenue growth, etc.)?
- i. Anticipated Transition and Commercialization Results. Include a schedule showing the anticipated quantitative transition and commercialization results from the Phase II project at one year after the start of Phase II, at the completion of Phase II, and after the completion of Phase II (i.e., amount of additional investment, sales revenue, etc.). After Phase II award, the company is required to report actual sales and investment data in its Company Commercialization Report at least annually.

Advocacy Letters (OPTIONAL)* Feedback received from potential Commercial and/or DoD customers and other end-users regarding their interest in the technology to support their capability gaps. Advocacy letters that are faxed or e-mailed separately will NOT be accepted.

Letters of Intent/Commitment (OPTIONAL)* Relationships established, feedback received, support and commitment for the technology with one or more of the following: Commercial customer, DoD PM/PEO, a Defense Prime, or vendor/supplier to the Primes and/or other vendors/suppliers identified as having a potential role in the integration of the technology into fielded systems/products or those under development. Letters of Intent/Commitment that are faxed or e- mailed separately will NOT be accepted.

*Advocacy Letters and Letters of Intent/Commitment are optional, and should ONLY be submitted to substantiate any transition or commercialization claims made in the commercialization strategy. Please DO NOT submit these letters just for the sake of including them in your proposal. These letters DO NOT count against any page limit.

In accordance with section 3-209 of DOD 5500.7-R, Joint Ethics Regulation, letters from government personnel will NOT be considered during the evaluation process.

d. Content of the Technical Volume (Volume 2) – White Paper & Slide Deck

White Paper (NTE 20 pages). Provide the following information:

Goals and Impact: Clearly describe what is being proposed and what difference it will make (qualitatively and quantitatively), including a brief discussion on how this directly relates to the topic.

1. Phase I Feasibility: This topic is accepting Direct to Phase II proposals ONLY. To be eligible, proposers must demonstrate that the feasibility requirements outlined in the topic have been met, and achieved outside of the SBIR program.
2. Technical Plan: Outline and address all technical areas and challenges inherent in the approach and possible solutions for overcoming potential problems. Provide specific objectives, metrics, and milestones at intermediate stages to demonstrate a plan for accomplishment of the project objectives. Propose additional appropriate qualitative and quantitative metrics specific to the approach, as needed. Intermediary milestones should occur at no greater than 1-month increments.
3. Management and Capabilities: Designate key personnel who will be involved in the Phase II effort. Provide a brief summary of expertise of the team, including subcontractors and key personnel. Describe the organizational experience in this technology area, previous work not directly related to the proposed effort but similar, existing intellectual property required to complete the project, and any specialized facilities to be used as part of the project. List Government-furnished materials or data assumed to be available. Describe any specialized facilities to be used as part of the project, the extent of access to these facilities, and any biological containment, biosafety, and certification requirements.
4. Transition and Commercialization Plan:
 - a. Describe the commercial product or DoD system to be developed.
 - b. Discuss the potential end users – DoD, Federal, and/or private sector customers. Discuss your business model for this technology (i.e., how do you anticipate generating revenue with this technology?). Who are you selling to directly or indirectly, a supplier, an integrator, or an end user?
 - c. Describe your company's funding history. Discuss how much additional funding above this proposed effort (include additional required technology development, staffing requirements, infrastructure requirements, IP strategy costs, etc.) that will be required to bring this technology to market and how you anticipate going about getting that funding (e.g., Govt S&T contracts, investment).
 - d. Describe the timeline to maturity for sales or transition to an end user. Describe your IP strategy.
 - e. Describe the technology, market, team and business risks associated with this proposed effort and your plan to mitigate these risks.

Slide Deck (NTE 15 slides). Provide the following information (convert the completed deck to a pdf and attach it to the white paper):

1. What are you trying to do and how does this directly relate to the topic?

2. Technology and commercial product: Specifically, what are you proposing to produce – software, system, application? Be specific on what your proposed technology development is targeting as an end state.
3. How is the technology approached today? Who is doing the research, development and delivering products/services? What are the current limitations in the technology and commercial marketplaces?
4. Technical and commercial value proposition: How have you substantiated the feasibility of your approach? What is innovative in your approach and how does it compare to the state-of-the-art? Why do you think it will be successful both from a technical and commercial perspective? If you are successful, what difference will it make? Discuss your proposed business model – how do you expect to generate revenue from your technology?
5. Technical and commercial risks: What are the key technical and commercial challenges and how do you plan to address/overcome these?
6. Technical and commercial market analysis: Who will care and what will the impact be if you are successful? What/who are the markets/industries/integrators/stakeholders that would/should care?
7. Cost, schedule and milestones: Provide a summary of your cost volume. Provide a summary of your schedule and milestones. How much will your proposed effort cost in total? How long will it take? What are your technical milestones for achieving the proposed efforts? What are your transition and commercialization plan milestones? Discuss how much funding will be required to bring your proposed technology to market and execute on your proposed transition and commercialization plan. Include any funding raised to date and expected plans for raising any additional required funding (government contracting revenue, product sales, internal R&D investment, loan, angel or Venture Capital investment, etc.). Describe timeline to maturity for operational use or commercial sales.
8. Management: Overview of team, facilities and qualifications.
9. Technical summary quad chart: Use template provided at <https://www.darpa.mil/work-with-us/for-small-businesses/participate-sbir-sttr-program>.
10. Commercialization summary quad chart: Use the DARPA Transition and Commercialization Strategy Plan (TCSP) template, located at <https://www.darpa.mil/work-with-us/for-small-businesses/commercialization-continued>.

NOTE: All letters of recommendation and CVs can be loaded in Volume 5: Supporting Documents.

e. Format of Cost Volume (Volume 3)

Proposers are required to use the Direct to Phase II – Volume 3: Cost Proposal Template (Excel Spreadsheet) provided at <https://www.darpa.mil/work-with-us/for-small-businesses/participate-sbir-sttr-program>, under SBIR/STTR BAA FORMS & TEMPLATES. The Cost Volume (and supporting documentation) DOES NOT count toward the page limit of the Technical Volume.

f. Content of the Cost Volume (Volume 3)

Some items in the Cost Breakdown Guidance below may not apply to the proposed project. If such is the case, there is no need to provide information on each and every item.

ALL proposed costs should be accompanied by documentation to substantiate how the cost was derived. For example, if you proposed travel cost to attend a project-related meeting or conference, and used a travel website to compare flight costs, include a screen shot of the comparison. Similarly, if you proposed to purchase materials or equipment, and used the internet to search for the best source, include your market research for those items. You do not necessarily have to propose the cheapest item or supplier, but you should explain your decision to choose one item or supplier over another. It's important to provide enough information to allow contracting personnel to understand how the proposer plans to use the requested funds. If selected for award, failure to include the documentation with your proposal will delay contract negotiation, and the proposer will be asked to submit the necessary documentation to the Contracting Officer to substantiate costs (e.g., cost estimates for equipment, materials, and consultants or subcontractors). It is important to respond as quickly as possible to the Contracting Officer's request for documentation.

Cost Breakdown Guidance:

1. List all key personnel by name as well as by number of hours dedicated to the project as direct labor. Special tooling and test equipment and material cost may be included. The inclusion of equipment and material will be carefully reviewed relative to need and appropriateness for the work proposed. The purchase of special tooling and test equipment must, in the opinion of the Contracting Officer, be advantageous to the Government and should be related directly to the specific topic. These may include such items as innovative instrumentation and/or automatic test equipment. Title to property furnished by the Government or acquired with Government funds will be vested with DARPA; unless it is determined that transfer of title to the contractor would be more cost effective than recovery of the equipment by the DARPA.
2. Cost for travel funds must be justified and related to the needs of the project.
3. Cost sharing is permitted for proposals under this announcement; however, cost sharing is not required nor will it be an evaluation factor in the consideration of a proposal.
4. All subcontractor costs and consultant costs must be detailed at the same level as prime contractor costs in regard to labor, travel, equipment, etc. Provide detailed substantiation of subcontractor costs in your cost proposal. Enter this information in the Explanatory Material section of the on-line cost proposal form. The Supporting Documents Volume (Volume 5) may be used if additional space is needed.

For more information about cost proposals and accounting standards, see the DCAA publication titled "Audit Process Overview – Information for Contractors" available at: <http://www.dcaa.mil>.

g. Company Commercialization Report (Volume 4)

The Company Commercialization Report (CCR) allows companies to report funding outcomes resulting from prior SBIR and STTR awards. The Company Commercialization Report (CCR) is required for Phase I and Direct to Phase II proposals. Please refer to the DoD STTR Program BAA for full details on this requirement. Information contained in the CCR will not be considered by DARPA during proposal evaluations.

h. Supporting Documents (Volume 5)

In addition to required DoD documentation and certifications, small businesses may also submit additional documentation to support the Technical Volume (Volume 2) and the Cost Volume (Volume 3) in Volume 5. Firms should fill out and upload the DARPA SBIR XL Milestones Template found on the

DARPA Small Business website under SBIR/STTR BAA FORMS & TEMPLATES at <https://www.darpa.mil/work-with-us/for-small-businesses/participate-sbir-sttr-program>. See Appendix A Introduction for **required** certifications that must be included in Volume 5. For additional information, see the SBIR 23.4 Annual Program Broad Agency Announcement (BAA) at <https://www.defensesbirstr.mil/SBIR-STTR/Opportunities/>.

i. Fraud Waste and Abuse (Volume 6)

The Fraud, Waste and Abuse (FWA) training is required for Phase I and Direct to Phase II proposals. FWA training provides information on what represents FWA in the SBIR/STTR program, the most common mistakes that lead to FWA, as well as the penalties and ways to prevent FWA in your firm. This training material must be thoroughly reviewed once per year. Plan ahead and leave ample time to complete this training based on the proposal submission deadline. Knowingly and willfully making any false, fictitious, or fraudulent statements or representations may be a felony under the Federal Criminal False Statement Act (18 U.S.C. Sec 1001), punishable by a fine of up to \$10,000, up to five years in prison, or both. Understanding the indicators and types of fraud, waste, and abuse that can occur is critical for the SBIR/STTR awardees' role in preventing the loss of research dollars.

Amendment 6

The purpose of Amendment 6 to DARPA Release 11 is to extend the proposal due date, clarify milestones and deliverables, and update submission information and required templates on pages 1, 2, 4, 10, 11, 12 and 18 (updated text is highlighted).

Defense Advanced Research Projects Agency (DARPA) DoD 23.4 Small Business Innovation Research (SBIR) Annual BAA Proposal Submission Instructions Release 11

INTRODUCTION

To achieve DARPA's mission to create technological surprise, the agency makes strategic, early investments in science and technology that will have long-term positive impacts on our national security. The pace of discovery in both science and technology is accelerating worldwide, resulting in new fields of study and the identification of scientific areas ripe for small business utilization through the SBIR and STTR programs. Small businesses are critical for developing technology to support national security. Proposers are encouraged to consider whether the **Research/Research & Development** (R/R&D) being proposed to **Department of Defense** (DoD) Components also has private sector potential, either for the proposed application or as a base for other applications. The topics below focus on technical domains important to DARPA's mission pursuing innovative research concepts that fall within one of its technology offices. More information about DARPA's technical domains and research topics of interest may be found at: <http://www.darpa.mil/about-us/offices>.

Proposers responding to a topic in this BAA must follow all general instructions provided in the DoD SBIR Program BAA. DARPA requirements in addition to or deviating from the DoD Program BAA are provided in the instructions below.

Proposers are encouraged to thoroughly review the DoD Program BAA and register for the Defense SBIR/STTR Innovation Portal (DSIP) Listserv to remain apprised of important programmatic and contractual changes.

- The DoD Program BAA is located at: <https://www.defensesbirsttr.mil/SBIR-STTR/Opportunities/#announcements>. Be sure to select the tab for the appropriate BAA cycle.
- Register for the DSIP Listserv at: <https://www.dodsbirsttr.mil/submissions/login>.

Specific questions pertaining to the administration of the DARPA Program and these proposal preparation instructions should be directed to: DARPA Small Business Programs Office at SBIR_BAA@darpa.mil. DSIP Topic Q&A will NOT be available for these DARPA topics. Technical questions related to improving the understanding of a topic's requirements must be submitted to SBIR_BAA@darpa.mil by the deadline listed below.

The following dates apply to this DARPA Topic release:

August 2, 2023: Topic issued for pre-release
August 17, 2023: Topic opens; DARPA begins accepting proposals via DSIP
September 12, 2023: Deadline for technical question submission
October 3, 2023: Deadline for receipt of proposals no later than **12:00 pm ET**
October 26, 2023: Topic reopens; DARPA accepting proposals via DSIP
November 9, 2023: Deadline for receipt of proposals no later than **12:00 pm ET**

This amendment allows all proposers interested in responding to the amended solicitation to submit a proposal. Proposers who submitted a timely proposal by the original due date of October 3, 2023 have two options: (1) take no action and have the previously submitted proposal evaluated as is, or

Amendment 6

(2) submit a revised proposal. Firms that wish to revise their proposal can make edits at any time during the amended open period but must ensure that the proposal is recertified and resubmitted by November 9, 2023 at 12:00 pm ET. Proposals that are unlocked for revision by the proposer and not recertified and resubmitted by the deadline will not be considered submitted and will not be evaluated.

DIRECT TO PHASE II PROPOSAL GUIDELINES

Proposers should refer to the DARPA Direct to Phase II SBIR Proposal Instructions, provided in Appendix A.

Current Release Award Structure

White Paper & Slide Deck Proposal

| Topic Number | Direct to Phase II | | | |
|------------------|--------------------|------------|--------------|-----------------------------|
| | Technical Volume | | Award Amount | Period of Performance (PoP) |
| | White Paper | Slide Deck | | |
| HR0011SB20234-17 | 20 pages | 15 pages | \$1,000,000 | 9 months |

Technical Volume (Volume 2) – White Paper & Slide Deck Format

If a proposer can provide adequate documentation to substantiate that the scientific and technical merit and feasibility described in the Phase I section of the topic has been met and describes the potential commercial applications, the Direct to Phase II (DP2) authority allows the Department of Defense (DoD) to make an award to a small business concern under Phase II of the SBIR program without regard to whether the small business concern was provided an award under Phase I of an SBIR program. This topic is accepting DP2 proposal submissions.

The white paper shall not exceed 20 pages, and the slide deck shall not exceed 15 pages. For information on the content of these elements of the technical proposal and the commercialization strategy, please see Attachment A: DARPA Direct to Phase II (DP2) Instructions.

Content of the Technical Volume

Please see Appendix A for complete instructions on the White Paper/Slide Deck technical volume content.

Cost Volume (Volume 3)

Please see the chart above for award amounts listed by topic. Proposers are required to use the Direct to Phase II – Volume 3: Cost Proposal Template (Excel Spreadsheet) provided on the DARPA Small Business site (<https://www.darpa.mil/work-with-us/for-small-businesses/participate-sbir-sttr-program>). Subcontractors may also submit unsanitized costs using this template directly to DARPA at SBIR_BAA@darpa.mil.

Please review the updated Percentage of Work (POW) calculation details included in the DoD Program BAA. DARPA will occasionally accept deviations from the POW requirements with a letter of explanation or approval from the Funding Agreement officer.

Company Commercialization Report (CCR) (Volume 4)

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Completion of the CCR as Volume 4 of the proposal submission in DSIP is required. Please refer to the DoD SBIR Program BAA for full details on this requirement. Information contained in the CCR will not be considered by DARPA during proposal evaluations.

Supporting Documents (Volume 5)

In addition to the documents required by DoD, small businesses may also submit additional documentation to support the Technical Volume (Volume 2) and the Cost Volume (Volume 3) in Volume 5. **See Appendix A for required certifications that must be included in Volume 5.** For additional information, see the SBIR 23.4 Annual Program Broad Agency Announcement (BAA) at <https://www.defensesbirsttr.mil/SBIR-STTR/Opportunities/>.

DISCRETIONARY TECHNICAL AND BUSINESS ASSISTANCE (TABA)

DARPA does not offer TABA funding.

EVALUATION AND SELECTION

All proposals will be evaluated in accordance with the evaluation criteria listed in the DoD SBIR 2023.4 BAA. DARPA will conduct an evaluation of each conforming proposal. Proposals that do not comply with the requirements detailed in this BAA and the research objective(s) of the corresponding topic are considered non-conforming and therefore are not evaluated nor considered for award.

Using the evaluation criteria, the Government will evaluate each proposal in its entirety, documenting the strengths and weaknesses relative to each evaluation criterion, and, based on these identified strengths and weaknesses, determine the proposal's overall selectability. Proposals will not be evaluated against each other during the evaluation process, but rather evaluated on their own individual merit to determine how well the proposal meets the criteria stated in this BAA and the corresponding DARPA topic.

Awards will be made to proposers whose proposals are determined to be the most advantageous to the Government, consistent with instructions and evaluation criteria specified in the DoD SBIR 2023.4 BAA and availability of funding. Given the limited funding available for each topic released, not all proposals considered selectable will be selected for funding.

For the purposes of this proposal evaluation process, a selectable proposal is defined as follows:

Selectable: A selectable proposal is a proposal that has been evaluated by the Government against the evaluation criteria listed in the DoD SBIR 2023.4 BAA and DARPA topic, and the strengths of the overall proposal outweighs its weaknesses. Additionally, there are no accumulated weaknesses that would require extensive negotiations and/or a resubmitted proposal.

For the purposes of this proposal evaluation process, a non-selectable proposal is defined as follows:

Non-Selectable: A proposal is considered non-selectable when the proposal has been evaluated by the Government against the evaluation criteria listed in the DoD SBIR 2023.4 BAA and DARPA topic, and the strengths of the overall proposal do not outweigh its weaknesses.

Proposing firms will be notified of selection or non-selection status for a Phase I award within 90 days of the closing date of the DoD SBIR 2023.4 BAA. It is the policy of DARPA to treat all proposals as source selection information and to disclose their contents only for the purpose of evaluation. Restrictive notices notwithstanding, during the evaluation process, submissions may be handled by support contractors for administrative purposes and/or to assist with technical evaluation. All DARPA support contractors are expressly prohibited from performing DARPA-sponsored technical research and are bound by appropriate

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nondisclosure agreements. Input on technical aspects of the proposals may be solicited by DARPA from other Government and/or non-Government consultants/experts who are strictly bound by the appropriate non-disclosure requirements. No submissions will be returned. Upon completion of the evaluation and selection process, an electronic copy of each proposal received will be retained at DARPA.

Proposal titles, abstracts, anticipated benefits, and keywords of proposals that are selected for contract award will undergo a DARPA Policy and Security Review. Proposal titles, abstracts, anticipated benefits, and keywords are subject to revision and/or redaction by DARPA. Final approved versions of proposal titles, abstracts, anticipated benefits, and keywords may appear on the DoD SBIR/STTR awards website and/or the SBA's SBIR/STTR award website (<https://www.sbir.gov/sbirsearch/award/all>).

Refer to the DoD SBIR 2023.4 Program BAA for procedures to protest the Announcement. As further prescribed in FAR 33.106(b), FAR 52.233-3, Protests regarding the selection decision should be submitted to:

DARPA
Contracts Management Office (CMO)
675 N. Randolph Street
Arlington, VA 22203
E-mail: CMO_SBIRProtests@darpa.mil and sbir@darpa.mil

AWARD AND CONTRACT INFORMATION

1. General Award Information

Multiple awards are anticipated. DARPA may award FAR-based government contracts (Firm- Fixed Price or Cost-Plus Reimbursement) or Other Transactions for Prototypes agreement (under the authority of 10 U.S.C. § 4022) subject to approval of the Contracting Officer. The amount of resources made available for each topic issued under this BAA will depend on the quality of the proposals received and the availability of funds.

Majority Ownership in Part. Proposers that are more than 50% owned by multiple venture capital operating companies (VCOC), hedge funds (HF), private equity firms (PEF), or any combination of these as set forth in 13 C.F.R. § 121.702, are eligible to submit proposals in response to DARPA topics advertised within this BAA.

For proposers that are a member of this ownership class the following must be satisfied for proposals to be accepted and evaluated:

- a. Prior to submitting a proposal, firms must register with the SBA Company Registry Database.
- b. The proposer within its submission must submit the Majority-Owned VCOC, HF, and PEF Certification. A copy of the SBIR VC Certification can be found on <https://www.darpa.mil/work-with-us/for-small-businesses/participate-sbir-sttr-program>, under SBIR/STTR BAA Forms. Include the SBIR VC Certification in the Supporting Documents (Volume 5).
- c. Should a proposer become a member of this ownership class after submitting its proposal and prior to any receipt of a funding agreement, the proposer must immediately notify the Contracting Officer, register in the appropriate SBA database, and submit the required certification which can be found under SBIR/STTR BAA Forms and Templates on <https://www.darpa.mil/work-with-us/for-small-businesses/participate-sbir-sttr-program>.

The Government reserves the right to select for negotiation all, some, one, or none of the proposals received in response to this announcement and to make awards with or without communications with

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proposers. Additionally, the Government reserves the right to award all, some, one, or none of the options on the contract(s)/agreement(s) of the performers based on available funding and technical performance. If warranted, portions of resulting awards may be segregated into pre-priced options. Additionally, DARPA reserves the right to accept proposals in their entirety or to select only portions of proposals for award. In the event that DARPA desires to award only portions of a proposal, negotiations may be opened with that proposer. The Government reserves the right to fund proposals in phases with options for continued work, as applicable.

The Government reserves the right to request any additional, necessary documentation once it makes the award instrument determination. The Government reserves the right to remove a proposal from award consideration should the parties fail to reach agreement on award terms, conditions, and price within a reasonable time, and/or the proposer fails to provide requested additional information within three business days.

In all cases, the Government Contracting Officer reserves the right to select award instrument type, regardless of instrument type proposed, and to negotiate all instrument terms and conditions with selectees. DARPA will apply publication or other restrictions, as necessary, if it determines that the research resulting from the proposed effort will present a high likelihood of disclosing performance characteristics of military systems or manufacturing technologies that are unique and critical to defense. Any award resulting from such a determination will include a requirement for DARPA permission before publishing any information or results on the program. For more information on publication restrictions, see the DoD SBIR 2023.4 BAA.

Because of the desire to streamline the award negotiation and program execution process, proposals identified for negotiation will result in negotiating a type of instrument for award that is in the best interest of the Government. In the case of an OT for Prototype agreement under DARPA's authority to award OTs for prototype projects, 10 U.S.C. § 4022, use of an OT provides significant opportunities for flexible execution to assist in meeting DARPA's aggressive SBIR/STTR program goals.

All proposers that wish to consider an OT award should carefully read the following:

The flexibility of the OT award instrument is beneficial to the program because the Performer will be able to apply its best practices as required to carry out the research project that may be outside of the Federal Acquisition Regulation (FAR) process-driven requirements. Streamlined practices will be used, such as milestone-driven performance, intended to reduce time and effort on award administration tasks and permit performers to focus on the research effort and rapid prototyping. Because of this ability, OTs provide the Agreements Officer the flexibility to create an award instrument that contains terms and conditions that promote commercial transition, reduce some administratively burdensome acquisition regulations, and meet SBIR/STTR program goals.

Proposers must only propose an OT agreement with fixed payable milestones. Fixed payable milestones are fixed payments based on successful completion of the milestone accomplishments agreed to in the milestone plan. Refer to the Other Transactions for Prototypes Fact Sheet and Other Transaction for Prototype Agreement, available at <https://www.darpa.mil/work-with-us/for-small-businesses/participate-sbir-sttr-program>. Specific milestones will be based upon the research objectives detailed in the topic.

Please see <https://www.darpa.mil/work-with-us/for-small-businesses/participate-sbir-sttr-program> for more information on OTs.

2. Transition and Commercialization Support Program (TCSP)

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DARPA will provide services to Phase II or DP2 awardees upon contract execution through the Transition and Commercialization Support Program (TCSP) at no cost to awardees. The TCSP goal is to maximize the potential for SBIR/STTR companies to move their technology beyond Phase II and into other research and development programs for further maturity or into solutions or products for DoD acquisition programs, other Federal programs, and/or the commercial market. Please visit <https://www.darpa.mil/work-with-us/for-small-businesses/commercialization-continued> for more information on DARPA TCSP.

3. Embedded Entrepreneurship Initiative

Awardees of SBIR funding pursuant to this BAA may be eligible to participate in the DARPA Embedded Entrepreneurship Initiative (EEI) during the Period of Performance. Invitation to participate in EEI is at the sole discretion of the Government based on evaluation of technical and commercial factors and subject to program balance and the availability of funding. EEI is a limited scope program offered by DARPA, at DARPA's discretion, to a small subset of awardees. The goal of DARPA's EEI is to increase the likelihood that DARPA-funded technologies take root in the U.S. and provide new capabilities for national defense. EEI supports DARPA's mission "to make pivotal investments in breakthrough technologies and capabilities for national security" by accelerating the transition of innovations out of the lab and into new capabilities for the Department of Defense (DoD). EEI investment supports development of a robust and deliberate Go-to-Market strategy for selling technology product to the government and commercial markets and positions DARPA awardees to attract U.S. investment. The following is for informational and planning purposes only and does not constitute solicitation of proposals to the EEI.

There are three elements to DARPA's EEI: (1) A Senior Commercialization Advisor (SCA) from DARPA who works with the Program Manager (PM) to examine the business case for the awardee's technology and uses commercial methodologies to identify steps toward achieving a successful transition of technology to the government and commercial markets; (2) Connections to potential industry and investor partners via EEI's Investor Working Groups; and (3) Additional funding on an awardee's contract for the awardee to hire an embedded entrepreneur to achieve specific milestones in a Go-to-Market strategy for transitioning the technology to products that serve both defense and commercial markets. This embedded entrepreneur's qualifications should include business experience within the target industries of interest, experience in commercializing early-stage technology, and the ability to communicate and interact with technical and non-technical stakeholders. Funding for EEI is typically no more than \$250,000 per awardee over the duration of the award. An awardee may apportion EEI funding to hire more than one embedded entrepreneur, if achieving the milestones requires different expertise that can be obtained without exceeding the awardee's total EEI funding. The EEI effort is intended to be conducted concurrent with the research program without extending the period of performance.

EEI Application Process:

After receiving an award under the solicitation, awardees interested in being considered for EEI should notify their DARPA Program Manager (PM) during the period of performance. Timing of such notification should ideally allow sufficient time for DARPA and the awardee to review the awardee's initial transition plan, identify milestones to achieve under EEI, modify the award, and conduct the work required to achieve such milestones within the original award period of performance. These steps may take 9-18 months to complete, depending on the technology. If the DARPA PM determines that EEI could be of benefit to transition the technology to product(s) the Government needs, the PM will refer the performer to DARPA Commercial Strategy.

DARPA Commercial Strategy will then contact the performer, assess fitness for EEI, and in consultation with the DARPA technical office, determine whether to invite the performer to participate in the EEI. Factors that are considered in determining fitness for EEI include DoD/Government need for the

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technology; competitive approaches to enable a similar capability or product; risks and impact of the Government's being unable to access the technology from a sustainable source; Government and commercial markets for the technology; cost and affordability; manufacturability and scalability; supply chain requirements and barriers; regulatory requirements and timelines; Intellectual Property and Government Use Rights, and available funding.

Invitation to participate in EEI is at the sole discretion of DARPA and subject to program balance and the availability of funding. EEI participants' awards may be subsequently modified bilaterally to amend the Statement of Work to add negotiated EEI tasks, provide funding, and specify a milestone schedule which will include measurable steps necessary to build, refine, and execute a Go-to-Market technology transition plan aimed at delivering new capabilities for national defense. Milestone examples are available at: <https://www.darpa.mil/work-with-us/contract-management>.

Awardees under this solicitation are eligible to be considered for participation in EEI, but selection for award under this solicitation does not imply or guarantee participation in EEI.

For more information, please refer to the EEI website <https://eei.darpa.mil/>.

4. DARPA Toolbox Initiative

DARPA Toolbox is an Agency-wide effort to provide open licensing opportunities with commercial technology vendors to the researchers behind DARPA programs. DARPA Toolbox provides easy, low-cost, scalable access to state-of-the-art tools and intellectual property (IP) under predictable legal terms and streamlined acquisition procedures. The goal is to reduce performer reliance on low-quality, low-cost tools and IP that increase execution risks and complicate post-DARPA transitions.

Through this initiative, DARPA performers are granted access to select vendor tools and technologies throughout the life of their contractual relationship with the Agency. The Toolbox suppliers bring to the table proven technologies commonly used in state-of-the-art commercial microelectronics or system design methodologies.

DARPA Toolbox program information and a full list of participating suppliers can be found at <https://www.darpa.mil/work-with-us/darpa-toolbox-initiative>. If there are tool or technologies of interest, contact the Supplier POC listed for the product, referencing the DARPA Toolbox Initiative. The Supplier POC will provide advice on products and pricing information. Include any non-production pricing quotes in your proposal. Products and pricing are between you and the suppliers – *do not* contact DARPA directly.

ADDITIONAL INFORMATION

DARPA intends to use electronic mail for all correspondence regarding these topics. Questions related to the technical aspect of the research objectives and awards specifically related to a topic should be emailed to SBIR_BAA@darpa.mil. Please reference the topic number in the subject line. All questions must be in English and must include the name, email address, and the telephone number of a point of contact.

DARPA will attempt to answer questions in a timely manner; however, questions submitted within seven (7) calendar days of the proposal due date listed herein may not be answered. DARPA will post a consolidated Frequently Asked Questions (FAQ) document. To access the posting please visit: <http://www.darpa.mil/work-with-us/opportunities>. Under the topic number summary, there will be a link to the FAQ. The FAQ will be updated on an ongoing basis until one week prior to the proposal due date.

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Technical support for the Defense SBIR/STTR Innovation Portal (DSIP) is available Monday through Friday, 9:00 a.m. – 5:00 p.m. ET. Requests for technical support must be emailed to DoDSBIRSupport@reisystems.com with a copy to SBIR_BAA@arpa.mil.

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DARPA SBIR 23.4 Topic Index
Release 11

HR0011SB20234-17

Artificial Intelligence Cyber Challenge (AIxCC)

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HR0011SB20234-17 TITLE: Artificial Intelligence Cyber Challenge (AIxCC)

OUSD (R&E) CRITICAL TECHNOLOGY AREA(S): Advanced Computing and Software, Integrated Sensing and Cyber, Trusted AI and Autonomy

OBJECTIVE: The objective of the Artificial Intelligence Cyber Challenge (AIxCC) SBIR topic is to develop innovative systems guided by Artificial Intelligence (AI) and Machine Learning (ML) to automatically find and fix software vulnerabilities. The AIxCC SBIR Topic is the Funded Track of DARPA's AI Cyber Challenge (DARPA AIxCC), which will use a competition format to drive the creation of these systems.

DESCRIPTION: In an increasingly interconnected world, software undergirds everything from modern financial systems to public utilities, and older software is unable to be secured manually at scale [1] [2]. Critical infrastructure is among the worst affected; most vulnerabilities within these systems go unidentified, and a majority of the identified vulnerabilities have no patch or mitigation [3]. This state of affairs presents a serious threat to U.S. national security.

Today, manual vulnerability discovery and remediation requires subject matter experts (SME) who can identify and investigate vulnerabilities within software and develop fixes for them. Beginning with the invention of fuzz testing in 1988 [4], the development of tools and techniques for automatic vulnerability discovery and remediation (AVD&R) has continued to move forward toward systems that implement logical reasoning and program analysis approaches to identify and characterize software vulnerabilities. Recent advancements in AI and ML, such as Large Language Models (LLMs), have potential to push AVD&R beyond the inherent barriers of today's logical reasoning systems. By leveraging their symbolic abstractions, neural networks and deep learning techniques can be harnessed to reduce false positives and produce more precise tooling, significantly reducing human intervention. A neuro-symbolic approach could learn novel vulnerability patterns, moving far beyond the capabilities of current tools. Further, by leveraging ML to generate code, patches can be generated automatically at scale. LLMs, have shown enormous potential for reasoning over software, and provide a strong foundation for innovation in AVD&R. Automatic code generation tools, such as CodePilot [5], have been able to write parts of software with little human-intervention. Further, ChatGPT [6] [7] has been shown to be able to accurately find, characterize, and fix certain vulnerabilities. LLMs will also enable new approaches to computer-human teaming for AVD&R, ameliorating the friction found in current tools that prevents their widespread use. [7]

The DARPA AIxCC and the AIxCC SBIR Topic intend to facilitate innovation at the intersection of AVD&R and AI to secure widely used code that underpins critical infrastructure.

PHASE I: This is a Direct to Phase II (DP2) solicitation. Therefore, Phase I proposals will not be accepted or reviewed. Phase I feasibility will be demonstrated through evidence of: a completed feasibility study or a basic prototype system; definition and characterization of properties desirable for both Department of Defense (DoD) and civilian use; and comparisons with alternative state-of-the-art methodologies (competing approaches). This includes determining, insofar as possible, the scientific and technical merit and feasibility of ideas appearing to have application to the core objective of developing a framework for scalable and automated discovery of vulnerabilities in arbitrary complex systems. Proposers interested in submitting a DP2 proposal must provide documentation to substantiate that the scientific and technical merit and feasibility described above have been met and describe the potential military or commercial applications. DP2 documentation should include:

- technical reports describing results and conclusions of existing work, particularly regarding the commercial opportunity or DoD insertion opportunity, and risks/mitigations, assessments;

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- presentation materials and/or white papers;
- technical papers;
- test and measurement data;
- prototype designs/models;
- performance projections, goals, or results in different use cases.

This collection of material will verify mastery of the required content for DP2 consideration. DP2 proposers must also demonstrate knowledge, skills, and ability in computer science, mathematics, physics, electrical engineering, and/or software engineering or related disciplines. For detailed information on DP2 requirements and eligibility, please refer to the DoD BAA and the DARPA Instructions for this topic.

PHASE II: The goal of DARPA's AI Cyber Challenge (DARPA AIxCC) is to leverage advancements in AI and ML, such as LLMs, to create solutions for automatically discovering and remediating software vulnerabilities at speed and at scale to secure widely used critical code.

Please note the AIxCC SBIR Topic does not require any deliverables to be made open-source. Test and evaluation of the prototype developed under this SBIR Topic will occur at the Month 6 Milestone, which requires participation in the DARPA AIxCC Semifinal Competition (ASC). While performance in the ASC may qualify the AIxCC team funded by this SBIR Topic for participation in the AIxCC Final Competition (AFC) and AIxCC Competition Prizes, the AIxCC SBIR Topic does not require continued participation in DARPA AIxCC after the ASC.

The rules governing participation in the AFC and AIxCC Competition Prizes are provided in the AIxCC Rules, available at <https://AICyberChallenge.com/rules>.

Further detail on the structure and environment of the DARPA AIxCC Competitions, including information on the scope of the software environment, required program language choices, addressed cybersecurity threat and the domains of interest is provided in the AIxCC Rules, available at <https://AICyberChallenge.com/rules>. Teams on both the Open Track and Funded Track begin the competition on the same date, with the same knowledge of the competition rules and requirements.

Proposers to the SBIR Topic are encouraged to make their assumptions explicit in their proposals, identify associated risks, and describe possible mitigations. DARPA does not seek to provide specific technical solutions.

DP2 proposals should:

- describe a proposed system to achieve the aforementioned goals and
- present a technical plan and approach, with notable risks/mitigations.

Phase II will include a test and evaluation event where the system must demonstrate its efficacy against a set of AVD&R challenges.

The below schedule of milestones and deliverables is provided to establish expectations and desired results/end products for the Phase II effort. It is expected that proposed technical approaches may evolve and the technical plan may shift throughout the period of performance in response to research results and test and evaluation details, including AIxCC Competition events referenced in the milestones.

Schedule/Milestones/Deliverables:

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Proposers will execute a Research and Development (R&D) plan as described in their proposal including the following fixed payable milestones for this program:

- Month 1: Phase II Kickoff briefing (with annotated slides) to the DARPA Program Manager (PM) including: any updates to the proposed plan and technical approach, risks/mitigations, schedule (inclusive of dependencies) with planned capability milestones and deliverables, and plan for prototype.
- **Month 3: Test and evaluation via participation in the AIxCC Qualifying Competition (AQC).** Technical progress report detailing technical progress to date, tasks accomplished, risks/mitigations, a technical plan for the remainder of Phase II (while this would normally report progress against the plan detailed in the proposal or presented at the Kickoff briefing, it is understood that scientific discoveries, competition, and regulatory changes may all have impacts on the planned work and DARPA must be made aware of any revisions that result), planned activities, trip summaries, and any potential issues or problem areas that require the attention of the DARPA PM.
- **Month 6: Test and evaluation of prototype via participation in the AIxCC Semifinal Competition (ASC). After ASC, awardees may continue to develop the tested and evaluated prototype.**
- Month 9: Final technical progress briefing (with annotated slides) to the DARPA PM. Final architecture with documented details and any other necessary documentation (including, at a minimum, user manuals and a detailed system design document, **and** the commercialization plan).

PHASE III DUAL USE APPLICATIONS: AIxCC has potential applicability across DoD and commercial entities. For USG, AIxCC is well-suited for scaled cybersecurity analysis of real-world systems. AIxCC has the same applicability as the USG for the commercial sector.

Phase III refers to work that derives from, extends, or completes an effort made under prior SBIR funding agreements, but is funded by sources other than the SBIR Program. The Phase III work will be oriented towards transition and commercialization of the developed AIxCC **systems**. The proposer is required to obtain funding from either the private sector, a non-SBIR Government source, or both, to develop the prototype into a viable product or non-R&D service for sale in military or private sector markets. Primary AIxCC support will be to national efforts to explore the ability develop automated cybersecurity tools applicable to real-world systems. Results from AIxCC are intended to improve cybersecurity posture and assessment across government and industry.

REFERENCES:

1. Carnegie, "Timeline of Cyber Incidents Involving Financial Institutions," 2022. [Online]. Available: <https://carnegieendowment.org/specialprojects/protectingfinancialstability/timeline>.
2. A. Haines, "DNI HAINES OPENING STATEMENT ON THE 2023 ANNUAL THREAT ASSESSMENT OF THE U.S. INTELLIGENCE COMMUNITY," DNI, 2023.
3. Dragos, "ICS/OT CYBERSECURITY YEAR IN REVIEW 2022," Dragos, 2022.
4. B. Miller, CS 736 Fall 1988, 1988.
5. OpenAI, "Evaluating Large Language Models Trained on Code," 2021.
6. D. Sobania, M. Briesch, C. Hanna and J. Petke, "An Analysis of the Automatic Bug Fixing Performance of ChatGPT," in arXiv:2301.08653, 2023.
7. E. Dreibelbis, "Watch Out, Software Engineers: ChatGPT Is Now Finding, Fixing Bugs in Code," PCMag, 27 January 2023. [Online]. Available: <https://www.pcmag.com/news/watch-out-software-engineers-chatgpt-is-now-finding-fixing-bugs-in-code>.

KEYWORDS: Cybersecurity, Vulnerability Research, Static Analysis, Symbolic Execution, Dynamic Analysis, Computer Network Security

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TPOC-1: DARPA SBIR BAA Help Desk
Email: SBIR_BAA@darpa.mil

APPENDIX A: DARPA DIRECT TO PHASE II (DP2) PROPOSAL INSTRUCTIONS

I. Introduction

A complete proposal submission consists of:

Volume 1: Proposal Cover Sheet

Volume 2: Technical Volume (feasibility documentation and technical proposal)

Volume 3: Cost Volume

Volume 4: Company Commercialization Report

Volume 5: Supporting Documents

a. Contractor Certification Regarding Provision of Prohibition on Contracting for Certain Telecommunications and Video Surveillance Services or Equipment (Attachment 1)

MANDATORY

b. Disclosures of Foreign Affiliations or Relationships to Foreign Countries (Attachment 2)

MANDATORY

c. Verification of Eligibility of Small Business Joint Ventures (Attachment 3), if applicable

d. Disclosure of Funding Sources (Attachment 4) MANDATORY

e. Other supporting documentation

A completed proposal submission in DSIP does NOT indicate that the mandatory supporting documents have been uploaded. It is the responsibility of the proposing small business concern to ensure that the mandatory documents listed above have been uploaded and included with the proposal submission.

Volume 6: Fraud, Waste and Abuse Training

The Defense SBIR/STTR Innovation Portal (DSIP) provides a structure for building the proposal volumes and submitting a consolidated proposal package. If this is your first time submitting an SBIR or STTR proposal using DSIP, please review detailed training guides at <https://www.dodsbirsttr.mil/submissions/learning-support/training-materials>. It is the responsibility of the proposing firm to ensure that a complete proposal package is certified and submitted by the close date listed in the topic to which they are responding.

To assist in proposal development, templates Volume 3: Cost Volume have been provided as attachments to the announcement posted at <https://www.darpa.mil/work-with-us/for-small-businesses/participate-sbir-sttr-program>. Use of this template is mandatory.

NOTE: All proposers are required to submit Volume 4: Company Commercialization Report (CCR).

II. Proprietary Information

Proposers that include in their proposals data that they do not want disclosed to the public for any purpose, or used by the Government except for evaluation purposes, shall follow instructions in section 4.5 regarding marking propriety proposal information.

III. DP2 Proposal Instructions

a. Proposal Cover Sheet (Volume 1)

The Cover Sheet must include a brief technical abstract of no more than 3000 characters that describes the proposed R&D project with a discussion of anticipated benefits and potential commercial applications.

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Do not include proprietary or classified information in the Proposal Cover Sheet. If your proposal is selected for award, the technical abstract and discussion of anticipated benefits may be publicly released.

b. Content of the Technical Volume (Volume 2) – White Paper & Slide Deck

NOTE: A step-by-step submission instruction document titled “HR0011SB20234-17 Phase II Technical Volume 2 Template” is available at <https://www.darpa.mil/work-with-us/for-small-businesses/participate-sbir-sttr-program>, under SBIR/STTR BAA FORMS & TEMPLATES

White Paper (NTE 20 pages). Provide the following information:

Goals and Impact: Clearly describe what is being proposed and what difference it will make (qualitatively and quantitatively), including a brief discussion on how this directly relates to the topic.

1. **Phase I Feasibility:** This topic is accepting Direct to Phase II proposals ONLY. To be eligible, proposers must demonstrate that the feasibility requirements outlined in the topic have been met, and achieved outside of the SBIR program.
2. **Technical Plan:** Outline and address all technical areas and challenges inherent in the approach and possible solutions for overcoming potential problems. Provide specific objectives, metrics, and milestones at intermediate stages to demonstrate a plan for accomplishment of the project objectives. Propose additional appropriate qualitative and quantitative metrics specific to the approach, as needed. Intermediary milestones should occur at no greater than 1-month increments.
3. **Management and Capabilities:** Designate key personnel who will be involved in the Phase II effort. Provide a brief summary of expertise of the team, including subcontractors and key personnel. Describe the organizational experience in this technology area, previous work not directly related to the proposed effort but similar, existing intellectual property required to complete the project, and any specialized facilities to be used as part of the project. List Government-furnished materials or data assumed to be available. Describe any specialized facilities to be used as part of the project, the extent of access to these facilities, and any biological containment, biosafety, and certification requirements.
4. **Transition and Commercialization Plan (5 pages):**
 - a. Describe the commercial product or DoD system to be developed.
 - b. Discuss the potential end users – DoD, Federal, and/or private sector customers. Discuss your business model for this technology (i.e., how do you anticipate generating revenue with this technology?). Who are you selling to directly or indirectly, a supplier, an integrator, or an end user?
 - c. Describe your company’s funding history. Discuss how much additional funding above this proposed effort (include additional required technology development, staffing requirements, infrastructure requirements, IP strategy costs, etc.) that will be required to bring this technology to market and how you anticipate going about getting that funding (e.g., Govt S&T contracts, investment).
 - d. Describe the timeline to maturity for sales or transition to an end user. Describe your IP strategy.
 - e. Describe the technology, market, team and business risks associated with this proposed effort and your plan to mitigate these risks.

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Slide Deck (NTE 15 slides). Provide the following information (convert the completed deck to a pdf and attach it to the white paper):

1. What are you trying to do and how does this directly relate to the topic?
2. Technology and commercial product: Specifically, what are you proposing to produce – software, system, application? Be specific on what your proposed technology development is targeting as an end state.
3. How is the technology approached today? Who is doing the research, development and delivering products/services? What are the current limitations in the technology and commercial marketplaces?
4. Technical and commercial value proposition: How have you substantiated the feasibility of your approach? What is innovative in your approach and how does it compare to the state-of-the-art? Why do you think it will be successful both from a technical and commercial perspective? If you are successful, what difference will it make? Discuss your proposed business model – how do you expect to generate revenue from your technology?
5. Technical and commercial risks: What are the key technical and commercial challenges and how do you plan to address/overcome these?
6. Technical and commercial market analysis: Who will care and what will the impact be if you are successful? What/who are the markets/industries/integrators/stakeholders that would/should care?
7. Cost, schedule and milestones: Provide a summary of your cost volume. Provide a summary of your schedule and milestones. How much will your proposed effort cost in total? How long will it take? What are your technical milestones for achieving the proposed efforts? What are your transition and commercialization plan milestones? Discuss how much funding will be required to bring your proposed technology to market and execute on your proposed transition and commercialization plan. Include any funding raised to date and expected plans for raising any additional required funding (government contracting revenue, product sales, internal R&D investment, loan, angel or Venture Capital investment, etc.). Describe timeline to maturity for operational use or commercial sales. Please use the template titled “ HR0011SB20234-17 AIxCC SBIR Milestones Template” available at <https://www.darpa.mil/work-with-us/for-small-businesses/participate-sbir-sttr-program>, under SBIR/STTR BAA FORMS & TEMPLATES
8. Management: Overview of team, facilities and qualifications.
9. Technical summary quad chart: Use template provided at <https://www.darpa.mil/work-with-us/for-small-businesses/participate-sbir-sttr-program>.
10. Commercialization summary quad chart: Use the DARPA Transition and Commercialization Strategy Plan (TCSP) template, located at <https://www.darpa.mil/work-with-us/for-small-businesses/commercialization-continued>.

NOTE: All letters of recommendation and CVs can be loaded in Volume 5: Supporting Documents.

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c. Format of Cost Volume (Volume 3)

Proposers are required to use the Direct to Phase II – Volume 3: Cost Proposal Template (Excel Spreadsheet) provided at <https://www.darpa.mil/work-with-us/for-small-businesses/participate-sbir-sttr-program>, under SBIR/STTR BAA FORMS & TEMPLATES. The Cost Volume (and supporting documentation) DOES NOT count toward the page limit of the Technical Volume.

d. Content of the Cost Volume (Volume 3)

Some items in the Cost Breakdown Guidance below may not apply to the proposed project. If such is the case, there is no need to provide information on each and every item.

ALL proposed costs should be accompanied by documentation to substantiate how the cost was derived. For example, if you proposed travel cost to attend a project-related meeting or conference, and used a travel website to compare flight costs, include a screen shot of the comparison. Similarly, if you proposed to purchase materials or equipment, and used the internet to search for the best source, include your market research for those items. You do not necessarily have to propose the cheapest item or supplier, but you should explain your decision to choose one item or supplier over another. It's important to provide enough information to allow contracting personnel to understand how the proposer plans to use the requested funds. If selected for award, failure to include the documentation with your proposal will delay contract negotiation, and the proposer will be asked to submit the necessary documentation to the Contracting Officer to substantiate costs (e.g., cost estimates for equipment, materials, and consultants or subcontractors). It is important to respond as quickly as possible to the Contracting Officer's request for documentation.

Cost Breakdown Guidance:

1. List all key personnel by name as well as by number of hours dedicated to the project as direct labor. Special tooling and test equipment and material cost may be included. The inclusion of equipment and material will be carefully reviewed relative to need and appropriateness for the work proposed. The purchase of special tooling and test equipment must, in the opinion of the Contracting Officer, be advantageous to the Government and should be related directly to the specific topic. These may include such items as innovative instrumentation and/or automatic test equipment. Title to property furnished by the Government or acquired with Government funds will be vested with DARPA; unless it is determined that transfer of title to the contractor would be more cost effective than recovery of the equipment by the DARPA.
2. Cost for travel funds must be justified and related to the needs of the project.
3. Cost sharing is permitted for proposals under this announcement; however, cost sharing is not required nor will it be an evaluation factor in the consideration of a proposal.
4. All subcontractor costs and consultant costs must be detailed at the same level as prime contractor costs in regard to labor, travel, equipment, etc. Provide detailed substantiation of subcontractor costs in your cost proposal. Enter this information in the Explanatory Material section of the on-line cost proposal form. The Supporting Documents Volume (Volume 5) may be used if additional space is needed.

For more information about cost proposals and accounting standards, see the DCAA publication titled "Audit Process Overview – Information for Contractors" available at: <http://www.dcaa.mil>.

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e. Company Commercialization Report (Volume 4)

The Company Commercialization Report (CCR) allows companies to report funding outcomes resulting from prior SBIR and STTR awards. The Company Commercialization Report (CCR) is required for Phase I and Direct to Phase II proposals. Please refer to the DoD STTR Program BAA for full details on this requirement. Information contained in the CCR will not be considered by DARPA during proposal evaluations.

f. Supporting Documents (Volume 5)

In addition to required DoD documentation and certifications, small businesses may also submit additional documentation to support the Technical Volume (Volume 2) and the Cost Volume (Volume 3) in Volume 5. Firms should fill out and upload the DARPA SBIR XL Milestones Template found on the DARPA Small Business website under SBIR/STTR BAA FORMS & TEMPLATES at <https://www.darpa.mil/work-with-us/for-small-businesses/participate-sbir-sttr-program>. See Appendix A Introduction for **required** certifications that must be included in Volume 5. For additional information, see the SBIR 23.4 Annual Program Broad Agency Announcement (BAA) at <https://www.defensesbirstr.mil/SBIR-STTR/Opportunities/>.

g. Fraud Waste and Abuse (Volume 6)

The Fraud, Waste and Abuse (FWA) training is required for Phase I and Direct to Phase II proposals. FWA training provides information on what represents FWA in the SBIR/STTR program, the most common mistakes that lead to FWA, as well as the penalties and ways to prevent FWA in your firm. This training material must be thoroughly reviewed once per year. Plan ahead and leave ample time to complete this training based on the proposal submission deadline. Knowingly and willfully making any false, fictitious, or fraudulent statements or representations may be a felony under the Federal Criminal False Statement Act (18 U.S.C. § 1001), punishable by a fine of up to \$10,000, up to five years in prison, or both. Understanding the indicators and types of fraud, waste, and abuse that can occur is critical for the SBIR/STTR awardees' role in preventing the loss of research dollars.

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**Defense Advanced Research Projects Agency (DARPA)
DoD 23.4 Small Business Innovation Research (SBIR) Annual BAA
Proposal Submission Instructions Release 12**

INTRODUCTION

To achieve DARPA's mission to create technological surprise, the agency makes strategic, early investments in science and technology that will have long-term positive impacts on our national security. The pace of discovery in both science and technology is accelerating worldwide, resulting in new fields of study and the identification of scientific areas ripe for small business utilization through the SBIR and STTR programs. Small businesses are critical for developing technology to support national security. Proposers are encouraged to consider whether the R/R&D being proposed to DoD Components also has private sector potential, either for the proposed application or as a base for other applications. The topics below focus on technical domains important to DARPA's mission pursuing innovative research concepts that fall within one of its technology offices. More information about DARPA's technical domains and research topics of interest may be found at: <http://www.darpa.mil/about-us/offices>.

Proposers responding to a topic in this BAA must follow all general instructions provided in the Department of Defense (DoD) SBIR Program BAA. DARPA requirements in addition to or deviating from the DoD Program BAA are provided in the instructions below.

Proposers are encouraged to thoroughly review the DoD Program BAA and register for the DSIP Listserv to remain apprised of important programmatic and contractual changes.

- The DoD Program BAA is located at: <https://www.defensesbirsttr.mil/SBIR-STTR/Opportunities/#announcements>. Be sure to select the tab for the appropriate BAA cycle. Register for the DSIP Listserv at: <https://www.dodsirsttr.mil/submissions/login>

Specific questions pertaining to the administration of the DARPA Program and these proposal preparation instructions should be directed to: DARPA Small Business Programs Office at SBIR_BAA@darpa.mil. DSIP Topic Q&A will NOT be available for these DARPA topics. Technical questions related to improving the understanding of a topic's requirements must be submitted to SBIR_BAA@darpa.mil by the deadline listed below.

The following dates apply to this DARPA Topic release:

August 03, 2023: Topic issued for pre-release

August 22, 2023: Topic opens; DARPA begins accepting proposals via DSIP

September 14, 2023: Deadline for technical question submission

September 21, 2023: Deadline for receipt of proposals no later than **12:00 pm ET**

DIRECT TO PHASE II PROPOSAL GUIDELINES

Proposers should refer to the DARPA Direct to Phase II SBIR XL Proposal Instructions, provided in Appendix A.

Current Release Award Structure

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| Topic Number | Direct to Phase II | | | | | |
|--------------------|--------------------|------------|--------------|-----------------------------|---------------|---------------|
| | Technical Volume | | Award Amount | Period of Performance (PoP) | Option Amount | Option Period |
| | White Paper | Slide Deck | | | | |
| HR0011SB20234XL-05 | 20 pages | 15 pages | \$1,000,000 | 6 months | \$3,000,000 | 6 months |

**For this topic DARPA will accept DP2 proposals with a total maximum cost/price of \$4,000,000. This maximum cost/price includes a 6-month base period not to exceed \$1,000,000 and a 6-month Option minimum of \$2,000,000. The base period and the minimum funding for the Option (if exercised) are funded entirely by DARPA. Additionally, if the Option is exercised, DARPA is encouraging the performer to arrange additional program funding with a commercial or government (non-DARPA) partner of up to \$500,000. Any proposed non-DARPA funding agreement must be written, signed, and received by DARPA 60 calendar days before the last day of the period of performance of the base period to permit DARPA sufficient time to access as part of the determination to award the Option effort. DARPA will match up to \$500,000 of non-DARPA funds under a written, signed, and timely submitted agreement. Securing a non-DARPA funding agreement does not obligate DARPA to exercise the Option effort, nor will the lack of a written funding agreement prevent the performer from receiving an Option. DARPA will make option award decisions based on performance and funding availability.

Note: Please see Appendix A section III (d) for complete instructions on the White Paper/Slide Deck technical volume format.

Content of the Technical Volume

Proposers should refer to the DARPA DP2 Proposal Instructions, provided in Appendix A and on the DARPA Small Business site (<https://www.darpa.mil/work-with-us/for-small-businesses/participate-sbir-sttr-program>).

Cost Volume (Volume 3)

Please see the chart above for award amounts listed by topic. Proposers are required to use the Direct to Phase II – Volume 3: Cost Proposal Template (Excel Spreadsheet) provided on the DARPA Small Business site (<https://www.darpa.mil/work-with-us/for-small-businesses/participate-sbir-sttr-program>). Subcontractors may also submit unsanitized costs using this template directly to DARPA at SBIR-BAA@darpa.mil.

Please review the updated Percentage of Work (POW) calculation details included in the DoD Program BAA. DARPA will occasionally accept deviations from the POW requirements with a letter of explanation or approval from the Funding Agreement officer.

Company Commercialization Report (CCR) (Volume 4)

Completion of the CCR as Volume 4 of the proposal submission in DSIP is required. Please refer to the DoD SBIR Program BAA for full details on this requirement. Information contained in the CCR will not be considered by DARPA during proposal evaluations.

Supporting Documents (Volume 5)

In addition to the documents required by DoD, small businesses may also submit additional documentation to support the Technical Volume (Volume 2) and the Cost Volume (Volume 3) in Volume 5. Firms should fill out and upload the DARPA SBIR XL Milestones Template found on the DARPA Small Business website under SBIR/STTR BAA FORMS & TEMPLATES at

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<https://www.darpa.mil/work-with-us/for-small-businesses/participate-sbir-sttr-program>. See Appendix A for required certifications that must be included in Volume 5. For additional information, see the SBIR 23.4 Annual Program Broad Agency Announcement (BAA) at <https://www.defensesbirstr.mil/SBIR-STTR/Opportunities/>.

DISCRETIONARY TECHNICAL AND BUSINESS ASSISTANCE (TABA)

DARPA does not offer TABA funding.

EVALUATION AND SELECTION

All proposals will be evaluated in accordance with the evaluation criteria listed in the DoD SBIR 2023.4 BAA. DARPA will conduct an evaluation of each conforming proposal. Proposals that do not comply with the requirements detailed in this BAA and the research objective(s) of the corresponding topic are considered non-conforming and therefore are not evaluated nor considered for award.

Using the evaluation criteria, the Government will evaluate each proposal in its entirety, documenting the strengths and weaknesses relative to each evaluation criterion, and, based on these identified strengths and weaknesses, determine the proposal's overall selectability. Proposals will not be evaluated against each other during the evaluation process, but rather evaluated on their own individual merit to determine how well the proposal meets the criteria stated in this BAA and the corresponding DARPA topic.

Awards will be made to proposers whose proposals are determined to be the most advantageous to the Government, consistent with instructions and evaluation criteria specified in the DoD SBIR 2023.4 BAA and availability of funding. Given the limited funding available for each topic released, not all proposals considered selectable will be selected for funding.

For the purposes of this proposal evaluation process, a selectable proposal is defined as follows:

Selectable: A selectable proposal is a proposal that has been evaluated by the Government against the evaluation criteria listed in the DoD SBIR 2023.4 BAA and DARPA topic, and the strengths of the overall proposal outweighs its weaknesses. Additionally, there are no accumulated weaknesses that would require extensive negotiations and/or a resubmitted proposal.

For the purposes of this proposal evaluation process, a non-selectable proposal is defined as follows:

Non-Selectable: A proposal is considered non-selectable when the proposal has been evaluated by the Government against the evaluation criteria listed in the DoD SBIR 2023.4 BAA and DARPA topic, and the strengths of the overall proposal do not outweigh its weaknesses.

Proposing firms will be notified of selection or non-selection status for a Phase I award within 90 days of the closing date of the DoD SBIR 2023.4 BAA. It is the policy of DARPA to treat all proposals as source selection information and to disclose their contents only for the purpose of evaluation. Restrictive notices notwithstanding, during the evaluation process, submissions may be handled by support contractors for administrative purposes and/or to assist with technical evaluation. All DARPA support contractors are expressly prohibited from performing DARPA-sponsored technical research and are bound by appropriate nondisclosure agreements. Input on technical aspects of the proposals may be solicited by DARPA from other Government and/or non-Government consultants/experts who are strictly bound by the appropriate non-disclosure requirements. No submissions will be returned. Upon completion of the evaluation and selection process, an electronic copy of each proposal received will be retained at DARPA.

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Proposal titles, abstracts, anticipated benefits, and keywords of proposals that are selected for contract award will undergo a DARPA Policy and Security Review. Proposal titles, abstracts, anticipated benefits, and keywords are subject to revision and/or redaction by DARPA. Final approved versions of proposal titles, abstracts, anticipated benefits, and keywords may appear on the DoD SBIR/STTR awards website and/or the SBA's SBIR/STTR award website (<https://www.sbir.gov/sbirsearch/award/all>).

Refer to the DoD SBIR 2023.4 Program BAA for procedures to protest the Announcement. As further prescribed in FAR 33.106(b), FAR 52.233-3, Protests regarding the selection decision should be submitted to:

DARPA
Contracts Management Office (CMO)
675 N. Randolph Street
Arlington, VA 22203
E-mail: scott.ulrey@darpa.mil and sbir@darpa.mil

AWARD AND CONTRACT INFORMATION

1. General Award Information

Multiple awards are anticipated. DARPA may award FAR-based government contracts (Firm- Fixed Price or Cost-Plus Reimbursement) or Other Transactions for Prototypes agreement (under the authority of 10 U.S.C. § 4022) subject to approval of the Contracting Officer. The amount of resources made available for each topic issued under this BAA will depend on the quality of the proposals received and the availability of funds.

Majority Ownership in Part. Proposers that are more than 50% owned by multiple venture capital operating companies (VCOC), hedge funds (HF), private equity firms (PEF), or any combination of these as set forth in 13 C.F.R. § 121.702, are eligible to submit proposals in response to DARPA topics advertised within this BAA.

For proposers that are a member of this ownership class the following must be satisfied for proposals to be accepted and evaluated:

- a. Prior to submitting a proposal, firms must register with the SBA Company Registry Database.
- b. The proposer within its submission must submit the Majority-Owned VCOC, HF, and PEF Certification. A copy of the SBIR VC Certification can be found on <https://www.darpa.mil/work-with-us/for-small-businesses/participate-sbir-sttr-program>, under SBIR/STTR BAA Forms. Include the SBIR VC Certification in the Supporting Documents (Volume 5).
- c. Should a proposer become a member of this ownership class after submitting its proposal and prior to any receipt of a funding agreement, the proposer must immediately notify the Contracting Officer, register in the appropriate SBA database, and submit the required certification which can be found under SBIR/STTR BAA Forms and Templates on <https://www.darpa.mil/work-with-us/for-small-businesses/participate-sbir-sttr-program>.

The Government reserves the right to select for negotiation all, some, one, or none of the proposals received in response to this announcement and to make awards with or without communications with proposers. Additionally, the Government reserves the right to award all, some, one, or none of the options on the contract(s)/agreement(s) of the performers based on available funding and technical performance. If warranted, portions of resulting awards may be segregated into pre-priced options. Additionally, DARPA reserves the right to accept proposals in their entirety or to select only portions of proposals for award. In the event that DARPA desires to award only portions of a proposal, negotiations may be opened

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with that proposer. The Government reserves the right to fund proposals in phases with options for continued work, as applicable.

The Government reserves the right to request any additional, necessary documentation once it makes the award instrument determination. The Government reserves the right to remove a proposal from award consideration should the parties fail to reach agreement on award terms, conditions, and price within a reasonable time, and/or the proposer fails to provide requested additional information within three business days.

In all cases, the Government Contracting Officer reserves the right to select award instrument type, regardless of instrument type proposed, and to negotiate all instrument terms and conditions with selectees. DARPA will apply publication or other restrictions, as necessary, if it determines that the research resulting from the proposed effort will present a high likelihood of disclosing performance characteristics of military systems or manufacturing technologies that are unique and critical to defense. Any award resulting from such a determination will include a requirement for DARPA permission before publishing any information or results on the program. For more information on publication restrictions, see the DoD SBIR 2023.4 BAA.

Because of the desire to streamline the award negotiation and program execution process, proposals identified for negotiation will result in negotiating a type of instrument for award that is in the best interest of the Government. In the case of an OT for Prototype agreement under DARPA's authority to award OTs for prototype projects, 10 U.S.C. § 4022, use of an OT provides significant opportunities for flexible execution to assist in meeting DARPA's aggressive SBIR/STTR program goals.

All proposers that wish to consider an OT award should carefully read the following:

The flexibility of the OT award instrument is beneficial to the program because the Performer will be able to apply its best practices as required to carry out the research project that may be outside of the Federal Acquisition Regulation (FAR) process-driven requirements. Streamlined practices will be used, such as milestone-driven performance, intended to reduce time and effort on award administration tasks and permit performers to focus on the research effort and rapid prototyping. Because of this ability, OTs provide the Agreement Officer the flexibility to create an award instrument that contains terms and conditions that promote commercial transition, reduce some administratively burdensome acquisition regulations, and meet SBIR/STTR program goals.

Proposers must only propose an OT agreement with fixed payable milestones. Fixed payable milestones are fixed payments based on successful completion of the milestone accomplishments agreed to in the milestone plan. Refer to the Other Transactions for Prototypes Fact Sheet and Other Transaction for Prototype Agreement, available at <https://www.darpa.mil/work-with-us/for-small-businesses/participate-sbir-sttr-program>. Specific milestones will be based upon the research objectives detailed in the topic.

Please see <https://www.darpa.mil/work-with-us/for-small-businesses/participate-sbir-sttr-program> for more information on OTs.

2. Transition and Commercialization Support Program (TCSP)

DARPA will provide services to Phase II or DP2 awardees upon contract execution through the Transition and Commercialization Support Program (TCSP) at no cost to awardees. The TCSP goal is to maximize the potential for SBIR/STTR companies to move their technology beyond Phase II and into other research and development programs for further maturity or into solutions or products for DoD acquisition programs, other Federal programs, and/or the commercial market. Please visit

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<https://www.darpa.mil/work-with-us/for-small-businesses/commercialization-continued> for more information on DARPA TCSP.

3. Embedded Entrepreneurship Initiative

Awardees of SBIR funding pursuant to this BAA may be eligible to participate in the DARPA Embedded Entrepreneurship Initiative (EEI) during the Period of Performance. Invitation to participate in EEI is at the sole discretion of the Government based on evaluation of technical and commercial factors and subject to program balance and the availability of funding. EEI is a limited scope program offered by DARPA, at DARPA's discretion, to a small subset of awardees. The goal of DARPA's EEI is to increase the likelihood that DARPA-funded technologies take root in the U.S. and provide new capabilities for national defense. EEI supports DARPA's mission "to make pivotal investments in breakthrough technologies and capabilities for national security" by accelerating the transition of innovations out of the lab and into new capabilities for the Department of Defense (DoD). EEI investment supports development of a robust and deliberate Go-to-Market strategy for selling technology product to the government and commercial markets and positions DARPA awardees to attract U.S. investment. The following is for informational and planning purposes only and does not constitute solicitation of proposals to the EEI.

There are three elements to DARPA's EEI: (1) A Senior Commercialization Advisor (SCA) from DARPA who works with the Program Manager (PM) to examine the business case for the awardee's technology and uses commercial methodologies to identify steps toward achieving a successful transition of technology to the government and commercial markets; (2) Connections to potential industry and investor partners via EEI's Investor Working Groups; and (3) Additional funding on an awardee's contract for the awardee to hire an embedded entrepreneur to achieve specific milestones in a Go-to-Market strategy for transitioning the technology to products that serve both defense and commercial markets. This embedded entrepreneur's qualifications should include business experience within the target industries of interest, experience in commercializing early-stage technology, and the ability to communicate and interact with technical and non-technical stakeholders. Funding for EEI is typically no more than \$250,000 per awardee over the duration of the award. An awardee may apportion EEI funding to hire more than one embedded entrepreneur, if achieving the milestones requires different expertise that can be obtained without exceeding the awardee's total EEI funding. The EEI effort is intended to be conducted concurrent with the research program without extending the period of performance.

EEI Application Process:

After receiving an award under the solicitation, awardees interested in being considered for EEI should notify their DARPA Program Manager (PM) during the period of performance. Timing of such notification should ideally allow sufficient time for DARPA and the awardee to review the awardee's initial transition plan, identify milestones to achieve under EEI, modify the award, and conduct the work required to achieve such milestones within the original award period of performance. These steps may take 9-18 months to complete, depending on the technology. If the DARPA PM determines that EEI could be of benefit to transition the technology to product(s) the Government needs, the PM will refer the performer to DARPA Commercial Strategy.

DARPA Commercial Strategy will then contact the performer, assess fitness for EEI, and in consultation with the DARPA technical office, determine whether to invite the performer to participate in the EEI. Factors that are considered in determining fitness for EEI include DoD/Government need for the technology; competitive approaches to enable a similar capability or product; risks and impact of the Government's being unable to access the technology from a sustainable source; Government and commercial markets for the technology; cost and affordability; manufacturability and scalability; supply chain requirements and barriers; regulatory requirements and timelines; Intellectual Property and Government Use Rights, and available funding.

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Invitation to participate in EEI is at the sole discretion of DARPA and subject to program balance and the availability of funding. EEI participants' awards may be subsequently modified bilaterally to amend the Statement of Work to add negotiated EEI tasks, provide funding, and specify a milestone schedule which will include measurable steps necessary to build, refine, and execute a Go-to-Market technology transition plan aimed at delivering new capabilities for national defense. Milestone examples are available at: <https://www.darpa.mil/work-with-us/contract-management>.

Awardees under this solicitation are eligible to be considered for participation in EEI, but selection for award under this solicitation does not imply or guarantee participation in EEI.

For more information please refer to the EEI website <https://eei.darpa.mil/>.

4. DARPA Toolbox Initiative

DARPA Toolbox is an Agency-wide effort to provide open licensing opportunities with commercial technology vendors to the researchers behind DARPA programs. DARPA Toolbox provides easy, low-cost, scalable access to state-of-the-art tools and intellectual property (IP) under predictable legal terms and streamlined acquisition procedures. The goal is to reduce performer reliance on low-quality, low-cost tools and IP that increase execution risks and complicate post-DARPA transitions.

Through this initiative, DARPA performers are granted access to select vendor tools and technologies throughout the life of their contractual relationship with the Agency. The Toolbox suppliers bring to the table proven technologies commonly used in state-of-the-art commercial microelectronics or system design methodologies.

DARPA Toolbox program information and a full list of participating suppliers can be found at <https://www.darpa.mil/work-with-us/darpa-toolbox-initiative>. If there are tool or technologies of interest, contact the Supplier POC listed for the product, referencing the DARPA Toolbox Initiative. The Supplier POC will provide advice on products and pricing information. Include any non-production pricing quotes in your proposal. Products and pricing are between you and the suppliers – *do not* contact DARPA directly.

ADDITIONAL INFORMATION

DARPA intends to use electronic mail for all correspondence regarding these topics. Questions related to the technical aspect of the research objectives and awards specifically related to a topic should be emailed to SBIR_BAA@darpa.mil. Please reference the topic number in the subject line. All questions must be in English and must include the name, email address, and the telephone number of a point of contact.

DARPA will attempt to answer questions in a timely manner; however, questions submitted within seven (7) calendar days of the proposal due date listed herein may not be answered. DARPA will post a consolidated Frequently Asked Questions (FAQ) document. To access the posting please visit: <http://www.darpa.mil/work-with-us/opportunities>. Under the topic number summary, there will be a link to the FAQ. The FAQ will be updated on an ongoing basis until one week prior to the proposal due date.

Technical support for the Defense SBIR/STTR Innovation Portal (DSIP) is available Monday through Friday, 9:00 a.m. – 5:00 p.m. ET. Requests for technical support must be emailed to DoDSBIRSupport@reisystems.com with a copy to SBIR_BAA@darpa.mil.

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**DARPA SBIR 23.4 Topic Index
Release 12**

HR0011SB20234XL-05

Project CAPTURE: Capturing Aerial Payloads To Unleash Reliable
Exploitation – SBIR XL

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HR0011SB20234XL-05

TITLE: Project CAPTURE: Capturing Aerial Payloads To Unleash Reliable Exploitation – SBIR XL

OUSD (R&E) CRITICAL TECHNOLOGY AREA(S): Human-Machine Interfaces

OBJECTIVE: Develop and demonstrate a prototype system to capture and recover exploitable payloads from slow speed high-altitude aerial systems of interest within or approaching U.S. sovereign airspace.

DESCRIPTION: Recent incursions of U.S. airspace demonstrated limitations of the ability to recover sensitive payloads from slow-speed high-altitude objects in a manner that is both effective for follow on exploitation and scalable to employment over diverse geographic areas. The military's current ability to respond to slow-moving, high-altitude objects is constrained by physics and the capabilities of current weapons systems. For example, the F-22 is one of few aircraft able to operate at an altitude above 50,000 feet. Additionally, these aircraft travel at hundreds of miles per hour while attempting to identify and target slow-moving or stationary objects. Aerial systems of interest are typically downed in areas of lower risk to humans. These constraints, coupled with current technical capabilities, result in limited engagement opportunities and difficult recovery operations.

The DARPA **CAPTURE** effort seeks to rapidly develop and demonstrate an integrated prototype system to capture and retrieve aerial systems of interest flying slowly at high altitudes under positive control in a manner safe to the surrounding area while maximizing exploitation of the captured system. Solutions should address the following unique challenges:

- Aerial systems of interest may range from 500 pounds (threshold) to 1,500 pounds (objective)
- Aerial systems of interest may constitute varying sizes or shapes
- Aerial systems of interest may operate up to 60,000 feet (threshold) to 75,000 feet (objective)
- Captured systems should include the aerial system's payloads (threshold) or the entirety of the aerial system of interest (objective)
- Capture of aerial systems of interest should be in a manner allowing for controlled descent for recovery near inhabited or otherwise currently avoided recovery areas
- Captured aerial systems of interest should be in a condition maximizing the ability for technical exploitation upon recoverySolution response time to aerial systems of interest approaching or within any U.S. sovereign airspace should scale to an order of hours after an engagement decision.

Solutions should take advantage of existing military and commercial logistics infrastructure where possible. Solutions should clearly identify what existing technologies or systems would be used as part of the approach. Examples may include, but are not limited to, involvement of specific slow-moving aircraft or use of surface-based systems. Solutions requiring additional government furnished information, dependencies, or equipment to be potentially provided as part of the solution should be clearly and plainly described for consideration of the proposed approach.

PHASE I: This topic is Direct to Phase II only. The desired system may leverage existing technologies and systems to rapidly integrate into a prototype system in order to demonstrate the desired objective capability. The proposal documentation should address the following areas to demonstrate system readiness to proceed straight to Phase II:

- Design, fabrication, and flight test experience of high-altitude systems that operate above 50,000 ft.
- Pedigree of the proposed concept to include any relevant prior test and analysis activities.

PHASE II: The base period should produce a fieldable prototype final design review that satisfies project objectives in no more than six months after contract award. A follow-on option phase should include a final demonstration no more than 9 to 12 months after contract award. This timeline emphasizes the desire for innovative yet simple development of readily available capabilities. The prototype system may

AMENDMENT 2

The purpose of Amendment 2 to DARPA Release 12 is to update period of performance language on page 2 (update highlighted)

use or modify existing technologies and operational systems (military or commercial) to rapidly achieve program objectives.

The performer will be expected to provide a Statement of Work (SOW) listing tasks and associated subtasks required to meet the following deliverables commensurate within the stated timeline for this effort:

- Description and analysis of the concept of employment
- Description and analysis of the concept of operations
- System concept and designs to include any modification of existing designs
- Technical, cost, and schedule risk analysis of the proposed approach
- Anticipated risk reduction testing plan and schedule
- Final prototype system hardware, software, and technical data packages
- Field test demonstration

The performer must identify what government information and assets must be made available as part of the development process and system testing (GFI and GFE). It is anticipated that multiple existing military systems may be required for completing the concept of operations. Engagement of these systems and organization functions is also expected to promote the rapid transition of the prototype system. Follow-on options to the base effort are expected to include the rapid incorporation into the operational systems and organizations.

PHASE III DUAL USE APPLICATIONS: Transition partners will be integral to the execution during the Phase II effort due to the rapid and inherent utilization of operational assets requirements.

REFERENCES:

1. <https://www.whitehouse.gov/briefing-room/speeches-remarks/2023/02/16/remarks-by-president-biden-on-the-united-states-response-to-recent-aerial-objects/>
2. <https://www.defense.gov/News/News-Stories/Article/Article/3297104/chinese-surveillance-balloons-global-in-scope-says-official/>

KEYWORDS: Manned/unmanned air vehicles; missiles; air capture/retrieval systems

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APPENDIX A: DARPA DIRECT TO PHASE II (DP2) PROPOSAL INSTRUCTIONS

I. Introduction

A complete proposal submission consists of:

Volume 1: Proposal Cover Sheet

Volume 2: Technical Volume (feasibility documentation and technical proposal)

Volume 3: Cost Volume

Volume 4: Company Commercialization Report

Volume 5: Supporting Documents

a. Contractor Certification Regarding Provision of Prohibition on Contracting for Certain Telecommunications and Video Surveillance Services or Equipment (Attachment 1)

MANDATORY

b. Disclosures of Foreign Affiliations or Relationships to Foreign Countries (Attachment 2)

MANDATORY

c. Verification of Eligibility of Small Business Joint Ventures (Attachment 3), if applicable

d. Disclosure of Funding Sources (Attachment 4) **MANDATORY**

e. Other supporting documentation

A completed proposal submission in DSIP does NOT indicate that the mandatory supporting documents have been uploaded. It is the responsibility of the proposing small business concern to ensure that the mandatory documents listed above have been uploaded and included with the proposal submission.

Volume 6: Fraud, Waste and Abuse Training

The Defense SBIR/STTR Innovation Portal (DSIP) provides a structure for building the proposal volumes and submitting a consolidated proposal package. If this is your first time submitting an SBIR or STTR proposal using DSIP, please review detailed training guides at <https://www.dodsbirsttr.mil/submissions/learning-support/training-materials>. It is the responsibility of the proposing firm to ensure that a complete proposal package is certified and submitted by the close date listed in the topic to which they are responding.

To assist in proposal development, templates Volume 3: Cost Volume have been provided as attachments to the announcement posted at <https://www.darpa.mil/work-with-us/for-small-businesses/participate-sbir-sttr-program>. Use of this template is mandatory.

NOTE: All proposers are required to submit Volume 4: Company Commercialization Report (CCR).

II. Proprietary Information

Proposers that include in their proposals data that they do not want disclosed to the public for any purpose, or used by the Government except for evaluation purposes, shall follow instructions in section 4.5 regarding marking propriety proposal information.

III. DP2 Proposal Instructions

a. Proposal Cover Sheet (Volume 1)

The Cover Sheet must include a brief technical abstract of no more than 3000 characters that describes the proposed R&D project with a discussion of anticipated benefits and potential commercial applications.

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Do not include proprietary or classified information in the Proposal Cover Sheet. If your proposal is selected for award, the technical abstract and discussion of anticipated benefits may be publicly released.

b. Content of the Technical Volume (Volume 2) – White Paper & Slide Deck

White Paper (NTE 20 pages). Provide the following information:

Goals and Impact: Clearly describe what is being proposed and what difference it will make (qualitatively and quantitatively), including a brief discussion on how this directly relates to the topic.

1. Phase I Feasibility: This topic is accepting Direct to Phase II proposals ONLY. To be eligible, proposers must demonstrate that the feasibility requirements outlined in the topic have been met, and achieved outside of the SBIR program.
2. Technical Plan: Outline and address all technical areas and challenges inherent in the approach and possible solutions for overcoming potential problems. Provide specific objectives, metrics, and milestones at intermediate stages to demonstrate a plan for accomplishment of the project objectives. Propose additional appropriate qualitative and quantitative metrics specific to the approach, as needed. Intermediary milestones should occur at no greater than 1-month increments.
3. Management and Capabilities: Designate key personnel who will be involved in the Phase II effort. Provide a brief summary of expertise of the team, including subcontractors and key personnel. Describe the organizational experience in this technology area, previous work not directly related to the proposed effort but similar, existing intellectual property required to complete the project, and any specialized facilities to be used as part of the project. List Government-furnished materials or data assumed to be available. Describe any specialized facilities to be used as part of the project, the extent of access to these facilities, and any biological containment, biosafety, and certification requirements.
4. Transition and Commercialization Plan:
 - a. Describe the commercial product or DoD system to be developed.
 - b. Discuss the potential end users – DoD, Federal, and/or private sector customers. Discuss your business model for this technology (i.e., how do you anticipate generating revenue with this technology?). Who are you selling to directly or indirectly, a supplier, an integrator, or an end user?
 - c. Describe your company's funding history. Discuss how much additional funding above this proposed effort (include additional required technology development, staffing requirements, infrastructure requirements, IP strategy costs, etc.) that will be required to bring this technology to market and how you anticipate going about getting that funding (e.g., Govt S&T contracts, investment).
 - d. Describe the timeline to maturity for sales or transition to an end user. Describe your IP strategy.
 - e. Describe the technology, market, team and business risks associated with this proposed effort and your plan to mitigate these risks.

Slide Deck (NTE 15 slides). Provide the following information (convert the completed deck to a pdf and attach it to the white paper):

1. What are you trying to do and how does this directly relate to the topic?

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The purpose of Amendment 2 to DARPA Release 12 is to update period of performance language on page 2 (update highlighted)

2. Technology and commercial product: Specifically, what are you proposing to produce – software, system, application? Be specific on what your proposed technology development is targeting as an end state.
3. How is the technology approached today? Who is doing the research, development and delivering products/services? What are the current limitations in the technology and commercial marketplaces?
4. Technical and commercial value proposition: How have you substantiated the feasibility of your approach? What is innovative in your approach and how does it compare to the state-of-the-art? Why do you think it will be successful both from a technical and commercial perspective? If you are successful what difference will it make? Discuss your proposed business model – how do you expect to generate revenue from your technology?
5. Technical and commercial risks: What are the key technical and commercial challenges and how do you plan to address/overcome these?
6. Technical and commercial market analysis: Who will care and what will the impact be if you are successful? What/who are the markets/industries/integrators/stakeholders that would/should care?
7. Cost, schedule and milestones: Provide a summary of your cost volume. Provide a summary of your schedule and milestones. How much will your proposed effort cost in total? How long will it take? What are your technical milestones for achieving the proposed efforts? What are your transition and commercialization plan milestones? Discuss how much funding will be required to bring your proposed technology to market and execute on your proposed transition and commercialization plan. Include any funding raised to date and expected plans for raising any additional required funding (government contracting revenue, product sales, internal R&D investment, loan, angel or Venture Capital investment, etc.). Describe timeline to maturity for operational use or commercial sales.
8. Management: Overview of team, facilities and qualifications.
9. Technical summary quad chart: Use template provided at <https://www.darpa.mil/work-with-us/for-small-businesses/participate-sbir-str-program>.
10. Commercialization summary quad chart: Use the DARPA Transition and Commercialization Strategy Plan (TCSP) template, located at <https://www.darpa.mil/work-with-us/for-small-businesses/commercialization-continued>.

NOTE: All letters of recommendation and CVs can be loaded in Volume 5: Supporting Documents.

c. Format of Cost Volume (Volume 3)

Proposers are required to use the Direct to Phase II – Volume 3: Cost Proposal Template (Excel Spreadsheet) provided as an attachment to this announcement. The Cost Volume (and supporting documentation) DOES NOT count toward the page limit of the Technical Volume.

d. Content of the Cost Volume (Volume 3)

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Some items in the Cost Breakdown Guidance below may not apply to the proposed project. If such is the case, there is no need to provide information on each and every item.

ALL proposed costs should be accompanied by documentation to substantiate how the cost was derived. For example, if you proposed travel cost to attend a project-related meeting or conference, and used a travel website to compare flight costs, include a screen shot of the comparison. Similarly, if you proposed to purchase materials or equipment, and used the internet to search for the best source, include your market research for those items. You do not necessarily have to propose the cheapest item or supplier, but you should explain your decision to choose one item or supplier over another. It's important to provide enough information to allow contracting personnel to understand how the proposer plans to use the requested funds. If selected for award, failure to include the documentation with your proposal will delay contract negotiation, and the proposer will be asked to submit the necessary documentation to the Contracting Officer to substantiate costs (e.g., cost estimates for equipment, materials, and consultants or subcontractors). It is important to respond as quickly as possible to the Contracting Officer's request for documentation.

Cost Breakdown Guidance:

1. List all key personnel by name as well as by number of hours dedicated to the project as direct labor. Special tooling and test equipment and material cost may be included. The inclusion of equipment and material will be carefully reviewed relative to need and appropriateness for the work proposed. The purchase of special tooling and test equipment must, in the opinion of the Contracting Officer, be advantageous to the Government and should be related directly to the specific topic. These may include such items as innovative instrumentation and/or automatic test equipment. Title to property furnished by the Government or acquired with Government funds will be vested with DARPA; unless it is determined that transfer of title to the contractor would be more cost effective than recovery of the equipment by the DARPA.
2. Cost for travel funds must be justified and related to the needs of the project.
3. Cost sharing is permitted for proposals under this announcement; however, cost sharing is not required nor will it be an evaluation factor in the consideration of a proposal.
4. All subcontractor costs and consultant costs must be detailed at the same level as prime contractor costs in regard to labor, travel, equipment, etc. Provide detailed substantiation of subcontractor costs in your cost proposal. Enter this information in the Explanatory Material section of the on-line cost proposal form. The Supporting Documents Volume (Volume 5) may be used if additional space is needed.

For more information about cost proposals and accounting standards, see the DCAA publication titled "Audit Process Overview – Information for Contractors" available at: <http://www.dcaa.mil>.

e. Company Commercialization Report (Volume 4)

The Company Commercialization Report (CCR) allows companies to report funding outcomes resulting from prior SBIR and STTR awards. The Company Commercialization Report (CCR) is required for Phase I and Direct to Phase II proposals. Please refer to the DoD STTR Program BAA for full details on this requirement. Information contained in the CCR will not be considered by DARPA during proposal evaluations.

f. Supporting Documents (Volume 5)

In addition to required DoD documentation and certifications, small businesses may also submit additional documentation to support the Technical Volume (Volume 2) and the Cost Volume (Volume 3) in Volume 5. Firms should fill out and upload the DARPA SBIR XL Milestones Template found on the

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DARPA Small Business website under SBIR/STTR BAA FORMS & TEMPLATES at <https://www.darpa.mil/work-with-us/for-small-businesses/participate-sbir-sttr-program>. See Appendix A Introduction for **required** certifications that must be included in Volume 5. For additional information, see the SBIR 23.4 Annual Program Broad Agency Announcement (BAA) at <https://www.defensesbirstr.mil/SBIR-STTR/Opportunities/>.

g. Fraud Waste and Abuse (Volume 6)

The Fraud, Waste and Abuse (FWA) training is required for Phase I and Direct to Phase II proposals. FWA training provides information on what represents FWA in the SBIR/STTR program, the most common mistakes that lead to FWA, as well as the penalties and ways to prevent FWA in your firm. This training material must be thoroughly reviewed once per year. Plan ahead and leave ample time to complete this training based on the proposal submission deadline. Knowingly and willfully making any false, fictitious, or fraudulent statements or representations may be a felony under the Federal Criminal False Statement Act (18 U.S.C. Sec 1001), punishable by a fine of up to \$10,000, up to five years in prison, or both. Understanding the indicators and types of fraud, waste, and abuse that can occur is critical for the SBIR/STTR awardees' role in preventing the loss of research dollars.

Defense Health Agency
2023.4 Small Business Innovation Research (SBIR)
Proposal Submission Instructions

BAA Pre-release: 9 March 2023

BAA Open: 23 March 2023

Topic Q&A close: 7 April 2023

BAA Proposal Submission Deadline: 25 April 2023 at 1200 EST

INTRODUCTION

The Defense Health Agency (DHA) SBIR Program seeks small businesses with strong research and development capabilities to pursue and commercialize medical technologies.

Proposers responding to a topic in this Broad Agency Announcement (BAA) must follow all general instructions provided in the Department of Defense (DoD) SBIR Program BAA. DHA requirements in addition to or deviating from the DoD Program BAA are provided in the instructions below.

Only Government personnel will evaluate proposals with the exception of technical personnel from Allied Technologies and Consulting, LLC and General Dynamics Information Technology who will provide technical analysis in the evaluation of proposals submitted against DHA topic:

- Anti-Shock Drug, Pre-Hospital (ASD-PH)

Specific questions pertaining to the administration of the DHA SBIR Program and these proposal preparation instructions should be directed to:

DHA SBIR Program Management Office (PMO)

Email: usarmy.detrick.medcom-usamrnc.mbx.dhpsbir@health.mil

Phone - (301) 619-5146

DIRECT TO PHASE II PROPOSAL GUIDELINES

The Defense SBIR/STTR Innovation Portal (DSIP) is the official portal for DoD SBIR/STTR proposal submission. Proposers are required to submit proposals via DSIP; proposals submitted by any other means will be disregarded. Detailed instructions regarding registration and proposal submission via DSIP are provided in the DoD SBIR Program BAA.

15 U.S.C. §638 (cc), as amended by NDAA FY2012, Sec. 5106, and further amended by NDAA FY2019, Sec. 854, PILOT TO ALLOW PHASE FLEXIBILITY, allows the Department of Defense to make an award to a small business concern under Phase II of the SBIR Program with respect to a project, without regard to whether the small business concern was provided an award under Phase I of an SBIR Program with respect to such project. DHA is conducting a "Direct to Phase II" implementation of this authority for this 2023.4 SBIR Announcement and does not guarantee Direct to Phase II opportunities will be offered in future Announcements. Each eligible topic requires documentation to determine that Phase I feasibility described in the Phase I section of the topic has been met.

DHA Direct to Phase II Proposals are different than traditional DHA SBIR Phase I proposals. The chart below explains some of these differences.

| | STANDARD DHA SBIR PROCESS | DHA D2P2 PROCESS |
|--|--------------------------------------|-------------------------|
| PHASE 1 TYPICAL FUNDING LEVEL | \$250,000 | None |
| PHASE 1 TECHNICAL *POP DURATION | 6 months | None |
| PHASE 2 TYPICAL FUNDING LEVEL | \$3,000,000** | \$3,000,000** |
| PHASE 2 TECHNICAL *POP DURATION | 24 months | 24 months |

*POP= Period of Performance

**This D2P2 topic is a candidate for a potential Jumbo award of a maximum of \$3,000,000.

DIRECT TO PHASE II PROPOSAL GUIDELINES

Direct to Phase II proposals must include all volumes, not to exceed maximum page limit, and must follow the formatting requirements provided in the DoD SBIR Program BAA.

- a. DoD Proposal Cover Sheet (Volume 1)
- b. Technical Volume (Volume 2):
 - Part 1: Phase I Justification (20 Pages Maximum)
 - Part 2: Phase II Technical Proposal (40 Pages Maximum)
- c. Cost Volume (Volume 3)
- d. Company Commercialization Report (Volume 4)
- e. Supporting Documents (Volume 5)
- f. Fraud, Waste, Abuse (Volume 6)

Technical Volume (Volume 2):

Phase I Justification: Offerors are required to provide evidence that the scientific and technical merit and feasibility have been established as described in the topic description.

Cost Volume (Volume 3):

The Cost Volume must contain a budget for the entire 24-month Direct to Phase II period. Topic DHA234-D001 is a candidate for a potential Jumbo award under the Direct to Phase II and not to exceed the maximum dollar amount of \$3,000,000. Costs must be separated and clearly identified on the Proposal Cover Sheet (Volume 1) and in the Cost Volume (Volume 3).

Please review the updated Percentage of Work (POW) calculation details included in section 5.3 of the DoD Program BAA. DHA will occasionally accept deviations from the POW requirements with written approval from the Funding Agreement Officer.

Travel must be justified and relate to the project needs for direct Research Development Test & Evaluation (RDT&E) Technology Readiness Level (TRL) increasing costs. Travel costs must include the purpose of the trip(s), number of trips, origin and destination, length of trip(s), and number of personnel.

Company Commercialization Report (Volume 4):

Completion of the CCR of the proposal submission in DSIP is required. Information contained in the CCR will be considered by DHA during proposal evaluations. Please refer to the DoD SBIR Program BAA for full details on this requirement.

DISCRETIONARY TECHNICAL AND BUSINESS ASSISTANCE (TABA)

The DHA SBIR Program **does not** participate in the Technical and Business Assistance (formerly the Discretionary Technical Assistance Program). Contractors shall not submit proposals that include Technical and Business Assistance.

The DHA SBIR Program has a Technical Assistance Advocate (TAA) who provides technical and commercialization assistance to small businesses that have Phase I and Phase II projects.

EVALUATION AND SELECTION

The DHA SBIR Program will evaluate and select Direct to Phase II proposals using the evaluation criteria in the DoD SBIR Program BAA. Due to limited funding, the DHA SBIR Program reserves the right to limit awards under any topic and only proposals considered to be of superior quality will be funded.

Proposing firms will be notified via email to the Corporate Official of selection or non-selection status for a Direct to Phase II award within 90 days of the closing date of the BAA.

Non-selected companies may request feedback within 15 calendar days of the non-select notification. The Corporate Official identified in the firm’s proposal shall submit the feedback request to the SBIR Office at usarmy.detrick.medcom-usamrmc.mbx.dhpsbir@health.mil as specified in the non-select notification. Please note feedback is provided in an official PDF via email to the Corporate Official identified in the firm proposal within 60 days of receipt of the request. Requests for oral feedback will not be accommodated. If contact information for the Corporate Official has changed since proposal submission, a notice of the change on company letterhead signed by the Corporate Official must accompany the feedback request.

NOTE: Feedback is not the same as a FAR Part 15 debriefing. Acquisitions under this solicitation are awarded via “other competitive procedures”. Therefore, offerors are neither entitled to nor will they be provided FAR Part 15 debriefs.

Refer to the DoD SBIR Program BAA for procedures to protest the Announcement. As further prescribed in FAR 33.106(b), FAR 52.233-3, Protests after Award shall be submitted to:

Ms. Samantha L. Connors
SBIR/STTR Chief, Contracts Branch 8
Contracting Officer
U.S. Army Medical Research Acquisition Activity
Phone: (301)-619-6979
Email: Samantha.l.connors.civ@health.mil

AWARD AND CONTRACT INFORMATION

Direct to Phase II awards will typically be Firm-Fixed-Price contracts with the Contracting Officer’s Representative and other contracting staff identified.

ADDITIONAL INFORMATION

RESEARCH INVOLVING HUMAN SUBJECTS, HUMAN SPECIMENS/DATA, OR ANIMAL RESEARCH

Prior to contract award when an IRB is indicated, proposers must demonstrate compliance with relevant regulatory approval requirements that pertain to proposals involving human subjects, human specimens, or research with animals. If necessary approvals are not obtained within two months of notification of selection, the decision to award may be terminated.

Offerors are expressly forbidden to use, or subcontract for the use of, laboratory animals in any manner without the express written approval of the U.S. Army Medical Research and Development Command (USAMRDC) Animal Care and Use Review Office (ACURO). Written authorization to begin research under the applicable protocol(s) proposed for this award will be issued in the form of an approval letter from the USAMRDC ACURO to the recipient. Modifications to previously approved protocols require re-approval by ACURO prior to implementation.

Research under this award involving the use of human subjects, to include the use of human anatomical substances or human data, shall not begin until the USAMRDC's Office of Human and Animal Research Oversight (OHARO) provides formal authorization. Written approval to begin a research protocol will be issued from the USAMRDC OHARO, under separate notification to the recipient. Written approval from the USAMRDC OHARO is required for any sub-recipient using funds from this award to conduct research involving human subjects. If the Offeror intends to submit research funded by this award to the U.S. Food and Drug Administration, Offerors shall propose a regulatory strategy for review.

Non-compliance with any provision may result in withholding of funds and or termination of the award.

WAIVERS

In rare situations, the DHA SBIR Program allows for a waiver to be incorporated allowing federal facility usage for testing/evaluation. A waiver will only be permitted when it has been determined that no applicable U.S. facility has the ability or expertise to perform the specified work. The DHA SBIR Program has the right of refusal. If approved, the DHA SBIR Program will assist in establishing the waiver for approval. If approved, the proposer will subcontract directly with the federal facility and not a third party representative.

Transfer of funds between a company and a Military Lab must meet the following APAN 15-01 requirements:

- 1) The DoD Intramural Researcher must obtain a letter from his/her commanding officer or Military Facility director authorizing his/her participation in the Extramural Research project. This letter must be provided to the Extramural Organization for inclusion in the proposal or application.
- 2) The DoD Intramural Researcher must also coordinate with his/her local RM office (or equivalent) to prepare a sound budget and justification for the estimated costs. Where there are no DoD-established reimbursement rates [e.g., institution review board (IRB) fees, indirect cost rates, etc.], the Military Facility's RM office (or equivalent) must provide details of how the proposed rates were determined. The DoD Intramural Researcher must use the enclosed budget and justification form when developing the estimated costs and provide it to the Extramural Organization for inclusion in the proposal or application. Instructions for completing this form will be included in the FOA.

- 3) The Extramural Research proposal or application must include a proposed financial plan for how the Military Facility's Intramural Research costs will be supported [i.e., directly funded by DoD, resources (other than award funds) provided by the Awardee to the Military Facility, or award funds provided by the Awardee to the Military Facility (in accordance with the requirements below)].
- 4) The DoD Intramural Researcher should also coordinate with his/her technology transfer office.

International Traffic in Arms Regulation (ITAR)

For topics indicating ITAR restrictions or the potential for classified work, limitations are generally placed on disclosure of information involving topics of a classified nature or those involving export control restrictions, which may curtail or preclude the involvement of universities and certain non-profit institutions beyond the basic research level. Small businesses must structure their proposals to clearly identify the work that will be performed that is of a basic research nature and how it can be segregated from work that falls under the classification and export control restrictions. As a result, information must also be provided on how efforts can be performed in later phases, such as Phase III, if the university/research institution is the source of critical knowledge, effort, or infrastructure (facilities and equipment).

END

DHA SBIR 23.4 Topic Index
Release 1

DHA234-D001 Anti-Shock Drug, Pre-Hospital (ASD-PH)

DHA234-D001 TITLE: Anti-Shock Drug, Pre-Hospital (ASD-PH)

OUSD (R&E) CRITICAL TECHNOLOGY AREA(S): Combat Casualty Care

OBJECTIVE: Develop a drug that would be useful in a pre-hospital setting for treatment of hemorrhagic shock in humans.

DESCRIPTION: Severe blood loss, such as may be experienced in combat or other settings, if left untreated, will result in a deficiency of oxygen that will lead to the death of cells, tissues, and organs, and ultimately death. A pharmaceutical solution is required to address, in a pre-hospital setting, this life-threatening situation. The desired benefits of the drug are that its administration would increase the probability of survival, reduce the need for other treatment products, and reduce the need for prompt medical evacuation. The following characteristics are considered desirable: (1) The drug would most likely be administered promptly after injury, before blood or blood components are administered; however, a drug that would be administered as a pre-treatment, prior to injury, would also be of interest. (2) The drug would be administered in a low volume, perhaps 5 to 20 milliliters, to minimize the burden of transporting it and administering it. (3) The drug would be stable (retain its effectiveness) for at least one year over a broad temperature range such as 2 to 40 degrees Celsius. (4) The drug would be amenable to administration by several routes, such as oral, intravenous, intraosseous, inhalation, and intramuscular.

PHASE I: DoD seeks the identification of an active pharmaceutical ingredient (API), administration of which will provide effective treatment of shock in a pre-hospital setting. The performer will determine the scientific, technical, and commercial merit and feasibility of such an API. Upon conclusion of Phase I, the performer will have:

- Identified a concept for the mechanism of action for the API.
- Ascertained key elements (chemical moieties) of the API.
- Produced a candidate formulation, for one or more routes of administration, for the API.
- Performed a detailed analysis of predicted performance (safety and efficacy) of the API as formulated for administration.
- Defined key technological milestones for development of the API into a drug approvable by the Food and Drug Administration (FDA) for human use.
- Demonstrated the feasibility of analyzing the safety and efficacy of the API when formulated for administration and outlined the criteria for success.

This topic is accepting Direct to Phase II (DPII) proposals ONLY. Proposers submitting a DPII proposal must provide documentation to substantiate that the scientific and technical merit and feasibility described above has been met and describes the potential commercial applications.

Documentation should include all relevant information including, but not limited to, technical reports, test data, and performance goals/results.

PHASE II: The expectations and required deliverables for Phase II work are:

- Using results from Phase I, produce a batch of candidate ASD-PH formulated for administration to one or more vertebrate species as part of pre-clinical testing.
- Test a candidate ASD-PH for efficacy in a suitable animal model. The animal model must involve blood loss that, untreated, would reproducibly lead to death of most test subjects from shock within approximately 60 minutes after blood loss.
- Prepare a Product Development Plan and seek comments from the FDA on its acceptability.

- Manufacture a batch of candidate ASD-PH suitable for pre-clinical testing of safety under Good Laboratory Practices (GLPs).
- Perform Investigational New Drug (IND)-enabling studies.
- Update/revise the Product Development Plan to take into account the results of pre-clinical testing and FDA advice.
- Deliver a Technical Data Package containing submissions to the FDA, communications from the FDA, and the Product Development Plan.
- Upon request by the Government sponsor, deliver a sample of candidate ASD-PH to the Government for retention and/or analyses at no cost to the performer. The quantity of sample delivered to the Government will not be so great as to interfere with the performer's plans for development.

PHASE III DUAL USE APPLICATIONS: Phase III will culminate in an FDA-approved treatment for shock suitable for use in role 1 of military health care and in similar non-military austere settings such as remote areas where paramedics and other personnel provide emergency medical treatment. It will be the logical conclusion of product development conducted in phases I and II. Phase III work will include the engagement of relevant stakeholders within DoD to ensure that product labeling and packaging are accomplished with due consideration of military operational requirements and logistical support.

REFERENCES:

1. Champion EM, Pritts TA, Dorlac WC, Nguyen AQ, Fraley SM, Hanseman D, Robinson BR. Implementation of a military-derived damage-control resuscitation strategy in a civilian trauma center decreases acute hypoxia in massively transfused patients. *J Trauma Acute Care Surg.* 2013 Aug;75(2 Suppl 2):S221-7. doi: 10.1097/TA.0b013e318299d59b. PMID:23883912; PMCID: PMC4245019. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4245019/>
2. Huang Q, Gao S, Yao Y, Wang Y, Li J, Chen J, Guo C, Zhao D, Li X. Innate immunity and immunotherapy for hemorrhagic shock. *Front Immunol.* 2022 Aug 25;13:918380. doi:10.3389/fimmu.2022.918380. PMID: 36091025; PMCID: PMC9453212. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9453212/>

KEYWORDS: Trauma; energy metabolism; hemorrhagic shock; hypoxia

Defense Health Agency
2023.4 Small Business Innovation Research (SBIR)
Proposal Submission Instructions

May 30, 2023: DHA begins accepting white papers via DSIP

June 16, 2023: DSIP Topic Q&A closes to new questions at 12:00 p.m. ET

July 18, 2023: Deadline for whitepaper submission at 12:00 p.m. ET

August 30, 2023: Deadline for full proposal submission 12:00 p.m. ET

INTRODUCTION

The Defense Health Agency (DHA) SBIR Program seeks small businesses with strong research and development capabilities to pursue and commercialize medical technologies.

The Defense SBIR/STTR Innovation Portal (DSIP) is the official portal for DoD SBIR/STTR proposal submission. Proposals submitted by any other means will be disregarded. Detailed instructions regarding registration and proposal submission are provided in the DoD SBIR Program Broad Agency Announcement (BAA) which must be followed by all proposers.

DHA requirements, in addition to or deviating from the DoD Program BAA, are provided in the instructions below.

Only Government personnel will evaluate proposals. Specific questions pertaining to the administration of the DHA SBIR Program and these proposal preparation instructions should be directed to:

DHA SBIR Program Management Office (PMO)

Email: usarmy.detrick.medcom-usamrmc.mbx.dhpsbir@health.mil

Proposers are encouraged to thoroughly review the DoD Program BAA and register for the DSIP Listserv to remain apprised of important programmatic and contractual changes.

- The DoD Program BAA is located at: <https://www.defensesbirsttr.mil/SBIR-STTR/Opportunities/#announcements>. Be sure to select the tab for the appropriate BAA cycle.
- Register for the DSIP Listserv at: <https://www.dodsbirsttr.mil/submissions/login>.

This release contains an open topic. As outlined in section 7 of the SBIR and STTR Extension Act of 2022, innovation open topic activities—

- (A) Increase the transition of commercial technology to the Department of Defense;
- (B) Expand the small business nontraditional industrial base;
- (C) Increase commercialization derived from investments of the Department of Defense; and
- (D) Expand the ability for qualifying small business concerns to propose technology solutions to meet the needs of the Department of Defense.

Unlike conventional topics, which specify the desired technical objective and output, open topics can use generalized mission requirements or specific technology areas to adapt commercial products or solutions to close capability gaps, improve performance, or provide technological advancements in existing capabilities.

A small business concern may only submit one (1) whitepaper submission and full proposal to each open topic. If more than one whitepaper and full proposal from a small business concern is received for a single open topic, only the most recent proposal to be certified and submitted prior to the submission deadline will receive an evaluation. All prior proposals submitted by the small business concern for the same open topic will be marked as nonresponsive and will not receive an evaluation.

Proposals submitted in response to this topic will follow a two-step submission process.

STEP ONE- Whitepaper submission: Proposing small business concerns must certify and submit, by the deadline listed above, the following proposal volumes in DSIP:

1. **All Firm-level Forms.** On the Defense SBIR/STTR Innovation Portal (DSIP) at <https://www.dodsbirsttr.mil/submissions/>, prepare the Firm-level Forms – Firm Certifications, Audit Information, and Company Commercialization Report (CCR).
2. **Supporting Documents (Volume 5).** A 1- 2 page whitepaper must be uploaded to Volume 5 outlining the proposed effort. **The header on each page of the whitepaper should contain your company name, topic number, and proposal number assigned by DSIP when the proposal was created. The header may be included in the one-inch margin.**
 - A. Technical abstract: (1 paragraphs)
 - Full understanding of the problem/opportunity and how it addresses the topic’s outlined capability gaps
 - Dual-use solution (non-Defense & DoD adaptation)
 - Solution’s uniqueness and why it is DoD preferred
 - Identify technical risks and present credible plan to tackle such risks
 - B. Evidence of Phase I feasibility results: (2-3 paragraphs)
 - Outline of evidence that the Phase I feasibility study outlined in the topic was met
 - Provide prototype design specifications and performance data if available
 - Summary of Scientific or Technical R/R&D effort, including research questions, methods, results, and relevant literature
 - GLP-biocompatibility (in vitro and in vivo) safety validation data, if available.
 - C. Phase II technical objectives and key results: (2-3 paragraph)
 - Clearly describe three to five objectives of the Phase II RDT&E effort. These should be tied to specific proposed Phase II tasks. They shall be qualitative and specific to the participating DoD end-user(s). They shall describe end-state outcomes (i.e. what will be done), rather than processes or activities (i.e., how it will be done). Each objective shall be accompanied by specific ‘key results’, measurable throughout Phase II performance
 - Include the refinement and optimization of the prototype
 - D. Commercialization strategy: (1 paragraph)
 - Commercialization plan

NOTE: At step one of this process, proposers will NOT complete Volume 1 (Proposal Coversheet), Volume 2 (Technical Volume), Volume 3 (Cost Volume), or Volume 6 (Fraud, Waste and Abuse training). The Company Commercialization Report will be required in the Firm-level Forms but will not be provided in Volume 4.

Upon the deadline listed above, whitepapers will be screened by DHA to determine suitability for full proposal submission. All whitepapers will be screened on a competitive basis. Whitepapers will only be screened in response to an active, corresponding DHA topic. Whitepapers will be initially screened to determine responsiveness to the topic objectives and an understanding of the capability gap. Whitepapers passing this initial screening will be notified to submit a full proposal (step two) that will be technically evaluated by subject matter experts to determine the most promising technical and scientific approaches. If at any point the whitepaper is deemed untimely, unresponsive, ineligible, the proposal will be rejected.

STEP TWO: No later than 8 August, proposers with favorably screened whitepapers will receive notification from DHA SBIR with instructions to submit a full proposal in DSIP. **Proposals that are submitted without prior notification from DHA SBIR will not receive an evaluation.** Full proposals

will follow the guidelines provided in the DoD Program BAA, with additional details and deviations below.

DIRECT TO PHASE II GUIDELINES

15 U.S.C. §638 (cc), as amended by NDAA FY2012, Sec. 5106, and further amended by NDAA FY2019, Sec. 854, PILOT TO ALLOW PHASE FLEXIBILITY, allows DoD to make a SBIR Phase II award to a small business concern with respect to a project, without regard to whether the small business concern was provided an award under Phase I of the SBIR program with respect to such project. DHA is conducting a "Direct to Phase II" implementation of this authority for select topics under this BAA. DoD does not guarantee Direct to Phase II opportunities will be offered in future BAAs.

Each eligible topic requires that proposing small business concerns provide documentation to demonstrate feasibility described in the Phase I section of the topic has been met. **Feasibility documentation cannot be based upon or logically extend from any prior or ongoing federally funded SBIR or STTR work.** Work submitted within the feasibility documentation must have been substantially performed by the proposing small business concern and/or the PI. If technology in the feasibility documentation is subject to Intellectual Property (IP), the proposing small business concern must either own the IP, or must have obtained license rights to such technology prior to proposal submission, to enable it and its subcontractors to legally carry out the proposed work. If the proposing small business concern fails to demonstrate technical merit and feasibility equivalent to the Phase I level as described in the associated topic, the related Phase II proposal will not be accepted or evaluated, in accordance with the Component-specific Direct to Phase II instructions.

DHA Direct to Phase II Proposals are different than traditional DHA SBIR Phase I proposals. The chart below explains some of these differences.

| | STANDARD DHA SBIR PROCESS | DHA D2P2 PROCESS |
|--|----------------------------------|-------------------------|
| PHASE 1 TYPICAL FUNDING LEVEL | \$250,000 | None |
| PHASE 1 TECHNICAL *POP DURATION | 6 months | None |
| PHASE 2 TYPICAL FUNDING LEVEL | \$1,300,000 | \$1,300,000 |
| PHASE 2 TECHNICAL *POP DURATION | 24 months | 24 months |

*POP= Period of Performance

DIRECT TO PHASE II PROPOSAL GUIDELINES

Direct to Phase II proposals must include all volumes, not to exceed maximum page limit, and must follow the formatting requirements provided in the DoD SBIR Program BAA. Technical Volumes that exceed the page limit will be reviewed only to the last word on the maximum page limit.

- a. DoD Proposal Cover Sheet (Volume 1)
- b. Technical Volume (Volume 2):
 - Part 1: Phase I Justification (20 Pages Maximum)
 - Part 2: Phase II Technical Proposal (40 Pages Maximum)

- c. Cost Volume (Volume 3)
- d. Company Commercialization Report (Volume 4)
- e. Supporting Documents (Volume 5)
- f. Fraud, Waste, Abuse (Volume 6)

Technical Volume (Volume 2):

- A. **Phase I Justification (20 Pages Maximum).** Offerors are required to provide evidence that the scientific and technical merit and feasibility has been established as described in the topic description.
- B. **Phase II Technical Objectives and Approach (40 Pages Maximum).** List the specific technical objectives of the Phase II research and describe the technical approach in detail to be used to meet these objectives.
- C. **Phase II Statement of work (including subcontractor's efforts).** Provide an explicit, detailed description of the Phase II approach. The plan should indicate what is planned, how and where the work will be carried out, a schedule of major events, and the final product to be developed. Phase II is the principal research and development effort and is expected to produce a well-defined deliverable prototype or product.
- D. **Related Work.** Describe significant activities directly related to the proposed effort, including those conducted by the Principal Investigator, the proposing firm, consultants, or others. Report how the activities interface with the proposed project and discuss any planned coordination with outside sources. The proposers' awareness of the state-of-the-art in the technology and associated science must be demonstrated.
- E. **Commercialization Strategy.** Describe your company's strategy for converting the proposed SBIR research, resulting from your proposed Phase II contract, into a product or non-R&D service with widespread commercial use -- including private sector and/or military markets. Include a schedule showing the quantitative commercialization results that your company expects to achieve.
- F. **Key Personnel.** Identify key personnel, including the Principal Investigator. List directly related education and experience and relevant publications (if any) of key personnel. No Government personnel may be listed. A concise resume of the Principal Investigator(s) must be included.
- G. **Foreign Citizens.** Identify any foreign citizens or individuals holding dual citizenship expected to be involved on this project as a direct employee, subcontractor, or consultant. For these individuals, please specify their country of origin, the type of visa or work permit under which they are performing and an explanation of their anticipated level of involvement on this project. Proposing small business concerns frequently assume that individuals with dual citizenship or a work permit will be permitted to work on an SBIR project and do not report them. This is not necessarily the case and a proposal will be rejected if the requested information is not provided. Therefore, proposing small business concerns should report any and all individuals expected to be involved on this project that are considered a foreign national as defined in Section 3 of the DoD Program BAA. You may be asked to provide additional information during negotiations in order to verify the foreign citizen's eligibility to participate on a SBIR contract. Supplemental information provided in response to this paragraph will be protected in accordance with the Privacy Act (5 U.S.C. 552a), if applicable, and the Freedom of Information Act (5 U.S.C. 552(b)(6)).
- H. **Facilities/Equipment.** Describe available instrumentation and physical facilities necessary. Justify items of equipment to be purchased (as detailed in the cost proposal) here, including Government Furnished Equipment (GFE). All requirements for government furnished

equipment or other assets, as well as associated costs, must be determined and agreed to during Phase II contract negotiations. State whether or not the facilities where the proposed work will be performed meet environmental laws and regulations of federal, state (name) and local governments for, but not limited to, the following groupings: airborne emissions, waterborne effluents, external radiation levels, outdoor noise, solid and bulk waste disposal practices, and handling and storage of toxic and hazardous materials.

1. **Subcontractors/Consultants.** Involvement of university, academic institution, or other consultants in the project may be appropriate. If such involvement is intended, it should be described in detail and identified in the Cost Volume.

Cost Volume (Volume 3):

The Cost Volume must contain a budget for the entire 24-month Direct to Phase II period and not to exceed \$1,300,000. Costs must be separated and clearly identified on the Proposal Cover Sheet (Volume 1) and in the Cost Volume (Volume 3).

Please review the updated Percentage of Work (POW) calculation details included in section 5.3 of the DoD Program BAA. DHA will occasionally accept deviations from the POW requirements with written approval from the Funding Agreement Officer.

Travel must be justified and relate to the project needs for direct Research Development Test & Evaluation (RDT&E) Technology Readiness Level (TRL) increasing costs. Travel costs must include the purpose of the trip(s), number of trips, origin and destination, length of trip(s), and number of personnel.

Company Commercialization Report (Volume 4):

Completion of the CCR upload from SBIR.gov to DSIP is required for proposing small business concerns with prior Federal SBIR or STTR awards.

Supporting Documents (Volume 5):

In addition to the Volume 5 requirements outlined in the DoD Program BAA, the following Supporting Documents are required:

1. 1-2 page whitepaper response to the open topic that was submitted by the deadline above.
2. The notification received to submit a full proposal.

****If the whitepaper and full proposal submission notification are not included, the proposal will be deemed unresponsive.**

DISCRETIONARY TECHNICAL AND BUSINESS ASSISTANCE (TABA)

The DHA SBIR Program **does not** participate in the Technical and Business Assistance (formerly the Discretionary Technical Assistance Program). Contractors shall not submit proposals that include Technical and Business Assistance.

The DHA SBIR Program has a Technical Assistance Advocate (TAA) who provides technical and commercialization assistance to small businesses that have Phase I and Phase II projects.

EVALUATION AND SELECTION

The DHA SBIR Program will evaluate and select Direct to Phase II proposals using the evaluation criteria in the DoD SBIR Program BAA. Due to limited funding, the DHA SBIR Program reserves the right to limit awards under any topic and only proposals considered to be of superior quality will be funded.

Proposing firms will be notified via email to the Corporate Official of selection or non-selection status

for a Direct to Phase II award within 90 days of the closing date of the BAA.

Non-selected companies may request feedback within 15 calendar days of the non-select notification. The Corporate Official identified in the firm's proposal shall submit the feedback request to the SBIR Office at usarmy.detrick.medcom-usamrmc.mbx.dhpsbir@health.mil as specified in the non-select notification. Please note feedback is provided in an official PDF via email to the Corporate Official identified in the firm proposal within 60 days of receipt of the request. Requests for oral feedback will not be accommodated. If contact information for the Corporate Official has changed since proposal submission, a notice of the change on company letterhead signed by the Corporate Official must accompany the feedback request.

NOTE: Feedback is not the same as a FAR Part 15 debriefing. Acquisitions under this solicitation are awarded via "other competitive procedures". Therefore, offerors are neither entitled to nor will they be provided FAR Part 15 debriefs.

Refer to the DoD SBIR Program BAA for procedures to protest the Announcement. As further prescribed in FAR 33.106(b), FAR 52.233-3, Protests after Award shall be submitted to:

Ms. Samantha L. Connors
SBIR/STTR Chief, Contracts Branch 8
Contracting Officer
U.S. Army Medical Research Acquisition Activity
Phone: (301)-619-6979
Email: Samantha.l.connors.civ@health.mil

AWARD AND CONTRACT INFORMATION

Direct to Phase II awards will typically be Firm-Fixed-Price contracts with the Contracting Officer Representative and other contracting staff identified. If you request a different contract type (cost plus) please include the rationale within the proposal. Note: Award times may increase depending on requested contract type.

RESEARCH INVOLVING HUMAN SUBJECTS, HUMAN SPECIMENS/DATA, OR ANIMAL RESEARCH

Prior to contract award when an IRB is indicated, proposers must demonstrate compliance with relevant regulatory approval requirements that pertain to proposals involving human subjects, human specimens, or research with animals. If necessary, approvals are not obtained within two months of notification of selection, the decision to award may be terminated.

Offerors are expressly forbidden to use, or subcontract for the use of, laboratory animals in any manner without the express written approval of the U.S. Army Medical Research and Development Command (USAMRDC) Animal Care and Use Review Office (ACURO). Written authorization to begin research under the applicable protocol(s) proposed for this award will be issued in the form of an approval letter from the USAMRDC ACURO to the recipient. Modifications to previously approved protocols require re-approval by ACURO prior to implementation.

Research under this award involving the use of human subjects, to include the use of human anatomical substances or human data, shall not begin until the USAMRDC's Office of Human and Animal Research Oversight (OHARO) provides formal authorization. Written approval to begin a research protocol will be issued from the USAMRDC OHARO, under separate notification to the recipient. Written approval from the USAMRDC OHARO is required for any sub-recipient using funds from this

award to conduct research involving human subjects. If the Offeror intends to submit research funded by this award to the U.S. Food and Drug Administration, Offerors shall propose a regulatory strategy for review.

Non-compliance with any provision may result in withholding of funds and or termination of the award.

WAIVERS

In rare situations, the DHA SBIR Program allows for a waiver to be incorporated allowing federal facility usage for testing/evaluation. A waiver will only be permitted when it has been determined that no applicable U.S. facility has the ability or expertise to perform the specified work. The DHA SBIR Program has the right of refusal. If approved, the DHA SBIR Program will assist in establishing the waiver for approval. If approved, the proposer will subcontract directly with the federal facility and not a third-party representative.

Transfer of funds between a firm and a Military Lab must meet the following APAN 15-01 requirements:

- 1) The DoD Intramural Researcher must obtain a letter from his/her commanding officer or Military Facility director authorizing his/her participation in the Extramural Research project. This letter must be provided to the Extramural Organization for inclusion in the proposal or application.
- 2) The DoD Intramural Researcher must also coordinate with his/her local RM office (or equivalent) to prepare a sound budget and justification for the estimated costs. Where there are no DoD-established reimbursement rates [e.g., institution review board (IRB) fees, indirect cost rates, etc.], the Military Facility's RM office (or equivalent) must provide details of how the proposed rates were determined. The DoD Intramural Researcher must use the enclosed budget and justification form when developing the estimated costs and provide it to the Extramural Organization for inclusion in the proposal or application. Instructions for completing this form will be included in the FOA.
- 3) The Extramural Research proposal or application must include a proposed financial plan for how the Military Facility's Intramural Research costs will be supported [i.e., directly funded by DoD, resources (other than award funds) provided by the Awardee to the Military Facility, or award funds provided by the Awardee to the Military Facility (in accordance with the requirements below)].
- 4) The DoD Intramural Researcher should also coordinate with his/her technology transfer office.

International Traffic in Arms Regulation (ITAR)

For topics indicating ITAR restrictions or the potential for classified work, limitations are generally placed on disclosure of information involving topics of a classified nature or those involving export control restrictions, which may curtail or preclude the involvement of universities and certain non-profit institutions beyond the basic research level. Small businesses must structure their proposals to clearly identify the work that will be performed that is of a basic research nature and how it can be segregated from work that falls under the classification and export control restrictions. As a result, information must also be provided on how efforts can be performed in later phases, such as Phase III, if the university/research institution is the source of critical knowledge, effort, or infrastructure (facilities and equipment).

END

DHA SBIR 23.4 Topic Index
Release 2

DHA234-P001 Open Topic for Temporary Stabilization of Corneal and Corneoscleral Injuries

DHA234-P001 TITLE: Open Topic for Temporary Stabilization of Corneal and Corneoscleral Injuries

OUSD (R&E) CRITICAL TECHNOLOGY AREA(S): Combat Casualty Care

OBJECTIVE: The objective of this topic is the development of a non-surgical prototype technology capable of obtaining approval/clearance by the Food and Drug Administration (FDA) that is simple enough for medical personnel to administer in a theater of operations (TO) with minimal additional training that will temporarily stabilize suspected full thickness corneal and corneoscleral injuries during transport to a higher echelon of care where surgical intervention is available. This award will seek offerors to engage the FDA, conduct Good Laboratory Practice (GLP) animal studies, and deliver prototype devices to the government.

DESCRIPTION: Ocular injuries are common occurrences among warfighters, occurring disproportionately compared to injuries affecting more protected areas of the body. The cornea is the first tissue of the ocular structure and often impacted first in trauma. Combat corneal injuries often have a significant impact on vision and there can be significant delays in receiving specialty care for combat ocular trauma. In recent combat operations corneal puncture injuries resulted in poor visual outcomes often resulting in blindness. This is predominantly due to inadequate battlefield interventions to close the open ocular wounds and restore intraocular pressure. A study published in 2020 describes the cause and type of ocular injuries in modern warfare and analyzed all patients with eye injuries from the Iraq and Afghanistan conflicts who were treated at Military Treatment Facilities (MTF). They reported 67,586 persons were admitted to either a United States or United Kingdom MTF for treatment of injuries. 8-10% of wounded soldiers had ocular injuries. 82% of those injuries occurred in battle and 71% were from explosions, and 56% had open globe injuries. [1]

If an open globe (OG) injury is suspected on the battlefield, a rigid eye shield is applied to protect the eye, and the injured warfighter is evacuated to an ophthalmic specialist. Then, OG injuries are closed with sutures to create a watertight seal. This may occur up to 24 hr post-injury currently and is expected to increase up to 72 hr in future combat operations where air evacuation may not be guaranteed. [2-4] However, 53% of OG injured eyes retain intraocular foreign body upon injury and require evacuation to an ophthalmic specialist for surgical intervention. [5]

In order to address corneal and corneoscleral injuries earlier and in a way that is relevant to the the austerity encountered in a TO, a product that allows for temporary stabilization of corneal and corneoscleral injuries is needed. The temporary cornea repair (TCR) will serve as a bridge management strategy that will remain in place until more definitive care is available. The TCR capability will be in support of MTFs associated with the Military Healthcare System at Role of Care (RoC) 2 (Forward Resuscitative Surgical Team) and RoC 3 (Combat Support Hospital). For a description of RoC please see the reference section.

PHASE I: This topic is intended for technology proven ready to move directly into Phase II. Therefore, the offeror shall provide detail and documentation which demonstrates the accomplishment of a "Phase I-like" effort, including a feasibility study. This includes, insofar as possible, the scientific and technical merit of a non-surgical prototype that will temporarily stabilize suspected full thickness corneal and corneoscleral injuries. Feasibility documentation of particular interest is prior evidence leading to:

- Preliminary data to support the safety and efficacy of the prototype.
- Design specifications for the prototype.
- GLP-biocompatibility (in vitro and in vivo) safety validation data if available.
- Statistically significant performance data if available.

PHASE II: This phase will focus on refinement and optimization of a non-surgical prototype that will temporarily stabilize suspected full thickness corneal and corneoscleral injuries and can be tested in a military relevant environment.

Offerors should propose technology solutions ranging from initial testing of design concepts and evaluation of candidate(s) where study endpoints are defined, and animal models are proposed. ((Technology Readiness level (TRL) 3)) to component validation in a non-GLP laboratory environment to refine hypothesis and identify relevant statistical data required for further technological assessment (TRL 4). Further information regarding DOD Biomedical TRLs can be found in the reference section.

The work may include, but is not necessarily limited to, the following:

- Prototype refinement/maturation progressing towards clinical product
- Preclinical studies (as needed) to support an Investigational Device Exemption (IDE) (or other appropriate FDA) submission
- Preclinical studies under GLP (as needed) to support IDE (or other appropriate FDA) submission
- IDE (or other appropriate FDA) submission
- Stability and shelf-life studies if performed
- Establishment of Good Manufacturing Practice (GMP) planning for clinical trials and for market release
- The performer is expected deliver up to 4 prototypes for military relevant testing.

The desired prototype should be simple enough for medical personnel to administer in a TO with minimal additional training, safe enough to use on any suspected corneal or corneoscleral injuries, capable of maintaining a tight seal for an extended period during transport, and effective at stabilizing the eye such that it preserves eyesight.

PHASE III DUAL USE APPLICATIONS: The goal for this Phase is to further development and testing of the prototype through commercialization and FDA approval for its intended use as a temporary stabilization of corneal and corneoscleral injuries. The temporary cornea repair would need to serve as a bridge management strategy that will remain in place until more definitive care is available. Military uses of this technology would support RoC 2 and 3, as well as a mass casualty event where casualties greatly overwhelm first responders and patients need to be triaged to preserve life, limb, and sight.

REFERENCES:

1. [1] Breeze J, Blanch RJ, Mazzoli R, DuBose J, Bowley DM, Powers DB. Comparing the Management of Eye Injuries by Coalition Military Surgeons during the Iraq and Afghanistan Conflicts. *Ophthalmology*. 2020 Apr;127(4):458-466.
1. [2] Linde, A. S., McGinnis, L. J. & Thompson, D. M. Multi-battle domain-perspective in military medical simulation trauma training. *J Trauma Treat* <https://doi.org/10.4172/2167-1222.1000391> (2017).
2. [3] Riesberg, J., Powell, D. & Loos, P. The loss of the golden hour. *Special Warfare Mag.* 30(1), 49–51 (2017).
3. [4] Army, U. S. The US army in multi-domain operations 2028. TRADOC Pamphlet 525, 3–1 (2018).
4. [5] Vlasov, A. et al. Corneal and Corneoscleral Injury in Combat Ocular Trauma from Operations Iraqi Freedom and Enduring Freedom. *Mil. Med.* 182, 114–119, <https://doi.org/10.7205/MILMED-D-16-00041> (2017).
5. Roles of Care doctrine: https://www.jcs.mil/Portals/36/Documents/Doctrine/pubs/jp4_02ch1.pdf
6. Combat Ocular Trauma: Open-globe wounds in operation Iraqi Freedom and Operation Enduring Freedom: risk factors for poor visual outcomes and enucleation; Harris JP, Justin GA, Brooks DI, Woreta FA, Agrawal RV, Ryan DS, Weichel ED, Colyer MH.; *Acta Ophthalmol.* 2021 Dec.

7. Military Relevant Testing: Development and Characterization of a Benchtop Corneal Puncture Injury Model; Eric J. Snider, Lauren E. Cornell, Jorge M. Acevedo, Brandon Gross, Peter R. Edsall, Brian J. Lund, and David O. Zamora; Sci Rep. 2020; 10: 4218.

KEYWORDS: Cornea injuries, corneoscleral injuries, corneal repair, combat ocular trauma, open globe injuries, roles of care

DMEA
23.4 Small Business Innovation Research (SBIR)
Direct to Phase II Proposal Submission Instructions

INTRODUCTION

The Defense Microelectronics Activity (DMEA) SBIR/STTR Program is implemented, administrated, and managed by the DMEA Office of Small Business Programs (OSBP). Proposers responding to a topic in this BAA must follow all general instructions provided in the Department of Defense (DoD) STTR Program BAA. DMEA requirements in addition to or deviating from the DoD Program BAA are provided in the instructions below.

Proposers are encouraged to thoroughly review the DoD Program BAA and register for the DSIP Listserv to remain apprised of important programmatic and contractual changes.

- The DoD Program BAA is located at: <https://www.defensesbirsttr.mil/SBIR-STTR/Opportunities/#announcements>. Be sure to select the tab for the appropriate BAA cycle.
- Register for the DSIP Listserv at: <https://www.dodsbirsttr.mil/submissions/login>.

Specific questions pertaining to the administration of the DMEA SBIR/STTR Program and these proposal preparation instructions should be directed to the DMEA Acting SBIR/STTR Program Manager (PM), Mr. Tien Dang, at osd.mcclellan-park.dmea.list.smbus@mail.mil.

IMPORTANT DATES:

Sep 27, 2023: Topics pre-release

Oct 12, 2023: Topics open, begin submitting proposals in DSIP

Oct 26, 2023: Topic Q&A closes to new questions at 12:00 p.m. ET

Nov 14, 2023: Topics close, full proposals must be submitted in DSIP no later than 12:00 p.m. ET

DIRECT TO PHASE II PROPOSAL GUIDELINES

15 U.S.C. §638 (cc), as amended by NDAA FY2012, Sec. 5106, and further amended by NDAA FY2019, Sec. 854, PILOT TO ALLOW PHASE FLEXIBILITY, allows the Department of Defense to make an award to a small business concern under Phase II of the SBIR program with respect to a project, without regard to whether the small business concern was provided an award under Phase I of an SBIR program with respect to such project. DMEA is conducting a "Direct to Phase II" implementation of this authority for this 23.4 SBIR Announcement and does not guarantee Direct to Phase II opportunities will be offered in future Announcements. Each eligible topic requires documentation to determine that Phase I feasibility described in the Phase I section of the topic has been met.

The DMEA SBIR Program reserves the right to not make any awards under this Direct to Phase II solicitation. The Government is not responsible for expenditures by the offeror prior to award of a contract. All awards are subject to availability of funds and successful negotiations.

The DMEA SBIR Direct to Phase II Proposals are different than traditional SBIR Phase I topics and proposals.

Direct to Phase II proposals must follow the steps outlined below:

STEP 1:

Offerors must create a Cover Sheet per the DoD SBIR 2023.4 Annual BAA instructions. Offerors must provide documentation that satisfies the Phase I feasibility requirement that will be included in the Supporting Documents (Volume 5) area of the Phase II proposal. Offerors must demonstrate that they have completed research and development through means other than the SBIR/STTR program to establish the feasibility of the proposed Phase II effort based on the criteria outlined in the topic description.

STEP 2:

1. Offerors must submit a Phase II proposal using the DMEA Phase II proposal instructions below.
2. The Phase II proposal must be submitted by the deadline as outlined in the DoD SBIR 2023.4 Annual BAA instructions.

Offerors are required to provide information demonstrating that the scientific and technical merit and feasibility has been established. DMEA will not evaluate the offeror's related Phase II proposal if it determines that the offeror has failed to demonstrate that technical merit and feasibility has been established or the offeror has failed to demonstrate that work submitted in the feasibility documentation was substantially performed by the offeror and/or the principal investigator (PI).

Refer to the Phase I description (within the topic) to review the minimum requirements that need to be demonstrated in the feasibility documentation. Feasibility documentation **MUST NOT** be based on work performed under prior or ongoing federally funded SBIR or STTR work.

PHASE II PROPOSAL GUIDELINES

Phase II is the prototype/demonstration of the technology that was found feasible in Phase I. DMEA encourages, but does not require, partnership and outside investment as part of discussions with DMEA sponsors for potential Phase II efforts.

The Technical Volume is not to exceed forty (40) pages and consists of a single PDF file with your firm name, topic number, and proposal number in the header of each page. All documentation should use no smaller than 10 point font on standard 8.5" X 11" paper with one-inch margins and not be in two-column format. Do not include blank pages.

Phase II proposals may be submitted for an amount not to exceed \$1,315,219.00. The technical period of performance for the Phase II effort shall be no more than twenty-four (24) months.

All Phase II proposals must have a complete electronic submission per the Proposal Volumes area listed below. Your proposal must be submitted via the submission site on or before the DMEA-specified deadline or it will not be considered for award.

Due to limited funding, DMEA's ability to award any Phase II, regardless of proposal quality or merit, is subject to availability of funds. Please ensure that your proposal is valid for 120 days after submission, and any extension to that time period will be requested by the contracting officer.

Any follow-on Phase II proposal (i.e., a second Phase II subsequent to the initial Phase II effort) shall be

initiated by the Government Technical Point of Contact for the initial Phase II effort and must be approved by the Acting DMEA SBIR/STTR Program Manager in advance.

A list of the topics currently eligible for proposal submission is included in this section followed by full topic descriptions. These are the only topics for which proposals will be accepted at this time. The topics are directly linked to DMEA's core research and development requirements.

Please ensure that your e-mail address listed in your proposal is current and accurate. DMEA cannot be responsible for notification to companies that change their mailing address, e-mail address, or company official after proposal submission.

PROPOSAL VOLUMES:

Cover page (Volume 1)

Required per the DoD SBIR 2023.4 Annual BAA instructions.

Technical Volume (Volume 2)

The technical volume is not to exceed forty (40) pages and must follow the formatting requirements provided in the DoD SBIR Program BAA.

Content of the Technical Volume

Read the DoD SBIR 2023.4 Annual BAA for detailed instructions on proposal format and program requirements. When you prepare your proposal submission, keep in mind that Phase I should address the feasibility of a solution to the topic. Only UNCLASSIFIED proposals will be entertained.

DMEA will evaluate and select Phase I proposals using the evaluation criteria contained in Section 6.0 of the DoD SBIR 2023.4 Annual BAA Preface Instructions. Due to limited funding, DMEA reserves the right to limit awards under any topic, and only proposals considered to be of superior quality will be funded.

Cost Volume (Volume 3)

DMEA does not accept Phase II proposals exceeding \$1,315,219.00. DMEA will conduct a price analysis to determine whether cost proposals, including quantities and prices, are fair and reasonable. Contractors should expect that cost proposals will be negotiated. Costs must be separated and clearly identified on the Proposal Cover Sheet (Volume 1) and in Volume 3.

The on-line cost volume for Phase II proposal submissions must be at a level of detail that would enable DMEA personnel to determine the purpose, necessity, and reasonability of each cost element. Provide sufficient information (a. through h. below) on how funds will be used if the contract is awarded. Include the itemized cost volume information (a. through h. below) as an appendix in your technical proposal. The itemized cost volume information (a. through h. below) will not count against the 40-page limit on Phase II proposal submissions.

- a. **Special Tooling and Test Equipment and Material:** The inclusion of equipment and materials will be carefully reviewed relative to need and appropriateness of the work proposed. The purchase of special tooling and test equipment must, in the opinion of the Contracting Officer, be advantageous to the Government and relate directly to the specific effort. They may include such items as innovative instrumentation and/or automatic test equipment. Title to property

furnished by the Government or acquired with Government funds will be vested with the DoD Component; unless it is determined that transfer of the title to the contractor would be more cost effective than recovery of the equipment by the DoD Component.

- b. Direct Cost Materials: Justify costs for materials, parts, and supplies with an itemized list containing types, quantities, price, and where appropriate, purposes.
- c. Other Direct Costs: This category of costs includes specialized services such as machining or milling, special testing or analysis, costs incurred in obtaining temporary use of specialized equipment. Proposals, which include leased hardware, must provide an adequate lease versus purchase justification or rationale.
- d. Direct Labor: Identify key personnel by name if possible or by labor category if specific names are not available. The number of hours, labor overhead and/or fringe benefits and actual hourly rates for each individual are also necessary.
- e. Travel: Travel costs must relate to the needs of the project. Break out travel cost by trip, with the number of travelers, airfare, and per diem. Indicate the destination, duration, and purpose of each trip.
- f. Cost Sharing: Cost sharing is permitted. However, cost sharing is not required, nor will it be an evaluation factor in the consideration of a proposal.
- g. Subcontracts: Involvement of university or other consultants in the planning and /or research stages of the project may be appropriate. If the offeror intends such involvement, describe the involvement in detail and include information in the cost proposal. The proposed total of all consultant fees, facility leases, or usage fees and other subcontract or purchase agreements may not exceed one-third of the total contract price or cost, unless otherwise approved in writing by the Contracting Officer. Support subcontract costs with copies of the subcontract agreements. The supporting agreement documents must adequately describe the work to be performed (i.e., Cost Volume). At the very least, a statement of work with a corresponding detailed cost volume for each planned subcontract must be provided.
- h. Consultants: Provide a separate agreement letter for each consultant. The letter should briefly state what service or assistance will be provided, the number of hours required, and the hourly rate.

Company Commercialization Report (CCR) (Volume 4)

Completion of the CCR as Volume 4 of the proposal submission in DSIP is required. Please refer to the DoD SBIR 2023.4 Annual BAA for full details on this requirement. Information contained in the CCR will be considered by DMEA during proposal evaluations.

Supporting Documents (Volume 5)

Supporting documents will include the following:

1. Contractor Certification Regarding Provision of Prohibition on Contracting for Certain Telecommunications and Video Surveillance Services or Equipment
2. Disclosures of Foreign Affiliations or Relationships to Foreign Countries

3. Disclosure of Funding Sources
4. Feasibility Documentation
 - a. Maximum page length for feasibility documentation is twenty (20) pages. If you have references, include a reference list or works cited list as the last page of the feasibility documentation. This will count towards the page limit.
 - b. Work submitted within the feasibility documentation must have been substantially performed by the offeror and/or the principal investigator (PI). Technology in the feasibility documentation is subject to intellectual property (IP) rights, the offeror must provide IP rights assertions. Provide a good faith representation that you either own or possess appropriate licensing rights to all IP that will be utilized under your proposal. Additionally, proposers shall provide a short summary for each item asserted with less than unlimited rights that describes the nature of the restriction and the intended use of the intellectual property in the conduct of the proposed research. Please see the DoD SBIR 2023.4 Annual BAA instructions for information regarding technical data rights.

Please refer to the DoD Program BAA for more information.

Fraud, Waste and Abuse Training (Volume 6)

Fraud, Waste and Abuse (FWA) training is required for Phase I and Direct to Phase II proposals. Please refer to the DoD 2023.4 SBIR Annual BAA for full details.

DMEA SBIR PHASE II ENHANCEMENT PROGRAM

To encourage transition of SBIR into DoD systems, DMEA has a Phase II Enhancement policy. DMEA's Phase II Enhancement program requirements include up to a one-year extension of existing Phase II, and up to \$657,610.00 of matching SBIR funds. Applications are subject to review of the statement of work, the transition plan, and the availability of funding. DMEA will generally provide the additional Phase II Enhancement funds by modifying the Phase II contract.

DISCRETIONARY TECHNICAL AND BUSINESS ASSISTANCE (TAB A)

DMEA does not provide Discretionary Technical and Business Assistance (TAB A).

EVALUATION AND SELECTION

All proposals will be evaluated in accordance with the evaluation criteria listed in the DoD SBIR 2023.4 Annual BAA. Proposing firms will be notified of selection or non-selection status for a Phase II award within 90 days of the closing date of the BAA.

Refer to the DoD SBIR 2023.4 Annual BAA for procedures to protest the Announcement.

As further prescribed in FAR 33.106(b), FAR 52.233-3, Protests after Award should be submitted to:

DMEA Acting SBIR/STTR Program Manager (PM):

- Name: Mr. Tien Dang
- Email: osd.mcclellan-park.dmea.list.smbus@mail.mil

DMEA SBIR 23.4 Topic Index
Release 1

DMEA234-D01 High Performance Clock Oscillator

DMEA234-D01 TITLE: High Performance Clock Oscillator

OUUSD (R&E) CRITICAL TECHNOLOGY AREA(S): Microelectronics; Space Technology

OBJECTIVE: The Department of Defense(DoD) is seeking the development of a high performance, full in-system programmable, industrial temperature rated (storage -55C to 125 C; operational -40 C to 105 C), US Sources, high G (30kG) operational shock, performance better than 0.001 ppb/g, 100kG survival shock, lower power (<30mW @ 1.8V), supply range 1.8 – 3.3V, microelectromechanical systems (MEMS) oscillator smaller than 9mm in area packaged and He proof, while capable of operations from 1 to 105 MHz with frequency stability of 0.5ppm in operational temperature range, the Allan deviation (ADEV) better than 1E-11 in 1 to 9 Sec. The device shall be printed circuit board (PCB) surface mountable with a large central electrically conductive pad for mechanical stability and seek to minimize the overall footprint and volume to the maximum extent possible.

DESCRIPTION: There are many applications for the DoD which require high precision, low Size, Weight, Area and power (SWAP) clock sources. For example, satellite communications (SATCOM), global navigation satellite system (GNSS) receivers require reference clocks that have high frequency stability, low phase noise and low power operations. Additional applications related to fuzing and other high acceleration applications require the clock generators for microelectronics to be survivable and operational under high G environments. Harshness of military environments and application of microelectromechanical systems (MEMS) oscillators is well documented [1]. Clock oscillators that can deliver high performance (50-100ppb frequency stability over operating temperatures, 1E-11 ADEV), low power, in system programming capability in the range of 1-105MHz are required. The oscillators should be operable under 30kG and survivable under 100kG shocks. Research on quartz crystals has demonstrated g-sensitivity of 2E-69/g [2] and MEMS oscillators have shown even lower sensitivity [3, 4].

PHASE I: Conduct a feasibility study and design of a MEMS oscillator with high performance and survivability under high-G conditions, 30kG and 100kG respectively. The consideration for the MEMS design shall be described. Architecture, design and methods of fabrication shall be defended regarding the following application-based specifications:

1. Frequency stability of 100ppb or better in the range of 1-105MHz.
2. ADEV of 1E-11 in 1 to 9 Sec.
3. Full in-system programmable for entire range.
4. The oscillator shall operate over the temperature range (-55 to 105C).
5. Power consumption <30mW@1.8V
6. Operation from 1.8V to 3.3V.
7. Operational under 30kG environment with low G-sensitivity of 0.001ppb/g.
8. Survivable under 100kG shock.

The feasibility study shall detail the process and techniques used along with associated costs. If there are bulk quantity discounts factored in, the report shall disclose quantity price break points and which steps were discounted wherever relevant. It must include:

1. Proposed manufacturing processes flow and techniques used including dicing and etching methodologies, along with figures and diagrams describing the process.
2. Bulk material and specification (i.e., crystal orientation, dopant species, resistivity, epi thickness, if any, etc.).

3. Cost break down for manufacturing compared to existing (both commercial and research) and comparative theoretical options.
4. Methodologies and analysis techniques used for characterizing the proposed device.

The delivered report shall fully describe the proposed techniques and characterization methodologies, including a notional list of fabrication tools, facility requirements, and a program plan for follow-on phase development. If any of the above items cannot be fully addressed, the report must include relevant research and rationale that demonstrates their inapplicability to the proposed technique. If adhering to the above items is possible, but not financially feasible, the report must include relevant justification. Finally, the challenges and special considerations for testing of accelerometers under high-g stress environments shall be addressed.

FEASIBILITY DOCUMENTATION: Offerors interested in participating in Direct to Phase II must include in their response to this topic Phase I feasibility documentation that substantiates the scientific and technical merit and Phase I feasibility described in Phase I above has been met (i.e., the small business must have performed Phase I-type research and development related to the topic, but from non-SBIR funding sources) and describes the potential commercialization applications. The documentation provided must validate that the proposer has completed development of technology as stated in Phase I above. Documentation shall include all relevant information including, but not limited to: technical reports, test data, prototype designs/models, and performance goals/results. Work submitted within the feasibility documentation must have been substantially performed by the offeror and/or the principal investigator (PI).

PHASE II: Build, test and deliver a fully functional MEMS oscillator based on the design developed in Phase I. Demonstrate the capability of performance while adhering to the specifications outlined in Phase I. Production yields should be considered to keep costs with commercialization a viable option. The final report shall address manufacturing yield and reflect that the tested prototypes were selected from across multiple lots to demonstrate repeatability and quality with low variation within wafer, wafer to wafer, and lot to lot. If a non-random selection was required to optimize performance, the final report must detail reasoning for using non-random selection and the selection criteria used.

Deliver a detailed final report that documents the cost breakdown per device, manufacturing processes utilized, fabrication toolset required to perform the proposed techniques, all facility requirements, all electrical characterization, and all device design data (Technology Computer Aided Design (TCAD) files, modeling/simulation results, etc.). If there are bulk quantity discounts factored in any of the cost breakdowns, the final report shall disclose quantity price break points and which steps were discounted wherever relevant. The final report shall contain sufficient technical detail such that an entity skilled in semiconductor fabrication can repeat the presented results.

PHASE III DUAL USE APPLICATIONS: This technology could be utilized for other DoD and commercial applications where high performance and/or repeated shock events may occur, such as precision SATCOM, GNSS microcircuits, fuzing and munition electronics, flight termination systems, or crash test instrumentation.

REFERENCES:

1. T. G. Brown, "Harsh military environments and microelectromechanical (MEMS) device", Proceedings of IEEE Sensors, vol 2, 2003

2. M Bloch et al, "Acceleration 'G' Compensated Quartz Crystal Oscillators", 2009 IEEE International Frequency Control Symposium Joint with the 22nd European Frequency and Time forum, 2009
3. Bongsang Kim et al, "MEMS Resonators with extremely low vibration and shock sensitivity", IEEE Sensors, 2011
4. Beheshteh Najafabadi, "Study of Acceleration Sensitivity and Nonlinear Behavior in Silicon-based MEMS Resonators", Doctoral Dissertation, University of Central Florida, 2019

KEYWORDS: MEMS, Temperature compensated Crystal Oscillator (TCXO), Oscillators

**Defense Threat Reduction Agency (DTRA)
DoD 2023.4 Small Business Innovation Research (SBIR) Program
Proposal Submission Instructions**

August 23, 2023: Topics issued for pre-release

September 20, 2023: DTRA begins accepting proposals

October 11, 2023: DSIP Topic Q&A closes to new questions at 12:00 p.m. ET

October 18, 2023: Deadline for receipt of proposals/whitepapers no later than **12:00 p.m. ET**

INTRODUCTION

The Defense Threat Reduction Agency (DTRA) mission is to enable the DoD, the U.S. Government, and International Partners to counter and deter Weapons of Mass Destruction (WMD) Chemical Biological, Radiological, Nuclear) and Improvised Threat Networks. The DTRA SBIR program is consistent with the purpose of the Federal SBIR/STTR Program, i.e., to stimulate a partnership of ideas and technologies between innovative small business concerns and through Federal-funded research or research and development (R/R&D).

The approved FY23.4 topics solicited for the Defense Threat Reduction Agency (DTRA) Small Business Innovation Research (SBIR) Program are included in these instructions followed by the full topic description. Offerors responding to this Broad Agency Announcement (BAA) must follow all general instructions provided in the related Department of Defense Annual Program BAA and submit proposals by the date and time listed in this release. Specific DTRA requirements that add to or deviate from the DoD Annual Program BAA instructions are provided below with references to the appropriate section of the DoD document.

Proposers are encouraged to thoroughly review the DoD Annual Program BAA and register for the DSIP Listserv to remain apprised of important programmatic and contractual changes.

- The DoD Annual Program BAA is located at: <https://www.defensesbirsttr.mil/SBIR-STTR/Opportunities/#announcements>. Be sure to select the tab for the appropriate BAA cycle.
- Register for the DSIP Listserv at: <https://www.dodsbirsttr.mil/submissions/login>.

The DTRA Small Business Innovation Research (SBIR) Program is implemented, administered, and managed by the DTRA SBIR/STTR Program Office. Specific questions pertaining to the administration of the DTRA SBIR program and these proposal preparation instructions should be directed to:

Mr. Mark D. Flohr
DTRA SBIR/STTR Program Manager
Mark.D.Flohr.civ@mail.mil
Tel: (571) 616-6066

Defense Threat Reduction Agency
8725 John J. Kingman Road
Stop 6201
Ft. Belvoir, VA 22060-6201

For technical questions about specific topic requirements during the pre-release period, contact the DTRA Technical Point of Contact (TPOC) for that specific topic. To obtain answers to technical questions during the formal BAA open period, visit: <https://www.dodsbirsttr.mil/submissions/login>. For questions regarding the Defense SBIR/STTR Innovation Portal, contact DSIP Support at: dodsbirsupport@reisystems.com.

Proposals not conforming to the terms of this announcement will not be considered. DTRA reserves the right to limit awards under any topic, and only those proposals of superior scientific and technical quality as determined by DTRA will be funded. DTRA reserves the right to withdraw from negotiations at any time prior to contract award. The Government may withdraw from negotiations at any time for any reason to include matters of national security (foreign persons, foreign influence or ownership, inability to clear the firm or personnel for security clearances, or other related issues).

Please read the entire DoD announcement and DTRA instructions carefully prior to submitting your proposal as there have been significant updates to the requirements.

This release contains an open topic. As outlined in section 7 of the SBIR and STTR Extension Act of 2022, innovation open topic activities—

- (A) Increase the transition of commercial technology to the Department of Defense;
- (B) Expand the small business nontraditional industrial base;
- (C) Increase commercialization derived from investments of the Department of Defense; and
- (D) Expand the ability for qualifying small business concerns to propose technology solutions to meet the needs of the Department of Defense.

Unlike conventional topics, which specify the desired technical objective and output, open topics can use generalized mission requirements or specific technology areas to adapt commercial products or solutions to close capability gaps, improve performance, or provide technological advancements in existing capabilities.

A small business concern may only submit one (1) proposal to each open topic. If more than one proposal from a small business concern is received for a single open topic, only the most recent proposal to be certified and submitted prior to the submission deadline will receive an evaluation. All prior proposals submitted by the small business concern for the same open topic will be marked as nonresponsive and will not receive an evaluation.

OPEN TOPIC GUIDELINES

DTRA will have one Open Topic (DTRA234-P01) for the SBIR 2023.4 Broad Agency Announcement and will incorporate a two-step Whitepaper process using a Technical Feasibility review approach providing a formal review of the proposed technical merit and feasibility. **This two-step process is applicable to topic DTRA234-P01 ONLY.** For those firms wishing to submit a proposal to the Open Topic please follow the instructions below. Firms must clearly identify the unique topic number in their proposal. Additionally, please follow carefully the requirements of Volume 5 as stated in the DoD Annual SBIR Program BAA.

OPEN TOPIC STEP ONE: Proposing small business concerns must certify and submit, by the deadline stated in the DoD BAA, the following proposal volumes in DSIP:

1. All Firm-level Forms. On the Defense SBIR/STTR Innovation Portal (DSIP) at <https://www.dodsbirsttr.mil/submissions/>, prepare the Firm-level Forms – Firm Certifications, Audit Information, and Company Commercialization Report (CCR).
2. Supporting Documents (Volume 5). All proposing small business concerns are REQUIRED to submit the following documents to Volume 5:
 - a. Contractor Certification Regarding Provision of Prohibition on Contracting for Certain Telecommunications and Video Surveillance Services or Equipment

- b. Disclosures of Foreign Affiliations or Relationships to Foreign Countries
- c. Disclosure of Funding Sources

In addition, a white paper outlining the proposed effort must be uploaded to Volume 5.

- a. White paper format:
 - 3-5 pages/1,000-1,200 words in length;
 - Single-column, single spaced typed lines format on the standard 8 1/2" x 11" paper with 1-inch margins. The header on each page of the whitepaper should contain your company name, topic number, and proposal number assigned by DSIP when the proposal was created. The header may be included in the one-inch margin.
- b. The paper should be a formalized focus on technical merits and feasibility of the project, which defines the specific technical problem and includes the research and development effort to determine the feasibility of the proposed approach to a solution. Any related significant activities by the offeror that relate directly to the proposed effort should be included.

Upon the deadline listed, subject matter experts in the technical field will review the white papers to determine suitability for full proposal submission. DTRA will review the technical merit of the whitepaper considering the Principal Investigator's assumptions, the technical approach, analysis, proposed results/conclusions and potential for commercialization. The DTRA SBIR/STTR Selection Authority will review and approve those white papers selected to move forward.

OPEN TOPIC STEP TWO: Offerors whose White Paper were favorably reviewed and selected for proposal submittal will receive, within 20 days, notification from DTRA with instructions for submitting a full proposal following guidelines provided in the DoD Annual Program BAA and the DTRA 2023.4 SBIR Instructions. Proposals that are submitted without prior notification from DTRA will not receive an evaluation.

Technical Volume (Volume 2)

The technical volume is not to exceed a twenty (20) pages and must follow the formatting requirements provided in the DoD Annual SBIR Program BAA. Any pages in the technical volume over 20 pages will not be considered in proposal evaluations.

Content of the Technical Volume

Please review the DoD Annual Program BAA and the DTRA 2023.4 SBIR Phase I Proposal Guidelines below for further details.

Cost Volume (Volume 3)

The Phase I Base amount must not exceed \$167,500. For the Cost Volume, The Defense Threat Reduction Agency requires the use of a Microsoft excel spread sheet which is available on the DSIP portal. Note: The DTRA Cost Volume template and instructions will be accessible once the Cost Volume is initiated.

At least 2/3 (66 2/3 %) of the research and/or analytical work in Phase I must be conducted by the proposing firm. The percentage of work is measured by both direct and indirect costs as a percentage of the total contract cost.

Company Commercialization Report (CCR) (Volume 4)

Completion of the CCR as Volume 4 of the proposal submission in DSIP is required. Please refer to the DoD Annual SBIR Program BAA for full details on this requirement. Information contained in the CCR will not be considered by DTRA during proposal evaluations.

Supporting Documents (Volume 5)

All proposing small business concerns are REQUIRED to submit the following documents to Volume 5:

1. Contractor Certification Regarding Provision of Prohibition on Contracting for Certain Telecommunications and Video Surveillance Services or Equipment
2. Disclosures of Foreign Affiliations or Relationships to Foreign Countries
3. Disclosure of Funding Sources

Please refer to the DoD Annual Program BAA for more information.

In addition to mandatory/required supporting documents as outlined in the DoD Annual Program BAA, proposers must include the original whitepaper **and** the notification to submit a full proposal within Volume 5. Additional supporting documents can be included in this Volume as well.

Fraud, Waste and Abuse Training (Volume 6)

Fraud, Waste and Abuse (FWA) training is required for all proposals. Please refer to the DoD Annual Program BAA instructions for full details.

PHASE I PROPOSAL GUIDELINES

The Defense SBIR/STTR Innovation Portal (DSIP) is the official portal for DoD SBIR/STTR proposal submission. Proposers are required to submit proposals via DSIP; proposals submitted by any other means will be disregarded. Detailed instructions regarding registration and proposal submission via DSIP are provided in the DoD Annual SBIR Program BAA.

Technical Volume (Volume 2)

The technical volume is not to exceed 20 pages and must follow the formatting requirements provided in the DoD SBIR Annual Program BAA. Any pages in the technical volume over 20 pages will not be considered in proposal evaluations.

Content of the Technical Volume

The Technical Volume should cover the following items in the order given below:

(a) Identification and Significance of the Problem or Opportunity.

Define the specific technical problem or opportunity addressed and its importance.

(b) Phase I Technical Objectives.

Enumerate the specific objectives of the Phase I work, including the questions the research and development effort will try to answer to determine the feasibility of the proposed approach.

(c) Phase I Statement of Work (including Subcontractors' Efforts)

- (1) Provide an explicit, detailed description of the Phase I approach. The Statement of Work should indicate what tasks are planned, how and where the work will be conducted, a schedule of major events, and the final product(s) to be delivered. The Phase I effort should attempt to determine the technical feasibility of the proposed concept. The methods planned to achieve each objective or task should be discussed explicitly and in detail. This section should be a substantial portion of the Technical Volume section.
- (2) This BAA may contain topics that have been identified by the Program Manager as research or activities involving Human/Animal Subjects and/or Recombinant DNA. In the event that Phase I performance includes performance of these kinds of research or activities, please identify the applicable protocols and how those protocols will be followed during Phase I. Please note that funds cannot be released or used on any portion of the project involving human/animal subjects or recombinant DNA research or activities until all of the proper approvals have been obtained. **Submitters proposing research involving human and/or animal use are encouraged to separate these tasks in the technical proposal and cost proposal in order to avoid potential delay of contract award.**

(d) Related Work.

Describe significant activities directly related to the proposed effort, including any conducted by the principal investigator, the proposing firm, consultants, or others. Describe how these activities interface with the proposed project and discuss any planned coordination with outside sources. The technical volume must persuade reviewers of the proposer's awareness of the state-of-the-art in the specific topic. Describe previous work not directly related to the proposed effort but similar. Provide the following:

- (1) Short description,
- (2) Client for which work was performed (including individual to be contacted and phone number), and
- (3) Date of completion.

(e) Relationship with Future Research or Research and Development

- (1) State the anticipated results of the proposed approach if the project is successful.
- (2) Discuss the significance of the Phase I effort in providing a foundation for Phase II research or research and development effort.
- (3) Identify the applicable clearances, certifications and approvals required to conduct Phase II testing and outline the plan for ensuring timely completion of said authorizations in support of Phase II research or research and development effort.

(f) Commercialization Strategy. Describe in approximately one page your company's strategy for commercializing this technology in DoD (such as a formal DoD Program), other Federal Agencies, and/or private sector markets. Provide specific information on the market need the technology will address and the size of the market. Also include a schedule showing the quantitative commercialization results from this SBIR project that your company expects to achieve.

- (g) Key Personnel.** Identify key personnel who will be involved in the Phase I effort including information on directly related education and experience. A concise technical resume of the principal investigator, including a list of relevant publications (if any), must be included (Please do not include Privacy Act Information). All resumes will count toward the page limitations for Volume 2.
- (h) Foreign Citizens.** Identify any foreign citizens or individuals holding dual citizenship expected to be involved on this project as a direct employee, subcontractor, or consultant. For these individuals, please specify their country of origin, the type of visa or work permit under which they are performing and an explanation of their anticipated level of involvement on this project. Proposers frequently assume that individuals with dual citizenship or a work permit will be permitted to work on an SBIR project and do not report them. This is not necessarily the case and a proposal will be rejected if the requested information is not provided. Therefore, firms should report any and all individuals expected to be involved on this project that are considered a foreign national as defined in the BAA. You may be asked to provide additional information (e.g., copy of valid passport, visa, work permit, etc.) during negotiations in order to verify the foreign citizen's eligibility to participate on an SBIR contract. Supplemental information provided in response to this paragraph will be protected in accordance with the Privacy Act (5 U.S.C. 552a), if applicable, and the Freedom of Information Act (5 U.S.C. 552(b)(6)).
- (i) Facilities/Equipment.** Describe available instrumentation and physical facilities necessary to carry out the Phase I effort. Justify equipment purchases in this section and include detailed pricing information in the Cost Volume. State whether or not the facilities where the proposed work will be performed meet environmental laws and regulations of federal, state (name), and local Governments for, but not limited to, the following groupings: airborne emissions, waterborne effluents, external radiation levels, outdoor noise, solid and bulk waste disposal practices, and handling and storage of toxic and hazardous materials.
- (j) Subcontractors/Consultants.** Involvement of a university or other subcontractors or consultants in the project may be appropriate. If such involvement is intended, it should be identified and described to the same level of detail as the prime contractor costs. A minimum of two-thirds (66%) of the research and/or analytical work in Phase I, as measured by direct and indirect costs, must be conducted by the proposing firm, unless otherwise approved in writing by the Contracting Officer. For Phase II, a minimum of one-half (50%) of the research and/or analytical work must be performed by the proposing firm. The percentage of work is measured by both direct and indirect costs. SBIR efforts may include subcontracts with Federal Laboratories and Federally Funded Research and Development Centers (FFRDCs). A waiver is no longer required for the use of federal laboratories and FFRDCs; however, proposer must certify their use of such facilities on the Cover Sheet of the proposal.

For both Phase I and II, the primary employment of the principal investigator must be with the small business firm at the time of the award and during the conduct of the proposed effort. Primary employment means that more than one-half of the principal investigator's time is spent

with the small business. Primary employment with a small business concern precludes full-time employment at another organization.

(k) Prior, Current, or Pending Support of Similar Proposals or Awards. If a proposal submitted in response to this BAA is substantially the same as another proposal that was funded, is now being funded, or is pending with another Federal Agency, or another or the same DoD Component, you must reveal this on the Proposal Cover Sheet and provide the following information. Refer to the instructions provided in the DoD SBIR BAA for this requirement.

Note: If this does not apply, state in the proposal "No prior, current, or pending support for Proposed work"

Cost Volume (Volume 3)

The Phase I Base amount must not exceed \$167,500. For the Cost Volume, The Defense Threat Reduction Agency requires the use of a Microsoft excel spread sheet which is available on the DSIP portal. Note: The DTRA Cost Volume template will be accessible once the Cost Volume is initiated.

Important: when completing the cost volume, enough information should be provided to allow the agency to understand how you plan to use the requested funds if a contract is awarded. Itemized costs of any subcontract or consultant should be provided to the same level as for the prime small business. If an unsanitized version of costs cannot be provided with the proposal, the Government may request it during negotiations if selected. Refer to the instruction provided in the DoD Annual SBIR program BAA for additional details on the content of the Cost Volume.

Note: Cost for travel funds must be justified and related to the needs of the project. DTRA does not include any fee on travel costs, so proposal should exclude fee on any travel costs proposed.

Please review the updated Percentage of Work (POW) calculation details included in the DoD Annual Program BAA. DTRA will not accept any deviation to the POW requirements.

Company Commercialization Report (CCR) (Volume 4)

Completion of the CCR as Volume 4 of the proposal submission in DSIP is required. Please refer to the DoD Annual SBIR Program BAA for full details on this requirement. Information contained in the CCR will not be considered by DTRA during proposal evaluations.

Supporting Documents (Volume 5)

Volume 5 is provided for proposers to submit additional documentation to support the Coversheet (Volume 1), Technical Volume (Volume 2), and the Cost Volume (Volume 3). Further, the SBIR and STTR Extension Act of 2022 mandated several new and important requirements that must be included in the Supporting Documents (Volume 5).

All proposing small business concerns are REQUIRED to submit the following documents to Volume 5:

1. Contractor Certification Regarding Provision of Prohibition on Contracting for Certain Telecommunications and Video Surveillance Services or Equipment
2. Disclosures of Foreign Affiliations or Relationships to Foreign Countries
3. Disclosure of Funding Sources

Please refer to the DoD Annual Program BAA for more information. Proposals that do not include the above documents will be deemed noncompliant and will not receive an evaluation.

Any of the following documents may be included in Volume 5 if applicable to the proposal.

1. Letters of Support
2. Additional Cost Information
3. Funding Agreement Certification
4. Technical Data Rights (Assertions)
5. Lifecycle Certification
6. Allocation of Rights

Fraud, Waste, and Abuse Training (Volume 6)

Fraud, Waste and Abuse (FWA) training is required for all proposals. Please refer to the DoD Annual SBIR Program BAA instructions for full details.

PHASE II PROPOSAL GUIDELINES

Phase II proposals may only be submitted by Phase I awardees.

The Phase II proposals are best submitted no later than (NLT) 30 days AFTER the end of the 7 month Phase I period of performance.

All SBIR Phase II awards made on topics from solicitations prior to FY13 will be conducted in accordance with the procedures specified in those solicitations.

DTRA is not responsible for any money expended by the proposer prior to contract award.

DTRA has established a **40-page limitation** for the Technical Volume submitted in response to its topics. This does not include the Proposal Cover Sheets (pages 1 and 2, added electronically by the DoD submission site), or the Cost Volume, or the Company Commercialization Report. The Technical Volume includes, but is not limited to: table of contents, pages left blank, references and letters of support, appendices, key personnel biographical information, and all attachments.

Further details on the due date, content, and submission requirements of the Phase II proposal will be provided either in the Phase I award or by subsequent notification.

Phase II Proposal Instructions

Each Phase II proposal must be submitted through the Defense SBIR/STTR Innovation Portal by the deadline as specified in the Phase II Proposal Guidelines, or in the Phase I award or subsequent notification. **The format should be similar to Phase I proposal except the Phase II Technical Proposal is limited to 40 pages.** Each proposal submission must contain a Proposal Cover Sheet, Technical Volume, Cost Volume, a Company Commercialization Report (see the appropriate section of the BAA Announcement) and Volume 5 with mandatory documents as stated in the DoD Annual SBIR Program BAA. The Commercialization Strategy Volume should be more specific than was required for Phase I.

As indicated in the DoD Annual STTR Program BAA, the CCR is generated by the submission website based on information provided by you through the "Company Commercialization Report" tool.

Commercialization Strategy

See the appropriate section of the DoD Annual SBIR 23.4 BAA.

Phase II Evaluation Criteria

Phase II proposals will be reviewed for overall merit based upon the criteria specified in this Broad Agency Announcement and will be similar to the Phase I process.

Public Release of Award Information

If your proposal is selected for award, the technical abstract and discussion of anticipated benefits will be publicly released via the Internet. Therefore, do not include proprietary or classified information in these sections. For examples of past publicly released DoD SBIR/STTR Phase I and II awards, visit <https://www.dodsbirsttr.mil/submissions/login>.

DISCRETIONARY TECHNICAL AND BUSINESS ASSISTANCE (TABA)

In accordance with the Small Business Act (15 U.S.C. 632), DTRA will authorize the recipient of a Phase I or Phase II STTR award to purchase Discretionary Technical & Business Assistance services, such as access to a network of scientists and engineers engaged in a wide range of technologies, or access to technical and business literature available through on-line data bases, for the purpose of assisting in areas such as:

- making better technical decisions concerning such projects;
- solving technical problems which arise during the conduct of such projects;
- minimizing technical risks associated with such projects;
- developing/ commercializing new commercial products/processes resulting from such projects; and,
- meeting cyber security requirements.

If you are proposing use of Discretionary Technical and Business Assistance (TABA), you must provide a cost breakdown in the Cost Volume under "Other Direct Costs (ODCs)" and provide a one-page description of the vendor you will use and the Technical and Business Assistance you will receive. For the Phase I project, the amount for TABA may not exceed \$6,500 per award. For the Phase II project, the TABA amount may be less than, equal to, but not more than \$50,000 per project. The description should be included in Volume 5 of the proposal.

Approval of Discretionary Technical and Business Assistance is not guaranteed and is subject to review of the contracting officer.

For Discretionary Technical and Business Assistance, small business concerns may propose one or more vendors. Additionally, business-related services aimed at improving the commercialization success of a small business concern may be obtained from an entity, such as a public or private organization or an agency or other entity established or funded by a State that facilitates or accelerates the commercialization of technologies or assists in the creation and growth of private enterprises that are commercializing technology.

EVALUATION AND SELECTION

All proposals will be evaluated in accordance with the evaluation criteria listed in the BAA.

Proposing firms will be notified of selection or non-selection status for a Phase I award within 90 days of the closing date of the BAA. DTRA has a single Evaluation Authority (EA) for all proposals received under this solicitation. The EA either selects or rejects Phase I and Phase II proposals based upon the results of the review and evaluation process plus other considerations including limitation of funds, and investment balance across all the DTRA topics in the solicitation. To provide this balance, a lower rated

proposal in one topic could be selected over a higher rated proposal in a different topic. DTRA reserves the right to select all, some, or none of the proposals in a particular topic.

Notifications. Following the EA decision, the DTRA SBIR/STTR office will release notification e-mails of selection or non-selection status for a Phase I award within 90 days of the closing date of the BAA. The E-mails will be sent to the addresses provided for the Principal Investigator and Corporate Official. Offerors may request a debriefing of the evaluation of their not selected proposal and should submit this request via email to: dtra.belvoir.RD.mbx.sbir@mail.mil and include "SBIR 23.4 / Topic XX Debriefing Request" in the subject line. Debriefings are provided to help improve the offeror's potential response to future solicitations. Debriefings do not represent an opportunity to revise or rebut the EA decision.

For selected offers, DTRA will initiate contracting actions which, if successfully completed, will result in contract award. DTRA Phase I awards are issued as fixed-price purchase orders with a maximum period of performance of seven-months. DTRA may complete Phase I awards without additional negotiations by the contracting officer or without opportunity for revision for proposals that are reasonable and complete.

DTRA Support Contractors

Select DTRA-employed support contractors may have access to contractor information, technical data or computer software that may be marked as proprietary or otherwise marked with restrictive legends. Each DTRA support contractor performs under a contract that contains organizational conflict of interest provisions and/or includes contractual requirements for nondisclosure of proprietary contractor information or data/software marked with restrictive legends. These contractors require access while providing DTRA such support as advisory and assistance services, contract specialist support, and support of the Defense Threat Reduction Information Analysis Center (DTRIAC). The contractor, by submitting a proposal or entering into this contract, is deemed to have consented to the disclosure of its information to DTRA's support contractors.

The following are, at present, the prime contractors anticipated to access such documentation: ASRC Federal (contract specialist support); Kent, Campa and Kate, Inc. (contract closeout support), ARServices (Program Management Advisory and Assistance Services--A&AS), Systems Planning and Analysis, Inc. (Subject Matter Expertise A&AS), Amentum (A&AS), Polaris Consulting (Small Business Program Support), Seventh Sense Consulting, LLC (Acquisition Support), Savantage Solutions (Accounting and Financial Systems Support); TekSynap Corporation and Kapili Services, LLC (DTRIAC).. This list is not all inclusive (e.g., subcontractors) and is subject to change.

Protests.

Refer to the DoD Annual SBIR Program BAA for procedures to protest the Announcement.

As further prescribed in FAR 33.106(b), FAR 52.233-3, Protests after Award should be submitted to:

- (a) Protests, as defined in section 33.101 of the Federal Acquisition Regulation, that are filed directly with an agency, and copies of any protests that are filed with the Government Accountability Office (GAO), shall be served on the Contracting Officer (addressed to Mr. Herbert Thompson, Contracting Officer, as follows) by obtaining written and dated acknowledgment of receipt from (if mailed letter) Defense Threat Reduction Agency, ATTN: AL-ACQ (Mr. Herbert Thompson), 1680 Texas Street, Kirtland AFB, NM 87117. If Federal Express is used for the transmittal, the appropriate address is: Defense Threat Reduction Agency, ATTN: AL-ACQ (Mr. Herbert Thompson), 8151 Griffin Avenue SE, Building 20414, Kirtland AFB, NM 87117-5669.

(b) The copy of any protest shall be received in the office designated above within one day of filing a protest with the GAO.

AWARD AND CONTRACT INFORMATION

DTRA plans on Phase I projects for a seven (7) month period of performance with six months devoted to the research and the final month for the final report. The award size of the Phase I contract is no more than \$167,500.00 not withstanding a maximum of \$6,500.00 for Discretionary Technical and Business Allowance (TABAs). For a Phase II project, DTRA plans on a 24 month period of performance. The award size of a Phase II contract is no more than \$1,100,000.00 not withstanding a maximum of \$50,000.00 for Discretionary Technical and Business Allowance (TABAs) for the entire project.

ADDITIONAL INFORMATION

Export Control Restrictions

The International Traffic in Arms Regulations (ITAR), 22 CFR Parts 120 through 130, and the Export Administration Regulations (EAR), 15 CFR Parts 730 through 799, will apply to all projects with military or dual-use applications that develop beyond fundamental research, which is basic and applied research ordinarily published and shared broadly within the scientific community. More information is available at https://www.pmdtc.state.gov/ddtc_public.

The technology within some DTRA topics is restricted under export control regulations including the International Traffic in Arms Regulations (ITAR) and the Export Administration Regulations (EAR). ITAR controls the export and import of listed defense-related material, technical data and services that provide the United States with a critical military advantage. EAR controls military, dual-use and commercial items not listed on the United States Munitions List or any other export control lists. EAR regulates export-controlled items based on user, country, and purpose. **The offeror must ensure that their firm complies with all applicable export control regulations.**

NOTE: Export control compliance statements found in these proposal instructions are not meant to be all inclusive. They do not remove any liability from the submitter to comply with applicable ITAR or EAR export control restrictions or from informing the Government of any potential export restriction as fundamental research and development efforts proceed.

Cyber Security

Any Small Business Concern receiving an SBIR award is required to provide adequate security on all covered contractor information systems. Specific security requirements are listed in DFARS 252.204.7012, and compliance is mandatory.

Feedback

In an effort to encourage participation in, and improve the overall SBIR award process, offerors may submit feedback on the SBIR solicitation and award process to: dtra.belvoir.RD.mbx.sbir@mail.mil for consideration for future SBIR BAAs.

DTRA SBIR 23.4 Topic Index
Release 1

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DTRA234-001 TITLE: Portable Automated Solution for the Library Preparation for Sequencing

OUSD (R&E) CRITICAL TECHNOLOGY AREA(S): Biotechnology

The technology within this topic is restricted under the International Traffic in Arms Regulation (ITAR), 22 CFR Parts 120-130, which controls the export and import of defense-related material and services, including export of sensitive technical data, or the Export Administration Regulation (EAR), 15 CFR Parts 730-774, which controls dual use items. Offerors must disclose any proposed use of foreign nationals (FNs), their country(ies) of origin, the type of visa or work permit possessed, and the statement of work (SOW) tasks intended for accomplishment by the FN(s) in accordance with the Announcement. Offerors are advised foreign nationals proposed to perform on this topic may be restricted due to the technical data under US Export Control Laws.

OBJECTIVE: DTRA seeks to develop a portable tool capable of preparing DNA and RNA libraries for sequencing utilizing a minION in a tactical environment. Further automatization is envisioned to extract, purify, and isolate the genomic library for use in sequencing using the minION. Successful development of this tool will provide benefits to both government and commercial users of the minION sequencing capability by decreasing both the operator load and potential error in the preparation of biological samples.

DESCRIPTION: Biological Warfare Agent (BWA) detection and identification options for tactical users are limited in both the available technologies and scope of the ID capability. Lab-based theater confirmatory DNA and RNA sequencing are possible, but are not technically or tactically feasible for operators at the current time. Additionally, the methods employed by operators, Hand Held Assay (HHA) and Polymerase Chain Reaction-based (PCR) tools, are definitively limited to known and specifically targeted BWAs. Sequencing, however, is capable of having a BWA library that is only limited by available processing power and available genomic data. The specific need for these users is a tool that can streamline the library preparation of low complexity, high biomass BWA samples for use in a minION in a time-constrained tactical environment. BWA library preparation includes the extraction and purification of the genomic sequence along with the fragmentation of the DNA and attachment of the adaptor protein. When combined with the Oxford Nanopores minION, on-target sequencing results will be viewable in real-time by CONUS/OCONUS laboratories, and decision-makers at the Joint Operations Center (JOC). Applying automated library preparation will prevent potential errors by employed operators, while minimizing the overall time commitment.

Requirements for this development are as follows:

- Tool Capabilities :
 - o Isolate DNA/RNA from low complexity, high biomass BWA sample
 - o Isolation of DNA/RNA must work on all types (i.e. bacteria, viruses, etc.) of BWA samples
 - o All steps must be automated, with the exception of the insertion of the raw sample.
 - o Production of DNA/RNA library must be compatible with Oxford Nanopores minION
- Tool Design
 - o Approximate Run Time (from insertion of raw sample): <= 10 minutes
 - o Approximate Overall Dimensions: 6" x 6" x 3"
 - o Weight = <5.0 lbs.
 - o Capable of running isolated or using a windows laptop with GUI software

PHASE I: Begin with a market research study of potential COTS hardware solutions that meet tool requirements. Demonstrate the feasibility of automated DNA/RNA library preparations and confirm the compatibility of the prepared library with the Nanopore Technologies (NPT) minION. Conduct successful benchtop functionality testing consisting of library preparation for a pre-determined raw sample followed

by accurate identification utilizing the minION and related software. Culminate Phase I with a conceptual flow chart and system design to demonstrate that for Phase II an initial development path from start to finish has been given adequate consideration, risk and their mitigation have been investigated, and a development plan that provides confidence in the outcome has been established.

PHASE II: Focus on building, testing, and refining with an integrated initial prototype. After full functionality is achieved with the prototype, conduct successful benchtop functionality testing consisting of library preparation for multiple pre-determined raw samples followed by accurate identification using the minION and related software. Pending a successful functionality test, a minimum of two fully functional units will be fabricated with packaging that meets all of the final tool's requirements. Discussion will occur with the DTRA program team about future integration into a fully equipped sequencing kit. DTRA seeks an end state that results in a single device that can prepare the library from a variety of biological raw samples while being run on the minION.

PHASE III DUAL USE APPLICATIONS: This phase will further develop the capability developed in Phase II by improving robustness and user application. Although additional funding may be provided through DoD sources, the awardee should look to other public or private sector funding sources for assistance with transition and commercialization.

REFERENCES:

1. Nanopore Technologies, MinION -<https://nanoporetech.com/products/minion>Handheld Genomic Sequencer Shows Promise in Field Demo
2. https://www.army.mil/article/209780/handheld_genomic_sequencer_shows_promise_in_field_demoSequencer for soldiers: battlefield genomics
3. <https://nanoporetech.com/resource-centre/sequencers-soldiers-battlefield-genomics-0>Arnhouse Digital Devices Corporation, BioDigital PC12X
4. <https://addc.com/product/biodigitalpc-12x/>

KEYWORDS: Biosequencing; Portable Genomic Sequencing; Sample Preparation

DTRA234-002 TITLE: Capability to Determine the Effect of Dust and Debris on the Chemistry Environment post CWMD Weapons Strike

OUSD (R&E) CRITICAL TECHNOLOGY AREA(S): Advanced Computing and Software

The technology within this topic is restricted under the International Traffic in Arms Regulation (ITAR), 22 CFR Parts 120-130, which controls the export and import of defense-related material and services, including export of sensitive technical data, or the Export Administration Regulation (EAR), 15 CFR Parts 730-774, which controls dual use items. Offerors must disclose any proposed use of foreign nationals (FNs), their country(ies) of origin, the type of visa or work permit possessed, and the statement of work (SOW) tasks intended for accomplishment by the FN(s) in accordance with the Announcement. Offerors are advised foreign nationals proposed to perform on this topic may be restricted due to the technical data under US Export Control Laws.

OBJECTIVE: Develop the diagnostics, experimentation processes, and the modeling and simulation (M&S) needed to determine the effects of dust and debris on agents after weapons detonating in structures.

DESCRIPTION: Real world CWMD strike kinetic weapons often encounter responding structures. Weapon strikes on targets generate significant dust and debris, e.g. fragment striking of walls and floors, building collapse, ground based debris.

Particulates in the environment have been shown to affect the late time chemical combustion of non-ideal explosives such as the metals found in many weapon systems and the late time combustion of biological and chemical agents. This reduces weapon effectiveness. Currently, we lack the ability to measure and model the effect of dust and debris on agent defeat.

Development of well-characterized experiments and accompanying M&S are needed for this critical effort. These experiments and M&S can be utilized outside of the DoD to understand the effects on environments from industrial pollution, forest fires, and other particulates in the air that would change natural and industrial occurring chemistry within buildings or in open air.

This SBIR looks at for a well entwined the experimental and M&S effort. This should include develop diagnostics, experimentation processes, and the M&S needed to determine the effects of dust and debris on agents and in general late-time chemistry. This effort pairs with other efforts at DTRA and elsewhere aimed at understanding the amount of dust and debris generated from weapons detonating in structures. It also ties into a separate ongoing DTRA effort aimed at generating a well-characterized amount of dust and debris in laboratory and field settings.

This SBIR has as an end goal of taking dust and debris generated as a function of time to determine effects on the chemistry throughout the process (not just end states). Effects to explore include mixing, pressure, and temperature, size of fireball and late-time combustion of agent, metals and other species. The work from this effort can incorporated into mission planning software for DoD/DOE programs and be utilized commercially in the modeling of environmental effects from pollutions and forest fires.

PHASE I: Phase I: Initial experimentation and modeling of effect of dust and debris

- Develop M&S, diagnostics, and testing for effects at the laboratory scale
- M&S code should be able to accept outside data on dust generation efforts

PHASE II: Phase 2: Prototype M&S and experimental techniques

- Develop M&S capability to determine effect of dust and debris on chemistry towards use in full scale application
- Perform experiments to examine scale-up effects of dust and late-time chemistry
- Utilize data, obtained through this SBIR, past efforts, and from concurrent DTRA projects to refine theory & models
- Develop experimental hardware/techniques for full scale applications towards model validation

PHASE III DUAL USE APPLICATIONS: Phase 3: Full-weapon and target efforts

- Model and participate in testing of full-scale weapons
- Refine techniques based on full-scale results
- Tie in with Agent Defeat mission planning codes such as IMEA
- Market capabilities to larger DoD/DOE and industrial/environmental community

REFERENCES:

1. "The simulation of dust effects from fragmenting charges" Orlando A. Soto et al. International Journal of Numerical Methods for Heat & Fluid Flow Vol. 26 No. 3/4, 2016pp. 999-1026
2. "A multiphase shock tube for shock wave interactions with dense particle fields" Justin L. Wagner et al. Exp Fluids
3. "On the passage of a shock wave through a dusty-gas layer" Miura H, Glass II Proc R Soc 385:85-105
4. "Dust Deflagration Extinction" Kris Chatrathi and John Going Process Safety Progress (Vo1.19, No.3)

KEYWORDS: CWMD; Kinetic; Chemistry; Dust; Debris; Effects; Weapons; Temperature; Pressure; Planning

DTRA234-003 TITLE: Deep Learning and Extraction of Chemical Synthesis or Biosynthetic Pathways from Scientific Literature

OUSD (R&E) CRITICAL TECHNOLOGY AREA(S): Advanced Computing and Software; Biotechnology

OBJECTIVE: Conduct proof-of-concept studies to enable automated knowledge extraction and Natural Language Processing (NLP) approaches in machine learning (ML) for chemical synthesis or biosynthetic pathways of publicly available scientific publications that may pose dual-use research of concern (DURC). This topic seeks development of (1) computational methods for employing large language models (LLMs) for automated production of knowledge ontologies from scientific literature and (2) a scalable system with automated annotation capability.

DESCRIPTION: Scientific research of dual use concern includes research that, based on current understanding, can be reasonably anticipated to provide knowledge, information, products, or technologies that could be directly misapplied to pose a significant threat with broad potential consequences to public health and safety, materiel, national security, among other sectors. Automated, large-scale extraction of procedures for chemical synthesis or biosynthesis will increase the efficiency and effectiveness of analysts seeking to provide timely courses of action (COA) for relevant decision makers concerning biological or chemical synthesis information of interest to the Defense Threat Reduction Agency (DTRA) and end users. An ideal system shall require minimal human-in-the-loop, enabling a subject matter expert (SME) to supplement the model with ad hoc data.

The development of open-source semantic systems have expanded beyond manually curated, commercial databases such as Reaxys (Reference 1). One recent effort, SynKB, has applied methods to automatically extract data from organic chemistry reactions described in United States (U.S.) and European commercial patents (Reference 2). The SynKB system enables chemists to perform structured queries over large corpora of synthesis procedures. Other research groups have applied language models for molecular design, whereby the model implicitly learns the “vocabulary” and composition of valid molecules and provides the ability to survey optimized molecular properties (Reference 3). Text-like representations of chemical reactions (SMILES) and Natural Language Processing (NLP) neural network Transformer architectures have been applied to retrosynthesis prediction problems (Reference 4). Another research team has developed the AiZynthTrain package for training synthesis models on USPTO patent data with the intent to integrate into retrosynthesis software (Reference 5). This topic seeks to build upon these and similar NLP-based approaches for knowledge extraction that may be broadly applied to chemical or biological scientific domains, improve system scalability, and automate data annotation capabilities. DTRA’s areas of interest include, but are not limited to: (1) understanding viable synthesis routes to a chemical compound from precursor molecules or substrates, and other starting materials, and (2) retrosynthesis prediction, which may be used to identify possible routes of synthesis and determine the most effective route for the synthesis process.

PHASE I: Leverage an LLM-based ontology system that uses textual knowledge of ontologies to extract information about biosynthetic or chemical synthetic procedure details from open source literature. The proof-of-concept system shall provide information about viable routes to a chemical compound and possible retrosynthesis analysis. Performers shall utilize visual analytical methods that enable users to browse and search for chemical-related data. Performers are encouraged to represent findings to a user with chemical-pathway association graphs, knowledge graphs, or by other means. The architecture shall be scalable, and shall leverage automated annotation capabilities in lieu of human annotation.

The devised solution shall capture relationships between concepts that indicate possible DURC. The performers will develop quantitative metrics to evaluate the LLM neural network classification performance by way of statistical approaches.

Phase I deliverables will include (1) a final report and (2) demonstration of the preliminary architecture. The report should provide results on architecture performance using unambiguous statistical methods, describe training and development, and identify advantages, limitations, and weaknesses. The architecture shall be described, including operating system, other software requirements (if applicable), and data sources.

PHASE II: Phase II efforts will focus on refinement of the approach developed during Phase I and prototype demonstration. The Phase II deliverables will be a prototype demonstration of the LLM neural network architecture and a report detailing: (1) a description of the approach, optimization techniques, and performance outcomes; (2) training, testing and validation methods; (3) a real world evaluation of the approach with a use case of mutual interest with DTRA; and (4) advantages, disadvantages, and limitations of the approach. The performer will identify weaknesses of the approach, and identify methods that may improve performance in the classifier and aspects of the overall architecture. The performer will provide details about user interfaces (if applicable) and any associated executables.

PHASE III DUAL USE APPLICATIONS: The performer will identify and employ features that have the potential for use in commercial applications.

REFERENCES:

1. "Reaxys: An Expert-curated Chemistry Database," <https://www.elsevier.com/solutions/reaxys>
2. F. Bai, et al., "SynKB: Semantic Search for Synthetic Procedures" in arXiv, 2022.
3. J. Owoyemi, et al., "SmilesFormer: Language Model for Molecular Design" in ChemRxiv, 2023 (preprint publication)
4. I. V. Tetko, et al. "State-of-the Art Augmented NLP Transformer Models for Direct and Single-Step Retrosynthesis," in Nature Communications, vol. 11, p. 1-11, 2020.
5. S. Genheden, et al. "AiZynth Train: Robust, Reproducible, and Extensible Pipelines for Training Synthesis Prediction Models" in ACS Journal of Chemical Information and Modeling, vol. 63, p. 1841 – 1846, 2023.

KEYWORDS: Biosynthetic Pathways, Chemical Synthesis, Deep Learning, Extraction

DTRA234-004 TITLE: Remote Through-Container Identification of CBRNE materials

OUSD (R&E) CRITICAL TECHNOLOGY AREA(S): Advanced Computing and Software

OBJECTIVE: Conduct a proof of concept study to develop a rapid, remote, handheld, ruggedized, all-weather, self-powered, user-friendly device to be used by first responders to quickly and accurately identify the contents within opaque, sealed containers at a stand-off distance.

DESCRIPTION: The aim of this effort is to conduct a proof of concept study to develop a remote, light-weight handheld, ruggedized, self-powered, device to identify the contents of opaque sealed containers at various stand-off distances. The solution should provide a user friendly interface and be accessible while wearing protective clothing for chemical or biological hazards. Additionally, the device should also have the capability to interpret and learn new materials as they are encountered. A similar topic was released in 2012 under DTRA122-012 which ran through a Phase I effort. However, the emphasis here is placed on designing a handheld solution rather than man-portable, ensuring it can be operated with the latest issue of CBRNE protective clothing, ensuring rapid results, and taking advantage of the latest machine learning algorithms to improve the identification of unknown materials encountered in the field. Currently available sensors fall short of meeting all of these requirements. The outcome of this effort shall improve upon current methods of identifying and characterizing CWAs in a tactical setting while streamlining and simplifying testing process for end users.

PHASE I: The performer must demonstrate in a laboratory environment the capability of sensing through opaque containers of varying thickness to detect and identify CBRNE contents such as chemical, biological, radiological materials with a high degree of confidence while minimizing physical contact with CWAs inside chemical munitions or improvised devices. The performer shall explore the tradeoff space related to the performance objectives and metrics. Additionally, the performer shall provide a design concept for a prototype related to form factors to include the device being handheld, ruggedized, providing rapid results, accessible while wearing CBRNE protective clothing, and providing a mechanism to discover new previously unknown materials in the field.

PHASE II: Phase II must develop a prototype device to meet the form factor requirements to include being lightweight, handheld, battery operated, and accessible while wearing protective clothing. The prototype must have a field upgradable library to learn new materials as they are encountered. The Phase II final report should include a development plan for follow-on production and a Phase III roadmap. Phase II demonstrations should be provided for the DoD community and clearly demonstrate successful and accurate detection and identification of unknown substances in sealed containers.

PHASE III DUAL USE APPLICATIONS: Phase III must include identification of support for commercialization of the device to include other government and commercial entities. Although additional funding may be provided through DoD sources, the awardee should look to other public or private sector funding sources for assistance with transition and commercialization.

REFERENCES:

1. <https://www.sbir.gov/sbirsearch/detail/372784>
2. Sinha, D.N., Anthony, B.W., and Lizon, D.C.. Swept frequency acoustic interferometry technique for chemical weapons verification and monitoring. United States: N. p., 1995. Web.
3. Phillip G. Wilcox, Phillip G. Wilcox, Jason A. Guicheteau, Jason A. Guicheteau, "Comparison of handheld Raman sensors through opaque containers", Proc. SPIE 10629, Chemical, Biological, Radiological, Nuclear, and Explosives (CBRNE) Sensing XIX, 106290M (16 May 2018); doi: 10.1117/12.2303968

4. W. E. Parker¹, W. M. Buckley¹, S. A. Kreek¹, A. J. Caffrey², G. J. Mauger¹, A. D. Lavieta¹, and A. D. Dougan¹, "A portable system for nuclear, chemical agent, and explosives identification." AIP Conference Proceedings 576, 1073 (2001);<https://doi.org/10.1063/1.1395491>

KEYWORDS: stand-off, opaque, remote identification

DTRA234-005 TITLE: Signature Detection and Training via Application of Digital Product-Insertion Technologies

OUSD (R&E) CRITICAL TECHNOLOGY AREA(S): Trusted AI and Autonomy

OBJECTIVE: To investigate and demonstrate a proof-of-concept to explore the applicability of emerging digital product-insertion technologies to the detection of and changes in signatures of interest and to the 3-D rendering of real-world objects and settings in synthetic VR/AR/XR training environments for operators and inspectors.

DESCRIPTION: Advances in commercial technologies and AI have led to the development of unique capabilities that can have direct application to DoD and national security requirements. For example, digital product insertion and related AI capabilities for seamlessly emplacing 2-D and 3-D products in media have demonstrated significant advancements that have direct application to technologies relevant to national security. These advances in AI can support requirements such as rendering 3-D environments in near-real-time and the development of models and signature identification capabilities that require limited or no training data. Areas of interest for Over-the-Horizon Arms Control and potential applications include:

- Identification of novel signatures of interest within the nuclear pathway
- Rapid generation of AR/VR/XR-enabled synthetic training environments from images, videos, CAD/CAM drawings
- Detecting evidence of alterations, including image and video authentication and DeepFake detection
- Enhancing capabilities of DTRA inspection teams and counterproliferation practitioners via VR/AR/XR technologies, including the real-time insertion of threat objects.

PHASE I: Design and execute a technical feasibility study to examine the application of novel artificial intelligence digital product-insertion capabilities in three priority areas:

Priority Area 1: Detection

1. Identification of abnormal seismic signatures in video footage.
2. Identification of other insights from video footage such as power fluctuations, equipment operating status, etc.

Priority Area 2: Training

1. 3-D rendering of objects and settings into synthetic VR/AR/XR training environments.

Priority Area 3: Image/Video Interpretation

1. Detection of indicators of alterations in images and video.
2. Identification of environmental change (e.g., equipment layout) in images and security camera footage.
3. Detection of image or video alteration.
4. Identification, extraction, and 3-D rendering of unfamiliar objects.
5. 2-D to 3-D rendering into CAD or comparable/relevant formats
6. Reduction or elimination for the need of training data to classify images/video or classify objects within images/video.

PHASE II: Design and execute a test plan to validate application of novel artificial intelligence digital product placement capabilities against one (threshold) or two (objective) priority areas determined to be feasible by the Phase I feasibility study. Tests will be conducted in laboratory (threshold) or field (objective) environments and place an emphasis on potential applications to nuclear pathway signature detection and the nuclear treaty verification space, such as remote monitoring, exercises, and training.

Test plans will include documentation on methodology to be employed and adhere to best experimental design practices.

The Phase II efforts will address research questions to include:

- The potential to transform a single 2-D image of an object into a 3-D object and place it into an interactive VR/AR/XR scenario
- The potential for a non-expert user with minimal knowledge of video editing or VR/AR/XR to insert objects into scenes after a short training course.
- An assessment of the additional value that can be extracted from still and motion video with limited to no training data and/or model iteration required
- The potential to integrate digital product placement and similar capabilities be integrated with Unreal Engine, Unity, or comparable capabilities

PHASE III DUAL USE APPLICATIONS: Phase III will consist of a demonstration of a fully capable and packaged artificial intelligence capabilities that address specific end-user requirements associated with Priority Areas 1-3.

Phase III for feasible Priority Area 1 use-cases will demonstrate a repeatable and accurate means of extracting established signatures from motion video (e.g., security camera footage). Data ingest and processing pipelines will be automated to the greatest extent feasible and leverage low-code, no-code interfaces where possible to allow for utility by users with varying ranges of technical expertise.

Phase III for feasible Priority Area 2 use-cases will demonstrate effective integration of VR/AR/XR and digital product insertion technologies. These integrations will validate enhancements to user experience and training quality. Technology integrations should also demonstrate a reduction in time associated with setting and scenario development associated with use for training, planning, and operational execution.

Phase III for feasible Priority Area 3 use-cases will demonstrate an ability to detect previously imperceptible signatures in still images and/or motion images. Phase II experiments should also demonstrate where savings were achieved (e.g., required volume of training data) in the development of models.

REFERENCES:

1. G. Varol, R. S. Kuzu and Y. S. Akgiil, "Product placement detection based on image processing," 2014 22nd Signal Processing and Communications Applications Conference (SIU), Trabzon, Turkey, 2014, pp. 1031-1034, doi: 10.1109/SIU.2014.6830408.
2. Using Machine Learning for Programmatic Product Placement in TV Advertising by Christopher Kuthan, Akhil Aendapally, and Anita Snyder, 27 JAN 2021, in *Post Types, Amazon Rekognition, Amazon Rekognition Video, Amazon SageMaker, Amazon Simple Queue Service (SQS), AWS Elemental MediaTailor, AWS Lambda, Case Study, Customer Solutions, Industries, Marketing & Advertising, <<https://aws.amazon.com/blogs/industries/using-machine-learning-for-programmatic-product-placement-in-tv-advertising/>>

KEYWORDS: 2-D to 3-D rendering; image and video exploitation; object detection; image and video authentication, synthetic training environments; virtual, augmented, and mixed reality; deep-fake detection

DTRA234-006 TITLE: Acoustic Agglomeration to aid fine aerosol particulate collection

OUSD (R&E) CRITICAL TECHNOLOGY AREA(S): Integrated Sensing and Cyber

OBJECTIVE: Organically develop or modify commercially available electroacoustic agglomerator for air pretreatment in an aerosol collection system similar to the Radionuclide Airborne Particulate Sampler Analyzer (RASA).

DESCRIPTION: DTRA supports the Comprehensive Nuclear Test Ban Treaty (CTBT) via the Nuclear Arms Control Technologies Program (NACT). The CTBT is strategically important to the United States (US) by banning nuclear testing for participating countries and allowing US access to 337 stations and laboratories worldwide. The NACT supports the US contribution to the CTBT with 37 stations and laboratories. Part of the CTBT monitoring regimen is radionuclide aerosol (RN) monitoring. The US accomplishes its CTBT RN monitoring via a system called the RASA. The required collection efficiency and Minimum Detectable Concentration (MDC) for RN collection as specified in the CTBT operational manuals are:

For filter: $\geq 80\%$ at $\varnothing = 0.2 \mu\text{m}$

Global^d: $\geq 60\%$ at $\varnothing = 10 \mu\text{m}$

MDC ≤ 10 to 30 Bq/m^3 for Ba-140

The current RASA system minimally meets these requirements.

The efficiency of particle capture on a filter is related to the intake air velocity, particle size, filter pore size and other variables such as humidity, wind speed, duct shape, etc.. A filter's efficiency is rated as a Minimum Efficiency Reporting Value (MERV), which measures a filter's ability to capture particles between 0.3 and 10 microns (μm). Most Penetrating Particle Size (MPPS) refers to the size of the particles that most easily pass through a filter. A high-efficiency particulate air (HEPA) filter can remove 99.97% of particles down to 0.3 Micron. An MPPS of 0.2 to 0.3 microns is difficult; many filters are effective at capturing particles smaller or larger than this, but 0.2 to 0.3 micron particles regularly gets by basic filtration. Using 0.3 microns as the MPPS measures the worst-case efficacy of the filter.

The fact that collection efficiency of 0.2 to 0.3 microns particles is worse than for smaller particles might seem counterintuitive, however the combined effect of the various filter collection mechanisms (interception, inertial effect, diffusion effect, gravitational effect, and electrostatic effect) as they relate to particles size causes a dip in the collection efficiency in the 0.2 to 0.3 micron

Ultrasonic sound can cause submicron particles to agglomerate and larger particles to disassociate. Literature varies with respect to the effectiveness; one study showed that mean particle size increased from sub-micron to five micron, and another study reduced the number concentration of micron & sub-micron by seventy and thirty percent respectively. Ultrasonic agglomeration studies, might not be comparable as the number and positioning of sound transducers, sound energy and frequency, shape and turbulence of the collection piping and chamber, humidity, etc./, varied from study to study. These variables have an effect on agglomeration effectiveness, however, in every study ultrasonic agglomeration increases particle size distribution from sub-micron to micron or greater. Collection efficiency greatly increases when particle size becomes 3 micron or greater. Furthermore, when combined with other collection mechanisms such as electrostatic charging or the addition of humidity or water droplets the collection efficiency may be substantially increased from any mechanisms acting alone. Successful application of this technology to the future RASA 2.0 system would allow for greater collection efficiency, reducing the Minimum Detectable Concentration (MDC) of targeted Radionuclides and improving the detection likelihood of a clandestine nuclear test.

PHASE I: Conduct extensive document research to determine state of the art with respect to aerosol collection via acoustic agglomeration aided with electrostatic charging and agglomerates such as water droplets. Design and model a system that could interface with the RASA 2.0 intake system for particle collection. Conduct trade-off studies for the system.

PHASE II: Based on the knowledge and determination of feasibility obtained in Phase I, construct a working prototype of the system designed in Phase I.

PHASE III DUAL USE APPLICATIONS: Provision of an aerosol agglomeration system that could interface with other aerosol collection or air purification systems such as the Senya Snow White.

REFERENCES:

1. de Sarabia E, Gallego-JuaÁrez JA. Ultrasonic agglomeration of micron aerosols understanding wave conditions. *J Sound Vib.* 1986; 110: 413±427. [https://doi.org/10.1016/S0022-460X\(86\)80144-4](https://doi.org/10.1016/S0022-460X(86)80144-4)
2. 99/02815 Pilot scale acoustic preconditioning of coal combustion fumes to enhance electrostatic precipitator performance. *Fuel and Energy Abstracts* (1999, July). , 40(4), 293.[https://doi.org/10.1016/S0140-6701\(99\)98584-3](https://doi.org/10.1016/S0140-6701(99)98584-3)
3. Ng BF, Xiong JW, Wan MP (2017) Application of acoustic agglomeration to enhance air filtration efficiency in air-conditioning and mechanical ventilation (ACMV) systems. Table 2 Summary of relevant experimental works in acoustic agglomeration with reported performances.<https://journals.plos.org/plosone/article/figure?id=10.1371/journal.pone.0178851.t002>
4. Daolai CHENG, Meng CAI, Fang ZHAO, Huimin Hu, Junfeng YAO (2015), The Study on the Removal of Ultrafine Particles, International Conference on Advances in Energy and Environmental Science (ICAEES 2015).<https://doi.org/10.2991/icaees-15.2015.120>
5. Zhongyang Luo, Hao Chen, Tao Wang, Dong Zhou, Mengshi Lu, Mingchun He, Mengxiang Fang, Kefa Cen, Agglomeration and capture of fine particles in the coupling effect of pulsed corona discharge and acoustic wave enhanced by spray droplets, *Powder Technology*, Volume 312, 2017, Pages 21-28, ISSN 0032-5910,<https://doi.org/10.1016/j.powtec.2017.02.025>
6. Li, F.; Cao, H.; Jia, Y.; Guo, Y.; Qiu, J. Interaction between Strong Sound Waves and Aerosol Droplets: Numerical Simulation. *Water* 2022, 14, 1661.<https://doi.org/10.3390/w14101661>

KEYWORDS: particulate, aerosol, radionuclide, agglomeration

DTRA234-P01 TITLE: OPEN TOPIC: Replacing User Name/Password Defaults - Alternative User Authentication Methods

OUSD (R&E) CRITICAL TECHNOLOGY AREA(S): Human-Machine Interfaces

OBJECTIVE: DTRA seeks technologies to replace the user name/password default for authenticating users in various applications and services. The alternative proposed should be compatible with existing and emerging cloud/cloud-capable architectures, reduce the operational overhead for support, increase security over username/password defaults, and be 'user-friendly' to employ at the user interface application.

DESCRIPTION: While the principal user authentication used is the Public Key Encryption (PKI) used in tokens (Common Access Cards (CACs), Personal Identity Verification (PIV) cards, etc.), the continued support of username/password authentication in some use cases poses an unwelcome burden to the services provided. Current password implementations require (increasingly longer) passwords containing mixes of upper case, lower case, numerical and special characters, which must be changed every 60 – 90 days without repeating passwords maintained on lists for the previous 10-24 valid passwords. Brute force password cracking approaches have improved success rates employing parallelization of GPU and specialized hardware such as floating-point gate arrays (FPGAs) over the previous attempts using high-powered CPUs. A class of cryptologic techniques called 'memory hard' make these approaches ineffective, and form one of the key specific objectives for evaluation in this proposal. While commercial tokens (e.g. RSA and ORC PKI) are available to the public, they are not suitable for the first responders and foreign partners this topic supports due to various reasons (cost, availability, operational support and management, etc.) While token-based approaches are allowed for consideration, token-less approaches are preferred given the previously stated concerns. The World Wide Web Consortium (W3C) and the Fast Identity Online (FIDO) Alliance are the principal bodies establishing standards, which various government agencies accept as governing standards. However, the new password-less standard known as FIDO2, endorsed formally by Apple, Google, and Microsoft, suffer from two issues in this initial implementation: The three major companies adopting this standard are deploying three incompatible proprietary systems, subjecting users to maintaining multiple credentials per supported website to accommodate devices in each ecosystem. That imposes a burden on users for not only certificate maintenance per site and device, but also for transporting and maintaining that certificate cache securely across their individual devices and platforms. That limitation is not as important a concern for this topic and our use cases, but is critical for future commercial interests. The second current FIDO2 implementation problem is that each user's PKI certificate for each website must be stored in the cache (again multiplied per vendor). Caching of the certificate is a departure from the FIDO token PKI implementation that supports existing CAC/PIV architectures used by government agencies and is a principal requirement for this proposal topic. In summary, the attributes desired for any proposed solutions for this topic are:

- Solution must be a dramatic improvement in security, operation support and/or user experience for authenticating and managing disadvantaged users to replace username/password baseline
- Encryption method must be a proven 'memory hard' approach and implementation to counter parallelized GPU/FPGA brute force or intelligent guessing to spoof authentication communications
- System must be immune (or highly resistant) to common security compromise strategies; for example, such as 'man in the middle' or intercepted data replay attacks.
- System must be standards compliant or compatible, e.g. compliant with or compatible to FIDO2 guidelines
- System must be a vendor independent solution; e.g. must not be constrained to a single vendor's ecosystem or platform, and not impose large overhead in storing or transferring user credentials across supported systems. This dramatically reduces any migration issues across domains.

PHASE I: Analyze alternative approaches, providing at least two options to include summaries of technical feasibility of implementation and integration with existing systems, operations and maintenance for principal alternatives. Demonstrate depth of understanding through a detailed technical report for preferred option illustrating deployment into “as is” authentication systems with PKI as principal authentication method, but using username/PW as the default targeted for replacement by this investigation. The report should include a proposal for Phase II prototype development. The prototype should be developed not only to merge into existing DoD or other government agencies’ systems, but should also be flexible enough for commercial deployment, such as small and medium businesses, local first responders, hospitals and clinics, etc.

PHASE II: Implement a fully functional prototype of the proposed solution, to include server-side added functionality to support the concept to the user side authentication application. The prototype should be amenable to functional and security testing. The prototype should be capable of being implemented in either traditional application-centric or cloud services environments. Documentation should include user, operational and testing information.

PHASE III DUAL USE APPLICATIONS: Implement further improvements that would enhance use of the developed product by the sponsoring office, identify and exploit features that would be attractive for commercial or other applications. Expand upon the documentation developed in Phase II to include improvements implemented in Phase III. Investigate commercialization avenues that could include other government agencies, national labs, research institutes, and defense contractors. Develop a plan to enable successful technology transition at the end of this phase.

REFERENCES:

1. Open Web Application Security Project (OWASP) Top Ten, <https://owasp.org/www-project-top-ten/>
2. FIDO Alliance – Authentication Specifications Overview, <https://fidoalliance.org/specifications/>
3. Memory-Hard Functions from Cryptographic Primitives, <https://par.nsf.gov/servlets/purl/10121369>
4. Tradeoff Cryptanalysis of Memory-Hard Functions <https://eprint.iacr.org/2015/227.pdf>

KEYWORDS: Secure authentication, PKI, Hard memory implementation, Simplified Migration

**Office of the Under Secretary of Defense for Research and Engineering
FutureG & 5G
23.4 Small Business Innovation Research (SBIR)
Proposal Submission Instructions**

July 11, 2023: Topics issued for pre-release

July 25, 2023: OUSD(R&E) begins accepting proposals via DSIP

August 15, 2023: DSIP Topic Q&A closes to new questions at 12:00 p.m. ET

August 29, 2023: Deadline for receipt of proposals no later than 12:00 p.m. ET

INTRODUCTION

The Office of the Undersecretary of Defense, Research and Engineering (OUSD(R&E) FutureG & 5G aims to ensure DoD can securely operate through or make use of existing commercial 5G network in any environment by delivering clear and actionable security assurances and providing enhancements and augmentation to a combination of the end user device and the existing communications infrastructure.

Proposers responding to a topic in this BAA must follow all general instructions provided in the Department of Defense (DoD) SBIR Program BAA. OUSD(R&E) FutureG & 5G requirements in addition to or deviating from the DoD Program BAA are provided in the instructions below.

Proposers are encouraged to thoroughly review the DoD Program BAA and register for the DSIP Listserv to remain apprised of important programmatic and contractual changes.

- The DoD Program BAA is located at: <https://www.defensesbirsttr.mil/SBIR-STTR/Opportunities/> and <https://www.defensesbirsttr.mil/SBIR-STTR/announcements>. Be sure to select the tab for the appropriate BAA cycle.
- Register for the DSIP Listserv at: <https://www.dodsbirsttr.mil/submissions/login>.

Specific questions pertaining to the administration of the OUSD(R&E) FutureG & 5G SBIR Program and these proposal preparation instructions should be directed to: Brian D. Saunders at Brian.D.Saunders2.ctr@mail.mil.

This release contains an open topic. As outlined in section 7 of the SBIR and STTR Extension Act of 2022, innovation open topic activities—

- (A) Increase the transition of commercial technology to the Department of Defense;
- (B) Expand the small business nontraditional industrial base;
- (C) Increase commercialization derived from investments of the Department of Defense; and
- (D) Expand the ability for qualifying small business concerns to propose technology solutions to meet the needs of the Department of Defense.

Unlike conventional topics, which specify the desired technical objective and output, open topics can use generalized mission requirements or specific technology areas to adapt commercial products or solutions to close capability gaps, improve performance, or provide technological advancements in existing capabilities.

A small business concern may only submit one (1) proposal to each open topic. If more than one proposal from a small business concern is received for a single open topic, only the most recent proposal to be certified and submitted prior to the submission deadline will receive an evaluation. All prior proposals submitted by the small business concern for the same open topic will be marked as nonresponsive and will not receive an evaluation.

PHASE I PROPOSAL GUIDELINES

The Defense SBIR/STTR Innovation Portal (DSIP) is the official portal for DoD SBIR/STTR proposal submission. Proposers are required to submit proposals via DSIP; proposals submitted by any other means will be disregarded. Detailed instructions regarding registration and proposal submission via DSIP are provided in the DoD SBIR Program BAA.

Technical Volume (Volume 2)

The technical volume is not to exceed twelve (12) pages of written text. Eight (8) additional pages of content such as graphics and charts that describe aspects of the solution and the company are allowed but not required. Technical volume beyond the twenty (20) pages will not be considered for evaluation purposes.

Additional formatting and content requirements are provided in the DoD Program BAA.

Cost Volume (Volume 3)

The Phase I Base amount must not exceed \$295,000 for a six (6) month period of performance. Costs must be clearly identified on the Proposal Cover Sheet (Volume 1) and in Volume 3.

Please review the updated Percentage of Work (POW) calculation details included in the DoD Program BAA. OUSD(R&E) FutureG & 5G will occasionally accept deviations from the POW requirements with written approval from the Funding Agreement officer.

Company Commercialization Report (CCR) (Volume 4)

Completion of the CCR as Volume 4 of the proposal submission in DSIP is required. Please refer to the DoD SBIR Program BAA for full details on this requirement. Information contained in the CCR will be considered by OUSD(R&E) FutureG & 5G during proposal evaluations.

Supporting Documents (Volume 5)

All proposing small business concerns are REQUIRED to submit the following documents to Volume 5:

1. Contractor Certification Regarding Provision of Prohibition on Contracting for Certain Telecommunications and Video Surveillance Services or Equipment
2. Disclosures of Foreign Affiliations or Relationships to Foreign Countries
3. Disclosure of Funding Sources

Please refer to the DoD Program BAA for more information.

PHASE II PROPOSAL GUIDELINES

Phase II proposals may only be submitted by Phase I awardees. Phase I awardees will receive a separate notification with detailed instructions and timelines for Phase II proposal submission.

DISCRETIONARY TECHNICAL AND BUSINESS ASSISTANCE (TABA)

OUSD (R&E) FutureG & 5G will not provide technical and business assistance for this open topic.

EVALUATION AND SELECTION

All proposals will be evaluated in accordance with the evaluation criteria listed in the DoD SBIR Program BAA.

Proposing firms will be notified of selection or non-selection status for a Phase I award within 90 days of the closing date of the BAA. All notifications will be made to the corporate official and principal investigator identified on the proposal coversheet.

Refer to the DoD SBIR Program BAA for procedures to protest the Announcement.
As further prescribed in FAR 33.106(b), FAR 52.233-3, protests after award should be submitted to:

Brian D. Saunders
Brian.D.Saunders2.ctr@mail.mil

Defense SBIR/STTR Program Office
osd.ncr.ousd-r-e.mbx.SBIR-STTR-Protest@mail.mil

END

OUSD(R&E)
FutureG & 5G SBIR 23.4 Topic Index
Release 1

OSD234-P001 5G RF Radio Frequency (RF) Coverage in Challenging Interior Spaces Open Topic

OSD234-P001 TITLE: 5G RF Radio Frequency (RF) Coverage in Challenging Interior Spaces Open Topic

OUSD (R&E) CRITICAL TECHNOLOGY AREA(S): FutureG; Sustainment & Logistics

OBJECTIVE: Identify, assess, develop, and demonstrate 5G RF (Radio Frequency) coverage solutions to provide an RF based communications for interior structures. The primary use case is in support of real-time logistic operations. Solutions should support data, voice, video, IoT (Internet of Things) and machine to machine-based applications.

DESCRIPTION: The Office of the Under Secretary of Defense (OUSD) for Research and Engineering (R&E) FutureG initiative seeks RF coverage solutions for challenging dynamic interior spaces such as warehouses, supply vessels, and hanger bays. Common characteristics of these spaces include dense interiors with metal dividers and barriers. Further, these spaces may be frequently reconfigured, creating new RF environments and new propagation challenges. For example, a previously empty area of a warehouse, ship hold, or hanger may be loaded with pallets of dense material. Later those pallets are distributed, returning that to an empty space. Providing coverage in these types of spaces will require unique solutions to ensure that the RF propagation supports performance requirements such as throughput, latency, and reliability.

Successful deployment solutions should provide high network capacity in small areas while minimizing compromises in latency, reliability, and overall performance. This topic does not seek a specific fixed network capacity, but instead seeks a solution that anticipates demands for network capacity in these areas will vary over time. Building on the example above, an empty region will typically include few (if any) devices, change from empty to hundreds of devices as pallets of dense materials are moved to the area, and then decrease down to tens of devices as those pallets are distributed.

Successful solutions will be assessed by focusing on four (4) metrics. Metric One (1) is the ability to support dynamic changes in network density, as measured by number of active devices that can be supported in a small region of the interior space. Preferred solutions will allow large changes in network density. Metric two (2) is ability to minimize changes in overall performance (such as latency and reliability) as the network density changes. Preferred solutions will have minimal changes in overall performance as density increases. Metric three (3) measures the overall cost of deployment, including both installation/capital expense (CAPEX) costs and operating expense (OPEX) costs. Metric four (4) measures the complexity of initial configuration and ongoing operations. An example of a complexity metric would be how many manual tasks are reduced or eliminated by automation or potential numbers of tasks that are handled by AI (Artificial Intelligence). Metrics are a key/critical tool in evaluating the overall effectiveness of a proposal's implementation. Low metrics with a solid get-well plan are as good as high metrics. No solution is ever perfect. The general metrics described here should be expanded into more granular metrics during the development of the proposal.

This topic does not require a specific technical approach. However, two approaches are discussed for illustrative purposes. One approach could be to deploy and/or reconfigure Distributed Antenna Systems (DAS) in response to high network capacity demands. However, accomplishing this in a dynamic environment requires substantial reconfiguration and/or extensions of an existing network. Another approach could deploy and/or reconfigure small cells to address the challenge of high density in small areas. However, deploying large numbers of small cells requires a corresponding large number of equipment (and hence cost). More importantly, in a dynamic environment this can compromise latency, reliability and overall performance due to a high number of hand-offs between cells. Neither DAS nor small cells are required. These approaches are intended only to illustrate the trade-offs between supporting high capacity while minimizing compromises in latency, reliability, and overall performance.

PHASE I: Develop an initial concept design and plan for practical deployment of 5G RF coverage solutions. Phase I will be a 6-month Period of Performance (PoP). During this period there will be a kickoff, Technical Interchange Meeting (TIM), and a Preliminary Design Review (PDR). Prior to the end of Phase I, the performer will develop and present a proposed, detailed plan related to how they expect to address Phase II prototype production, test, and evaluation efforts.

PHASE II: During Phase II, the performer will begin the prototype production and test and evaluation process for transition. Phase II will be a 12-month PoP with a Critical Design Review at month six (6) and prototype demonstration at month nine (9) which is 3 months before contract end at month twelve (12).

Prototype demonstration will be conducted at a DoD selected location, during which the prototype's capabilities must be successfully demonstrated. For budget and planning purposes, proposals should assume the test facility will be a DoD provided environment which will be a surface vessel or an environment which is identical in physical properties to a surface vessel. Test facilities may vary and will be determined as part of an award. A partial solution may be determined to be successful if the DoD determined it to be effective in a limited role. A Final Technical Report of the prototype capabilities as demonstrated at the Final Demonstration will also be required. Extended user evaluations or additional prototypes may be pursued to determine military utility.

PHASE III DUAL USE APPLICATIONS: The solution described in this topic has potential direct application to commercial applications such as container ships and cruise ships. These commercial environments have logistic tracking requirements that require RF solutions that deliver connectivity in very complex RF propagation environments. Additional military applications include multi-level underground and undersea mobile and fixed environments. Adaptability and flexibility in design and engineering of the solution is an additional benefit as these aspects will create more opportunities to solve similar coverage issues that were not initially identified.

REFERENCES:

1. U.S. Patent US009766321B2 "INDOOR POSITIONING WITH RADIO FREQUENCY CHIRP SIGNAL PROPAGATION DELAY MEASUREMENT" is an example of a potential technical consideration that a small business might utilize in their solution for this topic. The topic author is not endorsing this reference solution but is provided merely for reference purposes.
<https://patents.google.com/patent/US9766321>

KEYWORDS: 5G, RF coverage, Interior, Structure, Network.

Office of the Under Secretary of Defense for Research and Engineering
Strategic Capabilities Office
23.4 Small Business Innovation Research (SBIR)
Proposal Submission Instructions

August 15, 2023: Topic issued for pre-release

September 6, 2023: begins accepting proposals via DSIP

September 20, 2023: DSIP Topic Q&A closes to new questions at 12:00 p.m. ET

October 17, 2023: Deadline for receipt of proposals no later than 12:00 p.m. ET

INTRODUCTION

The Strategic Capabilities Office (SCO) seeks small businesses with strong research and development capabilities to pursue high priority operational and strategic challenges.

Offerors responding to a topic in this BAA must follow all general instructions provided in the DoD SBIR Program BAA. The Offeror is responsible for ensuring that their proposal complies with the requirements in the most current version of these instructions. Prior to submitting your proposal, please review the latest version of these instructions as they are subject to change before the submission deadline.

Proposers are encouraged to thoroughly review the DoD Program BAA and register for the DSIP Listserv to remain apprised of important programmatic and contractual changes.

- The DoD Program BAA is located at: <https://www.defensesbirsttr.mil/SBIR-STTR/Opportunities/#announcements>. Be sure to select the tab for the appropriate BAA cycle.
- Register for the DSIP Listserv at: <https://www.dodsirsttr.mil/submissions/login>.

This release contains an open topic. As outlined in section 7 of the SBIR and STTR Extension Act of 2022, innovation open topic activities—

- (A) Increase the transition of commercial technology to the Department of Defense;
- (B) Expand the small business nontraditional industrial base;
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- (D) Expand the ability for qualifying small business concerns to propose technology solutions to meet the needs of the Department of Defense.

Unlike conventional topics, which specify the desired technical objective and output, open topics can use generalized mission requirements or specific technology areas to adapt commercial products or solutions to close capability gaps, improve performance, or provide technological advancements in existing capabilities.

A small business concern may only submit one (1) proposal to each open topic. If more than one proposal from a small business concern is received for a single open topic, only the most recent proposal to be certified and submitted prior to the submission deadline will receive an evaluation. All prior proposals submitted by the small business concern for the same open topic will be marked as nonresponsive and will not receive an evaluation.

The Strategic Capabilities Office is a rapid prototyping organization focused on delivering capabilities in 3-5 years to address high priority operational and strategic challenges. Proposals focused on basic or applied Science and Technology are discouraged for this topic.

The Strategic Capabilities Office (SCO) is soliciting innovative proposals in the following technical areas:

- Autonomous Systems
- Machine Learning
- Cyber
- Cross-Domain Kill Chains
- Enhanced surveillance and reconnaissance
- Non-traditional Defense Technologies

Details on these technical areas can be found within the topic.

PHASE I PROPOSAL GUIDELINES

The Defense SBIR Innovation Portal (DSIP) is the official portal for DoD SBIR proposal submission. Offerors are required to submit proposals via DSIP; proposals submitted by any other means will be disregarded. Detailed instructions regarding registration and proposal submission via DSIP are provided in the DoD SBIR Program BAA.

Please Note:

1. It is the Offeror's responsibility to make sure all DoD and SCO instructions are followed, and proper documentation is submitted. The DSIP (DoD's SBIR proposal submission website) will NOT be able to ensure your submission is in accordance with both DoD and SCO instructions. The DSIP notice "100% submitted" means that the upload process is complete; it does NOT mean the proposal submission complies with the stated instructions and that all required documents are successfully uploaded.
2. SCO doesn't assist Offerors with proposal preparation nor does SCO review proposals for completeness. We recommend you use your local and state resources for assistance. (See DoD Instructions for resources information.)

Cover Sheet (Volume 1)

Volume 1 is created as part of the DoD Proposal Submissions process. Follow all instructions provided in the DoD SBIR Program BAA and DSIP.

Technical Volume (Volume 2)

The Technical Volume is not to exceed 5 pages and must follow the formatting requirements provided in the DoD SBIR Program BAA titled "Format of Technical Volume (Volume 2)". SCO will only evaluate the first five (5) pages of the Technical Volume. Additional pages will not be considered or evaluated.

Content of the Technical Volume:

Required items are specified in the DoD SBIR Program BAA Phase I Technical Volume instructions section titled "Content of the Technical Volume 2".

The identification of foreign national involvement in a SCO SBIR topic is needed to determine if a firm is ineligible for award on a SCO topic that falls within the parameters of the United States Munitions List, Part 121 of the International Traffic in Arms Regulation (ITAR). A firm employing a foreign national(s) (as defined in section titled "Foreign Nationals" of the DoD SBIR Program BAA) to work on a SCO ITAR topic must possess an export license to receive a SBIR Phase I contract.

Cost Volume (Volume 3)

The Phase I Base amount must not exceed \$150,000.00. Costs must be identified on the Proposal Cover Sheet (Volume 1) and in Volume 3. Once the proposal is initiated in DSIP, the Offeror will have access to the required SCO specific Cost Volume instructions and template.

Please review the updated Percentage of Work (POW) calculation details included in the DoD Program BAA SCO will not accept any deviation to the POW requirements.

Company Commercialization Report (CCR) (Volume 4)

Completion of the CCR in Volume 4 of the proposal submission in DSIP is required. Please refer to the DoD SBIR Program BAA for full details on this requirement. Information contained in the CCR will be considered by SCO during proposal evaluations.

Supporting Documents (Volume 5)

All proposing small business concerns are REQUIRED to submit the following documents to Volume 5:

1. Contractor Certification Regarding Provision of Prohibition on Contracting for Certain Telecommunications and Video Surveillance Services or Equipment
2. Disclosures of Foreign Affiliations or Relationships to Foreign Countries
3. Disclosure of Funding Sources

Please refer to the DoD Program BAA for more information.

In addition to the documentation outlined in the DoD SBIR Program BAA, the following documents must also be included with Volume 5: (1) Power Point Quad Chart, (2) Resumes.

- (1) PowerPoint Quad Chart: Potential Offerors shall submit a one slide Power Point quad chart. The Quad Chart is intended to describe a preliminary assessment of the SBIR Phase I feasibility proposal. The quad chart shall follow the below requirements:

- Number of pages – 1
- Font – Times New Roman, 11 Point (or in size relevance to)
- Page orientation – landscape
- Paper size – 8.5 x 11 inch
- Upper left quad – Pictorial data or representation **and** Intended Capability Focus Areas (CFAs). See Topic description for more detail on the CFAs
- Upper right quad – Description of effort and perceived benefits
- Lower left quad – Summary cost data; labor, materials, and subcontracting
- Lower right quad – Project schedule and milestones

A template for the quad chart can be found here:

https://media.defense.gov/2023/Aug/24/2003287164/-1/-1/1/SCO_BAA_CONCEPT_QUAD_TEMPLATE.PPTX

- (2) Resumes: Include resumes.

Fraud, Waste and Abuse Training (Volume 6)

Fraud, Waste and Abuse (FWA) training is required for Phase I proposals. Please refer to the DoD SBIR Program BAA instructions for full details.

DISCRETIONARY TECHNICAL AND BUSINESS ASSISTANCE (TABA)

SCO does not provide Discretionary Technical and Business Assistance for Phase I awards.

INQUIRIES

During the Pre-Release and Open Periods of the DoD SBIR Program BAA, all questions must be submitted to the online Defense SBIR/SBIR Innovation Portal (DSIP) Topic Q&A. All questions and answers submitted to DSIP Topic Q&A will be released to the general public. SCO does NOT allow inquirers to communicate directly in any manner to the topic authors (differs from the DoD SBIR Program BAA instructions). All inquiries through DSIP must include the topic number in the subject line of the e-mail.

Consistent with DoD SBIR instructions, SCO will not answer programmatic questions, such as who the technical point of contact is, the number of contracts to be awarded, the source of funding, transition strategy.

Site visits will not be permitted during the Pre-release and Open Periods of the DoD SBIR Program BAA.

EVALUATION AND SELECTION

All Offerors will be evaluated in accordance with the evaluation criteria listed in the DoD SBIR Program BAA, with the following exceptions:

1. The technical evaluation will use the Evaluation Criteria provided in DoD SBIR Program BAA instructions. The Technical Volume and Power Point quad chart will be reviewed holistically. Once the evaluations are complete, all Offerors will be notified in a timely manner.

The Cost Volume award amount is set at a not to exceed (NTE) amount and a technical evaluation of the proposal cost will be completed to assess price fairness and reasonableness. The Government evaluation team will assess the technical approach presented for the effort based on the number of labor hours by labor category, the key personnel level of involvement, materials, subcontractors and consultants (scope of work, expertise, participation and proposed effort), and other direct cost as proposed.

Additionally, input on technical aspects of the proposals may be solicited by SCO from non-Government consultants and advisors who are bound by appropriate non-disclosure requirements. When appropriate, non-Government advisors may have access to Offeror's proposals and may be utilized to objectively review a proposal in a particular functional area and provide comments and recommendations to the Government's decision makers. They may not establish final assessments of risk, or rate or rank Offerors' proposals. All advisors shall comply with procurement Integrity Laws and shall sign Non-Disclosure and Rules of Conduct/Conflict of Interest statements. The Government shall take into consideration requirements for avoiding conflicts of interest. Submission of a proposal in response to this request constitutes approval to release the proposal to Government support contractors.

Offerors will be notified of selection or non-selection status for a Phase I award within 90 days of the closing date of this BAA topic by the SCO SBIR Office. This notification will come by e-mail to the Corporate Official identified by the Offeror during proposal submission. The Government will also notify the Offerors if their proposal is considered non-responsive (disqualified).

AWARD AND CONTRACT INFORMATION

SBIR

| Topic | Technical Volume (Vol 2) | Additional Info. (Vol 5) | Period of Performance | Award Amount | Contract Type |
|----------------|--------------------------|--------------------------|------------------------|------------------|------------------|
| <i>Phase I</i> | Not to exceed 5 pages | Quad Chart – 1 Page | Not to exceed 4 months | NTE \$150,000.00 | Firm-Fixed-Price |

ADDITIONAL INFORMATION

Phase I proposals shall NOT include:

- 1) Any travel for Government meetings. All meetings with the Government will be conducted via electronic media.
- 2) Government furnished property or equipment.
- 3) Priced or Unpriced Options.
- 4) “Basic Research” (or “Fundamental Research”) defined as a “Systematic study directed toward greater knowledge or understanding of the fundamental aspects of phenomena and/or observable facts without specific applications toward processes or products in mind.”
- 5) Discretionary Technical and Business Assistance (TABAs)

OUUSD(R&E)
SCO SBIR 23.4 Topic Index
Release 2

OSD234-P002

Strategic Capabilities Office SBIR Open Topic Call

OUSD (R&E) CRITICAL TECHNOLOGY AREA(S):

- Trusted AI and Autonomy
- Integrated Sensing and Cyber
- Human-Machine Interfaces
- Space Technology

OBJECTIVE: Develop solutions for high priority operational and strategic challenges in the areas of Autonomous Systems, Machine Learning, Cyber, Cross-Domain Kill Chains, Enhanced surveillance and reconnaissance and Non-traditional Defense Technologies.

DESCRIPTION:

The Strategic Capabilities Office (SCO) is a rapid prototyping organization focused on delivering capabilities in 3-5 years to address high priority operational and strategic challenges for the Department of Defense (DoD). SCO is seeking innovative approaches that enable revolutionary advances in the following technology areas:

1. Autonomous Systems: The use of autonomous systems in military operations provides several advantages, including allowing soldiers to avoid performing overly tedious or hazardous tasks and improved decision making for time-critical operations. The SCO is interested in technologies that can help accelerate and expand the Department of Defense's (DOD's) use of autonomous systems as well as concepts for deterring or defeating an adversary's attempts to do the same. Recognizing the rapid advance of commercial autonomy applications, SCO particularly encourages concepts that leverage commercial investments in autonomy technologies. Sub-categories of interest under Autonomous Systems include, but are not limited to, the following:

- Improved Human/Autonomous System Interaction and Collaboration (HASIC) solutions for ground, sea, and air vehicles
- Manned/unmanned Army ground vehicle collaboration that reduces risk to mission or risk to force
- Manned/unmanned tactical aircraft collaboration that improves targeting or weapon magazine depth for 5th generation aircraft
- Low cost/medium range (200nm)/medium endurance organic tactical ISR for Army fire and maneuver elements to include artillery units and MLRS forces.
- Communication systems, robotics, and algorithms for swarming, cooperative object interception, high speed and high precision optical navigation, and obstacle avoidance
- Low-cost robotic systems, sensors, and compute

2. Machine Learning (ML): The ability to analyze large datasets quickly using deep learning algorithms could potentially provide significant military capabilities in the areas of indications and warnings (I&W) and automatic target recognition (ATR). Recent advances in computer vision, natural language processing, and neural networks, as well as the availability of massive amounts of computational power have made the prospect of fielding military systems that leverage deep learning in the near term a real possibility. Additionally advances in reinforcement learning (RL) and generative AI also hold to promise of changing the way tactics, techniques, and procedures (TTPs) are developed, data is summarized and acted upon, and the way control systems, cooperative effects delivery, and the ways software

and physical systems are designed. SCO is interested in innovative concepts that benefit the warfighter by leveraging machine learning approaches. Sub-categories of interest under Machine Learning include, but are not limited to, the following:

- Deep learning enabled by graphics processing unit (GPU) computing
- Approaches that use synthetic data to train neural networks
- Semantic processing
- ML applications for advanced modelling and simulation of militarily relevant problems
- RL/GAN generated physical systems, software, and control systems
- RL/GAN developed TTPs for swarming systems, concepts of operation (CONOPS), and software defined radios (SDRs)
- Large Language Model (LLM) applications

3. Cyber: As U.S. adversaries have invested heavily in developing offensive cyber capabilities, the Department of Defense (DoD) has implemented a cyber-defense strategy designed to deter adversaries by ensuring that the military can detect, respond and remain resilient under cyber-attack. SCO is interested in leveraging advanced cyber related technologies that will enable the U.S. military to stay ahead of the evolving cyber threat. Sub-categories of interest under Cyber include, but are not limited to, the following:

- Network protection tools that provide ways to identify network vulnerabilities and provide automated operational security capabilities
- Novel cyber-defensive techniques that leverage commercial advances in anomaly-based detection, data analytics and/or encryption methods

4. Cross-Domain Kill Chains: Finding new ways to connect sensors with weapons to complete kill chains across the air, surface, and undersea domains is critical to countering near peer adversaries. The ability to link any capable sensor with any weapon transforms the concept of a “kill chain”, where any individual link is a single point of failure, to that of a “kill web”, where it will be difficult for an adversary to prevent a successful engagement. SCO is interested in exploring alternative combinations of existing or near-term sensors, communications, and weapons. Sub-categories of interest under Cross-Domain Kill Chains include, but are not limited to, the following:

- Cross-domain fires/distributed lethality concepts
- Providing existing weapons with new capabilities (e.g., giving defensive weapons offensive capabilities, and vice versa)
- Low probability of intercept, low probability of detection (LPI/LPD) communication waveforms and architectures for air, land, or sea platforms
- Machine-to-machine network tools that allow for seamless translation across multiple data formats and waveforms

5. Enhanced Surveillance and Reconnaissance: Discover novel ways to detect, identify, locate, and characterize a range of signatures-of-interest to the DoD using novel and unconventional platforms. New platforms, and enhancements to existing platforms, are desired in all domains: subsea, surface, terrestrial, air, space, and cyber. Compute “at the edge”, when possible, is preferred as it reduces “back-end” communication demands and may enable expeditionary employment. Leveraging existing or emerging commercial technology, applied to this mission area, often accelerates prototyping through shortcutting traditional R&D timelines. Sub-categories of interest under Enhanced Surveillance and

Reconnaissance include, but are not limited to, the following:

- Collection of radio frequency signals of interest
- Leverage the “Internet of Things” (IoT) to network dispersed, heterogenous sensors, and also detect targeted signatures via existing IoT appliances and devices.
- Adaptability and tailor-ability in form factor enables deployment diversity

6. Non-traditional defense technologies: This category is intended to allow proposers to submit technology concepts that, while not originally developed for defense/military purposes, might be repurposed to create or enhance military capabilities. The development for many non-traditional DoD technologies is largely driven by a fast-paced and rapidly evolving commercial market. Therefore, leveraging commercial innovation is a key element of DoD’s strategy for ensuring emerging needs for technology innovation are met. Proposers wishing to submit a concept under this primary category are encouraged to consider a wide range of enhanced or new DoD relevant capabilities enabled by repurposing technologies that are not primarily used in defense applications. Examples of concepts that would be appropriate under this category include, but are not limited to, the following:

- Using high speed computing enabled by graphics processing units (GPUs) to increase the capabilities of DoD sensor systems
- Leveraging advances in driverless vehicle technology to enable DoD unmanned ground vehicles
- Applying big data analytics developed for business intelligence to DoD decision making tools
- Repurposing cybersecurity tools built to protect the Internet of Things (IoT) to defend DoD networks

Proposed research should investigate innovative approaches that enable revolutionary advances in science, devices, or systems. Specifically excluded is research that primarily results in evolutionary improvements to the existing state of practice.

PHASE I: Phase I feasibility will describe the existing proposed technology, existing DoD system(s) to improve, modifications required, anticipated improvements to existing capabilities, impacts to current logistics if any (i.e., transportation, storage, maintenance, safety, etc.) and transition approach. Results of Phase I will be detailed in a final technical report (Final Report). Phase I deliverables include: - Kick-Off Briefing, due 15 days from start of Base award - Final Report, due 120 days from start of Base award - Initial Phase II Proposal, due 120 days from start of Base award.

PHASE II: The scope of the Phase II effort will be specific to each project but is generally expected to develop a functional prototype to demonstrate the capability, develop transition plan including production and fielding approach (including updated logistics and safety consideration) and further commercialization.

PHASE III DUAL USE APPLICATIONS: The technologies developed could be used in a broad range of military and commercial applications.

REFERENCES:

- [DOD Committed to Ethical Use of Artificial Intelligence > U.S. Department of Defense > Defense Department News](#)

- [DOD's Cyber Strategy: 5 Things to Know > U.S. Department of Defense > Story](#)
- [2022 National Defense Strategy, Nuclear Posture Review, and Missile Defense Review](#)
- [DoD Solicits Carbon Pollution-Free Electricity > U.S. Department of Defense > Release](#)

KEYWORDS: Cybersecurity; Cross-Domain Kill Chains; machine learning; AI; Autonomous Systems; Intelligence, Surveillance, and Reconnaissance (ISR) systems (including manned and unmanned airborne, space-borne, maritime, and terrestrial systems)

Defense Human Resources Activity (DHRA)
23.4 DoD Small Business Innovation Research (SBIR)
Proposal Submission Instructions

September 20, 2023: Topic issued for pre-release

October 4, 2023: OSD begins accepting proposals via DSIP

October 24, 2023: DSIP Topic Q&A closes to new questions at 12:00 p.m. ET

November 7, 2023: Deadline for receipt of proposals no later than 12:00 p.m. ET

INTRODUCTION

The Defense Human Resources Activity (DHRA) SBIR Program seeks small businesses with strong research and development capabilities to pursue and commercialize technologies in the field of Trusted AI and Autonomy, Human Machine Interfaces.

Offerors responding to a topic in this BAA must follow all general instructions provided in the DoD SBIR Program BAA. DHRA requirements in addition to or deviating from the DoD Program BAA are provided in the instructions below.

Proposers are encouraged to thoroughly review the DoD Program BAA and register for the DSIP Listserv to remain apprised of important programmatic and contractual changes.

- The DoD Program BAA is located at: <https://www.defensesbirsttr.mil/SBIR-STTR/Opportunities/#announcements>. Be sure to select the tab for the appropriate BAA cycle.
- Register for the DSIP Listserv at: <https://www.dodsbirsttr.mil/submissions/login>.

Specific questions pertaining to the administration of the DHRA Program and these proposal preparation instructions should be directed to: Tammy J. Proffitt, DHRA, Office of Small Business Programs, tammy.j.proffitt2.civ@mail.mil.

This release contains an open topic. As outlined in section 7 of the SBIR and STTR Extension Act of 2022, innovation open topic activities—

- (A) Increase the transition of commercial technology to the Department of Defense;
- (B) Expand the small business nontraditional industrial base;
- (C) Increase commercialization derived from investments of the Department of Defense; and
- (D) Expand the ability for qualifying small business concerns to propose technology solutions to meet the needs of the Department of Defense.

Unlike conventional topics, which specify the desired technical objective and output, open topics can use generalized mission requirements or specific technology areas to adapt commercial products or solutions to close capability gaps, improve performance, or provide technological advancements in existing capabilities.

A small business concern may only submit one (1) whitepaper submission and full proposal to each open topic. If more than one whitepaper and full proposal from a small business concern is received for a single open topic, only the most recent proposal to be certified and submitted prior to the submission deadline will receive an evaluation. All prior proposals submitted by the small business concern for the same open topic will be marked as nonresponsive and will not receive an evaluation.

PHASE I PROPOSAL GUIDELINES

The Defense SBIR Innovation Portal (DSIP) is the official portal for DoD SBIR proposal submission. Offerors are required to submit proposals via DSIP; proposals submitted by any other means will be disregarded. Detailed instructions regarding registration and proposal submission via DSIP are provided in the DoD SBIR Program BAA.

Technical Volume (Volume 2)

The Technical Volume is not to exceed 10 pages and must follow the formatting requirements provided in the DoD SBIR Program BAA. DHRA will not consider any pages in excess of the 10-page limit.

Only the electronically generated Cover Sheets, Cost Volume and Company Commercialization Report (CCR) are excluded from the 10-page limit. Technical Volumes that exceed the 10-page limit will be reviewed only to the last word on the 10th page. Information beyond the 10th page will not be reviewed or considered in evaluating the offeror's proposal. To the extent that mandatory technical content is not contained in the first 10 pages of the proposal, the evaluator may deem the proposal as non-responsive and score it accordingly.

Content of the Technical Volume (Volume 2)

Refer to the DoD SBIR Program BAA for detailed instructions on the content of the technical volume.

Cost Volume (Volume 3)

The Phase I amount must not exceed \$280,000 for a 9-month duration.

Please review the updated Percentage of Work (POW) calculation details included in the DoD Program BAA. DHRA will not accept any deviation to the POW requirements.

Company Commercialization Report (CCR) (Volume 4)

Completion of the CCR in Volume 4 of the proposal submission in DSIP is required. Please refer to the DoD SBIR Program BAA for full details on this requirement. Information contained in the CCR will be considered by DHRA during proposal evaluations.

Supporting Documents (Volume 5)

All proposing small business concerns are REQUIRED to submit the following documents to Volume 5:

1. Contractor Certification Regarding Provision of Prohibition on Contracting for Certain Telecommunications and Video Surveillance Services or Equipment
2. Disclosures of Foreign Affiliations or Relationships to Foreign Countries
3. Disclosure of Funding Sources

Please refer to the DoD Program BAA for more information.

PHASE II PROPOSAL GUIDELINES

Phase II proposals may only be submitted by Phase I awardees. Phase II proposal submission window, notification process, and additional instructions will be provided in the Phase I contract or by subsequent notification. Phase II will be a 12 month base duration with a 6 month option, not to exceed a total value of \$1,300,000.00.

DISCRETIONARY TECHNICAL AND BUSINESS ASSISTANCE (TABA)

Technical and Business Assistance funds are not currently offered for DHRA topics.

EVALUATION AND SELECTION

All proposals will be evaluated in accordance with the evaluation criteria listed in the DoD SBIR Program BAA.

Proposing firms will be notified of selection or non-selection status for a Phase I award within 90 days of the closing date of the BAA. The Office of Small Business Programs will notify proposing vendors via email of selection status and debriefing procedures.

Refer to the DoD SBIR Program BAA for procedures to protest the Announcement.

As further prescribed in FAR 33.106(b), FAR 52.233-3, Protests after Award should be submitted to:
Tammy J. Proffitt, DHRA Office of Small Business Programs and
Contracting Officer, DHRA, Enterprise Acquisition Division
via email to tammy.j.proffitt2.civ@mail.mil.

AWARD AND CONTRACT INFORMATION

Up to two awards are anticipated. DHRA plans to award FAR-based government Firm-Fixed Price contracts, subject to approval of the Contracting Officer. The amount of resources made available for this topic depend on the quality of the proposals received and the availability of funds.

DHRA
SBIR 23.4 Topic Index

OSD234-P003 Rapid development of effective behaviorally aligned training simulations for human relations practitioners (Open Topic)

OSD234-P003 TITLE: Rapid development of effective behaviorally aligned training simulations for human relations practitioners (Open Topic)

OUSD (R&E) CRITICAL TECHNOLOGY AREA(S): Trusted AI and Autonomy, Human Machine Interfaces

OBJECTIVE: The goal is to use Artificial Intelligence (AI) and Modeling & Simulations (M&S) for rapid development of training scenarios with a scalable level of difficulty, sufficiently matched fidelity, and that elicits appropriate behavioral interactions and cues sufficient for effective learning and transfer of interpersonal skills. For use in sensitive topics of human relations and interaction.

DESCRIPTION: A true assessment still needs to be completed to test the effectiveness and adequacy of legacy and novel technological approaches to education and training (E&T) for Equal Opportunity (EO) practitioners. There is a need to develop and integrate adaptive learning approaches that tailor EO trainings that respond and adapt to the learner's capabilities. Therefore, the purpose of this topic is to develop technological and methodological approaches that will utilize realistic synthetic representations of human relation training scenarios that are adaptive and scalable on the level of difficulty, sufficiently matched fidelity, and elicit the appropriate behavioral interactions and cues to sufficiently elicit learning and transferability of interpersonal skills for use in training EO practitioners such as interpersonal relationships, team development, and resiliency. The need for this approach will potentially overcome the limitations of current educational modalities (e.g., didactic lectures, case studies, observations), which do not provide the complexity to replicate the nuances of real-life situations accurately and may result in the underdevelopment of the necessary abilities to embrace the complex and varied roles an EO practitioner fully.

Modernization of E&T is necessary to ensure that future EO practitioners are fully equipped with the necessary tools and skills to address and prevent complex human relations issues. Simulation learning (SL) will fill the gap in current E&T approaches by providing a tailored, interactive, and scalable learning environment that ensure acquisition of the necessary knowledge, skills, and abilities (KSAs) with fidelity. SL is an appropriate approach to EO education and training because it has demonstrated evidence to increase knowledge structuring, which is particularly important skill set for EO practitioners. SL also provides a tailored and adaptive approach to problem-solving skill development. Wherein the learner can progress at a pace that encourages mastery over completion - this is accomplished using realistic synthetic representations of adverse human relations events, which promote creativity in the learner to develop new solutions, critical thinking (i.e., reflection), formulate one or more solutions, establish, or recall strategies to implement the solution(s), discover new possible solutions, and explain the problem (i.e., understanding) and provide a realistic and actionable solution (i.e., evaluation).

Previous research indicates an increased proficiency in tasks and skill development when simulation training is included, as opposed to traditional classroom training alone. Specifically, SL is more effective than traditional learning approaches at increasing knowledge structuring for human relation topics. SL also provides a tailored and adaptive approach to problem-solving skill development.

The advantage of SL over traditional educational modalities is that it provides an environment that encourages transformative learning for the EO practitioner. SL is an immersive experience to addressing complex human relation scenarios wherein the learner is allowed to remain fully emerged, creating a higher sense of presence over face-to-face learning modules, which increases human relation skillsets, such as establishing contact with the victim, sharing emotions or ideas, and developing cooperation skills, such as awareness of others' ideas, tolerance toward others, and empathy.

SL also provides instructors with real-time objective data to assess the learners' mastery of job tasks or acquisition of new skills. SL objective data reduces threats to internal validity typically associated with human relations assessments because it removes the instructors' subjective self-observations. SL gives the DoD the ability to train and educate a broader audience in a variety of locations, with potentially fewer human resources, leveraging already funded technologies in development by other research organizations, thus saving millions of dollars, advancing the methods currently utilized in training and education (E&T) in human relations domain, and provide readily accessible and realistic refresher training for EO practitioners.

The Defense Equal Opportunity Management Institute (DEOMI) seeks solutions leveraging AI and SL to support the training of equal opportunity, equal employment, and diversity and inclusion practitioners to respond to challenging social issues happening in our military and other government agencies. These technologies should aid with the rapid development of very immersive and realistic scenarios portraying today's social challenges like racism, extremism, discrimination, harassment, etc. This training tool should be able to address the development of interpersonal skills, trigger a change in behavior, and deliver the knowledge-based training effectively.

GLOSSARY:

- Complexity – When multiple topics converge causing the lines of distinction to become unclear.
- Fidelity – the emersion or level of simulation that re-creates (simulates) a complex phenomenon, environment, or experience.
- Internal Validity – ability to accurately infer the causal relationship between two or more concepts.
- Presence – the self-reported feeling of emersion experience of the user in the virtual or simulated environment.
- Realistic Synthetic Representations - recreations of realistic equipment or people to represent real-world concepts or scenarios.
- Sensitivity - The underlying accepts of the human relation topic that is too difficult, complex, challenge to express without causing emotional distress to other members.
- Serious Game – highly interactive computer-based games or simulations that creates a sense of full emersion and engagement for the user.

PHASE I: Develop a concept for creating realistic synthetic representations of adverse human relations issues suitable for use in training and education for EO practitioners. Demonstrate the feasibility of the concept to meet all the requirements as stated in the Description. Establish feasibility through modeling and analysis of the design to include the initial design specifications and capabilities description to build a prototype solution in Phase II.

During Phase 1, the following questions will be answered:

- 1) How can we leverage simulation technology to enhance the learning experience?
- 2) What is the correct stimulation level for a given learning objective or outcome?
- 3) How does the fidelity of SL add or detract from the learning experience and E&T's effectiveness?
- 4) At what point does the sensitivity or complexity of the human relation topic(s) under review render them unfit for SL?
- 5) Will the learner perform accurate word tasks better after SL exposure?
- 6) When can SL become independent from the instructor, mediator, or facilitator?
- 7) What is the appropriate level of physical fidelity to accurately represent the necessary KSAs for EO practitioners?
- 8) Can SL in human relations present an opportunity to construct an adaptive learning environment that presents the learner with a personalized and adaptive curriculum and test based on ability?

PHASE II: Develop and demonstrate prototypes M&S tool in a realistic environment. Conduct testing to prove feasibility over extended operating conditions. Develop a rapid scenario development methodology and traditional training conversion to M&S at the applicable and appropriate level of fidelity and complexity, in addition to a methodology on how to properly evaluate the outcomes and performance of the students during training engagements.

PHASE III DUAL-USE APPLICATIONS: Supports the transition of EO modular simulation learning components to military training programs and the commercial market. The technology developed under this topic could create a dynamic training approach for industry and DoD programs. The innovation sought with this effort will reduce reliance on instructor capabilities, thus increasing T&E fidelity. This simulation technology is applicable in a broad range of military and civilian E&T applications where the nature of topics is sensitive, and an expert instructor or SME is not easily accessible.

REFERENCES:

1. “National Defense Strategy”. 2022. Online at <file:///C:/Users/1471179457A/Desktop/SBIR-%20Simulations/2022-NATIONAL-DEFENSE-STRATEGY-NPR-MDR.PDF>
2. Defense Modeling and Simulation Coordination Office, “Defense Modeling and Simulation Reference Architecture”. 10 February 2020. Online at <https://www.msco.mil/MSReferences/PolicyGuidance.aspx>
3. Cook, D. A., Hamstra, S. J., Brydges, R., Zendejas, B., Szostek, J. H., Wang, A. T., Erwin, P. T. Hatala, R. (2013). Comparative effectiveness of instructional design features in simulation-based education: Systematic review and meta-analysis, *Medical Teacher*, 35:1, e867 e898, DOI: [10.3109/0142159X.2012.714886](https://doi.org/10.3109/0142159X.2012.714886)
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5. Sauve, L., Kaufman, D., & Renaud, L. (2007). A systematic review of the impact of games and simulations on learning. *EdMedia*, 4149-4157.
6. de Smale, S., Overmans, T., Jeuring, J., & van de Grint, L. (2016). The effects of simulations and games on learning objectives in tertiary education: A systematic review. A. De Gloria and R. Velkamp (Eds.): *GALA 2015, LNCS 9599*, pp. 506–516, 2016. DOI: 10.1007/978-3-319-40216-1_55
7. Balint, B-N & Stevens, B. (2022). Transforming team training: The influence of virtual environment features. *Interservice/Industry Training, Simulation, and Education Conference (IITSEC)*, Orlando, FL.
8. Garcia, A. & Winer, E. (2022). Blending AR and VR to increase situational awareness during training. *Interservice/Industry Training, Simulation, and Education Conference (IITSEC)*, Orlando, FL.

KEYWORDS: Education and Training (E&T), Equal Opportunity (EO), Modeling and Simulations (M&S), Simulation Learning (SL), and Transformative Learning, Human machine interface, Trusted AI, Adaptive learning

UNITED STATES SPECIAL OPERATIONS COMMAND
23.4 Small Business Innovation Research (SBIR)
Phase I Proposal Submission Instructions

February 7, 2023: Topic issued for pre-release

February 21, 2023: USSOCOM begins accepting proposals via DSIP

March 9, 2023: DSIP Topic Q&A closes to new questions at 12:00 p.m. ET

March 23, 2023: Deadline for receipt of proposals no later than 12:00 p.m. ET

Join us for a virtual Q&A with our Technical Point of Contact
February 22, 2023, from 12:00PM-1:00PM ET

INTRODUCTION

The United States Special Operations Command (USSOCOM) seeks small businesses with strong research and development capabilities to pursue and commercialize technologies needed by Special Operations Forces through the Department of Defense (DoD) SBIR 23.4 Program Broad Agency Announcement (BAA).

Offerors responding to a topic in this BAA must follow all general instructions provided in the DoD SBIR Program BAA. USSOCOM requirements in addition to or deviating from the DoD Program BAA are provided in the instructions below. A thorough reading of the “DoD SBIR Program, SBIR 23.4 Program Broad Agency Announcement (BAA)”, located at <https://www.defensesbirstr.mil/SBIR-STTR/Opportunities/#announcements> prior to reading these USSOCOM instructions is highly recommended. The Offeror is responsible for ensuring that their proposal complies with the requirements in the most current version of these instructions. Prior to submitting your proposal, please review the latest version of these instructions as they are subject to change before the submission deadline.

The Government may withdraw from negotiations at any time for any reason to include matters of national security (foreign persons, foreign influence or ownership, inability to clear the firm or personnel for security clearances, or other related issues).

The USSOCOM SBIR/STTR Program Office will be hosting a virtual USSOCOM Industry Day on February 22, 2023 to further specify requirements and stimulate small business/research institute partnership-building. Please visit <https://events.sofwerx.org/sbir23-4/> for additional information and to sign up.

PHASE I PROPOSAL GUIDELINES

The Defense SBIR/STTR Innovation Portal (DSIP) is the official portal for DoD SBIR/STTR proposal submission. Offerors are required to submit proposals via DSIP; proposals submitted by any other means will be disregarded. Detailed instructions regarding registration and proposal submission via DSIP are provided in the DoD SBIR Program BAA.

Proposal Volumes are key in the qualification of the proposal. Offerors shall complete each of the following volumes. Those volume are (1) Cover Sheet, (2) Technical Volume, (3) Cost Volume, (4) Company Commercialization Report, (5) Pitch Day Presentation, and (6) Fraud, Waste and Abuse Training.

Please Note:

1. It is the Offeror’s responsibility to make sure all DoD and USSOCOM instructions are followed, and all required documents are submitted. The DSIP (DoD’s SBIR/STTR proposal submission website)

will NOT be able to ensure your submission is in accordance with both DoD and USSOCOM instructions. The DSIP “100% submitted” means that the upload process is complete; It does NOT mean the proposal submission complies with the stated instructions and that all required documentation is successfully uploaded.

2. USSOCOM doesn't assist Offerors with proposal preparation nor does USSOCOM review proposals for completeness. We recommend you use your local and state resources for assistance. (See DoD Instructions for resources information.)
3. USSOCOM has encountered issues while downloading proposals due to lengthy file names. The Offeror shall not use more than 20 characters to include spaces in any of the proposal documents titles.
4. **USSOCOM does NOT require a Government Letter of Support (LoS). Any Government LoS provided will deem the proposal to be non-responsive (Disqualified).**

Cover Page (Volume 1)

Is created as part of the DoD Proposal Submissions process.

Technical Volume (Volume 2)

The technical volume is not to exceed 5 pages and must follow the formatting requirements provided in the DoD SBIR Program BAA titled, “Format of Technical Volume (Volume 2)”. USSOCOM will only evaluate the first five (5) pages of the Technical Volume, additional pages will not be considered or evaluated.

Content of the Technical Volume

Required items are specified in the DoD SBIR Program BAA Phase I Technical Volume instructions section titled “Content of the Technical Volume 2”. To access the template, please go to <https://www.defensesbirsttr.mil/SBIR-STTR/Opportunities/> then scroll to the bottom of the page and click on the third tab titled “Supporting Documents and Attachments”. At the bottom of the list, select the document titled “Phase I Technical (Vol 2) Sample Template”

Contract Data Requirement Lists (CDRLs): CDRLs identifies which data products must be delivered by the contractor to the Government. Please make sure you read all required CDRLs requirements (each using a DD Form 1423-1) prior to developing your proposal. All five of the required Phase I CDRLs are available on <https://www.socom.mil/SOF-ATL/Pages/SBIR-P1.aspx>.

The identification of foreign national involvement in a USSOCOM SBIR topic is needed to determine if a firm is ineligible for award on a USSOCOM topic that falls within the parameters of the United States Munitions List, Part 121 in the International Traffic in Arms Regulation (ITAR). A firm employing a foreign national(s) (as defined section titled “Foreign Nationals” of the DoD SBIR Program BAA) to work on a USSOCOM ITAR topic must possess an export license to receive a SBIR Phase I contract.

Cost Volume (Volume 3)

The Phase I Base amount must not exceed \$210,000. Costs must be identified on the Proposal Cover Sheet (Volume 1) and in Volume 3. Once the proposal is initiated in DSIP the Offeror will have access to the required USSOCOM specific Cost Volume instructions and template.

A minimum of two-thirds of the research and/or analytical work in Phase I must be conducted by the proposing firm. The percentage of work is measured by both direct and indirect costs as a percentage of the total contract cost.

Please review the updated Percentage of Work (POW) calculation details included in section 5.3 of the DoD Program BAA. USSOCOM will not accept any deviation to the POW requirements.

The cost volume template (volume 3 template) is located on DSIP and <https://www.socom.mil/SOF-ATL/Pages/SBIR-P1.aspx>.

Company Commercialization Report (CCR) (Volume 4)

Completion of the CCR Volume 4 of the proposal submission in DSIP is required. Please refer to the DoD SBIR Program BAA for full details on this requirement. Information contained in the CCR will be considered by USSOCOM during proposal evaluations.

Supporting Documents (Volume 5)

In addition to the documentation outlined in the DoD SBIR Program BAA, the following documents must also be included with Volume 5: (1) PowerPoint presentation, (2) Section K, and (3) Resumes.

Note: If you can't find a proper "volume" or "selection" in DSIP, please attach under "Other".

- (1) PowerPoint Presentation: Potential Offerors shall submit a slide deck **not to exceed 15 PowerPoint slides (inclusive of the cover sheet)**. The presentation shall not have any videos or links to videos. There is no set format for this document. It is recommended (but not required) that more detailed information is included in the technical volume and higher-level information be included in the slide deck, suitable for a possible presentation. Refer to the "Phase I Evaluations" Section of this instruction for more details.
- (2) Section K - Titled "Representations, Certifications, and other statements of Offerors": If Section K is not submitted with the proposal, the proposal will still be considered responsive, but the completed Section K shall be required at the time of award. Section K is available at <https://www.socom.mil/SOF-ATL/Pages/SBIR-P1.aspx>.
- (3) Resumes: Include resumes.

Fraud, Waste and Abuse Training (Volume 6)

Fraud, Waste and Abuse (FWA) training is required for Phase I proposals. Please refer to the DoD SBIR Program BAA instructions for full details.

DISCRETIONARY TECHNICAL AND BUSINESS ASSISTANCE (TABA)

USSOCOM does not provide Discretionary Technical and Business Assistance for Phase I awards.

INQUIRIES

USSOCOM does not allow direct communication with the topic authors (differs from the DoD SBIR Program BAA instructions).

During the Pre-Release and Open Periods of the DoD SBIR Program BAA, only and all technical questions that enhance the Offerors understanding of the topic's requirements must be submitted to the online **Defense SBIR/STTR Innovation Portal (DSIP) Topic Q&A**. All questions and answers submitted to DSIP Topic Q&A will be released to the general public. USSOCOM does NOT allow inquirers to communicate directly in any manner to the topic authors (differs from the DoD STTR Program BAA instructions). Only questions pertaining to the proposal preparation instructions should

be directed to: sbir@socom.mil. All inquiries must include the topic number in the subject line of the e-mail.

Consistent with DoD SBIR instructions, USSOCOM will not answer programmatic questions, such as who the technical point of contact is, the number of contracts to be awarded, the source of funding, transition strategy.

Physical site visits will not be permitted during the Pre-release and Open Periods of the DoD SBIR Program BAA.

EVALUATION AND SELECTION

All proposals will be evaluated in accordance with the evaluation criteria listed in the DoD SBIR Program BAA, with the following exceptions:

1. Proposals missing any of the six above stated volumes or those that do not comply with the requirement of two-thirds of the work conducted by the proposing firm will not be evaluated. Likewise, proposals that exceed the maximum price allowed as per Table 1 of these instructions will be considered non-responsive.
2. The technical evaluation will utilize the Evaluation Criteria provided in DoD SBIR Program BAA instructions. The Technical Volume and PowerPoint Presentation slide deck will be reviewed holistically. The technical evaluation is performed in two parts:

Part I: The evaluation of the Technical Volume will utilize the Evaluation Criteria provided in the DoD SBIR Program BAA. Once the evaluations are complete, all Offerors will be notified in a timely manner.

Part II: Selected Offerors may receive an invitation to present their slide deck (30 minute presentation time / 30 minute Government question and answer period) to the USSOCOM technical evaluation team, using virtual teleconference. This will be a technical presentation only of the proposed solution and the key personnel listed in the proposal should be conducting the presentation and responding to the questions of the evaluation team. This presentation is NOT intended for business development personnel, it is purely technical. Selected Offerors shall restrict their Pitch Day presentations to only the 15-page PowerPoint presentations that were submitted with their respective proposals. There will be no changes or updates to the presentations from what was proposed. All selected firms will be required to provide teleconference information for the presentation. This presentation will complete the evaluation of the proposal the panel did against the criteria listed in the DoD SBIR 22.1 BAA.

3. The Cost Volume (Volume 3) evaluation:
For this Phase I, the award amount is set at a not to exceed (NTE) amount and a technical evaluation of the proposal cost will be completed to assess price fair and reasonableness. Proposals above the established NTE for the Phase I effort will not be considered for award. The team will assess the technical approach presented for the effort based on the number of labor hours by labor categories, the key personnel level of involvement, materials, subcontractors and consultants (scope of work, expertise, participation and proposed effort), and other direct cost as proposed.

Additionally, input on technical aspects of the proposals may be solicited by USSOCOM from non-Government consultants and advisors who are bound by appropriate non-disclosure requirements. When appropriate, non-government advisors may have access to Offeror’s proposals and may be utilized to objectively review a proposal in a particular functional area and provide comments and recommendations to the Government’s decision makers. They may not establish final assessments of risk, rate or rank Offerors’ proposals. All advisors shall comply with procurement Integrity Laws and shall sign Non-Disclosure and Rules of Conduct/ Conflict of Interest statements. The Government shall take into consideration requirements for avoiding conflicts of interest. Submission of a proposal in response to this request constitutes approval to release the proposal to Government support contractors.

Notifications:

For topic SOCOM234-001, the DEFENSEWERX (also known as SOFWERX) will notify each Offeror whether they have been selected for award or not. The e-mail notification will be sent to the Corporate Official (Business) identified by the Offeror.

Informal Feedback:

A non-selected Offeror can make a written request to SBIR@SOCOM.mil within 30 calendar days of receipt of notification of non-selection, for informal feedback. SOCOM SBIR/STTR Program Office will provide informal feedback in response to an Offeror’s written request rather than a debriefing.

Refer to the DoD SBIR Program BAA for procedures to protest the Announcement.

As further prescribed in FAR 33.106(b), FAR 52.233-3, Protests after Award should be submitted to: sbir@socom.mil.

PATH TO PHASE II

If awarded a Phase I, the Small Business will automatically be invited to propose a Phase II proposal unless otherwise informed by USSOCOM. To obtain the Phase II requirements, refer to the Contract Data Requirements List (CDRL) A004. The Final Report will be due on or before 6 months of the start of the Period of Performance (PoP) In Accordance With (IAW) CDRL A003. Your Phase II proposal will be due on or before the 195th day of the start of the PoP IAW CDRL A005.

All CDRLs are available on <https://www.socom.mil/SOF-ATL/Pages/SBIR-P1.aspx>. There are two different attachments for CDRL 5. Please refer to the section titled “Award and Contract Information” for the contracting path pertaining to the topic.

AWARD AND CONTRACT INFORMATION

Table 1: Consolidated SBIR Topic Information

| Topic | Technical Volume (Vol 2) | Additional Info. (Vol 5) | Period of Performance | Award Amount | Contract Type |
|--------------------------------|---------------------------------|---------------------------------|------------------------------|---------------------|----------------------|
| <i>Phase I</i> SOCOM234-001 | Not to exceed 5 pages | 15 page PowerPoint | Not to exceed 7 months | NTE \$210,000 | Firm-Fixed- Price |

SBIR awards for SOCOM234-001 may be made under the authority of National Defense Authorization Act (NDAA) for Fiscal Year 2022, Section 852, MODIFICATION OF PILOT PROGRAM FOR DEVELOPMENT OF TECHNOLOGY- ENHANCED CAPABILITIES WITH PARTNERSHIP INTERMEDIARIES. USSOCOM may use a partnership intermediary to award SBIR contracts and agreements to small business concerns. The stated topics SBIR contract awards may be done through SOFWERX and result in a commercial contract between

the firm and DEFENSEWERX. The Government will conduct the evaluation and select the proposals to be funded for award. .

ADDITIONAL INFORMATION

Phase I proposals shall NOT include:

- 1) Any travel for Government meetings. All meetings with the Government will be conducted via electronic media.
- 2) Government furnished property or equipment.
- 3) Priced or Unpriced Options.
- 4) "Basic Research" (or "Fundamental Research") defined as a "Systematic study directed toward greater knowledge or understanding of the fundamental aspects of phenomena and/or observable facts without specific applications toward processes or products in mind."
- 5) Human or animal studies.
- 6) Discretionary Technical and Business Assistance (TABAs)

SOCOM SBIR 23.4 Topic Index
Release 1

SOCOM234-001 Analyzing Narrative Evolution Across Social Networks

The technology within this topic is restricted under the International Traffic in Arms Regulation (ITAR), which controls the export and import of defense-related material and services. Offerors must disclose any proposed use of foreign nationals, their country of origin, and what tasks each would accomplish in the statement of work in accordance with section 5.4.c.(8) of the solicitation. Additionally, Offerors will describe compliance mechanisms offerors have in place or will put in place to address any ITAR issues that arise during the course of agreement administration.

OBJECTIVE: The objective of this topic is to develop applied research toward an innovative capability to automatically detect, track, and differentiate the evolution of narratives over time in the information environment. This study should explore the use of Artificial Intelligence (AI), such as natural language processing, to project long-term narratives among social networks and track changes associated with micro-changes in narratives based on responses, tracked online, to events shared by a social network.

IMPORTANT: For SOCOM instructions: please visit: <https://www.defensesbirsttr.mil/SBIR-STTR/Opportunities/>. Go to the bottom of the page and click "DoD SBIR 23.4 Annual". Once there, go to the SOCOM SBIR 23.4 Release 1

DESCRIPTION: As a part of this feasibility study, the proposers shall address all viable overall system design options with respective specifications for detection and tracking the evolution of narratives across time and social networks. Current research captures proto-narratives at a snapshot in time and can track the engagement of audiences with a particular proto-narrative over a time period. However, narratives are not static; they evolve in the course of engagement by audiences. The main features of technology development should focus on constructing a quantitative model for tracking the evolution of narratives over time, including the transformation of one narrative into another, the dissolution of existing narratives, and the merging and splitting of strategic narratives from / into sub-narratives.

PHASE I: Conduct a feasibility study to assess what is in the art of the possible that satisfies the requirements specified in the above paragraphs entitled "Objective" and "Description."

The objective of this USSOCOM Phase I SBIR effort is to conduct and document the results of a thorough feasibility study ("Technology Readiness Level 3") to investigate what is in the art of the possible within the given trade space that will satisfy a needed technology. The feasibility study should investigate all options that meet or exceed the minimum performance parameters specified in this write up. It should also address the risks and potential payoffs of the innovative technology options that are investigated and recommend the option that best achieves the objective of this technology pursuit. The funds obligated on the resulting Phase I SBIR contracts are to be used for the sole purpose of conducting a thorough feasibility study using scientific experiments and laboratory studies as necessary. Operational prototypes will not be developed with USSOCOM SBIR funds during Phase I feasibility studies. Operational prototypes developed with other than SBIR funds that are provided at the end of Phase I feasibility studies will not be considered in deciding what firm(s) will be selected for Phase II.

PHASE II: Develop, install, and demonstrate a prototype system determined to be the most feasible solution during the Phase I feasibility study on an advanced analytic capability to detect, track, manage, and differentiate the evolution of narratives across social networks in the information environment.

PHASE III DUAL USE APPLICATIONS: This system has applicability in a broad range of other broader DoD, USG, or private company applications where planners, operators, and assessors must determine the most appropriate target audience for engagement to create effects in the information and cognitive domain, leading to physical behavior change. Advanced narrative detection would allow for better predictive analysis and create flexibility and more rapid responsiveness to changes in the information environment. This responsiveness is paramount for DoD strategic communications, intelligence agencies, and can benefit private companies needing to track shifts in conversation regarding social trends related to their products. Importantly, advanced narrative detection presents opportunity to track, measure, and assess changes over time, and to better assess effectiveness by correlating changes to events in the information environment.

REFERENCES:

1. Bail, C. A. (2016). Combining natural language processing and network analysis to examine how advocacy organizations stimulate conversation on social media. *Proceedings of the National Academy of Sciences*, 113(42), 11823–11828. doi: 10.1073/pnas.1607151113
 - a. Link – <https://www.pnas.org/doi/10.1073/pnas.1607151113>
2. Davis, J. T., Perra, N., Zhang, Q., Moreno, Y., & Vespignani, A. (2020). Phase transitions in information spreading on structured populations. *Nature Physics*, 16(5), 590– 596. doi: 10.1038/s41567-020-0810-3
 - a. Link – <https://www.nature.com/articles/s41567-020-0810-3>
3. Measuring coordinated vs. spontaneous activity in online social movements. *SocArXiv*. doi: 10.1177/14614448211041176
 - a. Link – https://www.researchgate.net/publication/354281278_Measuring_coordinated_versus_spontaneous_activity_in_online_social_movements

KEYWORDS: Artificial intelligence (AI); Machine Learning (ML); social network analysis; narrative detection; narrative modeling; narrative evolution; narrative transformation; coordinate activity; cultural convergence; misinformation; disinformation; quantitative; qualitative; target audience; natural language processing; network analysis; social media

UNITED STATES SPECIAL OPERATIONS COMMAND
23.4 Small Business Innovation Research (SBIR)
Phase I Proposal Submission Instructions

April 4, 2023: Topic issued for pre-release

April 19, 2023: USSOCOM begins accepting proposals via DSIP

May 4, 2023: DSIP Topic Q&A closes to new questions at 12:00 p.m. ET

May 18, 2023: Deadline for receipt of proposals no later than 12:00 p.m. ET

Join us for a virtual Q&A with our Technical Point of Contact

INTRODUCTION

The United States Special Operations Command (USSOCOM) seeks small businesses with strong research and development capabilities to pursue and commercialize technologies needed by Special Operations Forces through the Department of Defense (DoD) SBIR 23.4 Program Broad Agency Announcement (BAA).

Offerors responding to a topic in this BAA must follow all general instructions provided in the DoD SBIR Program BAA. USSOCOM requirements in addition to or deviating from the DoD Program BAA are provided in the instructions below. A thorough reading of the DoD SBIR 23.4 Annual Program BAA, located at <https://www.defensesbirstr.mil/SBIR-STTR/Opportunities/> prior to reading these USSOCOM instructions is highly recommended. The Offeror is responsible for ensuring that their proposal complies with the requirements in the most current version of these instructions. Prior to submitting your proposal, please review the latest version of these instructions as they are subject to change before the submission deadline.

The Government may withdraw from negotiations at any time for any reason to include matters of national security (foreign persons, foreign influence or ownership, inability to clear the firm or personnel for security clearances, or other related issues).

The USSOCOM SBIR/STTR Program Office will be hosting a virtual USSOCOM Industry Day to further specify requirements and stimulate small business/research institute partnership-building. Please visit <https://events.sofwerx.org/sbir23-4r2/> for date and time information.

This release contains an open topic. As outlined in section 7 of the SBIR and STTR Extension Act of 2022, innovation open topic activities—

- (A) Increase the transition of commercial technology to the Department of Defense;
- (B) Expand the small business nontraditional industrial base;
- (C) Increase commercialization derived from investments of the Department of Defense; and
- (D) Expand the ability for qualifying small business concerns to propose technology solutions to meet the needs of the Department of Defense.

Unlike conventional topics, which specify the desired technical objective and output, open topics can use generalized mission requirements or specific technology areas to adapt commercial products or solutions to close capability gaps, improve performance, or provide technological advancements in existing capabilities.

A small business concern may only submit one (1) proposal to each open topic. If more than one proposal from a small business concern is received for a single open topic, only the most recent proposal to be certified and submitted prior to the submission deadline will receive an evaluation. All prior proposals

submitted by the small business concern for the same open topic will be marked as nonresponsive and will not receive an evaluation.

PHASE I PROPOSAL GUIDELINES

The Defense SBIR/STTR Innovation Portal (DSIP) is the official portal for DoD SBIR/STTR proposal submission. Offerors are required to submit proposals via DSIP; proposals submitted by any other means will be disregarded. Detailed instructions regarding registration and proposal submission via DSIP are provided in the DoD SBIR Program BAA.

Proposal Volumes are key in the qualification of the proposal. Offerors shall complete each of the following volumes: (1) Cover Sheet, (2) Technical Volume, (3) Cost Volume, (4) Company Commercialization Report, (5) PowerPoint Quad Chart, and (6) Fraud, Waste and Abuse Training.

Please Note:

1. It is the Offeror's responsibility to make sure all DoD and USSOCOM instructions are followed, and proper documentations is submitted. The DSIP (DoD's SBIR/STTR proposal submission website) will NOT be able to ensure your submission is in accordance with both DoD and USSOCOM instructions. The DSIP notice "100% submitted" means that the upload process is complete; it does NOT mean the proposal submission complies with the stated instructions and that all required documents are successfully uploaded.
2. USSOCOM doesn't assist Offerors with proposal preparation nor does USSOCOM review of proposals for completeness. We recommend you use your local and state resources for assistance. (See DoD Program BAA for resources information.)
3. USSOCOM has encountered issues while downloading proposals due to lengthy file names. The Offeror shall not use more than 20 characters to include spaces in any of the proposal documents titles.
4. **USSOCOM prohibits a Government Letter of Support (LoS). Any Government LoS provided will deem the proposal to be non-responsive (Disqualified).**

Cover Sheet (Volume 1)

Volume 1 is created as part of the DoD proposal submission process in DSIP. Follow all instructions provided in the DoD SBIR Program BAA and DSIP. Offerors are advised that a URL and UEI must be provided in the Firm Information section of the Firm Registration in DSIP.

Technical Volume (Volume 2)

The Technical Volume is not to exceed 5 pages and must follow the formatting requirements provided in the DoD SBIR Program BAA titled "Format of Technical Volume (Volume 2)". USSOCOM will only evaluate the first five (5) pages of the Technical Volume. Additional pages will not be considered or evaluated.

Content of the Technical Volume:

Required items are specified in the DoD SBIR Program BAA Phase I Technical Volume instructions section titled "Content of the Technical Volume 2". To access the template, please go to <https://www.defensesbirsttr.mil/SBIR-STTR/Opportunities/> then scroll to the bottom of the page and click on the third tab titled "Supporting Documents and Attachments". At the bottom of the list, select the document titled "Phase I Technical (Vol 2) Sample Template".

Contract Data Requirement Lists (CDRLs): CDRLs identifies which data products must be delivered by the contractor to the Government. Please make sure you read all required CDRLs requirements (each using a

DD Form 1423-1) prior to developing your proposal. All five of the required Phase I CDRLs are available on <https://www.socom.mil/SOF-ATL/Pages/SBIR.aspx>.

The identification of foreign national involvement in a USSOCOM SBIR topic is needed to determine if a firm is ineligible for award on a USSOCOM topic that falls within the parameters of the United States Munitions List, Part 121 of the International Traffic in Arms Regulation (ITAR). A firm employing a foreign national(s) (as defined in section titled “Foreign Nationals” of the DoD SBIR Program BAA) to work on a USSOCOM ITAR topic must possess an export license to receive a SBIR Phase I contract.

Cost Volume (Volume 3)

The Phase I Base amount must not exceed **\$175,000.00**. Costs must be identified on the Proposal Cover Sheet (Volume 1) and in Volume 3. Once the proposal is initiated in DSIP, the Offeror will have access to the required USSOCOM specific Cost Volume instructions and template.

A minimum of 67% of the research and/or analytical work in Phase I must be conducted by the proposing firm. The percentage of work is measured by both direct and indirect costs as a percentage of the total contract cost.

Please review the updated Percentage of Work (POW) calculation details included in section 5.3 of the DoD Program BAA. USSOCOM will not accept any deviation to the POW requirements on these Phase I topics.

The cost volume template (volume 3 template) is located on DSIP and <https://www.socom.mil/SOF-ATL/Pages/SBIR.aspx>.

Company Commercialization Report (CCR) (Volume 4)

Completion of the CCR in Volume 4 of the proposal submission in DSIP is required. Please refer to the DoD SBIR Program BAA for full details on this requirement. Information contained in the CCR will be considered by USSOCOM during proposal evaluations.

Supporting Documents (Volume 5)

In addition to the documentation outlined in the DoD SBIR Annual BAA, the following documents must also be included with Volume 5: (1) Power Point Quad Chart, (2) Section K, and (3) Resumes.

Note: If you can't find a proper “volume” or “selection” in DSIP, please attach under “Other”.

1. PowerPoint Quad Chart: Potential Offerors shall submit a one slide Power Point quad chart. The Quad Chart is intended to describe a preliminary assessment of the SBIR Phase I feasibility proposal. The quad chart shall follow the below requirements:
 - a. Number of pages – 1
 - b. Font – Times New Roman, 11 Point (or in size relevance to)
 - c. Page orientation – landscape
 - d. Paper size – 8.5 x 11 inch
 - e. Upper left quad – Pictorial data or representation and topic number and description.
 - f. Upper right quad – Description of effort and perceived benefits
 - g. Lower left quad – Summary cost data; labor, materials, and subcontracting
 - h. Lower right quad – Project schedule and milestones
2. Section K: If Section K is not submitted with the proposal, the proposal will still be considered responsive, but the completed Section K shall be required at the time of award.

3. Resumes: Include resumes.

Fraud, Waste and Abuse Training (Volume 6)

Fraud, Waste and Abuse (FWA) training is required for Phase I proposals. Please refer to the DoD SBIR/STTR Program BAA instructions for full details.

DISCRETIONARY TECHNICAL AND BUSINESS ASSISTANCE (TABA)

USSOCOM does not provide Discretionary Technical and Business Assistance for Phase I awards.

INQUIRIES

USSOCOM does not allow direct communication with the topic authors (differs from the DoD SBIR/STTR Program BAA instructions).

During the Pre-Release and Open Periods of the DoD SBIR Program BAA, all questions must be submitted to the online Defense SBIR/STTR Innovation Portal (DSIP) Topic Q&A. All questions and answers submitted to DSIP Topic Q&A will be released to the general public. USSOCOM does NOT allow inquirers to communicate directly in any manner to the topic authors (differs from the DoD SBIR Program BAA instructions). Only questions pertaining to the proposal preparation instructions should be directed to: sbir@socom.mil. All inquiries must include the topic number in the subject line of the e-mail.

Consistent with DoD SBIR instructions, USSOCOM will not answer programmatic questions, such as who the technical point of contact is, the number of contracts to be awarded, the source of funding, transition strategy.

Physical site visits will not be permitted during the Pre-release and Open Periods of the DoD SBIR Program BAA.

EVALUATION AND SELECTION

All Offerors will be evaluated in accordance with the evaluation criteria listed in the DoD SBIR Program BAA, with the following exceptions:

1. Proposals missing any of the six stated volumes, or those that do not comply with the requirement of the percentage of work (67%) to be executed by the proposing firm, or those proposals that exceed the maximum price allowed as per Table 1 of these instructions, will be considered non-responsive. Non-responsive proposals will not be evaluated.
2. The technical evaluation will use the Evaluation Criteria provided in DoD SBIR Program BAA instructions for this topic. The Technical Volume and Power Point quad chart will be reviewed holistically. Once the evaluations are complete, all Offerors will be notified in a timely manner.
3. In addition to the price evaluation the Government evaluation team will assess the elements of cost on those proposals recommended for funding.

Additionally, input on technical aspects of the proposals may be solicited by USSOCOM from non-Government consultants and advisors who are bound by appropriate non-disclosure requirements. When appropriate, non-Government advisors may have access to Offeror's proposals and may be utilized to objectively review a proposal in a particular functional area and provide comments and recommendations to the Government's decision makers. They may not establish final assessments of risk, or rate or rank Offerors' proposals. All advisors shall comply with procurement Integrity Laws and shall sign Non-

Disclosure and Rules of Conduct/Conflict of Interest statements. The Government shall take into consideration requirements for avoiding conflicts of interest. Submission of a proposal in response to this request constitutes approval to release the proposal to Government support contractors.

Offerors will be notified of selection or non-selection status for a Phase I award within 90 days of the closing date of this BAA topic by the USSOCOM Contracting Office. This notification will come by e-mail to the Corporate Official identified by the Offeror during proposal submission. The Government will also notify the Offerors if their proposal is considered non-responsive (disqualified).

A non-selected Offeror can make a written request to the Contracting Officer, within 30 calendar days of receipt of notification of non-selection, for informal feedback. The Contracting Officer will provide informal feedback after receipt of an Offeror's written request rather than a debriefing as specified in the DoD SBIR Program BAA instructions.

Refer to the DoD SBIR Annual BAA for procedures to protest the Announcement.

As further prescribed in FAR 33.106(b), FAR 52.233-3, Protests after Award should be submitted to: sbir@socom.mil.

PATH TO PHASE II

Phase II proposals may only be submitted by Phase I awardees. In the event that the Phase II of a topic is cancelled, Phase I awardees will be informed by USSOCOM and Phase II proposals will not be accepted. To obtain the Phase II requirements, refer to the Contract Data Requirements List (CDRL) A004. The Final Report will be due on or before 6 months of the start of the Period of Performance (PoP) In Accordance With (IAW) CDRL A003. Your Phase II proposal will be due on or before the 195th day of the start of the PoP IAW CDRL A005.

All CDRLs are available on <https://www.socom.mil/SOF-ATL/Pages/SBIR.aspx>. There are two different attachments for CDRL 5. Please refer to the section titled "Award and Contract Information" for the contracting path pertaining to the topic.

The Government reserves the right to issue any of the following type of awards for Phase II:

1. FAR type contract
2. Non-FAR based fixed price (level of effort type):
 - a. Other Transactions Agreements (OTA). Successful completion of the prototype under an OTA may result in a follow-on production OTA or contract. Successful completion of the prototype is defined as meeting one or more threshold requirements.
 - b. USSOCOM may use a partnership intermediary to award SBIR/STTR contracts and agreements to small business concerns. This may be done through USSOCOM's intermediary partner, SOFWERX (www.SOFWERX.org) resulting in a commercial contract between the firm and DEFENSEWERX. The is authorized by the National Defense Authorization Act (NDAA) for Fiscal Year 2022, Section 852, MODIFICATION OF PILOT PROGRAM FOR DEVELOPMENT OF TECHNOLOGY- ENHANCED CAPABILITIES WITH PARTNERSHIP INTERMEDIARIES. The Government will conduct the evaluation and select the proposals to be funded for award.

AWARD AND CONTRACT INFORMATION

Table 1: Consolidated SBIR Topic Information

| Topic | Technical Volume (Vol 2) | Additional Info. (Vol 5) | Period of Performance | Award Amount | Contract Type |
|---------------------------------|---------------------------------|---------------------------------|------------------------------|---------------------|----------------------|
| <i>Phase I</i> SOCOM234-P002 | Not to exceed 5 pages | Quad Chart – 1 Page | Not to exceed 7 months | NTE \$175,000.00 | Firm-Fixed- Price |

The Government will conduct evaluations and selections for SBIR Phase I topic award(s) listed in this BAA. SOCOM234-P002 awards will be made by USSOCOM SBIR Contracting Officer.

ADDITIONAL INFORMATION

Phase I proposals shall NOT include:

- 1) Any travel for Government meetings. All meetings with the Government will be conducted via electronic media.
- 2) Government furnished property or equipment.
- 3) Priced or Unpriced Options.
- 4) “Basic Research” (or “Fundamental Research”) defined as a “Systematic study directed toward greater knowledge or understanding of the fundamental aspects of phenomena and/or observable facts without specific applications toward processes or products in mind.”
- 5) Discretionary Technical and Business Assistance (TABAs)

SOCOM SBIR 23.4 Topic Index
Release 2

SOCOM234-P002

Open Topic for Family of Special Operations Vehicles

The technologies within these topics that are restricted under the International Traffic in Arms Regulation (ITAR), which controls the export and import of defense-related material and services, require Offerors to disclose any proposed use of foreign nationals, their country of origin, and what tasks each would accomplish in the statement of work in accordance with the solicitation. Additionally, Offerors will describe compliance mechanisms, offerors have in place or will put in place, to address any ITAR issues that arise during the course of agreement administration.

OBJECTIVE: The objective of this SBIR Open Topic is to develop **applied research** toward an innovative capability within USSOCOM Program Offices. The following are the **Program Offices** and their areas of interest.

DESCRIPTION:

The objective of this SBIR Open Topic is to develop **applied research** toward an innovative capability within USSOCOM Family of Special Operations Vehicles (FOSOV) Program Offices.

Computer dependency is becoming a foundation of vehicle development. In 2015, Digital Trends Magazine posted an article stating that the Ford GT has close to 3 million more lines of code than a Boeing 787 Airliner. These additional lines of code translate to additional overhead in physical space, programming, sustainment, safety and security. With vehicle trends moving more towards electric vehicles, to include military vehicles, industry is introducing new attack vectors for highly motivated and resourced enemies. This increases the demand for military vehicles to address the growing cyber threat within all environments. The technology areas of interest aim at addressing these attack vectors and exploring options to seamlessly integrate applicable technologies into Team Awareness Kit.

PROGRAM OFFICE: Family of Special Operations Vehicles (FOSOV)

The technology areas of interests are:

1. Navigation and Team Awareness Kit Integration: Inertial navigation systems within vehicles, vehicle positioning based on vehicle speed, steering and internal CANbus data, processing data from the Onboard Diagnostics II port, Global Positioning System integration, Artificial Intelligence/Machine Learning (AI/ML), Team Awareness Kit, telematics and cybersecurity.
2. Force Protection: Onboard Diagnostics II port, CANbus, Global Positioning System, Wi-Fi, on-board entertainment (infotainment) and information, facial recognition prevention, license plate obfuscation, smart city data protection, residual and stored data from previous users, Command, Control, Computers, Communications, Cyber, Intelligence, Surveillance and Reconnaissance (C5ISR), Fly Away Kits, Special Operation Forces (SOF) peculiar devices and cybersecurity. Platforms may include indigenous operating vehicles (IOVs) of Special Operations modified Commercial Vehicles (Non-Standard Commercial Vehicles or NSCV).
3. Open Architecture Electronic Control Unit: The technology areas of interest are original equipment manufacturer (OEM) electronic control unit (ECU), Government owned ECU, onboard vehicle systems. (Traction control, GPS transmission, onboard telematics, prognostics, vehicle skid control, antilock brakes, airbag operation, fuel shutoff, limp home mode, exterior light output). vehicle type, make and model independence and cybersecurity.
 - i) Navigation and Team Awareness Kit Integration: Internal navigation system to navigate in Compromised, unreliable, and denied environment, deciphering vehicle position such as

based on input of a known location, calculating movement and positioning based on vehicle speed, steering and direction, AI/ML to identify patterns of errors in vehicle data and correct errors to increase accuracy of location; detect and alert the user in real time of Global Positioning System jamming and/or interference. Navigation system data will be formatted and passed to integrate seamlessly with the on-board vehicle Team Awareness Kit to provide feedback for all occupants. The innovative research should focus beyond analyzing Global Positioning System -like data to discover other capabilities and opportunities to utilize onboard vehicle data for future capabilities and includes all viable system design options with respective specifications provided.

- ii) Force Protection: The sensor should plug into the Onboard Diagnostics II port, read data on the CANbus, ensure data and mission integrity, and communicate cyber risk to the operator while allowing them to manually disable telematics, such as Global Positioning System, Wi-Fi, on-board information and entertainment (“infotainment” systems”) on the fly. The sensor should include options to prevent facial recognition through the windshield, prevent recording data from the license plate and provide protections in an urban operating environment to include smart cities. The result of this topic should describe mechanisms disallowing a vehicle operator the ability to pull a previous operator’s data that has been recorded and stored onboard the vehicle. the Phase I report must present the integration of carry-on and carry-off Command, Control, Computers, Communications, Cyber, Intelligence, Surveillance and Reconnaissance (C5ISR) equipment to include radios, and amplifiers with vehicle systems.
- iii) Open Architecture Electronic Control Unit: Implement SOCOM’s unique requirements to selectively enable and/or disable standard vehicle features (traction control, GPS transmission, onboard telematics, prognostics, vehicle skid control, antilock brakes, airbag operation, fuel shutoff, limp home mode, exterior light output). Develop open architecture ECU that replaces the restrictive OEM ECUs. This will replace the process of “hacking” OEM ECUs in order to meet Non-Standard Commercial Vehicle requirements. This topic includes all viable system design options with respective specifications provided.

Note: Please make sure to read the USSOCOM Instructions in full detail at <https://www.defensesbirsttr.mil/SBIR-STTR/Opportunities/> at the bottom of the page under the tab titled “DoD SBIR 23.4 Annual”

PHASE I: Conduct a feasibility study to assess what is in the art of the possible that satisfies the requirements specified in the above paragraphs entitled “Objective” and “Description.”

The objective of this USSOCOM Phase I SBIR effort is to conduct and document the results of a thorough feasibility study (“Technology Readiness Level 3”) to investigate what is in the art of the possible within the given trade space that will satisfy a needed technology. The feasibility study should investigate all options that meet or exceed the minimum performance parameters specified in this write up. It should address the risks and potential payoffs of the innovative technology options that are investigated and recommend the option that best achieves the objective of this technology pursuit. The funds obligated on the resulting Phase I SBIR contracts are to be used for the sole purpose of conducting a thorough feasibility study using scientific experiments and laboratory studies as necessary. Operational prototypes will not

be developed with USSOCOM SBIR funds during Phase I feasibility studies. Operational prototypes developed with other than SBIR funds that are provided at the end of Phase I feasibility studies will not be considered in deciding what firm(s) will be selected for Phase II.

A Phase II proposal is expected at the conclusion of the Phase I effort.

PHASE II: Develop, install, and demonstrate a prototype system determined to be the most feasible solution during the Phase I feasibility study.

PHASE III DUAL USE APPLICATIONS: This system could be used in a broad range of military and commercial applications.

REFERENCES:

1. Modernization Strategy: Investing in the Future from https://www.army.mil/e2/downloads/rv7/2019_army_modernization_strategy_final.pdf (Army, 2019)
2. Department of Defense National Defense Strategy of 2022 found at <https://media.defense.gov/2022/Oct/27/2003103845/-1/-1/1/2022-NATIONAL-DEFENSE-STRATEGY-NPR-MDR.PDF> (Department of Defense, 2022)
3. National Cybersecurity Strategy from <https://www.whitehouse.gov/wp-content/uploads/2023/03/National-Cybersecurity-Strategy-2023.pdf> (White House, 2023)

KEYWORDS: Ground Combat Vehicles (GCV), Non Standard Commercial Vehicles (NSCV), electronics, On Board Diagnostics II, Global Positioning System, vehicle data, telematics, maintenance predictions, cybersecurity, Team Awareness Kit, Fly-Away Kits, Wi-Fi, infotainment, smart city, urban mission profile, Indigenous operating vehicle, Electronic Control Unit (ECU)

UNITED STATES SPECIAL OPERATIONS COMMAND
23.4 Small Business Innovation Research (SBIR)
Phase I Proposal Submission Instructions
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Join us for a virtual Q&A with our Technical Point of Contact
July 20, 2023, from 13:00 (1PM) – 14:00 (2PM) ET

INTRODUCTION

The United States Special Operations Command (USSOCOM) seeks small businesses with strong research and development capabilities to pursue and commercialize technologies needed by Special Operations Forces through the Department of Defense (DoD) SBIR 23.4 Program Broad Agency Announcement (BAA).

Offerors responding to a topic in this BAA must follow all general instructions provided in the DoD SBIR Program BAA. USSOCOM requirements in addition to or deviating from the DoD Program BAA are provided in the instructions below. A thorough reading of the “SBIR 23.4 Annual Program BAA – Amendment 2”, located at <https://www.defensesbirstr.mil/SBIR-STTR/Opportunities/> prior to reading these USSOCOM instructions is highly recommended. The Offeror is responsible for ensuring that their proposal complies with the requirements in the most current version of these instructions. Prior to submitting your proposal, please review the latest version of these instructions as they are subject to change before the submission deadline.

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The USSOCOM SBIR/STTR Program Office will be hosting a virtual USSOCOM Industry Day on July 20th, 2023 to further specify requirements and stimulate small business/research institute partnership-building. Please visit <https://events.sofwerx.org/sbir23-4r3/> for additional information and to sign up.

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Please Note:

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instructions. The DSIP notice “100% submitted” means that the upload process is complete; it does NOT mean the proposal submission complies with the stated instructions and that all required documentation is successfully uploaded.

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Cover Page (Volume 1)

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The technical volume is not to exceed five (5) pages and must follow the formatting requirements provided in the “SBIR 23.4 Annual Program BAA – Amendment 2”, “Format of Technical Volume” and “Content of Technical Volume”. USSOCOM will only evaluate the first (5) pages of the Technical Volume, additional pages will not be considered or evaluated.

Content of the Technical Volume

Required items are specified in the DoD SBIR Program BAA Phase I Format of Technical Volume instructions, reference <https://www.defensesbirsttr.mil/SBIR-STTR/Opportunities/> then scroll to the bottom of the page and click on the tab titled “Supporting Documents and Attachments”. At the bottom of the list, select the document titled “Phase I Technical (Vol 2) Sample Template”.

Contract Data Requirement Lists (CDRLs): CDRLs identifies which data products must be delivered by the contractor to the Government. Please make sure you read all required CDRLs requirements (each using a DD Form 1423-1) prior to developing your proposal. All five of the required Phase I CDRLs are available on <https://www.socom.mil/SOF-ATL/Pages/SBIR.aspx>.

Cost Volume (Volume 3)

The Phase I Base amount must not exceed \$175,000.00 Costs must be identified on the Proposal Cover Sheet (Volume 1) and in Volume 3. Once the proposal is initiated in DSIP the Offeror will have access to the required USSOCOM specific Cost Volume instructions and template.

A minimum of 67% of the research and/or analytical work in Phase I must be conducted by the proposing firm. The percentage of work is measured by both direct and indirect costs as a percentage of the total contract cost.

Please review the updated Percentage of Work (POW) calculation details included in section 5.3 of the DoD Program BAA. USSOCOM will not accept any deviation to the POW requirements on these Phase I topics.

The cost volume template (volume 3 template) is located on DSIP during proposal submission and <https://www.socom.mil/SOF-ATL/Pages/SBIR.aspx>.

Company Commercialization Report (CCR) (Volume 4)

Completion of the CCR Volume 4 of the proposal submission in DSIP is required. Please refer to the DoD SBIR Program BAA for full details on this requirement. Information contained in the CCR will be considered by USSOCOM during proposal evaluations.

Supporting Documents (Volume 5)

All proposing small business concerns are REQUIRED to submit the following documents to Volume 5:

1. Contractor Certification Regarding Provision of Prohibition on Contracting for Certain Telecommunications and Video Surveillance Services or Equipment (BAA Attachment 1)
2. Disclosures of Foreign Affiliations or Relationships to Foreign Countries (BAA Attachment 2)
3. Disclosure of Funding Sources (BAA Attachment 4)

The Verification of Eligibility of Small Business Joint Ventures (BAA Attachment 3), is required if applicable to the proposing small business.

In addition to the documents listed above, the following USSOCOM documents are REQUIRED:

1. PowerPoint Presentation: Potential Offerors must submit a slide deck **not to exceed 15 PowerPoint slides** (inclusive of the cover sheet). The presentation shall not have any videos or links to videos. There is no set format for this document. It is recommended (but not required) that more detailed information is included in the technical volume and higher-level information be included in the slide deck, suitable for a possible presentation. Refer to the "Phase I Evaluations" Section of this instruction for more details. The optimal place to add this is under the "Other" section of DSIP.
2. Section K - Titled "Representations, Certifications, and other statements of Offerors": If Section K is not submitted with the proposal, the proposal will still be considered responsive, but the completed Section K shall be required at the time of award. Section K is available at <https://www.socom.mil/SOF-ATL/Pages/SBIR.aspx>.
3. Resumes: Include resumes.

A completed proposal submission in DSIP does NOT indicate that the mandatory supporting documents have been uploaded. It is the responsibility of the proposing small business concern to ensure that the mandatory documents listed above have been uploaded and included with the proposal submission.

Fraud, Waste and Abuse Training (Volume 6)

Fraud, Waste and Abuse (FWA) training is required for Phase I proposals. Please refer to the DoD SBIR Program BAA instructions for full details.

DISCRETIONARY TECHNICAL AND BUSINESS ASSISTANCE (TABAs): USSOCOM does not provide Discretionary Technical and Business Assistance for Phase I awards.

INQUIRIES: USSOCOM does not allow direct communication with the topic authors (differs from the DoD SBIR Program BAA instructions).

During the Pre-Release and Open Periods of the DoD SBIR Program BAA, only and all technical questions that enhance the Offerors understanding of the topic's requirements must be submitted to the online Defense SBIR/STTR Innovation Portal (DSIP) Topic Q&A. All questions and answers submitted to DSIP Topic Q&A will be released to the general public.

USSOCOM does NOT allow inquirers to communicate directly in any manner to the topic authors (differs from the DoD STTR Program BAA instructions). Only questions pertaining to the proposal preparation instructions should be directed to: sbir@socom.mil. All inquiries must include the topic number in the subject line of the e-mail.

Consistent with DoD SBIR instructions, USSOCOM will not answer programmatic questions, such as who the technical point of contact is, the number of contracts to be awarded, the source of funding, transition strategy.

Physical site visits will not be permitted during the Pre-release and Open Periods of the DoD SBIR Program BAA.

EVALUATION AND SELECTION

All proposals will be evaluated in accordance with the evaluation criteria listed in the DoD SBIR Program BAA, with the following exceptions:

1. Proposals missing any of the six stated volumes, or those that do not comply with the requirement of the percentage of work (67%) to be executed by the proposing firm, or those proposals that exceed the maximum price allowed as per Table 1 of these instructions, will be considered non-responsive. Non-responsive proposals will not be evaluated.
2. The technical evaluation will utilize the Evaluation Criteria provided in DoD SBIR Program BAA instructions. The Technical Volume and PowerPoint Presentation slide deck will be reviewed holistically.

The technical evaluation is performed in two parts:

Part I: The evaluation of the Technical Volume will utilize the Evaluation Criteria provided in the DoD SBIR Program BAA. Once the evaluations are complete, all Offerors will be notified in a timely manner.

Part II: Selected offerors **may** receive an invitation to present their slide deck (30-minute presentation time/30-minute Government question and answer period) to the USSOCOM technical evaluation team, using virtual teleconference. This will be a technical presentation of the proposed solution **ONLY**. The key personnel listed in the proposal should represent the presentation and responding to the questions of the evaluation team. This presentation is NOT intended for business development personnel, it is purely technical. Selected offerors shall restrict their Pitch Day presentations to the 15-page PowerPoint presentation submitted with the respective proposals. There will be no changes or updates to the presentations from what was proposed. This presentation will complete the evaluation of the proposal against the criteria listed in the DoD SBIR Program BAA.

3. The Cost Volume (Volume 3) evaluation:
For this Phase I, the award amount is set at a not to exceed (NTE) amount and a technical evaluation of the proposal cost will be completed to assess price fair and reasonableness. The team will assess the technical approach presented for the effort based on the number of labor hours by labor categories, the key personnel level of involvement, materials, subcontractors, and consultants (scope of work, expertise, participation, and proposed effort), and other direct cost as proposed.
4. In accordance with S.4900 SBIR/STTR Reauthorization, USSOCOM will conduct a security due diligence on cybersecurity practices, patent analysis, employee analysis, foreign ownership of offerors, and financial ties and obligations for every offeror.

Additionally, input on technical aspects of the proposals may be solicited by USSOCOM from non-Government consultants and advisors who are bound by appropriate non-disclosure requirements. When appropriate, non-government advisors may have access to Offeror's proposals and may be utilized to objectively review a proposal in a particular functional area and provide comments and recommendations to the Government's decision makers. They may not establish final assessments of risk, or rate or rank Offerors' proposals. All advisors shall comply with procurement Integrity Laws and shall sign Non-Disclosure and Rules of Conduct/ Conflict of Interest statements. The Government shall take into consideration requirements for avoiding conflicts of interest. Submission of a proposal in response to this request constitutes approval to release the proposal to Government support contractors.

Offerors will be notified of selection or non-selection status for a Phase I award within 90 calendar days of the closing date of the BAA by the USSOCOM Contracting Office. This notification will come by e-mail to the Corporate Official identified by the Offeror during proposal submission. The Government will also notify the Offerors if their proposal is considered non-responsive (disqualified).

A non-selected Offeror can make a written request to the Contracting Officer, within 30 calendar days of receipt of notification of non-selection, for informal feedback. The Contracting Officer will provide informal feedback after receipt of an Offeror's written request rather than a debriefing as specified in the DoD SBIR Program BAA instructions.

Refer to the DoD SBIR Program BAA for procedures to protest the Announcement.

As further prescribed in FAR 33.106(b), FAR 52.233-3, Protests after Award should be submitted to: sbir@socom.mil.

PATH TO PHASE II

If awarded a Phase I, the Small Business will automatically be invited to propose a Phase II proposal, unless otherwise informed by USSOCOM. To obtain the Phase II requirements, refer to the Contract Data Requirements List (CDRL) A004. The Final Report will be due on or before 6 months of the start of the Period of Performance (PoP) In Accordance With (IAW) CDRL A003. Your Phase II proposal will be due on or before the 195th day of the start of the PoP IAW CDRL A005.

All CDRLs are available on <https://www.socom.mil/SOF-ATL/Pages/SBIR.aspx>. There are two different attachments for CDRL 5. Please refer to the section titled "Award and Contract Information" for the contracting path pertaining to the topic.

The Government reserves the right to issue any of the following type of awards for Phase II:

1. FAR type contract

2. Non-FAR based fixed price (level of effort type):
 - a. Other Transactions Agreements (OTA). Successful completion of the prototype under an OTA may result in a follow-on production OTA or contract. Successful completion of the prototype is defined as meeting one or more threshold requirements.
 - b. USSOCOM may use a partnership intermediary to award SBIR/STTR contracts and agreements to small business concerns. This may be done through USSOCOM's intermediary partner, SOFWERX (www.SOFWERX.org) resulting in a commercial contract between the firm and DEFENSEWERX. The is authorized by the National Defense Authorization Act (NDAA) for Fiscal Year 2022, Section 852, MODIFICATION OF PILOT PROGRAM FOR DEVELOPMENT OF TECHNOLOGY- ENHANCED CAPABILITIES WITH PARTNERSHIP INTERMEDIARIES. The Government will conduct the evaluation and select the proposals to be funded for award.

AWARD AND CONTRACT INFORMATION

Table 1: Consolidated SBIR Topic Information

| Topic | Technical Volume (Vol 2) | Additional Info. (Vol 5) | Period of Performance | Award Amount | Contract Type |
|--------------------------------|---------------------------------|---------------------------------|------------------------------|---------------------|----------------------|
| <i>Phase I</i> SOCOM234-003 | Not to exceed 5 pages | 15 page PowerPoint | Not to exceed 7 months | NTE \$175,000 | Firm-Fixed- Price |

The Government will conduct evaluations and selections for SBIR Phase I topic award(s) listed in this BAA.

Awards for SOCOM234-003 may be made under the authority of National Defense Authorization Act (NDAA) for Fiscal Year 2022, Section 852, MODIFICATION OF PILOT PROGRAM FOR DEVELOPMENT OF TECHNOLOGY- ENHANCED CAPABILITIES WITH PARTNERSHIP INTERMEDIARIES. USSOCOM may use a partnership intermediary to award SBIR/STTR contracts and agreements to small business concerns. The stated topics SBIR contract awards may be done through SOFWERX and result in a commercial contract between the firm and DEFENSEWERX. The Government will conduct the evaluation and select the proposals to be funded for award.

ADDITIONAL INFORMATION

Phase I proposals shall NOT include:

- 1) Any travel for Government meetings. All meetings with the Government will be conducted via electronic media.
- 2) Government furnished property or equipment.
- 3) Priced or Unpriced Options.
- 4) "Basic Research" (or "Fundamental Research") defined as a "Systematic study directed toward greater knowledge or understanding of the fundamental aspects of phenomena and/or observable facts without specific applications toward processes or products in mind."
- 5) Human or animal studies.
- 6) Discretionary Technical and Business Assistance (TABAs)

**SOCOM SBIR 23.4 Topic Index
Release 3**

SOCOM234-003

Visual Augmentation Systems (VAS) Range Finder

SOCOM234-003

TITLE: Visual Augmentation Systems (VAS) Range Finder

OUSD (R&E) CRITICAL TECHNOLOGY AREA(S): Trusted AI and Autonomy; Advanced Computing and Software; Integrated Sensing and Cyber; Microelectronics; Human-Machine Interfaces

The technologies within these topics that are restricted under the International Traffic in Arms Regulation (ITAR), which controls the export and import of defense-related material and services, require Offerors to disclose any proposed use of foreign nationals, their country of origin, and what tasks each would accomplish in the statement of work in accordance with the solicitation. Additionally, Offerors will describe compliance mechanisms that they have in place or will put in place, to address any ITAR issues that arise during the course of agreement administration.

OBJECTIVE:

SOF ground forces require an improved capability for situational awareness allowing reliable and effective day/night observation and range measurement in a small, low-cost, easy to use device in primarily urban or near-urban environments with ambient light sources.

Current observation and range measurement solutions possess the following requirements:

- requires digital integration
- requires low-light or night capability
- Too large
- Cost prohibitive
- Require active emission of laser energy
- Lack user-assistance, limiting the effective range
- Lack feedback mechanisms that allow the user to be sure of their measurement

IMPORTANT: For SOCOM instructions: please visit: <https://www.defensesbirsttr.mil/SBIR-STTR/Opportunities/>. Go to the bottom of the page and click "DoD SBIR 23.4 Annual". Once there, go to the SOCOM SBIR 23.4 Release 3.

DESCRIPTION:

Potential solutions should hyper enable the SOF operator by interrogating a potential target with its integrated sensors, organizing that gathered information in a useful manor, and reliably disseminating it via Tactical Assault Kit (TAK) interface to the End User Device (EUD).

Potential solutions include integrated sensing solutions capable of aiding the user in detecting human sized targets at the maximum possible distance for both day and night urban environments. Solutions must enable the user to gather range measurements to target types that include, but are not limited to humans, vehicles and buildings. Solutions utilizing a laser transmitter for range measurement must maintain user safety by using a laser with wavelength greater than 1400 nanometers and also by not exceeding the American National Standards Institute (ANSI) Class 1 laser hazard classification.

Potential solutions shall be capable of surviving all environments that SOF encounters, including immersion, transportation vibration, high and low temperatures, high humidity, high altitude, drops and

shocks, rain, ice, sand and dust, salt fog, and electromagnetic radiation. Participants are encouraged to outline the design trades associated with surviving immersion at 1 meter for 30 minutes.

The innovative research should focus on solutions that can be adapted to meet the size, weight, and power (SWaP) constraints listed below.

- Less than 18 oz. (1.125lbs) with power source(s) installed.
- Less than 64 cubic inches in volume, and not exceed 6 inches in either length, width, or height.
- Potential solutions must provide the operator with the following runtime profile before requiring a change of power source.
 - Daytime: 30 minutes of observation including 75 range measurements; and
 - Nighttime: 30 minutes of observation including 75 range measurements; and
 - 20 Rapid Ranging Events: A Rapid Ranging Event can be described as follows. User detects an object of interest while not using the device. User then picks up the device and utilizes its range measurement capability until user is confident, they have an accurate range measurement to the object of interest.

Clarifying Information: The purpose of this effort is not to generate precise target coordinates. For any target coordinates that the integrated sensing solution can generate, it should be able to communicate those digitally into TAK with all associated errors.

PHASE I: Conduct a feasibility study to assess what is in the art of the possible that satisfies the requirements specified in the above paragraphs entitled “Objective” and “Description.”

The objective of this USSOCOM Phase I SBIR effort is to conduct and document the results of a thorough feasibility study (“Technology Readiness Level 3”) to investigate what is in the art of the possible within the given trade space that will satisfy a needed technology. The feasibility study should investigate all options that meet or exceed the minimum performance parameters specified in this write up. It should address the risks and potential payoffs (including consequences to size, weight, power, and cost) of the innovative technology options that are investigated and recommend the option that best achieves the objective of this technology pursuit. The funds obligated on the resulting Phase I SBIR contracts are to be used for the sole purpose of conducting a thorough feasibility study using scientific experiments and laboratory studies as necessary. Operational prototypes will not be developed with USSOCOM SBIR funds during Phase I feasibility studies. Operational prototypes developed with other than SBIR funds that are provided at the end of Phase I feasibility studies will not be considered in deciding what firm(s) will be selected for Phase II.

A phase II proposal is expected at the conclusion of the Phase I effort.

PHASE II: Develop, install, and demonstrate a prototype system determined to be the most feasible solution during the Phase I feasibility study.

PHASE III DUAL USE APPLICATIONS: This system could be used in a broad range of military and commercial applications.

REFERENCES:

1. Tactical Assault Kit Website: <https://tak.gov/>
2. Butler, Michael. "The Developer's Guide to Cursor on Target." 2005, <https://apps.dtic.mil/sti/pdfs/ADA637348.pdf>.
3. Kristan, Michael J, et al. "Cursor on Target Message Router's Guide." Nov. 2009, https://www.mitre.org/sites/default/files/pdf/09_4937.pdf.

KEYWORDS: Range Finder, Range Measurement, Optics, Optical, Imaging, Imager, Camera, Night Vision, Visual Augmentation, Hyper Enabled Operator, Infrared, Low Light Level (LLL), Color Day, Urban Night, TAK, CMOS, Thermal, AI.

UNITED STATES SPECIAL OPERATIONS COMMAND
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Required items are specified in the DoD SBIR Program BAA Phase I Format of Technical Volume instructions, reference <https://www.defensesbirsttr.mil/SBIR-STTR/Opportunities/> then scroll to the bottom of the page and click on the tab titled "Supporting Documents and Attachments". At the bottom of the list, select the document titled "Phase I Technical (Vol 2) Sample Template".

Contract Data Requirement Lists (CDRLs): CDRLs identifies which data products must be delivered by the contractor to the Government. Please make sure you read all required CDRLs requirements (each using a DD Form 1423-1) prior to developing your proposal. All five of the required Phase I CDRLs are available on <https://www.socom.mil/SOF-ATL/Pages/SBIR.aspx>.

Cost Volume (Volume 3)

The Phase I Base amount must not exceed \$175,000.00 Costs must be identified on the Proposal Cover Sheet (Volume 1) and in Volume 3. Once the proposal is initiated in DSIP the Offeror will have access to the required USSOCOM specific Cost Volume instructions and template.

A minimum of 67% of the research and/or analytical work in Phase I must be conducted by the proposing firm. The percentage of work is measured by both direct and indirect costs as a percentage of the total contract cost.

Please review the updated Percentage of Work (POW) calculation details included in section 5.3 of the DoD Program BAA. USSOCOM will not accept any deviation to the POW requirements on these Phase I topics.

The cost volume template (volume 3 template) is located on DSIP during proposal submission and <https://www.socom.mil/SOF-ATL/Pages/SBIR.aspx>.

Company Commercialization Report (CCR) (Volume 4)

Completion of the CCR Volume 4 of the proposal submission in DSIP is required. Please refer to the DoD SBIR Program BAA for full details on this requirement. Information contained in the CCR will be considered by USSOCOM during proposal evaluations.

Supporting Documents (Volume 5)

All proposing small business concerns are REQUIRED to submit the following documents to Volume 5:

1. Contractor Certification Regarding Provision of Prohibition on Contracting for Certain Telecommunications and Video Surveillance Services or Equipment (BAA Attachment 1)
2. Disclosures of Foreign Affiliations or Relationships to Foreign Countries (BAA Attachment 2)
3. Disclosure of Funding Sources (BAA Attachment 4)
4. The Verification of Eligibility of Small Business Joint Ventures (BAA Attachment 3), is required if applicable to the proposing small business.

In addition to the documents listed above, the following USSOCOM documents are REQUIRED:

5. PowerPoint Presentation: Potential Offerors must submit a slide deck **not to exceed 15 PowerPoint slides** (inclusive of the cover sheet). The presentation shall not have any videos or links to videos. There is no set format for this document. It is recommended (but not required) that more detailed information is included in the technical volume and higher-level information be included in the slide deck, suitable for a possible presentation. Refer to the "Phase I Evaluations" Section of this instruction for more details. The optimal place to add this is under the "Other" section of DSIP.
6. Section K - Titled "Representations, Certifications, and other statements of Offerors": If Section K is not submitted with the proposal, the proposal will still be considered responsive, but the completed Section K shall be required at the time of award. Section K is available at <https://www.socom.mil/SOF-ATL/Pages/SBIR.aspx>.
7. Resumes: Include resumes.

A completed proposal submission in DSIP does NOT indicate that the mandatory supporting documents have been uploaded. It is the responsibility of the proposing small business concern to ensure that the mandatory documents listed above have been uploaded and included with the proposal submission.

Fraud, Waste and Abuse Training (Volume 6)

Fraud, Waste and Abuse (FWA) training is required for Phase I proposals. Please refer to the DoD SBIR Program BAA instructions for full details.

DISCRETIONARY TECHNICAL AND BUSINESS ASSISTANCE (TABA): USSOCOM does not provide Discretionary Technical and Business Assistance for Phase I awards.

INQUIRIES: USSOCOM does not allow direct communication with the topic authors (differs from the DoD SBIR Program BAA instructions).

During the Pre-Release and Open Periods of the DoD SBIR Program BAA, only and all technical questions that enhance the Offerors understanding of the topic's requirements must be submitted to the online Defense SBIR/STTR Innovation Portal (DSIP) Topic Q&A. All questions and answers submitted to DSIP Topic Q&A will be released to the general public.

USSOCOM does NOT allow inquirers to communicate directly in any manner to the topic authors (differs from the DoD STTR Program BAA instructions). Only questions pertaining to the proposal preparation instructions should be directed to: sbir@socom.mil. All inquiries must include the topic number in the subject line of the e-mail.

Consistent with DoD SBIR instructions, USSOCOM will not answer programmatic questions, such as who the technical point of contact is, the number of contracts to be awarded, the source of funding, transition strategy.

Physical site visits will not be permitted during the Pre-release and Open Periods of the DoD SBIR Program BAA.

EVALUATION AND SELECTION

All proposals will be evaluated in accordance with the evaluation criteria listed in the DoD SBIR Program BAA, with the following exceptions:

1. Proposals missing any of the six stated volumes, or those that do not comply with the requirement of the percentage of work (67%) to be executed by the proposing firm, or those proposals that exceed the maximum price allowed as per Table 1 of these instructions, will be considered non-responsive. Non-responsive proposals will not be evaluated.
2. The technical evaluation will utilize the Evaluation Criteria provided in DoD SBIR Program BAA instructions. The Technical Volume and PowerPoint Presentation slide deck will be reviewed holistically.

The technical evaluation is performed in two parts:

Part I: The evaluation of the Technical Volume will utilize the Evaluation Criteria provided in the DoD SBIR Program BAA. Once the evaluations are complete, all Offerors will be notified in a timely manner.

Part II: Selected offerors **may** receive an invitation to present their slide deck (30-minute presentation time/30-minute Government question and answer period) to the USSOCOM technical evaluation team, using virtual teleconference. This will be a technical presentation of the proposed solution **ONLY**. The key personnel listed in the proposal should represent the presentation and responding to the questions of the evaluation

team. This presentation is NOT intended for business development personnel, it is purely technical. Selected offerors shall restrict their Pitch Day presentations to the 15-page PowerPoint presentation submitted with the respective proposals. There will be no changes or updates to the presentations from what was proposed. This presentation will complete the evaluation of the proposal against the criteria listed in the DoD SBIR Program BAA.

3. The Cost Volume (Volume 3) evaluation:
For this Phase I, the award amount is set at a not to exceed (NTE) amount and a technical evaluation of the proposal cost will be completed to assess price fair and reasonableness. The team will assess the technical approach presented for the effort based on the number of labor hours by labor categories, the key personnel level of involvement, materials, subcontractors, and consultants (scope of work, expertise, participation, and proposed effort), and other direct cost as proposed.
4. As stated in the DoD Program BAA and in accordance with the SBIR and STTR Extension Act of 2022 (Pub. L. 117-183) , USSOCOM will conduct a security due diligence on cybersecurity practices, patent analysis, employee analysis, foreign ownership of offerors, and financial ties and obligations for every offeror. Please refer to the DoD Program BAA for additional information.

Additionally, input on technical aspects of the proposals may be solicited by USSOCOM from non-Government consultants and advisors who are bound by appropriate non-disclosure requirements. When appropriate, non-government advisors may have access to Offeror's proposals and may be utilized to objectively review a proposal in a particular functional area and provide comments and recommendations to the Government's decision makers. They may not establish final assessments of risk, or rate or rank Offerors' proposals. All advisors shall comply with procurement Integrity Laws and shall sign Non-Disclosure and Rules of Conduct/ Conflict of Interest statements. The Government shall take into consideration requirements for avoiding conflicts of interest. Submission of a proposal in response to this request constitutes approval to release the proposal to Government support contractors.

Offerors will be notified of selection or non-selection status for a Phase I award within 90 calendar days of the closing date of the BAA by the USSOCOM Contracting Office. This notification will come by e-mail to the Corporate Official identified by the Offeror during proposal submission. The Government will also notify the Offerors if their proposal is considered non-responsive (disqualified).

A non-selected Offeror can make a written request to the Contracting Officer, within 30 calendar days of receipt of notification of non-selection, for informal feedback. The Contracting Officer will provide informal feedback after receipt of an Offeror's written request rather than a debriefing as specified in the DoD SBIR Program BAA instructions.

Refer to the DoD SBIR Program BAA for procedures to protest the Announcement.

As further prescribed in FAR 33.106(b), FAR 52.233-3, Protests after Award should be submitted to: sbir@socom.mil.

PATH TO PHASE II

If awarded a Phase I, the Small Business will automatically be invited to propose a Phase II proposal, unless otherwise informed by USSOCOM. To obtain the Phase II requirements, refer to the Contract Data Requirements List (CDRL) A004. The Final Report will be due on or before 6 months of the start of the

Period of Performance (PoP) In Accordance With (IAW) CDRL A003. Your Phase II proposal will be due on or before the 195th day of the start of the PoP IAW CDRL A005.

All CDRLs are available on <https://www.socom.mil/SOF-ATL/Pages/SBIR.aspx>. There are two different attachments for CDRL 5. Please refer to the section titled “Award and Contract Information” for the contracting path pertaining to the topic.

The Government reserves the right to issue any of the following type of awards for Phase II:

1. FAR type contract
2. Non-FAR based fixed price (level of effort type):
 - a. Other Transactions Agreements (OTA). Successful completion of the prototype under an OTA may result in a follow-on production OTA or contract. Successful completion of the prototype is defined as meeting one or more threshold requirements.
 - b. USSOCOM may use a partnership intermediary to award SBIR/STTR contracts and agreements to small business concerns. This may be done through USSOCOM’s intermediary partner, SOFWERX (www.SOFWERX.org) resulting in a commercial contract between the firm and DEFENSEWERX. The is authorized by the National Defense Authorization Act (NDAA) for Fiscal Year 2022, Section 852, MODIFICATION OF PILOT PROGRAM FOR DEVELOPMENT OF TECHNOLOGY- ENHANCED CAPABILITIES WITH PARTNERSHIP INTERMEDIARIES. The Government will conduct the evaluation and select the proposals to be funded for award.

AWARD AND CONTRACT INFORMATION

Table 1: Consolidated SBIR Topic Information

| Topic | Technical Volume (Vol 2) | Additional Info. (Vol 5) | Period of Performance | Award Amount | Contract Type |
|--------------------------------|---------------------------------|---------------------------------|------------------------------|---------------------|----------------------|
| <i>Phase I</i> SOCOM234-004 | Not to exceed 5 pages | 15 page PowerPoint | Not to exceed 7 months | NTE \$175,000 | Firm-Fixed- Price |
| <i>Phase I</i> SOCOM234-005 | Not to exceed 5 pages | 15 page PowerPoint | Not to exceed 7 months | NTE \$175,000 | Firm-Fixed- Price |

The Government will conduct evaluations and selections for SBIR Phase I topic award(s) listed in this BAA.

Awards for SOCOM234-004 and SOCOM234-005 may be made under the authority of National Defense Authorization Act (NDAA) for Fiscal Year 2022, Section 852, MODIFICATION OF PILOT PROGRAM FOR DEVELOPMENT OF TECHNOLOGY- ENHANCED CAPABILITIES WITH PARTNERSHIP INTERMEDIARIES. USSOCOM may use a partnership intermediary to award SBIR/STTR contracts and agreements to small business concerns. The stated topics SBIR contract awards may be done through SOFWERX and result in a commercial contract between the firm and DEFENSEWERX.

ADDITIONAL INFORMATION

Phase I proposals shall NOT include:

- 1) Any travel for Government meetings. All meetings with the Government will be conducted via electronic media.
- 2) Government furnished property or equipment.
- 3) Priced or Unpriced Options.

- 4) "Basic Research" (or "Fundamental Research") defined as a "Systematic study directed toward greater knowledge or understanding of the fundamental aspects of phenomena and/or observable facts without specific applications toward processes or products in mind."
- 5) Human or animal studies.
- 6) Discretionary Technical and Business Assistance (TABA)

SOCOM SBIR 23.4 Topic Index
Release 4

| | |
|--------------|---------------------------------|
| SOCOM234-004 | Out-of-Band GNSS Tracker |
| SOCOM234-005 | Slim Form Cargo Loader/Unloader |

SOCOM234-004

TITLE: Out-of-Band GNSS Tracker

OUSD (R&E) CRITICAL TECHNOLOGY AREA(S): Advanced Computing and Software; Microelectronics; Human-Machine Interfaces

OBJECTIVE: The objective of this topic is to develop applied research toward an innovative capability to conduct the research, development, and assessment of a Global Navigation Satellite System (GNSS) based tracking system that consists of a transmitter attached to a target that broadcasts its location to a ground-based receiver. Even though this technology currently exists and is available commercially there is a need to develop a government specific version that transmits on currently unsupported frequencies.

IMPORTANT: For SOCOM instructions: please visit: <https://www.defensesbirsttr.mil/SBIR-STTR/Opportunities/>. Go to the bottom of the page and click the tab for "DoD SBIR 23.4 Annual". Once there, go to "SOCOM SBIR 23.4 – Release 4".

DESCRIPTION: The primary use case is to mount the transmitter on a small Unmanned Aerial System (UAS) (group 1-3) to provide time, space, position information (TSPI) truth data, real time, to a ground-based receiver. An important feature of the requested system, that sets it apart from commercially available systems, is the ability to transmit on currently unsupported frequencies or the ability to adjust the transmitter frequency. Other important design considerations include size, weight, power, and cost (SWaP-C), transmitter battery life, and transmitter range. As a part of this feasibility study, the proposers shall propose system designs based on the following minimum key system attributes:

- Transmitter to broadcast GNSS based location messages to a ground based receiver.
- Weight:
 - Transmitter less than 200 grams inclusive of antenna.
 - Receiver less than 5 pounds.
- Obtain location data using any combination of GNSS L1 constellations (i.e. Global Positioning System (GPS), Globalnaya Navigazionnaya Sputnikovaya Sistema (GLONASS), BeiDou, and Galileo).
- Range of more than 20kilometers
- Transmitter to operate in Ultra High Frequency band.
- The receiver shall output location data to another device in real time via a wired or wireless connection using non-proprietary connectors/cables or protocols.
- Present output location via cable with latitude/longitude Decimal Degrees format.

PHASE I: Conduct a feasibility study to assess what is in the art of the possible that satisfies the requirements specified in the above paragraphs entitled "Objective" and "Description."

The objective of this USSOCOM Phase I Small Business Innovation Research (SBIR) effort is to conduct and document the results of a thorough feasibility study ("Technology Readiness Level 3") to investigate what is in the art of the possible within the given trade space that will satisfy a needed technology. The feasibility study should investigate all options that meet or exceed the minimum performance parameters specified in this write up. It should also address the risks and potential payoffs of the innovative technology options that are investigated and recommend the option that best achieves the objective of this technology pursuit. The funds obligated on the resulting Phase I SBIR contracts are to be used for the sole purpose of conducting a thorough feasibility study using scientific experiments and laboratory studies

as necessary. Operational prototypes will not be developed with USSOCOM SBIR funds during Phase I feasibility studies. Operational prototypes developed with other than SBIR funds that are provided at the end of Phase I feasibility studies will not be considered in deciding what firm(s) will be selected for Phase II.

PHASE II: Develop, install, and demonstrate a prototype system determined to be the most feasible solution during the Phase I feasibility study on an Out-of-Band GNSS Tracker.

PHASE III DUAL USE APPLICATIONS: This system could be used in a broad range of military applications where real time tracking is required and any other application that can benefit from real time tracking outside of typical frequencies and potential interferers.

REFERENCES:

“A GNSS-GSM Integrated Location Tracking System”, Research Gate – Feb 2014
https://www.researchgate.net/profile/Anindya-Bose-4/publication/260157882_A_GNSS-GSM_Integrated_Location_Tracking_System/links/0f31752fcb649a5c5f000000/A-GNSS-GSM-Integrated-Location-Tracking-System.pdf

KEYWORDS: counter unmanned aerial system; counter unmanned aircraft system; counter uncrewed aerial system; counter uncrewed aircraft system; unmanned aerial system; unmanned aircraft system; uncrewed aerial system; uncrewed aircraft system; unmanned air vehicles; uncrewed air vehicle; GNSS; track; tracker; tracking; real time; geolocation; drones; situational awareness; aerial systems; aerial vehicles; autonomous vehicles

SOCOM234-005

TITLE: Slim Form Cargo Loader/Unloader

OUSD (R&E) CRITICAL TECHNOLOGY AREA(S): Trusted AI and Autonomy

OBJECTIVE: The objective of this topic is to develop applied research toward an innovative capability to lift, load, unload, and transport full-sized, fully loaded 463L pallets and containers from Air Force cargo planes in varying environments, with various terrain. Additionally, the system should only occupy one full pallet position on an aircraft.

IMPORTANT: For SOCOM instructions: please visit: <https://www.defensesbirsttr.mil/SBIR-STTR/Opportunities/>. Go to the bottom of the page and click the tab for “DoD SBIR 23.4 Annual”. Once there, go to “SOCOM SBIR 23.4 – Release 4”.

DESCRIPTION: As a part of this feasibility study, the proposers shall address all viable overall system design options with respect to the system being able to conduct all necessary cargo loading and unloading activities. Semi-autonomous interface and interaction is desired. This includes, but is not limited to:

- Lifting a fully loaded 463L pallet from the ground, moving it a distance of approximately 450 - 500m,
- Loading 463L pallet into the back of a C-130
- Unloading a fully loaded 463L pallet
- Moving it a distance of approximately 450 - 500m, and
- Setting the pallet down on the ground.

Additionally, maximum specifications of the system need to be identified including, but not limited to, length, width, gross vehicle weight, tare weight, and lift capacity.

PHASE I: Conduct a feasibility study to assess what is in the art of the possible that satisfies the requirements specified in the above paragraphs entitled “Objective” and “Description.”

The objective of this USSOCOM Phase I SBIR effort is to conduct and document the results of a thorough feasibility study (“Technology Readiness Level 3”) to investigate what is in the art of the possible within the given trade space that will satisfy a needed technology. The feasibility study should investigate all options that meet or exceed the minimum performance parameters specified in this write up. It should also address the risks and potential payoffs of the innovative technology options that are investigated and recommend the option that best achieves the objective of this technology pursuit. The funds obligated on the resulting Phase I SBIR contracts are to be used for the sole purpose of conducting a thorough feasibility study using scientific experiments and laboratory studies as necessary. Operational prototypes will not be developed with USSOCOM SBIR funds during Phase I feasibility studies. Operational prototypes developed with other than SBIR funds that are provided at the end of Phase I feasibility studies will not be considered in deciding what firm(s) will be selected for Phase II.

PHASE II: Develop, install, and demonstrate a prototype system determined to be the most feasible solution during the Phase I feasibility study on a real-world exercise that demonstrates the full capabilities of the system to lift, move, load, and unload a full-sized 463L on and off a C-130 aircraft.

PHASE III DUAL USE APPLICATIONS: This system could be used in a broad range of military and commercial applications where movement of loads from home base operations to an austere environment is required. The loader would be able to move full sized pallets across various terrains, including traditional hard surfaces. These applications apply to the civilian sector, as well since similar pallets are utilized in the civil cargo transportation industry.

REFERENCES:

1. US Air Force fact sheet on the C-130: <https://www.af.mil/About-Us/Fact-Sheets/Display/Article/1555054/c-130-hercules/>
2. Airmen loading cargo onto C-130 from the back of a truck: <https://www.defense.gov/Multimedia/Photos/igphoto/2001458195/>
3. US TRANSCOM load planning and documentation: https://www.ustranscom.mil/dtr/part-iii/dtr_part_iii_app_v.pdf
4. Personnel loading a HMMWV into a C-130: <https://www.youtube.com/watch?v=6AzWvidtAtQ>
5. Air Force Air Transportation Operations policy (references to 463L pallet will yield dimensions, weight, and restrictions): https://static.e-publishing.af.mil/production/1/af_a4/publication/afi24-605v2/afi24-605v2.pdf

KEYWORDS: cargo; loader; unloader; transport; 463L; pallet