

**DEPARTMENT OF THE AIR FORCE (AF)
SMALL BUSINESS TECHNOLOGY TRANSFER (STTR) PROGRAM
X20.D COMMERCIAL SOLUTIONS OPENING (CSO)**

*This solicitation applies ONLY to AFVentures Special Topic AFX20D-TCSO1. Phase I Open Topic supporting Agility
Prime: Open Call for Innovative Defense-Related Dual-Purpose Technologies/Solutions*

10 July 2020: Begin accepting proposals
10 August 2020: Full Proposals due **No Later Than 2:00 p.m. ET**

IAW with Section 879 of the National Defense Authorization Act (NDAA) for Fiscal Year 2017 (P.L. 114-328), Congress has authorized the Defense CSO Pilot Program. This program allows agencies to obtain solutions or potential new capabilities fulfilling requirements, closing capability gaps, or providing potential technological advancements. Consistent with FY17 NDAA Section 879, AF is soliciting proposals under a CSO. This solicitation is intended for informational purposes and reflects current planning. If there is inconsistency between the information in the CSO and resulting awards, if any, the awards' terms and conditions take precedent.

IMPORTANT

Deadline for Receipt: No exceptions will be made for the submission deadline above. AF recommends early submission, as computer traffic gets heavy near announcement closing. **Do not wait until the last minute.** AF is not responsible for missed proposal submission due to servers being “down” or inaccessible.

How to Submit: All proposals must be prepared and submitted through the Department of Defense (DOD) SBIR/STTR Innovation Portal (DSIP), <https://www.dodsbirsttr.mil/>. Ensure the proposal email address is accurate. AF is not responsible for missed notifications due to firms changing mailing address/email address/company points of contact after submission without notifying the AF. **Firms shall register in the System for Award Management, <https://www.sam.gov/> to be eligible for proposal acceptance.** Firms must verify registration for “All Contracts,” not just grants. Addresses must be consistent between the proposal and SAM at award.

Classified proposals are NOT accepted.

CSO Changes: The instructions/topic information are significantly revised – read carefully.

SBIR/STTR Updates and Notices:

- The CSO of record is found at <https://beta.sam.gov/> and <https://www.dodsbirsttr.mil/> (select ‘Topics’; scroll down to ‘SITIS & Topics/Instructions’ header and select ‘AFX’ tab). Proposals must meet all CSO of record requirements at proposal submission deadline.
- To receive AF Ventures and other AF innovation opportunity notifications, register at <https://af-ventures.com/> and <https://www.afwerx.af.mil/join.html>.

Help Desk: For AF SBIR/STTR Program questions, contact the AF Help Desk at 1-800-222-0336 or AFSBIRSTTR-Info@us.af.mil. For Defense SBIR/STTR Innovation Portal (DSIP) questions or issues, contact the DoD SBIR/STTR Help Desk at DoDSBIRSupport@reisystems.com.

TABLE OF CONTENTS

1.0	INTRODUCTION	3
2.0	PROGRAM DESCRIPTION	5
2.1	Objectives	5
2.2	Three Phase Program	5
3.0	DEFINITIONS	6
3.1	Certified HUBZone Small Business Concern	6
3.2	Commercial Solutions Opening (CSO)	6
3.3	Commercialization	6
3.4	Essentially Equivalent Work	6
3.5	Export Control	6
3.6	Federal Laboratory	6
3.7	Foreign Nationals	6
3.8	Fraud, Waste and Abuse	7
3.9	Funding Agreement	7
3.10	Innovative	7
3.11	Other Transaction	7
3.12	Performance Benchmarks for Progress Toward Commercialization	7
3.13	Principal Investigator	7
3.14	Proprietary Information	8
3.15	Research Involving Animal Subjects	8
3.16	Research Involving Human Subjects	8
3.17	Research Involving Recombinant DNA Molecules	8
3.18	Research or Research and Development	9
3.19	Service-Disabled Veteran-Owned Small Business (SDVOSB)	9
3.20	Small Business Concern (SBC)	9
3.21	Subcontract	9
3.22	United States	9
3.23	Women-Owned Small Business Concern	9
4.0	PROPOSAL FUNDAMENTALS	10
4.1	Introduction	10
4.2	Offeror Eligibility and Performance Requirements	10
4.3	Joint Ventures	11
4.4	Majority Ownership in Part	11
4.5	Conflicts of Interest	11
4.6	Classified Proposals	11
4.7	Research Involving Human Subjects	11
4.8	Research Involving Animal Subjects	12
4.9	Research Involving Recombinant DNA Molecules	12
4.10	Use of Unmanned Aerial Systems (UAS)	12
4.11	Proposal Status and Feedback	13
4.12	CSO Protests, Selection and Award Protests	13

4.13	Phase I Award Information	13
4.14	Phase II and Direct to Phase II Award Information	13
4.15	Questions about this CSO and CSO Topics	14
4.16	Registrations and Certifications	14
4.17	Promotional Materials	15
4.18	Prior, Current, or Pending Support of Similar Proposals or Awards	15
4.19	Fraudulent or False Statements	15
4.20	State and Other Assistance Available	15
4.21	Discretionary Technical and Business Assistance (TABAs)	16
4.22	Government Use of Support Contractors on AF SBIR/STTR Program	16
4.23	Innovation in Manufacturing	16
5.0	PHASE I PROPOSAL	16
6.0	PHASE I EVALUATION CRITERIA	28
7.0	PHASE II PROPOSAL	29
8.0	PHASE II EVALUATION CRITERIA	31
9.0	COMMERCIALIZATION READINESS PROGRAM (CRP)	32
10.0	CONTRACTUAL REQUIREMENTS	32
10.1	Other Contract Requirements	32
10.2	Commercialization Update in Phase II	33
10.3	Copyrights	34
10.4	Patents	34
10.5	Technical Data Rights	34
10.6	Invention Reporting	34
10.7	Final Technical Report	34
11.0	TOPIC	36
	<i>AFX20D-TCSO1 TITLE: Phase I Open Topic supporting Agility Prime: Open Call for Innovative Defense-Related Dual-Purpose Technologies/Solutions</i>	

1.0 INTRODUCTION

The Air Force (AF) invites small business firms to submit proposals under this CSO for the Small Business Technology Transfer (STTR) Program. Firms with the capability to conduct research and development (R&D) in the AF-related topics described in Section 11.0 and to commercialize the results are encouraged to participate.

The *2014 Quadrennial Defense Review* (QDR) established innovation as a central line of effort in the United States' (US') national defense strategy. The US' decisive military advantage over its adversaries and peer competitors is steadily eroding. Consequently, under section 879 of the National Defense Authorization Act (NDAA) for Fiscal Year (FY) 2017 (Pub. L. 114-328) contracting officers may acquire innovative commercial items, technologies, or services using a competitive procedure called a Commercial Solutions Opening (CSO). Under the CSO, DoD may competitively select proposals received in response to a general solicitation, similar to a Broad Agency Announcement, based on proposal review by Government scientific, technological, or other subject-matter experts. CSO use in accordance with Class Deviation 2018-O0016 is considered competitive for the purposes of 10 U.S.C. chapter 127 and FAR 6.102. Contracting officers shall treat items, technologies, and services acquired under a CSO as commercial items. The full definition of commercial items, i.e., products and services, under FAR 2.101 applies. This CSO includes no requirement for a commercial product or service be an already developed, off-the-shelf item.

This CSO seeks innovative, commercial technologies proposed to create new AF solutions or potential new capabilities fulfilling requirements, closing capability gaps, or providing potential technological advancements. The AF reserves the right to award all, part, or none of the proposals received. The Federal Government is not responsible for any monies expended by the applicant before award, if selected. The SBIR/STTR Programs are not substitutes for existing unsolicited proposal mechanisms. Unsolicited proposals are not accepted under the AF SBIR/STTR Programs for Phase I or Phase II.

AF will not issue a separate CSO for Phase II proposals; unsolicited proposals will not be accepted. All firms awarded Phase I awards under this CSO will be eligible to participate in Phases II competitions with potential for Phase III awards. AF will provide Phase I awardees the Phase II proposal submission requirements. Submission of Phase II proposals will be in accordance with instructions provided by AF. Phase II details regarding due date, content, and submission requirements will be provided either in the Phase I award dissemination or by subsequent notification. If a firm submits a Phase II proposal prior to solicitation's stated due date, it may be rejected without evaluation.

AF is not obligated to make any awards under Phases I, II, or III, and all awards are subject to the funds availability. AF is not responsible for any monies expended by the proposer before the issuance of any award.

The AF SBIR/STTR Program Manager is Mr. David Shahady. General information related to the AF Small Business Program is found at <http://www.airforcesmallbiz.af.mil/>. The site contains contracting opportunities within AF, as well as business information and upcoming outreach/conference events. Other informative sites include the Small Business Administration (SBA), www.sba.gov, and Procurement Technical Assistance Centers, <http://www.aptacus.us.org>. These centers provide Government contracting assistance and guidance to small businesses, typically at no cost.

General information related to the AF Small Business Program can be found at the AF Small Business website, <http://www.airforcesmallbiz.af.mil/>. The site contains information related to AF contracting opportunities, as well as business information and upcoming outreach/conference events. Other

informative sites include those for the Small Business Administration (SBA), www.sba.gov, and the Procurement Technical Assistance Centers (PTACs), <http://www.ptacus.us.org>. These centers provide Government contracting assistance and guidance to small businesses, generally at no cost.

AF Special Topic Information

AF SBIR/STTR Center for Excellence continues to pilot new processes via AF Special Topics in order to accelerate technologies to the warfighter. The AF Special topics are different in several ways from the standard AF SBIR/STTR proposal, award, and execution processes. Special Topics include shortened technical durations, reduced reporting requirements, and varying award amounts compared to normal traditional STTR topics.

Special Topic AFX20D-TCSO1: Sponsored by the Air Force Office of Scientific Research (AFOSR) in partnership with AFWERX, <https://www.afwerx.af.mil>, a catalyst for agile Air Force engagement across industry, academia, and non-traditional contributors, creating transformative opportunities and fostering an AF culture of innovation.

For the Special Topic, Phase I proposals shall include technical information not to exceed 25 slides, uploaded in Volume 1. The technical volume and slide deck will be reviewed holistically. There are no set document format requirements. The cost volume, Volume 3, will cover the total effort broken down into specified technical and reporting periods. See below chart for specific times. AF Special Topics shall follow the “Phase I Work Plan Outline” as stated below, except one Progress Report is required and no technical review requirement due to the short duration. Phase I final reports will be a SF298, Report Documentation Page, presentation in accordance with the purchase order.

Applicable Topics	Phase I					Traditional Phase II			
	Technical Volume (Vol 1)	Additional Info (Vol 5)	Award Amount	Tech Duration	Final Report Period	Tech Volume (Vol 1)	Additional Info (Vol 5)	Technical & Reporting	Initial Award Amount
Special Topics AFX20D-TCSO1	Tech volume NTE 25 slides	N/A	NTE \$150,000	5 months	1 month	NTE 25 slides, 5 page white paper	N/A	Typically 15 months	NTE \$750,000

It is critical Special Topic proposers register in the System for Award Management, <https://www.sam.gov/>. Proposals from offerors not registered in SAM at submission will be disqualified. Phase I awards under this CSO are FAR-based fixed price purchase orders. Therefore, offerors must be registered to receive “All Awards”, not just grants, and the firm address is consistent between the proposal and SAM information.

The request for AF Special Topic Phase II proposals will occur shortly after Phase I award execution. AF Special Topic may also use Phase II Supplemental Agreements. Unless otherwise stated above, all other requirements below apply. Contact afsbirsttr-info@us.af.mil with questions.

2.0 PROGRAM DESCRIPTION

2.1 Objectives

The DoD STTR Program objectives include stimulating technological innovation, strengthening small businesses' role in meeting DoD R&D needs, fostering and encouraging minority and disadvantaged persons' participation in technological innovation, and increasing commercial application of DoD-supported R/R&D results.

AF invites small business firms and research institutions to jointly submit proposals under this STTR CSO. Firms with the capability to conduct research or research and development (R/R&D) supporting the Agility Prime Technology Demonstration Program and commercialize the proposed results are encouraged to participate.

The STTR Program, although modeled substantially on the Small Business Innovation Research (SBIR) Program, is a separately managed and financed program. Subject to funds availability, AF seeks high quality R/R&D proposals for innovative concepts to solve defense-related scientific or engineering problems, especially those concepts with high potential for private sector commercialization. Partnerships between small businesses and Historically Black Colleges and Universities (HBCUs) or Minority Institutions (MIs) are encouraged, although no special award preference will be given.

The AF STTR Program follows the policies and practices of the Small Business Administration (SBA) SBIR/STTR Policy Directive (2 May 19), https://www.sbir.gov/sites/default/files/SBIR-STTR_Policy_Directive_2019.pdf. This CSO incorporates and makes use of Policy Directive flexibilities to encourage proposals based on scientific and technical approaches most likely to yield important results for the AF and private sector.

2.2 Three Phase Program

STTR is a three-phase program. Phase I objective is to determine, to the extent possible, selected proposals' scientific, technical, and commercial merit and feasibility. Proposals should concentrate on R/R&D significantly proving the proposed effort's scientific and technical feasibility and commercialization potential. Successful Phase I completion is a prerequisite to be considered for Phase II award. Proposers should consider whether the proposed R/R&D also has private sector potential or can be used as a base for other applications.

Phase II awards are selected based on Phase I results and/or the Phase II proposal's scientific and technical merit and commercialization potential Phase II, as the principal R/R&D effort, is expected to produce a well-defined, deliverable prototype. Phase II awardees may receive a second, sequential Phase II award to continue the project's work.

Phase III awards require funding from the private sector, non-SBIR/STTR Governmental sources, or both. The objective is to develop the prototype into a viable product or non-R&D service for military or

private sector market sales. Phase III awards must be based on work deriving from, extending, or completing an effort made under prior SBIR/STTR funding agreements, but funded as previously discussed. Phase III work is typically oriented toward technology commercialization.

3.0 DEFINITIONS

The following definitions from the SBA SBIR/STTR Policy Direction, the Federal Acquisition Regulation (FAR), and 10 USC 2371b apply to this CSO:

3.1 Certified HUBZone Small Business Concern: An SBC 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).

3.2 Commercial Solutions Opening (CSO): A competitive procedure contracting officers may use to acquire innovative commercial items, technologies or services.

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

3.4 Essentially Equivalent Work: Work substantially the same research, proposed for funding in more than one application submitted to the same Federal agency, or two or more different Federal agencies for review and funding consideration. It may also include work where a specific research objective and the research design for accomplishing project objective are the same or closely related to another proposal or award, regardless of funding source.

3.5 Export Control: The International Traffic in Arms Regulations (ITAR), 22 CFR Parts 120 through projects with military or dual-use applications beyond fundamental research. Fundamental research is basic and applied research ordinarily published and shared broadly within the scientific community. More information is available at https://www.pmdtc.state.gov/?id=ddtc_kb_article_page&sys_id=24d528fddbfc930044f9ff621f961987.

3.6 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.

3.7 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.

3.8 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 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.

3.9 Funding Agreement: Any contract, grant, cooperative agreement, or Other Transaction for Prototype 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.

3.10 Innovative:

- (1) Any new technology, process, or method, including research and development; or
- (2) Any new application of an existing technology, process, or method.

3.11 Other Transaction: Refers to the type of Other Transaction Agreement (OTA) that may be placed as a result of this CSO. This type of OT is authorized by 10 U.S.C 2371b for prototype projects directly relevant to enhancing the mission effectiveness of military personnel and the supporting platforms, systems, components, or material proposed to be acquired or developed by the DoD, or for the improvement of platforms, systems, components, or materials in use by the armed forces. This type of OTA is treated by DoD as an acquisition instruments, commonly referred to as an "other transaction" for a prototype or a Section 2371b "other transaction." The definition of a "prototype project" in the context of an OT is as follows: a prototype project addresses a proof of concept, model, reverse engineering to address obsolescence, pilot, novel application of commercial technologies for defense purposes, agile development activity, creation, design, development, demonstration of technical or operational utility, or combinations of the foregoing. A process, including a business process, may be the subject of a prototype project.

3.12 Performance Benchmarks for Progress Toward Commercialization: IAW the SBA SBIR/STTR Policy Directive Section 4.(a)(3), DoD's established benchmark threshold applies only to Phase I applicants with more than 20 awards in the prior five fiscal years. The ratio of Phase I awards to Phase II awards received during the period must be at least 4:1. Additional information can be found at <https://www.sbir.gov/performance-benchmarks>.

3.13 Principal Investigator: The principal investigator/project manager is the 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 SBC 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 SBC. 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 AF STTR Program Manager/Coordinator. Further, an SBC may replace the principal investigator on an STTR Phase I or Phase II award, subject to approval in writing by the contracting officer.

3.14 Proprietary Information: Proprietary information includes trade secrets, as well as commercial or financial information.

3.15 Research Involving Animal Subjects: "Activities involving animal subjects shall be conducted in accordance with DoDI 3216.01, "Use of Animals in DoD Programs"; 9 CFR parts 1-4; National Academy of Sciences Publication "Guide for the Care & Use of Laboratory Animals" as amended; Department of Agriculture rules implementing the Animal Welfare Act (7 U.S.C. §§ 2131-2159); and other applicable Federal/DoD/local laws, regulations, and instructions.

"Animal use" protocols apply to activities meeting 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) being used or 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 applicability to work involving animals

3.16 Research Involving Human Subjects: All research involving human subjects shall be conducted in accordance with 32 C.F.R. § 219 "The Common Rule", 10 USC §980 "Limitation on Use of Humans as Experimental Subjects", and DoDD 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. Offerors 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 (DoDD 3216.02), recruitment of military research subjects (DoDD 3216.02), and informed consent and surrogate consent (10 U.S.C. § 980) and chemical and biological agent research (DoDD 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-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 DoDD 3216.02 for definitions of these terms and more information about the applicability of DoDI 3216.02 to research involving human subjects.

3.17 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/2013/06/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.

3.18 Research or Research and Development:

- 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, systems, or methods, including prototype or process design, development, and improvement to meet specific requirements.

3.19 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).

3.20 Small Business Concern (SBC): A concern meeting the requirements set forth in 13 CFR. § 121.702. 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.)

3.21 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.

3.22 United States: 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.

3.23 Women-Owned Small Business Concern: An SBC 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

Unless otherwise specified, this section applies to Phase I and II proposals.

4.1 Introduction

The proposal must provide sufficient information to demonstrate to the reviewers the proposed work represents an innovative approach to investigation of important scientific or engineering problems and is worthy of support under the stated criteria. The proposed R/R&D must be responsive to the topic.

Before submitting a proposal, offerors should assess the intended effort to 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 firm has the capability to implement the technical approach, i.e., has or can obtain people and equipment suitable to the task.

4.2 Offeror Eligibility and Performance Requirements

- a. Each proposer must qualify as a small business concern IAW 13 C.F.R §§ 701-705 at time of award and certify to this on the proposal Cover Sheet. SBIR/STTR eligibility requirements are unique and do not correspond to other small business programs (see Section 3.20 of this CSO). Proposers must meet eligibility requirements for Small Business Ownership and Control IAW 13 CFR § 121.702 and Section 4.4 of this CSO.
- b. Each STTR project must be conducted a minimum of 40% by the small business concern and a single research institution must accomplish a minimum of 30% of the effort. The percentage is usually measured by direct and indirect costs.
- c. Phase I and II, the principal investigator must primarily be employed with the small business firm OR research institution. At Phase I or Phase II contract award, the small business concern must employ at least one employee in a management position whose primary employment is with the small business, not with the research institution. Primary employment means more than 50% of the employee's time is spent with the small business. Primary employment with the small business concern precludes full-time employment at another organization.
- d. All Phase I and Phase II R/R&D work must be performed by the small business concern and its subcontractors in the U.S.
- e. Allocation of Rights: Small business concerns (SBCs) must negotiate written agreements with the research institution allocating intellectual property rights and rights to carry out follow-on research, development, or commercialization. The SBC must submit this agreement to the awarding agency with the proposal. The SBC must certify in all proposals that the agreement is satisfactory to the SBC.
- f. Management of the STTR Project: The small business concern (SBC), and not its partnering Research Institution(s), is to provide satisfactory evidence that it will exercise management direction and control of the performance of the STTR Funding Agreement. Regardless of the proportion of the work or funding allocated to each of the performers under the Funding

Agreement, the SBC is to be the primary party with overall responsibility for performance of the project. All agreements between the SBC and the Research Institution cooperating in the STTR Funding Agreement, or any business plans reflecting agreements and responsibilities between the parties during performance of STTR Phase I or Phase II Funding Agreement, or for the Commercialization of the resulting technology, should reflect the controlling position of the SBC.

- g. **Benchmarks.** SBA is not compiling a list of companies deemed ineligible to submit proposals for new Phase I (or Direct-to-Phase II) awards based on failure to meet the Commercialization Benchmark requirement. This is subject to change; more information is found at <https://www.sbir.gov/performance-benchmarks>.

4.3 Joint Ventures

Joint ventures and limited partnerships are permitted, provided the entity created qualifies as a small business in accordance with the Small Business Act, 13 U.S.C. § 121.701.

4.4 Majority Ownership in Part

Small businesses owned in majority part by multiple venture capital operating companies (VCOCs), hedge funds, or private equity funds are ineligible to submit proposals under this CSO.

4.5 Conflicts of Interest

Contract awards to firms 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. Proposing firms should contact the cognizant Ethics Counselor from the employee's Government agency for further guidance if in this situation.

4.6 Classified Proposals

Classified proposals will not be accepted in response to this CSO. If efforts will require classified work during Phase II performance, the proposing firm must have or obtain a facility clearance. Additional information on facility and personnel clearance procedures and requirements can be found at the Defense Security Service site, <http://www.dss.mil/index.html>.

4.7 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 3.16).

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 AF. All institutions engaged in human subject research, to include subcontractors, must also have a valid Assurance. In addition, personnel involved in

human subject 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. 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 AF 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.**

4.8 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 3.15).

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 animal research may be conducted using DoD funding until all the appropriate DoD office(s) grant approval.**

4.9 Research Involving Recombinant DNA Molecules

All research involving recombinant DNA molecules shall comply with the applicable Federal and state laws and regulations and any additional agency guidance. Research shall be approved by an Institutional Biosafety Committee.

4.10 Use of Unmanned Aircraft Systems (UAS)

All activities involving the operation of Unmanned Aerial Systems shall be conducted IAW Department of Defense Memo entitled "Guidance for the Domestic Use of Unmanned Aircraft Systems in the U.S. National Airspace, dated 18 August 2018 and DOD memo entitled, "Delegation Authority to Approve Exemptions for Using Commercial-Off-The-Shelf Unmanned Aerial Systems in Support of Urgent Needs, dated 16 November 2018. Contractor personnel operating DoD or DoD-contracted UAS in U.S. National Airspace, whether or not the domestic use is related to an intelligence activity, will comply with all laws, regulations, and guidance relating to the operation of UAS in U.S. National Airspace. Specific programs utilizing UAS are required to obtain an exemption for operational use of a UAS; therefore, additional documentation may be requested by the AF to support an exemption request. The DOD exemption approval process can last as much as two months. **No funding can be used for contracted-UAS operations until ALL approvals are granted.**

4.11 Proposal Status and Feedback

The Principal Investigator (PI) and Corporate Official (CO) indicated on the Proposal Cover Sheet (Volume 1) will be notified by email regarding proposal selection or non-selection. The SBC will receive a notification for each proposal submitted. Please read each notification carefully and note the proposal number referenced. **If changes occur to the company mail or email address(es) or points of contact after proposal submission, the information must be provided to the AF at sbir@afwerx.af.mil. The message shall include the subject line, “20.2 Address Change”.**

Any feedback requests must be submitted in writing within 30 calendar days after receipt of notification of non-selection. Written requests for feedback must be submitted via sbir.feedback@afwerx.af.mil. Requests for feedback should include the company name and the telephone number/e-mail address for a specific point of contact, as well as an alternate. Additionally, include the proposal number(s). Feedback requests received more than 30 calendar days after non-selection notification receipt will be fulfilled at the Contracting Officers' discretion. Unsuccessful offerors are entitled to no more than one feedback response for each proposal.

Release of Proposal Review Information. After final award decisions have been announced, the peer review of the applicant's proposal may be provided to the offeror. The identity of the reviewer shall not be disclosed.

It is anticipated all proposal reviews will be complete, selection decisions made, and notification letters sent within approximately 45 calendar days of proposal receipt. Please refrain from contacting the CSO Contracting Officer for proposal status before that time.

4.12 CSO, Selection, and Award Protests

Interested parties may have the right to protest this CSO by serving the Contracting Officer, Ms. Kristina Croake, AF SBIR/STTR Contracting Officer, kristina-croake@us.af.mil, the protest, or by filing with the Government Accountability Office (GAO) or U.S. Court of Federal Claims. Protest of selections or awards should also be directed to Ms. Croake or by filing with the GAO or the U.S. Court of Federal Claims. If the protest is filed with the GAO, a copy of the protest shall be received by the AF Legal Operations Agency (AFLOA) within one day of filing. Protests of a selected firm's small business status should be directed to the SBA.

4.13 Phase I Award Information

- a. **Number of Phase I Awards.** The number of awards will depend upon funds availability. The Government reserves the right to award all, some, or none of the proposals received under this solicitation. The Federal Government is not responsible for any costs incurred before award receipt.
- b. **Type of Funding Agreement.** Phase I awards are FAR-based firm fixed price purchase orders.
- c. **Dollar Value.** Phase I awards will have a maximum value of \$150,000.
- d. **Timing.** It is intended that peer review, proposal selection, negotiations, and award will be complete within 45 calendar days of proposal receipt.

4.14 Phase II Award Information

- a. **Number of Awards.** The number of awards will depend upon funds availability. The Government reserves the right to award all, some, or none of the proposals received under this solicitation. The Federal Government is not responsible for any costs incurred before award receipt.
- b. **Type of Funding Agreement.** Phase II awards will be FAR-based firm fixed price contracts or Other Transactions for Prototype under the authority of 10 USC 2731b.

- c. **Average Dollar Value.** Maximum Phase II award value is \$750,000.
- d. **Timing.** It is intended that peer review, proposal selection, negotiations, and award will be complete within 60 calendar days of proposal receipt.

4.15 CSO and CSO Topic Questions

a. General STTR Questions/Information

1. **AF Help Desk.** The AF SBIR/STTR Help Desk is prepared to address general questions about this CSO, the proposal preparation and electronic submission process, and other program- related areas. The Help Desk may be contacted from 9:00 a.m. to 5:00 p.m. ET Monday through Friday at 1-800-222-0336 or AFSBIRSTTR-Info@us.af.mil.
2. **Updates and Notices.** To receive notifications about AFVentures/other AF innovation opportunities, go to <https://af-ventures.com/> and <https://www.afwerx.af.mil/join.html>. To receive SBIR/STTR opportunity notices and DoD SBIR/ STTR Programs email updates, subscribe at <https://sbir.defensebusiness.org/>.
3. **Web sites.** The DoD SBIR/STTR Program Web site at <http://www.acq.osd.mil/osbp/sbir> offers electronic access to SBIR/STTR opportunities, answers to commonly asked questions, sample SBIR/STTR proposals, model SBIR/STTR contracts, ongoing SBIR/STTR project abstracts, SBIR/ STTR Program updates, business and finance assistance hyperlinks, and other useful information.

The DoD SBIR/STTR Web site, <https://sbir.defensebusiness.org/>, mirrors the most frequently accessed information on the DoD SBIR/STTR Program Web site, including:

- SBIR and STTR Program opportunities
- Topics search engine
- Technical Q&A through the SBIR/STTR Interactive Topic Information System (SITIS) for Phase I and II proposals. First-time firms must register.

- b. **Online Q&A Webinars ('Ask me Anything'):** For information on these webinars, please visit <https://www.afwerx.af.mil/sbir.html>.

4.16 Registrations and Certifications

Firms must be registered in the DoD Submission system to prepare and submit proposals, <https://www.dodsbirsttr.mil/submissions/login>. Proposing firms must also register in the System for Award Management (SAM.gov). SAM.gov allows firms interested in conducting business with the Federal Government to provide basic business capability and financial information. To register, visit SAM.gov. Follow instructions to obtain a Commercial and Government Entity (CAGE) code and Dun and Bradstreet (DUNS) number. Proposals from offerors not registered in SAM at submission will be disqualified. Additionally, if information in the proposal and SAM are not consistent, the proposal will be disqualified.

In addition to the standard Federal and DoD procurement certifications, the SBA SBIR/STTR Policy Directive requires certain information be collected from firms at award and during the award life cycle. Each firm will be asked to provide this additional information at the time of award, prior to receiving 50% of the total award amount, and prior to final payment.

4.17 Promotional Material

Promotional and non-project related proposal content is discouraged. Additional information provided via website or other communication medium, except where explicitly requested, will not be considered.

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

IMPORTANT -- It is permissible, with proper notification, to submit identical proposals or proposals containing a significant amount of essentially equivalent work (see Section 3.4) for consideration under multiple Federal program solicitations. However, it is unlawful to enter into contracts, grants, cooperative agreements, Other Transactions or other award types, requiring essentially equivalent effort. Questions concerning prior, current, or pending support of similar proposals or awards must be disclosed to the soliciting agency or agencies as early as possible.

4.19 Fraud and False Statements

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

The DoD Office of Inspector General (IG) Hotline is an important avenue for reporting fraud, waste, abuse, and mismanagement within the DoD. The DoD IG 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 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/>. Written correspondence should be addressed to the Defense Hotline, The Pentagon, Washington DC, 20301-1900. Email reporting is available at hotline@dodig.mil.

4.20 State and Other Assistance Available

Many states have established programs to provide services to small business firms wishing to participate in the Federal STTR Program. These services vary from state to state, but may include:

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

Contact the state SBIR/STTR Support office at https://www.sbir.gov/state_services?state=105813# for further information.

4.21 Discretionary Technical and Business Assistance (TABAs).

TABA is not available for the CSO's AF STTR Special Topic.

4.22 Use of Support Contractors for the AF STTR Program

Proposals may be handled for administrative purposes only by support contractors, including Oasis Systems, Riverside Research, Peerless Technologies, HPC-COM, Mile Two, Wright Brother Institute, and MacB (an Alion Company). In addition, only Government employees and technical personnel from Federally Funded Research and Development Centers (FFRDCs) MITRE and Aerospace Corporations working under contract to provide technical support to AF Life Cycle Management Center and Space and Missiles Centers may evaluate proposals. All support contractors are bound by appropriate non-disclosure agreements. Contact Kristina Croake, AF SBIR/STTR Contracting Officer, at kristina.croake@us.af.mil, with concerns regarding the listed contractors.

4.23 Innovation in Manufacturing

Pursuant to EO 13329, high priority is accorded to proposals advancing innovation in U.S. small business manufacturing

5.0 Phase I Proposal Instructions

The following instructions apply **ONLY** to AFX20D-TCSO1.

5.1 Proposal Submission

Proposals must be electronically submitted through the DoD SBIR/STTR Submission Web site, <https://www.dodsbirsttr.mil/submissions/> no later than the date and time indicated on the CSO title page. Late proposals will not be accepted; no exceptions will be made. **Classified proposals are not accepted; proposals shall not contain classified information or data.**

Each proposal submission must contain a Proposal Cover Sheet, Technical Volume, Cost Volume, Supporting Documents, and Fraud, Waste and Abuse Training (see Section 5.4). The required submission format is Portable Document Format (.pdf). When combining .pdf documents into a full proposal, ensure digital signatures are not stripped. Graphics must be distinguishable in black and white. Virus-check all submissions.

NOTE: The Government is not obligated to make any Phase I awards, nor is it responsible for offeror expenditures prior to award. All awards are subject to successful negotiations and funds availability.

The AF SBIR/STTR Program Office has instituted training and certification requirements to combat fraud in the SBIR/STTR Programs. As a result, SBCs are required to complete Fraud, Waste, and Abuse Training as part of the proposal submission process. The training is available at <https://www.dodsbirsttr.mil/submissions/>. When training is complete and certified, DSIP will indicate so in the proposal, completing the Volume 6 requirement. If training is not completed, the submitter will receive an error message and submission cannot be completed.

This CSO and the DoD SBIR/STTR Innovation Portal (DSIP) are designed to reduce the proposal preparation time and cost.

A complete proposal consists of:

0. Registration
 - 0.1. DUNS Number
 - 0.2. System for Award Management (SAM) (CAGE Code)
 - 0.3. Small Business Association ID

- 0.4. DoD SBIR/STTR ID
- 1. Volume 1: Proposal Cover Sheet
 - 1.1. Basic Information (CAGE, DUNS)
 - 1.2. Certification Questions
 - 1.3. Business Information
 - 1.4. Proposal Information
 - 1.5. Contact Information
- 2. Volume 2: Technical Volume
 - 2.1. 25 Slide Deck
- 3. Volume 3: Cost Volume
 - 3.1. Direct Labor Costs
 - 3.2. Direct Material Costs (If Applicable)
 - 3.3. Other Direct Costs (If Applicable)
- 4. Volume 4: Company Commercialization Report (Not in use in 20.D)
- 5. Volume 5: Supporting Documents
 - 5.1. Teaming Agreement with Research Institution
 - 5.2. Resumes of Key Personnel
 - 5.3. DoD Funding Agreement Certification (Signed)
- 6. Volume 6: Fraud, Waste and Abuse Training (Signed)

DSIP provides a structure for five sections. When the offeror begins to populate the proposal cover sheet, the system will assign a proposal number. **Keep a copy for future reference.**

The proposer may modify the proposal cover sheet and add or remove documentation until the solicitation closes. After upload to the DoD Submission Site, click the “Verify Technical Volume” icon to ensure the proposal does not exceed 25 slides. If a proposal volume exceeds the stated page limit, AF will only consider pages within the limit. For example, if the technical volume’s specified limit is 25 slides and the firm submits 30 slides, only the first 25 will be reviewed.

5.2 Marking Proprietary Proposal Information

Information contained in unsuccessful proposals will remain the property of the Applicant. The Federal Government may, however, retain copies of all proposals. Public release of information in any proposal submitted will be subject to existing statutory and regulatory requirements. If proprietary information is provided by an Applicant in a proposal, which constitutes a trade secret, commercial or financial information, it will be treated in confidence, to the extent permitted by law, provided that the proposal is clearly marked by the Applicant as follows:

Proposal data the firm does not wish to make public, or to be used by the Government except for peer review, shall:

- (1) Mark the first page of each proposal volume 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 offeror 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."
DoD assumes no liability for unmarked data disclosure or use and may use or disclose such data for any purpose.

5.3 Phase I Proposal Instructions

a. Proposal Cover Sheet (Volume 1)

In DSIP at <https://sbir.defensebusiness.org/>, prepare the Proposal Cover Sheet. The Cover Sheet must include a brief technical abstract no more than 200 words describing the proposed R&D project, including anticipated benefits and potential commercial applications. **Do not include proprietary or classified information in the Proposal Cover Sheet, including the 'Technical Abstract' and 'Anticipated Benefits'. If proposal is selected for award, the technical abstract and anticipated benefits discussion may be publicly released.** Once the Cover Sheet is saved, the system will assign a proposal number. The cover sheet can be modified as often as necessary until the CSO closes.

SPECIAL TOPIC NOTE: To increase the speed of contract award under AF Special Topics, please include a 'Coversheet Supplement' in Volume 5. This provides an opportunity to enter additional information regarding certain questions, e.g., foreign nationals proposed as team members.

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. Detected viruses may cause proposal rejection. **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 Technical Volume is limited to 25 slides. If the submitted slide deck is more than 25 slides, the overage will not be considered during peer review.

(3) Layout: **Number all proposal slides consecutively.** Those wishing to respond must submit a direct, concise, and informative R/R&D proposal no more than 25 slides. Each slide should contain the company name, topic number, and proposal number assigned by DSIP when the Cover Sheet was created.

c. **Content of the Technical Volume (Volume 2)**

The technical volume should contain a MAXIMUM of 25 slides, although fewer is permissible. Brevity and clarity are important when communicating complex topics. **There are 12 required slides and nine slides required only if applicable to the proposal. The remaining slides may be used at the proposer's discretion.**

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

REQUIRED SLIDES

1. **Overall Summary Slide** - Including Company Name and Overview of Proposal
2. **Technical Merit Summary** – Include the most effective points that demonstrate the technical merit of your solution
3. **Team's Ability to Perform Research Summary** – Include the most effective points for demonstrating that your team can develop your solution AND adapt it to the needs of potential Air Force customers.
4. **Commercialization Potential Summary** – Include the most effective points that demonstrate your firm's ability to commercialize the solution (inside the DoD AND in the commercial sector)
5. **Significance of Problem/Opportunity** – Define the specific technical problem or opportunity addressed and its importance. Include a brief description of your proposed solution and the current state of the solution as applied to a non-defense customer and as applied to a defense customer.
6. **Phase I Objectives** – Enumerate the specific objectives of the Phase I work, including the questions the R&D effort will attempt to answer to determine the proposed approach's feasibility. Name a potential, *specific* Air Force stakeholder who could benefit from the solution. Describe the problem or benefit area(s) in relation to the proposed solution. Describe how success will be measured in helping the user.
7. **Related Work (Dual-Use)** – 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 and parallel 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. Describe your non-defense customers and any interviews you may have had with them. Describe your defense customers and any interviews you may have had with them. Describe the competitive landscape of your solution.
8. **Relationship with Future Work** – (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. Propose your high level Air Force acquisition customer (i.e. Air Force Research labs) and how your solution could integrate with their current projects.

9. **Work Plan (NON-PROPRIETARY)** – Provide an explicit, detailed description of the Phase I approach. The Work Plan should indicate the tasks 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. Describe what you will do during the Phase I, including the specific tasks, durations, descriptions, and who will actually complete the tasks. Be sure to include any sub-contractors efforts in the Work Plan.
10. **Commercialization Strategy** – Describe in approximately one page your company's strategy for commercializing this technology in DoD, other Federal Agencies, AND 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 STTR project that your company expects to achieve. Describe any outside investment, sources of cash flow and your potential to scale the proposed solution. Focus mainly on non-defense sales.
11. **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. Identify key personnel who will be working on the project and how their background qualifies them for the specific work they will be performing on this project. **Full resumes for key technical personnel should be included in Volume 5: Supporting Information.**
12. **Registrations** – Include the DUNS Number, CAGE code, SBA ID, and DOD STTR ID number. If you do not have any of these numbers, include the date on which the application was submitted. Note a valid CAGE code is required at submission or the proposal will be disqualified.

SLIDES TO INCLUDE IF APPLICABLE – Include the following slides if they apply to the proposed effort. If not, do not include them in the slide deck.

13. **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. Offerors frequently assume individuals with dual citizenship or a work permit will be allowed to work on an STTR 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 who are considered a foreign national as defined in Section 3.7 of the CSO. You may be asked to provide additional information during negotiations in order to verify the foreign citizen's eligibility to participate on a STTR 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)).

14. 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.

15. Prior, Current, or Pending Support of Similar Proposals or Awards. If a proposal submitted in response to this CSO 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 principal investigator for each proposal submitted or award received.
- (e) Title, number, and date of CSO/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 STTR proposal submitted or award received.

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

16. Technical Data Rights (Assertions): Rights in technical data, including software, developed under the terms of any contract resulting from proposals submitted in response to this CSO 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 five 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. See Section 10.0 for the clause's full text. Upon expiration of the five-year restrictive license, the Government has unlimited rights in the STTR data. During the license period, the Government may not release or disclose STTR 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 necessary for emergency repair or overhaul of items operated by the Government. See DFARS clause 252.227-7018, "Rights in Noncommercial Technical Data and Computer Software – Small Business Innovation Research (SBIR) Program." See Section 10.0 for the clause's full text.

Proposing firms that wish to assert data rights should include the following table in the proposal:

Technical Data/ Computer Software Furnished with Restrictions	Basis for Assertion <ul style="list-style-type: none"> • None, • Developed exclusively at private expense, • Developed partially at private expense 	Asserted Rights Category <ul style="list-style-type: none"> • None, • Government Purpose Rights • Limited Rights (Technical Data) • Restricted Rights (Software) • Specifically Negotiated License • Rights in STTR Data 	Name of Person Asserting Restrictions
(LIST)	(LIST)	(LIST)	(LIST)

If a proposer plans to submit assertions IAW DFARS 252.227-7017, identification and assertion of use, release, or disclosure restriction MUST be included with the proposal submission. If selected, the contract will not be awarded until assertions are negotiated and/or approved.

17. Supplemental Information on Direct Labor Costs. For any notable instances, i.e., a significant number of hours, very high hourly wages, or significant labor overhead/fringe rates, please justify them in this section. A helpful resource for rate comparisons is <https://www.bls.gov/bls/blswage.htm>.

18. Supplemental Information for Direct Material Costs. Justify costs for materials, parts, and supplies with an itemized list containing types, quantities, and price and where appropriate, purposes. For the materials included in the cost volume, please provide the bases for the listed costs. This can be historical information, vendor quotes, catalogs, etc.

19. Detailed Travel Costs (Included in Other Direct Costs). If travel was proposed as an Other Direct Cost, justify those expenses here. Cost for travel funds must be justified and related to the needs of the project. Provide the number of trips, travelers per trip, specific locations and purpose. Also include, to the extent practicable, the basis for the proposed flight, lodging, per diem (meals), and ground transportation costs. A useful resource for this section is <https://www.gsa.gov/travel/plan-book/per-diem-rates>.

NOTE: Travel is likely for the Phase I feasibility study so provide estimated costs here. Actual travel costs incurred will likely differ which is acceptable. However, this information aids Contracting Officers to determine proposed costs are reasonable.

20. Supplemental Information for Special Tooling and Test Equipment. While special tooling/test equipment and material cost may be included under Phase I, these items are carefully reviewed relative to need and appropriateness for the project. Special tooling/test equipment purchases must be determined by the Contracting Officer to be advantageous to the Government and directly related to the proposed effort. 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 Air Force unless it is determined title transfer to the contractor is more cost effective than equipment recovery by the Air Force.

21. Ownership Structure (From Coversheet) Guidance regarding potential answers:

Question 5: Is 50% or more of your firm owned, controlled, or managed by a corporate entity?

- i. If YES, and the corporate entity is also a small business as described in section 3.20, please include a description of the corporate relationship, including affiliates of the parent company, if any.
- ii. If the firm is 50% or more owned or managed by a corporate entity other than a small business, the proposal will be disqualified.

Question 11) Is your firm registered in the SBA's venture capital database as majority-owned by venture capital operating companies, hedge funds, or private equity firms?

- i. If YES, please state whether the VCOC, hedge fund, or private equity firm is also a small business as defined by the SBA. If so, then the VCOC, hedge fund, or private equity firm would count as an 'affiliate' and their employee numbers would be added to the prime contractor's employee total.
- ii. If the firm is majority-owned by VCOCs, hedge funds, or private equity firms NOT qualifying as a small business concern, the proposal will be disqualified.

Question 12) Is your firm more than 50% owned by a single Venture Capital Owned Company (VCOC), hedge fund, or private equity firm?

- i. If YES, please state whether the VCOC, hedge fund, or private equity firm is also a small business as defined by the SBA. If so, then the VCOC, hedge fund, or private equity firm would count as an 'affiliate' and their employee numbers would be added to the employee total.
- ii. If your firm is more than 50% owned by a single VCOC, hedge fund, or private equity firm NOT qualifying as a small business concern, the proposal will be disqualified.

Question 13) Is your firm more than 50% owned by multiple business concerns that are VCOCs, hedge funds, or private equity firms?

- i. If YES, please state whether the VCOC, hedge fund, or private equity firm is also a small business as defined by the SBA. If so, then the VCOC, hedge fund, or private equity firm would count as an 'affiliate' and their employee numbers would be added to the employee total.
- ii. If your firm is more than 50% owned by multiple VCOCs, hedge funds, or private equity firms NOT qualifying as small business concerns, the proposal will be disqualified.

Question 15) Is your firm affiliated as set forth in 13 CFR 121.103?

- i. If yes, then please describe your affiliations as described here:
<https://www.sba.gov/document/support--affiliation-guide-size-standards>

Question 23) Are teaming partners or subcontractors proposed?

i. If yes, include this information in the proposal Cover Sheet, Cost Volume, and Supplemental Cost Information. Include subcontractor information in the Cost Volume (Volume 3) and in Volume 5: Supplemental Information by including agreements between the offeror and its subcontractor(s). If teaming but not subcontracting with another firm, include this teaming arrangement in Volume 5: Supplemental Information.

d. **Content of the Cost Volume (Volume 3).** Complete the Cost Volume in the format shown in the Cost Breakdown Guidance by using the DSIP online cost volume form. Some items in the Cost Breakdown Guidance may not apply to the proposed project and, therefore, do not need to be included. Provide enough information to allow insight into the requested funds intended use if a contract is awarded. **Please note, costs will not be audited due to the award type**, i.e., FAR-based fixed price purchase orders.

(1) Direct Labor Costs: List all key personnel by name with estimated labor hours. List non-key personnel by position/skillset along with estimated hours.

(2) Direct Material Costs: Present costs for materials, parts, and supplies in an itemized list containing types, quantities, price, and, where appropriate, purposes. If proposing direct material costs, this justifying information can be included in the Volume 5 ‘Supplemental Cost Information’ with vendor quotes, historical costs, etc.

(3) Other Direct Costs: This category includes specialized services such as machining or milling, special testing or analysis, and/or costs incurred to use specialized equipment. Proposals including leased hardware, must provide an adequate lease vs. purchase justification. If proposing other direct costs, this additional information can be included in the ‘Supplemental Cost Information’ in Volume 5.

Include Travel costs in ‘Other Direct Costs’, in the cost volume, list the total cost of each proposed trip, and then justify the costs in the ‘Supplemental Cost Information’ in Volume 5. Actual travel may differ from that proposed, however this information allows Contracting Officers to ensure travel costs are not excessive.

Include any subcontractors or consultants’ costs in this section, broken out by total cost for each. 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. Include the associated subcontractor or consultant agreements in the ‘Supplemental Cost Information’ in Volume 5.

All subcontractor costs and consultant costs must be detailed at the same level as prime contractor costs with regards to labor, travel, equipment, etc. Provide detailed substantiation of subcontractor costs. Enter this information in the online cost proposal form’s Explanatory Material section. The Supporting Documents Volume (Volume 5) may be used if additional space is needed.

Research Institution as a Sub-Contractor. Involvement of a research institution in the project is required and the institution should be identified and described according to the [Cost Breakdown](#)

Guidance. A minimum of 40% 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. STTR efforts may include subcontracts with Federal Laboratories and Federally Funded Research and Development Centers (FFRDCs). A waiver is no longer required. However, proposers must certify facilities use on the proposal Cover Sheet

The Air Force may issue an SBIR/STTR Funding Agreement to an SBC that intends to enter into an agreement with a Federal Laboratory to perform portions of the award or has entered into a cooperative research and development agreement (see 15 U.S.C. 3710a(d)) with a Federal Laboratory, only if there is compliance with the following.

- (i) The Air Force will not require that the SBC enter into an agreement with any Federal Laboratory to perform any portion of an SBIR/STTR award, as a condition for an SBIR/STTR award.
- (ii) The Air Force will not issue an SBIR/STTR award or approve an agreement between an SBIR/STTR Awardee and a Federal Laboratory if the SBC will not meet the minimum performance of work requirements set forth in § 6(a)(4) of this Policy Directive.
- (iii) The Air Force will not issue an SBIR/STTR award or approve an agreement between an SBIR/STTR Awardee and a Federal Laboratory that violates any SBIR/STTR requirement set forth in statute or this Policy Directive, including any SBIR/STTR Data Rights protections.
- (iv) The Air Force and Federal Laboratory will not require any SBIR/STTR Awardee that has an agreement with the Federal Laboratory to perform portions of the activities under the SBIR/STTR award to provide advance payment to the Federal Laboratory in an amount greater than the amount necessary to pay for 30 days of such activities.

NOTE: Companies selected for award may be required to submit further documentation to substantiate costs, e.g., support equipment, materials, consultant, or subcontractor costs.

e. Company Commercialization Report (Volume 4) The Company Commercialization Report will not be used for X20.D. No submission required.

The Company Commercialization Report is Report is the fourth section of a complete proposal package. The Company Commercialization Report is prepared through the DoD Submission Web site (<https://sbir.defensebusiness.org/>). A Company Commercialization Report is required even if the proposing firm has not previously received SBIR or STTR awards. Follow the instructions on the web site and enter the quantitative commercialization results of your firm's prior Phase II projects. Include the items listed below as well as other information relative to your firm's commercialization track record.

- (1) Sales revenue from new products and non-R&D services resulting from Phase II technology;
- (2) Additional investment from sources other than the federal SBIR/STTR Program in activities that further the development and/or commercialization of Phase II technology;

- (3) Whether the Phase II technology has been used in a fielded DoD system or acquisition program and, if so, which system or program;
- (4) The number of patents resulting from the contractor's participation in the SBIR/STTR Program;
- (5) Growth in number of firm employees; and
- (6) Whether the firm has completed an initial public offering of stock (IPO) resulting, in part, from a Phase II project.

All prior DoD and non-DoD Phase II projects must be reported, regardless of whether the project has any commercialization to date.

The site will compare these results to the historical averages for the DoD STTR Program to calculate a Commercialization Achievement Index (CAI) value. Only firms with four or more Phase II projects that were awarded at least two years prior to this CSO will receive a CAI score; otherwise the CAI is not applicable (see the Company Commercialization Report section of the DoD Submission Web site for more details). Firms with a CAI at the 20th percentile or below will **receive no more than half of the evaluation points under evaluation criteria (c) in Section 6 of this document for Phase I proposals and evaluation criteria (b) in Section 8 of this document for Phase II proposals**. This report shall only be prepared once and submitted with all your proposals for this CSO. A report showing that a firm has received no prior Phase II awards will not affect the firm's ability to obtain an STTR award.

Additional explanatory material relating to the firm's record of commercializing its prior STTR or STTR projects may be included in the Commercialization Track Record Narrative section of the Company Commercialization Report. Examples of the additional information include: commercialization successes in government or private sector markets that are not fully captured in the quantitative results (e.g. commercialization resulting from your firm's prior Phase I projects); any mitigating factors that could account for low commercialization; and recent changes in the firm's organization or personnel designed to increase the firm's commercialization success.

f. Supporting Documents (Volume 5)

The Supporting Documents Volume (Volume 5) is provided for small businesses to submit additional documentation to support the Technical Volume (Volume 2) and the Cost Volume (Volume 3). The Supporting Documents Volume is available for use for submitting Phase I and Phase II proposals for both the DoD SBIR and STTR Programs. Note the online application may only allow for a single document to be uploaded to the 'Supporting Documents' Volume, therefore the documents may need to be combined into a single PDF file before uploading to the application form.

Documents **required** and **MUST** be included in Volume 5 are:

1. Research Institution Teaming Agreement (REQUIRED)
2. Resumes of Key Personnel (REQUIRED)
3. DoD Funding Agreement Certification (Signed) (REQUIRED) - The AF Special Topic requires a Funding Agreement Certification be completed and signed at time of proposal submission, and included in Volume 5. This certification can be found at: <https://www.afsbirsttr.af.mil/Program/Phase-I-and-II/> under “Phase I and II Certification – Funding agreement.”

Accepted documents to be included in Volume 5, applicable, are:

1. Letters of Support
2. Lifecycle
3. Allocation of Rights - <https://www.afsbirsttr.af.mil/Portals/60/Pages/Phase%20I-II/Model%20agreement%20for%20the%20allocation%20of%20rights.pdf>
4. ITAR/EAR Certification: For proposals whose solutions fall under export-controlled regulations, either International Traffic in Arms (ITAR) or Export Administration Regulations (EAR), a certified DD Form 2345, Militarily Critical Technical Data Agreement, or evidence of application submission must be included. The form, instructions, and FAQs may be found at the United States/Canada Joint Certification Program website, <http://www.dla.mil/HQ/InformationOperations/Offers/Products/LogisticsApplications/JCP/D2345Instructions.aspx> . Approval of the DD Form 2345 will be verified if proposal is chosen for award.
5. Other

g. Fraud, Waste and Abuse Training (Volume 6)

The Fraud, Waste and Abuse Certificate of Training Completion (Volume 6) must be completed within DSIP. When the training is complete, the system will provide an automated message and allow the proposal to continue on toward completion. The proposal will not advance until the training is completed.

5.4 Phase I Proposal Checklist

The Offeror’s proposal shall be in accordance with Section 5.0. A complete proposal consists of:

0. Registration
 - 0.1. DUNS Number
 - 0.2. System for Award Management (SAM) (CAGE Code)
 - 0.3. Small Business Association ID
 - 0.4. DoD SBIR/STTR ID
1. Volume 1: Proposal Cover Sheet
 - 1.1. Basic Information (CAGE, DUNS)
 - 1.2. Certification Questions
 - 1.3. Business Information
 - 1.4. Proposal Information
 - 1.5. Contact Information
2. Volume 2: Technical Volume

- 2.1. 25 Slide Deck
- 3. Volume 3: Cost Volume
 - 3.1. Direct Labor Costs
 - 3.2. Direct Material Costs (If Applicable)
 - 3.3. Other Direct Costs (If Applicable)
- 4. Volume 4: Company Commercialization Report
- 5. Volume 5: Supporting Documents
 - 5.1. Teaming Agreement with Research Institution
 - 5.2. Resumes of Key Personnel
 - 5.3. DoD Funding Agreement Certification (Signed)
- 6. Volume 6: Fraud, Waste and Abuse Training (Signed)

Offerors should note the proposal preparation tips listed below:

- a. Read and follow all CSO instructions.
- b. Register the firm in DSIP and prepare the firm's submission.
- c. Register the firm with SBA's Company Registry at www.sbir.gov and provide the SBA SBC Identification Number on each proposal coversheet.
- d. Check the cost is below or equal to the value specified in the CSO. Also ensure the Cover Sheet cost matches the Cost Volume.
- e. Ensure the Project Abstract and other Cover Sheet content contains NO proprietary information.
- f. Mark proprietary information within the Technical Volume as instructed in Section 5.2.
- g. The content in the Technical Volume, including the option (if applicable), includes the items in Section 5.3.c.
- h. Each technical volume page header should contain the company name, topic number, and proposal number.
- i. The Company Commercialization Report is submitted online in accordance with Section 5.3.e.
- j. Limit the Technical Volume to 25 slides.

6.0 PHASE I REVIEW CRITERIA

All Phase I and II proposals will be evaluated and judged on a competitive basis. Proposals will be initially screened to determine responsiveness. Proposals passing this initial screening will be peer reviewed by engineers or scientists to determine the most promising technical and scientific approaches. Each proposal will be judged on its own merit. AF is under no obligation to fund any proposal or any specific number of proposals under this topic. It also may elect to fund several or none of the topic's proposed approaches.

Proposals will be peer reviewed based on the criteria below. Selections will represent best value to the Government considering the following factors listed in descending order of importance:

- 1. The potential for commercial (Government or private sector) application and benefits expected to accrue from commercialization. The SBC's record of commercializing STTR or other research, the existence of Phase II follow-on commitments for the subject research, and matching funding, whether from Government or private sources, are evidence of commercialization potential.

2. The appropriateness, relevance, and specificity of an identified Defense Need. A complete, signed, and cogent Air Force Customer Memorandum is an indicator of the appropriateness, relevance, and specificity of an identified Defense Need. Adequacy of the proposed effort and its relationship to fulfilling the identified Defense Need.
3. The soundness, technical merit, and innovation of the proposed approach and its incremental progress toward fulfilling the identified Defense need and the qualifications of the proposed Principal Investigators/Project Managers, supporting staff, and consultants to execute against the proposed approach

Cost reasonableness will be considered to the extent appropriate.

IAW 15 USC 638(dd)(7), investment by venture capital, private equity firms, or hedge funds shall not be used as an award criterion.

Other Factors Considered During the Selection Process:

- Possible duplication with other R/R&D;
- Potential integration with other Air Force or DoD Programs;
- Phase III potential;
- Funding limitations;
- Innovativeness;
- USAF STTR program balance;
- Applicant small business size/status pursuant to 13 CFR 121.701-705; demonstrations of eligibility through registrations pursuant to FAR Subpart 4.11 and 4.18; and applicant responsibility pursuant to FAR Part 9;
- National security concerns.

The effort's cost to the Government may be considered to determine the successful offeror when more than one proposal is found to be essentially equal in merit.

7.0 PHASE II PROPOSAL

The AF reserves the right to modify Phase II submission requirements. Should requirements change, all Phase I awardees will be notified. The AF also reserves the right to change administrative procedures to improve AF STTR Program management.

7.1 Introduction

Phase II is the demonstration of the technology found feasible in Phase I. Only Phase I awardees are eligible to submit Phase II proposals. All Phase I awardees will be sent a notification with the Phase II proposal submittal date and detailed proposal preparation instructions.

7.2 Proposal Provisions

IMPORTANT -- While it is permissible, with proper notification, to submit identical proposals or proposals containing a significant amount of essentially equivalent work for consideration under numerous Federal program

solicitations, it is unlawful to enter into contracts or grants requiring essentially equivalent effort. If there is any question concerning this, it must be disclosed to the soliciting agency as early as possible. If a proposal submitted for a Phase II effort is substantially the same as a previously funded proposal, is now being funded, or is pending award with another Federal Agency, DoD Component, or AF organization, it must be noted on the Cover Sheet and required information included in Section 5.4.c(11).

Due to agency specific limitations on funding and number of awards made to a particular firm per topic using SBIR/STTR funds, Head of Agency determinations are now required before another agency may make an award under that topic. This limitation does not apply to Phase III funding. Please contact the original sponsoring agency before submitting a Phase II proposal to an agency other than the original topic sponsor.

Section 4(b)(1)(i) of the SBIR/STTR Policy Directives states, at the agency's discretion, projects awarded a Phase I under a SBIR solicitation may transition to STTR in Phase II and vice versa. A firm wishing to transfer from one to the other must contact the designated technical monitor to discuss the basis and the agency's ability to support it. The transition may be proposed prior to award or during Phase II performance. Agency disapproval of a change request shall not be grounds for granting relief from contractual performance requirements. All approved transitions requiring a research institution's removal and revision to work percentages must be noted in the Phase II award or modification signed by the Contracting Officer.

7.3 How to Submit

Each Phase II proposal must be submitted through the DSIP, <https://www.dodsbirsttr.mil/>.- Please ensure the proposal is submitted to the correct Command under the correct topic number. Each proposal submission must contain a Proposal Cover Sheet, Technical Volume, Cost Volume, Supporting Documents and Fraud, Waste and Abuse Training. The preferred format for proposal submission is Portable Document Format (.pdf). Graphics must be distinguishable in black and white. Please virus-check all submissions.

NOTE: The Government reserves the right to award all, some, or none of the proposals received. The Government is also not responsible for offeror expenditures prior to award. All awards are subject to successful negotiations and funds availability.

7.4 Commercialization Strategy

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

- (1) What is the first product into which the technology will be incorporated?
- (2) Who are the customers and what is the estimated market size? How much money is needed to bring the technology to market? How will the funding be raised?
- (3) Does the company possess marketing expertise? If not, how will it be obtained?
- (4) What companies are the proposing firm's competitors, and what is the firm's price and/or quality advantage over them?

The commercialization strategy must also include a schedule showing the anticipated quantitative commercialization results from the Phase II project one year after performance starts, at performance completion, and after performance completion, e.g., 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 (see Section 5.3.e) at least annually.

8.0 PHASE II REVIEW CRITERIA

All Phase I and II proposals will be evaluated and judged on a competitive basis. Proposals will be initially screened to determine responsiveness. Proposals passing this initial screening will be peer reviewed by engineers or scientists to determine the most promising technical and scientific approaches. Each proposal will be judged on its own merit. AF is under no obligation to fund any proposal or any specific number of proposals under this topic. It also may elect to fund several or none of the topic's proposed approaches.

Proposals will be peer reviewed based on the criteria below. Selections will represent best value to the Government considering the following factors listed in descending order of importance:

1. The potential for commercial (Government or private sector) application and benefits expected to accrue from commercialization. The SBC's record of commercializing STTR or other research, the existence of Phase II follow-on commitments for the subject research, and matching funding, whether from Government or private sources, are evidence of commercialization potential.
2. The appropriateness, relevance, and specificity of an identified Defense Need. A complete, signed, and cogent Air Force Customer Memorandum is an indicator of the appropriateness, relevance, and specificity of an identified Defense Need. Adequacy of the proposed effort and its relationship to fulfilling the identified Defense Need.
3. The soundness, technical merit, and innovation of the proposed approach and its incremental progress toward fulfilling the identified Defense need and the qualifications of the proposed Principal Investigators/Project Managers, supporting staff, and consultants to execute against the proposed approach

Cost reasonableness will be considered to the extent appropriate.

Peer reviewers will base their conclusions only on information contained in the proposals except when specified, e.g., the '100-second video'. It cannot be assumed that reviewers are acquainted with the firm or key individuals or any referenced experiments.

IAW 15 USC 638(dd)(7), investment by venture capital, private equity firms, or hedge funds shall not be used as an award criterion.

Other Factors Considered During the Selection Process:

- Possible duplication with other R/R&D;
- Potential integration with other Air Force or DoD Programs;
- Phase III potential;
- Funding limitations;
- Innovativeness;
- USAF STTR program balance;
- Applicant small business size/status pursuant to 13 CFR 121.701-705; demonstrations of eligibility through registrations pursuant to FAR Subpart 4.11 and 4.18; and applicant responsibility pursuant to FAR Part 9;

- National security concerns.

The effort's cost to the Government may be considered to determine the successful offeror when more than one proposal is found to be essentially equal in merit.

9.0 COMMERCIALIZATION READINESS PROGRAM (CRP)

The SBIR/STTR Reauthorization Act of 2011 formalized the Commercialization Readiness Program (CRP), a version of which the AF has established. The AF has also developed criteria and processes to identify existing Phase II projects expected to meet high-priority AF needs with potential for rapid transition to Phase III. Inclusion is by invitation and at the AF's discretion.

CRP projects may receive a variety of assistance services and/or opportunities to facilitate project transition. CRP participation may also result in STTR-funded modifications to existing Phase II contracts beyond the typical STTR funding parameters. These modifications enhance ongoing projects with expanded research, development, test, or evaluation to accelerate transition and commercialization. CRP participants may be required to provide additional reporting regarding results achieved.

10.0 CONTRACTUAL REQUIREMENTS

10.1 Other Contractual Requirements

Awardees will be required to make certain legal commitments through acceptance of Government contract clauses or OT articles. The following outline is illustrative of provisions required by the FAR or statute for inclusion in Phase II awards. This is not a complete list, nor does it contain specific clause/ article wording.

- a. **Standards of Work.** Work performed under the award must conform to professional standards.
- b. **Inspection.** Work performed under the award 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 awardee records involving award transactions.
- d. **Default.** The Government may terminate the award for failure to perform the negotiated effort.
- e. **Termination for Convenience.** The Government may terminate the award at any time if it deems termination in its best interest. The firm will be compensated for work performed and reasonable termination costs.
- f. **Disputes.** Any award dispute not resolved by agreement shall be decided by the Contracting or Agreements Officer with right of appeal.
- g. **Contract/OT Work Hours.** The awardee may not require an employee to work more than eight hours a day or forty hours a week unless compensated accordingly through overtime pay.
- h. **Equal Opportunity.** The firm will not discriminate against any employee or employee applicant because of race, color, religion, sex, or national origin.
- i. **Affirmative Action for Veterans.** The awardee will not discriminate against any employee or applicant for employment because he or she is a disabled veteran.
- j. **Affirmative Action for Handicapped.** The awardee 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 award.
- l. **Covenant Against Contingent Fees.** No person or agency has been employed to solicit or secure the award upon an understanding for compensation except bona fide employees or commercial agencies maintained by the awardee for the purpose of securing business.
- m. **Gratuities.** The Government may terminate the contract if gratuities have been offered to any Government representative to secure the awardee.
- n. **Patent Infringement.** The awardee shall report each notice or patent infringement claim based on contract performance.
- o. **Military Security Requirements.** The awardee shall safeguard classified information associated with the contracted work IAW applicable regulations.
- p. **American Made Equipment and Products.** The awardee will purchase equipment and/or products in support of the STTR award from U.S.-based sources whenever possible.
- q. **Unique Identification (UID).** If hardware will be delivered to the Government under the award, there is potential unique item identification will be required IAW DFARS 252.211-7003.
- r. **Publication Approval.** Government review and approval will be required prior to dissemination or publication, except within and between the awardee and its subcontractors (if any), of classified and non-fundamental information developed under this award or contained in reports to be furnished pursuant to this award.
- s. **Animal Welfare.** Awards involving research, development, test, evaluation, or training on vertebrate animals will incorporate DFARS clause 252.235-7002 or similar verbiage.
- t. **Protection of Human Subjects.** Effective 29 July 2009, contracts including or potentially including research involving human subjects IAW 32 CFR Part 219, DoD Directive 3216.02, and 10 U.S.C. 980, including research meeting exemption criteria under 32 CFR 219.101(b), will incorporate DFARS clause 252.235-7004 or similar verbiage.
- 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. Similar verbiage will be included in OT awards unless determined exempt through comparable determination.
- v. **ITAR.** IAW 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 solicitations and contracts; therefore, all awards resulting from this CSO will include DFARS 252.225-7048 or similar verbiage. Full text: http://farsite.hill.af.mil/reghtml/Regs/far2afmcfars/fardfars/Dfars/Dfars252_220.htm?zoom_highlight=dfars+252%2E225-7048#P4543_324418.
- w. **Cybersecurity.** Awardees are required to provide adequate security on all covered business information systems. Specific security requirements are listed in DFARS 252.204.7012, and compliance is mandatory.

10.2 Commercialization Updates in Phase II

After Phase II award, the awardee shall be required to periodically update the following Phase II commercialization results at <https://www.dodsbirsttr.mil/submissions>.

- a. Sales revenue from Phase II-developed new products and non-R&D services;
- b. Additional investment from non-Federal SBIR/STTR Program in activities furthering Phase II technology development and/or commercialization;
- c. Phase II technology used in a fielded DoD system or acquisition program and, if any, which system or program;
- d. The number of patents resulting from SBIR/STTR Program awards;
- e. Growth in number of firm employees; and
- f. Completion of an initial public offering of stock (IPO), if any, resulting all or in part from the Phase II project.

Project updates will be required one year after Phase I performance starts, at Phase II completion, and when the firm submits a new SBIR or STTR proposal to DoD. Firms not submitting new proposals to DoD will update annually after Phase II completion.

10.3 Copyrights

With the Contracting or Agreements Officer's prior written permission, 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 each publication contain an appropriate acknowledgment and disclaimer statement.

10.4 Patents

Awardees normally may retain the principal worldwide patent rights to Government-funded inventions. The Government receives a royalty-free license, reserves the right to require the patent holder to license others in certain limited circumstances, and requires anyone exclusively licensed to sell the invention in the United States to manufacture it domestically. As authorized by 35 USC 205, the Government will not make public 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 10.6.

10.5 Technical Data Rights

Rights in technical data, including software, developed under the award terms resulting from proposals submitted under this CSO, generally remain with the awardee. The Government obtains a royalty-free license to use such technical data only for Government purposes during the period commencing with acceptance of the last deliverable under the award and ending 5 years after project completion. This data should be marked with the restrictive legend specified in DFARS 252.227-7018 or similar. Upon expiration of the 20 year restrictive license, the Government has unlimited rights in the STTR data. During the license period, the Government may not release or disclose STTR data to any entity other than its support services contractors except (1) for evaluation purposes; (2) as expressly permitted by the contractor; or (3) use, release, or disclosure is necessary for emergency repair or overhaul of Government-operated items. See DFARS clause 252.227-7018, "Rights in Noncommercial Technical Data and Computer Software – Small Business Innovation Research (SBIR) Program" at https://www.ecfr.gov/cgi-bin/text-idx?rgn=div5;node=48%3A3.0.1.8.48#se48.3.252_1227_67018.

If a proposer plans to submit assertions IAW DFARS 252.227-7017 or similar award term, those assertions must be identified and restrictions **MUST** be included in the proposal submission. Award cannot be executed until assertions are approved or mutually agreed-upon during negotiations.

10.6 Invention Reporting

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

10.7 Final Technical Reports

- a. **Content:** A final report is required for each award. The reports must contain detail regarding the project objectives, work performed, results obtained, and estimates of technical feasibility. A completed SF 298, "Report Documentation Page," will be used as the report's first page. The Report Documentation Page may

be prepared and printed from Defense Technical Information Center's (DTIC's) site at http://www.dtic.mil/dtic/submit/guidance_on_submitting_docs_to_dtic.html.

b. SF 298 Form "Report Documentation Page" Preparation:

1. For unclassified reports, the submitting company 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 STTR Program Office." Note: Data developed under SBIR/STTR awards is subject to DFARS 252.227-7018 or similar protection. AF will review the awardee's Block 12 information and assign the final distribution statement.

For additional distribution statement guidance, visit the DTIC site: http://www.dtic.mil/dtic/pdf/distribution_statements_and_reasons.pdf

Block 14 (Abstract), "Report Documentation Page" must include as the first sentence, "Report developed under SBIR/STTR contract (or OT) for topic [insert topic number]. [Follow with the topic title, if possible.]" The abstract must identify the work's purpose and briefly describe that conducted, the findings/results, and potential applications. The abstract will be published by the DoD. Therefore, **it shall not contain proprietary or classified data.** Type "UU" in Block 17.

2. Block 15 (Subject Terms) 298 must include the term "STTR Report".

c. Submission:

All final reports are submitted to the awarding AF organization IAW the award document. Companies shall not submit Final Reports directly to DTIC.

Delivery is normally required within 30 calendar days after technical program completion.

Requirements regarding other deliverables' submission will be defined in Sections B and C of contract, and Appendix A of Other Transaction for Prototype, award documents.

Special submission instructions for CLASSIFIED reports will be defined in the award's delivery schedule.

DO NOT E-MAIL classified or controlled unclassified reports, or reports containing SBIR/STTR Data Rights protected under DFARS 252.227-7018.'

Proprietary Information in Proposals: Information contained in unsuccessful proposals will remain the property of the Applicant. However, the Federal Government may retain copies of all proposals. Public release of information in any proposal submitted will be subject to existing statutory and regulatory requirements. If proprietary information is provided by an Applicant in a proposal, which constitutes a trade secret, commercial or financial information, , it will be treated in confidence, to the extent permitted by law, provided that the proposal is clearly marked by the Applicant as follows:

- (A) The following legend must appear on the title page of the proposal: This proposal contains information that shall not be disclosed outside the Federal Government and shall not be duplicated, used, or disclosed in whole or in part for any purpose other than evaluation of this proposal, unless authorized

by law The Government shall have the right to duplicate, use, or disclose the data to the extent provided in the resulting contract if award is made as a result of the submission of this proposal. . . The information subject to these restrictions are contained on all pages of the proposal except for pages [*insert page numbers or other identification of pages that contain no restricted information.*] (End of Legend); and

(B) The following legend must appear on each page of the proposal that contains information the Applicant wishes to protect: Use or disclosure of information contained on this sheet is subject to the restriction on the title page of this proposal.

11.0 TOPIC

AFX20D-TCSO1 TITLE: *Phase I Open Topic supporting Agility Prime: Open Call for Innovative Defense-Related Dual-Purpose Technologies/Solutions*

TECHNOLOGY AREA(S): All

OBJECTIVE: This is a Department of the Air Force (DAF) Special Topic in partnership with AFWERX, please see the above DAF Special Topic instructions for further details. A Phase I award will be completed over 6 months with a maximum award of \$150K. Baseline phase II efforts may be awarded for a maximum period of 15 months at a value up to \$750K. The objective of this topic is to solicit any innovative dual-purpose technologies or solutions, such as those not actively being requested by the DAF. Additionally, this topic is intended to incentivize small business commercialization of cutting-edge research while also strengthening the United States' industrial base. This topic is intended for companies that can complete a feasibility study and prototype validated concepts in accelerated Phase I and II schedules. While this topic is specifically aimed at early stage concepts, it is most at later stage development efforts rather than basic science or research.

DESCRIPTION: The Department of Defense (DoD) is a large and complex organization that shares many functions with the commercial sector. We are interested in exploring innovative technology domains with clear prospective or realized commercial value and their application to DAF operations (i.e. dual-purpose technologies or solutions). We recognize that it is impossible for the STTR program to specifically solicit every potentially relevant technological area, thus this topic is intended to be an open call for specific ideas and technologies to include concepts or technologies that are not be currently solicited (i.e. the "unknown-unknown"). It is important that any potential solutions have a high probability of keeping pace with the technological change and thus should be closely tied to prospective commercial offerings that will help support the development of the solution for a DAF application. This topic is meant to facilitate development of solutions to meet DoD stakeholders' needs in a short timeframe and at low cost. Solutions for this topic should be focused on the three areas listed below and should try to satisfy the criteria below to the maximum extent possible.

1. Commercialization Potential – The offeror(s) should demonstrate broad commercialization potential for the prospective solution in both the Defense and commercial markets. The most effective solutions demonstrate this potential through clear and concise description of customer value or Return on Investment over the current alternative. Moreover, the best solutions are expected to generate varied interest of non-affiliated commercial, investment, and defense entities – financial or otherwise.

2. Relevance to the Defense market – The offeror(s) should demonstrate an understanding of the relevance of their solution to their prospective customers and end-users in the Defense market. The offeror(s) may provide an indication of a defense 'need' by demonstrating knowledge of the current status of the solution's prospective

operational environment and stakeholders as well as preliminary discussions with those stakeholders. In addition, the offeror(s) may demonstrate relevance to published Focus Areas or other given stakeholders.

3. Technical/Team – The proposed approach’s technical merit, as indicated by supporting, peer-reviewed advocacy (including but not limited to scientific articles or publications), depth and relevance of team member experience, and other demonstrations of relevant and varied interest as well as other means support of the relevant intellectual property.

In summary - proposals for this topic should demonstrate a high probability of quickly identifying and realizing product-market fit between an end user and the proposed solution.

BROAD FOCUS AREAS FOR AFX20D-TCSO1 OPEN TOPIC

Though the topic is truly ‘Open’ (agnostic of industry, technology, and problem area), we have identified known areas of interest for which potential DAF Customers and/or funding have already been identified. These areas, which are designed to facilitate streamlined customer discovery, are broken out into broad ‘Focus Areas’, are described below.

For this specific solicitation, the sole Focus Area supports the Agility Prime initiative:

FOCUS AREA 1: Orb/eVTOL/UAM (Electric Vertical Takeoff and Landing/Urban Air Mobility): The objective of this Focus Area is to explore potential commercial products being developed in the emerging eVTOL/UAM market for potential disaster response, humanitarian aid, and logistics missions. This sub-topic is intended survey a large scope of technologies to include: autonomy; advanced aircraft materials and manufacturing; novel acoustics techniques; subsystem, aircraft, and portfolio design and analysis tools; rapid mission planning for dense air environments and logistics efficiencies; command and control of air vehicles; robotic landing gear; large flotation devices; modular payload designs; air vehicle data networks and RF waveforms; sense and avoid architectures, algorithms, and sensors; electrical power storage, generation, charging; distributed electric propulsion control techniques.

The alignment between a proposal and a ‘Focus Area’ can strengthen or compliment a proposal’s merits, but does not singularly fulfill the requirement to demonstrate the defense need as listed above.

To be clear, the concept of ‘Focus Areas’ is not intended to discourage companies offering solutions not immediately applicable to current DAF interest areas, but are simply a mechanism by which current DAF interests are published to the broader small business industry base.

PHASE I: Validate the product-market fit between the proposed solution and a potential USAF stakeholder and conducting a feasibility study by defining a clear and immediately actionable plan for demonstrating value and mitigating risk with the proposed solution and the proposed DAF customer. This feasibility study should:

1. Clearly identify the prime potential DAF end user(s) and AF customer/transition agent (note: the user and customer will likely be two different people) and articulate how they would implement your solution(s) (i.e., the one who is most likely to an early adopter, first user, and initial transition partner).
2. Deeply explore the problem or benefit area(s) which are to be addressed by the solution(s) - specifically focusing on how this solution will impact the end user of the solution, especially in light of current alternatives.

3. Define clear and measureable objectives and key results for a potential trial of the proposed solution with the identified AF end user(s).

4. Clearly identify any additional specific stakeholders beyond the AF end user(s) who will be critical to the success of any potential trial. This includes, but is not limited to, program, contracting, or finance organizations as well as relevant certifying or validating entities

5. Describe how the solution would differ from the non-defense commercial offering (i.e. how would it be modified as compared to its commercial counterpart).

6. Describe the cost and feasibility of integration with current mission-specific products.

7. Describe if and how the demonstration can be used by other DoD or governmental customers.

The funds obligated on the resulting Phase I STTR contracts are to be used for the sole purpose of conducting a thorough feasibility study. Prototypes may be developed with STTR funds during Phase I studies to better address the risks and potential payoffs in innovative technologies.

PHASE II: Develop, install, integrate or otherwise demonstrate a prototype system determined to be the most feasible solution during the Phase I feasibility study. This demonstration should focus specifically on:

1. Evaluating the proposed solution against the objectives and measurable key results as defined in the Phase I feasibility study.

2. Describing in detail how the solution differs from prospective non-defense commercial offerings in comparison to DAF counterparts and how it can be scaled for broader use.

3. A clear transition path for the proposed solution that takes into account input from all affected stakeholders, including but not limited to: end users, engineering, sustainment, contracting, finance, legal, and cyber security.

4. Specific details about how the solution can integrate with other current and potential future solutions.

5. How the solution can be sustainable (i.e. overall supportability)

6. Clearly identify other specific DoD or governmental customers who want to use the solution

PHASE III DUAL USE APPLICATIONS: This is the main goal of this topic: we expect that some solutions may go directly from Phase I to Phase III upon verification of product-market fit. The contractor will transition the solution to provide expanded mission capability to a broad range of potential government and civilian users and alternate mission applications.

NOTES:

a. Due to the large amount of expected interest in this topic, we will not be answering individual questions through e-mail, except through support@afwerx.af.mil. Instead we will be holding a teleconference to address all questions in an efficient manner. This topic will be updated with the final call-in details as soon as the date is finalized.

b. This STTR does NOT award grants, but contracts, when registering in SAM.gov, be sure to select 'YES' to the question 'Do you wish to bid on contracts?' in order to be able to compete for this STTR topic. If you are only registered to compete for grants, you will be ineligible for this topic. For more information please visit

<https://www.afwerx.af.mil/sttr.html>

c. We are working to move fast, please register in SAMs and if already registered please double check your CAGE codes, company name, address information, DUNS numbers, etc. **If they are not correct at time of submission, you will be ineligible for this topic.** In order to ensure this, please include, in the 25-slide technical volume, a screenshot from SAM.gov as validation of your correct CAGE code, DUNS number and current business address along with the verification that you are registered to compete for 'All Contracts'. It is the responsibility of the SBC to ensure that the data in the proposal and the data in SAM.gov are aligned.

d. In order to keep pace with the fast timeline, if the purchase orders are not signed and returned to the contracting office within 5 business days of receipt, a Phase I award will not be issued.

e. The 'DoD SBIR/STTR Programs Funding Agreement Certification' form must be completed and signed at the time of *Proposal Submission* and can be found at:

<https://www.afsbirsttr.af.mil/Portals/60/Pages/Phase%20I-II/SBIR-STTR-Phase-I-II-Funding%20Agreement%20Certification.pdf>

f. It is the responsibility of the contractor to answer the questions in the STTR Cover Sheet and on the 'DoD SBIR/STTR Programs Funding Agreement Certification' accurately.

g. While these are firm fixed price contracts, it is important for the companies to include the cost volume in the STTR online application with reasonable fidelity in order to determine the reasonableness of the proposed effort.

h. Proposed technologies may be restricted under the International Traffic in Arms Regulation (ITAR) which controls defense-related materials/services import/export, or the Export Administration Regulation (EAR), controlling dual use items. Offerors must review the U.S. Munitions List,

<https://www.law.cornell.edu/cfr/text/22/121.1>, and provide a tentative determination regarding applicability to their proposed efforts. If determined applicable, a certified DD Form 2345, Militarily Critical Technology Agreement, must be submitted with the proposal. Information regarding the application process and instructions for form completion are found at

<https://www.dla.mil/HQ/LogisticsOperations/Services/JCP/DD2345Instructions/>.

i. If subject to ITAR, involvement of foreign nationals may be restricted. "Foreign National" is defined in 22 CFR 120.16 as a natural person who is neither a lawful permanent resident (8 U.S.C. § 1101(a)(20)), nor a protected individual (8 U.S.C. § 1324b(a)(3)). It also includes foreign corporations, business associations, partnerships, trusts, societies, other entities/groups not incorporated/organized to do business in the United States, international organizations, foreign governments, and their agencies/subdivisions. Offerors must identify foreign national team members and provide their countries of origin, visa/work permits possessed, and Work Plan tasks assigned. Additional information may be required during negotiations to verify eligibility. Even if eligible, participation may be restricted due to U.S. Export Control Laws.

NOTE: Export control compliance statements are not all-inclusive and do not remove submitters' liability to 1) comply with applicable ITAR/EAR export control restrictions or 2) inform the Government of potential export restrictions as efforts proceed.

REFERENCES:

- FitzGerald, B., Sander, A., & Parziale, J. (2016). Future Foundry: A New Strategic Approach to Military-Technical Advantage. Retrieved June 12, 2018, from <https://www.cnas.org/publications/reports/future-foundry>
- Blank, S. (2016). The Mission Model Canvas – An Adapted Business Model Canvas for Mission-Driven Organizations. Retrieved June 12, 2018, from <https://steveblank.com/2016/02/23/the-mission-model-canvas-an-adapted-business-model-canvas-for-mission-driven>
- US Department of Defense. (2018). 2018 National Defense Strategy of the United States Summary, 11. Retrieved from <https://www.defense.gov/Portals/1/Documents/pubs/2018-National-Defense-Strategy-Summary.pdf>

KEYWORDS: Open, other, disruptive, radical, dual-use, commercial; autonomy; advanced aircraft materials and manufacturing; novel acoustics techniques; subsystem, aircraft, and portfolio design tools; rapid mission planning for dense air environments and logistics efficiencies; command and control of air vehicles; robotic landing gear; large flotation devices; modular payload designs; air vehicle data networks and RF waveforms; sense and avoid architectures, algorithms, and sensors; electrical power storage, generation, charging; alternative onboard and ground-based electrical power generation; distributed electric propulsion control techniques.