Program Solicitation
Scalable On-Array Processing (SOAP)
DARPA-PS-24-05
Microsystems Technology Office
December 8, 2023

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PROGRAM SOLICITATION OVERVIEW INFORMATION

- **Federal Agency Name** – Defense Advanced Research Projects Agency (DARPA), Microsystems Technology Office (MTO)
- **Funding Opportunity Title** – Scalable On-Array Processing (SOAP)
- **Announcement Type** – Initial Announcement
- **Funding Opportunity Number** – DARPA-PS-24-05
- **Dates**
  - Posting Date: December 8, 2023
  - Proposers Day: December 11, 2023
  - Abstract Submission Deadline: January 9, 2024
  - FAQ Submission Deadline: February 9, 2024
  - Proposal Submission Deadline: February 19, 2024
  - Estimated period of performance start: September 2024
- **Concise description of the funding opportunity**: The Defense Advanced Research Projects Agency (DARPA) Microsystems Technology Office seeks innovative proposals for the development and demonstration of scalable algorithms that replace large matrix operations, facilitated by the design of supporting distributed processing hardware. The primary application of the algorithms and hardware will be large elemental digital arrays. Novel processing approaches adapted from disciplines outside of radar and phased arrays are of particular interest.
- **Multiple awards are anticipated**
- **Anticipated funding type:** 6.2
- **Types of instruments that may be awarded** – Other Transaction (OT) for Prototype agreements
- **Attachments to DARPA-PS-24-05:**
  - ATTACHMENT 1: Task Description Document (TDD) Template
  - ATTACHMENT 2: Other Transactions (OT) Certifications Template
  - ATTACHMENT 3: Schedule of Milestones and Payments
  - ATTACHMENT 4: DARPA Standard Cost Proposal Spreadsheet
  - ATTACHMENT 5: General Controlled Unclassified Information Guide (CUIG)
  - ATTACHMENT 6: Model Other Transaction for Prototype
- **Agency contact**
  - Point of Contact
    The Solicitation Coordinator for this effort can be reached at:
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    Dr. James Wilson, Program Manager
    DARPA/MTO
    675 North Randolph Street
    Arlington, VA 22203-2114

PROGRAM SOLICITATION
Defense Advanced Research Projects Agency (DARPA)
Scalable On-Array Processing (SOAP)

1. PROGRAM SOLICITATION AUTHORITY

This Program Solicitation (PS) may result in the award of Other Transaction (OT) for Prototype Projects, which can include not only commercially available technologies fueled by commercial or strategic investment, but also concept demonstrations, pilots, and agile development activities that can improve commercial technologies, existing Government-owned capabilities, and/or concepts for broad defense and/or public application(s). The Government reserves the right to award an OT for Prototype under 10 U.S.C. § 4022, make multiple OT awards, or make no award at all. Follow-on production contracts or transactions may also be awarded pursuant to 10 U.S.C. § 4022. In all cases, the Government Agreements Officer shall have sole discretion to negotiate all agreement terms and conditions with selected proposers. The OT agreement will not require cost sharing unless the proposer is a traditional defense contractor who is not working with a nontraditional defense contractor or nonprofit research institution participating in the project to a significant extent.

2. PROGRAM INFORMATION

This PS encourages solutions from all responsible sources capable of satisfying the Government's needs, including large and small businesses, FFRDCs and Government Entities, nontraditional defense contractors as defined in 10 U.S.C. § 3014, and nonprofit research institutions.

This solicitation requests proposals for a single Technical Area (TA) to develop a prototype during a single 18-month phase (Phase 1). Note that during Phase 1, each performer is expected to develop an expansion plan to further mature their prototype under a potential agreement modification.

2.1. Background

Digital array architectures possess recognized advantages over analog arrays, notably the ability to support multiple simultaneous beams and functions. However, as digital arrays have evolved, array operations have continued to use algorithms for signal processing and tracking that have been long established for analog arrays. While traditional array processing algorithms (e.g., those used in adaptive beamforming) were sufficient for legacy analog arrays, as digital systems scale to more elements and higher data rates, digital bottlenecks from traditional array computations have severely limited the promise of digital arrays. For example, phased arrays of greater than 1000 elements and instantaneous bandwidth (IBWs) of 1 GHz can easily require the real time numerical inversion of 1000 x 1000 matrices, with greater than 1 Tbps of data between the array front end and intermediate processor stages. This need to process and to move such large data flows has resulted in digital bottlenecks, which greatly limit the number of independent elements and IBWs achievable in today's digital array architectures. These digital bottlenecks scale with both the number of elements in the array and the IBW of each element. State-of-the-Art (SOA) interconnects do not have capacity for more than a few hundred elements at an IBW of 2 GHz. Specific digital bottlenecks are as follows, and constitute the basis of the technical challenges to be addressed as a part of the SOAP program:

Processing Bottlenecks

The computational complexity of today's array processing algorithms scales exponentially with the number of elements on the array, which results in processing bottlenecks for larger arrays. Digital arrays generate worldwide internet-level amounts of data that impact today's adaptive beamforming algorithms. For example, minimum variance distortionless response requires assembling and inverting the full array covariance matrix with an operation that scales as N^3, where N is the number of elements. A requirement to compute 1000 array updates per second (such as during target tracking) would require 1074 GOPS/s of computing power. The implied level of power consumption calls for aggressive computing power efficiencies across the array.

Data Movement Bottlenecks

Current digital arrays perform most of the processing on a centralized back-end processor, which often requires many racks of equipment and consumes thousands of watts of power. At the same time, this centralized approach requires all of the array data to be moved off the array, creating data movement bottlenecks. With limited data movement capacity, large arrays with thousands of elements are forced to combine elements in a digital or analog manner, often in a hierarchical tree or a serial topology, at the cost of losing information at every combining stage. The result is that today's arrays can maintain elemental data only for narrow IBW (< 20 MHz) and at fewer simultaneous beams. Higher IBW values or beam counts result in information being lost due to the elemental combining stages, which reduces the ability to mitigate interference.

The data movement and processing bottlenecks described above are the result of attempting to use traditional array processing algorithms in modern digital array architectures. SOAP attempts to break legacy approaches to phased array processing, and bring non-traditional array processing disciplines to phased array algorithms and architectures. For this reason, communities of signal processing experts are encouraged to bring their talents to revolutionary new approaches to phased array computation and design.

2.2. Program Objectives, Scope, and Metrics

Objectives

SOAP is designed to achieve scalable algorithms and processing architectures to overcome the inherent digital bottlenecks that severely limit today's wideband operation on arbitrarily large elemental digital phased arrays. SOAP seeks to develop new approaches to array operations that leverage techniques that have proven successful in other fields that have to manage large amounts of data, such as machine vision, large language model training, etc. SOAP aims to reduce the computational complexity of array processing as a function of element count, from exponential to linear scaling. SOAP also seeks to move the processing from physically separated back-end processors to processors integrated into the array, in order to fully process all the information generated at the element level, with no elemental information loss. To achieve these aims, SOAP will design processors that can be distributed within the array, as close to the elements as possible. These processors should be connected and networked in such a way that the data from any element can be processed by any processor. To facilitate the data movements from the elements to and between the processors, SOAP will leverage recent research in SOA interconnects being used in data centers and in the training of large language models.

Scope

SOAP seeks proposals which address the technical challenges (TCs) that prevent the full

exploitation and advantages of digital arrays. These technical challenges are described as follows:

TC1: Realizing scalable algorithms for digital array computations.

Today's adaptive beamforming algorithms require assembling the full array covariance matrix, then computing its inverse matrix. The computational complexity of these algorithms scales exponentially with the size of the array, which results in processing bottlenecks. For example, adaptive beamforming with simple covariance matrix inversion scales as N^3 using conventional matrix inversion techniques such as QR or Cholesky decomposition, where N is the number of digital array elements. This exponential scaling prevents multibeam and multifunction operation on digital arrays beyond a relatively small number of elements. Scalable algorithms for digital arrays would ideally achieve computational loads that scale linearly, but no worse than N·log(N) (see Figure 1).

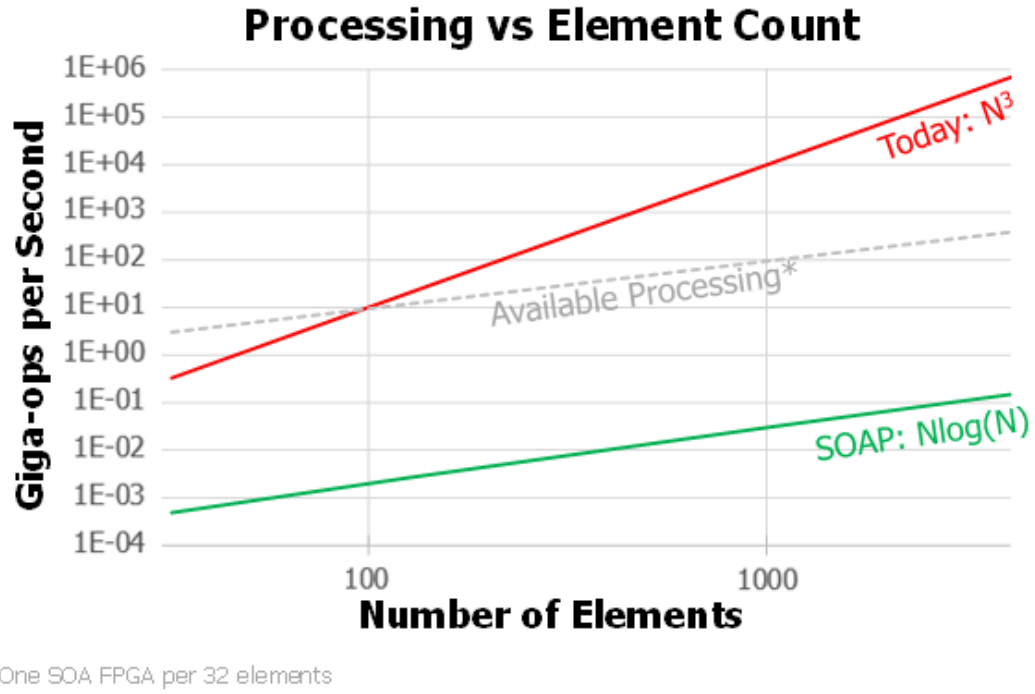

Figure 1. Scaling of adaptive beamforming computations.

Research has shown promising results, adapting image processing and machine vision algorithms for radar processing functions. While these algorithms scale linearly (or near linearly), they provide approximate, rather than exact, solutions. SOAP will explore the applicability of non-traditional algorithms such as these to beamforming, with the aim of reducing the computation complexity of radar processing. Other array applications—such as target tracking and even target recognition, signal source localization, and multiple-input multiple-output (MIMO) radar and communications—will likewise be encouraged with an eye towards new multi-purpose computing infrastructure within the array. In addition, SOAP will explore methods that can take advantage of digital I/Q data and consider forming array products without beams.

TC2: Realizing processing architectures that can scale to extremely large aggregate data rates.

Required data rates scale with both the number of elements in the array and the IBW of each element. SOA interconnects do not have the capacity for more than a few hundred elements at an IBW of 2 GHz, which results in data movement bottlenecks. Current digital arrays with thousands of elements address this problem by combining elements in a digital or analog manner, often in a hierarchical tree or a serial topology, but at the cost of losing information at every combining stage. The result is that today's arrays can maintain elemental data only if the IBW is less than 20 MHz and if the number of simultaneous beams is less than ten. Higher IBW values or beam counts result in information being lost due to the elemental combining stages.

A compelling new approach to overcome this TC is distributed on-array processing. Distributed processing refers to a non-centralized architecture in which the computational load is shared across multiple processors. This is similar, in digital electronics, to multicore processors, which enable more efficient simultaneous processing of multiple tasks. The key insight is that array processing, such as beamforming, can be entirely recast in ways in which such approaches can be efficiently achieved. It is anticipated SOAP will determine the optimal mix of computational resources specific for array processing. SOAP will move these processing elements onto the array, as close to the radio frequency (RF) elements as possible, so that processing on the digital data can begin as soon as it is generated, before having to transport it across or off the array.

Such a distributed architecture will enable the concept of virtual sub-arrays, where any combination of RF elements, from one to all, can be used to perform a particular function. Multiple virtual sub-arrays are expected, and any element can be part of one or more virtual sub-arrays. SOAP will develop an interconnection scheme to allow every element to be addressable by any processing element on the array. SOA high-speed interconnection links, such as those used in high performance computing and data centers, should be considered.

Digital arrays could enable simultaneous multi-beam, multi-function RF operation. Despite considerable investment by the U.S. defense industrial base, elemental digital arrays have not lived up to revolutionary performance advantages over analog and hybrid analog-subarray designs. It is envisioned the SOAP program will, for the first time, enable wideband digital arrays that can support high beam count (>> 10) operation at high IBWs (>> 10 MHz). Furthermore, it will enable truly multi-function (e.g., communication, tracking, search, electronic warfare, etc.) operation with low latency. In a highly contested environment, the implications are increased survivability of size-, weight-, and power-constrained platforms. Equally important, SOAP will serve as the underlying digital backplane architecture of new array applications driven by new algorithms and disciplines (e.g., MIMO and machine learning) that have not been possible with today's field programmable gate arrays, central processing units (CPUs) and graphical processing units.

Metrics

Performance metrics for SOAP are summarized in Table 1 below.

Table 1 SOAP Program Metrics

Metric	Unit	SOA	Phase 1
SINR [A]	dB	20	20
Algorithm Scaling [B]	N/A	-	$N \cdot \log_{10} N$
Operations/beam 128 element array [C]	GOP/S	12	1
Processor efficiency [D]	GOPS/W	30	75
Inter-processor data rates [E]	Gbps	672	9,000

[A] Assumes Jammer-to-Noise Ratio of 30 dB, baseline SNR = 20 dB. Phase 1 with 10 interferers and 128 elements.
[B] Log-log plot of GOPs vs. number of elements measured at 32, 64, and 128 elements, with an ideal N·log(N) line for reference.
[C] Full array beam. Lower is better.
[D] Higher is better.
[E] SOA architectures (e.g., hierarchical) result in data reduction of 20x

2.3. Acquisition Strategy

The Government's acquisition strategy for SOAP is structured to minimize the administrative burden of entry, reduce program risk, and foster competition. To facilitate this objective, the Government will use the following acquisition process:

a. **Proposers Day:** The Government will hold a SOAP Proposers Day on December 11, 2023 to provide information on the SOAP program, promote additional discussion on this topic, address questions from potential proposers, and provide an opportunity for potential proposers to share their capabilities and ideas for teaming arrangements.

b. **Questions and Answers:** DARPA will post a consolidated Question and Answer (FAQ) document on a regular basis. To access the posting go to: http://www.darpa.mil/work-with-us/opportunities. Under the DARPA-PS-24-05 summary will be a link to the FAQ. Submit your question/s by e-mail to DARPA-PS-24-05@darpa.mil. In order to receive a response sufficiently in advance of the proposal due date, send your question/s on or before 5:00 p.m., Eastern Time, February 9, 2024.

c. **Abstracts:** Proposers are strongly encouraged to submit an abstract in advance of a full proposal in order to provide potential proposers with a rapid response and to minimize unnecessary effort in proposal preparation and review. See Section 3 for details.

d. **Full Proposals:** All proposers will have the opportunity to prepare a full proposal for SOAP in accordance with Section 4.

The Government will not pay proposers responding to this solicitation for the costs associated with proposal preparation and submission.

2.4. Program Structure

SOAP comprises an 18-month, single-phase program that will develop scalable algorithms to be implemented on distributed on-array processors through the co-design and simulation of algorithms, processing elements, and interconnects. Program kickoff and periodic review sessions will be required for SOAP performers and represent an opportunity to interact with the Government on planned work, specifics of the technical approach, and any technical or programmatic items of concern.

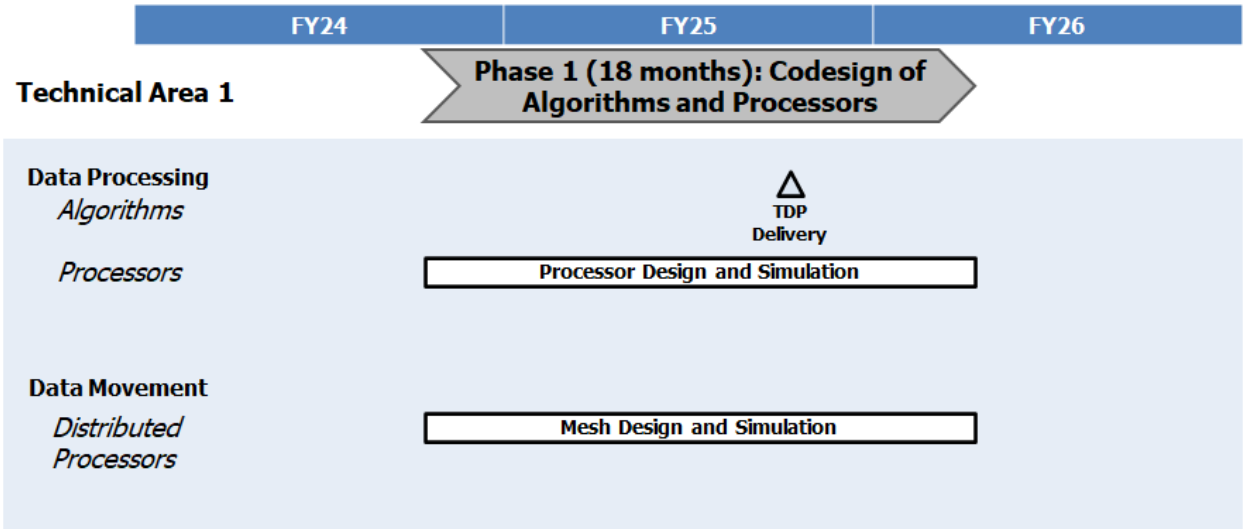

Figure 1. SOAP program schedule overview; see below for specific event dates

Radar return data will be provided by the Government to performers to aid in the development of SOAP algorithm and computing concepts and for use in testing. The data will include target and interference signals, including 5G signals to represent a congested environment of medium power unintended interferers. Data will be provided as early in the program as possible, but performers shall initially be expected to self-assess and present their algorithm's performance at regular status updates and quarterly program reviews (QPRs). This self-assessment will be in accordance with the program metrics described above and may use simulation, performer-defined data sets, or data sets provided by the Government. The intent of these presentations is to show program progress. Twelve months after award it is anticipated all SOAP performers will deliver algorithms with results showing $N \cdot \log(N)$ scaling (slope of ≤ 1.6 when GOPs vs. number of elements is plotted on a log-log plot).

An independent assessment will start approximately twelve months after award, upon the delivery of the algorithm. This assessment will be performed by the Government team using a separate set of data. This independent review approach ensures that performers do not over-optimize their development to a particular data set. The SOAP performer developments will be compared to the performance of a conventional adaptive beamforming baseline algorithm implemented by the Government team on a conventional computing platform, such as CPUs. To support the independent review, performers will provide to the Government team a technical data package (TDP) consisting of their code, any compiled modules, instructions for executing/testing the code with the data sets provided by the Government, and hardware required for demonstration.

DARPA expects to fund a variety of technical approaches within the SOAP program. Proposals

must address both of the technical challenges described above. Proposals should include a diversity of algorithm development approaches. Teaming that includes multiple organizations doing algorithm development is acceptable; however, proposals from non-traditional algorithm developers beyond the radar community are strongly encouraged.

DARPA plans to use key intermediate Phase 1 results to inform potential program expansion beyond Phase 1; performer activities are expected to support identification of the most promising directions for future SOAP research. DARPA anticipates defining specific program expansion goals and objectives by Month 15. In alignment with these objectives and as a Phase 1 activity, SOAP performers are expected to develop and deliver expansion plans to further mature their prototype beyond the Phase 1 goals. Each expansion plan is expected to include a draft red-lined Task Description Document (TDD), a draft red-lined Schedule of Milestones, and budgetary pricing. DARPA expects performers to deliver expansion plans by Month 16. Expansion plans are not proposals for additional SOAP tasking and are for planning purposes only.

At the Government's discretion, DARPA may request proposals to select SOAP performers for specific expansion tasks. Government decisions on any request for proposals or potential awards/modifications, in support of a program expansion related to support of large arrays and the associated computing hardware, will be made based on technical progress and the availability of funds. It is the Government's intent to negotiate and award any expansion tasks no later than the Phase 1 end date. Proposals received in response to the SOAP PS should include a brief description of a general approach for future program expansion in the technical volume, and cost proposals should include development of an expansion plan. Cost proposals should not otherwise include expansion tasking.

2.5. Program Milestones and Deliverables

SOAP performers are expected to systematically develop their array processing algorithms using a constructive plan that (1) draws on prior matrix and related computation work from within and outside of the phased array community, (2) accounts for co-designed implication of the algorithms on distributed processing hardware – either available now or conceptual in nature, and (3) supports the demonstration of a proof of concept showing the algorithms' data flow reductions while maintaining accuracy.

All performers will be provided Government Furnished Data from the SOAP Government Support Team after Program Kick Off. The data may contain simulated radar returns corresponding to various use cases, including skin returns from ground-based and aerial targets. Interference from active and passive (e.g., 5G base station) emitters of various waveforms may also be considered. The performers will be expected to analyze such data, accounting for the following:

- Demonstration of how the new adaptive array processing algorithms reduce the number of computational steps and scales more linearly as array size increases. Specifically, and as a proof-of-concept, performers will show scaling at array element counts from 32 to 128. These analyses should include a comparison against more traditional adaptive beamforming methods. Nevertheless, performers will have to describe the feasibility of their adaptive array methods when scaled to much larger arrays (e.g., thousands of elements) with dozens of interferers present.
- Demonstration of how, despite fewer computational steps, the array processing algorithm maintains SINR performance at corresponding element counts.
- High-level descriptions and analyses of underlying compute and internal data networking technologies showing how the proposed co-designed algorithms and hardware will be

implemented to achieve the processing speeds and efficiency metrics described in Table 1. Quantified results of the processing speeds and efficiencies are to be provided along with an explanation of how the performance improvements are derived.

Milestone Reports containing results of the above demonstrations and analyses are to be provided according to the schedule of deliverables in Table 2. Proposers must complete *Attachment 3 – Schedule of Milestones and Payments* as part of their proposal submission based on Table 2. Proposers may modify milestone and deliverable definitions if needed to align with their development plan.

Table 2: SOAP Milestones

#	Milestone Description	Due Date	Deliverables (D#)
1	Description of overall algorithmic approach to phased array processing	Month 1	D1: Month 1 Milestone Report
2	Details on algorithmic approach and computing platform implementation.	Month 3	D2: Month 3 Milestone Report
3	Application of Government Furnished Radar Data to the algorithms developed towards meeting program goals	Month 6	D3: Month 6 Milestone Report
4	Refinements to the algorithms, with a view towards co-designed advanced distributed processing. First pass delivery of Technical Data Package (TDP) to IV&V team, containing software / firmware prototypes and documentation required for IV&V team to assess the algorithm operation and performance.	Month 9	D4: Month 9 Milestone Report D5: TDP delivery to IV&V Team.
5	Implementation on demonstrable (e.g., COTS) computing hardware to show proof of concept in achieving matrix operation speeds for a 128-element array model. Deliver algorithms with results showing N·log(N).	Month 12	D6: Month 12 Milestone Report
6	Further refinements in the implementation towards meeting program goals. Second pass delivery to IV&V team.	Month 16	D7: Month 16 Milestone Report D8: Updated TDP delivery to IV&V Team.
7	Phase 1 final report. Demonstration by IV&V team and / or performer (if appropriate).	Month 18	D9: Final report D10: Demonstration

DARPA plans to hold Quarterly Program Review (QPR) meetings collectively with selected performers as part of Milestones 2, 3, and 5. For budgetary purposes, proposers may assume that these meetings will be held at or nearby DARPA in Arlington, Virginia. Additionally, DARPA plans to manage the program through bi-monthly status meetings with each performer team via interactive teleconference (Teams or Zoom).

Technical data packages D5 and D8 support independent prototype performance evaluation by the Government IV&V team. The technical data package D8 will include source and executable software developed under SOAP, along with other detailed prototype design artifacts.

2.6. Solicitation Procedure

Please see Section 3.0 for details on abstracts, and Section 4.0 for details on full proposal submissions. DARPA will review full proposals to determine which proposed solutions sufficiently meet the evaluation criteria stated in Section 4.7. Upon favorable review, and subject to the availability of funds, the Government may award one or more OT for Prototypes under 10 U.S.C. § 4022 with fixed-price milestones. The Government reserves the right to select for negotiation all, some, one, or none of the proposals received in response to this solicitation, and to make awards without discussions with proposers. The Government also reserves the right to conduct discussions if it is later determined to be necessary. If warranted, portions of resulting awards may be segregated into pre-priced options. Additionally, DARPA reserves the right to accept proposals in their entirety or to select only portions of proposals for award. In the event that DARPA desires to award only portions of a proposal, negotiations may be opened with that proposer. The Government reserves the right to fund proposals in phases with options for continued work at the end of one or more of the phases, as applicable.

2.7. Eligibility

All responsible sources capable of satisfying the Government's needs may submit a proposal that shall be considered by DARPA. Historically Black Colleges and Universities, Small Businesses, Small Disadvantaged Businesses and Minority Institutions are encouraged to submit proposals and join others in submitting proposals; however, no portion of this Program Solicitation will be set aside for these organizations' participation due to the impracticality of reserving discrete or severable areas of this research for exclusive competition among these entities.

2.7.1. Federally Funded Research and Development Centers (FFRDCs)

FFRDCs are subject to applicable direct competition limitations and cannot propose to this solicitation in any capacity unless they meet the following conditions. (1) FFRDCs must clearly demonstrate that the proposed work is not otherwise available from the private sector. (2) FFRDCs must provide a letter, on official letterhead from their sponsoring organization, that (a) cites the specific authority establishing their eligibility to propose to Government solicitations and compete with industry, and (b) certifies the FFRDC's compliance with the associated FFRDC sponsor agreement's terms and conditions. These conditions are a requirement for FFRDCs proposing to be awardees or subawardees.

2.7.2. Government Entities

Government Entities (e.g., Government/National laboratories, military educational institutions, etc.) are subject to applicable direct competition limitations. Government Entities must clearly demonstrate that the work is not otherwise available from the private sector and provide written documentation citing the specific statutory authority and contractual authority, if relevant, establishing their ability to propose to Government solicitations and compete with industry. This information is required for Government Entities proposing to be awardees or subawardees.

2.7.3. **Authority and Eligibility**

At the present time, DARPA does not consider 15 U.S.C. § 3710a to be sufficient legal authority to show eligibility. While 10 U.S.C.§ 4892 may be the appropriate statutory starting point for some entities, specific supporting regulatory guidance, together with evidence of agency approval, will still be required to fully establish eligibility. DARPA will consider FFRDC and Government Entity eligibility submissions on a case-by-case basis; however, the burden to prove eligibility for all team members rests solely with the proposer.

FFRDCs and Government Entities interested in participating in the SOAP program or proposing to this solicitation should first contact the Agency Point of Contact (POC) listed in Part 1 prior to the Abstract due date to discuss eligibility.

2.7.4. **Other Applicants**

Non-U.S. organizations and/or individuals may participate to the extent that such participants comply with any necessary nondisclosure agreements, security regulations, export control laws, and other governing statutes applicable under the circumstances.

3. GUIDELINES FOR ABSTRACTS

3.1. General Guidelines

Proposers are strongly encouraged to submit an abstract in advance of a full proposals to minimize unnecessary effort in proposal preparation and review. DARPA will acknowledge receipt of the submission and assign a control number that should be used in all further correspondence regarding the abstract.

3.2. Abstract Due Date

Abstracts must be submitted to DARPA/MTO on or before 5:00 p.m., Eastern Time, January 9, 2024. **Abstracts received after this time and date may not be reviewed.**

3.3. Abstract Format and Content

All submissions, including abstracts and proposals must be written in English with type not smaller than 12-point font. Smaller font may be used for figures, tables, and charts. Copies of all documents submitted must be clearly labeled with the DARPA PS number, proposer organization, and proposal title/proposal short title. **An official transmittal letter is not required when submitting a Proposal Abstract.**

Proposers are strongly encouraged to submit an abstract in advance of a full proposal. Abstracts should follow the format described below in this section. The cover sheet should be clearly marked "ABSTRACT" and the **total length of Section 3.3.2 should not exceed 5 pages.** If included, bibliographies will not count toward the page count limit.

3.3.1. **Administrative**

Cover sheet to include:
(1) PS number (DARPA-PS-24-05);
(2) Lead Organization submitting abstract;

(3) Type of organization, selected among the following categories:
Large Organization, Small Disadvantaged Organization, Other Small Organization, HBCU, MI, Other Educational, Other Nonprofit;
(4) Proposer's internal reference number (if any);
(5) Other team members (if applicable) and type of organization for each;
(6) Proposal title;
(7) Technical point of contact to include:
Salutation, last name, first name, street address, city, state, zip code (+4), telephone, fax (if available), electronic mail;
(8) Administrative point of contact to include:
Salutation, last name, first name, street address, city, state, zip code (+4), telephone, fax (if available), electronic mail;
(9) Total funds requested from DARPA, and the amount of cost share (if any); AND
(10) Date proposal abstract was submitted.

3.3.2. **Abstract Details**

This section provides an overview of the proposed work as well as an introduction to the associated technical and management issues.

A. Innovative Claims
Summary of innovative claims for the proposed research. This section is the centerpiece of the abstract and should succinctly describe the uniqueness and benefits of the proposed approach relative to the current SOA alternate approaches.

B. Technical Approach
Technical rationale, technical approach, and constructive plan for accomplishment of technical goals in support of innovative claims and deliverable production.

C. Deliverables
Deliverables associated with the proposed research and the plans and capability to accomplish technology transition and commercialization.

D. Cost and Schedule
Provide a cost estimate for resources (e.g., labor, materials) and any subcontractors over the proposed timeline of the project, broken down by Government fiscal year.

3.4. Abstract Submission

All abstracts sent in response to DARPA-PS-24-05 shall be submitted via DARPA's BAA Website (https://baa.darpa.mil). Visit the website to complete the two-step registration process. Submitters will need to register for an Extranet account (via the form at the URL listed above) and wait for two separate e-mails containing a username and temporary password. After accessing the Extranet, submitters may then create an account for the DARPA BAA website (via the "Register your Organization" link along the left side of the homepage), view submission instructions, and upload/finalize the abstract. Proposers using the DARPA BAA Website may encounter heavy traffic on the submission deadline date; it is highly advised that submission process be started as early as possible.

All abstracts submitted electronically through the DARPA BAA Submission website must be uploaded as zip files (.zip or .zipx extension). The final zip file should only contain the document(s) requested herein and must not exceed 100 MB in size. Only one zip file will be accepted per abstract; abstracts not uploaded as zip files will be rejected by DARPA.

NOTE: YOU MUST CLICK THE 'FINALIZE PROPOSAL ABSTRACT' BUTTON AT THE BOTTOM OF THE CREATE PROPOSAL ABSTRACT PAGE. FAILURE TO DO SO WILL RESULT IN YOUR ABSTRACT NOT BEING OFFICIALLY SUBMITTED TO THIS PS AND THEREFORE NOT BEING REVIEWED.

Please note that the DoD-issued certificate associated with the BAA website is not recognized by all commercial certificate authorities, resulting in untrusted connection errors/messages. You can either bypass the warning (possibly by adding https://baa.darpa.mil to your listed of trusted sites, or darpa.mil as a trusted domain), or visit DISA's site to download the Root Certificate Authority (CA): https://public.cyber.mil/from-iase/.

Technical support for DARPA's BAA Website may be reached at BAAT_Support@darpa.mil, and is typically available during regular business hours, (9:00 AM - 5:00 PM EST Monday - Friday).

Note: DO NOT SUBMIT ABSTRACTS TO GRANTS.GOV.

3.5. Abstract Response

DARPA will respond to abstracts with a statement as to whether DARPA is interested in the idea. If DARPA does not recommend the proposer submit a full proposal, DARPA will provide feedback to the proposer regarding the rationale for this decision. Regardless of DARPA's response to an abstract, proposers may submit a full proposal. DARPA will review all conforming full proposals using the published evaluation criteria and without regard to any comments resulting from the review of an abstract.

4. GUIDELINES FOR PROPOSALS

4.1. General Guidelines

a. All submissions must contain the following:

- Volume 1: Technical and Management Proposal (detailed in Section 4.4 below)
- Volume 2: Cost Proposal (detailed in Section 4.5 below)
- SOAP Other Transaction Reps and Certs (Section 6.3)
- Proposed Redlines to the Model OT Document

b. All submissions must be written in English with type not smaller than 12-point font. Smaller font may be used for figures, tables, and charts. Copies of all documents submitted must be clearly labeled with the DARPA PA number, proposer organization, and proposal title/proposal short title.

c. Do not include elaborate brochures; only include information relevant to the submission requirements or evaluation criteria.

d. Use of a diagram(s) or figure(s) to depict the essence of the proposed solution is permitted.

e. Proposers are responsible for clearly identifying proprietary information. Submissions containing proprietary information must have the cover page and each page containing such information clearly marked with a label such as "Proprietary" or "Company Proprietary." NOTE: "Confidential" is a classification marking used to control the dissemination of U.S. Government National Security Information as dictated in Executive Order 13526 and should not be used to identify proprietary business information.

f. Submissions sent through other mediums, channels, or after the prescribed PS deadline will not be considered, nor reviewed, nor evaluated.

4.2. Full Proposal Due Date

Full proposals must be submitted to DARPA/MTO on or before 5:00 PM, Eastern Time, February 19, 2024, in order to be considered during the single round of selections. **Proposals received after this deadline will not be reviewed.**

4.3. Full Proposal Content

All full proposals must be in the format given below. Proposals shall consist of two volumes: Volume 1: Technical and Management Proposal and Volume 2: Cost Proposal (4 sections). The submission of other supporting materials along with the proposals is strongly discouraged and will not be considered for review. **Volume 1: Technical and Management Proposal, shall not exceed 15 pages. The page limitation for full proposals includes all figures, tables, and charts. There is no page limit for Volume 2: Cost Proposal.**

4.4. Volume 1: Technical and Management Proposal

a. Cover sheet to include (does not count toward page limit):

(1) PS number (DARPA-PS-24-05);
(2) Lead Organization submitting proposal;
(3) Type of organization, selected among the following categories:
Large Organization, Small Disadvantaged Organization, Other Small Organization, HBCU, MI, Other Educational, Other Nonprofit;
(4) Proposer's internal reference number (if any);
(5) Other team members (if applicable) and type of organization for each;
(6) Proposal title;
(7) Technical point of contact to include:
Salutation, last name, first name, street address, city, state, zip code (+4), telephone, fax (if available), electronic mail;
(8) Administrative point of contact to include:
Salutation, last name, first name, street address, city, state, zip code (+4), telephone, fax (if available), electronic mail;
(9) Total funds requested from DARPA, and the amount of cost share (if any); AND
(10) Date proposal was submitted.

b. Official transmittal letter (does not count toward page limit)

The transmittal letter should identify the PS number, the proposal by name, and the proposal reference number (if any), and should be signed by an individual who is authorized to submit proposals to the Government.

The proposer shall include a statement that identifies and substantiates which of the following condition(s) are met to permit use of OTs for Prototypes in accordance with 10 U.S.C. § 4022(d)(1):

(A) There is at least one nontraditional defense contractor or nonprofit research institution participating to a significant extent in the prototype project;
(B) All significant participants in the transaction other than the Federal Government are small businesses (15 U.S.C. 638) or nontraditional defense contractors;
(C) At least one third of the total cost of the prototype project is to be paid out of funds provided by sources other than the Federal Government; or
(D) The senior procurement executive for the agency determines in writing that exceptional circumstances justify the use of a transaction that provides for innovative business arrangements or structures that would not be feasible or appropriate under a contract, or would provide an opportunity to expand the defense supply base in a manner that would not be practical or feasible under a contract.

c. Executive Summary

Summarize the technical approach, anticipated performance, and expected outcomes of the proposed effort. The executive summary should be concise and to the point. Tables, graphs, and diagrams can be used as supplemental material along with narrative to convey the information. It is strongly recommended that Executive Summary not exceed two pages.

d. Technical Approach

This section is the centerpiece of the proposal and should succinctly summarize the innovative claims for the proposed research and clearly describe the proposed approach without using any jargon. This section should demonstrate that the proposer has a clear understanding of the state-of-the-art and should provide sufficient justification for the feasibility of the proposed approach(es). This section should include a detailed technical rationale, technical approach, and constructive plan for accomplishment of technical goals in support of innovative claims and deliverable creation. The technical approach must explicitly address each of the technical challenges as well as describe how the proposed approach will meet the overall DARPA program metrics and goals. Clearly state and justify any proposer-defined metrics.

e. Technology Transition and Program Expansion

Describe the results, products, transferable technology, and expected technology transfer of the proposed effort. Describe the expected maturity of the proposed prototype at the conclusion of Phase 1, and a brief description of the vision for further maturation of this prototype under a potential program expansion.

Address how technologies developed under the effort may be matured and made available to the defense industrial base after the conclusion of the program. This section should describe:

- Plans and capabilities to transition technologies developed under this effort to U.S. national security applications and/or to U.S. industry. As applicable, identify how SOAP technology would transition to specific mission partners and systems. The proposer may also discuss previous technology transitions to the benefit of U.S. interests.

- Mitigation of life-cycle and sustainment risks associated with transitioning intellectual property for U.S. military applications, if applicable. See also Section 4.4. If there are no proprietary claims, this should be stated.

f. Proposer Accomplishments

Discuss the proposer's previous accomplishments and work in closely related research areas.

g. Facilities and Equipment

Describe the facilities and equipment that would be used for the proposed effort and how they will support meeting program metrics.

h. Team Organization

Describe the teaming arrangements which will be used to execute this effort. Describe the programmatic relationship between investigators and the rationale for choosing this teaming strategy. Present a coherent organization chart for the program team which includes, as applicable: (1) the programmatic relationship of team member; (2) the unique capabilities of team members; (3) the task of responsibilities of team members; (4) the teaming strategy among the team members; (5) the principal investigator (PI), co-PI, and program manager (if applicable) for each team member to include subcontractor's PI, co-PI, and program manager; and (6) the key personnel along with the amount of effort to be expended by each person during each year.

i. Task Description Document (TDD) (does not count toward page limit)

Using the *Attachment 1 – Task Description Document (TDD) Template,* describe the task plan to meet the SOAP objectives, metrics, and deliverables. For each task, include a general description of the objective and the planned approach. The TDD must not include proprietary information. Proposers' task structure must be consistent across the TDD, Schedule of Milestones and Payments, and Cost Proposal. If selected for award negotiation, following any negotiated changes or revisions the TDD will be directly incorporated into *Attachment 1* of the OT agreement.

Note: Include a TDD for each subcontractor and/or consultant in the ***Cost Proposal Volume****. Do not include any proprietary information in the TDD(s).*

j. Additional Information (does not count toward page limit)

Information in this section may include a brief bibliography of relevant technical papers and research notes (published and unpublished) which document the technical ideas upon which the proposal is based. Copies of not more than three (3) relevant prior papers may be included in the submission.

4.5. Volume 2: Cost Proposal: (does not count toward page limit)

The proposer shall provide a fully detailed cost volume in sufficient detail to substantiate the full program price proposed to include the total funds requested by DARPA and any non-federal cost share. In doing so, the proposer shall provide, for both the prime and each subcontractor (to include Interdivisional Work Transfer Agreements (ITWA) or similar), a "Summary Cost Breakdown" by phase and performer fiscal year, and a "Detailed Cost Breakdown" by phase, technical task/sub-task, and month. The proposer should utilize *Attachment 4 – DARPA Standard Cost Proposal*

Spreadsheet. All tabs and tables in the cost proposal spreadsheet should be developed in an editable format with calculation formulas intact to allow traceability of the cost proposal. This cost proposal spreadsheet should be used by the prime organization and all subcontractors. A customized cost proposal spreadsheet may be an attachment to this solicitation. In addition to using the cost proposal spreadsheet, the cost proposal still must include all other items required in this announcement that are not covered by the editable spreadsheet. The breakdown/s shall include, at a minimum, the following major cost items along with associated backup documentation:

a. Direct Labor

A breakout clearly identifying the individual labor categories with associated labor hours and direct labor rates, as well as a detailed Basis-of-Estimate (BOE) narrative description of the methods used to estimate labor costs;

b. Indirect Costs

Including Fringe Benefits, Overhead, General and Administrative Expense, Cost of Money, Fee, etc. (must show base amount and rate);

c. Travel

Provide the purpose of the trip, number of trips, number of days per trip, departure and arrival destinations, number of people, etc.;

d. Other Direct Costs

Itemized with costs; back-up documentation is to be submitted to support proposed costs;

e. Material/Equipment

(i) An itemization of any information technology (IT) purchase. Documentation supporting the reasonableness of the proposed equipment costs (vendor quotes, past purchase orders/purchase history, detailed engineering estimates, etc.) shall be provided, including a letter stating why the proposer cannot provide the requested resources from its own funding for prime and all sub-awardees.
(ii) A priced Bill-of-Material (BOM) clearly identifying, for each item proposed, the quantity, unit price, the source of the unit price (i.e., vendor quote, engineering estimate, etc.), the type of property (i.e., material, equipment, special test equipment, information technology, etc.), and a cross-reference to the TDD task/s that require the item/s. At time of proposal submission, any item that exceeds $2,000 if the proposal includes no non-federal (performer) cost share or $5,000 if non-federal (performer) cost share is included, must be supported with basis-of-estimate (BOE) documentation such as a copy of catalog price lists, vendor quotes or a written engineering estimate (additional documentation may be required during negotiations).

f. Consultants

If consultants are to be used, the proposer must provide a copy of the consultant's proposed TDD as well as a signed consultant agreement or other document which verifies the proposed loaded daily / hourly rate and any other proposed consultant costs (e.g., travel);

g. Subcontracts

Itemization of all subcontracts. Additionally, the proposer is responsible for compiling and providing, as part of its proposal submission to the Government, subcontractor proposals prepared at the same level of detail as that required by the prime. Subcontractor proposals include Interdivisional Work Transfer Agreements (ITWA) or similar arrangements. All proprietary subcontractor proposal documentation, prepared at the same level of detail as that required of the prime, shall be made immediately available to the Government, upon request, under separate cover (i.e., mail, electronic/email, etc.), either by the proposer or by the subcontractor organization. This does not relieve the proposer from the requirement to include, as part of their submission, subcontract proposals that do not include proprietary pricing information (rates, factors, etc.).

A Rough Order of Magnitude (ROM), or similar budgetary estimate, is not considered a fully qualified subcontract cost proposal submission. Inclusion of a ROM, or similar budgetary estimate, may result in the full proposal being deemed non-conforming or evaluation ratings may be lowered;

h. Cost-Sharing

The amount of any non-federal (performer) cost-sharing (the source and nature of any proposed cost-sharing should be discussed in the narrative portion of the cost volume).

i. Payable Milestone Plan

Using *Attachment 3 – Schedule of Milestones and Payments Template*, describe the planned milestones and deliverables for the proposed effort. Proposers may modify milestones and deliverable definitions provided in the template if necessary to align with their development plan, but all proposed milestones should include:

- A description of the milestone
- Completion/Exit criteria (to include identifying all associated data deliverables excluding those specifically providing project status)
- Due date
- Payment/funding schedule (to include, if cost share is proposed, awardee and Government share amounts)
- For each data deliverable, identify the proposed Government data rights (keeping in mind how each data deliverable will need to be used by the Government given the goals and objectives of the proposed project)

It is noted that, at a minimum, milestones should relate directly to accomplishment of program technical metrics as defined in the PS and/or the proposer's proposal. The *Schedule of Milestones and Payments* may not include proprietary information. Proposers' task structure must be consistent across the TDD, Schedule of Milestones and Payments, and Cost Proposal. If selected for award negotiation, following any negotiated changes or revisions these fixed-price payable milestones will be directly incorporated into *Attachment 3* of the OT agreement.

4.6. Full Proposal Submission

DARPA will acknowledge receipt of all submissions and assign an identifying control number that

should be used in all further correspondence regarding the submission. DARPA intends to use electronic mail correspondence regarding DARPA-PS-24-05 Submissions may not be submitted by fax or e-mail; any so sent will be disregarded.

Submissions will not be returned. An electronic copy of each submission received will be retained at DARPA and all other non-required copies destroyed. A certification of destruction may be requested, provided the formal request is received by DARPA within 5 days after notification that a proposal was not selected.

All administrative correspondence and questions on this solicitation, including requests for clarifying information on how to submit an abstract or full proposal to this PS should be directed to DARPA-PS-24-05@darpa.mil. DARPA intends to use electronic mail for correspondence regarding DARPA-PS-24-05. Proposals and abstracts may not be submitted by fax or e-mail; any so sent will be disregarded. DARPA encourages use of the Internet for retrieving the Program Solicitation and any other related information that may subsequently be provided.

Unclassified full proposals sent in response to this Program Solicitation may be submitted via DARPA's BAA Website (https://baa.darpa.mil). Note: If an account has recently been created for the DARPA BAA Website, this account may be reused. Accounts are typically disabled and eventually deleted following 75-90 days of inactivity – if you are unsure when the account was last used, it is recommended that you create a new account. If no account currently exists for the DARPA BAA Website, visit the website to complete the two-step registration process. Submitters will need to register for an Extranet account (via the form at the URL listed above) and wait for two separate e-mails containing a username and temporary password. The “Password Reset” option at the URL listed above can be used if the password is not received in a timely fashion. After accessing the Extranet, submitters may then create an account for the DARPA BAA website (via the "Register your Organization" link along the left side of the homepage), view submission instructions, and upload/finalize the proposal. Note: Even if a submitter’s organization has an existing registration, each user submitting a proposal must create their own Organization Registration.

All unclassified concepts submitted electronically through DARPA’s BAA Website must be uploaded as zip archives (i.e., files with a .zip or .zipx extension). The final zip archive should be no greater than 100 MB in size. Only one zip archive will be accepted per submission – subsequent uploads for the same submission will overwrite previous uploads, and submissions not uploaded as zip archives will be rejected by DARPA.

Proposers using the DARPA BAA Website may encounter heavy traffic on the submission deadline date; proposers should start this process as early as possible. Technical support for DARPA's BAA Website may be reached at BAAT_Support@darpa.mil, and is typically available during regular business hours (9:00 AM – 5:00 PM Eastern Time).

4.7. Evaluation Criteria

Proposals will be evaluated using the following criteria, listed in descending order of importance:

a. Overall Scientific and Technical Merit

The proposed technical approach is innovative, feasible, achievable, and complete. The

proposed technical team has the expertise and experience to accomplish the proposed tasks. Task descriptions and associated technical elements provided are complete and in a logical sequence with all proposed deliverables clearly defined such that a final outcome that achieves the goal can be expected as a result of award. The proposal identifies major technical risks and planned mitigation efforts are clearly defined and feasible.

b. Potential Contribution and Relevance to the DARPA Mission

The potential contributions of the proposed effort are relevant to the national technology base. Specifically, DARPA's mission is to make pivotal early technology investments that create or prevent strategic surprise for U.S. National Security.

The proposer clearly demonstrates its plans and capabilities to contribute to U.S. national security and U.S. technological capabilities. The evaluation will consider the proposer's plans and capabilities to transition proposed technologies to U.S. national security applications and to U.S. industry. The evaluation may consider the proposer's history of transitioning or plans to transition technologies to foreign governments or to companies that are foreign owned, controlled, or influenced. The evaluation will also consider the proposer's plans and capabilities to assist its employees and agents to be eligible to participate in the U.S. national security environment. In addition, the evaluation will take into consideration the extent to which the proposed intellectual property (IP) rights structure will potentially impact the Government's ability to transition the technology.

c. Cost Realism

The proposed costs are realistic for the technical and management approach and accurately reflect the technical goals and objectives of the solicitation. The proposed costs are consistent with the proposer's Task Description Document (TDD) and reflect a sufficient understanding of the costs and level of effort needed to successfully accomplish the proposed technical approach. The costs for the prime proposer and proposed subawardees are substantiated by the details provided in the proposal (e.g., the type and number of labor hours proposed per task, the types and quantities of materials, equipment and fabrication costs, travel and any other applicable costs and the basis for the estimates).

It is expected that the effort will leverage all available relevant prior research in order to obtain the maximum benefit from the available funding. For proposals that contain cost share, the proposer has provided sufficient rationale as to the appropriateness of the cost share arrangement relative to the objectives of the proposed solution (e.g., high likelihood of commercial application, etc.).

DARPA will conduct a scientific/technical review of each conforming proposal. Conforming proposals comply with all requirements detailed in this solicitation; proposals that fail to do so may be deemed non-conforming and may be removed from consideration. Proposals will not be evaluated against each other since they are not submitted in accordance with a common work statement. DARPA's intent is to review proposals as soon as possible after they arrive; however, proposals may be reviewed periodically for administrative reasons.

As soon as the evaluation of a proposal is complete, the proposer will be notified that (1) the proposal has been selected for funding pending contract negotiations, in whole or in part, or (2) the proposal has not been selected. These official notifications will be sent via email to the Technical POC identified on the proposal coversheet.

5. SECURITY INFORMATION

5.1. Program Security Information

Proposers should include with their proposal any proposed solution(s) to program security requirements unique to this program. Common program security requirements include but are not limited to: operational security (OPSEC) contracting/sub-contracting plans; foreign participation or materials utilization plans; program protection plans (which may entail the following) manufacturing and integration plans; range utilization and support plans (air, sea, land, space, and cyber); data dissemination plans; asset transportation plans; classified test activity plans; disaster recovery plans; classified material / asset disposition plans and public affairs / communications plans.

5.2. Controlled Unclassified Information (CUI)

For Unclassified proposals containing controlled unclassified information (CUI), applicants will ensure personnel and information systems processing CUI security requirements are in place.

5.2.1. CUI Proposal Markings

If an unclassified submission contains CUI or the suspicion of such, as defined by Executive Order 13556 and 32 CFR Part 2002, the information must be appropriately and conspicuously marked CUI in accordance with DoDI 5200.48. Identification of what is CUI about this DARPA program will be detailed in the General MTO Controlled Unclassified Information Guide (CUIG) and is provided as Attachment 5 to the PS.

5.2.2. CUI Submission Requirements

Unclassified submissions containing CUI may be submitted via DARPA's BAA Website (https://baa.darpa.mil) in accordance with Section 3.4 or 4.6 of this PS.

Proposers submitting proposals involving the pursuit and protection of DARPA information designated as CUI must have, or be able to acquire prior to contract award, an information system authorized to process CUI information IAW NIST SP 800-171 and DoDI 8582.01.

5.3. Unclassified Submissions

DARPA anticipates that submissions received under this PS will be unclassified. However, should a proposer wish to submit classified information, an *unclassified* email must be sent to the PS mailbox notifying the Technical Office PSO of the submission and the below guidance must be followed.

Security classification guidance and direction via a Security Classification Guide (SCG) and/or DD Form 254, "DoD Contract Security Classification Specification," will not be provided at this time. If a determination is made that the award instrument may result in access to classified information, a SCG and/or DD Form 254 will be issued by DARPA and attached as part of the award.

6. AWARD INFORMATION

6.1. Organizational Conflicts of Interest

DARPA has an organizational conflicts of interest (OCI) policy that prohibits contractors/ performers from concurrently providing Scientific Engineering Technical Assistance (SETA), Advisory and

Assistance Services (A&AS), or similar support services and being a technical performer. Therefore, proposers are required to identify and disclose all facts relevant to potential OCI involving the proposer's organization and any proposed team member, to include consultants. The proposer is responsible for providing any disclosure with any Executive Summary and Full Proposal submitted to the announcement. The disclosure must include the following:

1. A mitigation plan for the proposer and any affected team members. At a minimum, the plan should include a description of the actions the proposer has taken, or intends to take, to prevent the existence of conflicting roles that might bias the proposer's judgment and to prevent the proposer from having unfair competitive advantage. The mitigation plan should specifically discuss the disclosed OCI in the context of each of the OCI limitations.
2. Affirmation as to whether the proposer or any proposed team member, to include consultants, is providing SETA, A&AS, or similar support to any DARPA office(s) under: (a) a current award or subaward; or (b) a past award or subaward that ended within one calendar year prior to the proposal's submission date.
3. If SETA, A&AS, or similar support is being or was provided to any DARPA office(s), the proposal must include:
    - The name of the DARPA office receiving the support
    - The prime contract number
    - Identification of proposed team member (subrecipient, consultant) providing the support
    - An OCI mitigation plan

In accordance with Agency requirements, the Government will evaluate OCI mitigation plans to avoid, neutralize, or mitigate potential OCI issues before award and to determine whether it is in the Government's interest to grant a waiver. The Government will only evaluate OCI mitigation plans for proposals that are determined selectable in accordance with the stated evaluation criteria and funding availability. The Government may require proposers to provide additional information to assist the Government in evaluating the proposer's OCI mitigation plan.

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

6.2. General Guidelines

Award(s) will be made to proposers whose proposals are determined to be the most advantageous to the Government, all factors considered, including the potential contributions of the proposed work to the overall research program and the availability of funding for the effort. Upon favorable review of the proposal, and subject to the availability of funds, the Government may choose to award an OT for Prototypes agreement for Phase 1.

The Agreements Officer reserves the right to negotiate directly with the proposer on the terms and conditions prior to execution of the resulting OT agreement, including payment terms, and will

execute the agreement on behalf of the Government. Be advised, only a Government Agreements Officer has the authority to enter into, or modify, a binding agreement on behalf of the United States Government.

In order to receive an award:

a. Proposers must be registered in the System for Award Management (SAM) https://sam.gov/ at time of proposal submission and must maintain an active registration for 'All Awards' throughout the life of any resulting award.

b. Proposers will be required to submit invoices for payment electronically via Wide Area Work Flow (WAWF) at https://wawf.eb.mil, unless an exception applies. Registration in WAWF is required prior to award.

c. Proposers must be determined to be responsible by the Agreements Officer and must not be suspended or debarred from award by the Federal Government nor be prohibited by Presidential Executive Order and/or law from receiving an award.

6.3. Representations and Certifications

All proposers are required to submit DARPA-specific representations and certifications for Prototype OT awards in order to be eligible to receive an OT award. The SOAP OT certifications document is attached to this solicitation.

6.4. Fundamental Research

It is DoD policy that the publication of products of fundamental research will remain unrestricted to the maximum extent possible. National Security Decision Directive (NSDD) 189 defines fundamental research as follows:

> *'Fundamental research' means basic and applied research in science and engineering, the results of which ordinarily are published and shared broadly within the scientific community, as distinguished from proprietary research and from industrial development, design, production, and product utilization, the results of which ordinarily are restricted for proprietary or national security reasons.*

As of the date of publication of this solicitation, the Government expects that program goals as described herein may be met by proposed efforts for fundamental research and non-fundamental research. Some proposed research may present a high likelihood of disclosing performance characteristics of military systems or manufacturing technologies that are unique and critical to defense. Based on the anticipated type of proposer (e.g., university or industry) and the nature of the solicited work, the Government expects that some awards will include restrictions on the resultant research that will require the awardee to seek DARPA permission before publishing any information or results relative to the program.

Proposers should indicate in their proposal whether they believe the scope of the research included in their proposal is fundamental or not. While proposers should clearly explain the intended results of their research, the Government shall have sole discretion to determine whether the proposed research shall be considered fundamental and to select the award instrument type. Appropriate language will be included in resultant awards for non-fundamental research to prescribe publication requirements and other restrictions, as appropriate. This language can be found at http://www.darpa.mil/work-with-us/additional-baa.

For certain research projects, it may be possible that although the research to be performed by a

potential awardee is non-fundamental research, its proposed subawardee's effort may be fundamental research. It is also possible that the research performed by a potential awardee is fundamental research while its proposed subawardee's effort may be non-fundamental research. In all cases, it is the potential awardee's responsibility to explain in its proposal which proposed efforts are fundamental research and why the proposed efforts should be considered fundamental research.

6.5. Competition Sensitive Information

DARPA policy is to treat all submissions as competition sensitive, and to disclose their contents only for the purpose of evaluation. Restrictive notices notwithstanding, during the evaluation process, submissions may be handled by support contractors for administrative purposes and/or to assist with technical evaluation. All DARPA support contractors performing this role are expressly prohibited from performing DARPA sponsored technical research and development, and are bound by appropriate nondisclosure agreements. Input on technical aspects of the proposals may be solicited by DARPA from non-Government consultants/experts who are strictly bound by the appropriate non-disclosure requirements.

6.6. Intellectual Property / Data Rights

Any use of proposer-defined intellectual property (patents, proprietary information, etc.) should be clearly marked as such within the proposal. Include all proprietary claims to the results, prototypes, intellectual property, or systems supporting the effort and/or necessary for the use of the research, results and/or prototype. If there are no proprietary claims, this should be stated. All Proposers must provide a good faith representation that the proposer either owns or possesses the appropriate licensing rights to all intellectual property that will be utilized under the proposed effort. Proposers should appropriately identify any potential restrictions on the Government's use of any Intellectual Property contemplated under the award instrument in question. This includes both Noncommercial Items and Commercial Items.

6.7. Procurement Integrity Act (PIA)

All awards under this PS shall be treated as Federal Agency procurements for purpose of 41 U.S.C. Chapter 21. Accordingly, the PS competitive solicitation process and awards made thereof must adhere to the ethical standards required by the PIA.

6.8. Follow-on Production

The Government reserves the right to negotiate and award follow-on production contracts and transactions to performers who successfully complete the prototype phase of Other Transactions awarded under this PS, without further competition, per 10 U.S.C. § 4022.

7. PS DEFINITIONS

"Data" refers to recorded information, regardless of form or method of recording, which includes but is not limited to, technical data, software, mask works and trade secrets. The term does not include financial, administrative, cost, pricing or management information and does not include inventions.

"Government Purpose" means any activity in which the United States Government is a party,

including cooperative agreements with international or multi-national defense organizations or sales or transfers by the United States Government to foreign Governments or international organizations. Government purposes do not include the rights to use, modify, reproduce, release, perform, display, or disclose technical data for commercial purposes or authorize others to do so.

"Government Purpose Rights" means the rights to use, duplicate, or disclose Data, in whole or in part and in any manner, for Government Purposes only and to have or permit others to do so for Government Purposes only.

"Nontraditional defense contractor", with respect to a procurement or with respect to a transaction authorized under 10 U.S.C § 4022, means an entity that is not currently performing and has not performed, for at least the one-year period preceding the solicitation of sources by the Department of Defense for the procurement or transaction, any contract or subcontract for the Department of Defense that is subject to full coverage under the cost accounting standards prescribed pursuant to section 1502 of title 41 and the regulations implementing such section. To be considered as participating to a significant extent, the proposal should substantiate that the effort being performed by the nontraditional defense contractor is critical to the technical success of the project." (10 U.S.C § 3014)

"Nonprofit [research] institution" means an organization owned and operated exclusively for scientific or educational purposes, no part of the net earnings of which inures to the benefit of any private shareholder or individual." (15 U.S.C. § 3703 (3)) Example attestation may include (but is not limited to): Tax-exempt status of the subject nonprofit research institution under IRS § 501(c).

"Other Transaction" refers to the type of OT that may be awarded as a result of this PS. This type of OT is authorized by 10 U.S.C. § 4022 for prototype projects directly relevant to enhancing the mission effectiveness of military personnel and the supporting platforms, systems, components, or materials 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.

"Prototype Project" in the context of an OT is (A) a prototype project addresses a proof of concept, model, (B) reverse engineering to address obsolescence, (C) a pilot or novel application of commercial technologies for defense purposes, (D) agile development activity, (E) the creation, design, development, demonstration of technical or operational utility, or (F) combinations of the foregoing. A process, including a business process, may be the subject of a prototype project (DoD Other Transactions Guide (Version 2.0, July 2023) issued by the Office of the Under Secretary of Defense for Acquisition and Sustainment)

"Small Business Concern" is defined in the Small Business Act (15 U.S.C. § 632)

"Unlimited Rights" means the rights to use, duplicate, release, or disclose, Data in whole or in part, in any manner and for any purposes whatsoever, and to have or permit others to do so.