Broad Agency Announcement

Smart Noninvasive Assays of Physiology (SNAP)

BIOLOGICAL TECHNOLOGIES OFFICE

HR001122S0044

July 12, 2022

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- **Federal Agency Name –** Defense Advanced Research Projects Agency (DARPA), Biological Technologies Office (BTO)
- **Funding Opportunity Title –** Smart Noninvasive Assays of Physiology (SNAP)
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  - Proposers' Day: **July 21, 2022**
    https://sam.gov/opp/2c8bb75ec1a3496498af91e14c456c08/view
- **Concise description of the funding opportunity –** The Smart Noninvasive Assays of Physiology (SNAP) program aims to develop a portable, multi-omic, multiplexed molecular sensor prototype capable of implementing models that assess warfighter physiological states based on molecular biomarkers. SNAP will be rapidly adaptable to diverse Department of Defense end-user needs for readiness assessment and training, providing warfighters with a personalized view into their performance state. Recent research demonstrates that bodily fluids such as saliva carry signatures of physiological states in both health and disease, and in particular, physical and cognitive exertion. Ultimately, models of readiness or other physiological states will require point-of-person tools to process samples, analyze different classes of biomarkers in a single device, and implement these predictive models in real-world settings and on operationally relevant time frames.
- **Anticipated individual awards –** Multiple awards are anticipated.
- **Types of instruments that may be awarded –** Procurement contract, grant, cooperative agreement, or other transaction.
- **Agency contact**

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PART II: FULL TEXT OF ANNOUNCEMENT

1. Funding Opportunity Description

This publication constitutes a Broad Agency Announcement (BAA) as contemplated in Federal Acquisition Regulation (FAR) 6.102(d)(2) and 35.016 and 2 C.F.R. § 200.203. Any resultant award negotiations will follow all pertinent law and regulation, and any negotiations and/or awards for procurement contracts will use procedures under FAR 15.4, Contract Pricing, as specified in the BAA.

The Biological Technologies Office (BTO) is soliciting innovative proposals to develop portable, quantitative, multi-omic, multiplexed, molecular biomarker sensor systems capable of implementing models of human performance readiness under development in the Department of Defense (DoD) and scientific community. The ideal final prototype is intended to be a salivary assay, smaller than a typical cell phone, which objectively measures warfighter readiness for militarily relevant tasks in less than 30 minutes. Other biofluids will be considered, though a strong case must be presented to support biofluids other than saliva. Proposed research must include the development of innovative approaches that enable revolutionary advances in portable biochemical sensing. Specifically excluded is research that primarily results in incremental improvements to the existing state of practice.

1.1. PROGRAM OVERVIEW

The United States warfighter must always be prepared to respond to threats and mission needs, ready to answer the call. Decreased readiness of an individual warfighter can pose grave risks to the health of the individual and fellow warfighters, as well as to the chance of mission success. However, readiness is an ambiguous term without context to the physiological and cognitive demands of the task or mission. Because of the diversity of warfighter roles and associated tasks, defining readiness, even within the military, remains challenging. No single definition of readiness will suffice for all possible military tasks. Therefore, for the purposes of this program, we define readiness as a prediction of an individual warfighter's performance, relative to their peak, in one or more tasks associated with their military role. "Readiness" is a task specific, short time-horizon performance forecast (e.g., < 18 hour), potentially in combination with an absolute prediction of a physiological variable (e.g., VO_2 max). These predictions must not be binary (ready/not ready), but rather scalar and tailored to the task at hand.

Current approaches to assess readiness, while often context aware, are insufficient for providing useful outputs on operationally relevant timescales. Such approaches include medical checkups, physical fitness tests, and subjective self-assessment questionnaires - all of which are imprecise, time-consuming, and often fail to predict outcomes. Moreover, these evaluations are typically conducted periodically (on the order of months or years) further adding to the temporal misalignment of readiness outputs with mission preparation and/or execution.

Many of these existing practices to assess warfighter readiness have not evolved alongside advances in biotechnology, and efforts to improve the state-of-the-art face significant logistical challenges to widespread use. To develop objective assessments with predictive value, various research groups are exploring physiology-based biomarker predictors of readiness. However, the

technologies currently used to analyze biological samples to determine predictive value either require analytical equipment in a laboratory with extensive processing times to obtain accurate results, or portable devices that are unable to analyze multiple classes of biomarkers simultaneously. While wearable technologies have appeal due to their widespread adoption in the consumer space and for enabling continuous, portable sensing, they are limited in the level of insight they can give into physiological processes for performance readiness assessments.

DARPA seeks proposals for development of a device that can quickly quantify, at point-of-person, the variety of molecular biomarkers necessary to predict task performance across a wide range of warfighter roles. The Smart Noninvasive Assays of Physiology (SNAP) program aims to develop a portable, fieldable, noninvasive device to assess warfighter physiological states, focusing on those associated with physical and cognitive readiness. Importantly, the device will leverage a combination of multi-omic, multiplexed biomarker detection, as well as integrated assessment and readout, to predict human performance in the context of real-world, DoD-relevant tasks. SNAP devices will be readily configurable to diverse DoD end-user needs for readiness assessment, and training, thereby providing an individualized view into warfighter performance state relative to that individual's peak. As a result, this technological platform is anticipated to empower not only warfighters and associated decision makers, but also research groups across the DoD pursuing human performance and other physiology research.

1.2. TECHNICAL APPROACH AND PROGRAM STRUCTURE

SNAP is focused on a single technical area (TA): To develop a portable device that can predict warfighter readiness through sensing and assessment of molecular biomarkers from an individual's bodily fluids. To this end, proposers must describe approaches to develop a device with six key attributes:

(1) Be rugged, fieldable, and easy to use.
(2) Uses noninvasive or minimally invasive sample collection of bio-fluids (e.g., saliva).
(3) Encompass all analytical steps from sample preparation to readout.
(4) Return operationally useful information in operationally useful timeframes (<30 minutes).
(5) Have very low size, weight, and power (SWaP) (<200 cm^2, <150g, and internally powered) requirements in order to have little to no impact on warfighter logistical burden.
(6) Have analytical capabilities that are adaptable to different physiological states in the context of the warfighter's specific role(s).

This last attribute is particularly important, as adaptability will render the SNAP device useful for readiness assessments in the aforementioned diverse array of DoD roles, as well as future diagnostic and/or prognostic tests. Each DoD role will likely require specific performance-based tasks, each associated with a distinct set of physiological variables that uniquely define readiness for that role, as well as specific stressors that compromise readiness for that role. For example, physiological readiness states for a cognitive operation, such as remote operation of a drone, are expected to be different than readiness states for physical performance, such as traversing long stretches of rough terrain while hauling a 50kg rucksack. Prediction of readiness states for different roles can be accomplished in a single device if the device is capable of measuring a

sufficient variety of both cognitive and physical biomarker signals, and use those as inputs to a task-specific model which generates the readiness score. Thus, it is preferred that adaptability be achieved through the careful selection and use of a sufficient variety of specific molecular biomarker sensors (Note: For purposes of this solicitation, sensor or molecular sensor refers to part of the overall device that measures a specific biomarker. Thus, the resulting device is anticipated to contain multiple molecular biomarker sensors.). However, in addition, the ability to rapidly develop and implement new molecular biomarker sensors into the device will enable refinement of readiness prediction capabilities, as well as further adaptability of the system to new tasks and roles. Both will be important considerations within the SNAP program. Proposers must clearly describe how their proposed device will be adaptable to different physical and cognitive performance tasks using a diverse set of molecular biomarker sensors, as well as logistical requirements for adapting the device to measure and assess newly discovered biomarkers.

1.2.1. TECHNICAL CHALLENGES

To develop a device to measure molecular biomarkers in a given biofluid (ideally saliva) and utilize those measurements to predict warfighter readiness, proposers must address how their device will overcome all three of the following technical challenges: (1) Multi-omic Biomarker Detection, (2) Robust Readiness Models, and (3) Embedded Compute and Readout.

1.2.1.1. Multi-omic Biomarker Detection

Recent studies have identified molecular biomarkers that are predictive of human performance on physical, cognitive, and combined physical/cognitive tasks. Proposers must identify and reference pertinent studies (published and/or preliminary data) that identify readiness biomarkers in saliva/biofluid. Subsequently, proposals must describe the use and/or development of molecular sensors to detect and measure a subset of those biomarkers, providing justification for the choice and number of proposed biomarkers with regard to their ability to accurately predict readiness across physical, cognitive, and combined physical/cognitive tasks within operationally relevant timeframes for the associated tasks. The appropriateness and quantity of these proposed biomarkers will be considered under the "Overall Scientific and Technical Merit" evaluation criterion described in Section 5.1.1 below.

Published readiness biomarkers span a wide range of biomolecule types, from small molecules (including metabolites and hormones) to large oligomers (and modifications thereof), including nucleic acids and proteins. When describing their solution to the Multi-omic Biomarker Detection challenge, proposals must include the development of an array of molecular sensors capable of detecting and providing quantitative, scalar measurements of the proposed multi-omic biomarkers (nucleic acids, proteins, metabolites, etc.). Such approaches may involve the development of individual molecular sensors specific to each biomarker or, alternatively, a combination of molecular sensors that can collectively enable accurate measurements of one or more molecular biomarkers. Few highly specific analytical technologies are sufficiently rugged and portable to warrant being carried by warfighters in the field, and fewer still, if any, are currently able to simultaneously detect these various biomolecules due to the diverse range of physical and chemical properties they possess. Therefore, one or more novel biomarker detection technologies are expected to be leveraged and developed to the prototype level during this program.

SNAP molecular sensor systems must be:

- Multi-omic, to measure biomarkers from multiple classes;
- Multiplexed, to simultaneously measure multiple biomarkers within each class;
- Fast, to deliver results in operationally relevant timeframes;
- Sensitive, to detect biomarkers at relevant concentrations;
- Specific, to preclude false classifications; and
- Quantitative, to measure relative biomarker concentrations.

Proposers must specifically address the anticipated timeframes involved in measuring each of the proposed molecular biomarkers (e.g., based on their biochemical kinetics), as well as the timeframe over which readiness outputs from the proposed biomarker subsets are anticipated to predict task performance. Moreover, for a given molecular biomarker, different bodily fluids may contain different concentrations of the biomarker over the course of different timescales; proposers must address whether and how such differences play a role in selection of the proposed body fluid (ideally saliva) for readiness prediction. For example, some biomarkers that can be detected in blood may also appear in interstitial fluid, but at a delayed onset. While some molecular biomarkers may be more easily measured than others, this factor must be weighed against their predictive value for readiness within operationally useful timeframes. If a given biomarker is not expressed in a meaningful concentration in a given bodily fluid within the timeframe required to inform readiness models, this biomarker/bodily fluid combination should not be proposed.

1.2.1.2. Robust Models

As mentioned above, some readiness biomarkers have been identified in published and unpublished studies of performance. Some model or formula is required to quantitatively translate molecular signature measurements into a task performance forecast (i.e., readiness) output. While published studies have discovered biomarkers predictive of specific physical and/or cognitive tasks, those specific tasks were rarely directly relevant to warfighter roles. SNAP performers must develop robust computational models to measure readiness using their proposed set of biomarkers for three military tasks (one physical, one cognitive, and one combined physical/cognitive) in three military cohorts selected during the course of the program and coordinated by DARPA. Proposers must describe how they are formalizing and operationalizing readiness (see 6-month deliverable for Phase I). Proposers must address whether concentrations of their proposed biomarkers are expected to be influenced by various factors such as hydration, temporal factors (e.g., circadian rhythms), individual/group variability, environmental conditions, and/or other real-world factors. Proposals must also include a description of how the proposed readiness models will be robust enough to account for factors that affect concentrations of the proposed biomarkers (see Section 1.3 on the program structure and availability of military data for model fine-tuning).

It is expected that ongoing and future extramural and internal DARPA studies (e.g., those funded under the Measuring Biological Aptitude (MBA) program) will discover new biomarkers of readiness over the course of the SNAP program. Therefore, efforts to develop and refine robust models may involve reviewing and monitoring literature for the latest discoveries of applicable

molecular biomarkers. Responsive proposals must include an optional task, along with an associated description, cost, and schedule, for per-biomarker additions/modifications to the initially proposed biomarker set.

While not the focus of SNAP, performers are permitted to design and propose optional tasks that include innovative multi-omics studies to validate and refine proposed biomarkers for readiness prediction in the context of the program's military tasks. Such validation/refinement studies would measure one or more molecules that are known to be a readiness biomarker detectable in humans but have not been previously validated as biomarkers in a SNAP specific context (e.g., readiness for a specific task or military role, measured in the proposed bodily fluid, etc.).

It is preferred for proposed work to use known/published biomarkers. However, proposers may also design optional biomarker discovery studies in their response to the SNAP BAA solicitation to improve device performance. Discovery studies would be aimed at discovering new biomarkers (i.e., discovering new compounds that are correlated with readiness; contrast discovery with refinement or validation as described in the previous paragraph). Proposers who choose to include biomarker discovery studies in their proposed efforts must provide rationale for why new biomarker(s) are needed, above and beyond previously discovered biomarkers, in the context of readiness prediction.

For proposed validation/refinement and/or discovery studies, proposals should address experience authoring and executing successful Human Subject Research (HSR) protocols within a DoD context. Furthermore, full proposals must include detailed plans for how the performer intends to acquire all required approvals in a timely manner to meet specified milestones, including Institutional Review Board (IRB) and Human Research Protection Office (HRPO) approvals. If HSR is proposed, proposals must include a draft IRB protocol package, including draft consent form and drafts of questionnaires to be completed by participants. These draft IRB protocols, consent forms, and questionnaires will not count toward page limits. Proposers are requested to clearly separate and mark HSR tasks from those that do not require human-use within their Statements of Work. These plans must also include a description of planned safeguards to ensure the exclusion or deidentification of any Personally Identifiable Information (PII) or Protected Health Information (PHI) and considerations for use of protected populations such as active duty military personnel.

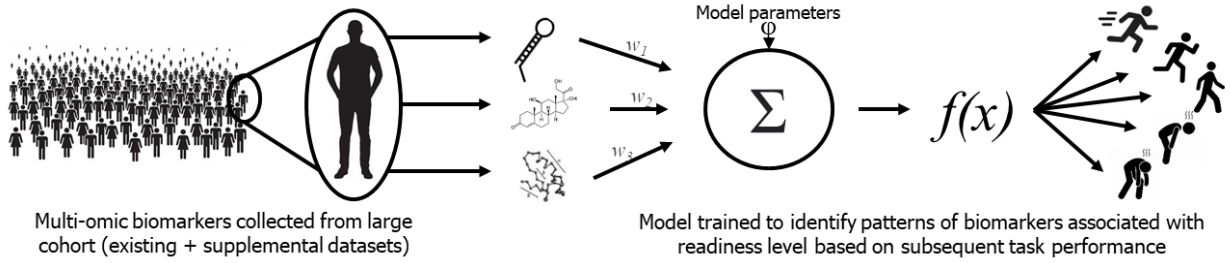

Figure 1. Robust Model development concept

1.2.1.3. Embedded Compute and Readout

Embedded Compute and Readout is the physical implementation of the model and its integration with molecular sensors, which together generate a readiness prediction result that is communicated to the user. This challenge includes developing the physical substrate containing the molecular biomarker sensors, the hardware by which model calculations will be performed, the approach for transforming/transducing the various molecular sensor outputs into the format needed as inputs to the model, and the physical readout of current readiness level(s) compared to peak performance level(s) in a form most useful to the user.

While much of the work of transducing specific molecular sensor outputs and making specific readiness calculations will take place in the second phase of the program, after those specific molecular sensors (1.2.1.1) and models (1.2.1.2) have been developed, SNAP performer teams must also demonstrate progress toward the embedded compute and readout capabilities during the first phase of the program (See Month 16 Milestone). During Phase I, the use of embedded placeholder models must be demonstrated to perform a rudimentary computation utilizing weighted outputs from a minimum of two molecular sensors that can display the results in a manner that can be quantified by the end user. Proposers are welcome to utilize promising novel embedded compute and readout technologies (e.g., the recent paradigms of molecular neural networks or physical neural networks) that require further development before being leveraged for the SNAP device.

As with the Multi-omic Biomarker Detection technical challenge, proposers should describe how their proposed compute and readout technology will be rugged and low SWaP. As an example, recent work in cell-free synthetic biology and molecular computation has demonstrated that machine learning algorithms can be implemented in disposable "smart paper" devices that embed computation into a paper-based substrate. Incorporation of the assay and computational readout into paper-based strips is one potential pathway toward achieving a portable, low-power module to provide rapid readiness outputs from multiple biomarker classes. Other technological approaches for combining assay and readout may include but are not limited to electrochemical methods and/or novel molecular recognition elements coupled to complementary metal oxide semiconductor (CMOS) sensors.

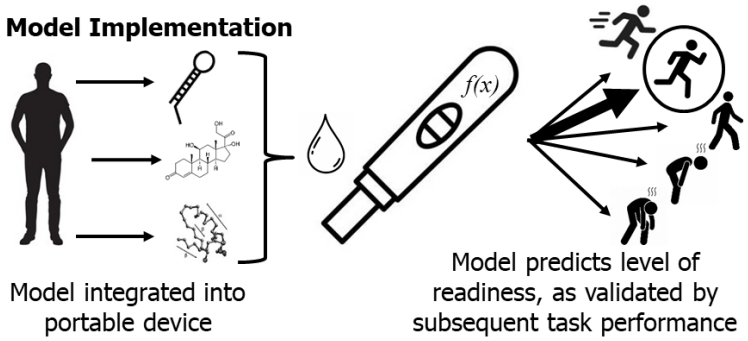

Figure 2. Embedded Compute and Readout concept

1.2.2. PROGRAM OVERARCHING CONSIDERATIONS

While not technical goals in their own right, Overarching Considerations greatly inform metrics and impose constraints that make aspects of the program more technically challenging. These considerations sometimes overlap with each other but are essential to any solutions proposed to the technical challenges. For example, the concept that the SNAP device should integrate into the U.S. Military supply lines is derived from both the "Real World Utility" and "Integration" overarching considerations, and informs solutions to both the "Multi-omic Biomarker Detection" and "Embedded Compute and Readout." When planning, proposing, and executing the work, the following two aspects of the final product must be considered by performers when making every decision.

1.2.2.1. Real World Utility

The goal of the SNAP program is a prototype technology that can be readily developed into a real, fieldable device useful to the warfighter. Proposers are required to describe how their solution will readily translate into a useful real-world device. Specific examples under the umbrella of Real-World Utility include but must not be limited to:

- Environmental conditions for use, including but not limited to variations in temperature and humidity. Note devices will undergo military standard (e.g., MilSpec) testing (MIL-STD-810H) in later phases of the program. Reference https://www.esd.whs.mil/Portals/54/Documents/DD/issuances/dodm/412024m.pdf?ver=2017-12-13-110538-837
- Environmental conditions for storage, such as shelf life, and during shipping. Proposed devices must not require cold-chain storage or transport. Proposers should specify the anticipated shelf life of their proposed devices and describe efforts to test and validate shelf life over the course of the program. If individual device components (e.g., different molecular sensors) have different shelf lives, thus limiting the shelf life of the final product to that of the component with the shortest shelf life, proposers should address these details when describing a rationale for the use of specific molecular sensors, materials, etc.
- Usability in the field includes not only ruggedness but also ease of use. For instance, the device must have the ability to utilize samples collected in the field in a non- or minimally invasive fashion; therefore, automated sample collection and preparation steps may be required. While blood can be collected in a minimally invasive fashion and thus is not ruled out as a potential bodily fluid for the SNAP device, solutions that can feasibly meet program metrics using saliva samples will be favored. For all biofluids, collected sample volumes must be feasible within an operational environment.
- The device must impose only a minimal logistical burden on the warfighter, not just the lowest SWaP possible.
- Much of the value of the SNAP device will be in its widespread use. Cost and manufacturability requirements for deployment of a final product are anticipated to vary depending on the associated task(s) across which the device can produce accurate

readiness outputs, as well as on end-user needs. Therefore, proposers should include descriptions of their devices' ultimate manufacturability and estimated cost-per-test as well as consistency of manufacture.

- Internal verification of device functionality is required. These are internal controls that will indicate to users that the device is functioning properly (e.g., the control line on lateral flow immunoassays or internal standards). Proposers must describe how their device will inform the user about whether or not the device is functioning properly and that outputs from the device that convey a particular readiness state are accurate within the confines of its known variability. For instance, damage to a specific type of molecular sensor could potentially skew the readiness outputs toward one extreme or the other; for this reason, proposers should consider approaches such as outputting a "null" result if the measurements of one or more biomarkers fall outside a certain range. Or, in addition to readiness outputs, devices may produce confidence ratings to indicate the level of confidence in the readiness outputs.

1.2.2.2 Integration

Proposers should consider the systems engineering of both the compatibility of internal components, as well as anticipated integration within the extensive ecosystem of warfighter tools.

Internally, components will require consideration of materials compatibility (e.g., casing material must not leach/outgas molecules that interfere with molecular sensors). As referred to in the technical challenge Embedded Compute and Readout (Section 1.2.1.3), output from molecular sensor technologies must be compatible with required input formats for calculation and readout technologies. Furthermore, compatibility assessment of the internal components will likely be more extensive than that required for typical molecular sensor development, as the multi-omic requirement may require the fusion of more than one sensing technology. Because multiple technologies will ultimately be needed to satisfy all three of the SNAP technical challenges, care must be taken to ensure these technologies work harmoniously when combined. For example, one proposed detection chemistry might require the sample to be under acidic conditions, whereas acidic conditions might destroy target molecules to be detected by a second complementary detection technology. Does the sample get split, chromatographically separated, or more simply analyzed in series? Moreover, what are the implications to sensitivity, sample contamination, analysis time, etc.? Responders must address such known constraints of their proposed technological components and propose solutions to enable effective integration of these components.

For external considerations, the product resulting from further advanced development following the SNAP program would ultimately need to adhere to U.S. military specifications and regulations (https://www.esd.whs.mil/Portals/54/Documents/DD/issuances/dodm/412024m.pdf?ver=2017-12-13-110538-837). For example, if the device, or the biofluid sample after use, would be considered a biohazard, proper disposal must be considered. If leveraging smart paper, temperature, humidity, and shelf stability must be considered. If utilizing a battery power source,

the device must be integrated with military approved batteries. Proposers should refer to MilSpec (MIL-STD-810H 501.6, 502.6, 503.6, and/or 507.6) for detail on these requirements.

1.2.3. TRANSITION

As referred to above, much of the value of the SNAP device will be its widespread use. Therefore, transition to advanced development and/or commercialization efforts will be of particular importance. Proposals must include a transition plan which clearly demonstrates the proposer team's capability to transition the technology developed during the SNAP program to the research, industrial, and/or operational military communities in such a way as to enhance U.S. defense. In these detailed plans for transition, proposers are encouraged to include stakeholders beyond the defense community, such as commercial and other industrial applications. Proposers should specifically address the scalability of manufacturing for their approach and constituent technologies. Although DARPA does not expect proposals to include market research results or fully developed business plans for commercial transition, proposers should make substantive claims about potential markets. Notably, although clinical applications are out of scope for the studies to be conducted under SNAP, which is rooted in human performance, resulting technologies could potentially be refined to serve clinical markets. Proposers who choose to address clinical applications in their transition plan should outline the pathway(s) and targeted outcomes that would define clinical utility for healthcare practitioners. Furthermore, desired intellectual property (IP) rights should be clearly described (See Section 4.2.3). Proposer teams may also need to consider prime/subcontractor relationships and the implications for IP and technology transfer. To further support transition and commercialization goals, performers may consider inclusion of qualified personnel to support these activities in order to increase a performer team's ability to move technology from the lab to a sustainable business that can provide new capabilities to the military.

DARPA Embedded Entrepreneurship Initiative (EEI)

In support of commercialization, awardees pursuant to this solicitation may be eligible to participate in the DARPA Embedded Entrepreneurship Initiative (EEI) during the award's period of performance. EEI is a limited scope program offered by DARPA, at DARPA's discretion, to a small subset of awardees. EEI supports DARPA's mission "to make pivotal investments in breakthrough technologies and capabilities for national security" by accelerating the transition of innovations out of the lab and into new capabilities for the Department of Defense (DoD). EEI investment supports the development of a robust and deliberate go-to-market strategy for selling technology product(s) to the government and commercial markets and positions DARPA awardees to attract U.S. investment.

There are three elements to DARPA's EEI: (1) A Senior Commercialization Advisor (SCA) from DARPA who works with the Program Manager (PM) to examine the business case for the awardee's technology and uses commercial methodologies to identify steps toward achieving a successful transition of technology to the government and commercial markets; (2) Connections to potential industry and investor partners via EEI's Investor Working Groups; and (3) Additional funding on an awardee's contract to hire an embedded entrepreneur with business experience with target industries and in commercializing early stage technology, to achieve specific milestones in a Go-to-Market strategy for transitioning the technology to products that serve both defense and commercial markets. Funding for EEI is typically no more than $250,000

per awardee over the duration of the award. Further information can be found at https://eei.darpa.mil/

Invitation to participate in EEI is at the sole discretion of DARPA and subject to program balance and the availability of funding. Awardees under this solicitation are eligible to be considered for participation in EEI, but selection for award under this solicitation does not imply or guarantee participation in EEI. Nevertheless, proposers interested in participating in EEI are encouraged to include an optional task in their proposed Statement of Work describing their effort, milestones, etc., should they be selected for EEI. Description of this optional task does not count toward page limit but is itself limited to four (4) pages.

1.3. PROGRAM STRUCTURE, DEMONSTRATIONS, METRICS, MILESTONES AND DELIVERABLES

Over the duration of the program, progress toward program goals will be evaluated through the use of Metrics, Milestones, and Deliverables. These are specified below (Sections 1.3.3 and 1.3.4) in order to bound the effort while still affording the maximum flexibility, creativity, and innovation in proposing solutions to the stated problems. Proposers are encouraged to specify metrics, milestones, and deliverables beyond the minimum defined below.

1.3.1. PROGRAM STRUCTURE

SNAP is a 48-month program divided into three Phases, with demonstrations occurring at multiple points during each phase. Continuation from one phase to the next is dependent on performance and ability to achieve metrics. To highlight technology development, SNAP program Independent Verification and Validation (IV&V) partners will facilitate demonstrations to be carried out at the end of program phases as described in Section 1.3.2.

1. Phase I is 24 months long and is focused on developing molecular sensors and associated models for predicting performance in a physical task, as well as proof-of-concept capabilities for embedded sensing and read-out. Progression to Phase II will, among other factors (See Section 1.4.5), likely require performers to meet the metrics associated with the end of Phase I.
2. Phase II is 18 months long and is focused on developing molecular sensors and associated models for predicting performance in a cognitive task, as well as developing integrated embedded sensing and read-out systems that can output readiness predictions. Progression to Phase III, among other factors (See Section 1.4.5), will likely require a breadboard prototype that meets or exceeds the metrics associated with the end of Phase II.
3. Phase III is 6 months long and is focused on refinement of a fully integrated device for predicting performance on tasks with mixed/combined cognitive and physical characteristics. Sensor device is expected to reach a brassboard prototype level that meets or exceeds the metrics associated with the end of Phase III.

1.3.2. DEMONSTRATIONS AND INDEPENDENT VERIFICATION AND VALIDATION (IV&V)

At least six demonstration events will occur over the course of the program. Notionally illustrated in Figure 3, these demonstrations will provide checkpoints to assess performance of developed SNAP technologies throughout all Phases of the program to ensure that the resulting technologies meet DoD needs. Three formal end-of-phase demonstrations are detailed below. In addition at least three informal performer-driven intra-phase demonstrations will be held at performer facilities to demonstrate progress toward program goals. Proposers are welcome to propose additional intra-phase demonstrations. The focus and metrics assessed at all demonstrations will be consistent with the focus of the program Phase in which they are held:

- Phase I: Readiness assessments for Physical Task performance and device proof of concept;
- Phase II: Readiness assessments for Cognitive Task performance and component integration; and
- Phase III: Readiness assessment for performance on tasks utilizing both physical and cognitive skillsets, as well as field-ability of a prototype.

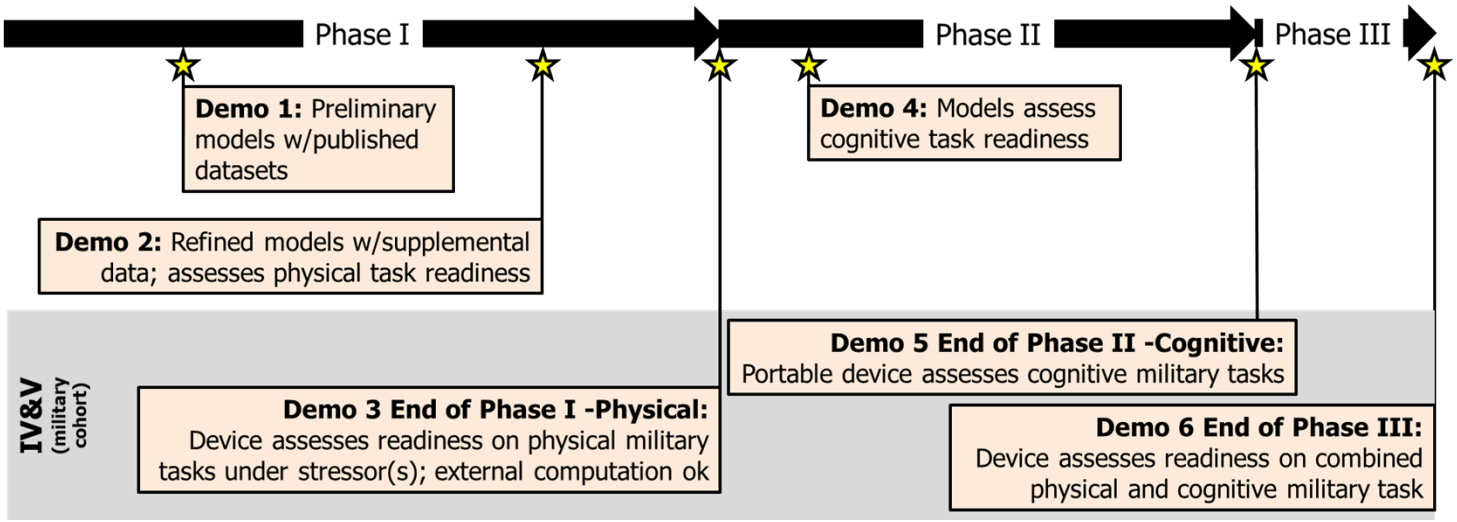

Figure 3. Notional Program Schedule

It is imperative that each performer team's device is evaluated not only independently but also in military cohorts performing military tasks associated with their military role. At the end of each program phase, one or more DARPA identified Government IV&V partner(s) will arrange and coordinate demonstrations of performer devices within military cohorts performing tasks specific to their military roles. These IV&V driven end-of-phase demonstrations are expected to be held on location at the selected military facilities with the relevant cohorts and concluding (including data evaluations) before their respective contractual program Phase ends. Proposals must include, as an optional task, one week of support for each of these demonstrations wherein performer teams travel to the site of military exercises, transport and set up device prototype(s), and collect and analyze samples on site. The Government IV&V partners will coordinate with the performer teams and military facilities to generate testing protocols and obtain IRB and

HRPO approval. The IV&V partner will then collect, analyze, verify, and validate performer device data, results, and predictive accuracy. Furthermore, concurrent to the collection of performer device sampling, an IV&V partner will analyze collected samples using gold standard analytical instruments to verify the presence and concentrations of all performer-identified molecular biomarkers. Furthermore, in later phases, IV&V partner will evaluate the prototype devices for their real-world utility, such as environmental conditions (e.g., temperature, humidity, etc.) required for use and storage, shelf life, ruggedness, etc.

1.3.3. METRICS

The minimum metrics for each Phase are outlined below (notionally summarized in Figure 4). These will be evaluated independently at three End-of-Phase Demonstrations coordinated by the IV&V partner.

1. End-of-Phase I Demonstration will focus on readiness for a purely physical military task, such as some of the physical tasks that might be expected of a U.S. Army Infantry Soldier (e.g., 300m Shuttle). This event will demonstrate prediction of task performance with an Area Under receiver/operator Curve (AUC) or Correlation Coefficient (R^2) ≥0.7 with and without a stressor (e.g., sleep deprivation, extreme environment, hypoxia). At most, 100 training samples will be permitted to fine tune the model to the specific military cohort. At this point, at least 6 molecular biomarkers will be utilized spanning at least 3 biomarker classes, but they need not be integrated with each other nor does there need to be an embedded compute and readout. Instead, external computation can be used to demonstrate the model using the developed molecular sensor outputs. At this point, the time required from sampling to reading out the results should require less than 10 hours.
2. End-of-Phase II Demonstration will focus on readiness for a purely cognitive military task, such as some of the cognitive tasks that might be expected of a U.S. Military Drone Pilot (e.g., Flight Simulator). This event will demonstrate prediction of task performance with an Area Under receiver/operator Curve (AUC) or Correlation Coefficient (R^2) ≥0.8 with and without a stressor (e.g., sleep deprivation, extreme environment, hypoxia, etc.). At most 50 training samples will be permitted to fine tune the model to the specific military cohort. At this point, at least 15 molecular biomarkers will be utilized with at least 2 in each of three biomarker classes. At this demonstration all components (sample preparation (if applicable), molecular biomarker sensors, internal controls, embedded compute, and readout) are expected to be integrated into a benchtop, breadboard configuration able to read out the results from a sample in less than 3 hours. IV&V partners will need to retain devices/components for testing with synthetic samples under MilSpec (MIL-STD-810 501.6, 502.6, 503.6, and/or 507.6) conditions to evaluate performance over a range of real-world conditions. Therefore, performers should prepare to build more than one prototype by this point in the program.
3. End-of-Phase III Demonstration will focus on readiness for a military task that employs high levels of both physical and cognitive function that might be expected of a U.S. Special Operator (e.g., Shoot House). This event will demonstrate prediction of task

performance with an Area Under receiver/operator Curve (AUC) or Correlation Coefficient (R^2) ≥0.9 with and without a stressor (e.g., sleep deprivation, extreme environment, hypoxia, etc.). At most 25 training samples will be permitted to fine tune the model to the specific military cohort. At least 20 molecular biomarkers will be utilized on a fully integrated platform, and the time required from sampling to reading out the results should require less than 30 minutes. The fully integrated device is now expected to meet the final size (<200 cm^2), Weight (150g), and power (internally powered) requirements. IV&V partners will retain devices for testing with real samples under MilSpec (MIL-STD-810 501.6, 502.6, 503.6, and/or 507.6) conditions to evaluate performance over a range of real-world conditions.

Phase I - 24 months	Phase II -18 months	Phase III -6 months
Demo 3 End of Phase I: Physical • AUC/R^2 ≥0.7 predicting a physical military performance task (e.g. push ups, grip strength, 300m shuttle) under stressor (e.g. sleep deprivation, extreme environment) in device with ≤100 training samples • 3+ biomarker classes and 6+ biomarkers assessed on platform (not integrated); Can use external computation • Sample read out ≤ 10 hours	**Demo 5 End of Phase II: Cognitive** • AUC/R^2 ≥0.8 predicting a cognitive performance tasks (e.g. flight simulator) under stressor in device with ≤50 training samples • 3+ biomarker classes and 2+ biomarkers in each class and a total of 15+ assessed on integrated benchtop breadboard platform • Sample read out ≤ 3 hours • Performance with synthetic samples under MILSPEC	**Demo 6 End of Phase III: Simultaneous Physical & Cognitive** • AUC/R^2 >0.9 predicting a mixed cognitive and physical performance task (e.g. shoot house) in a single military training scenario under stressor with ≤25 training samples • 3+ biomarker classes and 2+ biomarkers in each class and a total of 20+ assessed on integrated portable brassboard prototype • SWaP <200 cm2; ≤150g; internal power; Sample to read out ≤ 30 min • Performance with real-world samples under MILSPEC

Figure 4. Summary of End of Phase Metrics

1.3.4. MILESTONES AND DELIVERABLES

A minimum set of Milestones and Deliverables are outlined below according to Phase (Table 1). Proposers must explain quantitative success criteria for each Milestone and provide information on how these will be achieved in their Statement of Work (SOW).

Table 1. Milestones and Deliverables

	Milestones	Deliverables
Phase I (24 months)	**Month 1:** Human Subjects Research (HSR) Protocol developed and submitted to IRB **Month 2:** IRB approved Protocol sent to HRPO for approval **Month 2:** Initial set of biomarkers chosen **Month 3:** Optional prospective data collection (as mentioned in 1.2.1.2) underway and pipeline in place for biological sample analysis with COTS methods (where applicable) **Month 6 Demo 1:** Preliminary *in silico* models w/published datasets **Month 9:** Functional quantitative molecular sensor developed for each biomarker from initial set. **Month 12:** Begin coordinating with IV&V to develop plans and test protocols for End of Phase I Demo **Month 16:** Embedded placeholder model demonstrates rudimentary computation & display using weighted outputs from 2+ molecular sensors **Month 18:** Quantitative molecular sensor for each model biomarker from supplementary data **Month 18 Demo 2:** Refined models w/supplemental data; predicts physical task outcomes; AUC/R2 >0.6 **Month 23 Demo 3: End-of Phase I**	**Month 1:** Copy of submitted HSR Protocol **Month 3:** Report summarizing choices of molecular biomarkers of physical readiness, justification, modelling approach and experimental design **Month 6:** Presentation detailing choice of readiness model output, i.e. what the user sees **Month 9:** Report detailing progress on molecular sensors for biomarkers from literature and initial strategy for integrated sample preparation if applicable **Month 12:** Report detailing progress on molecular sensors from supplementary data **Month 15:** Test plan and protocol for End of Phase III demo **Month 18:** Report on all molecular sensors and advanced strategy for integrated sample preparation if applicable **Month 24:** Phase I Final Report; Physical Task Prediction results
Phase II (18 months)	**Month 27:** Distilled model for deployment on portable platform **Month 30 Demo 4:** Models predict cognitive task outcomes; AUC/R2 >0.7 **Month 31:** Begin coordinating with IV&V to develop plans and test protocols for End of Phase II and III Demos **Month 33:** Sample to read out 6 hours **Month 33:** Placeholder model readout for embedded computation using synthetic samples **Month 36:** Internal controls for verification of device function complete and integrated; sample preparation hardware complete and integrated **Month 41 Demo 5: End-of Phase II**	**Month 25:** Reports summarizing choices of molecular biomarkers for cognitive readiness, development plan for embedded compute and readout, and strategy for internal verification of device function **Month 27:** Report describing integration efforts and approach **Month 34:** Test plan and protocol for End of Phase II demo **Month 36:** Report estimating effort and time required to develop and integrate addition molecular biomarker sensor **Month 42:** Phase II Final Report including overall lessons learned for rapid development of molecular biomarker sensor
Phase III (6 months)	**Month 43:** Finish coordinating with IV&V to develop plans and test protocols for End of Phase III Demo **Month 47 Demo 6: End-of Phase III**	**Month 43:** Test plan and protocol for End of Phase III demo **Month 43:** Device design concept schematics **Month 48:** Program Final Report

1.3.5. RISKS, MITIGATIONS, AND REGULATORY AFFAIRS

Proposals must include a section identifying technical and programmatic risks and associated mitigation strategies. Furthermore, this section will include a description of any regulatory requirements associated with the technical approach and product vision, any regulatory milestones that must be met to avoid program disruption, and plans to meet those milestones. This includes but is not limited to Human Subjects Research (HSR) regulatory requirements (See Section 4.2.3).

1.4. GENERAL REQUIREMENTS

1.4.1. Proposing Teams

DARPA anticipates that performers will be comprised of cross-disciplinary teams that include personnel with complementary and diverse technical expertise (e.g., biology, chemistry, physics, computer science, and various engineering disciplines). Specific content, communications, networking, and team formation are the sole responsibility of the proposer teams. Proposer teams must submit a single, integrated proposal led by a single Principal Investigator (PI) or prime contractor.

1.4.2. Data Sharing and Associate Contractor Agreement (ACA)

DARPA anticipates that a large amount of data will be generated under this program by each performer. Data analysis and modeling will be strengthened by compiling and integrating information across performers. Particularly in the context of predictive machine learning models, it is in the best interest of all performers to have as much training data available as possible and from a diversity of sources. Therefore, proposals must include the description of a plan to share data with teams internally to the SNAP performer group. As needed, data sharing plans to facilitate exchange will then be formalized in an ACA (See Section 8), to be included in the contract or agreement awarded. Performers will also be encouraged to share data externally with the broader research community, and may include plans for external data sharing in the Metrics, Milestones, and Deliverables in their proposed project plan.

1.4.3. Permits and Compliance

It is the proposing team's responsibility to obtain all necessary federal, state, and local government permits and approvals, and abide by all applicable laws where necessary for the proposed work to be conducted.

1.4.4. Ethical, Legal, and Societal Implication (ELSI)

DARPA maintains its commitment to ensuring that efforts funded under this BAA adhere to ethical and legal regulations currently in place for Federally and DoD-funded research. In addition to obtaining all necessary regulatory permits, proposers should plan to support ELSI activities with DARPA, including semi-annual teleconference calls with a SNAP program ELSI group that DARPA will engage. SNAP performers will need to consider the feedback from the ELSI group regarding their research activities.

1.4.5. Down-selects

Progression from Phase 1 to 2 and Phase 2 to 3 depends on funding availability and performance towards Phase-specific goals in end-of-phase demonstrations and milestones outlined in Section

1.3.3 and Section 1.3.4 of this BAA and their likelihood of success in developing a device to predict warfighter readiness using molecular biomarkers in Phase III. All Phase II and Phase III tasks are considered options that the Government may elect to exercise, and down-selection refers to the Government electing not to exercise some or all options associated with work in a given phase. In addition to meeting metrics, down-selection decisions will be informed by, but not limited to:

- Solutions with the most reasonable technical path to achieving metrics in subsequent Program Phases.
- Effective intra-team working relationships across co-/sub-PIs.
- Clear ability to achieve Phase II and Phase III objectives within their proposed budget.

1.4.6. Other Requirements

Performers are expected to attend annual program reviews to provide updates to the DARPA program management team and other SNAP performers on progress towards their milestones and scientific goals on the SNAP program. Performers will also summarize outstanding challenges and limitations that must be overcome to achieve the goals of the program. Program level meetings will be held at the kick-off of each phase (Phases 1, 2, and 3). In addition, performers will also engage regularly with the DARPA program team, including quarterly progress reviews and site visits as well as informal, ad hoc teleconferences to ensure progress is being made toward program objectives.

2. Award Information

2.1. GENERAL AWARD INFORMATION

Multiple awards are anticipated. The amount of resources made available under this BAA will depend on the quality of the proposals received and the availability of funds.

The Government reserves the right to select for negotiation all, some, one, or none of the proposals received in response to this 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, as applicable.

The Government reserves the right to request any additional, necessary documentation once it makes the award instrument determination. Such additional information may include but is not limited to Representations and Certifications (see Section VI.B.2., "Representations and Certifications"). The Government reserves the right to remove proposers from award consideration should the parties fail to reach an agreement on award terms, conditions, and/or cost/price within a reasonable time, and the proposer fails to timely provide requested additional information. Proposals identified for negotiation may result in a procurement contract, cooperative agreement, or other transaction, depending upon the nature of the work proposed, the

required degree of interaction between parties, whether or not the research is classified as Fundamental Research, and other factors.

Proposers looking for innovative, commercial-like contractual arrangements are encouraged to consider requesting Other Transactions. To understand the flexibility and options associated with Other Transactions, consult http://www.darpa.mil/work-with-us/contract-management#OtherTransactions.
In accordance with 10 U.S.C. § 4022(f), the Government may award a follow-on production contract or Other Transaction (OT) for any OT awarded under this solicitation if: (1) that participant in the OT, or a recognized successor in interest to the OT, successfully completed the entire prototype project provided for in the OT, as modified; and (2) the OT provides for the award of a follow-on production contract or OT to the participant, or a recognized successor in interest to the OT.

In all cases, the Government contracting officer shall have sole discretion to select award instrument type, regardless of instrument type proposed, and to negotiate all instrument terms and conditions with selectees. DARPA will apply publication or other restrictions, as necessary, if it determines that the research resulting from the proposed effort will present a high likelihood of disclosing performance characteristics of military systems or manufacturing technologies that are unique and critical to defense. Any award resulting from such a determination will include a requirement for DARPA permission before publishing any information or results on the program. For more information on publication restrictions, see the section below on Fundamental Research

2.2. 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 proposers intending to perform fundamental research and does not anticipate applying publication restrictions of any kind to individual awards for fundamental research that may result from this solicitation. Notwithstanding this statement of expectation, the Government is not prohibited from considering and selecting research proposals that, while perhaps not qualifying as fundamental research under the foregoing definition, still meet the solicitation criteria for submissions. If proposals are selected for award that offer other than a fundamental research solution, the Government will either work with the proposer to modify the proposed statement of work to bring the research back into line with fundamental research or else the proposer will agree to restrictions in order to receive an award.

University or non-profit research institution performance under this solicitation will include effort categorized as fundamental research. In addition to Government support for free and open scientific exchanges and dissemination of research results in a broad and unrestricted manner, the academic or non-profit research performer or recipient, regardless of tier, acknowledges that such research may have implications that are important to U.S. national interests and must be protected against foreign influence and exploitation. As such, the academic or non-profit research performer or recipient agrees to comply with the following requirements:

(a) The University or non-profit research institution performer or recipient must establish and maintain an internal process or procedure to address foreign talent programs, conflicts of commitment, conflicts of interest, and research integrity. The academic or non-profit research performer or recipient must also utilize due diligence to identify Foreign Components or participation by Senior/Key Personnel in Foreign Government Talent Recruitment Programs and agree to share such information with the Government upon request.

i. The above described information will be provided to the Government as part of the proposal response to the solicitation and will be reviewed and assessed prior to award. Generally, this information will be included in the Research and Related Senior/Key Personnel Profile (Expanded) form (SF-424) required as part the proposer's submission through Grants.gov.

1. Instructions regarding how to fill out the SF-424 and its biographical sketch can be found through Grants.gov.

ii. In accordance with USD(R&E) direction to mitigate undue foreign influence in DoD-funded science and technology, DARPA will assess all Senior/Key Personnel proposed to support DARPA grants and cooperative agreements for potential undue foreign influence risk factors relating to professional and financial activities. This will be done by evaluating information provided via the SF-424, and any accompanying or referenced documents, in order to identify and assess any associations or affiliations the Senior/Key Personnel may have with foreign strategic competitors or countries that have a history of intellectual property theft, research misconduct, or history of targeting U.S. technology for unauthorized transfer. DARPA's evaluation takes into consideration the entirety of the Senior/Key Personnel's SF-424, current and pending support, and biographical sketch, placing the most weight on the Senior/Key Person's professional and financial activities over the last 4 years. The majority of foreign entities lists used to make these determinations are publicly available. The DARPA Countering Foreign Influence Program (CFIP) "Senior/Key Personnel Foreign Influence Risk Rubric" details the various risk ratings and factors. The rubric can be seen at the following link:
https://www.darpa.mil/attachments/092021DARPACFIPRubric.pdf

iii. Examples of lists that DARPA leverages to assess potential undue foreign influence factors include, but are not limited to:

1. Executive Order 13959 "Addressing the Threat From Securities Investments That Finance Communist Chinese Military Companies": https://www.govinfo.gov/content/pkg/FR-2020-11-17/pdf/2020-25459.pdf
2. The U.S. Department of Education's College Foreign Gift and Contract Report: College Foreign Gift Reporting (ed.gov)
3. The U.S. Department of Commerce, Bureau of Industry and Security, List of Parties of Concern: https://www.bis.doc.gov/index.php/policy-guidance/lists-of-parties-of-concern
4. Georgetown University's Center for Security and Emerging Technology (CSET) Chinese Talent Program Tracker: https://chinatalenttracker.cset.tech
5. Director of National Intelligence (DNI) "World Wide Threat Assessment of the US Intelligence Community": 2021 Annual Threat Assessment of the U.S. Intelligence Community (dni.gov)
6. Various Defense Counterintelligence and Security Agency (DCSA) products regarding targeting of US technologies, adversary targeting of academia, and the exploitation of academic experts: https://www.dcsa.mil/

DARPA's analysis and assessment of affiliations and associations of Senior/Key Personnel is compliant with Title VI of the Civil Rights Act of 1964. Information regarding race, color, or national origin is not collected and does not have bearing in DARPA's assessment.

University or non-profit research institutions with proposals selected for negotiation that have been assessed as having high or very high undue foreign influence risk, will be given an opportunity during the negotiation process to mitigate the risk. DARPA reserves the right to request any follow-up information needed to assess risk or mitigation strategies.

iv. Upon conclusion of the negotiations, if DARPA determines, despite any proposed mitigation terms (e.g. mitigation plan, alternative research personnel), the participation of any Senior/Key Research Personnel still represents high risk to the program, or proposed mitigation affects the Government's confidence in proposer's capability to successfully complete the research (e.g., less qualified Senior/Key Research Personnel) the Government may determine not to award the proposed effort. Any decision not to award will be predicated upon reasonable disclosure of the pertinent facts and reasonable discussion of any possible alternatives while balancing program award timeline requirements.

(b) Failure of the academic or non-profit research performer or recipient to reasonably exercise due diligence to discover or ensure that neither it nor any of its Senior/Key Research Personnel involved in the subject award are participating in a Foreign Government Talent Program or have a Foreign Component with an a strategic competitor or country with a history of targeting U.S. technology for unauthorized transfer may result in the Government exercising remedies in accordance with federal law and regulation.

i. If, at any time, during performance of this research award, the academic or non-profit research performer or recipient should learn that it, its Senior/Key Research Personnel, or applicable team members or subtier performers on this award are or are believed to be participants in a Foreign Government Talent Program or have Foreign Components with a strategic competitor or country with a history of targeting U.S. technology for unauthorized transfer , the performer or recipient will notify the Government Contracting Officer or Agreements Officer within 5 business days.

1. This disclosure must include specific information as to the personnel involved and the nature of the situation and relationship. The Government will have 30 business days to review this information and conduct any necessary fact-finding or discussion with the performer or recipient.
2. The Government's timely determination and response to this disclosure may range anywhere from acceptance, to mitigation, to termination of this award at the Government's discretion.
3. If the University receives no response from the Government to its disclosure within 30 business days, it may presume that the Government has determined the disclosure does not represent a threat.

ii. The performer or recipient must flow down this provision to any subtier contracts or agreements involving direct participation in the performance of the research.

(c) Definitions

i. Senior/Key Research Personnel

1. This definition would include the Principal Investigator or Program/Project Director and other individuals who contribute to the scientific development or execution of a project in a substantive, measurable way, whether or not they receive salaries or compensation under the award. These include individuals whose absence from the project would be expected to impact the approved scope of the project.
2. Most often, these individuals will have a doctorate or other professional degrees, although other individuals may be included within this definition on occasion.

ii. Foreign Associations/Affiliations

1. Association is defined as collaboration, coordination or interrelation, professionally or personally, with a foreign government-connected entity where no direct monetary or non-monetary reward is involved.
2. Affiliation is defined as collaboration, coordination, or interrelation, professionally or personally, with a foreign government-connected entity where direct monetary or non-monetary reward is involved.

iii. Foreign Government Talent Recruitment Programs

1. In general, these programs will include any foreign-state-sponsored attempt to acquire U.S. scientific-funded research or technology through

foreign government-run or funded recruitment programs that target scientists, engineers, academics, researchers, and entrepreneurs of all nationalities working and educated in the U.S.

2. Distinguishing features of a Foreign Government Talent Recruitment Program may include:
    a. Compensation, either monetary or in-kind, provided by the foreign state to the targeted individual in exchange for the individual transferring their knowledge and expertise to the foreign country.
    b. In-kind compensation may include honorific titles, career advancement opportunities, promised future compensation or other types of remuneration or compensation.
    c. Recruitment, in this context, refers to the foreign-state-sponsor's active engagement in attracting the targeted individual to join the foreign-sponsored program and transfer their knowledge and expertise to the foreign state. The targeted individual may be employed and located in the U.S. or in the foreign state.
    d. Contracts for participation in some programs that create conflicts of commitment and/or conflicts of interest for researchers. These contracts include, but are not limited to, requirements to attribute awards, patents, and projects to the foreign institution, even if conducted under U.S. funding, to recruit or train other talent recruitment plan members, circumventing merit-based processes, and to replicate or transfer U.S.-funded work in another country.
    e. Many, but not all, of these programs aim to incentivize the targeted individual to physically relocate to the foreign state. Of particular concern are those programs that allow for continued employment at U.S. research facilities or receipt of U.S. Government research funding while concurrently receiving compensation from the foreign state.
3. Foreign Government Talent Recruitment Programs DO NOT include:
    a. Research agreements between the University and a foreign entity, unless that agreement includes provisions that create situations of concern addressed elsewhere in this section,
    b. Agreements for the provision of goods or services by commercial vendors, or
    c. Invitations to attend or present at conferences.

iv. Conflict of Interest

1. A situation in which an individual, or the individual's spouse or dependent children, has a financial interest or financial relationship that could directly and significantly affect the design, conduct, reporting, or funding of research.

v. Conflict of Commitment

1. A situation in which an individual accepts or incurs conflicting obligations between or among multiple employers or other entities.
2. Common conflicts of commitment involve conflicting commitments of time and effort, including obligations to dedicate time in excess of institutional or funding agency policies or commitments. Other types of conflicting obligations, including obligations to improperly share information with, or withhold information from, an employer or funding agency, can also threaten research security and integrity and are an element of a broader concept of conflicts of commitment.

vi. Foreign Component

1. Performance of any significant scientific element or segment of a program or project outside of the U.S., either by the University or by a researcher employed by a foreign organization, whether or not U.S. government funds are expended.
2. Activities that would meet this definition include, but are not limited to:
    a. Involvement of human subjects or animals;
    b. Extensive foreign travel by University research program or project staff for the purpose of data collection, surveying, sampling, and similar activities;
    c. Collaborations with investigators at a foreign site anticipated to result in co-authorship;
    d. Use of facilities or instrumentation at a foreign site;
    e. Receipt of financial support or resources from a foreign entity; or
    f. Any activity of the University that may have an impact on U.S. foreign policy through involvement in the affairs or environment of a foreign country.
3. Foreign travel is not considered a Foreign Component.

vii. Strategic Competitor

1. A nation, or nation-state, that engages in diplomatic, economic or technological rivalry with the United States where the fundamental strategic interests of the U.S are under threat.

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.

3. Eligibility Information

3.1. ELIGIBLE APPLICANTS

All responsible sources capable of satisfying the Government's needs may submit a proposal that shall be considered by DARPA.

3.1.1. Federally Funded Research and Development Centers (FFRDCs) and Government Entities

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.

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.

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.

3.1.2. Non-U.S. Organizations

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.

3.2. ORGANIZATIONAL CONFLICTS OF INTEREST

FAR 9.5 Requirements

In accordance with FAR 9.5, proposers are required to identify and disclose all facts relevant to potential OCIs involving the proposer's organization and *any* proposed team member (subawardee, consultant). Under this Section, the proposer is responsible for providing this disclosure with each proposal submitted to the solicitation. The disclosure must include the proposer's, and as applicable, proposed team member's OCI mitigation plan. The OCI mitigation plan must 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 OCI mitigation plan will specifically discuss the disclosed OCI in the context of each of the OCI limitations outlined in FAR 9.505-1 through FAR 9.505-4.

Agency Supplemental OCI Policy

In addition, DARPA has a supplemental OCI policy that prohibits contractors/performers from concurrently providing Scientific Engineering Technical Assistance (SETA), Advisory and Assistance Services (A&AS) or similar support services and being a technical performer. Therefore, as part of the FAR 9.5 disclosure requirement above, a proposer must affirm whether the proposer or *any* proposed team member (subawardee, consultant) 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. 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 (subawardee, consultant) providing the support; and
- An OCI mitigation plan in accordance with FAR 9.5.

Government Procedures

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

3.3. COST SHARING/MATCHING

Cost sharing is not required; however, it will be carefully considered where there is an applicable statutory condition relating to the selected funding instrument. Cost sharing is encouraged where there is a reasonable probability of a potential commercial application related to the proposed research and development effort.

4. Application and Submission Information

4.1. ADDRESS TO REQUEST APPLICATION PACKAGE

This announcement, any attachments, and any references to external websites herein constitute the total solicitation. If proposers cannot access the referenced material posted in the announcement found at http://www.darpa.mil, contact the administrative contact listed herein.

4.2. CONTACT AND FORM OF APPLICATION SUBMISSION

All submissions, including abstracts and proposals, must be written in English with type no smaller than 12-point font. Smaller font may be used for figures, tables, and charts. The page limitation includes all figures, tables, and charts. All pages shall be formatted for printing on 8-1/2 by 11-inch paper. Margins must be 1-inch on all sides. Copies of all documents submitted must be clearly labeled with the DARPA BAA number, proposer organization, and proposal title/proposal short title.

4.2.1. Proposal Abstract Format

Proposers are **strongly** encouraged to submit an abstract in advance of a proposal to minimize effort and reduce the potential expense of preparing an out of scope proposal. DARPA will respond to abstracts providing feedback and indicating whether, after preliminary review, there is interest within BTO for the proposed work. DARPA will attempt to reply within **14** calendar days of receipt. Proposals may be submitted irrespective of comments or feedback received in response to the abstract. Proposals are reviewed without regard to feedback given as a result of abstract review. The time and date for submission of proposal abstracts are specified in Part I above.

The abstract is a concise version of the proposal comprising a maximum of **5** pages, including all figures, tables, and charts. All submissions must be written in English with type no smaller than 12-point font. Smaller font may be used for figures, tables, and charts. All pages shall be formatted for printing on 8-1/2 by 11-inch paper. Margins must be 1-inch on all sides. Copies of all documents submitted must be clearly labeled with the DARPA BAA number, proposer organization, and proposal abstract title.

The page limit does NOT include:

- Official transmittal letter (optional);
- Cover sheet;
- Executive summary slide;
- Resumes; and
- Bibliography (optional).

Abstracts must include the following components (recommended page count in parentheses):

A. Cover Sheet (does not count towards page limit): Include the administrative and technical points of contact (name, address, phone, fax, e-mail, lead organization). Also include the BAA number, title of the proposed project, primary subcontractors, estimated cost, duration of the project, and the label "ABSTRACT."

B. Executive Summary Slides (1 page/slide, does not count towards page limit): The slide template is provided as **Attachment 1** to the BAA posted at https://beta.SAM.gov. Use of this template is required.

C. Goals and Impact (1 page): Clearly describe what is being proposed and what difference it will make (qualitatively and quantitatively), including brief answers to the following questions:

1. What is the proposed work attempting to accomplish or do?
2. How is it done today? And what are the limitations?
3. What is innovative in your approach, and how does it compare to the current state-of-the-art (SOA)?
4. What are the key technical challenges in your approach, and how do you plan to overcome these?

D. Technical Plan: Outline and address all three of the technical challenges described in this solicitation, as well as challenges inherent in the proposed approach and possible solutions for overcoming potential problems. This section should provide objectives, metrics, and milestones specific to your technical approach at intermediate stages of the project to demonstrate a plan for accomplishment of the program goals.

E. Management and Capabilities (1 page): Provide a brief summary of expertise of the team, including subcontractors and key personnel.

A principal investigator for the project must be identified, and a description of the team's organization. All teams are strongly encouraged to identify a Project Manager/Integrator to serve as the primary point of contact to communicate with the DARPA Program Manager, IV&V partner, and Contracting Officer's Representative, coordinate the effort across co-performer, vendor, and subcontractor teams, organize regular performer meetings or discussions, facilitate data sharing, and ensure timely completion of milestones and deliverables.

Include a description of the team's organization, including roles and responsibilities. Team member descriptions should address the Technical Plan, describe the time and percent effort divisions for members participating across multiple TAs, and delineate individuals to avoid duplication of efforts.

Describe the organizational experience in this area, existing intellectual property required to complete the project, and any specialized facilities to be used as part of the project. List Government-furnished materials or data assumed to be available. Describe

any specialized facilities to be used as part of the project, the extent of access to these facilities, and any biological containment, biosafety, and certification requirements.

F. Cost and Schedule (1 page): Provide a cost estimate for resources over the proposed timeline of the project, broken down by phase and major cost items (e.g., labor, materials, etc.). Include cost estimates for each potential subcontractor (may be a rough order of magnitude).

G. Curriculum Vitae (do not count towards page limit): Include CVs of key team members, one of which must be from/for the Principal Investigator.

H. References (Optional, does not count towards page limit): If desired, include a brief list of references cited in the abstract with links to relevant papers and reports. The references list should not exceed two (2) pages.

4.2.2. Proposal Format

As soon as the evaluation of all proposals is complete, the proposer will be notified that (1) the proposal has been selected for funding pending award negotiations, in whole or in part, or (2) the proposal has not been selected. These official notifications will be sent via e-mail to the Technical POC and Administrative POC identified on the proposal coversheet.

All full proposals must be in the format given below. Proposals shall consist of two volumes: 1) **Volume I, Technical and Management Proposal**, and 2) **Volume II, Cost Proposal.** All submissions must be written in English with type no smaller than 12-point font. A smaller font may be used for figures, tables, and charts. The page limitation includes all figures, tables, and charts. All pages shall be formatted for printing on 8-1/2 by 11- inch paper. Margins must be 1-inch on all sides. Copies of all documents submitted must be clearly labeled with the DARPA BAA number, proposer organization, and proposal title/proposal short title. Volume I, Technical and Management Proposal, may include an attached bibliography of relevant technical papers or research notes (published and unpublished) that document the technical ideas and approach upon which the proposal is based. Copies of not more than three (3) relevant papers may be included with the submission. The bibliography and attached papers are not included in the page counts given below. The submission of other supporting materials along with the proposals is strongly discouraged and will not be considered for review. **The maximum page count for Volume 1 is 25 pages.** Volume I should include the following components:

NOTE: Non-conforming submissions that do not follow the instructions herein may be rejected without further review.

a. Volume I, Technical and Management Proposal

Section I. Administrative (does not count towards page limit)

A. Cover Sheet (LABELED "PROPOSAL: VOLUME I"):

1. BAA number (HR001122S0044);
2. Lead organization submitting proposal (prime contractor);
3. Type of organization, selected from among the following categories: "LARGE BUSINESS," "SMALL DISADVANTAGED BUSINESS," "OTHER SMALL BUSINESS," "HBCU," "MI," "OTHER EDUCATIONAL," OR "OTHER NONPROFIT";
4. Proposer's reference number (if any);
5. Other team members (if applicable) and type of business for each;
6. Proposal title;
7. Technical point of contact (Program Manager or Principle Investigator) to include: salutation, last name, first name, street address, city, state, zip code, telephone, fax, e-mail;
8. Administrative point of contact (Contracting Officer or Award Officer) to include: salutation, last name, first name, street address, city, state, zip code, telephone, fax, e-mail;
9. Award instrument requested: cost-plus-fixed-free (CPFF), cost-contract—no fee, cost sharing contract – no fee, or other type of procurement contract (*specify*), cooperative agreement, or other transaction;
10. Place(s) of performance, including all subcontractors and consultants;
11. Period of performance;
12. Total funds requested from DARPA, total funds requested per phase and the amount of any cost share (if any);
13. Proposal validity period; AND
14. Date proposal was submitted.

Information on award instruments is available at http://www.darpa.mil/work-with-us/contract-management.

B. Official Transmittal Letter

C. Executive Summary Slides: The slide template is provided as **Attachment 1** to the BAA posted at https://beta.SAM.gov. Use of this template is **required**.

Section II. Detailed Proposal Information

A. Executive Summary: Provide a synopsis of the proposed project, including answers to the following questions:

- What is the proposed work attempting to accomplish or do?
- How is it done today, and what are the limitations?
- What is innovative in your approach?
- What are the key technical challenges in your approach, and how do you plan to overcome these?
- Who or what will be affected, and what will be the impact if the work is successful?
- How much will it cost, and how long will it take?

B. Goals and Impact: Clearly describe what the team is trying to achieve and the difference it will make (qualitatively and quantitatively) if successful. Describe the innovative aspects of the project in the context of existing capabilities and approaches, clearly delineating the uniqueness and benefits of this project in the context of the state of the art, alternative approaches, and other projects from the past and present. Describe how the proposed project is revolutionary and how it significantly rises above the current state-of-the-art. Describe the deliverables associated with the proposed project and any plans to commercialize the technology, transition it to a customer, or further the work.

C. Technical Plan: Outline and address technical challenges inherent in the approach and possible solutions for overcoming potential problems. This section should provide appropriate measurable milestones (quantitative if possible) at intermediate stages of the program to demonstrate progress, plan for achieving the milestones, and must include a simple process flow diagram of their final system concept. The technical plan should demonstrate a deep understanding of the technical challenges and present a credible (even if risky) plan to achieve the program goal. Discuss mitigation of technical risk.

D. Management Plan: Provide a summary of expertise of the team, including any subcontractors, and key personnel who will be doing the work. A Principal Investigator (PI) for the project must be identified, along with a description of the team's organization. All teams are strongly encouraged to identify a Project Manager/Integrator to serve as the primary point of contact to communicate with the DARPA Program Manager, IV&V partner, and Contracting Officer's Representative, coordinate the effort across co-performer, vendor, and subcontractor teams, organize regular performer meetings or discussions, facilitate data sharing, and ensure timely completion of milestones and deliverables.

Provide a clear description of the team's organization, including an organization chart that includes, as applicable: the programmatic relationship of team members; the unique

capabilities of team members; the task responsibilities of team members, the teaming strategy among the team members; and key personnel with the amount of effort to be expended by each person during each year. Provide a detailed plan for coordination, including explicit guidelines for interaction among collaborators/subcontractors of the proposed effort. Include risk management approaches. Describe any formal teaming agreements that are required to execute this program.

E. Capabilities: Describe organizational experience in relevant subject area(s), existing intellectual property, specialized facilities, and any Government-furnished materials or information. Describe any specialized facilities to be used as part of the project, the extent of access to these facilities, and any biological containment, biosafety, and certification requirements. Discuss any work in closely related research areas and previous accomplishments.

F. Qualifications of Key Personnel (does not count towards page limit): Curriculum Vitae for PI, PM, and key co-Investigators.

G. Current and pending awards (does not count towards page limit): Provide a list of current and pending awards related to the proposed research, including the funding source (for PI, PM/I, and key co-Investigators). Describe areas of overlap or leveraging with your SNAP proposal.

H. Statement of Work (SOW) (does not count towards page limit)**:** The SOW should provide a detailed task breakdown, citing specific tasks for each challenge, and their connection to the milestones and program metrics. Each phase of the program should be separately defined. The SOW must not include proprietary information. It is encouraged, though not required, to use the SOW template provided as **Attachment 3**. SOW is not included in the Volume 1 page count.

For each task/subtask, provide:

- A detailed description of the approach to be taken to accomplish each defined task/subtask.
- Identification of the primary organization responsible for task execution (prime contractor, subcontractor(s), consultant(s), by name).
- A measurable milestone, i.e., a deliverable, demonstration, or other event/activity that marks task completion. Include completion dates for all milestones. Include quantitative metrics.
- A definition of all deliverables (e.g., data, reports, software) to be provided to the Government in support of the proposed tasks/subtasks.

It is recommended that the SOW be developed so that each Challenge and Phase of the program is separately defined.

I. **Schedule and Milestones:** Provide a detailed schedule showing tasks (task name, duration, work breakdown structure element as applicable, performing organization), milestones, and the interrelationships among tasks. The task structure must be consistent with that in the SOW. Measurable milestones should be clearly articulated and defined in time relative to the start of the project.

J. **Transition Plan:** Provide information regarding the types of partners (e.g., government, private industry) that will be pursued and submit a timeline with incremental milestones toward successful engagement. The plan should include a description of how DARPA will be included in the development of potential technology transfer relationships. If the Transition Plan includes the formation of a start-up company, a business development strategy must also be provided.

K. **Draft Institutional Review Board (IRB) Protocol, Consent Forms, and Questionnaires** (does not count towards page limit)**:** If Humans Subjects Research (HSR) is proposed, then proposals must include a draft IRB protocol package, including draft consent form and drafts of questionnaires to be completed by participants. These draft IRB protocols, consent forms, and questionnaires will not count toward page limits.

b. Volume II, Cost Management Proposal

Cover Sheet (LABELED "PROPOSAL: VOLUME II"):

1. BAA Number (HR001122S0044);
2. Lead Organization Submitting proposal;
3. Type of organization, selected among the following categories: "LARGE BUSINESS", "SMALL DISADVANTAGED BUSINESS", "OTHER SMALL BUSINESS", "HBCU", "MI", "OTHER EDUCATIONAL", OR "OTHER NONPROFIT";
4. Proposer's reference number (if any);
5. Other team members (if applicable) and type of business for each;
6. Proposal title;
7. Technical point of contact (Program Manager or Principal Investigator) to include: salutation, last name, first name, street address, city, state, zip code, telephone, fax (if available), electronic mail (if available);
8. Administrative point of contact (Contracting Officer or Award Officer) to include: salutation, last name, first name, street address, city, state, zip code, telephone, fax (if available), and electronic mail (if available);

9. Award instrument requested: cost-plus-fixed-free (CPFF), cost-contract—no fee, cost sharing contract – no fee, or other type of procurement contract (*specify*), GRANT, cooperative agreement, or other transaction;
10. Place(s) of performance, including all subcontractors and consultants;
11. Period of performance;
12. Total funds requested from DARPA, total funds requested per phase (as defined in Table 1), and the amount of any cost share (if any);
13. Name, address, and telephone number of the proposer's cognizant Defense Contract Management Agency (DCMA) administration office (*if known)*;
14. Name, address, and telephone number of the proposer's cognizant Defense Contract Audit Agency (DCAA) audit office (*if known*);
15. Date proposal was prepared;
16. Data Universal Numbering System (DUNS) number (http://www.dnb.com/get-a-duns-number.html);
17. Taxpayer ID number (https://www.irs.gov/Individuals/International-Taxpayers/Taxpayer-Identification-Numbers-TIN);
18. Commercial and Government Entity (CAGE) code (https://cage.dla.mil/Home/UsageAgree);
19. Proposal validity period

NOTE: Non-conforming submissions that do not follow the instructions herein may be rejected without further review.

The Government requires that proposers use the provided MS Excel™ DARPA Standard Cost Proposal Spreadsheet in the development of their cost proposals. A customized cost proposal spreadsheet may be an attachment to this solicitation. If not, the spreadsheet can be found on the DARPA website at http://www.darpa.mil/work-with-us/contract-management (under "Resources" on the right-hand side of the webpage). 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. 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. Subcontractor cost proposal spreadsheets may be submitted directly to the Government by the proposed subcontractor via e-mail to the address in Part I of this solicitation. **Using the provided cost proposal spreadsheet will assist the Government in a rapid analysis of your proposed costs and, if your proposal is selected for a potential award, speed up the negotiation and award execution process**.

(1) Total program, per phase (Phase I (Base); Phase II (Option); and Phase III (Option)), and per task cost broken down by major cost items to include:
    i. **Direct labor** – provide an itemized breakout of all personnel, listed by name or TBD, with labor rate (or salary), labor hours (or percent effort), and labor category. All senior personnel must be identified by name.

ii. **Materials and Supplies** – itemized list which includes a description of material, quantity, unit price, and total price. If a material factor is used based on historical purchases, provide data to justify the rate.

iii. **Equipment** – itemized list which includes description of equipment, unit price, quantity, and total price. Any equipment item with a unit price over $5,000 must include a vendor quote.

iv. **Animal Use Costs** – itemized list of all materials, animal purchases, and per diem costs, associated with proposed animal use; include documentation supporting daily rates.

v. Travel – provide an itemized list of travel costs to include the purpose of trips, departure and arrival destinations, projected airfare, rental car and per GSA approved diem, number of travelers, number of days); provide screenshots from travel website for proposed airfare and rental car, as applicable; provide screenshot or web link for conference registration fee and note if the fee includes hotel cost. Conference attendance must be justified, explain how it is in the best interest of the project. **Plan for two (2) DARPA program review meetings per year.**

vi. Other Direct Costs (e.g., computer support, clean room fees) – Should be itemized with costs or estimated costs. Backup documentation and/or a supporting cost breakdown is required to support proposed costs with a unit price over $5,000. An explanation of any estimating factors, including their derivation and application, must be provided. Please include a brief description of the proposers' procurement method to be used.

vii. **Other Direct Costs** – Consultants: provide executed Consultant Agreement that describes work scope, rate and hours.

viii. **Indirect costs** including, as applicable, fringe benefits, overhead, General and Administrative (G&A) expense, and cost of money (see university vs. company-specific requirements below).

ix. **Indirect costs specific to a University performer:** (1) **Fringe Benefit Rate** (provide current Department of Health and Human Services (DHHS) or Office of Naval Research (ONR) negotiated rate package; if calculated by other than a rate, provide University documentation identifying fringe costs by position or HR documentation if unique to each person); (2) **F&A Indirect Overhead Rate** (provide current DHHS or ONR negotiated rate package); (3) **Tuition Remission** (provide current University documentation justifying per-student amount); and (4) **Health Insurance/Fee** (provide current University documentation justifying per-student amount, if priced separately from fringe benefits with calculations included in the EXCEL cost file).

Indirect costs specific to a Company performer: (1) **Fee/Profit** (provide rationale for proposed fee/profit percentage using criteria found in Defense Federal Acquisition Regulation Supplement (DFARS) 215.404-70); and (2) **Fringe Benefit/Labor OH/Material OH/G&A Rates** (provide current Forwarding Pricing Rate Proposal (FPRP) or DCMA/DCAA Forward Pricing Rate Recommendation or Agreement (FPRR or FPRA). If these documents are not available, provide company

historical data, preferably two years, a minimum of one, to include both pool and expense costs used to generate the rates).

(2) A summary of total program costs by phase I, II, and III and task.

(3) An itemization of Subcontracts. All subcontractor cost proposal documentation must be prepared at the same level of detail as that required of the prime. Subcontractor proposals should include Interdivisional Work Transfer Agreements (IWTA) or evidence of similar arrangements (an IWTA is an agreement between multiple divisions of the same organization). The prime proposer is responsible for compiling and providing all subcontractor proposals for the Procuring Contracting Officer (PCO). The proposal must show how subcontractor costs are applied to each phase and task. If consultants are to be used, proposer must provide the consultant agreement or other document that verifies the proposed loaded daily/hourly rate.

(4) An itemization of any information technology (IT) purchase (including a letter stating why the proposer cannot provide the requested resources from its own funding), as defined in FAR Part 2.101.

(5) A summary of projected funding requirements by month for all phases of the project.

(6) A summary of tasks that have animal or human use funding.

(7) The source, nature, and amount of any industry cost-sharing. Where the effort consists of multiple portions that could reasonably be partitioned for purposes of funding, these should be identified as options with separate cost estimates for each.

(8) Identification of pricing assumptions of which may require incorporation into the resulting award instrument (e.g., use of Government Furnished Property/Facilities/Information, access to Government Subject Matter Expert/s, etc.).

(9) Any Forward Pricing Rate Agreement, DHHS rate agreement, other such approved rate information, or such documentation that may assist in expediting negotiations (if available).

(10) Proposers with a Government acceptable accounting system who are proposing a cost-type contract must submit the DCAA document approving the cost accounting system.

Per FAR 15.403-4, certified cost or pricing data shall be required if the proposer is seeking a procurement contract award per the referenced threshold, unless the proposer requests and is granted an exception from the requirement to submit cost or pricing data. Certified cost or pricing data" are not required if the proposer proposes an award instrument other than a procurement contract (e.g., a grant, cooperative agreement, or other transaction.)

Subawardee Proposals

The awardee is responsible for compiling and providing all subawardee proposals for the Procuring Contracting Officer (PCO)/Grants Officer (GO)/Agreements Officer (AO), as applicable. Subawardee proposals should include Interdivisional Work Transfer Agreements (ITWA) or similar arrangements. Where the effort consists of multiple portions which could

reasonably be partitioned for purposes of funding, these should be identified as options with separate cost estimates for each.

All proprietary subawardee proposal documentation, prepared at the same level of detail as that required of the awardee's proposal and which cannot be uploaded with the proposed awardee's proposal, shall be provided to the Government either by the awardee or by the subawardee organization when the proposal is submitted. Subawardee proposals submitted to the Government by the proposed subawardee should be submitted via e-mail to the address in Section I.

Other Transaction (OT) Requests

All proposers requesting an OT must include a detailed list of milestones for each phase of the program (I, II, and III). Each milestone must include the following:

- milestone description,
- completion criteria,
- due date, and
- payment/funding schedule (to include, if cost share is proposed, awardee and Government share amounts).

It is noted that, at a minimum, milestones should relate directly to accomplishment of program technical metrics as defined in the BAA and/or the proposer's proposal. Agreement type, expenditure or fixed-price based, will be subject to negotiation by the Agreements Officer. Do not include proprietary data.

4.2.3. Additional Proposal Information

Proprietary Markings

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.

Unclassified Submissions

DARPA anticipates that submissions received under this BAA will be unclassified. However, should a proposer wish to submit classified information, an *unclassified* e-mail must be sent to the BAA mailbox requesting submission instructions from the Technical Office Program Security Officer (PSO). If a determination is made that the award instrument may result in access to classified information, a Security Classification Guide (SCG) and/or DD Form 254 will be issued by DARPA and attached as part of the award.

Disclosure of Information and Compliance with Safeguarding Covered Defense Information Controls

The following provisions and clause apply to all solicitations and contracts; however, the definition of "controlled technical information" clearly exempts work considered fundamental

research and therefore, even though included in the contract, will not apply if the work is fundamental research.
DFARS 252.204-7000, "Disclosure of Information"
DFARS 252.204-7008, "Compliance with Safeguarding Covered Defense Information Controls"
DFARS 252.204-7012, "Safeguarding Covered Defense Information and Cyber Incident Reporting"
The full text of the above solicitation provision and contract clauses can be found at http://www.darpa.mil/work-with-us/additional-baa#NPRPAC.
Compliance with the above requirements includes the mandate for proposers to implement the security requirements specified by National Institute of Standards and Technology (NIST) Special Publication (SP) 800-171, "Protecting Controlled Unclassified Information in Nonfederal Information Systems and Organizations" (see https://nvlpubs.nist.gov/nistpubs/SpecialPublications/NIST.SP.800-171r2.pdf) and DoDI 8582.01 that are in effect at the time the solicitation is issued.
For awards where the work is considered fundamental research, the contractor will not have to implement the aforementioned requirements and safeguards. However, should the nature of the work change during performance of the award, work not considered fundamental research will be subject to these requirements.

Human Subjects Research (HSR)/Animal Use

The Defense Advanced Research Projects Agency (DARPA) is dedicated to ensuring the rights, safety, and well-being of volunteers participating in research. Accordingly, DARPA assures that all of its research selected for funding involving human subjects (to include the use of human biological specimens and human data) complies with federal regulations for human subjects protection. Further, research involving humans, as defined in the DoD Instruction (DoDI) 3216.02 "Protection of Human Subjects and Adherence to Ethical Standards in DoD Supported Research," dated 15 April 2020, will be guided by the ethical principles set forth in the report of the National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research entitled "Ethical Principles and Guidelines for the Protection of Human Subjects of Research" (the "Belmont Report").

All institutions engaged in research involving human subjects, specimens, and data must provide documentation of a current Assurance of Compliance with federal regulations for human subjects protection, such as a Department of Health and Human Services, Office of Human Research Protection Federal Wide Assurance (http://www.hhs.gov/ohrp). All research must be reviewed and approved by an Institutional Review Board (IRB) that is identified on the institution's Assurance of Compliance with human subjects protection regulations. The protocol 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 informed consent document must comply with federal regulations (32 C.F.R. § 219.116). The protocol package submitted to the IRB must contain evidence of completion of appropriate human subjects research training by all investigators and personnel involved with human subjects research. In addition to a local IRB approval, a Human Research Protection Official (HRPO) administrative review and approval are required for all research conducted or supported by the Department of Defense. The Army, Navy, or Air Force office responsible for managing

the award will provide guidance and information about their component's HRPO review process. Note: a fully approved IRB package is required before HRPO approval can be issued.

The time required to complete both the IRB and HRPO review/approval process varies depending on the complexity of the research and the level of risk involved with the study. Ample time should be allocated to complete the approval process. DoD/DARPA funding cannot be used toward human subjects research until ALL approvals are granted.

Proposers that anticipate involving human subjects or animals in the proposed research must comply with the approval procedures detailed at http://www.darpa.mil/work-with-us/additional-baa, to include providing the information specified therein as required for proposal submission.

Approved Cost Accounting System Documentation

Proposers that do not have a Cost Accounting Standards (CAS) complaint accounting system considered adequate for determining accurate costs that are negotiating a cost-type procurement contract must complete an SF 1408. For more information on CAS compliance, see http://www.dcaa.mil/cas.html. To facilitate this process, proposers should complete the SF 1408 found at http://www.gsa.gov/portal/forms/download/115778 and submit the completed form with the proposal.

Small Business Subcontracting Plan

Pursuant to Section 8(d) of the Small Business Act (15 U.S.C. § 637(d)) and FAR 19.702(a)(1), each proposer who submits a contract proposal and includes subcontractors might be required to submit a subcontracting plan with their proposal. The plan format is outlined in FAR 19.704.

Section 508 of the Rehabilitation Act (29 U.S.C. § 749d)/FAR 39.2

All electronic and information technology acquired or created through this BAA must satisfy the accessibility requirements of Section 508 of the Rehabilitation Act (29 U.S.C. § 749d)/FAR 39.2.

Intellectual Property

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.

For Procurement Contracts

Proposers responding to this BAA requesting procurement contracts will need to complete the certifications at DFARS 252.227-7017. See http://www.darpa.mil/work-with-us/additional-baa for further information. If no restrictions are intended, the proposer should state "none." The table below captures the requested information:

Technical Data Computer Software To be Furnished With Restrictions	Summary of Intended Use in the Conduct of the Research	Basis for Assertion	Asserted Rights Category	Name of Person Asserting Restrictions

(LIST)	(NARRATIVE)	(LIST)	(LIST)	(LIST)

For All Non-Procurement Contracts

Proposers responding to this BAA requesting a Cooperative Agreement, Technology Investment Agreement, or Other Transaction for Prototypes shall follow the applicable rules and regulations governing these various award instruments but, in all cases, 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. Proposers are encouraged to use a format similar to that described in the section above. If no restrictions are intended, then the proposer should state "NONE."

System for Award Management (SAM) and Universal Identifier Requirements

All proposers must be registered in SAM unless exempt per FAR 4.1102. FAR 52.204-7, "System for Award Management" and FAR 52.204-13, "System for Award Management Maintenance" are incorporated into this solicitation. See http://www.darpa.mil/work-with-us/additional-baa for further information.
International entities can register in SAM by following the instructions in this link: https://www.fsd.gov/sys_attachment.do?sys_id=c08b64ab1b4434109ac5ddb6bc4bcbb8.

4.2.4. Submission Information

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 HR001122S0044. Submissions may not be sent 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 business days after notification that a proposal was not selected.

For abstract and proposal submission dates, see Part I., Overview Information. Submissions received after these dates and times may not be reviewed.

Abstracts and Full Proposals sent in response to HR001122S0044 may 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 the submission process be started as early as possible.

All unclassified concepts submitted electronically through DARPA's BAA Website must be uploaded as zip files (.zip or .zipx extension). The final zip file should be no greater than 50 MB in size. Only one zip file will be accepted per submission. Classified submissions and proposals requesting or cooperative agreements should NOT be submitted through DARPA's BAA Website (https://baa.darpa.mil), though proposers will likely still need to visit https://baa.darpa.mil to register their organization (or verify an existing registration) to ensure the BAA office can verify and finalize their submission.

Technical support for 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).

Proposers using the DARPA BAA Website may encounter heavy traffic on the submission deadline date; it is highly advised that the submission process be started as early as possible.

For Technology Investment Agreements only:

Proposers requesting Technology Investment Agreements (TIA) awarded under 10 U.S.C.§ 4021 must include the completed form indicated below. This requirement only applies only to those who expect to receive a TIA as their ultimate award instrument.

The National Defense Authorization Act (NDAA) for FY 2019, Section 1286, directs the Secretary of Defense to protect intellectual property, controlled information, key personnel, and information about critical technologies relevant to national security and limit undue influence, including foreign talent programs by countries that desire to exploit United States' technology within the DoD research, science and technology, and innovation enterprise. This requirement is necessary for all research and research-related educational activities. The DoD is using the form below to collect the necessary information to satisfy these requirements.

The Research and Related Senior/Key Person Profile (Expanded) form, available on the Grants.gov website at https://apply07.grants.gov/apply/forms/sample/RR_KeyPersonExpanded_3_0-V3.0.pdf, will be used to collect the following information for all senior/key personnel, including Project Director/Principal Investigator and Co-Project Director/Co-Principal Investigator, whether or not the individuals' efforts under the project are funded by the DoD. The form includes 3 parts: the main form administrative information, including the Project Role, Degree Type and Degree Year; the biographical sketch; and the current and pending support. The biographical sketch and current and pending support are to be provided as attachments:

- Biographical Sketch: Mandatory for Project Directors (PD) and Principal Investigators (PI), optional, but desired, for all other Senior/Key Personnel. The biographical sketch should include information pertaining to the researchers:
    - Education and Training.
    - Research and Professional Experience.
    - Collaborations and Affiliations (for conflict of interest).
    - Publications and Synergistic Activities.

- Current and Pending Support: Mandatory for all Senior/Key Personnel including the PD/PI. This attachment should include the following information:
    - A list of all current projects the individual is working on, in addition to any future support the individual has applied to receive, regardless of the source.
    - Title and objectives of the other research projects.
    - The percentage per year to be devoted to the other projects.
    - The total amount of support the individual is receiving in connection to each of the other research projects or will receive if other proposals are awarded.
    - Name and address of the agencies and/or other parties supporting the other research projects
    - Period of performance for the other research projects.

Additional senior/key persons can be added by selecting the "Next Person" button at the bottom of the form. Note that, although applications without this information completed may pass Grants.gov edit checks, if DARPA receives an application without the required information, DARPA may determine that the application is incomplete and may cause your submission to be rejected and eliminated from further review and consideration under the solicitation. DARPA reserves the right to request further details from the applicant before making a final determination on funding the effort.

For Grants or Cooperative Agreements only:

Proposers requesting cooperative agreements must submit proposals through one of the following methods: (1) electronic upload per the instructions at https://www.grants.gov/applicants/apply-for-grants.html (DARPA-preferred); or (2) hard-copy mailed directly to DARPA. If proposers intend to use Grants.gov as their means of submission, then they must submit their entire proposal through Grants.gov; applications cannot be submitted in part to Grants.gov and in part as a hard-copy. Proposers using Grants.gov do not submit hard-copy proposals in addition to the Grants.gov electronic submission.

Submissions: In addition to the volumes and corresponding attachments requested elsewhere in this solicitation, proposers must also submit the three forms listed below.

Form 1: SF 424 Research and Related (R&R) Application for Federal Assistance, available on the Grants.gov website at https://apply07.grants.gov/apply/forms/sample/RR_SF424_2_0-V2.0.pdf. *This form must be completed and submitted.*

To evaluate compliance with Title IX of the Education Amendments of 1972 (20 U.S.C. § 1681 et.seq.), the Department of Defense (DoD) is collecting certain demographic and career information to be able to assess the success rates of women who are proposed for key roles in applications in science, technology, engineering or mathematics disciplines. In addition, the National Defense Authorization Act (NDAA) for FY 2019, Section 1286, directs the Secretary of Defense to protect intellectual property, controlled information, key personnel, and information about critical technologies relevant to national security and limit undue influence, including foreign talent programs by countries that desire to exploit United States' technology within the

DoD research, science and technology, and innovation enterprise. This requirement is necessary for all research and research-related educational activities. The DoD is using the two forms below to collect the necessary information to satisfy these requirements. Detailed instructions for each form are available on Grants.gov.

Form 2: The Research and Related Senior/Key Person Profile (Expanded) form, available on the Grants.gov website at https://apply07.grants.gov/apply/forms/sample/RR_KeyPersonExpanded_3_0-V3.0.pdf, will be used to collect the following information for all senior/key personnel, including Project Director/Principal Investigator and Co-Project Director/Co-Principal Investigator, whether or not the individuals' efforts under the project are funded by the DoD. The form includes 3 parts: the main form administrative information, including the Project Role, Degree Type and Degree Year; the biographical sketch; and the current and pending support. The biographical sketch and current and pending support are to be provided as attachments:

- Biographical Sketch: Mandatory for Project Directors (PD) and Principal Investigators (PI), optional, but desired, for all other Senior/Key Personnel. The biographical sketch should include information pertaining to the researchers:
    - Education and Training.
    - Research and Professional Experience.
    - Collaborations and Affiliations (for conflict of interest).
    - Publications and Synergistic Activities.
- Current and Pending Support: Mandatory for all Senior/Key Personnel including the PD/PI. This attachment should include the following information:
    - A list of all current projects the individual is working on, in addition to any future support the individual has applied to receive, regardless of the source.
    - Title and objectives of the other research projects.
    - The percentage per year to be devoted to the other projects.
    - The total amount of support the individual is receiving in connection to each of the other research projects or will receive if other proposals are awarded.
    - Name and address of the agencies and/or other parties supporting the other research projects
    - Period of performance for the other research projects.

Additional senior/key persons can be added by selecting the "Next Person" button at the bottom of the form. Note that, although applications without this information completed may pass Grants.gov edit checks, if DARPA receives an application without the required information, DARPA may determine that the application is incomplete and may cause your submission to be rejected and eliminated from further review and consideration under the solicitation. DARPA reserves the right to request further details from the applicant before making a final determination on funding the effort.

Form 3: Research and Related Personal Data, available on the Grants.gov website at https://apply07.grants.gov/apply/forms/sample/RR_PersonalData_1_2-V1.2.pdf. *Each applicant*

must complete the name field of this form, however, provision of the demographic information is voluntary. Regardless of whether the demographic fields are completed or not, this form must be submitted with at least the applicant's name completed.

Grants.gov requires proposers to complete a one-time registration process before a proposal can be electronically submitted. First-time registration can take between three (3) business days and four (4) weeks. For more information about registering for Grants.gov, see http://www.darpa.mil/work-with-us/additional-baa.

Proposal abstracts will not be accepted if submitted via Grants.gov.

Hard copy Submissions: Proposers electing to submit cooperative agreement proposals as hard copies must complete the SF 424 R&R form (Application for Federal Assistance), available on the Grants.gov website (https://apply07.grants.gov/apply/forms/sample/SF424_2_1-V2.1.pdf).

Failure to comply with the submission procedures may result in the submission not being evaluated. DARPA will acknowledge receipt of complete submissions via e-mail and assign control numbers that should be used in all further correspondence regarding proposals.

4.3. FUNDING RESTRICTIONS

Not applicable.

4.4. OTHER SUBMISSION INFORMATION

DARPA will post a consolidated Frequently Asked Questions (FAQ) document. To access the posting go to http://www.darpa.mil/work-with-us/opportunities. A link to the FAQ will appear under the HR001120S0044 summary. Submit your question(s) via e-mail to SNAP@darpa.mil.

5. Application Review Information

5.1. EVALUATION CRITERIA

Proposals will be evaluated using the following criteria, listed in descending order of importance: 5.1.1 Overall Scientific and Technical Merit; 5.1.2 Potential Contribution and Relevance to the DARPA Mission; and 5.1.3 Cost Realism.

5.1.1. 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. The timeline for achieving major milestones is aggressive but rationally supported with a clear description of the requirements and risks. The proposer's prior experience in similar efforts must clearly demonstrate an ability to deliver products that meet the proposed technical performance within the proposed budget and schedule. The proposed team has the expertise to manage the cost and schedule.

5.1.2. 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.

5.1.3. 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 Statement of Work 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 efforts with a likelihood of commercial application, appropriate direct cost sharing may be a positive factor in the evaluation. DARPA recognizes that undue emphasis on cost may motivate proposers to offer low-risk ideas with minimum uncertainty and to staff the effort with junior personnel in order to be in a more competitive posture. DARPA discourages such cost strategies.

5.2. REVIEW OF PROPOSALS

Review Process

It is the policy of DARPA to ensure impartial, equitable, comprehensive proposal evaluations based on the evaluation criteria listed in Section V.A and to select the source (or sources) whose offer meets the Government's technical, policy, and programmatic goals.

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.

Award(s) will be made to proposers whose proposals are determined to be the most advantageous to the Government, consistent with instructions and evaluation criteria specified in the BAA herein, and availability of funding.

Handling of Source Selection Information

DARPA policy is to treat all submissions as source selection information (see FAR 2.101 and 3.104) 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 are bound by appropriate nondisclosure agreements.

Subject to the restrictions set forth in FAR 37.203(d), 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.

Federal Awardee Performance and Integrity Information (FAPIIS)

Per 41 U.S.C. § 2313, as implemented by FAR 9.103 and 2 C.F.R. § 200.205, prior to making an award above the simplified acquisition threshold, DARPA is required to review and consider any information available through the designated integrity and performance system (currently FAPIIS). Awardees have the opportunity to comment on any information about themselves entered in the database, and DARPA will consider any comments, along with other information in FAPIIS or other systems, prior to making an award.

Countering Foreign Influence Program (CFIP)

DARPA's CFIP is an adaptive risk management security program designed to help protect the critical technology and performer intellectual property associated with DARPA's research projects by identifying the possible vectors of undue foreign influence. The CFIP team will create risk assessments of all proposed Senior/Key Personnel selected for negotiation of a fundamental research grant or cooperative agreement award. The CFIP risk assessment process will be conducted separately from the DARPA scientific review process and adjudicated prior to final award.

6. Award Administration Information

6.1. SUBMISSION STATUS NOTIFICATIONS

Proposal Abstracts and Full Proposals submitted in response to HR001122S0044 will be evaluated following the submission deadlines listed in Part 1. DARPA will respond as described below. These official notifications will be sent via e-mail to the Technical Point of Contact (POC) and/or Administrative POC identified on the submission coversheet.

6.1.1. Proposal Abstracts

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.

6.1.2. Full Proposals

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 award negotiations, in whole or in part, or (2) the proposal has not been selected.

6.2. ADMINISTRATIVE AND NATIONAL POLICY REQUIREMENTS

6.2.1. Meeting and Travel Requirements

There will be a program kickoff meeting in the Arlington, VA vicinity, and all key participants are required to attend. Performers should also anticipate regular program-wide PI meetings and periodic site visits at the Program Manager's discretion to the Arlington, VA vicinity. Proposers shall include within the content of their proposal details and costs of any travel or meetings they deem to be necessary throughout the course of the effort, including periodic status reviews by the government.

6.2.2. Solicitation Provisions and Award Clauses, Terms and Conditions

Solicitation clauses in the FAR and DFARS relevant to procurement contracts and FAR and DFARS clauses that may be included in any resultant procurement contracts are incorporated herein and can be found at http://www.darpa.mil/work-with-us/additional-baa.

6.2.3. Controlled Unclassified Information (CUI) and Controlled Technical Information (CTI) on Non-DoD Information Systems

Further information on Controlled Unclassified Information on Non-DoD Information Systems is incorporated herein can be found at http://www.darpa.mil/work-with-us/additional-baa.

6.2.4. Representations and Certifications

In accordance with FAR 4.1102 and 4.1201, proposers requesting a procurement contract must complete electronic annual representations and certifications at https://www.sam.gov/.
In addition, all proposers are required to submit for all award instrument types supplementary DARPA-specific representations and certifications at the time of proposal submission. See http://www.darpa.mil/work-with-us/reps-certs for further information on required representation and certification depending on your requested award instrument.

6.2.5. Terms and Conditions

For terms and conditions specific to grants and/or cooperative agreements, see the DoD General Research Terms and Conditions (latest version) at http://www.onr.navy.mil/Contracts-Grants/submit-proposal/grants-proposal/grants-terms-conditions and the supplemental DARPA-specific terms and conditions at http://www.darpa.mil/work-with-us/contract-management#GrantsCooperativeAgreements.

6.3. REPORTING

The number and types of reports will be specified in the award document but will include as a minimum monthly financial status reports, 6-week technical status reports, and quarterly technical status reports. The reports shall be prepared and submitted in accordance with the procedures contained in the award document and mutually agreed on before award. Reports and briefing material will also be required as appropriate to document progress in accomplishing

program metrics. A Final Report that summarizes the project and tasks will be required at the conclusion of the performance period for the award, notwithstanding the fact that the research may be continued under a follow-on vehicle.

6.4. ELECTRONIC SYSTEMS

6.4.1. Wide Area Work Flow (WAWF)

Performers will be required to submit invoices for payment directly to https://wawf.eb.mil, unless an exception applies. Performers must register in WAWF prior to any award under this BAA.

6.4.2. I-EDISON

The award document for each proposal selected for funding will contain a mandatory requirement for patent reports and notifications to be submitted electronically through i-Edison (http://public.era.nih.gov/iedison).

7. Agency Contacts

Administrative, technical or contractual questions should be sent via e-mail to the mailbox listed below.

Points of Contact
The BAA Coordinator for this effort may be reached at:
SNAP@darpa.mil
DARPA/BTO
ATTN: HR001122S0044
675 North Randolph Street
Arlington, VA 22203-2114

For information concerning agency level protests see http://www.darpa.mil/work-with-us/additional-baa#NPRPAC.

8. Other Information

8.1. PROPOSERS DAY

DARPA will host a Proposers Day in support of the SNAP program on **July 21, 2022**. The purpose is to provide potential proposers with information on the SNAP program, promote additional discussion on this topic, address questions, provide a forum to present their capabilities, and encourage team formation.

Interested proposers are not required to attend to respond to the SNAP BAA, and relevant information and materials discussed at Proposers Day will be made available to all potential proposers in the form of a FAQ posted on the DARPA Opportunities Page.

DARPA will not provide cost reimbursement for interested proposers in attendance. An online registration form and various other meeting details can be found at the registration website, https://events.sa-meetings.com/SNAPProposersDay.

Participants are required to register no later than **July 18, 2022**. This event is not open to the Press. The Proposers Day will be open to members of the public who have registered in advance for the event; there will be no onsite registration.

Proposers Day Point of Contact:
SNAP@darpa.mil
ATTN: DARPA-SN-22-42

8.2. ASSOCIATE CONTRACTOR AGREEMENT (ACA)

This same or similar language may be included in procurement contract awards against HR001122S0044. Awards other than FAR-based contracts may contain similar agreement language:

(a) It is recognized that success of the SNAP research effort depends in part upon the open exchange of information between the various Associate Contractors involved in the effort. This language is intended to ensure that there will be appropriate coordination and integration of work by the Associate Contractors to achieve complete compatibility and to prevent unnecessary duplication of effort. By executing this contract, the Contractor assumes the responsibilities of an Associate Contractor. For the purpose of this ACA, the term Contractor includes subsidiaries, affiliates, and organizations under the control of the Contractor (e.g., subcontractors).

(b) Work under this contract may involve access to proprietary or confidential data from an Associate Contractor. To the extent that such data is received by the Contractor from any Associate Contractor for the performance of this contract, the Contractor hereby agrees that any proprietary information received shall remain the property of the Associate Contractor and shall be used solely for the purpose of the SNAP research effort. Only that information which is received from another contractor in writing and which is clearly identified as proprietary or confidential shall be protected in accordance with this provision. The obligation to retain such information in confidence will be satisfied if the Contractor receiving such information utilizes the same controls as it employs to avoid disclosure, publication, or dissemination of its own proprietary information. The receiving Contractor agrees to hold such information in confidence as provided herein so long as such information is of a proprietary/confidential or limited rights nature.

(c) The Contractor hereby agrees to closely cooperate as an Associate Contractor with the other Associate Contractors on this research effort. This involves as a minimum:

(1) maintenance of a close liaison and working relationship;

(2) maintenance of a free and open information network with all Government-identified associate Contractors;

(3) delineation of detailed interface responsibilities;

(4) entering into a written agreement with the other Associate Contractors setting forth the substance and procedures relating to the foregoing, and promptly providing the Agreements Officer/Procuring Contracting Officer with a copy of same; and,

(5) receipt of proprietary information from the Associate Contractor and transmittal of Contractor proprietary information to the Associate Contractors subject to any applicable proprietary information exchange agreements between associate contractors when, in either case, those actions are necessary for the performance of either.

(d) In the event that the Contractor and the Associate Contractor are unable to agree upon any such interface matter of substance, or if the technical data identified is not provided as scheduled, the Contractor shall promptly notify the DARPA SNAP Program Manager. The Government will determine the appropriate corrective action and will issue guidance to the affected Contractor.

(e) The Contractor agrees to insert in all subcontracts hereunder which require access to proprietary information belonging to the Associate Contractor, a provision which shall conform substantially to the language of this ACA, including this paragraph (e).

(f) Associate Contractors for the SNAP research effort include:

9. APPENDIX 1 – Volume II checklist

Volume II, Cost Proposal
Checklist and Sample Templates

The following checklist and sample templates are provided to assist the proposer in developing a complete and responsive cost volume. Full instructions appear in Section 4.2.2 of HR001120S0044. This worksheet must be included with the coversheet of the Cost Proposal.

1. Are all items from Section 4.2.2 (Volume II, Cost Proposal) of **HR001120S0044** included on your Cost Proposal cover sheet?
   ○ **YES** ○ **NO** **Appears on Page(s)** [Type text]
   If reply is "No", please explain:

2. Does your Cost Proposal include (1) a summary cost buildup by Phase, (2) a summary cost buildup by Year, and (3) a detailed cost buildup of for each Phase that breaks out each task and shows the cost per month?
   ○ **YES** ○ **NO** **Appears on Page(s)** [Type text]

   If reply is "No", please explain:

3. Does your cost proposal (detailed cost buildup #3 above in item 2) show a breakdown of the major cost items listed below:
   Direct Labor (Labor Categories, Hours, Rates)
   f○ **YES** ○ **NO** **Appears on Page(s)** [Type text]

   Indirect Costs/Rates (i.e., overhead charges, fringe benefits, G&A)
   ○ **YES** ○ **NO** **Appears on Page(s)** [Type text]

   Materials and/or Equipment
   ○ **YES** ○ **NO** **Appears on Page(s)** [Type text]

   Subcontracts/Consultants
   ○ **YES** ○ **NO** **Appears on Page(s)** [Type text]

   Other Direct Costs
   ○ **YES** ○ **NO** **Appears on Page(s)** [Type text]

   Travel
   ○ **YES** ○ **NO** **Appears on Page(s)** [Type text]

   If reply is "No", please explain:

4. Have you provided documentation for proposed costs related to travel, to include purpose of trips, departure and arrival destinations and sample airfare?

○ **YES** ○ **NO** **Appears on Page(s)** [Type text]

If reply is "No", please explain:

5. Does your cost proposal include a complete itemized list of all material and equipment items to be purchased (a priced bill-of-materials (BOM))?
   ○ **YES** ○ **NO** **Appears on Page(s)** [Type text]

   If reply is "No", please explain:

6. Does your cost proposal include vendor quotes or written engineering estimates (basis of estimate) for all material and equipment with a unit price exceeding $5000?
   ○ **YES** ○ **NO** **Appears on Page(s)** [Type text]

   If reply is "No", please explain:

7. Does your cost proposal include a clear justification for the cost of labor (written labor basis-of-estimate (BOE)) providing rationale for the labor categories and hours proposed for each task?
   ○ **YES** ○ **NO** **Appears on Page(s)** [Type text]

   If reply is "No", please explain:

8. Do you have subcontractors/consultants? If YES, continue to question 9. If NO, skip to question 13.
   ○ **YES** ○ **NO** **Appears on Page(s)** [Type text]

9. Does your cost proposal include copies of all subcontractor/consultant technical (to include Statement of Work) and cost proposals?
   ○ **YES** ○ **NO** **Appears on Page(s)** [Type text]

   If reply is "No", please explain:

10. Do all subcontract proposals include the required summary buildup, detailed cost buildup, and supporting documentation (SOW, Bill-of-Materials, Basis-of-Estimate, Vendor Quotes, etc.)?
    ○ **YES** ○ **NO** **Appears on Page(s)** [Type text]

    If reply is "No", please explain:

11. Does your cost proposal include copies of consultant agreements, if available?
    ○ **YES** ○ **NO** **Appears on Page(s)** [Type text]

    If reply is "No", please explain:

12. If requesting a FAR-based contract, does your cost proposal include a tech/cost analysis for all proposed subcontractors?
    ○ **YES** ○ **NO** **Appears on Page(s)** [Type text]

    If reply is "No", please explain:

13. Have all team members (prime and subcontractors) who are considered a Federally Funded Research & Development Center (FFRDC), included documentation that clearly demonstrates work is not otherwise available from the private sector AND provided a letter on letterhead from the sponsoring organization citing the specific authority establishing their eligibility to propose to government solicitations and compete with industry, and compliance with the associated FFRDC sponsor agreement and terms and conditions.

○ **YES** ○ **NO** **Appears on Page(s)** [Type text]

If reply is "No", please explain:

14. Does your proposal include a response regarding Organizational Conflicts of Interest?

○ **YES** ○ **NO** **Appears on Page(s)** [Type text]

If reply is "No", please explain:

15. Does your proposal include a completed Data Rights Assertions table/certification?

○ **YES** ○ **NO** **Appears on Page(s)** [Type text]

If reply is "No", please explain: