Broad Agency Announcement

Active Social Engineering Defense (ASED)

HR001117S0050

September 08, 2017

Defense Advanced Research Projects Agency
Information Innovation Office
675 North Randolph Street
Arlington, VA 22203-2114

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PART I: OVERVIEW INFORMATION

- **Federal Agency Name:** Defense Advanced Research Projects Agency (DARPA), Information Innovation Office (I2O)

- **Funding Opportunity Title:** Active Social Engineering Defense (ASED)

- **Announcement Type:** Initial Announcement

- **Funding Opportunity Number:** HR001117S0050

- **Catalog of Federal Domestic Assistance Numbers (CFDA):**
  12.910 Research and Technology Development

- **Dates**
  - Posting Date: September 08, 2017
  - Proposers Day: August 7, 2017, 9:00 a.m. (ET)
  - Abstract Due Date: September 19, 2017, 12:00 noon (ET)
  - Proposal Due Date: November 9, 2017, 12:00 noon (ET)
  - BAA Closing Date: November 9, 2017, 12:00 noon (ET)

- **Anticipated Individual Awards:** DARPA anticipates multiple awards under this solicitation.

- **Types of Instruments that May be Awarded:** Procurement contracts, cooperative agreements or Other Transaction

- **Agency Contacts**

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    Arlington, VA 22203-2114

  - **I2O Solicitation Website:** http://www.darpa.mil/work-with-us/opportunities

PART II: FULL TEXT OF ANNOUNCEMENT

I. Funding Opportunity Description

DARPA is soliciting innovative research proposals in the area of automated defense against social engineering attacks. Proposed research should investigate innovative approaches that enable revolutionary advances in science, devices, or systems. Specifically excluded is research that primarily results in evolutionary improvements to the existing state of practice.

This Broad Agency Announcement (BAA) is being issued, and any resultant selection will be made, using procedures under Federal Acquisition Regulation (FAR) 6.102(d)(2) and 35.016. Any negotiations and/or awards will use procedures under FAR 15.4 (or 32 CFR § 200.203 for cooperative agreements). Proposals received as a result of this BAA shall be evaluated in accordance with evaluation criteria specified herein through a scientific review process.

DARPA BAAs are posted on the Federal Business Opportunities (FBO) website (https://www.fbo.gov/) and the Grants.gov website (http://www.grants.gov/).

The following information is for those wishing to respond to this BAA.

A. Introduction/Background

Over the past 40 years, our world has become increasingly connected. These connections have enabled major advances in national security from pervasive real-time intelligence and communications to optimal logistics. With this connectivity has come the threat of cyber attacks on both military systems and critical infrastructure. While we focus the vast majority of our security efforts on protecting computers and networks, more than 80% of cyber attacks and over 70% of those from nation states are initiated by exploiting humans rather than computer or network security flaws. To build secure cyber systems, it is necessary to protect not only the computers and networks that make up these systems but the humans as well.

We call attacks on humans "social engineering" because they manipulate or "engineer" users into performing desired actions or divulging sensitive information. The most general social engineering attacks simply attempt to get unsuspecting internet users to click on malicious links. More focused attacks attempt to elicit sensitive information, such as passwords or private information from organizations or steal things of value from particular individuals by earning unwarranted trust.

These attacks always have an "ask", a desired behavior that the attacker wants to induce from the victim. To do this, they need trust from the victim, which is typically earned through interaction or co-opted via a spoofed or stolen identity. Depending on the level of sophistication, these attacks will go after individuals, organizations, or wide swathes of the population.

Social engineering attacks work because it is difficult for users to verify each and every communication they receive; moreover, that verification requires a level of technical expertise that most users lack. To compound the problem, the number of users that have access to privileged information is often large, creating a commensurately large attack surface.

B. Program Description/Scope

The core technology to be developed in this program is the capability to automatically elicit information from a malicious adversary in order to identify, disrupt, and investigate social engineering attacks. ASED will do this by mediating communications between users and potential attackers with bots that actively detect attacks and coordinate investigations to discover the identity of the attacker.

Technical Areas (TAs)

The ASED program is divided into three technical areas:

1. Automated Detection of Social Engineering Attacks

2. Automated Investigation of Social Engineers

3. Scalable Evaluation Team

Figure 1 shows the TAs 1-3 diagrammatically with a U.S. Government-provided test range designed to evaluate ASED's automated defense measures. The program will construct a test range using the email/phone systems of a real organization. This testbed is designed to create realistic environments for TAs 1-3 technology evaluation. To support the defensive goals of ASED, the program will enlist TA3 performers to generate a series of realistic attacks in this testbed, allowing the program to conduct controlled experiments comparing ASED technologies against existing baselines. The Government and the TA3 evaluation teams will measure the ability of TA1 systems to detect and prevent attacks from succeeding. Similarly, the U.S. Government evaluation team will measure the ability of TA2 systems to identify attackers.
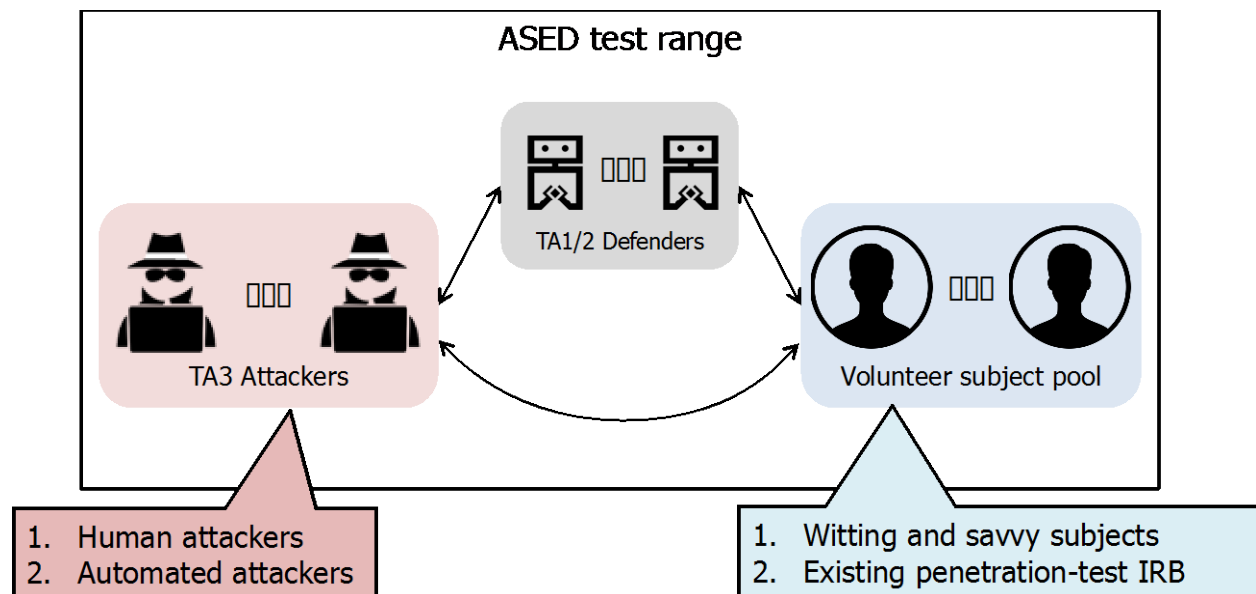

Figure 1: ASED Technical Areas and Evaluation Strategy

TA1: Automated Detection of Social Engineering Attacks

TA1 performers will develop technology to automatically detect social engineering attacks. This will require a way to observe the signatures of social engineering attacks and validate the identities of communicants.

To facilitate detection, TA1 systems will address three technical challenges:

1. Examine mechanisms used by attackers;

2. Force attackers to leave a detectable trace; and

3. Validate the trust mechanism used by a potential attacker.

TA1 performers will develop communications bots that mediate and observe communications between attackers and potential victims (as shown in Figure 2). These bots must be able to see communications from an attacker to multiple victims via information sharing across bots (enabling challenge 1) and intervene when a victim may be under attack to actively validate the identity of the potential attacker (enabling challenge 3).
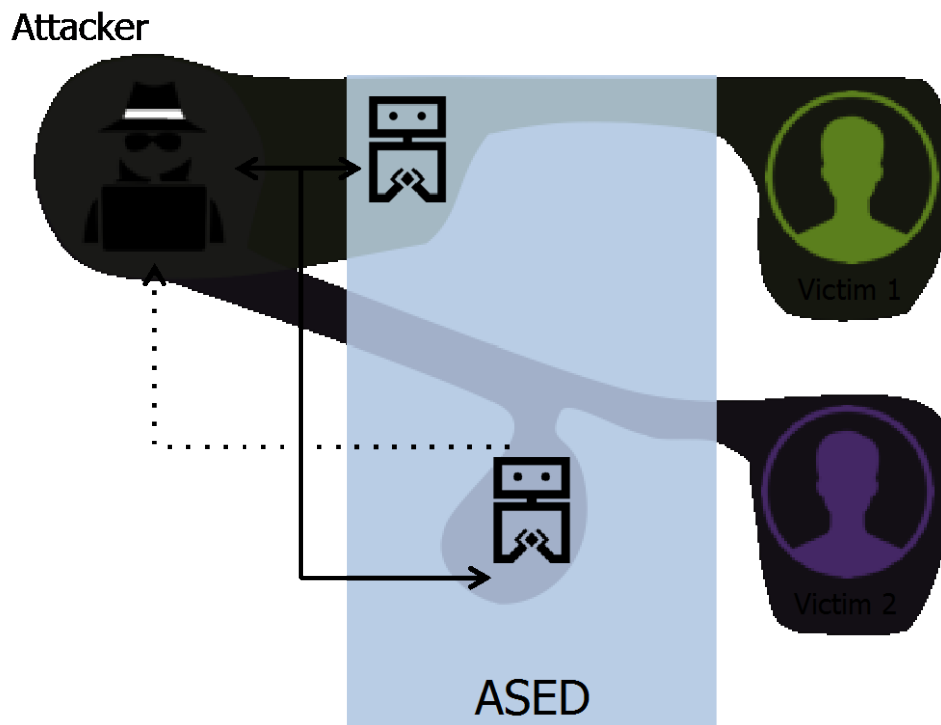
Figure 2: Virtual Alter Ego Bot Infrastructure

To address challenge 2, TA1 systems will develop approaches to coordinate multiple bots per user, each managing a set of "virtual alter egos." These virtual alter egos are purpose-based, communications channels where each channel allows one entity (or group of associated entities) to legitimately ask a victim for information. Many people already use such channels, for example communicating via different email addresses and phone numbers to separate work and personal activities. In the limit, imagine having a different channel for everyone you communicate with, and each channel being mediated by its own bot. To make using multiple channels practical, TA1 systems must automatically route communications appropriately.

The purpose of these channels is twofold:

1. First, they create multiple vantage points for detection of broad phishing attacks; and

2. Second, in order to spoof the identity of someone the victim already trusts, an attacker must select the exact channel for that identity. Consider as an example an attacker who knows that a victim is a My State Bank customer and wants to phish his account password. He now has to find the exact email address the victim uses to communicate with My State Bank in order to successfully phish. If the attacker chooses to multiple victim email addresses, each virtual alter ego will receive similar phishing attempts, creating a detectable signature.

Proposers to TA1 will create a detection capability that aggregates communications for an enterprise on email, SMS, and social media channels to enable identification of attack mechanisms. The resulting systems must include tools to help users easily route communications via appropriate channels. And while TA1 and TA2 systems will have access to the communications of an entire enterprise, these systems should safeguard private user information and prevent its disclosure to other members of the enterprise.

TA1 systems will use this capability to:

- **Perform passive detection:** Because these bots share data across potential victims and channels, they can assess whether specific communications from attackers have multiple users, individuals or organizations. This should allow for passive detection of phishing attacks even when the content of a communication is highly personalized.

- **Perform active detection:** The attacker may find the right channel and mount a highly personalized attack, especially when communicants within the victim's social network have been compromised. In these cases, ASED bots must be able to actively verify the communication. Both out-of-band verification and challenge/response approaches are of interest. Out-of-band verification could be done, for example, by testing the content of links, or by validating emails and/or text messages through alternate communications channels. Because these attacks are likely to be highly personalized and often from co-opted accounts, TA1 systems must also be capable of using dialog-based challenges and responses to validate the identity of the sender. For example, this could be accomplished by asking the sender to verify shared secrets: information that only the sender and victim would know. TA1 systems might keep track of this kind of identifying information automatically by aggregating prior communications from the attacker to the victim and analyzing their contents. TA1 systems may request help from the victim to curate, edit, and/or select potential challenges.

Ultimately, the goal of TA1 systems will be to detect attacks while minimizing the number of behaviors an attacker is able to elicit from potential victims within an enterprise deploying ASED. To evaluate TA1 systems, the evaluation team will measure the detection characteristics of TA1 systems (in P_d/P_{fa} terms; P_d = Probability of detection, P_{fa} = Probability of false alarm) and the cost (measured in terms of the total number of challenges and out-of-band communications needed to perform a detection).

TA2: Automated Investigation of Social Engineers

When an attack is detected, the ASED program envisions the use of automated, virtual, alter-ego bots to coordinate active investigation and tracing of the attacker's identity. To facilitate this, each bot should be able to manage a set of resources that it can trade to gain identifying information about the attacker. These resources could include sandboxed virtual machines, disposable accounts, etc.

These bots should automatically optimize the use of these resources to elicit as much identifying information as possible. Information could come in the form of direct or indirect disclosure or via transactions that leave observable traces. ASED should be capable of coordinating multiple bots to investigate attacks with multiple victims, as shown in Figure 3.
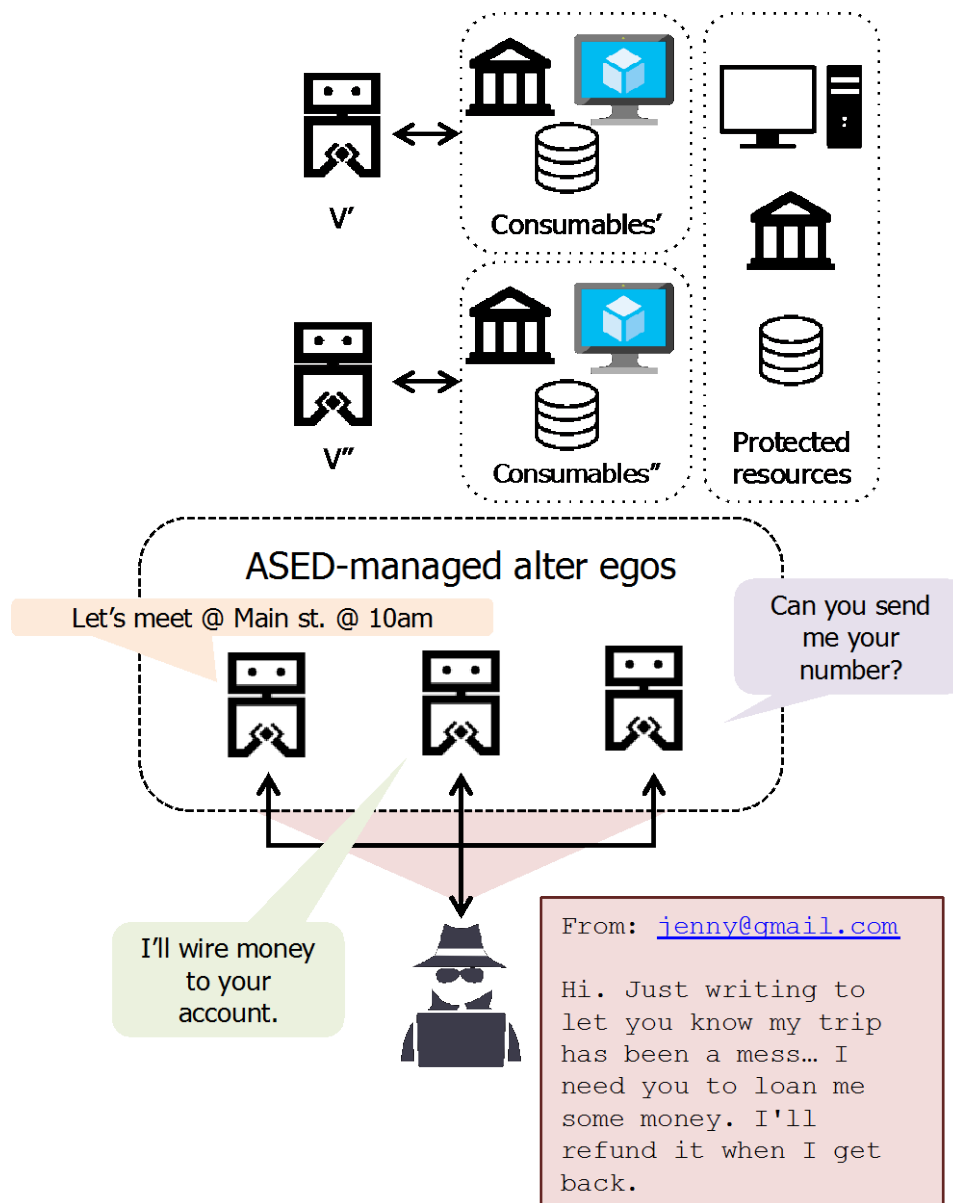

Figure 3: Active and coordinated investigation

Smart adversaries may not be willing to disclose identifying information. In these cases, ASED bots should be able to maintain dialogs for multiple turns, to distract and increase the work factor for the adversary.

TA2 systems will develop technologies that semi-automatically conduct coordinated, active investigations and perform adversary distraction. Investigation and distraction tasks may make use of the victim(s) to help edit, author, mediate or curate potential elicitations or distractions while minimizing the amount of victim effort needed. TA2 systems must also be able to optimally coordinate these activities across multiple victims.

TA2 auto-investigation and distraction solutions will be integrated with TA1 systems during bi-annual evaluation events. TA2 systems will be evaluated in terms of the rate at which they can retrieve or force the emissions of identifying information from an attacker and the cost (both in terms of an expendable resource needed and dialog turns required) per identifier retrieved.

TA3: Scalable Evaluation Team

TA3 performers will evaluate TA1/TA2 performers and measure their progress via social engineering attacks. TA3 performers will curate and maintain a set of social engineering scenarios that they will employ for testing and training. TA3 teams will also recruit a set of human attackers to perform attacks based on these scenarios on a live testbed. These attacks and their transcripts will help train TA1/TA2 systems.

During program evaluations TA3 performers will need to employ multiple variations of each scenario for each of the TA1-TA2 defensive systems to be evaluated and analyzed in statistically meaningful ways. To increase the number of attack samples per scenario, TA3 teams must develop an automated mechanism that dynamically generates attack variants and executes them in a repeatable and cost-effective manner that takes these transcripts as inputs. These systems should be able to dynamically replay scenarios automatically, and in their entirety, from early stage planning through attack execution.

TA3 systems and teams will be required to deploy on a U.S. Government-provided test range for continuous evaluation as described below in Section I.C. TA3 teams must work with the U.S. Government team to manage the deployment of their systems and the evaluation of bi-annual improvements of TA1-TA2 systems throughout the program.

C. Program Structure

Figure 4 shows the anticipated program schedule for ASED. The program is divided into two phases (18 months and 30 months). During the first phase of the program, performers will develop initial TA1-3 technologies. At the end of phase one, teams will begin to integrate their systems in the government provided test bed.

Biannual evaluations will be held as part of 2-week long integration exercises that are required for all teams. During these exercises, TA1 and TA2 teams will be required to integrate and deploy systems into the ASED test range against TA3 opponents. Evaluations will run continuously between deployment cycles and scored by the U.S. Government team. These two-week events will also encompass program PI meetings.
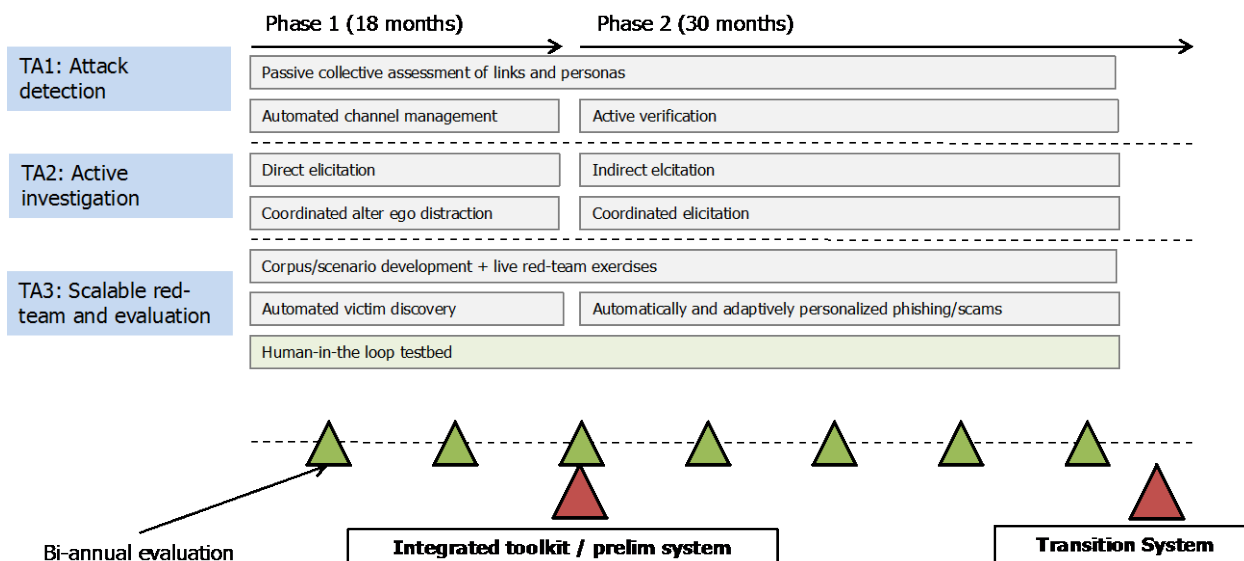
Figure 4: ASED Program Structure

Proposers may submit proposals to TA1 and/or TA2 or to TA3. Proposals to TA3 must be separate from proposals to TA1 and/or TA2. Proposers may submit to all technical areas, but to maintain the independence of the TA3 evaluation team, and to avoid an organizational conflict of interest, the same organization may not perform on TA3 and on TA1 and/or TA2. The Government reserves the right to choose which proposals to select for award.

D. Government-furnished Property/Equipment/Information

DARPA will provide a test range to be used by all TA1-3 performers for deployment and evaluation. Experimentation and evaluation will be performed exclusively on this platform in order to centralize human subjects research with the U.S. Government-supplied test range and ensure uniformity of testing. TA1 and TA2 performers' systems will be supplied with accounts and virtual alter egos from participants in the test range. TA3 performers must create and manage their own identities.

E. Program Metrics and Targets

Figure 5 shows the evaluation metrics to be used for ASED and the program targets for each phase (P_1 and P_2; P_0 denotes pre-program estimates of current state of the art methods).

Metrics		P_0	P_1	P_2
TA1: Attack detection	**P_d/P_{fa} for identification of friend/foe** • Number of challenges needed to perform identification	70%/12%	90%/3%	95%/1%
TA2: Active investigation	**Retrieval rate for attacker's identifying information** • Number of turns plus number of alter egos needed to extract information • Amount of expendable resources needed per identifier extracted • Engagement time (in dialog turns) when distracting adversary	17%	70%	90%
TA3: Scalable red team	**P_d/P_{fa} detection of soft targets** • At differing numbers of seeds **Success rate of attacks against non-ASED accounts**	65%/20% 70%	85%/4% 80%	97%/1% 95%

Figure 5: Program metrics and targets

TA1 metrics for detection are measured in relation to the number of challenges needed (i.e. the cost of detection). This balances the "annoyance" factor (i.e. how frequently non-malicious communications require extra verification) against detection accuracy.

Similarly, TA2 metrics are designed to help evaluate the retrieval accuracy of attribution information against the number of resources and interactions needed to accomplish this retrieval.

For TA3 we evaluate the ability of systems to detect susceptible victims given a number of potential seeds. We also measure the success rate of attacks mounted by TA3 performers.

Note: TA3 program targets are defined as success rates for non-ASED defended systems whereas TA1 and TA2 metrics are defined relative to TA3 attackers.

F. Intellectual Property

The program will emphasize creating and leveraging adaptable *open source/open architecture* technology solutions. Intellectual property rights asserted by proposers are strongly encouraged to be aligned with non-viral open source regimes. Make sure to carefully document and explain these reasons in submitted proposals. See Section VI.B for more details on intellectual property.

II.   Award Information

A. Awards

Multiple awards are anticipated. The level of funding for individual awards made under this solicitation has not been predetermined and will depend on the quality of the proposals received and the availability of funds. Awards will be made to proposers whose proposals are determined to be the most advantageous to the Government, all factors considered, including the potential contributions of the proposed work, overall funding strategy, and availability of funding. See Section V for further information.

The Government reserves the right to:

– select for negotiation all, some, one, or none of the proposals received in response to this solicitation;

– make awards without discussions with proposers;

– conduct discussions with proposers if it is later determined to be necessary;

– segregate portions of resulting awards into pre-priced options;

– accept proposals in their entirety or to select only portions of proposals for award;

– fund proposals in increments and/or with options for continued work at the end of one or more phases;

– request additional documentation once the award instrument has been determined (e.g., representations and certifications); and

– remove proposers from award consideration should the parties fail to reach agreement on award terms within a reasonable time or the proposer fails to provide requested additional information in a timely manner.

Proposals selected for award negotiation may result in a procurement contract, cooperative agreement, or Other Transaction (OT) depending upon the nature of the work proposed, the required degree of interaction between parties, 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 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.

B. 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 BAA, 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 BAA. 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 BAA 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.

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 select award instrument type and to negotiate all instrument terms and conditions with selectees. Appropriate clauses will be included in resultant awards for non-fundamental research to prescribe publication requirements and other restrictions, as appropriate. This clause 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 being performed by the awardee is restricted research, a subawardee may be conducting fundamental research. In those cases, it is the awardee's responsibility to explain in their proposal why its subawardee's effort is fundamental research

C. 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://doi.org/10.6028/NIST.SP.800-171r1) that are in effect at the time the BAA is issued, or as authorized by the Contracting Officer, not later than December 31, 2017.

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.

III.   Eligibility Information

A. Eligible Applicants

DARPA welcomes engagement from all responsible sources capable of satisfying the Government's needs, including academia (colleges and universities); businesses (large, small, small disadvantaged, etc.); other organizations (including non-profit); entities (foreign, domestic, and government); FFRDCs; minority institutions; and others.

DARPA welcomes engagement from non-traditional sources in addition to current DARPA performers.

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

a. FFRDCs

FFRDCs are subject to applicable direct competition limitations and cannot propose to this BAA 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 citing the specific authority establishing their eligibility to propose to Government solicitations and compete with industry, and their compliance with the associated FFRDC sponsor agreement's terms and conditions. This information is required for FFRDCs proposing to be awardees or subawardees.

b. 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.

c. 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.§ 2539b 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.

2. Foreign Participation

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.

B. 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 BAA. 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 BAA 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.

C. 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 (e.g., OTs under the authority of 10 U.S.C. § 2371).

D. Other Eligibility Requirements

1. Ability to Receive Awards in Multiple Technical Areas - Conflicts of Interest

While proposers may submit proposals for all three technical areas, proposers selected for TA3 cannot be selected for any portion of the other two technical areas, whether as a prime, subcontractor, or in any other capacity from an organizational to an individual level. This is to avoid OCI situations between the technical areas and to ensure objective test and evaluation results. The decision as to which proposal to consider for award is at the discretion of the Government.

2. Ability to Support Classified Deployment

Although the technical work in TA1-3 is not classified, there may be transition-related deployments of ASED systems that require security clearances from proposers. In your proposals, please provide applicable Commercial and Government Entity (CAGE) code and security point(s) of contact in your proposals. This information should be included on the Cover Sheet of your proposal.

IV. Application and Submission Information

A. Address to Request Application Package

This document contains all information required to submit a response to this solicitation. No additional forms, kits, or other materials are needed except as referenced herein. No request for proposal (RFP) or additional solicitation regarding this opportunity will be issued, nor is additional information available except as provided at the Federal Business Opportunities website (https://www.fbo.gov), the Grants.gov website (http://www.grants.gov/), or referenced herein.

B. Content and Form of Application Submission

1. Abstracts

Proposers are highly 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. The abstract provides a synopsis of the proposed project, including brief 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?
- Who will care and what will the impact be if the work is successful?
- How much will it cost, and how long will it take?

Abstract Format: Abstracts may address a single technical area for TA1 through TA3. Abstracts may also address TA1 and TA2 jointly; however, proposals addressing TA3 should not be combined with any other technical area efforts due to the nature of the work required by TA3. Submissions addressing other combinations of TAs will not be accepted.

Abstracts shall not exceed a maximum of 5 pages including the cover sheet and all figures, tables, and charts. The page limit does not include a submission letter (optional).

All pages shall be formatted for printing on 8-1/2 by 11-inch paper with 1-inch margins and font size not smaller than 12 point. Font sizes of 8 or 10 point may be used for figures, tables, and charts. Document files must be in .pdf, .odx, .doc, .docx, .xls, or .xlsx formats. Submissions must be written in English. All pages should be numbered.

Abstracts must include the following components:

- **Cover Sheet**: Provide the administrative and technical points of contact (name, address, phone, email, lead organization). Include the BAA number, title of the proposed project, primary subcontractors, estimated cost, duration of the project, and the label "Abstract."

- **Goals and Impact:** Describe what is being proposed and what 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 relationship of this work to any other projects from the past and present.

- **Technical Plan:** Outline and address all technical challenges inherent in the approach and possible solutions for overcoming potential problems. Provide appropriate specific milestones (quantitative, if possible) at intermediate stages of the project to demonstrate progress.

- **Capabilities/Management Plan:** Provide a brief summary of expertise of the team, including subcontractors and key personnel. Identify a principal investigator for the project and include a description of the team's organization including roles and responsibilities. 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 property, facilities, or data assumed to be available. Please include a brief bibliography with links to relevant papers, reports, or resumes of key performers. Do not include more than two resumes as part of the abstract. Resumes count against the abstract page limit.

- **Statement of Work, Cost, and Schedule:** Provide a cost estimate for resources over the proposed timeline of the project, broken down by year. Include labor, materials, a list of deliverables and delivery schedule. Provide cost estimates for each subcontractor (may be a rough order of magnitude).

2. Proposals

Proposals consist of Volume 1: Technical and Management Proposal (including mandatory Appendix A); Volume 2: Cost Proposal; the Level of Effort Summary by Task Excel spreadsheet; and the PowerPoint summary slide.

All pages shall be formatted for printing on 8-1/2 by 11-inch paper with 1-inch margins, single-line spacing, and a font size no smaller than 12 point. Font sizes as small as 8 point may be used for figures, tables, and charts. Document files must be in .pdf, .odx, .doc, .docx, .xls, or .xlsx formats. Submissions must be written in English. All pages of Volume 1 should be numbered.

A summary slide of the proposed effort, in PowerPoint format, should be submitted with the proposal. A template slide is provided as an attachment to the BAA. Submit this PowerPoint file in addition to Volumes 1 and 2 of your full proposal, and the Level of Effort Summary by Task Excel spreadsheet. This summary slide does not count towards the total page count.

Proposals may address a single technical area for TA1 through TA3. Proposals may also address TA1 and TA2 jointly; however, proposals addressing TA3 should not be combined with any other technical area efforts due to the nature of the work required by TA3. Submissions should separate costs, statement of work and level-of-effort for each technical area proposed. Submissions addressing other combinations of TAs will not be accepted.

Proposals not meeting the format prescribed herein may not be reviewed.

a. Volume 1: Technical and Management Proposal

The maximum page count for Volume 1 is 25 pages for proposals addressing one technical area, and 35 pages for those addressing two technical areas, including all figures, tables, and

charts but not including the cover sheet, table of contents or appendices. A submission letter is optional and is not included in the page count. Appendix A and bibliographies do not count against the page limit and is mandatory.

Volume 1 must include the following components:

   i. Cover Sheet: Include the following information.
   – Label: "Proposal: Volume 1"
   – BAA number (HR001117S0050)
   – Technical Area
   – Proposal title
   – Lead organization (prime contractor) name
   – Type of organization, selected from the following categories: Large Business, Small Disadvantaged Business, Other Small Business, HBCU, MI, Other Educational, or Other Nonprofit
   – Technical point of contact (POC) including name, mailing address, telephone, and email
   – Administrative POC including name, mailing address, telephone number, and email address
   – Award instrument requested: procurement contract (specify type), cooperative agreement or OT.[1]
   – Total amount of the proposed effort
   – Place(s) and period(s) of performance
   – Other team member (subcontractors and consultants) information (for each, include Technical POC name, organization, type of organization, mailing address, telephone number, and email address)
   – Proposal validity period (minimum 120 days)
   – Data Universal Numbering System (DUNS) number[2]
   – Taxpayer identification number[3]
   – Commercial and Government Entity (CAGE) code[4]
   – Proposer's reference number (if any)

   ii. Table of Contents

   iii. 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?

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[1] Information on award instruments can be found at http://www.darpa.mil/work-with-us/contract-management.
[2] The DUNS number is used as the Government's contractor identification code for all procurement-related activities. Go to http://fedgov.dnb.com/webform/index.jsp to request a DUNS number (may take at least one business day). For further information regarding this subject, please see www.darpa.mil/work-with-us/additional-baa for further information.
[3] See http://www.irs.gov/businesses/small/international/article/0,,id=96696,00.html for information on requesting a TIN. Note, requests may take from 1 business day to 1 month depending on the method (online, fax, mail).
[4] A CAGE Code identifies companies doing or wishing to do business with the Federal Government. For further information regarding this subject, please see www.darpa.mil/work-with-us/additional-baa.

- How is it done today, and what are the limitations?
- 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?

The executive summary should include a description of the key technical challenges, a concise review of the technologies proposed to overcome these challenges and achieve the project's goal, and a clear statement of the novelty and uniqueness of the proposed work.

iv. Innovative Claims and Deliverables: 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. Discuss the mitigation of any issues related to sustainment of the technology over its entire lifecycle, assuming the technology transition plan is successful.

v. Technical Plan: Outline and address technical challenges inherent in the approach and possible solutions for overcoming potential problems. Demonstrate a deep understanding of the technical challenges and present a credible (even if risky) plan to achieve the project's goal. Discuss mitigation of technical risk. Provide appropriate measurable milestones (quantitative if possible) at intermediate stages of the project to demonstrate progress and a plan for achieving the milestones.

vi. Management Plan: Provide a summary of expertise of the proposed team, including any subcontractors/consultants and key personnel who will be executing the work. Identify a principal investigator (PI) for the project. Provide a clear description of the team's organization including an organization chart that includes, as applicable, the relationship of team members; unique capabilities of team members; task responsibilities of team members; teaming strategy among the team members; and key personnel with the amount of effort to be expended by each person during the project. Provide a detailed plan for coordination including explicit guidelines for interaction among collaborators/subcontractors of the proposed project. Include risk management approaches. Describe any formal teaming agreements that are required to execute this project. List Government-furnished materials or data assumed to be available.

vii. Personnel, Qualifications, and Commitments: List key personnel (no more than one page per person), showing a concise summary of their qualifications, discussion of previous accomplishments, and work in this or closely related research areas. Indicate the level of effort in terms of hours to be expended by each person during each contract year and other (current and proposed) major sources of support for them and/or commitments of their efforts. DARPA expects all key personnel associated with a proposal to make a substantial time commitment to the proposed activity and the proposal will be evaluated accordingly. It is DARPA's intention to put key personnel conditions into the awards, so

proposers should not propose personnel that are not anticipated to execute the award.

Include a table of key individual time commitments as follows:

Key Individual	Project	Status (Current, Pending, Proposed)	Hours on Project		
			Phase 1	Phase 2	Phase 3
Name 1	**ASED**	Proposed	x	x	x
	Project Name 1	Current	x	x	n/a
	Project Name 2	Pending	n/a	x	x
Name 2	**ASED**	Proposed	x	x	x
	Project Name 3	Proposed	x	x	x

viii. Capabilities: Describe organizational experience in relevant subject area(s), existing intellectual property, or specialized facilities. Discuss any work in closely related research areas and previous accomplishments.

ix. Statement of Work (SOW): The SOW must provide a detailed task breakdown, citing specific tasks and their connection to the interim milestones and metrics, as applicable. Each phase of the project should be separately defined. The SOW must not include proprietary information. For each defined task/subtask, provide:

- A general description of the objective.

- 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, (e.g., a deliverable, demonstration, or other event/activity that marks task completion).

- A definition of all deliverables (e.g., data, reports, software) to be provided to the Government in support of the proposed tasks/subtasks.

- Identify any tasks/subtasks (by the prime or subcontractor) that will be accomplished at a university and believed to be fundamental research.

x. 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.

xi. Appendix A: This section is mandatory and must include all of the following components. If a particular subsection is not applicable, state "NONE".

- **(1). Team Member Identification:** Provide a list of all individual team members from the prime, subcontractor(s), and consultant(s), as applicable. Identify specifically whether any are a non-US organization or individual, FFRDC and/or Government entity. Use the following format for this list:

| Individual Name | Role (Prime, Subcontractor or Consultant) | Organization | Non-US? | | FFRDC or Govt? |
			Org	Ind.	

(2). Government or FFRDC Team Member Proof of Eligibility to Propose:
If none of the team member organizations (prime or subcontractor) are a Government entity or FFRDC, state "NONE".

If any of the team member organizations are a Government entity or FFRDC, provide documentation (per Section III.A.1) citing the specific authority that establishes the applicable team member's eligibility to propose to Government solicitations to include: 1) statutory authority; 2) contractual authority; 3) supporting regulatory guidance; and 4) evidence of agency approval for applicable team member participation.

(3). Government or FFRDC Team Member Statement of Unique Capability: If none of the team member organizations (prime or subcontractor) are a Government entity or FFRDC, state "NONE".

If any of the team member organizations are a Government entity or FFRDC, provide a statement (per Section III.A.1) that demonstrates the work to be performed by the Government entity or FFRDC team member is not otherwise available from the private sector.

(4). Organizational Conflict of Interest Affirmations and Disclosure: If none of the proposed team members are currently providing SETA or similar support as described in Section III.B, state "NONE".

If any of the proposed team members (individual or organization) is currently performing SETA or similar support, furnish the following information:

Prime Contract Number	DARPA Technical Office supported	A description of the action the proposer has taken or proposes to take to avoid, neutralize, or mitigate the conflict

(5). Intellectual Property (IP): If no IP restrictions are intended, state "NONE". The Government will assume unlimited rights to all IP not explicitly identified as having less than unlimited rights in the proposal.

For all technical data or computer software that will be furnished to the

Government with other than unlimited rights, provide (per Section VI.B.1) a list describing all proprietary claims to results, prototypes, deliverables or systems supporting and/or necessary for the use of the research, results, prototypes and/or deliverables. Provide documentation proving ownership or possession of appropriate licensing rights to all patented inventions (or inventions for which a patent application has been filed) to be used for the proposed project. Use the following format for these lists:

NONCOMMERCIAL				
Technical Data and/or 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)
(List)	(Narrative)	(List)	(List)	(List)

COMMERCIAL				
Technical Data and/or 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)
(List)	(Narrative)	(List)	(List)	(List)

(6). Human Subjects Research (HSR): If HSR is not a factor in the proposal, state "NONE".

If the proposed work will involve human subjects, provide evidence of or a plan for review by an institutional review board (IRB). For further information on this subject, see Section VI.B.2.

(7). Animal Use: If animal use is not a factor in the proposal, state "NONE".

If the proposed research will involve animal use, provide a brief description of the plan for Institutional Animal Care and Use Committee (IACUC) review and approval. For further information on this subject, see Section VI.B.2.

(8). Representations Regarding Unpaid Delinquent Tax Liability or a Felony Conviction under Any Federal Law: For further information regarding this subject, please see www.darpa.mil/work-with-us/additional-baa.

Please also complete the following statements.

(1) The proposer is [   ] is not [   ] a corporation that has any unpaid Federal tax liability that has been assessed, for which all judicial and administrative remedies have been exhausted or have lapsed, and that is not being paid in a timely manner pursuant to an agreement with the authority responsible for collecting the tax liability,

(2) The proposer is [ ] is not [ ] a corporation that was convicted of a felony criminal violation under a Federal law within the preceding 24 months.

(9). Cost Accounting Standards (CAS) Notices and Certification: For any proposer who submits a proposal which, if accepted, will result in a CAS-compliant contract, must include a Disclosure Statement as required by 48 CFR 9903.202.

Further information regarding the CAS notices and certification can be found in the FAR 52.230-1, as well as at www.darpa.mil/work-with-us/additional-baa.

If this section is not applicable, state "NONE".

b. Volume 2 - Cost Proposal

This volume is mandatory and must include all the listed components. No page limit is specified for this volume.

The cost proposal should include a working spreadsheet file (.xls or equivalent format) that provides formula traceability among all components of the cost proposal. The spreadsheet file should be included as a separate component of the full proposal package. Costs must be traceable between the prime and subcontractors/consultants, as well as between the cost proposal and the SOW.

Pre-award costs will not be reimbursed unless a pre-award cost agreement is negotiated prior to award.

i. Cover Sheet: Include the same information as the cover sheet for Volume 1, but with the label "Proposal: Volume 2."

ii. Cost Summary Tables: Provide a single-page summary table broken down by fiscal year listing cost totals for labor, materials, other direct charges (ODCs), indirect costs (overhead, fringe, general and administrative [G&A]), and any proposed fee for the project. Include costs for each task in each fiscal year of the project by prime and major subcontractors, total cost and proposed cost share, if applicable. Provide a second table containing the same information broken down by project phase.

iii. Cost Details: For each task, provide the following cost details by month. Include supporting documentation describing the method used to estimate costs. Identify any cost sharing.

(1) Direct Labor: Provide labor categories, rates and hours. Justify rates by providing examples of equivalent rates for equivalent talent, past commercial or Government rates from a Government audit agency such as the Defense Contract Audit Agency (DCAA), the Office of Naval Research (ONR), the Department of Health and Human Services (DHHS), etc.

(2) Indirect Costs: Identify all indirect cost rates (such as fringe benefits, labor overhead, material overhead, G&A, or F&A, etc.) and the basis for each.

(3) Materials: Provide an itemized list of all proposed materials, equipment, and supplies for each year including quantities, unit prices, proposed vendors (if known), and the basis of estimate (e.g., quotes, prior purchases, catalog price lists, etc.). For proposed equipment/information technology (as defined in FAR 2.101) purchases equal to or greater than $50,000, include a letter justifying the purchase. Include any requests for Government-furnished equipment or information with cost estimates (if applicable) and delivery dates.

(4) Travel: Provide a breakout of travel costs including the purpose and number of trips, origin and destination(s), duration, and travelers per trip.

(5) Subcontractor/Consultant Costs: Provide above info for each proposed subcontractor/consultant. Subcontractor cost proposals must include interdivisional work transfer agreements or similar arrangements. If the proposer has conducted a cost or price analysis to determine reasonableness, submit a copy of this along with the subcontractor proposal.

The proposer is responsible for the compilation and submission of all subcontractor/consultant cost proposals. At a minimum, the submitted cost volume must contain a copy of each subcontractor or consultant non-proprietary cost proposal (i.e. cost proposals that do not contain proprietary pricing information such as rates, factors, etc.) Proprietary subcontractor/consultant cost proposals may be included as part of Volume 2. Proposal submissions will not be considered complete unless the Government has received all subcontractor/consultant cost proposals.

If proprietary subcontractor/consultant cost proposals are not included as part of Volume 2, they may be emailed separately to ASED@darpa.mil.   Email messages must include "Subcontractor Cost Proposal" in the subject line and identify the principal investigator, prime proposer organization and proposal title in the body of the message. Any proprietary subcontractor or consultant proposal documentation which is not uploaded to Broad Agency Announcement Tool (BAAT) as part of the proposer's submission or provided by separate email shall be made immediately available to the Government, upon request, under separate cover (i.e., mail, electronic/email, etc.), either by the proposer or by the subcontractor/consultant organization.

Please note that a ROM or similar budgetary estimate is not considered a fully qualified subcontract cost proposal submission. Inclusion of a ROM or similar budgetary estimate, or failure to provide a subcontract proposal, will result in the full proposal being deemed non-compliant.

(6) ODCs: Provide an itemized breakout and explanation of all anticipated other direct costs.

iv. Proposals Requesting a Procurement Contract: Provide the following information where applicable.

(1) Proposals for $750,000 or more: Provide "certified cost or pricing data" (as defined in FAR 2.101) or a request for exception in accordance with FAR 15.403.

(2) Proposals for $700,000 or more: Pursuant to Section 8(d) of the Small Business Act (15 U.S.C. § 637(d)), it is Government policy to enable small business and small disadvantaged business concerns to be considered fairly as subcontractors to organizations performing work as prime contractors or subcontractors under Government contracts, and to ensure that prime contractors and subcontractors carry out this policy. In accordance with FAR 19.702(a)(1) and 19.702(b), prepare a subcontractor plan, if applicable. The plan format is outlined in FAR 19.704.

(3) Proposers without an adequate cost accounting system: If requesting a cost-type contract, provide the DCAA Pre-award Accounting System Adequacy Checklist to facilitate DCAA's completion of an SF 1408. Proposers without an accounting system considered adequate for determining accurate costs must complete an SF 1408 if a cost type contract is to be negotiated. 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. To complete the form, check the boxes on the second page, then provide a narrative explanation of your accounting system to supplement the checklist on page one.

v. Proposals Requesting an Other Transaction Agreement: Proposers must indicate whether they qualify as a nontraditional Defense contractor[5], have teamed with a nontraditional Defense contractor, or are providing a one-third cost share for this effort. Provide information to support the claims.

Provide a detailed list of milestones including: description, completion criteria, due date, and payment/funding schedule (to include, if cost share is proposed, contractor and Government share amounts). Milestones must relate directly to accomplishment of technical metrics as defined in the solicitation and/or the proposal. While agreement type (fixed price or expenditure based) will be subject to negotiation, the use of fixed price milestones with a payment/funding schedule is preferred. Proprietary information must not be included as part of the milestones.

c. Level of Effort Summary by Task Spreadsheet

Provide a one-page table summarizing estimated level of effort per task (in hours) broken out by senior, mid-level, and junior personnel, in the format shown below in Figure 6. Also include dollar-denominated estimates of travel, materials, and equipment. For this table, consider materials to include the cost of any data sets or software licenses proposed. For

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[5] For definitions and information on an OT agreement see http://www.darpa.mil/work-with-us/contract-management.

convenience, an Excel template is available for download along with the BAA. Submit the Level of Effort Summary Excel file (do not convert the Excel file to pdf format) in addition to Volumes 1 and 2 of your full proposal. This Excel file does not count towards the total page count.

SOW Task	Duration (months)	Intensity (hrs/mo)	Labor Hours for Prime Sr	Skill set(s)	Mid	Skill set(s)	Jr	Skill set(s)	Total	Labor Hours for Subcontractor/Consultants SubC-Sr	Skill set(s)	SubC-Mid	Skill set(s)	SubC-Jr	Skill set(s)	Conslt	Total
1.1.0 <Phase 1 Task 1 name>	7	135	240		680		24		944	-						200	1,144
1.1.1 <Subtask 1.1.1 name>	4	90	80		280		-		360	-						200	560
1.1.2 <Subtask 1.1.2 name>	3	195	160		400		24		584	-						-	584
1.2.0 <Phase 1 Task 2 name>	6	385	108		400		1,800		2,308	1,400						-	3,708
1.2.1 <Subtask 1.2.1 name>	3	656	48		320		1,600		1,968	600						-	2,568
1.2.2 <Subtask 1.2.2 name>	3	113	60		80		200		340	800						-	1,140
:	:	:	:		:		:		:	:						:	:
Phase 1 Total Hours			348		1,080		1,824		3,252	1,400						200	4,652
Phase 1 Costs *First column is prime, second is total subcontractor, third is total consultant, fourth is total*			Travel						$ 44,000	$ 12,000						$ 2,000	$ 58,000
			Materials & Equipment						$ 8,000	$ -						$ -	$ 8,000
2.1.0 <Phase 2 Task 1 name>	8	100	176		560		64		800	100						100	1,000
2.1.1 <Subtask 2.1.1 name>	7	51	96		240		24		360	100						100	560
2.1.2 <Subtask 2.1.2 name>	4	110	80		320		40		440	-						-	440
2.2.0 <Phase 2 Task 2 name>	6	417	180		520		1,800		2,500	1,240						-	3,740
2.2.1 <Subtask 2.2.1 name>	4	435	140		400		1,200		1,740	400						-	2,140
2.2.2 <Subtask 2.2.2 name>	4	190	40		120		600		760	840						-	1,600
:	:	:	:		:		:		:	:						:	:
Phase 2 Total Hours			356		1,080		1,864		3,300	1,340						100	4,640
Phase 2 Costs *First column is prime, second is total subcontractor, third is total consultant, fourth is total*			Travel						$ 47,000	$ 12,000						$ 2,000	$ 61,000
			Materials & Equipment						$ 4,000	$ -						$ -	$ 4,000
3.1.0 <Phase 3 Task 1 name>	9	71	120		400		120		640	100						100	840
3.1.1 <Subtask 3.1.1 name>	3	93	40		200		40		280	100						100	480
3.1.2 <Subtask 3.1.2 name>	6	60	80		200		80		360	-						-	360
3.2.0 <Phase 3 Task 2 name>	6	460	160		800		1,800		2,760	1,200						-	3,960
3.2.1 <Subtask 3.2.1 name>	4	370	80		400		1,000		1,480	600						-	2,080
3.2.2 <Subtask 3.2.2 name>	3	427	80		400		800		1,280	600						-	1,880
:	:	:	:		:		:		:	:						:	:
Phase 3 Total Hours			280		1,200		1,920		3,400	1,300						100	4,800
Phase 3 Costs *First column is prime, second is total subcontractor, third is total consultant, fourth is total*			Travel						$ 48,000	$ 12,000						$ 2,000	$ 62,000
			Materials & Equipment						$ -	$ -						$ -	$ -
Project Total Hours			984		3,360		5,608		9,952	4,040						400	14,092
Total Project Costs *First column is prime, second is total subcontractor, third is total consultant, fourth is total*			Travel						$ 139,000	$ 36,000						$ 6,000	$ 181,000
			Materials & Equipment						$ 12,000	$ -						$ -	$ 12,000

Figure 6: Example level-of-effort summary table. Numbers illustrate roll-ups and subtotals. The SubC column captures all subcontractor hours and the Conslt column captures all consultant hours. The Skill set(s) columns should indicate an area of expertise (e.g., engineer, software developer, data scientist, subject matter expert).

d. Summary Slide

The submission of a PowerPoint slide summarizing the proposed effort is mandatory. A template PowerPoint slide will be provided on the Federal Business Opportunities (FedBizOpps) website as an attachment. Submit the PowerPoint file (do not convert PowerPoint file to pdf format) in addition to Volumes 1 and 2 of your full proposal. This summary slide does not count towards the total page count.

3. Proprietary and Classified Information

DARPA policy is to treat all submissions as source selection information (see FAR 2.101 and 3.104) and to disclose the 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.

a. Proprietary Information

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.

b. Classified Information

Classified submissions (classified technical proposals or classified appendices to unclassified proposals) addressing TA1, TA2 or TA3 will not be accepted under this solicitation.

C. Submission Dates and Times

Proposers are warned that submission deadlines as outlined herein are strictly enforced. Note: some proposal requirements may take from 1 business day to 1 month to complete. See the proposal checklist in Section VIII.D for further information.

When utilizing the DARPA BAA Submission Website, as described in Section IV.E.1 below, a control number will be provided at the conclusion of the submission process. This control number should be used in all further correspondence regarding your abstract/proposal submission.

For proposal submissions requesting cooperative agreements, Section IV.E.1.c, you must request your control number via email at ASED@darpa.mil. Please note that the control number will not be issued until after the proposal due date and time.

Failure to comply with the submission procedures outlined herein may result in the submission not being evaluated.

1. Abstracts

Abstracts must be submitted per the instructions outlined herein and received by DARPA no later than **September 19, 2017 at 12:00 noon (ET)**. Abstracts received after this date and time will not be reviewed.

2. Proposals

The proposal package -- full proposal (Volumes 1 and 2; the Level of Effort Summary by Task Spreadsheet, and the Summary Slide) and, as applicable, proprietary subcontractor cost proposals -- must be submitted per the instructions outlined herein and received by DARPA no later than **November 9, 2017 at 12:00 noon (ET)**. Submissions received after this date and time will not be reviewed.

D. Funding Restrictions

Not applicable.

E. Other Submission Requirements

Unclassified Submission Instructions

Proposers must submit all parts of their submission package using the same method; submissions cannot be sent in part by one method and in part by another method nor should duplicate submissions be sent by multiple methods. Emailed submissions of abstracts or full proposals will not be accepted.

a. Abstracts

DARPA/I2O will employ an electronic upload submission system (https://baa.darpa.mil/) for all UNCLASSIFIED abstract responses under this solicitation. *Abstracts should not be submitted via Email or Grants.gov.*

First-time users of the DARPA BAA Submission Website must complete a two-step account creation process at https://baa.darpa.mil/. The first step consists of registering for an Extranet account by going to the above URL and selecting the "Account Request" link. Upon completion of the online form, proposers will receive two separate emails; one will contain a user name and the second will provide a temporary password. Once both emails have been received, proposers must go back to the submission website and log in using that user name and password. After accessing the Extranet, proposers must create a user account for the DARPA BAA Submission Website by selecting the "Register Your Organization" link at the top of the page. The DARPA BAA Submission Website will display a list of solicitations open for submissions. Once a proposer's user account is created, they may view instructions on uploading their abstract.

Proposers who already have an account on the DARPA BAA Submission Website may simply log in at https://baa.darpa.mil/, select this solicitation from the list of open DARPA solicitations and proceed with their abstract submission. Note: Proposers who have created a DARPA BAA Submission Website account to submit to another DARPA Technical Office's solicitations do not need to create a new account to submit to this solicitation.

All submissions submitted electronically through DARPA's BAA website must be uploaded as zip files (.zip or .zipx extension). The final zip file should contain only the files requested herein and must not exceed 50 MB in size. Only one zip file will be accepted per submission. Note: Submissions not uploaded as zip files will be rejected by DARPA.

Please note that all submissions MUST be finalized, meaning that no further editing will be possible, when submitting through the DARPA BAA Submission Website in order for DARPA to be able to review your submission. If a submission is not finalized, the submission will not be deemed acceptable and will not be reviewed.

Website technical support may be reached at Action@darpa.mil and is typically available during regular business hours (9:00 AM – 5:00 PM ET, Monday-Friday). Questions regarding submission contents, format, deadlines, etc. should be emailed to ASED@darpa.mil.

Since abstract submitters may encounter heavy traffic on the web server, they should not wait until the day abstracts are due to request an account and/or upload the submission.

Abstracts should not be submitted via Email. Any abstracts submitted by Email will not be accepted or reviewed.

b. Proposals Requesting a Procurement Contract or Other Transaction

DARPA/I2O will employ an electronic upload submission system (https://baa.darpa.mil/) for UNCLASSIFIED proposals requesting award of a procurement contract or Other Transaction under this solicitation.

First-time users of the DARPA BAA Submission Website must complete a two-step account creation process at https://baa.darpa.mil/. The first step consists of registering for an Extranet account by going to the above URL and selecting the "Account Request" link. Upon completion of the online form, proposers will receive two separate emails; one will contain a user name and the second will provide a temporary password. Once both emails have been received, proposers must go back to the submission website and log in using that user name and password. After accessing the Extranet, proposers must create a user account for the DARPA BAA Submission Website by selecting the "Register Your Organization" link at the top of the page. The DARPA BAA Submission Website will display a list of solicitations open for submissions. Once a proposer's user account is created, they may view instructions on uploading their proposal.

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Please note that all submissions MUST be finalized, meaning that no further editing will be possible, when submitting through the DARPA BAA Submission Website in order for DARPA to be able to review your submission. If a submission is not finalized, the submission will not be deemed acceptable and will not be reviewed.

Website technical support may be reached at Action@darpa.mil and is typically available during regular business hours (9:00 AM – 5:00 PM ET, Monday-Friday). Questions regarding submission contents, format, deadlines, etc. should be emailed to ASED@darpa.mil.

Since proposers may encounter heavy traffic on the web server, they should not wait until the day proposals are due to request an account and/or upload the submission. Full proposals should not be submitted via Email. Any full proposals submitted by Email will not be accepted or evaluated.

c. Proposals Requesting a Cooperative Agreement

Proposers requesting cooperative agreements may submit proposals through one of the following methods: (1) hard copy mailed directly to DARPA; or (2) electronic upload per the instructions at http://www.grants.gov/applicants/apply-for-grants.html. Cooperative agreement proposals may not be submitted through any other means. 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 the Grants.gov do not submit paper proposals in addition to the Grants.gov electronic submission.

Grants.gov requires proposers to complete a one-time registration process before a proposal can be electronically submitted. If proposers have not previously registered, this process can take between three business days and four weeks if all steps are not completed in a timely manner. See the Grants.gov user guides and checklists at http://www.grants.gov/web/grants/applicants/applicant-resources.html for further information.

Once Grants.gov has received an uploaded proposal submission, Grants.gov will send two email messages to notify proposers that: (1) their submission has been received by Grants.gov; and (2) the submission has been either validated or rejected by the system. It may take up to two business days to receive these emails. If the proposal is rejected by Grants.gov, it must be corrected and re-submitted before DARPA can retrieve it (assuming the solicitation has not expired). If the proposal is validated, then the proposer has successfully submitted their proposal and Grants.gov will notify DARPA. Once the proposal is retrieved by DARPA, Grants.gov will send a third email to notify the proposer. The proposer will then receive an email from DARPA acknowledging receipt and providing a control number.

To avoid missing deadlines, proposers should submit their proposals to Grants.gov in advance of the proposal due date, with sufficient time to complete the registration and submission processes, receive email notifications and correct errors, as applicable.

For more information on submitting proposals to Grants.gov, visit the Grants.gov submissions page at: http://www.grants.gov/web/grants/applicants/apply-for-grants.html.

Proposers electing to submit cooperative agreement proposals as hard copies must complete the SF 424 R&R form (Application for Federal Assistance, Research and Related) available on the Grants.gov website http://apply07.grants.gov/apply/forms/sample/RR_SF424_2_0-V2.0.pdf.

Proposers choosing to mail hard copy proposals to DARPA must include one paper copy and one electronic copy (e.g., CD/DVD) of the full proposal package. Technical support for the Grants.gov website may be reached at 1-800-518-4726 and support@grants.gov. Questions regarding submission contents, format, deadlines, etc. should be emailed to ASED@darpa.mil.

V.   Application Review Information

A. Evaluation Criteria

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

- *Overall Scientific and Technical Merit*:

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

  The task descriptions and associated technical elements are complete and in a logical sequence, with all proposed deliverables clearly defined such that a viable attempt to achieve project goals is likely as a result of award. The proposal identifies major technical risks and clearly defines feasible mitigation efforts.

  Proposer should also take note of the information provided in Section I, as DARPA will also look at how a proposer addresses the technical challenges relevant to each TA, as well as view how key personnel will work on those challenges.

- *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.

  This includes considering the extent to which any proposed intellectual property restrictions will potentially impact the Government's ability to transition the technology to both other Government agencies and to industry.

- *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).

B. Review and Selection Process

The review process identifies proposals that meet the evaluation criteria described above and are, therefore, selectable for negotiation of awards by the Government. DARPA policy is to ensure impartial, equitable, comprehensive proposal evaluations and to select proposals that meet DARPA technical, policy, and programmatic goals. If necessary, panels of experts in the appropriate areas will be convened. As described in Section IV, proposals must be deemed conforming to the solicitation to receive a full technical review against the evaluation criteria; proposals deemed non-conforming will be removed from consideration.

DARPA will conduct a scientific/technical review of each conforming proposal. Conforming proposals comply with all requirements detailed in this BAA; 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

Selections may be made at any time during the period of solicitation. Pursuant to FAR 35.016, the primary basis for selecting proposals for award negotiation shall be technical, importance to agency programs, and fund availability. Conforming proposals based on a previously submitted abstract will be reviewed without regard to feedback resulting from review of that abstract. Furthermore, a favorable response to an abstract is not a guarantee that a proposal based on the abstract will ultimately be selected for award negotiation. Proposals that are determined selectable will not necessarily receive awards.

For evaluation purposes, a proposal is defined to be the document and supporting materials as described in Section IV.B. 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. No submissions, classified or unclassified, will be returned.

VI. Award Administration Information

A. Abstract Responses

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 full proposals submitted using the published evaluation criteria and without regard to any comments resulting from the review of an abstract.

B. Proposal Selection Notices

After proposal evaluations are complete, proposers will be notified as to whether their proposal was selected for award negotiation as a result of the review process. Notification will be sent by email to the technical and administrative POCs identified on the proposal cover sheet. If a proposal has been selected for award negotiation, the Government will initiate those negotiations following the notification.

C. Administrative and National Policy Requirements

1. Intellectual Property

Proposers should note that the Government does not own the intellectual property of technical data/computer software developed under Government contracts; it acquires the right to use the technical data/computer software. Regardless of the scope of the Government's rights, performers may freely use their same data/software for their own commercial purposes (unless restricted by U.S. export control laws or security classification). Therefore, technical data and computer software developed under this solicitation will remain the property of the performers, though DARPA desires to have at a minimum of Government Purpose Rights (GPR) to noncommercial technical data/computer software developed through DARPA sponsorship.

The program will emphasize creating and leveraging open source technology and architecture. Intellectual property rights asserted by proposers are strongly encouraged to be aligned with open source/open architecture regimes.

Proposers expecting to use, but not to deliver, commercial open source tools or other materials in implementing their approach may be required to indemnify the Government against legal liability arising from such use.

All references to "Unlimited Rights" or "Government Purpose Rights" are intended to refer to the definitions of those terms as set forth in the Defense Federal Acquisition Regulation Supplement (DFARS) Part 227.

a. Intellectual Property Representations

All proposers must provide a good faith representation of either ownership or possession of appropriate licensing rights to all other intellectual property to be used for the proposed project. Proposers must provide a short summary for each item asserted with less than

unlimited rights that describes the nature of the restriction and the intended use of the intellectual property in the conduct of the proposed research. If proposers desire to use proprietary software or technical data or both as the basis of their proposed approach, in whole or in part, they should: (1) clearly identify such software/data and its proposed particular use(s); (2) explain how the Government will be able to reach its program goals (including transition) within the proprietary model offered; and (3) provide possible nonproprietary alternatives in any area that might present transition difficulties or increased risk or cost to the Government under the proposed proprietary solution.

b. Patents

All proposers must include documentation proving ownership or possession of appropriate licensing rights to all patented inventions to be used for the proposed project. If a patent application has been filed for an invention, but it includes proprietary information and is not publicly available, a proposer must provide documentation that includes: the patent number, inventor name(s), assignee names (if any), filing date, filing date of any related provisional application, and summary of the patent title, with either: (1) a representation of invention ownership, or (2) proof of possession of appropriate licensing rights in the invention (i.e., an agreement from the owner of the patent granting license to the proposer).

c. Procurement Contracts

- **Noncommercial Items (Technical Data and Computer Software):** Proposers requesting a procurement contract must list all noncommercial technical data and computer software that it plans to generate, develop, and/or deliver, in which the Government will acquire less than unlimited rights and to assert specific restrictions on those deliverables. In the event a proposer does not submit the list, the Government will assume that it has unlimited rights to all noncommercial technical data and computer software generated, developed, and/or delivered, unless it is substantiated that development of the noncommercial technical data and computer software occurred with mixed funding. If mixed funding is anticipated in the development of noncommercial technical data and computer software generated, developed, and/or delivered, proposers should identify the data and software in question as subject to GPR. In accordance with DFARS 252.227-7013, "Rights in Technical Data - Noncommercial Items," and DFARS 252.227-7014, "Rights in Noncommercial Computer Software and Noncommercial Computer Software Documentation," the Government will automatically assume that any such GPR restriction is limited to a period of 5 years, at which time the Government will acquire unlimited rights unless the parties agree otherwise. The Government may use the list during the evaluation process to evaluate the impact of any identified restrictions and may request additional information from the proposer, as may be necessary, to evaluate the proposer's assertions. Failure to provide full information may result in a determination that the proposal is not compliant with the solicitation. A template for complying with this request is provided in Section IV.B.2.a.xi.(5).

- **Commercial Items (Technical Data and Computer Software):** Proposers requesting a procurement contract must list all commercial technical data and commercial computer software that may be included in any deliverables contemplated under the research project, and assert any applicable restrictions on

the Government's use of such commercial technical data and/or computer software. In the event a proposer does not submit the list, the Government will assume there are no restrictions on the Government's use of such commercial items. The Government may use the list during the evaluation process to evaluate the impact of any identified restrictions and may request additional information from the proposer to evaluate the proposer's assertions. Failure to provide full information may result in a determination that the proposal is not compliant with the solicitation. A template for complying with this request is provided in Section IV.B.2.a.xi.(5).

d. Other Types of Awards

Proposers responding to this solicitation requesting an award instrument other than a procurement contract shall follow the applicable rules and regulations governing those award instruments, but in all cases should appropriately identify any potential restrictions on the Government's use of any intellectual property contemplated under those award instruments in question. This includes both noncommercial items and commercial items. The Government may use the list as part of the evaluation process to assess the impact of any identified restrictions, and may request additional information from the proposer, to evaluate the proposer's assertions. Failure to provide full information may result in a determination that the proposal is not compliant with the solicitation. A template for complying with this request is provided in Section IV.B.2.a.xi.(5).

2. Human Research Subjects/Animal Use

Proposers that anticipate involving Human Research Subjects or Animal Use must comply with the approval procedures detailed at http://www.darpa.mil/work-with-us/additional-baa.

3. Electronic and Information Technology

All electronic and information technology acquired through this solicitation must satisfy the accessibility requirements of Section 508 of the Rehabilitation Act (29 U.S.C. § 794d) and FAR 39.2. Each project involving the creation or inclusion of electronic and information technology must ensure that: (1) Federal employees with disabilities will have access to and use of information that is comparable to the access and use by Federal employees who are not individuals with disabilities; and (2) members of the public with disabilities seeking information or services from DARPA will have access to and use of information and data that is comparable to the access and use of information and data by members of the public who are not individuals with disabilities.

4. 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 BAA. See http://www.darpa.mil/work-with-us/additional-baa for further information.

Note that new registrations can take an average of 7-10 business days to process in SAM. SAM registration requires the following information:
- DUNS number
- TIN

- CAGE Code. If a proposer does not already have a CAGE code, one will be assigned during SAM registration.
- Electronic Funds Transfer information (e.g., proposer's bank account number, routing number, and bank phone or fax number).

D. Reporting

1. Technical and Financial Reports

The number and types of technical and financial reports required under the contracted project will be specified in the award document, and will include, at a minimum, monthly financial status reports and a yearly status summary. A final report that summarizes the project and tasks will be required at the conclusion of the performance period for the award. The reports shall be prepared and submitted in accordance with the procedures contained in the award document.

2. Representations and Certifications

If a procurement contract is contemplated, prospective awardees will need to be registered in the SAM database prior to award and complete electronic annual representations and certifications consistent with FAR guidance at 4.1102 and 4.1201; the representations and certifications can be found at www.sam.gov. Supplementary representations and certifications can be found at http://www.darpa.mil/work-with-us/additional-baa.
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3. Wide Area Work Flow (WAWF)

Unless using another means of invoicing, performers will be required to submit invoices for payment directly at https://wawf.eb.mil. If applicable, WAWF registration is required prior to any award under this solicitation.

4. Terms and Conditions

A link to the DoD General Research Terms and Conditions for Grants and Cooperative Agreements and supplemental agency terms and conditions can be found at http://www.darpa.mil/work-with-us/contract-management#GrantsCooperativeAgreements.

5. FAR and DFARS Clauses

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 www.darpa.mil/work-with-us/additional-baa.

See also Section II.C regarding the disclosure of information and compliance with safeguarding covered defense information controls (for FAR-based procurement contracts only).

6. i-Edison

Award documents will contain a requirement for patent reports and notifications to be submitted electronically through the i-Edison Federal patent reporting system at http://s-edison.info.nih.gov/iEdison.

7. Controlled Unclassified Information (CUI) on Non-DoD Information Systems

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

VII.   Agency Contacts

DARPA will use email for all technical and administrative correspondence regarding this solicitation.

- **Technical POC:** Wade Shen, Program Manager, DARPA/I2O

- **Email:** ASED@darpa.mil

- **Mailing address**:
  DARPA/I2O
  ATTN: HR001117S0050
  675 North Randolph Street
  Arlington, VA 22203-2114

- **I2O Solicitation Website:** http://www.darpa.mil/work-with-us/opportunities

VIII. Other Information

A. Frequently Asked Questions (FAQs)

Administrative, technical, and contractual questions should be sent via email to ASED@darpa.mil. All questions must be in English and must include the name, email address, and the telephone number of a point of contact.

DARPA will attempt to answer questions in a timely manner; however, questions submitted within 7 days of closing may not be answered. If applicable, DARPA will post FAQs to http://www.darpa.mil/work-with-us/opportunities.

B. Proposers Day

The ASED Proposers Day was held on August 7, 2017, in Arlington, VA. The special notice regarding the ASED Proposers Day, DARPA-SN-17-67, can be found at https://www.fbo.gov/index?s=opportunity&mode=form&id=b94bcfabaca9df0f14d59dccf1ee0098&tab=core&_cview=1.

For further information regarding the ASED Proposers Day, including slides from the event, please see http://www.darpa.mil/work-with-us/opportunities under HR001117S0050.

C. Submission Checklist

The following items apply prior to proposal submission. Note: some items may take up to 1 month to complete.

✔	Item	BAA Section	Applicability	Comment
	Abstract	IV.B.1	Optional but highly recommended	Conform to stated page limit.
	Obtain DUNS number	IV.B.2.a.i	Required of all proposers	The DUNS Number is the Federal Government's contractor identification code for all procurement-related activities. See http://fedgov.dnb.com/webform/index.jsp to request a DUNS number. Note: requests may take at least one business day.
	Obtain Taxpayer Identification Number (TIN)	IV.B.2.a.i	Required of all proposers	A TIN is used by the Internal Revenue Service in the administration of tax laws. See http://www.irs.gov/businesses/small/international/article/0,,id=96696,00.html for information on requesting a TIN. Note: requests may take from 1 business day to 1 month depending on the method (online, fax, mail).
	Register in the System for Award Management (SAM)	VI.B.4	Required of all proposers	The SAM combines Federal procurement systems and the Catalog of Federal Domestic Assistance into one system. See www.sam.gov for information and registration. Note: new registrations can take an average of 7-10 business days. SAM registration requires the following information: -DUNS number -TIN -CAGE Code. A CAGE Code identifies companies doing or wishing to do business with the Federal Government. If a proposer does not already have a CAGE code, one will be assigned during SAM registration. -Electronic Funds Transfer information (e.g., proposer's bank account number, routing number, and bank phone or fax number).

✔				
	Ensure eligibility of all team members	III	Required of all proposers	Verify eligibility, as applicable, for in accordance with requirements outlined in Section 3.
	Register at Grants.gov	IV.E.1.c	Required for proposers requesting grants or cooperative agreements	Grants.gov requires proposers to complete a one-time registration process before a proposal can be electronically submitted. If proposers have not previously registered, this process can take between three business days and four weeks if all steps are not completed in a timely manner. See the Grants.gov user guides and checklists at http://www.grants.gov/web/grants/applicants/applicant-resources.html for further information.

The following items apply as part of the submission package:

✔	Item	BAA Section	Applicability	Comment
	Volume 1 (Technical and Management Proposal)	IV.B.2	Required of all proposers	Conform to stated page limits and formatting requirements. Include all requested information.
	Appendix A	IV.B.2.a.xi	Required of all proposers	-Team member identification - Government/FFRDC team member proof of eligibility - Organizational conflict of interest affirmations - Intellectual property assertions - Human subjects research - Animal use - Unpaid delinquent tax liability/felony conviction representations -CASB disclosure, if applicable
	Volume 2 (Cost Proposal)	IV.B.2.b	Required of all proposers	- Cover Sheet - Cost summary - Detailed cost information including justifications for direct labor, indirect costs/rates, materials/equipment, subcontractors/consultants, travel, ODCs - Cost spreadsheet file (.xls or equivalent format) - If applicable, list of milestones for OTs - Subcontractor plan, if applicable Subcontractor cost proposals - Itemized list of material and equipment items to be purchased with vendor quotes or engineering estimates for material and equipment more than $50,000 - Travel purpose, departure/arrival destinations, and sample airfare
	Level of Effort Summary by Task Excel spreadsheet	IV.B.2.c	Required of all proposers	A template LoE Excel file will be provided on the FedBizOpps website as an attachment. Submit the LoE Excel file (do not convert Excel file to pdf format).
	PowerPoint Summary Slide	IV.B.2.d		A template PowerPoint slide will be provided on the FedBizOpps website as an attachment. Submit the PowerPoint file (do not convert PowerPoint file to pdf format).

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