



Broad Agency Announcement

Friend or Foe

BIOLOGICAL TECHNOLOGIES OFFICE

HR001118S0025

February 16, 2018

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PART I: OVERVIEW INFORMATION

- **Federal Agency Name** – Defense Advanced Research Projects Agency (DARPA), Biological Technologies Office
- **Funding Opportunity Title** – Friend or Foe
- **Announcement Type** – Initial Announcement
- **Funding Opportunity Number** – HR001118S0025
- **Catalog of Federal Domestic Assistance Numbers (CFDA)** – 12.910 Research and Technology Development
- **Dates**
 - Posting Date – February 16, 2018
 - Proposal Abstract Due Date and Time – March 14, 2018 4:00 PM ET
 - Proposal Due Date and Time – April 25, 2018 4:00 PM ET
 - BAA Closing Date – April 25, 2018
 - Proposers Day – February 28, 2018

<https://www.fbo.gov/spg/ODA/DARPA/CMO/DARPA-SN-18-28/listing.html>
- **Concise description of the funding opportunity** - Friend or Foe will develop a high-throughput screening platform that improves our readiness against new microbial threats through isolation and phenotypic characterization of bacterial pathogenicity.
- **Anticipated individual awards** - Multiple awards are anticipated.
- **Types of instruments that may be awarded** - Cooperative agreement, procurement contract and other transaction.
- **Agency contact**
 - Points of Contact

The BAA Coordinator for this effort may be reached at:
FriendorFoe@darpa.mil
DARPA/BTO
ATTN: HR001118S0025
675 North Randolph Street
Arlington, VA 22203-2114

PART II: FULL TEXT OF ANNOUNCEMENT

1. Funding Opportunity Description

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

The Defense Advanced Research Projects Agency (DARPA) is soliciting innovative proposals to enable the development of technology for rapid phenotype-based identification of bacterial pathogens in complex environments. Proposed research should represent revolutionary advances in the science, devices, and systems needed for the isolation and characterization of potentially unknown and unculturable bacteria. Specifically excluded is research that primarily results in incremental improvements to the existing state of practice.

1.1. Program Overview

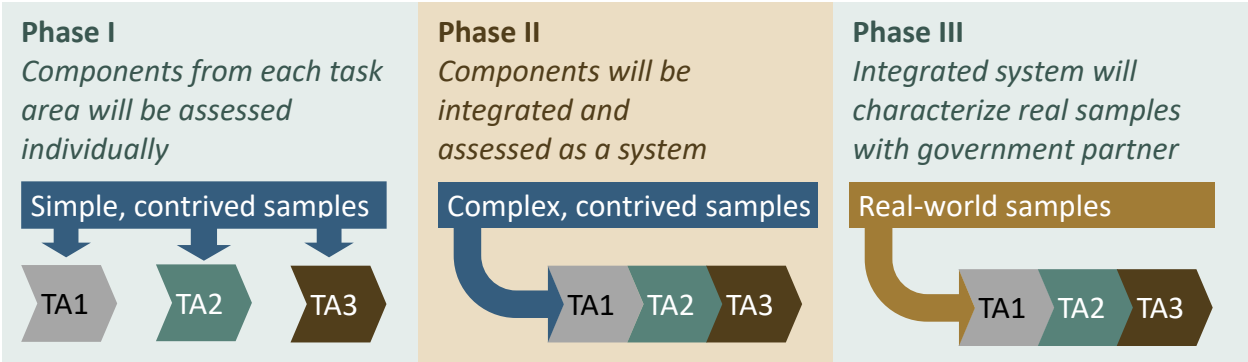
The Friend or Foe program will develop the capability to rapidly identify potential bacterial pathogens in complex environments through analysis of their behavior (i.e., their phenotype). New pathogens, both naturally occurring and adversary-engineered, are increasingly likely to emerge due to changes in the environment, rising global population, and the wide availability of genetic engineering tools to both state and non-state actors. These factors, coupled with faster potential dispersal due to increasing global travel and population density, have significantly increased the danger posed by bacterial pathogens. Current detection strategies based on biochemical markers would not work on previously undiscovered bacteria or on bacteria designed to evade detection. Moreover, genetic sequencing and omics analyses are insufficient to address this growing challenge, since the phenotype of a pathogen might not be determinable from the genetic make-up (i.e., the genotype) alone. The novel capability developed under Friend or Foe will provide detailed, high-throughput phenotype-based characterization of unknown bacteria through identification of pathogenic traits. Specifically, the technology should reliably extract representative samples of bacteria from complex environments, maintain their viability while they are repeatedly interrogated to identify virulence factors, and then analyze them using an omics approach that leverages external pathogen and gene databases. Ultimately, this technology will detect bacterial pathogens as, or even before, they emerge as a threat to the public.

1.2. Technical Approach and Schedule

The performing teams for Friend or Foe will develop complete end-to-end systems that will probe the phenotypes of bacteria to assess their pathogenic potential. The first step will be the extraction and isolation of potentially unknown and/or unculturable bacteria from complex matrices such as laboratory swabs, sewage/run-off, and biofilms. This will be followed by interrogation of the extracted bacteria with a series of non-destructive biochemical and biophysical assays. In the initial phase, interrogation of small populations (<100) of bacteria is acceptable; however, the ultimate goal will be the interrogation of a single bacterium. Bacteria identified as pathogenic should be processed for omics analyses to enable the mapping of phenotype to genotype. For the first two phases of the program, phenotype discovery will be demonstrated on contrived samples composed of known

bacteria. The complexity of these samples will increase as the program progresses, ending with real-world samples in Phase III. These real-world samples will only be examined in conjunction with a Government partner specifically tasked to prevent bacterial outbreaks.

The Friend or Foe program is structured into three Technical Areas (TAs)—Viable Bacterial Isolation (TA1), Interrogation (TA2), and Bioinformatics and Decision Management (TA3)—with an additional and separate Independent Verification and Validation (IV&V) component. The TAs and IV&V components are described below. As shown in the schematic, the program will progress in three phases. In Phase I the components for each technical area will be tested independently, while in Phase II the components for all TAs must be integrated into a single system that can assess pathogenic phenotypes and then map them to genotypes. In Phase III, the developed technology will be transitioned to a Government partner with whom performers will collaborate to characterize real-world samples. Integrated systems must, at a minimum, meet all characteristics described under individual TAs below, with additional proposal and use case-specific characteristics defined by proposers as needed.



TA1: Viable Bacterial Isolation

TA1 focuses on extracting viable bacteria from their native environments and inserting them into the interrogation platform, while retaining their phenotype for the downstream analysis. This is challenging since in their native environment bacteria are often anchored to surfaces forming complex, heterogeneous communities. Physically separating these bacteria can damage them, while using enzymatic solutions to separate them could potentially degrade surface molecules that are also the virulence factors of interest. Proposals should define high throughput methods that can collect and disaggregate bacteria from complex media and then separate them so that they can be subsequently inserted into the interrogation stations of TA2. Proposals should indicate how the proposed techniques will sufficiently minimize damage to enable subsequent analysis. Preference will be given to technologies that can address complicated samples.

After this initial extraction and isolation, the cells must be maintained at least 24 hours in a state that is sufficiently healthy to respond to the stimuli in TA2. For example, depending on the proposed stimuli in TA2, the cells might need to remain viable through changes in carbon sources, salinity, temperature, or pH. In general, bacterial activity and viability can depend on the environmental niche (chemical, biological, geological, etc.) where the bacterial community was collected. Proposers should describe how they will characterize a complex medium’s composition and thereby predict the conditions that will maximize cellular viability and preserve natural phenotype. This analysis will guide the selection of media and conditions for extraction and analysis. This approach should also

be generalizable to multiple different environmental samples, allowing bacteria to be isolated and interrogated from a variety of sources. Proposals should discuss the necessary resolution of environmental conditions for unbiased sampling, and procedures for adapting techniques to new environments.

The real-world samples examined in Phase III will likely have much greater bacterial diversity than the contrived benchmark samples and will have widely varying population densities. Proposers should identify the environmental sample that is their primary target as well as two notional alternate samples, providing justification for the selection based on potential pathogenic threat. For the primary target, the proposal should include environmental descriptions that includes projected ranges of bacterial density, structural and biochemical characteristics, and community complexity. It should also include a detailed plan for moving from the contrived samples of Phase II to the real-world samples of Phase III that describes how the full bacterial diversity of the chosen isolate will be addressed. For these complex samples, screening methods to triage bacteria are allowed as long as the full diversity of microbes can still be assayed. While performers must meet the minimum metrics described below in [section 1.3](#), they should also propose a concept of operations (protocol) based on the estimated throughput necessary for success.

Performers must develop methods and devices for (i) isolating viable bacteria from their environments, and (ii) maintaining the cells' viability and phenotype during interrogation. The minimum requirements for TA1 are as follows:

- Methods and devices must isolate individual or small-number consortia of bacteria without destroying viability or damaging cellular features needed for phenotypic characterization;
- Media used within the system must maintain viability and enable pathogenic trait interrogation;
- Methods and devices must isolate bacteria in numbers sufficient for phenotypic and omics analyses as determined by TA2; and
- Methods and devices must accurately capture the full diversity of cells found in the environment being sampled.

TA2: Interrogation

This program aims to develop new analytical techniques that quickly determine the pathogenicity of an unknown bacterium. However, pathogenicity describes a broad range of behaviors, all of which would need to be assessed to determine overall virulence. For this program all proposals must, at a minimum, generate techniques that address the three main categories of pathogenic traits: (1) niche finding (e.g., ability to adhere to host tissues); (2) ability to harm a host (e.g., secretion of exotoxins to damage host cells); and (3) self-preservation (e.g., ability to evade the immune system). Because pathogenic traits are often expressed only in the environment where they are needed—on or near a host cell—experimental assays should work in a medium where this behavior has been activated. Additionally, pathogenicity is often associated with a particular host cell or tissue. Proposers should specify their target cell(s) or tissue and justify their choice. For the chosen host cell or tissue, the system must characterize pathogenic traits sufficiently to establish the bacteria's overall virulence. Preference will be given to approaches that provide the fullest possible measure of a bacterium's virulence. Consequently, multiple assays for each trait class are encouraged. Finally, because the program seeks the capability to identify unknown pathogenic functions or mechanisms, assays

should characterize behavior (e.g., ability to bind to a host cell) rather than merely detect the presence of known biomolecular signatures (e.g., presence of a specific bacterial adhesin).

Beyond determining pathogenicity, there are additional challenges inherent in interrogating isolates from environmental samples. First, these isolates may contain only individual or small populations of a bacterium. The small size of bacteria and the low concentrations of associated analytes is at or near the resolution of many detection methods. Consequently, proposals should indicate how the chosen assays have sufficient resolution to reliably identify pathogenic traits from low numbers (5-100) of bacteria. Second, while the clusters of bacteria may contain few bacteria, the total number of bacteria may be quite high. Soil samples, for example, may contain up to 10 billion microbes. Since the program aims to screen samples in less than 24 hours, the proposed techniques must maintain high sensitivity while operating at a sufficient throughput. To attain such throughput, methods must be inherently quick or readily run in parallel. Proposals that rely on assays that are not scalable to the throughput specified in section 1.3, or that cannot ultimately subject individual cells to multiple phenotypic tests, are discouraged.

Finally, the approaches will be constrained by the need for an integrated system. The assays developed in TA2 must integrate with the sampling technology developed in TA1. Consequently, the assays should function with bacterial species with diverse characteristics including size and shape, distinct pathogenic behaviors, and required environmental conditions (carbon sources, pH, trace metals, etc.). Secondly, examining all of the classes of pathogenic traits will likely require a series of nondestructive assays. Proposals should discuss potential interference due to the sequence of assays performed and outline the ability to reconfigure the platform to mitigate challenges. Finally, for integration into the bioinformatics effort in TA3, phenotyped bacteria determined to have high virulence should be available for a final destructive omics-based approach to learn more about their genetics.

Performers must develop quantitative, high-throughput methods and devices for characterizing and assessing the pathogenicity of single bacteria non-destructively with the following characteristics:

- Integrated devices/platforms must collectively interrogate the three primary classes of pathogenic traits:
 - Niche finding
 - Ability to harm the host
 - Self-preservation
- Platforms must function accurately with diverse species of bacteria from environments with diverse biochemical and structural compositions; and
- For a given tissue or host cell, trait characterization must identify the overall virulence and nature of the threat posed by bacteria.

TA3: Bioinformatics and Decision Management

Algorithms and computational infrastructure that integrate and analyze multiple data types will be needed both to predict pathogenicity and to optimize the sequence of TA2 assays. An additional need for computation comes when a potentially pathogenic bacterium is discovered. Omics analysis and phenotype-to-genotype mapping should be completed to determine the genes responsible for new pathogenic traits or, at least, provide a molecular barcode of that organism or trait for future

identification. Proposals must describe their strategy for performing single-cell omics on likely pathogens. The minimum requirements for TA3 are as follows:

- Database infrastructure must integrate data from the pathogen-detection system with external databases, and support analysis of data independent of experimental approach;
- Based on pathogenic features identified from the interrogation pipeline, algorithms must automatically sort bacteria for disposal, storage, or omics analysis;
- System must perform at least one genomic or transcriptomic analysis on selected bacteria of interest;
- System must support rapid processing of omics data for identification of novel or engineered bacteria;
- Algorithms must map pathogenic phenotypes to genetic signatures; and
- Algorithms must identify and direct the system towards the optimal set and order of interrogation assays.

Independent Verification and Validation (IV&V)

Performers addressing the TAs described above will interact throughout the program with an independent verification and validation (IV&V) team, established by DARPA that will help test and validate progress. The IV&V team will consist of subject matter experts from Government, Federally Funded Research and Development Centers (FFRDCs), academia and/or other relevant domains. Over the course of the program, the IV&V team will provide contrived benchmark samples with relevance to the performers' concept of operations and of increasing complexity so as to allow performers to demonstrate the reproducibility and performance of the developed systems. This increased complexity may result from a larger variety of bacterial species, the inclusion of less well-known or non-bacterial microbes, a wider range of species concentrations, and/or other methods deemed appropriate by the IV&V team in consultation with DARPA. In Phase I, this bacterial population will be mixed with simple simulated media (soil, seawater, etc.). In Phase II, the bacterial population will be mixed with real-world media that has been sterilized.

Analysis of IV&V milestone samples by performer teams should be restricted to assays performed on the platform under development. Bacteria in the IV&V samples will be classified as Risk Group 2 (RG2) or lower according to Appendix B of the National Institute of Health (NIH) Guidelines for Research Involving Recombinant or Synthetic Nucleic Acid Molecules. Inventory of known bacteria included in samples will be provided for regulatory purposes, but contents should be shielded from experimental teams to avoid biasing analytical results. Proposals must budget and include plans for accepting biological samples from and transmitting analysis results to the IV&V team; and plans should include procedures for firewalling information about sample contents, along with internal and external safety and regulatory filings and protocols.

Samples will be delivered by the IV&V team as described in the milestones and metrics section below. Performer teams will have one (1) week to perform their analyses of sample contents and pathogenic phenotypes and deliver results to the IV&V team for comparison to sample ground truth.

To avoid potential conflicts of interest, performers for HR001118S0025 will not be allowed to compete for the IV&V contract. DARPA is not soliciting proposals for IV&V under HR001118S0025.

Schedule

The Friend or Foe program consists of three sequential phases of 18, 24, and 6 months, respectively. Progress towards the overall program goal will be assessed throughout the program. During Phase I, performers will be expected to validate the operation of their prototype systems using a simple contrived sample. By the end of Phase I, the feasibility of integrating components from all three TAs must be demonstrated. By the end of Phase II, performers must demonstrate successful operation of a fully-integrated system on complex contrived samples. Following successful demonstration of the developed technology, DARPA will fund performers to work with Government partners to transition the initial capability to that partner for deployment. Several potential Government partners will be identified by DARPA. A full system that successfully performs high throughput pathogenic screening analysis on real-world samples shall be delivered by the end of Phase III.

1.3. Program Milestones, Metrics, and Deliverables

Progress toward the program goal will be determined through the use of regular milestones, metrics, and deliverables. The Government specifies the following minimally-required milestones, metrics, and deliverables in order to bound the effort while still affording the maximum flexibility, creativity, and innovation in proposing solutions to the stated problems. Proposers are expected to define additional quantitative and qualitative success criteria as needed. Proposers must clearly and uniquely itemize tasks needed to accomplish planned milestones and deliverables.

Proposals must be written to address milestones in all three TAs: Viable Isolation (TA1), Interrogation (TA2), and Bioinformatics and Decision Management (TA3). **Proposals that do not address all three technical areas will be considered non-conforming and rejected without review.** The milestones and metrics for each technical area and phase are outlined below. Proposers must explain quantitative success criteria for each milestone, and information on how it will be achieved, in their Statement of Work (SOW).

Phase I (months 1 through 18)

Technical Area 1: Viable Isolation

Goal: Develop methods for isolating diverse, representative populations of bacteria from samples while maintaining cell viability.

Milestones:

- (i) Demonstrate the sorting of 10^5 bacteria per hour from heterogeneous samples of ≥ 20 bacterial species from simulated environmental samples (12 months).
- (ii) Demonstrate rapid analysis and reproduction of media conditions for unknown simulated environmental samples, with turnaround time of less than 4h from initial analysis to reproduction of conditions (12 months).
- (iii) Maintain the viability of isolated bacteria for at least 24 hours (15 months).
- (iv) Demonstrate that the isolation system can be integrated with interrogation system (18 months).

In Phase I, performers will develop the technologies necessary to isolate, without significant bias, viable bacteria from complex media. The system must isolate bacteria in sufficient health and abundance to enable subsequent interrogation. The performers should demonstrate that their system

can ultimately isolate single bacterial cells by the end of Phase I and that this system can be integrated with the components developed in the other TAs.

The long-term objective of this program is to create a flexible platform and associated protocols for analyzing bacteria from a wide range of environments. With this in mind, the proposed methods should analyze a sample's composition (pH, nutrients, salts, etc.) with sufficient resolution to create media that mimic this composition and to support the viability of all bacterial community members (supporting viability may not require promoting cell division). Media developed to maintain cell viability should not materially interfere with downstream applications. Methods and devices must be developed with integration across TAs in mind.

IV&V test samples will be provided:

- Month 12, heterogeneous bacterial cultures containing ≥ 20 species of varied size, shape, motility, and community structure.
- Month 15, heterogeneous bacterial cultures containing ≥ 20 species mixed into simple, simulated environmental samples.

Metrics:

- More than 50% of bacteria must survive extraction.
- Enough bacteria from each of the initial species must survive to enable analysis by TA2 of all species present in the sample.
- 10^5 cells extracted and recovered per hour.

Technical Area 2: Interrogation

Goal: Develop systems that can characterize the pathogenicity of a small number of bacteria across all three classes of pathogenic traits.

Milestones:

- (i) Demonstrate detection of at least one trait for each of the three classes of pathogenic traits (18 months).
- (ii) Test positive and negative control species and deliver data to algorithm development team (18 months).
- (iii) Demonstrate feasibility of integration with TA1 and TA2 systems (18 months).

In Phase I, the TA2 objective is to establish the initial set of assays for pathogenicity. The assays must identify at least one pathogenic trait in the three classes defined in this program: niche finding, ability to harm the host, and self-preservation. Though the platform should eventually isolate individual bacteria, such precision is not required in Phase I. Assays sensitive to groups with 100 or fewer bacteria will be sufficient to complete the Phase I TA2 milestone.

Cell viability and phenotype must be maintained throughout testing. This does not mandate that the bacteria continually grow and divide in the assay conditions; however, they should maintain core functions and respond to their environment (i.e., sensing the addition of chemical stimuli or the presence of a host cell). Assays should operate reliably on multiple bacterial species, spanning a range of sizes, shapes, motility mechanisms, and community structures.

Validation will be performed on pure cultures of bacteria provided by the IV&V team. Beyond the samples provided by the IV&V team, proposals should identify a set of positive and negative control strains to be used during development and testing. Data acquired from the TA2 tests during Phase I will be used for the TA3 analysis, providing initial experimental training data for trait identification algorithms.

At the end of Phase I, performers must demonstrate use of the output from the TA1 isolation component as the input to the TA2 interrogation system. Performers must also demonstrate that the output from the interrogation system can be used with the single-cell omics analysis from TA3.

The TA2 objectives do not require operation at the final throughput and resolution required for this program by the conclusion of Phase I. However, a detailed plan for scaling the analysis platform to the final target performance should be provided to DARPA by the conclusion of Phase I. Key metrics of success include the time needed for discrimination of each cell or cluster of cells, the number of traits distinguished, and the number of cells (or clusters of cells) that can be analyzed per run.

IV&V test samples will be provided:

- Month 12, ≥ 20 different bacterial strains with varied pathogenic traits, from pure cultures.

Metrics:

- Detectors must be sensitive enough to detect pathogenic traits at the level of ≤ 100 bacteria.
- Platform must function with all types of bacteria provided by the IV&V team (approximately 20 species at Month 12).
- Viability after testing across all three pathogenic trait classes, as determined by viability stains or other measure of metabolic activity.

Technical Area 3: Bioinformatics and Decision Management

Goal: Demonstrate successful pathogenic trait prediction using defined cultures and simple manufactured samples.

Milestones:

- (i) Detailed plan for integration of the components from each TA (15 months).
- (ii) Methods that fuse phenotype and single-cell omics data, to support mapping of detected pathogenic characteristics to genetic traits (18 months).
- (iii) Training data set constructed using control samples and external data, of sufficient size and detail for use in pathogen identification (18 months).
- (iv) Algorithms for identifying bacteria of interest based on pathogen assays and omics data (18 months).
- (v) Demonstrate ability to integrate single-cell omics system with interrogation platform (18 months).

Metric: Predictive pathogenic trait identification with $\geq 90\%$ accuracy on control samples.

In Phase I, performers will develop a computational and experimental framework to support all data analysis tasks associated with their effort. The framework should enable data manipulation that fuses multiple different data types, maps genotype-to-phenotype, and identifies potential pathogens.

Computational frameworks that readily extend to incorporate new types of assays and data beyond those in the performer's specific effort are welcome.

Performers will provide a storage solution for data generated by TA2, as well as any additional external data that may support the effort (e.g., phenotype data extracted from existing literature or provided by other performers). Data storage solutions that can be easily transitioned so that they "live on" beyond the lifespan of the Friend or Foe are preferred.

Performers will develop and implement methods for fusion of multiple data types and for identifying bacteria of interest based on the combined data. Performers must also construct an appropriate training data set using control samples developed by TA2 along with external data as needed. Performers are encouraged to incorporate as much data as possible relevant to pathogenicity and bacterial identification. The scope of this work may include methods for large-scale mining and processing of existing literature. The sufficiency of the training data and validity of any algorithms must be confirmed by the end of Phase I using samples provided by the IV&V team; performers must demonstrate pathogen identification with $\geq 90\%$ accuracy on the IV&V samples described under TA1 and TA2 by the end of the phase.

Performers must implement single-cell omics techniques to complement the phenotypic assays and to generate genotype data for use in phenotype-to-genotype mapping. Performers may adapt existing methods and/or develop new methods as appropriate. As with the phenotypic data, omics data must be stored and manageable within the developed computational framework.

Phase II (months 19 through 42)

Technical Area 1: Viable Isolation

Goal: Integrated system that isolates diverse, representative populations of bacteria from increasingly complex samples while maintaining cell viability.

At the end of Phase II, performers must provide a mitigation strategy dealing with any remaining challenges their technology will face in dealing with real-world samples. In particular, they will need to deal with the greater biological and chemical diversity of such samples. To manage the biological diversity, the isolation strategy in Phase II may include triage to rapidly separate the cells of greatest interest to researchers, provided that it does not reduce the overall accuracy below the limits set in TA2. The strategy should also address any substances that occur naturally in their targeted environmental samples (e.g., metals, pollen, humic acids, detergents, etc.) that may confound their detection approaches.

Milestones:

- (i) Must isolate bacteria from communities of 50-100 cell types from:
 - o Samples consisting of a complex, contrived environmental samples (30 months)
 - o Sterilized real-world media (soil, seawater, etc.) (36 months).
- (ii) Operate as an integrated unit with interrogation platform from TA2 (21 months).
- (iii) Detailed transition plan that addresses analysis of real-world samples (36 months).

The Phase II goals for TA1 are focused on extending the technology developed in Phase I to operate on increasingly complex samples, with 10-fold higher throughput per unit time. IV&V samples must be processed as an integrated platform with TA2.

By the end of Phase II, the performers must demonstrate that their integrated system is able to process the increasingly complex samples provided by IV&V, with reliable identification of members of the communities with pathogenic traits. More than 80% of initial bacteria must survive the extraction process, while maintaining the relative abundance of community members. At least some representatives of each cell type must survive, and throughput must be increased to 10^6 cells per hour.

IV&V test samples will be provided:

- Month 19, contrived samples with communities of 50-100 different cell types mixed into a simple medium.
- Month 30, contrived samples with bacteria of 50-100 different cell types mixed into a more complex medium. Here, complex means more potential confounding agents such as metabolites, metal ions, or mineral sources.
- Month 36, quasi-environmental samples consisting of 50-100 different cell types mixed into sterilized real-world samples.

Metrics:

- More than 80% of bacteria must survive extraction.
- Enough bacteria from each of the initial species must survive to enable analysis by TA2.
- 10^6 cells extracted and recovered per hour.

Technical Area 2: Interrogation

Goal: Develop an integrated system that successfully performs high throughput pathogenic screening analysis on increasingly complex samples. The number of tests should be sufficient to establish the pathogenicity of the bacteria for the chosen host cell or tissue.

Milestones:

- (i) Operate using output from integrated isolation platform from TA1 (month 36).
- (ii) Operate as integrated unit with single-cell omics platform from TA3 (month 36).
- (iii) Improve the sensitivity of detectors to operate at the level of single bacteria (month 42).
- (iv) Within the context of a chosen host cell or tissue, perform ≥ 2 assays for each of the three classes of pathogenic traits or otherwise perform a sufficient number of assays to identify 90% of the pathogenic strains in the IV&V samples in the context of a chosen host cell or tissue (month 42).

During Phase II, TA2 will expand the technology developed in Phase I to work on increasingly complex samples, at throughput compatible with intended use cases. Assays will be refined to operate at resolution compatible with single cells, from the previous constraint of ≤ 100 bacteria.

By the end of Phase II, the TA2 assays must be able to map pathogenic traits to single bacteria, in a platform integrated with the viable isolation process developed in TA1. These assays must also work with the technologies in TA1 and TA3 to form a fully-integrated platform ready for transitioning to a Government partner in Phase III.

Metrics will include the time needed to analyze each input sample, the number of traits distinguished, and the number of cells (or clusters of cells) analyzed per run.

IV&V test samples:

Since the system will be integrated at the beginning of this phase, the IV&V samples are the same as for TA1.

Metrics:

- Detectors must be sensitive enough to analyze single bacteria.
- Platform must function with all types of bacteria provided by the IV&V team.
- A sufficient variety of traits must be assessed to establish the pathogenicity of the bacterium for the chosen host cell or tissue.

Technical Area 3: Bioinformatics and Decision Management

Goal: Demonstrate successful pathogenic trait detection using increasingly complex contrived samples and an efficient interrogation pipeline, and assign genetic origins of the identified pathogen-associated phenotypes.

Milestones:

- (i) Optimized predictive threat identification algorithms with improved performance over Phase I (month 36).
- (ii) Algorithms for decision tree optimization (month 36).
- (iii) Algorithms for mapping phenotype-to-genotype (month 36).

NOTE: Proposers should provide interim milestones to demonstrate progress against the objectives listed above.

Metrics:

- (i) Predictive pathogenic trait identification with $\geq 95\%$ accuracy on control samples.
- (ii) Increased pipeline efficiency with reduction (over Phase I) in number of assays required for successful pathogenic trait identification.
- (iii) $\geq 90\%$ accuracy in mapping of pathogen phenotypes to known genetic features in control sample species.

Computational and analytic methods developed in Phase I shall be extended and improved in Phase II to enable improved prediction accuracy ($\geq 95\%$) on the more complex samples provided by the IV&V team. Accuracy includes correct identification of bacteria with and without known pathogenic traits.

Performers must develop algorithms for the interrogation pipeline that optimize the assay decision tree. Reports should detail precisely how these algorithms represent an improvement over the baseline decision tree algorithm used in Phase I or some other nominal algorithm. Performers shall demonstrate the efficiency improvement by characterizing the interrogation approach (e.g., by time to positive identification, number of assays) and contrasting with the process from Phase I.

Performers must demonstrate successful mapping of phenotype-to-genotype for identified bacteria with pathogenic traits, by identifying the specific genetic sequences associated with those

characteristics. Genotype must be established using the single-cell omic tools developed in Phase I (and extended in Phase II, as needed).

Data collected during Phase II must fit into the larger computational framework of the effort. Control data from known samples may be added to the training dataset created in Phase I.

Phase III (months 43 through 48)

Phase III focuses on transitioning to a Government partner a high-throughput system that can identify pathogens in real-world samples. Performers that have demonstrated a system with sufficient throughput and accuracy will be funded to transfer that system to a Government partner with whom they will collaboratively examine a real-world sample and so establish the duplicated system's performance.

Technical Area 1: Viable Isolation

Milestone: Protocol that successfully performs bacterial isolation from high-value real-world samples (month 45).

The key metrics for TA1 in Phase III will be similar to the Phase II metrics. The performers will aid the Government transition partner with duplication of a fully-integrated, high-performing system with detailed protocols and instructions.

The performers and Government transition partner must show that the transferred platform shows comparable throughput and sensitivity when operating on high-value samples. This will include statistics on time taken to analyze each sample, number of traits distinguished, and accuracy in reflecting the composition of the input community.

Technical Area 2: Interrogation

Milestone: Integrated analysis done in replicated system with Government partner that detects pathogenic traits of bacteria in natural samples (month 48).

The Phase III TA2 goals are to ensure that the assays function at the resolution and throughput needed for platform transfer to a Government partner. The proposer will collaborate with the Government transition partner to ensure that the assays work at the reliability and precision needed in the transferred platform.

Assays in Phase III must work at resolution compatible with single cells, on realistic samples relevant to the applications of the platform in the real-world. Validation will be confirmed upon transfer to the Government partner and must reflect the known composition of real-world samples that contain pathogens.

Technical Area 3: Bioinformatics and Decision Management

Milestone: Transfer of fully-documented data analysis platform to Government partner (month 45).

The Phase III TA3 goal is to ensure the successful transfer of the data-processing and decision system to the Government transition partner. This will include transfer of fully-documented

software, as well as any relevant databases based on both publicly-available databases and any new training data collected in the course of this program.

The key metric of success in this phase will be IV&V verification of the performance of the bioinformatics and decision management system on the samples identified by the Government partner and drawn from the environment or clinical settings.

1.4. General Requirements

Proposing Teams

Proposer teams must address all three technical TAs described above which should run in parallel. Consequently, it is expected that the teams will include experts from the multiple disciplines related to the program challenges and goal (e.g., bacterial pathogenesis, single-cell assay development, microfluidics, metabolomics/genomics/proteomics, bioinformatics). Because several different technologies must ultimately work together, teams are encouraged to identify one or more members as project integrators who will ensure that team members focused on a specific TA are also appropriately working towards the overall program goal. The project integrator should also address all risks specifically associated with integration.

Specific content, communications, networking, and team formation are the sole responsibility of the proposer teams. Proposer teams must submit a single, integrated proposal led by a single Principal Investigator or prime contractor.

DARPA will hold a Proposers Day (see Section 8, [Other Information](#)) to help facilitate the formation of proposer teams and to enable sharing of information among interested parties through the DARPA Opportunities Page and the Proposers Day registration website.

Data Sharing

DARPA anticipates that a large amount of data will be generated under this program by each performer. DARPA encourages sharing of data generated in the course of this program, as well as data aggregated for the integrated analysis workflow from pre-existing work or research funded by other sources, although this is not a requirement of the program.

Biocontainment and Biosafety

As the core of the program requires characterization of environmental samples that may include live pathogens and control samples consisting of known pathogens, the Friend or Foe program will be conducted in appropriate biocontainment facilities in accordance with Center for Disease Control (CDC) regulations. Friend or Foe will not support any proposals that include uncontained experiments and/or environmental release of pathogens. DARPA follows all regulations and laws related to pathogen detection.

The Friend or Foe program is structured such that Phase III is the only time at which performers will use their integrated platform to process real-world samples with known or anticipated pathogenic bacteria. In the event that a performer wishes to use their platform to analyze real-world samples potentially containing new or known bacterial species that may qualify as Select Agents,

DARPA requires that the performer must notify DARPA of this intention in advance. This notification must include information on an appropriate Government agency partner (e.g., Defense Threat Reduction Agency (DTRA), United States Army Research Institute for Environmental Medicine (USARIEM), Armed Forces Health Surveillance Center (AFHSC), Center for Disease Control (CDC), Department of Homeland Security (DHS), etc.) that has agreed to work with the performer's team to ensure compliance with CDC select agent regulations. It must also contain a detailed justification and explanation of the performer's intended experiments, including proposed containment strategies to prevent unauthorized access, theft, loss, or environmental release of potential select agents. Any such proposals are subject to DARPA approval. **DARPA will not support any research on real-world samples that is not supervised by an appropriate Government partner organization.**

Technology Transfer

Proposals must discuss the transition of the technology developed to a Government partner, including plans for partner engagement, IP issues, logistics of reproducing the technology, and any non-commercial items required. DARPA will identify a set of potential partners for technology transfer; however, performers may identify other Government partners that can be pursued at DARPA's discretion. Notional needs and examples of clinical or environmental samples will be presented at the Proposer's Day, slides from which will be available at <http://www.darpa.mil/work-with-us/opportunities>. Proposals must budget resources for the development and execution of a Technology Transfer Plan that describes steps for a successful engagement and transfer of data and methods. A formal plan must be finalized by six months prior to the conclusion of Phase II, with transition to Phase III requiring active engagement with a Government partner. If awarded, DARPA must be included in the development of potential technology transfer relationships.

Other Requirements

Performers are expected to attend semi-annual program reviews to provide updates to the DARPA program management team and other Friend or Foe performers on progress towards their milestones and scientific goals on the Friend or Foe program. Performers will also summarize outstanding challenges and limitations that must still be overcome to achieve the overarching goals of the program.

2. Award Information

2.1. General Award Information

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

The Government reserves the right to select for negotiation all, some, one, or none of the proposals received in response to this solicitation and to make awards without discussions with proposers. The Government also reserves the right to conduct discussions if it is later determined to be necessary. If warranted, portions of resulting awards may be segregated into pre-priced options. Additionally, DARPA reserves the right to accept proposals in their entirety or to select only portions of proposals for award. In the event that DARPA desires to award only portions of a

proposal, negotiations may be opened with that proposer. The Government reserves the right to fund proposals in phases with options for continued work, as applicable.

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

Proposers looking for innovative, commercial-like contractual arrangements are encouraged to consider requesting Other Transactions. To understand the flexibility and options associated with Other Transactions, consult <http://www.darpa.mil/work-with-us/contract-management#OtherTransactions>.

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

2.2. Fundamental Research

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

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

As of the date of publication of this 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

3. Eligibility Information

3.1. Eligible Applicants

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

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

FFRDCs

FFRDCs are subject to applicable direct competition limitations and cannot propose to this 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.

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.

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.

3.1.2. Non-U.S. Organizations

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

3.2. Organizational Conflicts of Interest

FAR 9.5 Requirements

In accordance with FAR 9.5, proposers are required to identify and disclose all facts relevant to potential OCIs involving the proposer's organization and *any* proposed team member (subawardee, consultant). Under this Section, the proposer is responsible for providing this disclosure with each proposal submitted to the 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.

3.3. Cost Sharing/Matching

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

For more information on potential cost sharing requirements for Other Transactions for Prototype, see <http://www.darpa.mil/work-with-us/contract-management#OtherTransactions>

4. Application and Submission Information

4.1. Address to Request Application Package

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

4.2. Content and Form of Application Submission

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

4.2.1. Proposal Abstract Format

Proposers are strongly encouraged to submit an abstract in advance of a proposal to minimize effort and reduce the potential expense of preparing an out of scope proposal. The abstract is a concise version of the proposal comprising a maximum of 8 pages including all figures, tables, and charts. The (optional) submission letter is not included in the page count. All pages shall be formatted for printing on 8-1/2 by 11-inch paper with font size not smaller than 12 point. Smaller font sizes may be used for figures, tables, and charts.

Submissions must be written in English.

Abstracts must include the following components:

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

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

1. What is the proposed work attempting to accomplish or do?
2. How is it done today? And what are the limitations?
3. What is innovative in your approach and how does it compare to SOA?
4. What are the key technical challenges in your approach and how do you plan to overcome these?
5. Who will care and what will the impact be if you are successful?
6. How much will it cost and how long will it take?

C. Technical Plan: Outline and address all technical challenges inherent in the approach and possible solutions for overcoming potential problems. This section should provide appropriate specific milestones (quantitative, if possible) at intermediate stages of the project to demonstrate progress, and a brief plan for accomplishment of the milestones.

D. Capabilities: Provide a brief summary of expertise of the team, including subcontractors and key personnel. A principal investigator for the project must be identified, and a description of the team's organization. No more than two resumes should be included as part of the abstract. 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 materials or data assumed to be available. If desired, 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.

E. Executive Summary Slide (does count against abstract page limit): Provide a one-slide summary in PowerPoint that effectively and succinctly conveys the information requested in the slide template provided as **Attachment 1** to the BAA posted at <https://www.fbo.gov>. Use of this template is required.

4.2.2. Proposal Format

All full proposals must be in the format given below. Proposals shall consist of two volumes: 1) **Volume I, Technical and Management Proposal**, and 2) **Volume II, Cost Proposal**. All pages shall be printed on 8-1/2 by 11-inch paper with type not smaller than 12 point. Smaller font may be used for figures, tables and charts. The page limitation for full proposals includes all figures, tables, and charts. Volume I, Technical and Management Proposal, may include an attached bibliography of relevant technical papers or research notes (published and unpublished) which document the technical ideas and approach upon which the proposal is based. Copies of not more than three (3) relevant papers may be included with the submission. The Statement of Work, bibliography, and attached papers are not included in the page counts given below. The submission of other supporting materials along with the proposals is strongly discouraged and will not be considered for review. **The maximum page count for Volume 1 is 40 pages.** A submission letter is optional and is not included in the page count. Volume I should include the following components:

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

a. Volume I, Technical and Management Proposal

Section I. Administrative

A. Cover Sheet (LABELED “PROPOSAL: VOLUME I”):

1. BAA number (HR001118S0025);
2. Lead organization submitting proposal (prime contractor);
3. Type of organization, selected from among the following categories: “LARGE BUSINESS,” “SMALL DISADVANTAGED BUSINESS,” “OTHER SMALL BUSINESS,” “HBCU,” “MI,” “OTHER EDUCATIONAL,” OR “OTHER NONPROFIT”;
4. Proposer’s reference number (if any);
5. Other team members (if applicable) and type of business for each;
6. Proposal title;
7. Technical point of contact (Program Manager or Principle Investigator) to include: salutation, last name, first name, street address, city, state, zip code, telephone, fax, e-mail;
8. Administrative point of contact (Contracting Officer or Grant Officer) to include: salutation, last name, first name, street address, city, state, zip code, telephone, fax, e-mail;
9. Award instrument requested: cost-plus-fixed-free (CPFF), cost-contract—no fee, firm-fixed-price, cooperative agreement, other transaction, or other type (specify);
10. Place(s) and period(s) of performance ;
11. Proposal validity period;
12. Total funds requested from DARPA, and the amount of cost share (if any); AND
13. Date proposal was submitted.

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

B. Official Transmittal Letter.

C. Executive Summary Slide: Provide a one-slide summary in PowerPoint that effectively and succinctly conveys the information requested in the slide template provided as **Attachment 1** to the BAA posted at <https://www.fbo.gov>. Use of this template is required.

Section II. Detailed Proposal Information

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

- What is the proposed work attempting to accomplish or do?
- How is it done today, and what are the limitations?
- What is innovative in your approach?

- What are the key technical challenges in your approach and how do you plan to overcome these?
 - Who or what will be affected and what will be the impact if the work is successful?
 - How much will it cost, and how long will it take?
- B. Goals and Impact:** Clearly describe what the team is trying to achieve and the difference it will make (qualitatively and quantitatively) if successful. Describe the innovative aspects of the project in the context of existing capabilities and approaches, clearly delineating the uniqueness and benefits of this project in the context of the state of the art, alternative approaches, and other projects from the past and present. Describe how the proposed project is revolutionary and how it significantly rises above the current state of the art. Describe the deliverables associated with the proposed project and any plans to commercialize the technology, transition it to a customer, or further the work.
- C. Technical Plan:** Outline and address technical challenges inherent in the approach and possible solutions for overcoming potential problems. This section should provide appropriate measurable milestones (quantitative if possible) at intermediate stages of the program to demonstrate progress, and a plan for achieving the milestones. The technical plan should demonstrate a deep understanding of the technical challenges and present a credible (even if risky) plan to achieve the program goal. Discuss mitigation of technical risk.
- D. Management Plan:** Provide a summary of expertise of the team, including any subcontractors, and key personnel who will be doing the work. Resumes count against the proposal page count. Identify a principal investigator for the project. Provide a clear description of the team's organization including an organization chart that includes, as applicable: the programmatic relationship of team members; the unique capabilities of team members; the task responsibilities of team members, the teaming strategy among the team members; and key personnel with the amount of effort to be expended by each person during each year. Provide a detailed plan for coordination including explicit guidelines for interaction among collaborators/subcontractors of the proposed effort. Include risk management approaches. Describe any formal teaming agreements that are required to execute this program.
- E. Capabilities:** Describe organizational experience in relevant subject area(s), existing intellectual property, specialized facilities, and any Government-furnished materials or information. Discuss any work in closely related research areas and previous accomplishments.
- F. Statement of Work (SOW):** The SOW should provide a detailed task breakdown, citing specific tasks and their connection to the interim milestones and program metrics. Each

phase of the program should be separately defined. The SOW must not include proprietary information. It is strongly encouraged, though not required, to use the SOW template provided as **Attachment 2**. The SOW is not included in the Volume 1 page count.

For each task/subtask, provide:

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

G. 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.

H. Friend or Foe Technology Transfer Plan: Provide information and submit a timeline with incremental milestones toward successful engagement. The plan should include a description of how DARPA will be included in the development of potential technology transfer relationships.

Section III. Additional Information (Note: Does not count towards page limit)

A brief bibliography of relevant technical papers and research notes (published and unpublished) which document the technical ideas upon which the proposal is based. Copies of not more than three (3) relevant papers can be included in the submission.

- a. Volume II, Cost Management Proposal

Cover Sheet (LABELED “PROPOSAL: VOLUME II”) and Appendix 1:

1. BAA number;
2. Lead Organization Submitting proposal;
3. Type of organization, selected among the following categories: “LARGE BUSINESS”, “SMALL DISADVANTAGED BUSINESS”, “OTHER SMALL BUSINESS”, “HBCU”, “MI”, “OTHER EDUCATIONAL”, OR “OTHER NONPROFIT”;
4. Proposer’s reference number (if any);
5. Other team members (if applicable) and type of business for each;
6. Proposal title;

7. Technical point of contact (Program Manager or Principal Investigator) to include: salutation, last name, first name, street address, city, state, zip code, telephone, fax (if available), electronic mail (if available);
8. Administrative point of contact (Contracting Officer or Grant Officer) to include: salutation, last name, first name, street address, city, state, zip code, telephone, fax (if available), and electronic mail (if available);
9. Award instrument requested: cost-plus-fixed-fee (CPFF), cost-contract—no fee, cost sharing contract – no fee, or other type of procurement contract (*specify*), cooperative agreement, or other transaction;
10. Place(s) and period(s) of performance;
11. Total proposed cost separated by basic award and option(s) (if any);
12. Name, address, and telephone number of the proposer’s cognizant Defense Contract Management Agency (DCMA) administration office (*if known*);
13. Name, address, and telephone number of the proposer’s cognizant Defense Contract Audit Agency (DCAA) audit office (*if known*);
14. Date proposal was prepared;
15. DUNS number (<http://www.dnb.com/get-a-duns-number.html>);
16. Taxpayer ID number (<https://www.irs.gov/Individuals/International-Taxpayers/Taxpayer-Identification-Numbers-TIN>);
17. CAGE code (<https://www.dlis.dla.mil/bincs/FAQ.aspx>);
18. Proposal validity period

Note that nonconforming proposals may be rejected without review.

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

The Government strongly encourages that tables included in the cost proposal also be provided in an editable (e.g., MS Excel™) format with calculation formulas intact to allow traceability of the cost proposal numbers across the prime and subcontractors. The Government encourages proposers to complete an editable MS Excel™ budget template that is provided as **Attachment 3** to this BAA. If you choose to use Attachment 3, submit the MS Excel™ template in addition to Volume I and II of your proposal. Volume II must include all other items discussed below that are not covered by the editable MS Excel™ budget template. Proposers are welcome to utilize an alternative format, provided the information requested below is clearly and effectively communicated.

The Government strongly encourages that the proposer provides a detailed cost breakdown to include:

- (1) Total program cost broken down by major cost items to include:
 - i. Direct Labor – Including individual labor categories with associated labor hours and direct labor rates. If selected for award, be prepared to submit supporting documentation to justify labor rates. (i.e., screenshots of HR databases, comparison to NIH or other web-based salary database);
 - ii. Consultants – If consultants are to be used, proposer must provide a copy of the consultant’s proposed SOW, as well as a signed consultant agreement or other document which verifies the proposed loaded daily / hourly rate, hours and any other proposed consultant costs (e.g., travel);
 - iii. Indirect Costs – Including Fringe Benefits, Overhead, General and Administrative Expense, Cost of Money, Fee, etc. (must show base amount and rate), if available, provide current Forward Pricing Rate Agreement or Forward Pricing Rate Proposal. If not available, provide 2 years historical data to include pool and expense costs used to generate the rates. For academia, provide DHHS or ONR negotiated rate package or, if calculated by other than a rate, provide University documentation identifying G&A and fringe costs by position;
 - iv. Travel – Provide the purpose of the trip, number of trips, number of days per trip, departure and arrival destinations, number of people, estimated rental car and airfare costs, and prevailing per diem rates as determined by gsa.gov, etc.; Quotes must be supported by screenshots from travel websites;
 - v. Other Direct Costs – Itemized with costs including tuition remission, animal per diem rates, health insurance/fee; back-up documentation is to be submitted to support proposed costs;
 - vi. Equipment Purchases – Itemization with individual and total costs, including quantities, unit prices, proposed vendors (if known), and the basis of estimate (e.g., quotes, prior purchases, catalog price lists, etc.); any item that exceeds \$5,000 must be supported with back-up documentation such as a copy of catalog price lists or quotes prior to purchase (NOTE: For equipment purchases, include a letter stating why the proposer cannot provide the requested resources from its own funding), and;
 - vii. Materials – Itemization with costs, including quantities, unit prices, proposed vendors (if known), and the basis of estimate (e.g., quotes, prior purchases, catalog price lists, etc.); any item that exceeds \$5,000 must be supported with back-up documentation such as a copy of catalog price lists or quotes prior to purchase.
- (2) A summary of major program tasks by Government Fiscal Year (GFY = Oct 1 – Sep 30)
- (3) A summary of total program costs by phase and task;
- (4) A summary of projected funding requirements by month;
- (5) An itemization of any information technology (IT) purchase (including a letter stating why the proposer cannot provide the requested resources from its own funding), as defined in FAR Part 2.101;
- (6) An itemization of Subcontracts. **All subcontractor cost proposal documentation must be prepared at the same level of detail as that required of the prime.** Subcontractor proposals should include Interdivisional Work Transfer Agreements (IWTA) or evidence of similar arrangements (an IWTA is an agreement between multiple divisions of the same organization);
- (7) The source, nature, and amount of any industry cost-sharing. Where the effort consists of multiple portions which could reasonably be partitioned for purposes of funding, these should be identified as options with separate cost estimates for each;

- (8) Identification of pricing assumptions of which may require incorporation into the resulting award instrument (e.g., use of Government Furnished Property/Facilities/Information, access to Government Subject Matter Expert(s), etc.);
- (9) Any Forward Pricing Rate Agreement, DHHS rate agreement, other such approved rate information, or such documentation that may assist in expediting negotiations (if available); and
- (10) Proposers with a Government acceptable accounting system who are proposing a cost-type contract, must submit the DCAA document approving the cost accounting system.

4.2.3. Additional Proposal Information

Proprietary Markings

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

Unclassified Submissions

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

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>.

Approved Cost Accounting System Documentation

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

Small Business Subcontracting Plan

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

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

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

Intellectual Property

All proposers must provide a good faith representation that the proposer either owns or possesses the appropriate licensing rights to all intellectual property that will be utilized under the proposed effort.

For Procurement Contracts

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

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

For All Non-Procurement Contracts

Proposers responding to this BAA requesting a Cooperative Agreement, Technology Investment Agreement, or Other Transaction for Prototypes shall follow the applicable rules and regulations governing these various award instruments, but, in all cases, should appropriately identify any potential restrictions on the Government’s use of any Intellectual Property contemplated under the award instrument in question. This includes both Noncommercial Items and Commercial Items. Proposers are encouraged to use a format similar to that described in the section above. If no restrictions are intended, then the proposer should state “NONE.”

System for Award Management (SAM) and Universal Identifier Requirements

All proposers must be registered in SAM unless exempt per FAR 4.1102. FAR 52.204-7, “System for Award Management” and FAR 52.204-13, “System for Award Management Maintenance” are incorporated into this BAA. See <http://www.darpa.mil/work-with-us/additional-baa> for further information.

4.2.4. Submission Information

DARPA will acknowledge receipt of all submissions and assign an identifying control number that should be used in all further correspondence regarding the submission. DARPA intends to use electronic mail correspondence regarding HR001118S0025. Submissions may not be submitted by fax or e-mail; any so sent will be disregarded.

Submissions will not be returned. An electronic copy of each submission received will be retained at DARPA and all other non-required copies destroyed. A certification of destruction may be

requested, provided the formal request is received by DARPA within 5 days after notification that a proposal was not selected.

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

For Proposers Submitting Proposal Abstracts or Full Proposals as Hard Copies/On CD-ROM:

Proposers must submit an original hardcopy and one (1) electronic copy of the abstract or proposal in PDF (preferred) on a CD-ROM to the mailing address listed in Part I. Each copy must be clearly labeled with HR001118S0025, proposer organization, technical point of contact, and proposal title (short title recommended).

Please note that submitters via hardcopy/CD-ROM will still need to visit <https://baa.darpa.mil> to register their organization concurrently to ensure the BAA office can verify and finalize their submission.

For Proposers Submitting Proposal Abstracts or Full Proposals Requesting Procurement Contracts or OTs through DARPA's BAA Submission Portal:

Abstracts and Full Proposals sent in response to HR001118S0025 may be submitted via DARPA's BAA Website (<https://baa.darpa.mil>). Visit the website to complete the two-step registration process. Submitters will need to register for an Extranet account (via the form at the URL listed above) and wait for two separate e-mails containing a username and temporary password. After accessing the Extranet, submitters may then create an account for the DARPA BAA website (via the "Register your Organization" link along the left side of the homepage), view submission instructions, and upload/finalize the abstract. Proposers using the DARPA BAA Website may encounter heavy traffic on the submission deadline date; it is highly advised that submission process be started as early as possible.

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

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

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

For Full Proposals Requesting Cooperative Agreements:

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

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

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

4.2.5. 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.

4.3. Funding Restrictions

Not Applicable.

4.4. Other Submission Requirements

Not Applicable.

5. Application Review Information

5.1. Evaluation Criteria

Proposals will be evaluated using the following criteria, listed in descending order of importance: 5.1.1 Overall Scientific and Technical Merit; 5.1.2 Potential Contribution and Relevance to the DARPA Mission; 5.1.3 Cost Realism; and 5.1.4 Plans and Capability to Accomplish Technology Transition

5.1.1. Overall Scientific and Technical Merit

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

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

5.1.2. Potential Contribution and Relevance to the DARPA Mission

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

5.1.3. Cost Realism

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

It is expected that the effort will leverage all available relevant prior research in order to obtain the maximum benefit from the available funding. For efforts with a likelihood of commercial application, appropriate direct cost sharing may be a positive factor in the evaluation. DARPA recognizes that undue emphasis on cost may motivate proposers to offer low-risk ideas with minimum uncertainty and to staff the effort with junior personnel in order to be in a more competitive posture. DARPA discourages such cost strategies.

5.1.4. Plans and Capability to Accomplish Technology Transition

The proposer clearly demonstrates its capability to transition the technology to the research, industrial, and/or regulatory government communities in such a way as to enhance U.S. National Security. In addition, the evaluation will take into consideration the extent to which the proposed intellectual property (IP) rights will potentially impact the Government's ability to transition the technology.

5.2. Review of proposals

Review Process

It is the policy of DARPA to ensure impartial, equitable, comprehensive proposal evaluations based on the evaluation criteria listed in Section 5.1. and to select the source (or sources) whose offer meets the Government's technical, policy, and programmatic goals.

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

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

Handling of Source Selection Information

DARPA policy is to treat all submissions as source selection information (see FAR 2.101 and 3.104), and to disclose their contents only for the purpose of evaluation. Restrictive notices notwithstanding, during the evaluation process, submissions may be handled by support contractors for administrative purposes and/or to assist with technical evaluation. All DARPA support contractors performing this role are expressly prohibited from performing DARPA-sponsored technical research and are bound by appropriate nondisclosure agreements. Subject to the restrictions set forth in FAR 37.203(d), input on technical aspects of the proposals may be solicited by DARPA from non-Government consultants/experts who are strictly bound by the appropriate non-disclosure requirements.

Federal Awardee Performance and Integrity Information (FAPIIS)

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

6. Award Administration Information

6.1. Selection Notices

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

6.1.1. Proposal Abstracts

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

6.1.2. Full Proposals

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

6.2. Administrative and National Policy Requirements

6.2.1. Meeting and Travel Requirements

There will be a program kickoff meeting in the Arlington, VA vicinity and all key participants are required to attend. Performers should also anticipate regular program-wide PI meetings and periodic site visits at the Program Manager's discretion to the Arlington, VA vicinity.

Proposers shall include within the content of their proposal details and costs of any travel or meetings they deem to be necessary throughout the course of the effort, to include periodic status reviews by the government.

6.2.1. 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 <http://www.darpa.mil/work-with-us/additional-baa>.

6.2.2. 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 <http://www.darpa.mil/work-with-us/additional-baa>.

6.2.3. 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>.

6.2.4. 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>.

6.3. Reporting

The number and types of reports will be specified in the award document, but will include as a minimum monthly financial status reports and monthly technical status reports. The reports shall be prepared and submitted in accordance with the procedures contained in the award document and mutually agreed on before award. Reports and briefing material will also be required as appropriate to document progress in accomplishing program metrics. A Final Report that summarizes the project and tasks will be required at the conclusion of the performance period for the award, notwithstanding the fact that the research may be continued under a follow-on vehicle.

6.4. Electronic Systems

6.4.1. Wide Area Work Flow (WAWF)

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

6.4.2. i-EDISON

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

7. Agency Contacts

Administrative, technical or contractual questions should be sent via e-mail to FriendorFoe@darpa.mil.

Points of Contact

The BAA Coordinator for this effort may be reached at:

FriendorFoe@darpa.mil

DARPA/BTO

ATTN: HR001118S0025

675 North Randolph Street

Arlington, VA 22203-2114

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

8. Other Information

DARPA will be hosting a Proposers Day in support of the Friend or Foe program on Friday, **February 28, 2018**, at the DARPA Conference Center (675 N. Randolph Street) in Arlington, VA. Advance registration is required.

Attendance at this event is not a requirement for submission of a proposal for selection or funding. Information relayed during the Proposers Day will be made available on the BTO section of the DARPA Opportunities page: <http://www.darpa.mil/work-with-us/opportunities>.

An online registration form and various other meeting details can be found at the registration website, <http://www.cvent.com/d/ztqrzk>.

To encourage team formation, interested proposers are encouraged to submit information to be shared with all potential proposers through the Proposers Day website and the DARPA Opportunities Page. This information may include contact information, relevant publications, and a slide or poster to summarize the proposer's interests.

Participants must register in advance through the registration website no later than **February 21, 2018**. Registration is not final until you have completed and returned a DARPA Conference Center Visitor form (DARPA 104) and/or a U.S. Permanent Resident and Foreign National (DARPA 60) form, as appropriate. Failure to furnish the requested information may delay or prevent your requested access to the Friend or Foe Proposers Day. This event is not open to the Press. The Proposers Day will be open to members of the public who have registered in advance for the event; **there will be no onsite registration.**

Proposers Day Point of Contact: DARPA-SN-18-28@darpa.mil.

9. APPENDIX 1 – Volume II checklist

Volume II, Cost Proposal Checklist

The following checklist and sample templates are provided to assist the proposer in developing a complete and responsive cost volume. Full instructions appear in Section 4.2.2 beginning on Page 25 of HR001118S0025. This worksheet must be included with the coversheet of the Cost Proposal.

1. Are all items from Section 4.2.2 (Volume II, Cost Proposal) of HR001118S0025 included on your Cost Proposal cover sheet?

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

If reply is "No", please explain:

2. Does your Cost Proposal include (1) a summary cost buildup by Phase, (2) a summary cost buildup by Year, and (3) a detailed cost buildup of for each Phase that breaks out each task and shows the cost per month?

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

If reply is "No", please explain:

3. Does your cost proposal (detailed cost buildup #3 above in item 2) show a breakdown of the major cost items listed below:

Direct Labor (Labor Categories, Hours, Rates)

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

Indirect Costs/Rates (i.e., overhead charges, fringe benefits, G&A)

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

Materials and/or Equipment

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

Subcontracts/Consultants

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

Other Direct Costs

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

Travel

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

If reply is "No", please explain:

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

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

If reply is "No", please explain:

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

If reply is “No”, please explain:

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

If reply is “No”, please explain:

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

If reply is “No”, please explain:

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

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

If reply is “No”, please explain:

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

If reply is “No”, please explain:

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

If reply is “No”, please explain:

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

If reply is “No”, please explain:

13. Have all team members (prime and subcontractors) who are considered a Federally Funded Research & Development Center (FFRDC), included documentation that clearly demonstrates work is not otherwise

available from the private sector AND provided a letter on letterhead from the sponsoring organization citing the specific authority establishing their eligibility to propose to government solicitations and compete with industry, and compliance with the associated FFRDC sponsor agreement and terms and conditions.

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

If reply is “No”, please explain:

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

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

If reply is “No”, please explain:

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

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

If reply is “No”, please explain: