



Broad Agency Announcement
Prototype Resilient Operations Testbed for Expeditionary
Urban Scenarios (PROTEUS)

STRATEGIC TECHNOLOGY OFFICE

HR001117S0037

June 15, 2017

TABLE OF CONTENTS

PART I: OVERVIEW INFORMATION4

PART II: FULL TEXT OF ANNOUNCEMENT5

1. FUNDING OPPORTUNITY DESCRIPTION5

1.1. PROGRAM OVERVIEW5

1.2. SCHEDULE/MILESTONES14

1.3. PROGRAM METRICS18

1.4. GOVERNMENT FURNISHED EQUIPMENT19

2. AWARD INFORMATION19

2.1. GENERAL AWARD INFORMATION.....19

2.2. FUNDAMENTAL RESEARCH20

3. ELIGIBILITY INFORMATION20

3.1. ELIGIBLE APPLICANTS.....21

3.2. ORGANIZATIONAL CONFLICTS OF INTEREST21

3.3. COST SHARING/MATCHING23

4. APPLICATION AND SUBMISSION INFORMATION23

4.1. ADDRESS TO REQUEST APPLICATION PACKAGE23

4.2. CONTENT AND FORM OF APPLICATION SUBMISSION24

4.3. FORMATTING CHARACTERISTICS28

4.4. SUBMISSION DATES AND TIMES.....36

4.5. FUNDING RESTRICTIONS.....36

4.6. OTHER SUBMISSION REQUIREMENTS36

5. APPLICATION REVIEW INFORMATION36

5.1. EVALUATION CRITERIA.....36

5.2. REVIEW AND SELECTION PROCESS.....37

6. AWARD ADMINISTRATION INFORMATION.....38

6.1. SELECTION NOTICES AND NOTIFICATIONS38

6.2. ADMINISTRATIVE AND NATIONAL POLICY REQUIREMENTS38

6.3. REPORTING40

6.4. ELECTRONIC SYSTEMS40

7. AGENCY CONTACTS41

8. OTHER INFORMATION41

8.1. INTELLECTUAL PROPERTY41

9. APPENDIX 1: ABSTRACT SUMMARY SLIDE43

**10. APPENDIX 2: ABSTRACT TECHNICAL DESCRIPTION AND COST
TEMPLATE44**

11. APPENDIX 3: PROPOSAL SLIDE SUMMARY47

12. APPENDIX 4: VOLUME 1 COVER SHEET TEMPLATE50

**13. APPENDIX 5: VOLUME 2 COVER SHEET, CHECKLIST AND SAMPLE
TEMPLATES.....51**

PART I: OVERVIEW INFORMATION

- **Federal Agency Name** – Defense Advanced Research Projects Agency (DARPA), Strategic Technology Office
- **Funding Opportunity Title** – Prototype Resilient Operations Testbed for Expeditionary Urban Scenarios (PROTEUS)
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 - Questions and Answers Due Date: August 1, 2017
 - Proposal Due Date: August 22, 2017
 - BAA Closing Date: December 11, 2017
- **Total amount of money to be awarded** – Approximately \$50M over 3 years
- **Anticipated individual awards** - Multiple awards are anticipated.
- **Types of instruments that may be awarded** - Procurement contract or other transaction.
- **Agency contact**

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PART II: FULL TEXT OF ANNOUNCEMENT

1. FUNDING OPPORTUNITY DESCRIPTION

This publication constitutes a Broad Agency Announcement (BAA) as contemplated in Federal Acquisition Regulation (FAR) 6.102(d)(2) and 35.016 and 2 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 in the areas of development and application of novel integrated decision-making and system assessment platforms for the interactive exploration and testing of expeditionary, urban warfare concepts leveraging nascent capabilities for the dynamic, adaptive composition of human capabilities, systems and plans. Proposed research should investigate innovative approaches that enable revolutionary advances in science, devices, or systems. Specifically excluded is research that primarily results in evolutionary improvements to the existing state of practice, such as extensions to existing Live-Virtual-Constructive tools and testbeds currently employed by the Department of Defense.

1.1. PROGRAM OVERVIEW

A. Background

The goal of the Prototype Resilient Operations Testbed for Expeditionary Urban Operations (PROTEUS) program is to create and demonstrate tools to develop and test agile expeditionary urban operations concepts based on dynamically composable force packages. To achieve this goal, performers will:

- Develop software for simultaneous and dynamic real-time task organization, force package (i.e. platforms & weapons) combination and configuration, and tactics planning suitable for implementation in devices (e.g. Android Tactical Assault Kit (ATAK) phones, tablets with KILSWITCH software, or successors) available to Marines in the 2030-2040 timeframe;
- Develop a purpose-built virtual test environment to exercise and demonstrate this capability with an appropriately detailed virtual representation of combined arms operations in a complex urban battlespace; and
- Exercise both capabilities in a series of benchmarking tests involving a player cohort for both friendly and opposing forces drawn from active duty Marines. These tests will demonstrate that the ability to dynamically compose small unit organization, capabilities and tactics enable superior performance in the battlespace quantified using metrics such as lethality/(area-cost), resilience, and cost imposition.

If successful, the software tools and concepts developed in the PROTEUS program will enable

assessment and exploration of new approaches to combined arms operations involving coordination of effects in multiple domains. These approaches, termed “Agile Precision Warfighting,” could define new doctrine beyond existing notions of enhanced maneuver in a complex battlespace. These concepts could include combinations of unmanned attrition with manned maneuver and novel logistics concepts based on creating and closing windows of sustainment.

i. Context

Expeditionary urban operations are a core responsibility of the Marine Corps, which employs an adaptable and scalable task organization, the Marine Air Ground Task Force (MAGTF). The MAGTF accomplishes all six warfighting functions – command and control (C2), fires, logistics, maneuver, intelligence and force protection – as a single, integrated unit. The MAGTF has unity of command, simplifying cross- and multi-domain operations, with task organization and force package assets corresponding to pre-defined mission sets (e.g., raid or non-combatant evacuation operation) enabling adaptability to variation in mission types.

Future anti-access and area denial (A2AD) scenarios involving conflicts against peer- and near-peer adversaries in coastal and littoral urban settings severely challenge existing MAGTF task organization and force package concepts. The high dimensionality of urban terrain – time, three-dimensional physical space with complex geometry, including air and subsurface levels, and spectrum – makes maneuver difficult and standoff tactics ineffective, absorbs large numbers of combatants, and particularly in an A2AD setting, negates air superiority advantages traditionally enjoyed by US forces. Urban warfare is fundamentally unchanged since World War II¹ in many regards: battle is human-centric, with most casualties resulting from discovering the enemy; a highly distributed defense requires combined arms tactics that incur high logistical and coordination costs; and the presence of a civilian populace means that indiscriminate force is not an option and precision effects are required. Historically, US forces have prevailed in the urban battlespace through the initiative and adaptability of lower echelon (company and below) commanders to overcome adversaries in highly tactical settings.

To succeed in the more complex peer and near-peer battlespace of the 21st century, new task organization and force package concepts are needed to enable Marines to rapidly identify fleeting opportunities in a fluid and ever-changing environment, adapt force packages to exploit them, and achieve disproportionate impact relative to unit size. This enhanced agility may be enabled by dynamically composing *individual* task-appropriate Marines, assets (platforms and subsystems), and tactics to provide a desired warfighting function (e.g., fires) to achieve tactical goals. “Agile expeditionary urban operations” are Marine operations in urban terrain (cities) that can rapidly adapt to changing circumstances and provide disproportionate effects through precise combined application of warfighting functions.

¹ e.g., A. Wahlman, *Storming the City: U.S. Military Performance in Urban Warfare from World War II to Vietnam*, University of North Texas Press, 2015 (covering Manila and Hue) and B. West, *No True Glory: A Frontline Account of the Battle for Fallujah*, Bantam Books, 2005, highlight the challenges. **The scale and intensity of these three battles is representative of the focus of the program.**

A distributed, dynamically composable approach to warfighting couples choices made at higher echelons of command on order of battle, mission objectives and unit placement to tactical outcomes at the small unit level in an especially direct, non-linear, and complex way. The increased agility changes the nature of decision making at all levels of command. A higher echelon commander not only needs to consider if the task organization and force package is suited to the mission, but also must consider adaptability to a range of outcomes and branching mission threads that evolve rapidly. The small-unit leader potentially gains the ability to coordinate and execute combined arms effects with high precision that currently require planning at the battalion level- but only if provisioned with the right tools and people. A persistent and timely common operating picture is unlikely in an austere environment, so new concepts for local command, control and coordination are necessary. New technology such as autonomy further increases the complexity of the problem. The co-evolution of both the Marine and opposing force tactics and capabilities lead to a wide range of possible outcomes even for simple scenarios.

ii. State of the Art Approaches

Systematically exploring the large trade space of task organization, assets, and tactics crossing multiple domains using live testing and exercises is prohibitively expensive and complex. Assessing the impact of systems comprising multiple technologies in a combined-arms setting is especially hard. Consequently, current approaches to exploring future capabilities are largely limited to wargaming coupled with extensive live testing of the impact of new technologies at the small-unit level.

Wargaming captures the adaptive nature of adversarial human decision-making processes but loses vital tactical detail. Constructive simulation platforms (e.g., One Semi-Automated Forces) accurately capture certain system behaviors but are poorly suited to capturing human-centric Marine adaptation of technology and fail to capture battlespace geometry or tactical behaviors with sufficient detail. First person shooter tactical platforms (e.g., Virtual Battlespace 3) capture battlespace geometry well, but scale poorly to higher echelon for assessment of tactics. Current USMC modeling and simulation (M&S) and training approaches utilize inadequate federations of these capabilities². A new approach is required to unify command, tactical and systems-level viewpoints and navigate the trade space of system concepts, Marine tactics, techniques and procedures (TTP) development, and opposing force actions in a dynamic, complex battlespace including air, ground, maritime, subsurface, and electronic warfare components.

B. Program Description

The PROTEUS program will develop a new approach for scalable assessment and exploration of combined arms concepts in the urban environment by building on nascent capabilities for system composition and leveraging novel game mechanics and software architectures. The program deliverable will be an integrated software platform to enable dynamic and adaptive composition

² For example, the “Interactive Tactical Decision Games” being utilized by 2/6 Marines illustrate the power of an accessible gaming/test environment approach for teaching small unit decision making, but do not consider many of the dimensions of interest here. (<https://www.mcafdn.org/gazette/2017/04/decision-room>)

of systems of task organization, assets and TTP's that crosses multiple echelons of command (e.g., battalion to fire team) in a complex environment and an appropriately detailed virtual urban combat environment in which to assess the effectiveness of those composed systems. The resulting platform will enable Marines to explore how to adapt their systems to provide enhanced fires, targeting, spectrum operations, or other functions and develop new concepts of operation or tactics to realize dynamic mission needs.

The envisioned PROTEUS deliverable consists of a virtual test environment that encompasses a realistic but fictional urban combat environment. This virtual environment will assess the agility and lethality of a Marine task organization drawing from all elements (command, air combat, logistics combat, ground combat) of the MAGTF with approximately 150-200 Marines³. Given a notional scenario, an initial force laydown for both Marine and opposing force assets will populate the environment, with human participants controlling individual combatants or systems. Leadership elements within the unit (from commander to fire team leaders) will be equipped with devices ("functional compilers") that assess available units and systems, integrate this understanding with mission objectives, logistical constraints and current understanding of opposing forces, and recommend/compile (integrate) the best force composition to provide the required warfighting functions as the scenario evolves. As appropriate at each echelon of command, the commander/leader would then give the necessary orders to meet the objectives. The test environment participants would then progress within the virtual environment to attempt to realize these objectives against opposing force participants, potentially also equipped with advanced battle management capabilities, attempting to defeat them. As the battle progresses or new information becomes available within the virtual environment, the participants will reengage the functional compiler to produce updated force compositions to provide enhanced agility and lethality.

The PROTEUS program will consist of three technical areas:

- Technical Area 1 (TA1): Composable Operations Development Environment
- Technical Area 2 (TA2): Functional Compiler
- Technical Area 3 (TA3): Systems for Functions

Proposers are expected to focus on a single technical area. Proposals including more than one technical area will not be accepted. Although the majority of the program will be performed at the unclassified level, later portions may be classified (such as outcomes of the testing and demonstrations). Proposers should indicate how they would handle such situations.

At this time, TA3 proposers should only address the warfighting functions of Command and Control, Fires and Maneuver. DARPA will release a separate BAA for additional warfighting functions at a later date. TA3 proposers should select only a *single* warfighting function.

Although performer teams must individually address all program goals, metrics and milestones, DARPA expects performers to work collaboratively with one another. Given the diversity of approaches anticipated, it is critical to the success of the PROTEUS program that performers share information about their project achievements and challenges and provide insight, expertise and advice to other performer groups throughout the course of the program. All proposals must

³ Future task organization concepts of interest to the USMC are this scale, for example: <https://www.mca-marines.org/sites/default/files/Compnay%20Landing%20Team%20II.pdf>

clearly describe plans for interfacing and integrating their proposed technologies/approaches with other teams.

Technical Area 1, Composable Operations Development Environment:

Performers in TA1 will develop the test environment used to explore functional composition and its impact on tactics across levels of command. The environment should focus on revealing the consequences of choices made in the environment within the complex dynamics of the adversarial contest between humans. The test environment will ingest systems data from TA3 and co-evolve with force composition decisions made using the TA2 functional compiler capability. The aforementioned shortcomings in existing capabilities motivate a “clean sheet” approach to a novel “mission engineering” tool to realize the goals of the program.

The test environment is a key enabler for the program and TA1 performers will:

- Utilize innovative game mechanics and software architecture concepts to enable detailed assessment and exploration of the dynamic composition approach to combined arms operations in urban terrain
- Provide the user interface for the command and tactical level instantiations of the platform, including the devices (e.g., virtual representation of a tablet or phone) for the TA2 functional compiler capability.
- Clearly define an Application Programming Interface (API) or Software Development Kit (SDK), including data and interoperability requirements, for both TA2 and TA3 performers.

TA1 proposers should describe the basic mechanics of their innovative test environment approach, highlighting the following:

- *Test Environment Detail:* Given the primary goal of the test environment of helping to judge the impact of choices in force composition and tactics, high fidelity simulation of the environment would impose a heavy computational burden without a comparable improvement in the assessment of choices. Describe what the key factors in the environment are and how they are represented to achieve quantitatively meaningful performance measures.
- *Assessment:* Choices made by the participants and their consequences will need to be assessed both during and after each exercise (see *Instrumentation* below and program metrics). Describe the approach to obtaining meaningful performance assessment in the complex, multi-scale environment.
- *Scale:* The events simulated in the test environment will depend on the actions of 150+ people in each force, in addition to a civilian population, over the course of an operation that might last for 45 days. Describe how the various scales in the development environment will be represented and managed.
- *Interaction:* Interpersonal interactions greatly impact the outcomes of any wargaming activity, but are especially important in a platform designed to test an approach for enabling the initiative and creativity of the participants. Explain how will these be implemented and managed.

- *Architecture*: Explain the underlying software architecture and how it will be utilized to enable all of the system requirements.

Given these goals, incremental extensions to or applications of existing Live-Virtual-Constructive (LVC) tools such as OneSAF, JSAF, MTWS, and VBS are explicitly not of interest. Additionally, naïve approaches simply linking pre-existing game engines to render a command- and tactical-level game are also not of interest.

As appropriate for their environment architecture and mechanics, proposers to TA1 should consider and discuss the following attributes in their response:

- Basic architecture and mechanics: An initial design review (see schedule) is expected to review in detail the environment concept *prior to beginning software development*. Innovative mechanics⁴ that address the high dimensionality of the battlespace, particularly when logistics and spectrum are included, are of interest and proposers should be able to describe these without resorting to software.
- User Interface/User Experience (UI/UX): Detail the UI/UX strategy and implementation plan to execute the mechanics.
- Software architecture: Proposers should define a software architecture that achieves the goals of scalability, fidelity, and as appropriate to the game mechanics, a range of viewpoints (e.g., command, tactical, scenario designer). Approaches utilizing cloud-based, distributed software or scalable microservices approaches and multiple levels of abstraction that can be dynamically composed in context are of particular interest. Naïve data backplane strategies for combining multiple abstraction levels are not of interest.
- AI development: Although the focus of the program is not AI development, standard “semi-automated” approaches using combinations of virtual tests with automated exploration of alternative outcomes using constructive simulation are incapable of capturing the richness of co-adaptive human decision making. Innovative approaches that can learn from and can adapt to player behaviors are of interest for both white cell and automated opposing force tactics development. Innovative approaches leveraging nascent techniques based on deep learning and economic/game theory are of interest as a means to sample the large space of possible outcomes without resorting to Monte Carlo techniques. As appropriate, proposers should also discuss how “Non-Player Character” (NPC) assets are defined in the development environment: current approaches in conventional game engines entail laborious manual definition of waypoints, paths and objectives that scale poorly.
- Content management: Proposers should discuss their strategy for content definition, ingestion and management and how cost/schedule risks for content development will be

⁴ For example, the real time strategy (RTS) game Achron (<http://www.achrongame.com/site/>) uses an innovative time management mechanic. While this mechanic is too complicated for the Marine (or even the average RTS) user, and an RTS approach is itself inadequate, it is a unique example of exploring effects in time and space in an adversarial setting.

managed. For example, what will be the approach for definition of terrain, TA3-defined systems & tactics and TA2 approaches as manifested in “virtual apps” in the platform? As appropriate to the proposed approach, how will urban terrain, including spectrum, be defined? Innovative approaches⁵ to doing so are of particular interest, and programmatic approaches to create urban terrain that contains key features as appropriate to game mechanics are acceptable. However, the urban terrain instantiated in the platform does not have to conform to any particular city or town.

- Scenario generation: Proposers should describe how scenario generation is implemented, understanding the end user may be a military trainer tasked with training scenario construction or a command planner tasked with assessing the performance of an operational plan.
- Instrumentation: How are performance of assets, teams, and tactics measured and recorded in the test environment? How do these metrics inform the end user (see UI/UX) and the AI in the platform? Of particular interest are integrated approaches that leverage the platform data to enrich the collection of tactics available to TA2 and TA3 performers. Simple approaches to assess user workload as it pertains to the TA2 user interface are encouraged. Detailed and involved testing protocols involving intrusive measurements of player state are not of interest.

Finally, TA1 proposers should describe a plan for deliverables to include:

- Final software deliverable, to be provided with unlimited or at minimum, Government Purpose Rights, at the conclusion of each phase.
- Data from the tests conducted using the test environment, including documentation for the form, content and format of data to enable implementation and use in future benchmarking or training scenarios

Technical Area 2: Functional Compiler

Performers in TA2 will develop an integrated dynamic composition capability to construct adaptive force packages, task organizations, and tactics (TTPs) “on the fly” to meet rapidly evolving mission needs. This capability will be embodied in a software tool that integrates capabilities that identify constraints, mix and match systems to provide desired functional outcomes, integrate systems with novel interoperability approaches, and provide adaptive planning to maximize resilience using mathematically principled approaches and algorithms. This integrated functional composition tool should allow Marine users to compose functions in time and space. Proposers should recognize that this toolchain is a “human in the loop” system and as with TA1, novel approaches that integrate understanding of human factors with the mathematics and algorithms for composition are of primary interest.

⁵ E.g. Nascent data science tools enable automation of much of the definition of urban terrain (<https://improbable.io/2016/03/17/disrupting-cities-through-technology-a-new-event-with-wilton-park>), but defining building interiors and subsurface features for purposes of certain instantiations of the world are not currently addressed by any technology.

The resulting capability will be provided through affordances (i.e., the device with which the Marine is using the functional compiler) in the TA1 testbed. TA2 performers are responsible for the user interface with the capability in the virtual tablet, phone or other device. Realizations of this interface early in the program could likely be simple recommender systems for combinations of Marines, assets and tactics depending on the echelon of command. Later in the program, TA2 performers might develop a “warfighting function as a service” capability as the underlying composition and battle management algorithms are matured.

TA2 performers are expected to provide a Software Development Kit or API for ingestion of system properties from TA3. TA2 performers should define both friendly and opposing force instantiations of the tool, and define initial tactics for new composed system concepts. To benchmark the effectiveness of the dynamic composition approach, the opposing force in the test environment will initially plan and fight with no compiler. Precise implementation of opposing force capability is expected to be defined during the base phase of the program, but for planning purposes can be assumed to be implemented on commercial hardware (e.g., a virtual representation of a commercial smartphone) and integrate either player-defined TTP’s or opposing force TTPs as defined by TA3.

TA2 proposers should discuss their approach to provide an integrated dynamic composition capability, noting that a human is also in the loop and can potentially inject information or reasoning, including:

- *Problem representation:* Given an input of the state of the battlespace, what are the mission objectives, current state and constraints that define and constrain a functional composition? Approaches using or enabling real-time qualitative reasoning, diagnosis, and inference are of interest.
- *System composition:* What is composed to provide the desired function in space and time on the battlefield? Approaches to automatically compose and assess systems using novel mathematical formalisms are of interest.
- *System integration:* Given potential interoperability issues (e.g. communications protocols), how can the elements communicate and convey state and actions to each other? Note this includes verifiable interoperability approaches but also includes coordination of humans across the MAGTF.
- *Adaptive execution:* How is the functional composition of Marines and systems used? While current task organizations and systems will start from TA3-defined TTPs, the development of novel TTPs for unusual task organizations and force packages is a primary goal of the program.

These approaches are expected to be integrated using mathematically principled formalisms that preserve information while unifying the various abstractions. *Incremental extensions to and/or federations of standard system analysis (e.g., SysML) and conventional planning tools or approaches are explicitly not of interest.* Finally, while highly innovative approaches that are currently being explored in other DARPA-sponsored efforts are of interest, proposers should note the program timeline when assessing possible approaches. The mathematical and algorithmic foundations should be mature enough for instantiation in the testbed within 6 months

of proposed start. Proposers should clearly explain the mathematical basis and algorithmic maturity of each element of their proposed approach.

TA2 proposers should discuss the following aspects of their proposed capability:

- User interface/User experience (UI/UX): Proposers should define how the functional composition capability will be presented to the command-level and tactical-level users. This capability should include the ability to compose functions and tactics.
- Enabling surprise and deception: Proposers should address approaches to leverage data from the TA1 environment to learn and explore novel TTPs.
- Scalability: Proposers should discuss scalability in terms of functional breadth. While initial demonstrations are focused on kinetic functions, later phases of the program address functions that occur on widely variable spatial and temporal scales (e.g. logistics).

Finally, TA2 proposers should describe a plan for deliverables to include:

- Final software deliverable, to be provided with unlimited or at a minimum, Government Purpose Rights, at the conclusion of each phase.
- Data from the tests conducted using the test environment, including documentation for the form, content and format of data to enable implementation and use in future benchmarking or training scenarios

Technical Area 3: Systems for Functions

TA3 performers will define both Marine Corps and possible adversary systems and tactics to realize these functions at the unclassified level as described below. Performers in TA3 will provide models that define functional characteristics of systems being composed as well as tactics (TTP's) associated with groupings of these systems. As noted above, for purposes of this solicitation, this "technical library" only includes systems supporting the warfighting functions of Command and Control (C2), fires and maneuver, and TA3 proposers should select only one function to address in their proposal. While the USMC definition of fires includes both lethal and non-lethal fires, only lethal fires are of interest at this time. The technical library will provide relevant inputs to enable virtual realization of the systems in the TA1 test environment as well as provide composable elements for the TA2 functional compiler.

TA3 performers will provide an inventory of systems that support these three warfighting functions (C2, maneuver and lethal fires). The TA3 technical library should include, but is not limited to:

- Static and dynamic physical characteristics;
- Performance models and/or data (e.g., radio frequency ranges, vehicle fuel burn curves);
- A 3D model for visualization as appropriate in the TA1 environment;
- Data or models for the behavior of the system (e.g., loss of GPS signal in a subterranean operation);

- Aspects of the system which could affect how it is used with other systems to conduct tasks;
- Functional data, including type of tasks the system supports, starting from the USMC Mission Essential Tasks/Mission Essential Task Lists (METs/METLs)⁶;
- Tasks, Techniques and Procedures (TTPs) associated with the systems and combinations of systems for the warfighting function of interest.

TA3 proposers should describe an iterative strategy for providing system data at the level of resolution able to drive real time interactive representation in the test environment and to provide types of system data which would be need to assess options and trades for various compositions as these capabilities are matured. TA3 proposers should also define what is anticipated in terms of software interfaces and formats in order to facilitate interaction with TA1 and TA2 performer teams.

TA3 proposers should define a palette of “ways to realize functions today” and “ways to realize functions in 2030.” For the latter, these are restricted to systems that are currently under development and at TRL 3 or above. For adversary assets, notional technologies are acceptable with publically available understanding of TTPs. TA3 proposers should define a plan to provide a final deliverable of the system libraries with description of format and content, noting software format, data type and description, provided with unlimited or Government purpose rights, for potential future use.

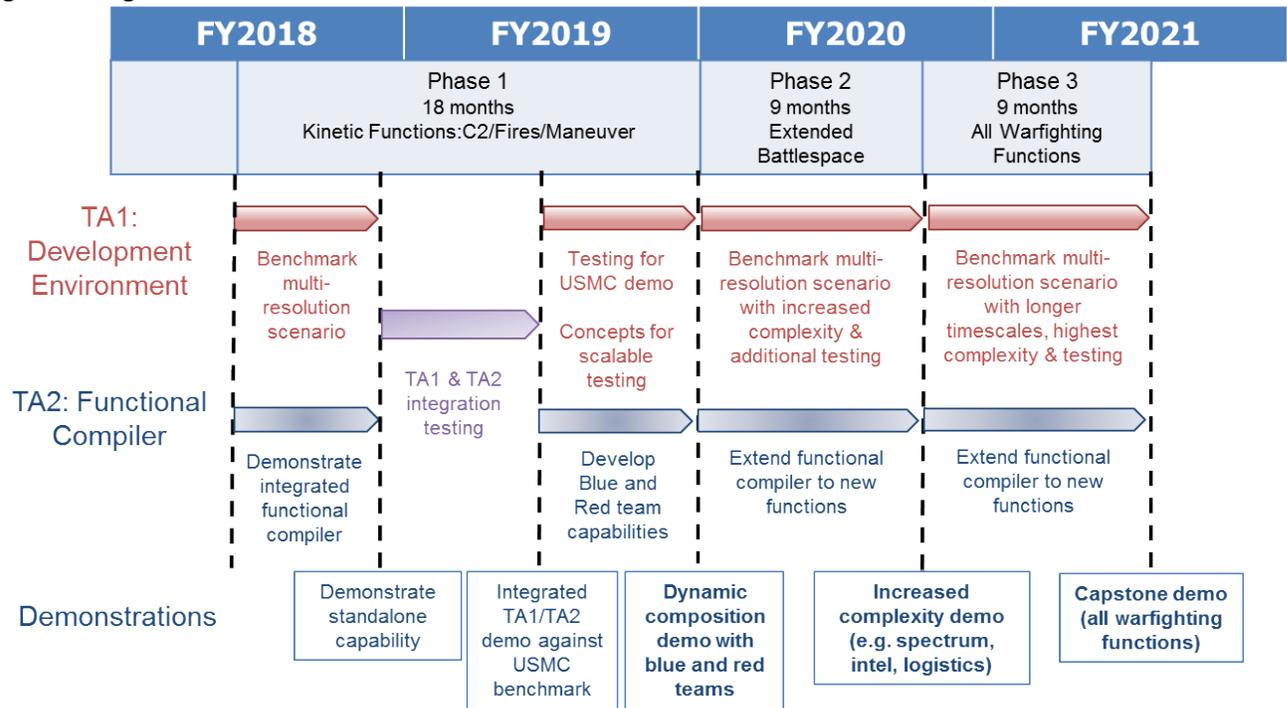
1.2. SCHEDULE/MILESTONES

There will be three phases in the PROTEUS program as shown in both Figures 1 and 2 below: an initial 18-month phase focused on capability maturation, benchmarking and demonstration; a second 9-month phase focused on an expanded set of warfighting functions; and a final 9-month phase culminating in a capstone demonstration addressing all warfighting functions.

Proposers to Technical Areas 1 and 2 should provide a technical and programmatic strategy that conforms to the entire 36-month program schedule, assuming Phase 1 as the Base Phase and Phases 2 and 3 as options, and presents an aggressive plan to fully address all program goals, metrics, milestones, and deliverables. The task structure is expected to be consistent across the proposed schedule, Statement of Work, and cost volume. TA1 and TA2 teams should plan for a preliminary design review shortly after program kickoff to review mechanics and architecture before substantive software development commences, and a comprehensive design review at the end of the first quarter of the program.

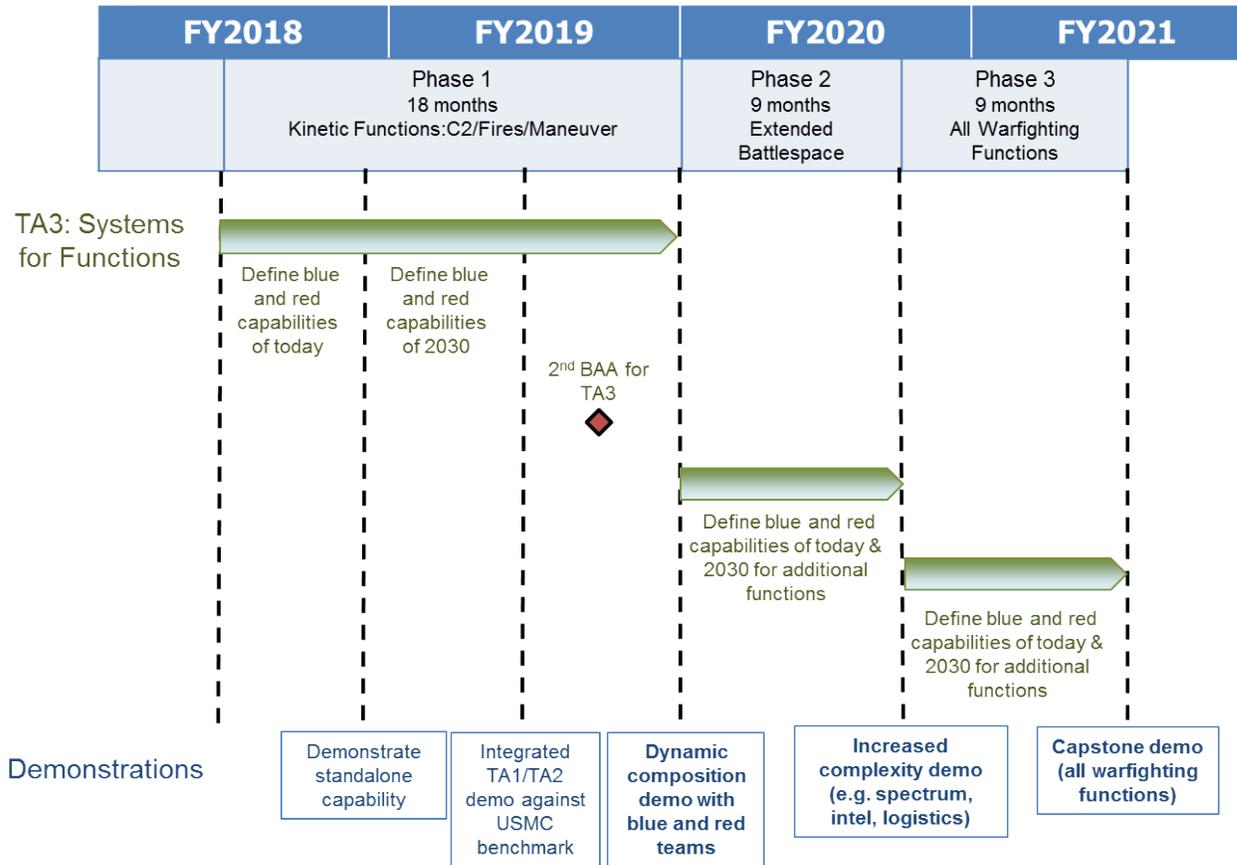
⁶ The Marine Corps Task List is a starting point:
http://www.mccdc.marines.mil/Portals/172/Docs/MCTL/MCTL%20WordDoc%201%20APR%202017_MCCDC%20Website%20PDF.pdf?ver=2017-04-17-102657-913

Figure 1: Program Timeline: Technical Areas 1 and 2



Proposers to Technical Area 3 should provide a technical and programmatic strategy for a single phase, 18 month period of performance as shown in Figure 2 that will coincide with the Base Phase efforts for TA1 and TA2 performers. A second BAA will be issued at a future date to solicit proposals from new TA3 teams to define assets that provide additional warfighting functions in Phases 2 and 3 of the program.

Figure 2: Program Timeline: Technical Area 3



Schedules will be synchronized across TA1, 2 and 3 performers in order to realize program demonstration goals as required, and monitored/ revised as necessary throughout the program. For proposal purposes, use the schedule below (with a target start date of February 1, 2018) to establish a program plan.

PROTEUS is divided into three program phases as outlined below, with milestones defined for each phase. As noted above, TA3 performers will have a single 18-month period of performance coinciding with Phase 1 with deliverables identified in Phase 1 below. The demonstration milestones are decision points for DARPA to determine which TA1 and TA2 performers will move forward into the option periods.

Phase 1 – Benchmarking/Kinetic Functions (18 months)

TA1 and TA2 performers are expected to develop the test environment and compiler architectures, respectively, that are subsequently integrated and validated. The warfighting functions may be limited to demonstration of kinetic capability integrating Command and Control (C2), Fires, and Maneuver assets and TTPs, as defined by TA3 performers, across domains. The benchmarking demonstration at 12 months is expected to establish credibility with operational users by matching outcomes from a representative scenario from a Marine exercise or experiment as measured using both standard measures of performance and effectiveness and

novel metrics accessible with the platform. The functional compiler should demonstrate the ability to assemble novel task organizations (e.g., combined mounted-dismounted units) seen in this scenario. The demonstration at 18 months should extend this scenario to demonstrate dynamic composition concepts with Marines playing both friendly and opposing forces, both with and without functional compiler capabilities, to illustrate the impact on metrics such as lethality/(cost-area).

Phase 2 – Extended Battlespace (9 months)

TA1 and TA2 performers will further extend the testbed and composition capabilities, respectively. The warfighting functions are expected to be extended to demonstrate spectrum effects, limited integration of intelligence, and short duration (e.g., between 72 hours and 7 days) logistics. The demonstration at the end of this phase should include maneuver within and combined arms utilizing spectrum (e.g., jammed communications, localized C2 networks) as well as constraints to maneuver imposed by logistics needs (water, ammunition and fuel) to assess the scalability and dimensionality management of the both the platform and the functional compiler.

Phase 3 – Full Battlespace (9 months)

TA1 and TA2 Performers will further extend the testbed and composition capabilities, respectively, to enable a capstone demonstration for the USMC. The warfighting functions will include all six functions and cover longer duration operations (e.g., up to 45 days). A notional demonstration is a brigade-scale conflict with fractionated expeditionary landing teams conducting prolonged operations in a peer-threat environment, which increases the temporal complexity and dimensionality. The demonstration should illustrate the ability to usefully assess and plan over multiple scales in high-dimensional space and time in the platform and the functional compiler.

Technical Area	Milestone Description	Months after program kickoff
	Phase 1	18-month PoP
TA3	Define current friendly/opposing forces - ground	3
TA1	Demonstrate and benchmark multi-resolution scenario	6
TA2	Demonstrate integrated functional compiler using MAGTF assets	6
TA3	Define current friendly/opposing forces – air and sea	6
TA3	Define 2030 friendly/opposing forces - ground	9
TA1&2	Demonstrate an integrated capability using benchmark scenario	12
TA3	Define 2030 friendly/opposing – air and sea	12
TA1&2	Demonstration of adaptive composition capability with Marine participants	18
	Phase 2	9-month PoP
TA1	Demonstrate and benchmark a multi-resolution scenario	22
TA2	Demonstrate an augmented integrated functional compiler	22
TA2	Demonstrate a dynamically composed “warfighting as a function” app within the testbed	26
TA1&2	Demonstration of enhanced adaptive composition capability with Marine participants	27
	Phase 3	9-month PoP

TA1	Demonstrate and benchmark a multi-resolution scenario	31
TA2	Demonstrate an augmented integrated functional compiler	31
TA2	Demonstrate a dynamically composed “warfighting as a function” app within the testbed for multiple functions	31
TA1&2	Capstone demonstration of adaptive composition capability with Marine participants	36

1.3. PROGRAM METRICS

In order for the Government to evaluate the effectiveness of a proposed solution in achieving the stated program objectives, proposers should note that the Government hereby promulgates the following program metrics that may serve as the basis for determining whether satisfactory progress is being made to warrant continued funding of the program. Although the following program metrics are specified, proposers should note that the government has identified these goals with the intention of bounding the scope of effort, while affording the maximum flexibility, creativity, and innovation in proposing solutions to the stated problem.

The PROTEUS test environment and dynamic composition capability is expected to enable assessment of performance metrics that cannot be assessed using current methods. Definition of absolute metrics for urban combat, composition effectiveness, and battle management capabilities is challenging and in general, metrics such as mission effectiveness or measures of performance are highly context dependent. The goals are to provide quantitative and qualitative reproduction of key factors in urban combat scenarios as judged by the Marine end-user and then to assess and understand the increase in mission effectiveness using the Agile Precision Warfighting approaches enabled by functional composition. Even this measure is scenario-dependent and conventional approaches to C2 or other core functions may fail (e.g. denied communications environments). Proposers should discuss how they will enable assessment of metrics using an integrated TA1-TA2-TA3 capability, and what information is required from the other TA’s to provide such measures. Below are potential metrics to be used although their applicability and computability depends on the approach being taken:

- *Lethality/(area-cost)*: Composable force structures should enable higher lethality as measured by elimination of opposing forces or denial of opposing force options, over a larger area, and with lower logistics burden and human cost (wounded in action/killed in action) than current task organizations with conventional force packages.
- *Agility*: The change in measures of effectiveness (e.g. time to realize mission objectives) using a composable force should be qualitatively superior to a baseline task organization and force package.
- *Cost imposition*: Cost in this context is not just economic or logistics cost, but also denial of strategic or tactical options as manifested in measures of agility for the opposing force.

Additionally, proposers are encouraged to offer additional metrics of their own, describe their performance against metrics used in a relevant urban warfare scenario, and propose improvements to aid in acceptance and transition.

1.4. GOVERNMENT FURNISHED EQUIPMENT

Performers should plan on use of a Government-furnished cloud computing environment for code development, testing and program execution. This capability will be available by the program kickoff. Proposers should not budget for their own cloud or other computing infrastructure.

2. AWARD INFORMATION

2.1. GENERAL AWARD INFORMATION

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

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

The Government reserves the right to request any additional, necessary documentation once it makes the award instrument determination. Such additional information may include but is not limited to Representations and Certifications (see Section 6.2.11., “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 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 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 either cannot be met by proposers intending to perform fundamental research or the proposed research is anticipated to present a high likelihood of disclosing performance characteristics of military systems or manufacturing technologies that are unique and critical to defense. Therefore, the Government anticipates restrictions on the resultant research that will require the awardee⁷ to seek DARPA permission before publishing any information or results relative to the program.

Proposers should indicate in their proposal whether they believe the scope of the research included in their proposal is fundamental or not. While proposers should clearly explain the intended results of their research, the Government shall have sole discretion to 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 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

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

⁷ As used throughout this BAA, awardee refers to anyone who might receive a prime award from the Government, including recipients of procurement contracts, grants, cooperative agreements, Other Transactions, or any type of award. Subawardee refers to anyone who might receive a subaward from a prime awardee.

3.1. ELIGIBLE APPLICANTS

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

3.1.1.1. 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.

3.1.1.2. Government Entities

Government Entities (e.g., Government/National laboratories, military educational institutions, etc.) are subject to applicable direct competition limitations. Government entities must clearly demonstrate that the work is not otherwise available from the private sector and provide written documentation citing the specific statutory authority and contractual authority, if relevant, establishing their ability to propose to Government solicitations.

3.1.1.3. Authority and Eligibility

At the present time, DARPA does not consider 15 U.S.C. § 3710a to be sufficient legal authority to show eligibility. While 10 U.S.C. § 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.

3.1.3. Applicants Considering Classified Submissions

For classified proposals, applicants will ensure all industrial, personnel, and information systems processing security requirements are in place and at the appropriate level (e.g., Facility Clearance Level (FCL), Automated Information Security (AIS), Certification and Accreditation (C&A), and any Foreign Ownership Control and Influence (FOCI) issues are mitigated prior to submission. Additional information on these subjects can be found at <http://www.dss.mil>.

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

Prior to submitting a full proposal, proposers are strongly encouraged to first submit an abstract as described below. This process allows a proposer to ascertain whether the proposed concept is: (1) applicable to the PROTEUS BAA and (2) currently of interest. For the purposes of this BAA, applicability is defined as follows:

- The proposed concept is applicable to the technical goals described herein.
- The proposed concept is important to STO's current investment portfolio.
- The proposed concept investigates an innovative approach that enables revolutionary advances, i.e., will not primarily result in evolutionary improvements to the existing state of practice.
- The proposed work has not already been completed (i.e., the research element is complete but manufacturing/fabrication funds are required).
- The proposer has not already received funding or a positive funding decision for the proposed concept (whether from DARPA or another Government agency).

Abstracts and full proposals that are not found to be applicable to the PROTEUS BAA as defined above may be deemed non-conforming⁸ and removed from consideration. All abstracts and full proposals must provide sufficient information to assess the validity/feasibility of their claims as well as comply with the requirements outlined herein for submission formatting, content and transmission to DARPA. Abstracts and full proposals that fail to do so may be deemed non-conforming and removed from consideration. Proposers will be notified of non-conforming determinations via email.

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 www.darpa.mil, contact the administrative contact listed herein.

⁸ "Conforming" is defined as having been submitted in accordance with the guidelines outlined herein.

4.2. CONTENT AND FORM OF APPLICATION SUBMISSION

4.2.1. Security And Proprietary Issues

NOTE: If proposals are classified, the proposals must indicate the classification level of not only the proposal itself, but also the anticipated award document classification level.

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.

Submissions will not be returned. The original 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 at this office within 5 days after notification that a proposal was not selected.

a. Proprietary Information

Proposers are responsible for clearly identifying proprietary information. Submissions containing proprietary information must have the cover page and each page containing such information clearly marked with a label such as "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.

b. Security Information

Classified submissions shall be transmitted in accordance with the following guidance. Additional information on the subjects discussed in this section may be found at <http://www.dss.mil/>.

If a submission contains Classified National Security Information as defined by Executive Order 13526, the information must be appropriately and conspicuously marked with the proposed classification level and declassification date. Similarly, when the classification of a submission is in question, the submission must be appropriately and conspicuously marked with the proposed classification level and declassification date. Submissions requiring DARPA to make a final classification determination shall be marked as follows:

"CLASSIFICATION DETERMINATION PENDING. Protect as though classified _____ (insert the recommended classification level, e.g., Top Secret, Secret or Confidential)"

NOTE: Classified submissions must indicate the classification level of not only the submitted materials, but also the classification level of the anticipated award.

Proposers submitting classified information must have, or be able to obtain prior to contract award, cognizant security agency approved facilities, information systems, and appropriately cleared/eligible personnel to perform at the classification level proposed. All proposer personnel performing Information Assurance (IA)/Cybersecurity related duties on classified Information Systems shall meet the requirements set forth in DoD Manual 8570.01-M (Information Assurance Workforce Improvement Program).

Proposers choosing to submit classified information from other collateral classified sources (i.e., sources other than DARPA) must ensure (1) they have permission from an authorized individual at the cognizant Government agency (e.g., Contracting Officer, Program Manager); (2) the proposal is marked in accordance with the source Security Classification Guide (SCG) from which the material is derived; and (3) the source SCG is submitted along with the proposal.

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.

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

4.2.2. Proposal Abstract Information

As stated above, proposers are strongly encouraged to submit an abstract in advance of a full proposal to minimize effort and reduce the potential expense of preparing an out of scope proposal. The abstract provides a synopsis of the proposed project by briefly answering the following questions:

- What is the proposed work attempting to accomplish or do?
- What is new about your approach vs. how is it done today?
- Why do we think this will be successful at this time?
- How much will it cost, and how long will it take?

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

While it is DARPA policy to attempt to reply to abstracts within thirty calendar days, proposers to this solicitation may anticipate a response within approximately two weeks. These official notifications will be sent via email to the Technical POC and/or Administrative POC identified

on the abstract coversheet as noted in Section 7.1.1 below.

Abstracts sent in response to HR001117S0037 may be submitted via DARPA's BAA Website (<https://baa.darpa.mil>). Visit the website to complete the two-step registration process. Submitters will need to register for an Extranet account (via the form at the URL listed above) and wait for two separate e-mails containing a username and temporary password. After accessing the Extranet, submitters may then create an account for the DARPA BAA website (via the "Register your Organization" link along the left side of the homepage), view submission instructions, and upload/finalize the abstract. Proposers using the DARPA BAA Website may encounter heavy traffic on the submission deadline date; it is highly advised that the submission process be started as early as possible.

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

4.2.3. Full Proposal Information

Proposals consist of Volume 1: Technical and Management Volume, and Volume 2: Cost Volume.

Proposers are encouraged to submit concise, but descriptive, proposals. Specific examples of problems, approaches, or goals are preferred to qualitative generalities. The Government will not consider pages in excess of the page count limitations, as described herein. Proposals with fewer than the maximum number of pages will not be penalized.

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

Unclassified full proposals sent in response to this BAA may be submitted via DARPA's BAA Website (<https://baa.darpa.mil>). Proposals may not be submitted by fax or email; any so sent will be disregarded. Note: If an account has already been created for the DARPA BAA Website, this account may be reused. If no account currently exists for the DARPA BAA Website, visit the website to complete the two-step registration process. Submitters will need to register for an Extranet account (via the form at the URL listed above) and wait for two separate e-mails containing a username and temporary password. After accessing the Extranet, submitters may then create an account for the DARPA BAA website (via the "Register your Organization" link along the left side of the homepage), view submission instructions, and upload/finalize the proposal. 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, and submissions not uploaded as zip files will be rejected by DARPA

Classified submissions and proposals requesting assistance instruments 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 DARPA's BAA Website may be reached at BAAT_Support@darpa.mil, and is typically available during regular business hours, (9:00 AM- 5:00 PM EST Monday - Friday).

DARPA will acknowledge receipt of the unclassified submission and assign a control number that should be used in all further correspondence regarding the submission.

For a proposal that includes both classified and unclassified information, the proposal may be separated into an unclassified portion and a classified portion. The proposal should use the unclassified portion to the maximum extent reasonable. The unclassified portion can be submitted through the DARPA BAA Website, per the instructions above. The classified portion must be mailed separately, according to the instructions outlined in the "Security Information" section above. If a classified proposal may not be partitioned into classified and unclassified portions, then submit according to the instructions outlined in the "Security Information" section above.

When a proposal includes a classified portion, and when able according to security guidelines, we ask that proposers send an e-mail to HR001117S0037@darpa.mil as notification that there is a classified portion to the proposal. When sending the classified portion via mail according to the instructions outlined in the "Security Information" section above, proposers should submit six (6) hard copies of the classified portion of their proposal and two (2) CD-ROMs containing the classified portion of the proposal as a single searchable Adobe PDF file. Please ensure that all CDs are well-marked. Each copy of the classified portion must be clearly labeled with HR0011170037, proposer organization, proposal title (short title recommended), and Copy _ of _.

All administrative correspondence and questions on this solicitation, including requests for information on how to submit a proposal to this BAA, should be directed to one of the administrative addresses below; e-mail is preferred.

BAA Administrator
E-mail: HR001117S0037@darpa.mil

DARPA/STO
ATTN: HR001117S0037
675 North Randolph Street
Arlington, VA 22203-2114
Office Website: http://www.darpa.mil/Our_Work/STO/
Solicitations Page: http://www.darpa.mil/Opportunities/Solicitations/STO_Solicitations.aspx

DARPA intends to use electronic mail for correspondence regarding HR001117S0037. Proposals and proposal abstracts may not be submitted by fax or e-mail; any so sent will be disregarded. DARPA encourages use of the Internet for retrieving the BAA and any other related information that may subsequently be provided.

4.2.4. Restrictive Markings on Proposals

All proposals should clearly indicate limitations on the disclosure of their contents. Proposers who include in their proposals data that they do not want disclosed to the public for any purpose, or used by the Government except for evaluation purposes, shall-

(1) Mark the title page with the following legend:

This proposal includes data that shall not be disclosed outside the Government and shall not be duplicated, used, or disclosed-in whole or in part-for any purpose other than to evaluate this proposal. If, however, a contract is awarded to this proposer as a result of, or in connection with, the submission of this data, the Government shall have the right to duplicate, use, or disclose the data to the extent provided in the resulting contract. This restriction does not limit the Government's right to use information contained in this data if it is obtained from another source without restriction. The data subject to this restriction are contained in sheets [insert numbers or other identification of sheets]; and

(2) Mark each sheet of data it wishes to restrict with the following legend:

Use or disclosure of data contained on this sheet is subject to the restriction on the title page of this proposal.

Markings like "Company Confidential" or other phrases that may be confused with national security classifications shall be avoided. See Section 6.0, for additional information.

4.3. FORMATTING CHARACTERISTICS

4.3.1. Proposal Abstract Format

All pages shall be formatted for printing on 8-1/2 by 11-inch paper with 1-inch margins and font size not smaller than 12 point. Font sizes of 8 or 10 point may be used for figures, tables, and charts. Document files must be in .pdf, .odx, .doc, .docx, .xls, or .xlsx formats. Submissions must be written in English. The Abstract Summary Slide described herein must be in .ppt or .pptx format and should be attached as a separate file to this document.

To assist in abstract development, various templates have been provided along with the BAA posted at <http://www.fbo.gov/>. APPENDIX 1 is for the Abstract Summary Slide and APPENDIX 2 is an Abstract Template. Use of the Abstract Summary Slide (APPENDIX 1) and the Abstract Template (APPENDIX 2) is mandatory.

Abstracts shall not exceed a maximum of 7 pages for TA1 and TA2, 4 pages for TA3.

Page limit includes:	Page limit does NOT include:
Figures, tables, charts	Cover Sheet
Abstract Summary Slide	Table of Contents
	References/Bibliography (optional and should not exceed 1 page)
	Resumes

While not included in the overall page limit, the bibliography should not exceed one page. No technical papers should be included with an abstract submission.

Abstracts must include the following components:

i. Cover Sheet: Provide the following information:

- (1) Label: "Abstract"
- (2) BAA number (HR001117S0037)
- (3) Abstract title
- (4) Lead organization name
- (5) Technical point of contact (POC) including name, mailing address, telephone, and email address
- (6) Administrative POC including name, mailing address, telephone number, and email address
- (7) Estimated total cost
- (8) Estimated period of performance
- (9) Primary subawardees (if known/applicable)
- (10) Identify any other solicitation(s) to which this concept has been proposed

ii. Abstract Summary Slide: Using the slide template provided as APPENDIX 1 to the BAA, provide a summary in PowerPoint that effectively and succinctly conveys the main objective, key innovations, expected impact, and other unique aspects of the proposed project. Include the PowerPoint slide as a separate attachment to this document.

iii. Goals and Impact: Describe what is being proposed and how it addresses the goals of the PROTEUS program. Describe the innovative aspects of the project in the context of existing capabilities and approaches.

iv. Technical Plan: Outline and address the technical approach, inherent challenges and possible solutions for overcoming potential problems. Provide appropriate milestones at intermediate stages of the project to demonstrate progress, and a plan for achieving the program milestones.

v. Capabilities/Management Plan: Provide a brief summary of expertise of the team, including subawardees and key personnel. Teaming arrangements do not need to be finalized at the time of abstract submission; however, mention of potential teaming/collaboration arrangements is encouraged. Identify a principal investigator for the project and include a description of the team's organization including roles and

responsibilities.

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

vii. Bibliography (Optional): If desired, include a brief, one-page bibliography with *links* to relevant papers, reports, resumes of key team members, etc.

Proposal abstracts are encouraged in advance of proposals in order to provide potential proposers with a rapid response to minimize unnecessary effort. Proposal abstracts should follow the format provided below. The cover sheet should be clearly marked “PROPOSAL ABSTRACT” and the total length should not exceed seven (7) pages for TA1 and TA2 and four (4) pages for TA3, excluding cover page and official transmittal letter. 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 proposal abstracts includes all figures, tables, and charts. No formal transmittal letter is required. All proposal abstracts must be written in English.

4.3.2. Proposal Format

a. Volume 1: Technical and Management Proposal

Volume 1 shall not exceed a maximum of 30 pages for TA1 and TA2; 20 pages for TA3. All proposals must be in the format given below. Nonconforming proposals may be rejected without review. Proposals shall consist of two volumes. 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 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. These papers or research notes will not be formally reviewed against the evaluation criteria, but should allow technical understanding of the claims made. Copies of not more than three (3) relevant papers may be included with the submission. The bibliography and attached papers are not included in the page counts given below. The submission of other supporting materials along with the proposals is strongly discouraged and will not be considered for review. Maximum page lengths for each section are shown in brackets { } below. All proposals must be written in English.

Section I. Administrative

A. Cover sheet to include:

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

- (7) Proposal title;
- (8) Technical point of contact to include: salutation, last name, first name, street address, city, state, zip code, telephone, fax (if available), electronic mail (if available);
- (9) Administrative point of contact to include: salutation, last name, first name, street address, city, state, zip code, telephone, fax (if available), electronic mail (if available) ;
- (10) Total funds requested from DARPA, and the amount of cost share (if any);
- (11) Date proposal was submitted.

B. Official transmittal letter

Section II. Summary of Proposal

- A. Innovative claims for the proposed research. This section is the centerpiece of the proposal and should succinctly describe the uniqueness and benefits of the proposed approach relative to the current state-of-art alternate approaches.
- B. Deliverables associated with the proposed research and the plans and capability to accomplish technology transition and commercialization. Include in this section all proprietary claims to the results, prototypes, intellectual property, or systems supporting and/or necessary for the use of the research, results, and/or prototype. If there are not proprietary claims, this should be stated.
- C. Technical rationale, technical approach, and constructive plan for accomplishment of technical goals in support of innovative claims and deliverable production. (In the proposal, this section should be supplemented by a more detailed plan in Section III.)
- D. General discussion of other research in this area.
- E. A clearly defined organization chart for the program team which includes, as applicable: (1) the programmatic relationship of team member; (2) the unique capabilities of team members; (3) the task of responsibilities of team members; (4) the teaming strategy among the team members; and (5) the key personnel along with the amount of effort to be expended by each person during each year.
- F. A five slide summary of the proposal in PowerPoint that quickly and succinctly indicates the concept overview, key innovations, expected impact, and other unique aspects of the proposal. The format for the summary slides is included as APPENDIX 3 to this BAA and does not count against the page limit.

Section III. Detailed Proposal Information

- A. Statement of Work (SOW) - Clearly define the technical tasks/subtasks to be performed, their durations, and dependencies among them. The page length for the SOW will be dependent on the amount of the effort. For each task/subtask, provide:
 - A general description of the objective (for each defined task/activity);
 - A detailed description of the approach to be taken to accomplish each defined task/activity);
 - Identification of the primary organization responsible for task execution (prime, sub, team member, by name, etc.);
 - The completion criteria for each task/activity - a product, event or milestone that defines its completion.

- Clearly identify any tasks/subtasks (to be performed by either an awardee or subawardee) that will be accomplished on-campus at a university, if applicable.
- Define all deliverables (reporting, data, reports, software, etc.) to be provided to the Government in support of the proposed research tasks/activities.

Reporting Deliverables	
Item	Date/Frequency
(LIST)	(LIST)

Tech Deliverables		
Item	Deliverable Date	Deliverable Location
(LIST)	(LIST)	(LIST)

IP Claims	(LIST)
Data Restrictions	(LIST)

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

Do not include any proprietary information in the SOW.

- B. Description of the results, products, transferable technology, and expected technology transfer path enhancing that of Section II. B. This should also address mitigation of life-cycle and sustainment risks associated with transitioning intellectual property for U.S. military applications, if applicable. See also Section 8.1 “Intellectual Property.”
- C. Detailed technical rationale enhancing that of Section II.
- D. Detailed technical approach enhancing and completing that of Section II.
- E. Comparison with other ongoing research indicating advantages and disadvantages of the proposed effort.
- F. Discussion of proposer’s previous accomplishments and work in closely related research areas.
- G. Description of the facilities that would be used for the proposed effort. This section should address how safeguarding of materials will be handled at each facility to include classified materials when applicable.
- H. Detail support enhancing that of Section II, including formal teaming agreements which are required to execute this program.
- I. Cost schedules and measurable milestones for the proposed research, including estimates of cost for each task in each year of the effort delineated by the proposed awardee and major subawardees, total cost, and any company cost share. **Note: Measurable milestones should capture key development points in tasks and should be clearly articulated and defined in time relative to start of effort.** These milestones should enable and support a decision

for the next part of the effort. Additional interim non-critical management milestones are also highly encouraged at regular intervals. 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. Additionally, proposals should clearly explain the technical approach(es) that will be employed to meet or exceed each program metric and provide ample justification as to why the approach (es) is/are feasible. The milestones must not include proprietary information.

Section IV. Additional Information

A brief bibliography of relevant technical papers and research notes (published and unpublished) which document the technical ideas upon which the proposal is based. These papers or research notes will not be formally reviewed against the evaluation criteria, but should allow technical understanding of the claims made. Copies of not more than three (3) relevant papers can be included in the submission.

b. Volume 2, Cost Proposal – {No Page Limit}

All proposers, including FFRDCs, must submit the following:

Cover sheet to include:

- (1) BAA number;
- (2) Technical area;
- (3) Lead Organization Submitting proposal;
- (4) Type of organization, selected among the following categories: “LARGE BUSINESS”, “SMALL DISADVANTAGED BUSINESS”, “OTHER SMALL BUSINESS”, “HBCU”, “MI”, “OTHER EDUCATIONAL”, OR “OTHER NONPROFIT”;
- (5) Proposer’s reference number (if any);
- (6) Other team members (if applicable) and type of organization for each;
- (7) Proposal title;
- (8) Technical point of contact to include: salutation, last name, first name, street address, city, state, zip code, telephone, fax (if available), electronic mail (if available);
- (9) Administrative point of contact to include: salutation, last name, first name, street address, city, state, zip code, telephone, fax (if available), and electronic mail (if available);
- (10) Award instrument requested: cost-plus-fixed-fee (CPFF), cost-contract—no fee, cost sharing contract – no fee, or other type of procurement contract (*specify*), or other transaction;
- (11) Place(s) and period(s) of performance;
- (12) Total proposed cost separated by basic award and option(s) (if any);
- (13) Name, address, and telephone number of the proposer’s cognizant Defense Contract Management Agency (DCMA) administration office (*if known*);
- (14) Name, address, and telephone number of the proposer’s cognizant Defense Contract Audit Agency (DCAA) audit office (*if known*);
- (15) Date proposal was prepared;
- (16) DUNS number
- (17) TIN number
- (18) Cage Code

- (19) Subawardee Information
- (20) Proposal validity period

Proposers without an accounting system considered adequate for determining accurate costs must complete an SF 1408 if a cost type contract is to be negotiated. To facilitate this process, proposers should complete the SF 1408 found at <http://www.gsa.gov/portal/forms/download/115778> and submit the completed form with the proposal. To complete the form, check the boxes on the second page, then provide a narrative explanation of your accounting system to supplement the checklist on page one. For more information, please 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 subawardees. This includes the calculations and adjustments that are utilized to generate the Summary Costs from the source labor hours, labor costs, material costs, etc. input data. The Government prefers receiving cost data as Excel files; however, this is not a requirement. If the PDF submission differs from the Excel submission, the PDF will take precedence. Each copy must be clearly labeled with the DARPA BAA number, proposer organization, and proposal title (short title recommended).

The Government also strongly encourages that the proposer provide 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 or persons, with associated labor hours and numbered direct labor rates
 - ii. If consultants are to be used, proposer must provide consultant agreement or other document which verifies the proposed loaded daily/hourly rate
 - iii. Indirect costs including Fringe Benefits, Overhead, General and Administrative Expense, Cost of Money, etc. (Must show base amount and rate)
 - iv. Travel – Number of trips, number of days per trip, departure and arrival destinations, number of people, etc.
 - v. Other Direct Costs – Should be itemized with costs or estimated costs. Backup documentation will be submitted to support proposed costs. An explanation of any estimating factors, including their derivation and application, must be provided.
Please include a brief description of the proposers' procurement method to be used
- (2) major program tasks by fiscal year
- (3) an itemization of major subcontracts and equipment purchases, to include: a cost proposal as detailed as the Proposer's cost proposal
- (4) an itemization of any information technology (IT) purchase, as defined in FAR Part 2.101
- (5) a summary of projected funding requirements by month
- (6) 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

- (7) 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.)

The proposer should include supporting cost and pricing information in sufficient detail to substantiate the summary cost estimates and should include a description of the method used to estimate costs and supporting documentation. Tables included in the cost proposal in editable (e.g. MS Excel) format with calculation formulas intact. NOTE: If PDF submissions differ from the Excel submission, the PDF will take precedence.

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

Subwardee Proposals

The prime awardee is responsible for compiling and providing all subawardee proposals for the Procuring Contracting Officer (PCO). Subawardee proposals should include Interdivisional Work Transfer Agreements (ITWA) or similar arrangements. Where the effort consists of multiple portions which could reasonably be partitioned for purposes of funding, these should be identified as options with separate cost estimates for each. NOTE: for IT and equipment purchases, include a letter stating why the proposer cannot provide the requested resources from its own funding.

All proprietary subawardee proposal documentation, prepared at the same level of detail as that required of the prime and which cannot be uploaded with the proposed prime awardee’s proposal), shall be provided to the Government either by the prime awardee or by the subawardee organization when the proposal is submitted. Subawardee proposals submitted to the Government by the prime contractor should be submitted in a sealed envelope that the prime awardee will not be allowed to view. The subawardee must provide the same number of electronic proposals as is required of the prime awardee.

Other Transaction Requests

All proposers requesting an Other Transaction for Prototypes (OT) agreement must include a detailed list of milestones. Each milestone must include the following: milestone description, completion criteria, due date, and payment/funding schedule (to include, if cost share is proposed, contractor and Government share amounts). It is noted that, at a minimum, milestones should relate directly to accomplishment of program technical metrics as defined in the BAA and/or the proposer’s proposal. Agreement type, fixed price or expenditure based, will be subject to negotiation by the Agreements Officer. Do not include proprietary data.

NOTE: PROPOSERS ARE CAUTIONED THAT PROPOSALS MAY BE REJECTED IF SUBMITTAL INSTRUCTIONS ARE NOT FOLLOWED.

4.4. SUBMISSION DATES AND TIMES

4.4.1. Proposal Abstract Submission Deadline

The proposal abstract must be submitted via the DARPA BAA website on or before 4:00 p.m., EST, July 12, 2017. Proposal abstracts received after this time and date may not be reviewed.

4.4.2. Full Proposal Submission Deadline

The full proposal must be submitted via the DARPA BAA website on or before 4:00 p.m., EST August 22, 2017 in order to be considered during the initial round of selections; however, proposals received after this deadline may be received and evaluated up to six months (180 days) from date of posting on FedBizOpps. Full proposals submitted after the due date specified in the BAA or due date otherwise specified by DARPA after review of proposal abstracts may be selected contingent upon the availability of funds. Proposers are warned that the likelihood of available funding is greatly reduced for proposals submitted after the initial closing date deadline. 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.

DARPA will post a consolidated Question and Answer list in response to any relevant and/or BAA clarification question(s) after August 8, 2017 before final full proposals are due. In order to receive a response to your question, submit your question by August 1, 2017 to HR001117S0037@darpa.mil.

4.5. FUNDING RESTRICTIONS

Not Applicable.

4.6. 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; and 5.1.3. Cost Realism.

5.1.1. Overall Scientific and Technical Merit

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

The proposed technical team has the expertise and experience to accomplish the proposed tasks.

Task descriptions and associated technical elements provided are complete and in a logical

sequence with all proposed deliverables clearly defined such that a final outcome that achieves the goal can be expected as a result of award. The proposal identifies major technical risks and planned mitigation efforts are clearly defined and feasible.

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.

The proposed intellectual property restrictions (if any) will not significantly impact DARPA's ability to transition the technology.

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 considered positively in the evaluation. The evaluation criterion recognizes that undue emphasis on cost may motivate proposers to offer low-risk ideas with minimum uncertainty and to staff the effort with junior personnel in order to be in a more competitive posture. DARPA discourages such cost strategies.

5.2. REVIEW AND SELECTION PROCESS

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, all factors considered, including the potential contributions of the proposed work to the overall research program and the availability of funding for the effort.

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.

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 AND NOTIFICATIONS

6.1.1. 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. Proposals

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.

6.2. ADMINISTRATIVE AND NATIONAL POLICY REQUIREMENTS

6.2.1. Meeting And Travel Requirements

Proposers should plan and include costs in their proposals for a two-day Principal Investigator (PI) meeting will be held approximately every six months in Washington, DC. In the base phase, and every 4.5 months in the option phases. For budgeting purposes, proposers should plan for nine two-day meetings over the course of 36 months. Proposers should also anticipate and provide cost details for at least one site visit per phase by the DARPA Program Manager during which they will have the opportunity to demonstrate progress towards agreed-upon milestones.

6.2.2. 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.

6.2.3. FAR and DFARS Clauses

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

6.2.4. Human Research Subjects/Animal Use

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

6.2.5. 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.

6.2.6. 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.

6.2.7. 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 § 794d)/FAR 39.2.

6.2.8. 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 www.darpa.mil/work-with-us/additional-baa for further information.

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

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

6.2.10. Terms and Conditions

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

6.3. REPORTING

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

6.4. ELECTRONIC SYSTEMS

6.4.1. Wide Area Work Flow (WAWF)

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

6.4.2. i-EDISON

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

7. AGENCY CONTACTS

Administrative, technical or contractual questions should be sent via e-mail to HR001117S0037@darpa.mil. All requests must include the name, email address, and phone number of a point of contact.

Points of Contact

The BAA Coordinator for this effort may be reached at:
HR001117S0037@darpa.mil.

DARPA/STO

ATTN: HR001117S0037

675 North Randolph Street

Arlington, VA 22203-2114

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

8. OTHER INFORMATION

8.1. INTELLECTUAL PROPERTY

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

If proposers desire to use proprietary computer software or technical data or both as the basis of their proposed approach, in whole or in part, they should: (1) clearly identify such software/data and its proposed particular use(s); (2) explain how the Government will be able to reach its program goals (including transition) within the proprietary model offered; and (3) provide possible nonproprietary alternatives in any area that might present transition difficulties or increased risk or cost to the Government under the proposed proprietary solution. Proposers expecting to use, but not to deliver, commercial open source tools or other materials in implementing their approach may be required to indemnify the Government against legal liability arising from such use.

All references to "Unlimited Rights" or "Government Purpose Rights" are intended to refer to the

definitions of those terms as set forth in the Defense Federal Acquisition Regulation Supplement (DFARS) 227.

8.1.1. PROCUREMENT CONTRACT

Proposers responding to this BAA requesting procurement contracts will need to complete the certifications at DFARS 252.227-7017. See 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)

8.1.2. NONPROCUREMENT CONTRACTS

Proposers responding to this BAA requesting an 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 use a format similar to that described in Paragraph a. above. If no restrictions are intended, then the proposer should state “NONE.”

9. APPENDIX 1: ABSTRACT SUMMARY SLIDE

Abstract Title Organization Name(s); Technical POC Name(s)	
CONCEPT Provide graphic.	APPROACH Describe new ideas.
IMPACT Describe need and problem being addressed. Describe goal.	CONTEXT Describe existing approaches/state of the art.
PROTEUS BAA (HR001117S0037) APPENDIX 1	

10. APPENDIX 2: ABSTRACT TECHNICAL DESCRIPTION AND COST TEMPLATE

Use of this template is mandatory for all abstract submissions to this BAA. Do not replicate this template using personal or organizational letterhead or formatting (except as directed herein) or submit this document as an un-editable image file. This document must include all components described herein (pages 45-47) and must be submitted in .pdf, .odx, .doc, or .docx formats. The Abstract Summary Slide (APPENDIX 1) described herein must be in .ppt or .pptx format and should be attached as a separate file to this document.

All submissions must be written in English and all pages shall be formatted for printing on 8-1/2 by 11-inch paper with 1-inch margins and font size not smaller than 12 point. Font sizes of 8 or 10 point may be used for figures, tables, and charts.

Abstracts shall not exceed 7 pages for TA1 and TA2, 4 pages for TA3.

Page limit includes:	Page limit does NOT include:
Figures, tables, charts	Cover Sheet
Abstract Summary Slide	Table of Contents
	References/Bibliography (optional and should not exceed 1 page)
	Resumes

While not included in the overall page limit, the bibliography should not exceed one page. No technical papers should be included with an abstract submission.

Instructional text is provided within brackets and is blue. This text does not count toward your page limit and should be deleted from your final submission.

<PRIME ORGANIZATION LOGO>
HR001117S0037 PROTEUS

Abstract Title	
Proposer Organization	
Technical Point of Contact (POC)	Name: Address: Telephone: Email:
Administrative POC	Name: Address: Telephone: Email:
Other Team Members (subawardees and consultants), if known/applicable	Technical POC Name: Organization: Technical POC Name: Organization:
Total Proposed Cost	\$
Period of Performance	
Identify any other solicitation(s) to which this concept has been proposed	

Abstract Summary Slide

[Using the slide template provided as APPENDIX 1 to the BAA, provide a summary in PowerPoint that effectively and succinctly conveys the main objective, key innovations, expected impact, and other unique aspects of the proposed project. Include the PowerPoint slide as a separate attachment to this document.]

Goals and Impact

[Describe what is being proposed and how it addresses the goals of the PROTEUS program. Describe the innovative aspects of the project in the context of existing capabilities and approaches.]

Technical Plan

[Outline and address technical challenges inherent in the approach and possible solutions for overcoming potential problems. Provide appropriate milestones at intermediate stages of the project to demonstrate progress, and a plan for achieving the program milestones.]

Capabilities/Management Plan

[Provide a brief summary of expertise of the proposer team, including subawardees and key personnel. Collaboration arrangements do not need to be finalized at the time of abstract submission; however, mention of any potential such arrangement is encouraged. Identify a principal investigator for the project and describe how the proposed team will be organized including roles and responsibilities.]

Cost and Schedule

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

Bibliography (optional)

[If desired, include a brief, one-page bibliography with *links* to relevant papers, reports, resumes, etc.]

11. APPENDIX 3: PROPOSAL SLIDE SUMMARY

Organization Name Concept
Describe How It Works / Innovative Claims

Organization Name Contract/Proposal Specifics
<ul style="list-style-type: none"><input type="checkbox"/> Intellectual Property<input type="checkbox"/> Data rights summary<input type="checkbox"/> Deliverables

Organization Name Schedule/Cost		
Base	# Months	###M
Option 1	## Months	###M
Option 2	## Months	###M
Program Total	## Months	###M

- Proposed award type [i.e. Cost Plus Fixed Fee (CPFF), Cost Plus Award Fee (CPAF), Cost Plus Incentive Fee (CPIF), Fixed Firm Price (FFP), etc.]

 **Cost Summary: Proposal Title**
 Technical Area X; Organization Name(s); Technical POC Name(s)

	Phase 1	Phase 2	Phase 3	Phase 4
Direct Labor (\$)				
# of FTEs/year (Senior Researcher)				
# of FTEs/year (/Junior Researcher/Technician)				
# of FTEs/year (Program Mgmt/Admin)				
Other Direct Costs (specify type, \$)				
Materials and Equipment (\$)				
Travel (\$)				
Total Proposal Cost (\$)				



Proposal Title
 PI: Name, Organization (Subs: list)

Cost Summary Slide
 (by task)

Proposed funding by phase and task:

Team Member	Task	Phase 1 \$	Phase 2 \$	Phase 3 \$	Phase 4 \$	Total \$
Team Member #1	T1	T1.1				
		T1.2				
		T1.3				
	T3					
	T4					
	⋮					
Team Member #2	T2					
	T4					
Etc....	...	---	---			---
Subtotal \$						

12. APPENDIX 4: VOLUME 1 COVER SHEET TEMPLATE

**Volume 1, Technical and Management Proposal
Cover Sheet**

- (1) BAA Number: _____
- (2) Technical Area: _____
- (3) Lead Organization Submitting Proposal: _____
- (4) Type of Organization, selected among the following categories: “LARGE BUSINESS”, “SMALL DISADVANTAGED BUSINESS”, “OTHER SMALL BUSINESS”, “HBCU”, “MI”, “OTHER EDUCATIONAL”, OR “OTHER NONPROFIT”
- (5) Other team members (if applicable) and type of organization for each:
Company 1 (Other Small Business)
Company 2 (Large Business)
Company 3 (Large Business)
University (Other Educational)
- (6) Contractor’s reference number (if any): _____
- (7) Proposal Title: _____
Proposal directed to the attention of (if applicable): _____
- (8) Technical point of contact to include:
Salutation, last name first name
Street Address
Street Address 2
City, State, Zip Code
Telephone, Fax (if available)
Electronic mail (if available)
- (9) Administrative point of contact to include:
Salutation, last name first name
Street Address
Street Address 2
City, State, Zip Code
Telephone, Fax (if available)
Electronic mail (if available)
- (10) Date proposal submitted: _____
- (11) Total funds requested from DARPA, and the amount of cost share (if any): _____

**13. APPENDIX 5: VOLUME 2 COVER SHEET, CHECKLIST AND SAMPLE
TEMPLATES**

**Volume 2, Cost Proposal
Cover Sheet**

- (1) BAA Number: _____
- (2) Technical Area: _____
- (3) Lead Organization Submitting Proposal: _____
- (4) Type of Organization, selected among the following categories: “LARGE BUSINESS”, “SMALL DISADVANTAGED BUSINESS”, “OTHER SMALL BUSINESS”, “HBCU”, “MI”, “OTHER EDUCATIONAL”, OR “OTHER NONPROFIT”
- (5) Other team members (if applicable) and type of organization for each:
Company 1 (Other Small Business)
Company 2 (Large Business)
Company 3 (Large Business)
University (Other Educational)
- (6) Contractor’s reference number (if any): _____
- (7) Proposal Title: _____
Proposal directed to the attention of (if applicable): _____
- | | |
|--|---|
| (8) Technical point of contact to include: | (9) Administrative point of contact to include: |
| Salutation, last name first name | Salutation, last name first name |
| Street Address | Street Address |
| Street Address 2 | Street Address 2 |
| City, State, Zip Code | City, State, Zip Code |
| Telephone, Fax (if available) | Telephone, Fax (if available) |
| Electronic mail (if available) | Electronic mail (if available) |
- (10) Award Instrument Requested: cost-plus-fixed-fee (CPFF), cost-contract – no fee, cost sharing contract – no fee, or other type of procurement contract (specify), or other transaction
- (11) Place and period of performance: _____
- (12) Total proposed cost separated by basic award and option(s) (if any): _____
- (13) Proposer’s Cognizant Defense Contract Management Agency (DCMA), Defense Contract Audit Agency (DCAA) Information:
- | | |
|--|----------------------------------|
| DCMA Administration Office (if known): | DCAA Audit Office (if known): |
| Salutation, last name first name | Salutation, last name first name |
| Street Address | Street Address |
| Street Address 2 | Street Address 2 |

City, State, Zip Code
Telephone, Fax (if available)

City, State, Zip Code
Telephone, Fax (if available)

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

(15) Date proposal submitted: _____

(16) DUNS number: _____

(17) TIN (Tax Information Number): _____

(18) CAGE Code: _____

(19) Subcontractor Information: _____

(20) Proposal validity period: _____

**Volume 2, Cost Proposal
Checklist and Sample Templates**

The following checklist and sample templates are provided to assist the proposer in developing a complete and responsive cost volume. Full instructions appear in Section 4.3.2.b. beginning on Page 33 of HR001117S0037. This worksheet must be included with the coversheet of the Cost Proposal.

1. Are all items from Section 4.3.2.b. (Volume 2, Cost Proposal) of HR001117S0037 included on your Cost Proposal cover sheet?

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

If reply is “No”, please explain:

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

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

If reply is “No”, please explain:

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

Direct Labor (Labor Categories, Hours, Rates)

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

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

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

Materials and/or Equipment

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

Subcontracts/Consultants

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

Other Direct Costs

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

Travel

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

If reply is “No”, please explain:

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

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

If reply is "No", please explain:

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

If reply is "No", please explain:

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

If reply is "No", please explain:

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

If reply is "No", please explain:

8. Do you have subawardees/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 subawardee/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 subawardee 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 subawardees) 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:

SAMPLE – SUMMARY PROPOSAL BUDGET (One per Phase)

SAMPLE: COST ELEMENT SUMMARY

Phase 1			
COST ELEMENT	BASE	RATE	AMOUNT
DIRECT LABOR (List each direct labor category separately)	Hours		\$
TOTAL DIRECT LABOR			\$
FRINGE BENEFITS	\$	%	\$
TOTAL LABOR OVERHEAD	\$	%	\$
SUBAWARDEE(S), CONSULTANT(S) (List Each Separately)			\$
MATERIALS & EQUIPMENT			\$
MATERIAL OVERHEAD	\$	%	\$
TRAVEL			\$
OTHER DIRECT COSTS (ODC)			\$
General and Administrative (G&A)	\$	%	\$
Independent Research and Development (IR&D)/Bid and Proposal (B&P)	\$	%	\$
SUBTOTAL COSTS			\$
COST OF MONEY (See DD Form 1861)			\$
TOTAL COST			\$
PROFIT/FEE	\$	%	\$
TOTAL PRICE/COST			\$
GOVERNMENT SHARE			\$
RECIPIENT SHARE (if applicable)			\$

Phase 2 Option			
BASE	RATE	AMOUNT	TOTAL PROPOSED AMOUNT
Hours			
	\$	\$	
		\$	
\$	%	\$	
\$	%	\$	
		\$	
		\$	
\$	%	\$	
		\$	
\$	%	\$	
		\$	
		\$	
\$	%	\$	
		\$	
		\$	

SAMPLE: SUBAWARDEES & CONSULTANTS PRICE SUMMARY

A	B	C	D	E	F
Subawardee or Consultant Name	SOW Tasks to be performed*	Type of Award	Subawardee of Consultant Quoted Price	Cost Proposed by Prime for the Subawardee or Consultant	Difference (Column D - Column E) IF APPLICABLE
TOTALS					

* Identify Statement of Work, Milestone or Work Breakdown Structure paragraph or provide a narrative explanation as an addendum to this Table that describes the effort to be performed.