



Broad Agency Announcement
Rational Integrated Design of Energetics (RIDE)
Defense Sciences Office

HR001120S0040

March 11, 2020

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PART I: OVERVIEW INFORMATION

- **Federal Agency Name:** Defense Advanced Research Projects Agency (DARPA), Defense Sciences Office (DSO)
- **Funding Opportunity Title:** Rational Integrated Design of Energetics (RIDE)
- **Announcement Type:** Initial Announcement
 - **Funding Opportunity Number:** HR001120S0040
- **Catalog of Federal Domestic Assistance (CFDA) Number(s):** 12.910 Research and Technology Development
- **Dates** (All times listed herein are Eastern Time.)
 - Posting Date: March 11, 2020
 - Proposers Day: March 10, 2020
 - Abstract Due Date: March 25, 2020, 4:00 p.m.
 - FAQ Submission Deadline: April 24, 2020, 4:00 p.m. See Section VIII.A.
 - Full Proposal Due Date: May 8, 2020, 4:00 p.m.
- **Anticipated Individual Awards:** DARPA anticipates multiple awards.
- **Types of Instruments that May be Awarded:** Procurement contracts, cooperative agreements or other transactions
- **Agency contacts**
 - **Technical POC:** Anne Fischer, Program Manager, DARPA/DSO
 - **BAA Email:** RIDE@darpa.mil
 - **BAA Mailing Address:**
DARPA/DSO
ATTN: HR001120S0040
675 North Randolph Street
Arlington, VA 22203-2114
 - **DARPA/DSO Opportunities Website:** <http://www.darpa.mil/work-with-us/opportunities>
- **Frequently Asked Questions (FAQ):** FAQs for this solicitation may be viewed on the DARPA/DSO Opportunities Website. See Section VIII.A for further information.

PART II: FULL TEXT OF ANNOUNCEMENT

I. Funding Opportunity Description

This Broad Agency Announcement (BAA) constitutes as a public notice of a competitive funding opportunity as described in Federal Acquisition Regulation (FAR) 6.102(d)(2) and 35.016 as well as 2 C.F.R. § 200.203. Any resultant negotiations and/or awards will follow all laws and regulations applicable to the specific award instrument(s) available under this BAA, e.g., FAR 15.4 for procurement contracts.

A. Introduction

The Defense Sciences Office (DSO) at the Defense Advanced Research Projects Agency (DARPA) is soliciting innovative research proposals in the area of technologies that speed, parallelize and systematize energetics formulation¹ development. Capabilities developed for explosive and propellant formulations are of primary interest, though development may also entail capabilities for other energetics including obscurants and pyrotechnics. Specifically, DARPA seeks to develop 1) safe, semi-automated experimental capabilities that integrate energetics ingredient synthesis with formulation development and testing and 2) theoretical, experimental, and/or statistical methods that enable safe, accurate evaluation of key energetics properties at reduced scale. Proposed research should investigate innovative approaches that enable revolutionary advances in energetics research capabilities. Specifically excluded is research that primarily results in evolutionary improvements to the existing state of practice.

B. Background

Advances in automation and artificial intelligence in the chemical sciences are poised to enable fast, reproducible experimentation and efficient property optimization of molecules across many application areas relevant to national security. Recent advances pioneered in DARPA's Make-It and Accelerated Molecular Discovery (AMD) programs, coupled with those in the broader research community, are replacing slow, labor-intensive design/test cycles with data-informed models and efficient, hands-free experimentation. Such advances have already revolutionized the discovery and production of molecular classes including pharmaceuticals; however, niche areas such as energetics, characterized by unique chemical space, limited literature precedence and specialized requirements for experimental hardware have experienced relatively slow improvement. For example, while Make-It synthetic route design algorithms provide many reasonable routes for molecules such as antibiotics and dyes, they typically fail to provide a single viable route for active small molecule ingredients in explosives and propellants. Similarly, automated small molecule production and systematized property screening capabilities that now provide efficient means to experimentally optimize functional properties in more conventional applications are not compatible with the harsh chemistry, analytical protocols or safety considerations critical to energetics development.

¹ Energetics are employed as a formulation, or precise mixture of many subcomponents (i.e., ingredients) that are combined in specific ratios under customized processing conditions. Ingredients include energetic molecules (e.g., trinitrotoluene, TNT), binders (e.g., hydroxyl-terminated polybutadiene), oxidizers (e.g., ammonium perchlorate), etc.

Rational Integrated Design of Energetics (RIDE) seeks to overcome these and other long-standing challenges that limit development of high-performance energetics. RIDE will transform energetics research approaches and capabilities by developing safe, semi-automated, experimental capabilities that integrate energetics ingredient synthesis with formulation development and testing (Technical Area 1) and theoretical, experimental and/or statistical methods that allow safe, accurate evaluation of key energetics properties at reduced scale (Technical Area 2). Technologies developed in each technical area will be integrated by the end of the program to provide disruptive experimental capabilities that enable safe, precise, reproducible and efficient optimization of energetics formulations. With these new capabilities in hand, researchers will be able to safely and rapidly develop new high-performance energetics needed for currently fielded platforms and build new capabilities for future systems.

C. Program Description/Scope

The goal of RIDE is to speed and systematize energetics research, enabling advanced development and implementation of automation and discovery tools to the energetics domain. Technologies developed in RIDE will 1) enable safer development of energetics by applying new process control, flow synthesis and parallel formulation approaches to reduce volumes of dangerous energetic materials, 2) systematize energetics development by collecting critical property data that will ultimately inform DoD energetics design models, 3) automate components of the energetics development process to enable a design-of-experiments (DOE) approach to rapidly optimize energetics formulations in parallel with ingredients, and 4) provide new theory and experimental capabilities that significantly reduce the scale of material required to determine key energetics figures of merit.

With a focus on optimizing high-performance energetics formulations, as opposed to a more limited focus on energetics ingredients, RIDE approaches will explicitly integrate the development of ingredients with formulation DOE optimization in a single platform. Conventional research in energetics is focused on optimizing one or two key performance metrics (e.g., density, heat of formation, sensitivity, etc.) for individual ingredients prior to integration into and development of formulations. However, developing new viable formulations (i.e., combinations of energetic molecules, binders, oxidizers, etc.) that better reflect energetics as employed in the field requires consideration of a much broader array of properties, including performance, mechanical strength, viscosity, stability, sensitivity and cost, which ultimately limit the practicality of even the most promising high-performance ingredients. RIDE will adapt the energetics optimization process to enable development of new candidate ingredients in parallel with formulations using a DOE approach. Doing so will avoid costly downstream attrition due to unforeseen issues (“fail fast”) and will also identify energetics ingredient candidates that may not feature outstanding individual performance, but are effective components of a formulation.

RIDE is a four-year program divided into three phases that will be executed through two Broad Agency Announcements (BAAs). **This BAA only solicits proposals for RIDE Phases 1 and 2, the first 30 months of the 48-month program.**

During Phases 1 and 2, RIDE is divided into two separate Technical Areas (TAs) focused on building core component technologies for energetics formulation development:

TA1 Chemical Synthesis and Formulation Platforms: Develop safe, semi-automated, experimental capabilities that integrate energetics ingredient synthesis with formulation development and testing

TA2 Advanced Energetics Metrology: Develop new theoretical, experimental and/or statistical methods that enable safe, accurate evaluation of key energetics properties at reduced scale

Details of the technical scope for TA1 and TA2 is provided in Section E., Technical Area Descriptions. Note that, as described in Section E., proposers may propose to both TAs but must do so in two separate proposals. During the 18-month final phase of RIDE (not solicited under this BAA), capabilities relevant to TA1 and TA2 will be integrated to build a complete, semi-automated energetics synthesis and formulation development platform with advanced on-board metrology. Devices will be delivered to and operated at a cleared research facility for Phase 3 demonstrations.

D. Program Structure

RIDE is a four-year program divided into three phases that will be executed through two Broad Agency Announcements (BAAs). This BAA solicits proposals for RIDE Phases 1 and 2, the first 30 months of the 48-month program. DARPA anticipates releasing a second BAA during Phase 2 to solicit proposals for the final program phase. Figure 1 provides an overview of the program schedule, including the alignment of phases, TAs, system demonstrations/capability challenges and involvement of Government teams.

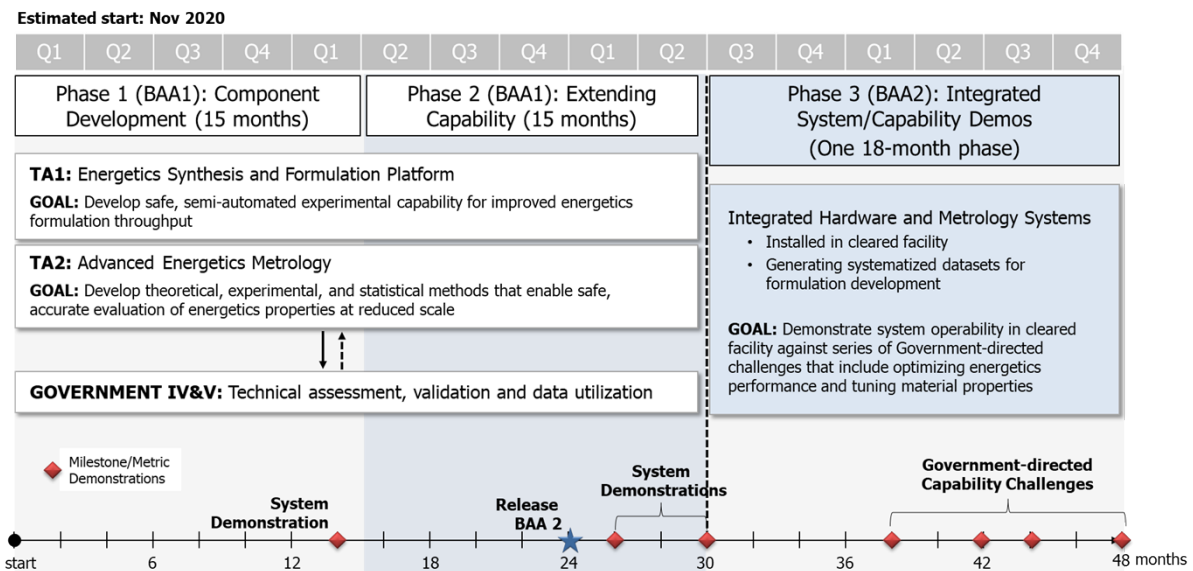


Figure 1. RIDE Program Schedule.

PHASE 1 (15 months): Phase 1 is a Base period for demonstrating proposed approaches in TA1 and TA2. During this phase, performers will develop experimental capabilities relevant for explosive formulations. At the end of Phase 1, performers will demonstrate that their approaches can produce formulations with at least three relevant ingredients for on-board and off-board

testing (TA1) and demonstrate the experimental viability and applicability of novel approaches for determining detonation properties without sufficient material for conventional detonation tests (TA2). Ingredients exploited in developing Phase 1 capabilities for both TAs will include those selected by RIDE performers and Government Independent Verification and Validation (IV&V) teams.

PHASE 2 (15 months): During Phase 2, performers will extend their capabilities to demonstrate relevance for propellant formulations, including development and/or testing of materials with at least six different ingredients. Ingredients exploited in developing Phase 2 capabilities for both TAs will include those selected by RIDE performers and Government IV&V teams. At the end of Phase 2, DARPA anticipates that TA1 and TA2 performers will provide both component-level capabilities and stand-alone systems for propellant formulation development and testing.

PHASE 3 (18 months): Phase 3 is NOT solicited in this BAA. DARPA anticipates that Phase 3 will entail full integration of experimental components, systems, tools and approaches that address TA1 and TA2 capabilities in a single system or systems. Performers in Phase 3 will deliver an integrated, optimized semi-automated chemical synthesis and formulation development platform with on-board advanced energetics metrology capabilities. Delivery and demonstration of the device is expected to be carried out at a cleared facility. As such, DARPA anticipates Phase 3 will be restricted to performers eligible for a U.S. SECRET security clearance. DARPA anticipates that the BAA for Phase 3 will be released on or about Month 24 of the RIDE program.

TA1 and TA2 performance will be assessed independently during Phases 1 and 2. However, DARPA will continue to assess component and system compatibility across TAs, as well as novel approaches that are developed outside of RIDE, in developing plans for Phase 3.

GOVERNMENT IV&V: Government personnel will serve as technical advisors and IV&V partners throughout the program, providing DARPA an assessment of performer capabilities and also validating experimental data and/or system performance. Performers will be expected to work openly and regularly with DARPA and designated Government IV&V teams throughout the program. Performers will be required to provide details of their systems, including but not limited to engineering drawings, operating methods and instructions, software, datasets and samples to DARPA and/or any designated Government IV&V member or organization upon request. **Proposals should include a task to reflect interaction with government teams and delivery of requested information, data, hardware, software and materials; the details of the work arrangement will be defined as the program proceeds.** This BAA does *NOT* solicit Government IV&V participation. Government personnel interested in learning more about RIDE or potentially participating in IV&V activities should contact DARPA at RIDE@darpa.mil.

As noted, this BAA only solicits TA1 and TA2 proposals for RIDE Phases 1 and 2. Proposals should include a schedule, Statement of Work, and cost volume for a Base (Phase 1) and Option (Phase 2). Proposers may apply to both TAs, but must do so in two separate proposals; proposed approaches to TA1 and TA2 may not be dependent on one another. Proposals should *NOT* address Phase 3. Performance will be evaluated throughout the program with respect to progress towards meeting the milestones (i.e., System Demonstrations) that are indicated in Figure 1 and associated metrics defined in Table 1 (TA1) and Table 2 (TA2) below. In addition to metrics

provided in Table 2, proposers to TA2 should include additional metrics and milestones specific to their particular technical approach and target properties. Metrics should address quantitative targets (e.g., key energetics figures of merit, measurement rate(s), reproducibility assessment, formulation type/amount, etc.), not just qualitative objectives. In addition to providing technical justification for the proposed approach and its potential applicability to RIDE goals, proposals to TA1 and TA2 should also clearly define limitations of the methodology.

E. Technical Area Descriptions

RIDE Phases 1 and 2 are comprised of two independent TAs: TA1 (Chemical Synthesis and Formulation Platforms) and TA2 (Advanced Energetics Metrology). Proposers may propose to both TAs, but must do so in two separate proposals.

TA1 Chemical Synthesis and Formulation Platforms

TA1 performers will develop the core, semi-automated hardware platforms for energetics chemical synthesis and formulation development and testing. Proposals should describe a complete system that allows for systematized production, processing and testing of energetics formulations, including, for example, integration of multiple ingredients relevant for energetics formulations, on-board formulation processing via mixing, heating and cooling of materials with a wide range of properties (e.g., viscosity, vapor pressure, stability) and associated property tests. The examples noted here are not all inclusive; proposers should clearly define their envisaged system, its capabilities to enable the RIDE goals and its limitations. Proposals should include a thorough plan for constructing and demonstrating the capability that clearly defines how the goals and metrics of RIDE will be met.

Proposed systems should accommodate a wide range of material inputs, including all standard energetics ingredients, binders, inorganic additives and plasticizers as well as relevant molecular precursors. The systems should include synthesis, purification, processing and formulation capabilities consistent with producing finished samples of formulated energetics for testing. On-board characterization and testing should be included. Automation of these capabilities is encouraged, although some manual steps are expected. Use of off-the-shelf components is advisable when available. The system is envisioned as a table-top or hood-enclosed device; however, additional ancillary analytical systems or pumps may be included. The entire final system must be physically housed in a single laboratory room, though capabilities for remote operation of automated components are encouraged.

Proposers should not be constrained by current practice in energetics research. Unconventional equipment and/or approaches (e.g., types of reactors, mixers, test apparatuses, synthetic approaches, etc.) that offer improved process automation and safety are encouraged. DARPA is not specifying the types of equipment that must be included in the system; rather, proposers should determine what is most broadly applicable to be efficient and effective at achieving the RIDE goals to develop, process, test and validate both explosives and propellants formulations.

Proposers should specify and justify the scale and throughput at which their system will produce samples. RIDE experimental capabilities are not intended to be high-throughput screening tools; rather, they are intended to build capabilities that enable a systematic DOE approach to high-

performance energetics formulation development. To accommodate this approach, both commercial and custom components must have clearly defined operating ranges that encompass a broad design space applicable to the targets of interest. As an example, consider that while energetics formulations comprise a few ingredients with mass fractions >10%, propellants often require precise addition of additives at part-per-thousand level.

On-board synthesis capabilities are not intended for common reagents that can be easily purchased, nor for complex organic transformations that require a specialized apparatus for uncommon reaction sequences. Instead, DARPA anticipates approaches that enable common, energetics-relevant transformations on the platform that are broadly applicable and, as such, provide value for a wide range of energetics materials. Specialized chemistry may be performed off-line using traditional laboratory procedures and then transferred to the system for subsequent processing (e.g., nitration or oxidation). Proposals must include a clear description and justification of what synthetic capabilities and methods will be integrated on the system as well as what will be required/anticipated for off-line development.

Purification, processing and formulation capabilities should conform to a common workflow and include relevant analytical tools that enable robust characterization of ingredients and formulated samples. For example, if continuous crystallization is employed for purification, the system should be able to characterize and process different types of crystals. A different purification strategy might necessitate different characterization techniques. Proposed systems should strive to provide maximum experimental flexibility with a minimum number of components.

On-board testing is intended to provide rapid assessment of ingredients as they are introduced to the system as well as DOE-based assessment of formulated samples that can be tied back to ingredients and processing conditions. Some common formulation tests might include drop hammer, flame test or calorimetry. Approaches do not need to replicate standard test methods but should instead focus on developing and integrating capabilities that enable systematic and efficient data collection of key energetics formulation figures of merit. Performers must detail the tests that will be included on-board the device and provide technical justification for the method(s) and the data that will be generated. Performers are also encouraged to incorporate capabilities relevant for energetics qualification, such as the ability for accelerated lifetime studies. Systems should be able to scale and produce samples for conducting traditional testing, including detonation, offline. This can be done in many different ways, for example, running several batches of a particular formulation design to scale the amount of material produced.

It is critical that these systems integrate with modeling and testing components. For this reason experimental systems should provide the data from synthesis monitoring (e.g., NMR, IR, MS), formulation characterization (e.g., particle size, XRD, rheology) and on-board testing in a standardized format.

System demonstrations at 14 and 26 months (Figure 1 above and Table 1 below) will provide critical assessment points for DARPA and the Government IV&V teams (see section I.F. below). Proposals should suggest ingredients on which systems will be developed, tested and validated and justify why these will demonstrate platform capability and flexibility toward developing high-performance explosives and propellants. Government teams may also provide specific

material requirements during the program on which system performance will be tested and/or validated. DARPA may modify the parameters of the demonstration during the course of the program in response to either technical progress or performer requirements.

Table 1. TA1 milestones and metrics

Phase 1: Month 14 Demonstration	Phase 2: Month 26 Demonstration
<p>Produce Explosive Formulations: Automated integration of ≥ 3 ingredients; scale of ≥ 10 g per formulation</p> <p>System Versatility: Select between ≥ 9 ingredients, including inline verification of ingredient purity; < 24 h between finished samples</p> <p>System Reproducibility: On-board sensitivity and one additional characterization test; $< 10\%$ variability; 5 replicates</p> <p>Scalability and System Validation with Conventional Tests: Produce ≥ 50 g samples for off-board tests; ≥ 2 tests within 20% known value</p>	<p>Produce Propellant Formulations: Automated integration of ≥ 6 ingredients; scale of ≥ 25 g per formulation</p> <p>System Versatility: Select between ≥ 15 ingredients, including metallic particles (5–250 μm); < 24 h between finished samples</p> <p>System Reproducibility: On-board sensitivity and three additional characterization tests; $< 5\%$ variability; 5 replicates</p> <p>Scalability and System Validation with Conventional Tests: Produce ≥ 500 g samples for off-board testing; ≥ 4 tests within 10% known value</p>

TA2 Advanced Energetics Metrology

Performers in TA2 will develop new approaches to generate key energetics performance data faster, using less material (10-100x), while maintaining comparable accuracy to industry standard measurements. Approaches may rely exclusively on direct measurement of performance parameters using experimental configurations that dramatically reduce the amount of sample required, or they may develop and/or incorporate proxy measurements that are statistically demonstrated (during the course of the program) to correlate with the desired property. Approaches may consist of multiple measurements; however, each developed method will be evaluated on its overall resource (e.g., time and material) requirements as well as its reproducibility and accuracy relative to accepted values. Computational approaches and those requiring model training will be considered as long as they can be applied successfully to unknown and novel samples. DARPA is most interested in tests that do not rely *a priori* on structural or composition information, but rather can directly analyze an unknown sample.

Unlike TA1, which will build operational chemical synthesis and formulation platforms primarily from cutting-edge but proven technologies, TA2 is exploratory and is anticipated to include effort dedicated to developing, testing and validating proposed strategies, as well as understanding the underlying science and theory. Proposals should carefully describe the reasoning behind the proposed approach(es), including underlying assumptions and a plan to both demonstrate the strategy and implement it for testing energetics formulations.

In Phase 1, TA2 is focused on explosive properties including critical diameter, detonation velocity and gurney energy. These three parameters can be predicted to varying degrees using current models; however, measuring them requires at least grams of material. The ability to analytically determine their values using small samples (mg or less) would not only enable rapid

screening of new energetics molecules, but also provide a “snapshot” of the material that covers initiation, propagation of the shock wave and its effect on a metal target. DARPA is most interested in developing one or more effective property measurement capabilities at small scale, but encourages approaches that include capabilities for multiple properties. Proposals should clearly define the target explosive properties for the proposed methodology and detail limitations on extension across other relevant properties. Proposals should also suggest explosive formulation compositions on which systems will be developed, tested and validated and justify why these will demonstrate advanced energetics metrology capabilities. Government IV&V teams may also provide specific material requirements during the program on which system performance will be tested and/or validated.

In Phase 2, TA2 is focused on advancing tests for explosives and addressing propellant properties including burn rate and specific impulse. The complexity of propellant formulations and of deflagration processes makes current models for these parameters less reliable than those for explosives. Furthermore, current tests often use hundreds of grams of material. Approaches from Phase 1 may be modified to address propellant properties or a separate approach may be proposed. Proposals should clearly define the target propellant properties for the proposed methodology and detail limitations on extension across other relevant properties. Proposals should also suggest propellant formulation compositions on which systems will be developed, tested and validated and justify why these will demonstrate advanced energetics metrology capabilities. Government IV&V teams may also provide specific material requirements during the program on which system performance will be tested and/or validated.

Table 2: TA2 milestones and metrics

Phase 1 (Base): Month 14 Demonstration	Phase 2 (Option): Month 26 Demonstration
<p>Break Current Measurement Barrier: Determine critical diameter using sub-critical diameter quantities with $\leq 20\%$ error</p> <p>Demonstrate Accuracy (Explosives): Determine detonation velocity and gurney energy using ≤ 10 g sample with $\leq 5\%$ error</p>	<p>Discover Novel Property Correlations: Predict insensitive munition response using small scale sensitivity data with $> 80\%$ accuracy</p> <p>Demonstrate Accuracy (Propellants): Determine specific impulse using ≤ 25 g and burn rate ≤ 5 g sample with $\leq 5\%$ error</p>

System demonstrations at 14 and 26 months (Figure 1 and Table 2, above) will provide critical assessment points for DARPA and the Government IV&V teams (see section I.F. below). Based on technical progress and partner requirements, DARPA will provide a set of known energetics material requirements on which to demonstrate the approach, both during the program and for the final demonstrations. Approaches will be evaluated relative to factors such as accuracy, reproducibility, ease of implementation, safety and the time and material savings relative to tests commonly employed by the energetics research community. Time required for sample preparation, data processing and resetting the experiment should all be considered. DARPA may modify the parameters of the demonstration during the course of the program in response to either technical progress or performer requirements.

Depending on the approach, more effort may be dedicated to developing either the experimental apparatus or to building and demonstrating models. Note that proposals must include scope for experimental validation and demonstration on novel samples, both as defined by performers as

the capability matures and by Government IV&V teams. Proposals that only propose to work from existing data will not be considered.

It is critical that all TA2 methods can ultimately be integrated into experimental systems such as those developed under TA1. While the footprint of the test is not specified, it must be self-contained such that it could be readily integrated into a laboratory workflow. In addition, data produced by these tests should be available in standard, common formats (both preprocessed measurements as well as the final energetics property values).

F. Schedule/Milestones

Proposers should provide a technical and programmatic strategy that conforms to the entire program schedule for Phases 1 and 2, the first 30 months of the RIDE program. Proposals should present an aggressive plan to fully address program goals, metrics, milestones and deliverables. The task structure must be consistent across the proposed schedule, Statement of Work (SOW) and cost volume. Schedules will be synchronized across performers, as required, and monitored/revised as necessary throughout the program. A start date of November 2020 may be assumed for planning purposes.

Performers should plan for demonstrations in months 14 and 26 that meet the metrics and specifications for each TA (see section I.E. above). There will also be a comprehensive demonstration in month 30 of all work completed in Phases 1 and 2. This demonstration will target the same metrics but utilize novel energetics materials (i.e., those under development by performers or requested by Government IV&V partners).

All proposals must include the following meetings and travel in the proposed schedule and costs:

- To continue integration and development between TAs, foster collaboration between teams and disseminate program developments, a two-day Principal Investigator (PI) meeting will be held approximately every six months in Arlington, VA. For budgeting purposes, plan for five two-day meetings over the course of 30 months.
- Regular teleconference meetings will be scheduled with DARPA and the Government IV&V team for progress reporting as well as identification and mitigation of technical and programmatic challenges. Proposers should also anticipate at least one site visit per phase by the DARPA Program Manager and/or Government IV&V team during which performers should provide laboratory tours and demonstrations that illustrate progress toward agreed-upon milestones and metrics.

G. Deliverables

Performers are expected to provide at a minimum the following deliverables, regardless of TA:

- Comprehensive quarterly technical reports due within ten days of the end of the given quarter, describing progress made on the specific milestones and metrics as laid out in the SOW.
- A phase completion report submitted within 30 days of the end of each phase, summarizing the research done and progress made on the specific milestones and metrics as laid out in the SOW.

- Hardware and software as requested that may include engineering drawings, operating methods and instructions, software, datasets, material samples and/or entire developed experimental capabilities (e.g., operational chemical synthesis and formulation development platform and/or full experimental advanced energetics metrology system).
- Other negotiated deliverables specific to the objectives of the individual efforts. These may include registered reports, experimental protocols, publications, data management plan, intermediate and final versions of software libraries, code, and APIs, including documentation and user manuals, and/or a comprehensive assemblage of design documents, models, modeling data and results, and model validation data.
- Reporting as outlined in Section VI.C.

H. Other Program Objectives and Considerations

1. Collaboration

Throughout the course of the program, performers from both TAs will be required to share detailed information about their project with DARPA and the Government IV&V team. In addition, given the intended integration of components, capabilities and/or systems toward the RIDE Phase 3 goals, performers will be encouraged to share relevant details of their capabilities with other RIDE teams. Proposers should carefully review the goals for the entire program in order to fully understand the context of each program objective and TA within the overall program structure.

2. Intellectual Property

A key goal of RIDE is to create tools that can be readily used by Government partners and integrated with existing experimental systems and, potentially, those being developed by other performers. This includes the ability to easily add, remove, substitute and modify software and hardware components. Therefore, DARPA anticipates that all noncommercial software (including source code), software documentation, hardware designs and documentation, experimental hardware and technical data generated by the program may be requested as deliverables to the Government with a minimum of Government Purpose Rights (GPR), as lesser rights may adversely impact the lifecycle costs of affected items, components or processes.

II. Award Information

A. General Award Information

DARPA anticipates multiple awards. The level of funding for individual awards made under this BAA will depend on the quality of the proposals received and the availability of funds. Awards will be made to proposers² whose proposals are determined to be the most advantageous to the Government, all evaluation factors considered. See Section V for further information.

² As used throughout this BAA, “proposer” refers to the lead organization on a submission to this BAA. The proposer is responsible for ensuring that all information required by a BAA--from all team members--is submitted in accordance with the BAA. “Awardee” refers to anyone who might receive a prime award from the Government, including recipients of procurement contracts, cooperative agreements, or Other Transactions. “Subawardee” refers to anyone who might receive a subaward from a prime awardee (e.g., subawardee, consultant, etc.).

The Government reserves the right to:

- select for negotiation all, some, one, or none of the proposals received in response to this solicitation;
- make awards without discussions with proposers;
- conduct discussions with proposers if it is later determined to be necessary;
- segregate portions of resulting awards into pre-priced options;
- accept proposals in their entirety or to select only portions of proposals for award;
- fund awards in increments with options for continued work at the end of one or more phases;
- request additional documentation once the award instrument has been determined (e.g., representations and certifications); and
- remove proposers from award consideration should the parties fail to reach agreement on award terms within a reasonable time or the proposer fails to provide requested additional information in a timely manner.

Proposals identified for negotiation may result in a procurement contract, cooperative agreement, or other transaction (OT), depending upon the nature of the work proposed, the required degree of interaction between parties, and other factors.

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

In accordance with 10 U.S.C. § 2371b(f), the Government may award a follow-on production contract or Other Transaction (OT) for any OT awarded under this BAA if: (1) that participant in the OT, or a recognized successor in interest to the OT, successfully completed the entire prototype project provided for in the OT, as modified; and (2) the OT provides for the award of a follow-on production contract or OT to the participant, or a recognized successor in interest to the OT.

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

B. Fundamental Research

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

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

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

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

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

III. Eligibility Information

A. Eligible Applicants

All responsible sources capable of satisfying the Government's needs may submit a proposal DARPA’s consideration.

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

a. FFRDCs

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

b. Government Entities

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

c. Authority and Eligibility

At the present time, DARPA does not consider 15 U.S.C. § 3710a to be sufficient legal authority to show eligibility. While 10 U.S.C. § 2539b may be the appropriate statutory starting point for some entities, specific supporting regulatory guidance, together with evidence of agency approval, will still be required to fully establish eligibility. DARPA will consider FFRDC and Government Entity eligibility submissions on a case-by-case basis; however, the burden to prove eligibility for all team members rests solely with the proposer.

2. Foreign Participation

Non-U.S. organizations and/or individuals may participate to the extent that such participants comply with any necessary nondisclosure agreements, security regulations, export control laws, and other governing statutes applicable under the circumstances. For classified submissions, this includes mitigating any Foreign Ownership Control and Influence (FOCI) issues prior to transmitting the submission to DARPA. Additional information on these subjects can be found at <https://www.dcsa.mil/mc/ctp/foci/>.

B. Organizational Conflicts of Interest

FAR 9.5 Requirements

In accordance with FAR 9.5, proposers are required to identify and disclose all facts relevant to potential OCIs involving the proposer's organization and *any* proposed team member (subawardee, consultant). Under this Section, the proposer is responsible for providing this disclosure with each proposal submitted to the BAA. The disclosure must include the proposer's, and as applicable, proposed team member's OCI mitigation plan. The OCI mitigation plan must include a description of the actions the proposer has taken, or intends to take, to prevent the existence of conflicting roles that might bias the proposer's judgment and to prevent the proposer

from having unfair competitive advantage. The OCI mitigation plan will specifically discuss the disclosed OCI in the context of each of the OCI limitations outlined in FAR 9.505-1 through FAR 9.505-4.

Agency Supplemental OCI Policy

In addition, DARPA has a supplemental OCI policy that prohibits contractors/performers from concurrently providing Scientific Engineering Technical Assistance (SETA), Advisory and Assistance Services (A&AS) or similar support services and being a technical performer. Therefore, as part of the FAR 9.5 disclosure requirement above, a proposer must affirm whether the proposer or *any* proposed team member (subawardee, consultant) is providing SETA, A&AS, or similar support to any DARPA office(s) under: (a) a current award or subaward; or (b) a past award or subaward that ended within one calendar year prior to the proposal's submission date.

If SETA, A&AS, or similar support is being or was provided to any DARPA office(s), the proposal must include:

- The name of the DARPA office receiving the support;
- The prime contract number;
- Identification of proposed team member (subawardee, consultant) providing the support; and
- An OCI mitigation plan in accordance with FAR 9.5.

Government Procedures

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

The Government may require proposers to provide additional information to assist the Government in evaluating the proposer's OCI mitigation plan.

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

Include any OCIs affirmations and disclosures in Attachment G Proposal Template Vol. 3-Admin and National Policy Requirements.

C. Cost Sharing/Matching

Cost sharing is not required; however, it will be carefully considered where there is an applicable statutory condition relating to the selected funding instrument (e.g., OTs under the authority of 10 U.S.C. § 2371). 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>.

D. Other Eligibility Requirements

1. Ability to Support Classified Development

DARPA anticipates that efforts in RIDE Phases 1 and 2 will be unclassified. As such, proposers are not required to hold or obtain security clearances prior to proposal submission. However, it is possible that some approaches and/or experimental outcomes may require classification. Therefore, while DoD security clearances are not required for RIDE Phases 1 and 2, proposers who believe their proposed research may be classified should identify proposed personnel with current clearances (if any) as well as identify if the prime proposer has a current Facility Clearance (FCL). Additionally, proposers should describe the willingness of their company to be submitted for, and maintain eligibility for a SECRET FCL and security clearances in accordance with DoD Manual 5200.02, Procedures for the DoD Personnel Security Program (PSP), and DoD 5220.22-M, National Industrial Security Program Operating Manual. Proposers should provide their CAGE code and security point(s) of contact in their proposals.

IV. 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 RIDE 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 areas described herein.
- The proposed concept is important to DSO'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 RIDE BAA as defined above may be deemed non-conforming³ 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-

³ "Conforming" is defined as having been submitted in accordance with the requirements outlined herein.

conforming and removed from consideration. Proposers will be notified of non-conforming determinations via letter.

A. Address to Request Application Package

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

B. Content and Form of Application Submission

1. 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?
- How is it done today, and what are the limitations?
- Who will care and what will the impact be if the work is successful?
- How much will it cost, and how long will it take?

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.

- **Abstract Format**

All proposers are required to use Attachment A: Abstract Summary Slide Template and Attachment B: Abstract Template provided to this solicitation on <https://beta.sam.gov/> and <http://www.grants.gov/>. Attachment A Abstract Summary Slide Template described herein must be in .ppt or .pptx format and should be attached as a separate file to this document.

2. Full Proposal Information

Proposals consist of Volume 1: Technical and Management Volume, Volume 2: Cost Volume, and Volume 3: Administrative and National Policy Requirements Volume).

To assist in proposal development, various attachments have been provided along with the BAA posted on <https://beta.sam.gov/> (Attachment C: Proposal Summary Slide Template, Attachment D: Proposal Template Volume 1 Technical & Management Volume, Attachment E: Proposal Template Volume 2 Cost Volume, Attachment F: Cost Proposal Template and Attachment G: Proposal Template Volume 3 Administrative & National Policy Requirements Volume).

Full proposals requesting a procurement contract or other transaction (OT) must use the following attachments:

- Attachment C
- Attachment D
- Attachment E
- Attachment F
- Attachment G

Full proposals requesting a cooperative agreement must use the following attachments in addition to the Grants.gov application package:

- Attachment C
- Attachment D
- Attachment F
- Attachment G

*Note – Budget Justification should be provided as Section L of the SF 424 Research & Related Budget form provided via Grants.gov. The Budget Justification should include the following information for the recipient and all subawardees: (1) Direct Labor: Detail the total number of persons and their level of commitment for each position listed (in sections A and B), as well as which specific tasks (as described in the SOW) they will support. (2) Equipment (section C) Provide an explanation for listed requested equipment exceeding \$5,000, properly justifying their need to meet the objectives of the program. (3) Travel (section D) Provide the purpose of the trip, number of trips, number of days per trip, departure and arrival destinations, number of people, etc. (4) Other Direct Costs (section F). Provide a justification for the items requested and an explanation of how the estimates were obtained.

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

- **Full Proposal Format**

All proposers are required to use the templates provided as attachments to this solicitation on <https://beta.sam.gov/> and <http://www.grants.gov>. Formatting instructions are provided therein.

3. 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” or “Company Proprietary.” NOTE: “Confidential” is a classification marking used to control the dissemination of U.S. Government National Security Information as dictated in Executive Order 13526 and should not be used to identify proprietary business information. See Section V.B.1 for additional information.

4. Security Information

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 DARPA/DSO Program Security Officer (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.

C. Submission Dates and Times

Proposers are warned that submission deadlines as outlined herein are in Eastern Time and will be strictly enforced. When planning a response to this solicitation, proposers should take into account that some parts of the submission process may take from one business day to one month to complete (e.g., registering for a Data Universal Numbering System (DUNS) number or Taxpayer Identification Number (TIN)).

DARPA will acknowledge receipt of *complete* submissions via email and assign identifying numbers that should be used in all further correspondence regarding those submissions. If no confirmation is received within two business days, please contact the BAA Administrator at RIDE@darpa.mil to verify receipt.

1. Abstracts

Abstracts must be submitted per the instructions outlined herein *and received by DARPA* no later than the due date and time listed in Part One: Overview Information. Abstracts received after this time and date may not be reviewed.

2. Full Proposals

Full proposal packages--full proposal (Volume 1: Technical and Management Volume, Volume 2: Cost Volume, and Volume 3: Administrative and National Policy Requirements Volume) and, as applicable, proprietary subawardee cost proposals, classified appendices to unclassified proposals – must be submitted per the instructions outlined herein *and received by DARPA* no later than the due date and time listed in Part One: Overview Information. Proposals received after this time and date may not be reviewed.

D. Funding Restrictions

Not applicable.

E. Other Submission Requirements

Unclassified Submission Instructions

Proposers must submit all parts of their submission package using the same method; submissions cannot be sent in part by one method and in part by another method nor should duplicate submissions be sent by multiple methods. Email submissions will not be accepted. Failure to comply with the submission procedures outlined herein may result in the submission being deemed non-conforming and withdrawn from consideration.

a. Abstracts

DARPA/DSO will employ an electronic upload submission system (<https://baa.darpa.mil/>) for all UNCLASSIFIED abstracts sent in response to this solicitation. *Abstracts must not be submitted via Grants.gov.*

First time users of the DARPA BAA Submission website must complete a two-step account creation process. The first step consists of registering for an extranet account by going to the URL listed above and selecting the “Account Request” link. Upon completion of the online form, proposers will receive two separate emails; one will contain a user name and the second will provide a temporary password. Once both emails have been received, the second step requires proposers to go back to the submission website and log in using that user name and password. After accessing the extranet, proposers may then create a user account for the DARPA BAA Submission website by selecting the “Register your Organization” link at the top of the page. Once the user account is created, proposers will be able to see a list of solicitations open for submissions, view submission instructions, and upload/finalize their abstract.

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

All abstracts submitted electronically through the DARPA BAA Submission website must meet the following requirements: (1) uploaded as a zip file (.zip or .zipx extension); (2) only contain the document(s) requested herein; (3) only contain unclassified information; and (4) must not exceed 100 MB in size. Only one zip file will be accepted per abstract and abstracts not uploaded as zip files will be rejected by DARPA.

Technical support for the DARPA BAA Submission website is available during regular business hours, Monday – Friday, 9:00 a.m. – 5:00 p.m. Requests for technical support must be emailed to BAAT_Support@darpa.mil with a copy to RIDE@darpa.mil. Questions regarding submission contents, format, deadlines, etc. should be emailed to RIDE@darpa.mil. Questions/requests for support sent to any other email address may result in delayed/no response.

Since proposers may encounter heavy traffic on the web server, DARPA discourages waiting

until the day abstracts are due to request an account and/or upload the submission.

Note: Proposers submitting an abstract via the DARPA BAA Submission site MUST (1) click the “Finalize” button in order for the submission to upload AND (2) do so with sufficient time for the upload to complete prior to the deadline. Failure to do so will result in a late submission.

b. Proposals Requesting a Procurement Contract or Other Transaction

Proposers requesting procurement contracts or other transactions may submit full proposals through ONE of the following methods: (1) electronic upload (DARPA-preferred); or (2) direct mail/hand-carry.

i. Electronic Upload

DARPA/DSO encourages proposers to submit UNCLASSIFIED proposals via the DARPA BAA Submission website at <https://baa.darpa.mil/>.

First time users of the DARPA BAA Submission website must complete a two-step account creation process. The first step consists of registering for an extranet account by going to the URL listed above and selecting the “Account Request” link. Upon completion of the online form, proposers will receive two separate emails; one will contain a user name and the second will provide a temporary password. Once both emails have been received, the second step requires proposers to go back to the submission website and log in using that user name and password. After accessing the extranet, proposers may then create a user account for the DARPA BAA Submission website by selecting the “Register your Organization” link at the top of the page. Once the user account is created, proposers will be able to see a list of solicitations open for submissions, view submission instructions, and upload/finalize their proposal.

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

All full proposals submitted electronically through the DARPA BAA Submission website must meet the following requirements: (1) uploaded as a zip file (.zip or .zipx extension); (2) only contain the document(s) requested herein; (3) only contain unclassified information; and (4) must not exceed 100 MB in size. Only one zip file will be accepted per full proposal and full proposals not uploaded as zip files will be rejected by DARPA.

Technical support for the DARPA BAA Submission website is available during regular business hours, Monday – Friday, 9:00 a.m. – 5:00 p.m. Requests for technical support must be emailed to BAAT_Support@darpa.mil with a copy to RIDE@darpa.mil. Questions regarding submission contents, format, deadlines, etc. should be emailed to RIDE@darpa.mil. Questions/requests for support sent to any other email address may result in delayed/no response.

Since proposers may encounter heavy traffic on the web server, DARPA discourages waiting until the day proposals are due to request an account and/or upload the submission. Note: Proposers submitting a proposal via the DARPA BAA Submission site MUST (1) click the

“Finalize” button in order for the submission to upload AND (2) do so with sufficient time for the upload to complete prior to the deadline. Failure to do so will result in a late submission.

ii. Direct Mail/Hand-carry

Proposers electing to submit procurement contract or other transaction proposals via direct mail or hand-carried must provide one paper copy and one electronic copy on CD or DVD of the full proposal package. All parts of the proposal package must be mailed or hand-carried in a single delivery to the address noted in Section VII below.

c. Proposals Requesting a Cooperative Agreement

Proposers requesting cooperative agreements may only submit proposals through ONE of the following methods: (1) electronic upload at Grants.gov (DARPA-preferred); or (2) direct mail/hand-carry to DARPA.

To evaluate compliance with Title IX of the Education Amendments of 1972 {20 U.S.C. A§ 1681 Et. Seq.}, the Department of Defense is collecting certain demographic and career information to be able to assess the success rates of women who are proposed for key roles in applications in STEM disciplines. To enable this assessment, each application must include the two following forms completed as instructed: the Research and Related Senior/Key Person Profile (Expanded) form and the Research and Related Personal Data form. Both forms are provided with the application package in Grants.gov.

i. Electronic Upload

DARPA encourages cooperative agreement proposers to submit their proposals via electronic upload at <http://www.grants.gov/web/grants/applicants/apply-for-grants.html>. Proposers electing to use this method must complete a one-time registration process on Grants.gov before a proposal can be electronically submitted. *If proposers have not previously registered, this process can take up to four weeks so registration should be done in sufficient time to ensure it does not impact a proposer’s ability to meet required submission deadlines.* Registration requirements and instructions are outlined at <http://www.grants.gov/web/grants/register.html>.

Carefully follow the DARPA submission instructions provided with the solicitation application package on Grants.gov. Only the required forms listed therein (e.g., SF-424 and Attachments form) should be included in the submission. *Note: Grants.gov does not accept zipped or encrypted proposals.*

Once Grants.gov has received an uploaded proposal submission, Grants.gov will send two email messages to notify proposers that: (1) the proposal has been received by Grants.gov; and (2) the proposal has been either validated or rejected by the system. *It may take up to two business days to receive these emails.* If the proposal is validated, then the proposer has successfully submitted their proposal. If the proposal is rejected, the submission must be corrected, resubmitted and revalidated before DARPA can retrieve it. If the solicitation is no longer open, the rejected proposal cannot be resubmitted. Once the proposal is retrieved by DARPA, Grants.gov will send a third email to notify the proposer. DARPA will send a final confirmation email as described in

Section IV.C.

To avoid missing deadlines, Grants.gov recommends that proposers submit their proposals to Grants.gov 24-48 hours in advance of the proposal due date to provide sufficient time to complete the registration and submission process, receive email notifications and correct errors, as applicable.

Technical support for Grants.gov submissions may be reached at 1-800-518-4726 or support@grants.gov.

ii. Direct Mail/Hand-carry

Proposers electing to submit cooperative agreement proposals via direct mail or hand-carried must provide one paper copy and one electronic copy on CD or DVD of the full proposal package. Proposers must complete the SF 424 R&R form (Application for Federal Assistance, Research and Related) provided at Grants.gov as part of the opportunity application package for this BAA and include it in the proposal submission. All parts of the proposal package must be mailed or hand-carried to the address noted in Section VII below.

V. Application Review Information

A. Evaluation Criteria

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

- **Overall Scientific and Technical Merit**

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

The proposed technical team has the expertise and experience to accomplish the proposed tasks. Task descriptions and associated technical elements provided are complete and in a logical sequence with all proposed deliverables clearly defined such that a final outcome that achieves the goal can be expected as a result of award. The proposal identifies major technical risks and planned mitigation efforts are clearly defined and feasible. The proposed schedule aggressively pursues performance metrics in an efficient time frame that accurately accounts for the anticipated workload.

- **Potential Contribution and Relevance to the DARPA Mission**

The potential contributions of the proposed effort bolster the national security technology base, and support DARPA's mission to make pivotal early technology investments that create or prevent technological surprise. The proposed intellectual property restrictions (if any) will not significantly impact the Government's ability to transition the technology.

- **Cost Realism**

The proposed costs are realistic for the technical and management approach and accurately reflect the technical goals and objectives of the solicitation. The proposed costs are consistent

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

B. Review and Selection Process

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.

The review process identifies proposals that meet the evaluation criteria described above and are, therefore, selectable for negotiation of awards by the Government. DARPA policy is to ensure impartial, equitable, comprehensive proposal evaluations and to select proposals that meet DARPA technical, policy, and programmatic goals. Proposals that are determined selectable will not necessarily receive awards (see Section II). Selections may be made at any time during the period of solicitation. For evaluation purposes, a proposal is defined to be the document and supporting materials as described in Section IV.

• Handling of Source Selection Information

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

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 via email to the BAA mailbox, provided the formal request is received within 5 days after being notified of submission status.

C. Federal Awardee Performance and Integrity Information (FAPIIS)

Following the review and selection process described above, but prior to making an award above

the simplified acquisition threshold (FAR 2.101), DARPA is required⁴ to review and consider any information available through the designated integrity and performance system (currently FAPIIS). Selectees have the opportunity to comment on any information about themselves entered in the database. DARPA will consider any comments and other information in FAPIIS or other systems prior to making an award.

VI. Award Administration Information

A. Selection Notices

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

B. Administrative and National Policy Requirements

1. Solicitation Provisions and Award Clauses, Terms and Conditions

Solicitation provisions relevant to DARPA BAAs are listed on the Additional BAA Content page on DARPA's website at www.darpa.mil/work-with-us/additional-baa. This page also lists award clauses that, depending on their applicability, may be included in the terms and conditions of awards resultant from DARPA solicitations. This list is not exhaustive and the clauses, terms and conditions included in a resultant award will depend on the nature of the research effort, the specific award instrument, the type of awardee, and any applicable security or publication restrictions.

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

The above information serves to put potential proposers and awardees on notice of proposal requirements and award terms and conditions to which they may have to adhere.

2. System for Award Management (SAM) and Universal Identifier Requirements

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

⁴ Per 41 U.S.C. 2313, as implemented by FAR 9.103 and 2 CFR § 200.205.

International entities can register in SAM by following the instructions in this link: https://www.fsd.gov/fsd-gov/answer.do?sysparm_kbid=dbf8053adb119344d71272131f961946&sysparm_search=KB0013221.

NOTE: new registrations can take an average of 7-10 business days to process in SAM. SAM registration requires the following information:

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

3. Representations and Certifications

In accordance with FAR 4.1102 and 4.1201, proposers requesting a procurement contract must complete electronic annual representations and certifications at <https://www.sam.gov/>. In addition, resultant procurement contracts will require supplementary DARPA-specific representations and certifications. See <http://www.darpa.mil/work-with-us/additional-baa> for further information.

4. 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 will have, at a minimum, 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.

a. Intellectual Property Representations

All proposers must provide a good faith representation of either ownership or possession of appropriate licensing rights to all other intellectual property to be used for the proposed project. Proposers must provide a short summary for each item asserted with less than unlimited rights that describes the nature of the restriction and the intended use of the intellectual property in the conduct of the proposed research.

b. Patents

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

c. Procurement Contracts

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

commercial computer software that may be included in any noncommercial deliverables contemplated under the research project, and assert any applicable restrictions on the Government's use of such commercial technical data and/or computer software. In the event a proposer does not submit the list, the Government will assume there are no restrictions on the Government's use of such commercial items. The Government may use the list during the evaluation process to evaluate the impact of any identified restrictions and may request additional information from the proposer to evaluate the proposer's assertions. Failure to provide full information may result in a determination that the proposal is non-conforming. A template for complying with this request is provided in Section IV.B.2.

d. Other Types of Awards

Proposers requesting an award instrument other than a procurement contract shall follow the applicable rules and regulations governing those award instruments, but in all cases should appropriately identify any potential restrictions on the Government's use of any intellectual property contemplated under those award instruments. This includes both noncommercial items and commercial items. The Government may use the list as part of the evaluation process to assess the impact of any identified restrictions, and may request additional information from the proposer, to evaluate the proposer's assertions. Failure to provide full information may result in a determination that the proposal is non-conforming. A template for complying with this request is provided in Section IV.B.2.

5. Program-generated Data

Data are increasingly the key product of research and engineering endeavors. To ensure the reproducibility of results and access to source data for future research, awardees will be required to maintain and deliver any data generated during award performance ("program-generated data") that is needed to accomplish these goals. Awardees shall be expected to document both the proprietary and non-proprietary products of their research to ensure the retention and potential reusability of this information. This may include:

- Raw unprocessed data, software source code and executables, build scripts, process sequence, programmatic communication and other collaboration activities;
- Data sets: rarified, experimental, test and measurement data;
- Design of experiments and simulations;
- Models or simulations (computational or mathematical);
- Recordings of various physical phenomena (including images, videos, sensor data, etc.);
- Access to and use of institutional, organizational or scientific community repositories and archives

When appropriate, DARPA may share some or all of the program-generated data with the energetics research community (with permission to access, reuse, and redistribute under appropriate licensing terms where required) to the extent permitted by applicable law and regulations (e.g., privacy, security, rights in data, and export control). DARPA plans to enable

reproducibility of results through data sharing and to establish (or contribute to) digital collections that can advance this and other scientific fields.

6. Human Subjects Research (HSR)/Animal Use

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

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

Proposers and awardees may be subject to the DoD requirements related to CUI or CTI on Non-DoD Information Systems as detailed at www.darpa.mil/work-with-us/additional-baa.

During Phases 1 and 2, performers may generate models, data, and experimental capabilities that are unclassified and may be appropriate for publication. However, RIDE may also generate models, data, and experimental capabilities closely tied to, or indicative of, energetics performance that will be protected as CUI/CTI. DARPA will make a determination if a CUI/CTI guide is necessary during the selection process and selectees will be notified of CUI/CTI guidance during contract negotiations. Proposers should indicate if they believe their approach will include CUI or CTI in their proposal.

CUI is defined as unclassified information that requires safeguarding or dissemination controls, pursuant to and consistent with applicable law, regulations, and Government-wide policies.

Controlled Technical Information (CTI) is defined as technical information with military or space application that is subject to controls on its access, use, reproduction, modification, performance, display, release, disclosure, or dissemination. The term CTI does not include information that is lawfully publicly available without restrictions.

DOD considers “technical information” to be technical data or computer software, as those terms are defined in Defense Federal Acquisition Regulation Supplement clause 252.227-7013, "Rights in Technical Data - Noncommercial Items" (48 CFR 252.227-7013). Examples of technical information include research and engineering data, engineering drawings, and associated lists, specifications, standards, process sheets, manuals, technical reports, technical orders, catalog-item identifications, data sets, studies and analyses and related information, and computer software code. Note that such technical information may or may not be controlled (i.e., CTI), depending on whether it has military or space application.

CTI is to be marked “DISTRIBUTION C. Distribution authorized to U.S. Government agencies and their contractor; Critical Technology; Current date. Other requests for this document shall be referred to DARPA, DSO” in accordance with Department of Defense Instruction 5230.24, "Distribution Statements on Technical Documents."

Proposers should provide a plan for protecting Controlled Unclassified Information that may be

generated during RIDE as part of Attachment G: Proposal Template Volume 3 Administrative & National Policy Requirements Volume.

8. Electronic Invoicing and Payments

Awardees will be required to submit invoices for payment electronically via Wide Area Work Flow (WAWF) at <https://wawf.eb.mil>, unless an exception applies. Registration in WAWF is required prior to any award under this BAA.

9. Electronic and Information Technology

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

10. Publication of Cooperative Agreement Awards

Per Section 8123 of the Department of Defense Appropriations Act, 2015 (Pub. L. 113-235), all cooperative agreements must be posted on a public website in a searchable format. To comply with this requirement, proposers requesting cooperative agreements must submit a maximum one (1) page abstract that may be publicly posted and explains the program or project to the public. The proposer should sign the bottom of the abstract confirming the information in the abstract is approved for public release. Proposers are advised to provide both a signed PDF copy, as well as an editable (e.g., Microsoft word) copy. Abstracts contained in cooperative agreement proposals that are not selected for award will not be publicly posted.

11. 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.

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.

C. Reporting

1. Technical and Financial Reports

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

2. Patent Reports and Notifications

All resultant awards will contain a mandatory requirement for patent reports and notifications to be submitted electronically through i-Edison (<https://public.era.nih.gov/iedison>).

VII. Agency Contacts

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

- **Technical POC:** Anne Fischer, Program Manager, DARPA/DSO
- **BAA Email:** RIDE@darpa.mil
- **BAA Mailing Address:**
DARPA/DSO
ATTN: HR001120S0040
675 North Randolph Street
Arlington, VA 22203-2114
- **DARPA/DSO Opportunities Website:** <http://www.darpa.mil/work-with-us/opportunities>

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

VIII. Other Information

A. Frequently Asked Questions (FAQs)

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

DARPA will attempt to answer questions in a timely manner; however, questions submitted within 10 days of the proposal due date may not be answered. DARPA will post an FAQ list at: <http://www.darpa.mil/work-with-us/opportunities>. The list will be updated on an ongoing basis until the BAA expiration date as stated in Part I.

B. Proposers Day

The RIDE Proposers Day was webcast on March 10, 2020. Viewing of the webcast was voluntary and not required to propose to this solicitation.