



# UNIVERSITY CONSORTIUM FOR APPLIED HYPERSONICS



## PROJECT CALL

**Announcement #: TEES/JHTO-RPP-2023-001**

**AMENDMENT 1 – October 4, 2023**

Project Call Release Date	July 24, 2023
Request for Project Proposal Questions Cutoff	August 7, 2023 (5:00PM EST)
Notice of Intent Deadline	September 11, 2023 (5:00PM EST)
Prototype Proposal Submission Deadline	November 1, 2023 (5:00 PM EST)
Agreement Award Notifications	February 1, 2024
Anticipated Project Start Date	May 1, 2024
Period of Performance	3 Years
Agreement Ceiling	Approximately \$500,000 per year/per award
Expected Agreement Classification	Controlled Unclassified Information

TO APPLY TO THIS PROJECT CALL, YOUR UNIVERSITY'S AUTHORIZED ORGANIZATIONAL REPRESENTATIVE WILL NEED TO HAVE AN ACCOUNT AND SUBMIT PROPOSAL DOCUMENTS THROUGH THE UNIVERSITY CONSORTIUM FOR APPLIED HYPERSONICS WEBSITE:

[HTTPS://HYPERSONICS.TAMU.EDU](https://hypersonics.tamu.edu)

PROPOSALS WILL BE RECEIVED UNTIL THE ABOVE DEADLINE. IF YOU ENCOUNTER ANY ISSUES OR CONCERNS WITH YOUR SUBMISSION, PLEASE EMAIL: [UCAH@TAMU.EDU](mailto:UCAH@TAMU.EDU). QUESTIONS REGARDING THE CONTENT OF THE REQUEST FOR PROPOSALS **SHALL** BE SUBMITTED THROUGH THE UNIVERSITY CONSORTIUM FOR APPLIED HYPERSONICS WEBSITE.





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## 1. OVERVIEW

### 1.1 GENERAL INFORMATION

#### 1.1.1 Request for Project Proposals Title

University Consortium for Applied Hypersonics (UCAH) Project Call, Announcement #: TEES/JHTO-RPP-2023-001.

#### 1.1.2 AUTHORITY

10 U.S.C. § 4022, “Authority of the Department of Defense to Carry Out Certain Prototype Projects”

#### 1.1.3 DESCRIPTION

The Office of the Under Secretary of Defense (OUSD), Research and Engineering (R&E) Joint Hypersonics Transition Office (JHTO), in partnership with Texas A&M Engineering Experiment Station (TEES) and the UCAH, is soliciting for Prototype Project Proposals (PPPs) supporting projects that will accelerate hypersonics technology development, develop the nation’s future hypersonics workforce, and facilitate the transition of ready technologies into operational capabilities. The project topic descriptions are listed in Section 2 of this document. The JHTO reserves the right to fund none, some, or all the submissions made in response to this RPP. Furthermore, JHTO may choose to fund a portion of a submission or a combination of submissions. No funding for direct reimbursement of PPP development costs will be provided. Any references within this document to the UCAH website, specific to this RPP Project Call, will utilize the following website: <https://hypersonics.tamu.edu/project-call/>.

#### 1.1.4 PERIOD OF PERFORMANCE

Three years from the agreement award date with an anticipated start date of May 1, 2024.

#### 1.1.5 ESTIMATED PROJECT CEILING

Each Project Sub-Agreement (PSA) will be approximately \$500,000 per year.

#### 1.1.6 CANDIDATE ELIGIBILITY

Candidate must be a University Consortium Member prior to submitting a Notice of Intent (NOI), as described in Section 3.3.1 of this document. **All personnel supporting the proposal shall be approved participants prior to award.** All Awardees shall maintain their Consortium Membership, in good standing, for the duration of the PSA.

Affiliate Consortium Members are not eligible to respond to this RPP as the lead institution, but may team with an eligible University Consortium Member and be funded accordingly. Affiliate Consortium Members include industry, laboratories, University-Affiliated Research Centers (UARCs), and Federally Funded Research and Development Centers (FFRDCs), U.S. Military Academies, and Universities (on a case-by-case basis) from Australia, Canada, New Zealand, and the United Kingdom. University Consortium Candidates and team members are generally responsible for determining the extent to which their participation in PPP submissions is appropriate and consistent with their own entities’ authorities and applicable laws, regulations, and policies. Submissions including an FFRDC, however, must include a statement from the FFRDC representing (1) that their participation in the competition is consistent with federal law and policy as well as their governing contract(s) (2) the rationale under which they are able participate in the competition given restrictions on FFRDCs competing with the private sector.

Candidates and teaming partners must be capable of safeguarding information and complying with export controls consistent with federal law and policy. Awarded PSAs are expected to include controlled unclassified information (CUI); export-controlled items or information subject to Arms Export Control Act, the International Traffic in Arms Regulations, the Export Administration Act of 1979, as amended, and the Export Administration Regulations; and/or Distribution Statement C information.



As a general matter, all participants must be United States citizens. Participation of foreign member universities and individuals may be permitted on a case-by-case basis. However, a candidate and its teaming partners must be capable of complying with any and all safeguarding requirements and export controls associated with any such entities/individual's participation.

Candidates must disclose any actual or potential conflicts of interest. Failure to disclose a conflict of interest or conflicts of interest that cannot be satisfactorily mitigated may result in removal from the competition.

#### **1.1.7 ADMINISTRATIVE AND EVALUATION SUPPORT**

All submissions will be treated as "source selection information" as defined by 41 U.S.C. § 2101(7), and contents will be disclosed only in accordance with 41 U.S.C. § 2102. During the evaluation process, submissions may be handled by Government support contractors, TEES' personnel, and other Consortium Members for both administrative purposes and to support technical evaluations. Consortium Members that are proposing under this RPP will not be reviewers within the topic area that they proposed in. All persons performing these roles are expressly prohibited from performing sponsored technical research and are bound by appropriate nondisclosure agreements (NDAs).

#### **1.1.8 KICK-OFF MEETING**

Following the issuance of a PSA award, the Government will conduct a post-award orientation, or kick-off meeting, with the Awardee. The goal of this meeting is to ensure all parties fully understand the PSA terms and conditions, security requirements, inspection, acceptance, and invoicing procedures, and any other topics or requirements, as appropriate. NOTE: The kick-off meeting is not a substitute for Awardees to fully understand the requirements, nor is it to be used to alter the PSA.

#### **1.1.9 ANNUAL TECHNOLOGY REVIEW**

Each year, JHTO will hold an Annual Technology Review. The purpose of this event is to conduct a peer review of the current PSAs in an open technical environment. Attendance for current PSA Awardees is required. Attendees may come from current and former PSAs, academia, Government, and/or industry. JHTO will also hold an Annual Forum. Attendance at this event, although not required, is strongly encouraged.

#### **1.1.10 DELIVERABLES**

Each PSA, topic notwithstanding, shall submit the following:

- a. Quarterly updates.
- b. Annual reports for year 1 and year 2 of performance.
- c. A final report covering all three years at project completion.
- d. A Technical Data Package (TDP) to include, but not be limited to, the following items:
  - i. All raw and filtered test data.
  - ii. Algorithms, simulations, and models, including description documents and code for Government use.

Project Technology Areas may have additional deliverables included in their description.

## **2. TECHNOLOGY AREA DESCRIPTIONS**

### **2.1 TOPIC 1: Thermal Energy Harvesting**

**Introduction:** The Joint Hypersonics Transition Office (JHTO) is soliciting innovative proposals in the topic area of thermal energy harvesting. The specific area of interest is generation of electrical power by leveraging the high temperature thermal environment present in hypersonic systems. Approaches should consider the size, weight, and power (SWaP) requirements for these systems and should improve upon the SWaP for analogous battery or generator systems. Additionally, approaches should be broadly applicable across different hypersonic platforms including boost-glide and air-breathing cruise vehicles.



**Background:** Electrical power for military air vehicles is currently provided by thermal batteries or by generators. Pyroelectric and thermoelectric devices have been demonstrated in the laboratory that have the potential to compliment or supplant existing power sources in some applications leading to overall smaller and lighter systems. Example devices include lithium niobate devices that can create high voltages, up to 10,000 volts DC, when bridged across surfaces with different temperatures with increasing efficiency up to about 2,000°F, providing opportunity to extract power from the hot sections of jet engines, rockets and hypersonic vehicles. Additionally, these devices can be as small as a grain of wheat and linked in parallel to create extremely high voltages, up to 100,000 volts, without bulky transformers or other arcing prone systems.

**Description and Scope:** Efforts that are responsive to this topic will conduct development and experimentation to accurately assess the size, weight, and performance characteristics of a pyroelectric or thermoelectric power supply systems for relevant aircraft or missile applications. Strong proposals will include advancement of the technology through benchtop testing. Two general applications have been identified for these novel power supplies. The first is a lightweight, low volume alternative to thermal batteries or turbine powered generators. Because many vehicles require power from a cold start, a smaller conventional power source may be necessary until the system is at temperature. The second is a stand-alone power supply for a new or unique payload. This includes fitting a new payload to an existing aircraft or missile that lacks sufficient power or where unusual power demands are deemed risky and difficult to qualify for service. In these instances, the power supply for the air vehicle's critical flight controls, navigation, communications, etc. would not be connected, or at risk, with the payload's power system.

**Milestones / Deliverables:** The following milestones are examples of desired technical progress in this research area:

- Laboratory benchtop demonstration of the power supply device.
- Analytical and experimental demonstration of potential system performance, size, weight and temperature operational limitations.

Milestones should be established that are commensurate with proposed schedule of deliverables. A successful technical outcome may lead to the opportunity to seek follow-on funding.

## 2.2 TOPIC 2: Implementation and Validation of Navigation, Guidance, and Control Algorithms

**Introduction:** The Joint Hypersonics Transition Office (JHTO) is soliciting proposals for the development of navigation, guidance, and control (NG&C) algorithms and their implementation in flight ready hardware. Of particular interest are system-agnostic hardware in the loop (HWIL) approaches and testing of NG&C software and components on relevant processing and flight control hardware in simulated realistic mission scenarios.

**Background:** While NG&C algorithms have been developed, the algorithms are frequently developed independently of the potential hardware limitations. Resulting NG&C algorithms maximize performance but are difficult to implement on computationally limited onboard control systems. The development of algorithms with relevant hardware and mission parameters should result in faster and more effective development and integration of NG&C systems. The development of effective test setups will demonstrate capability to further algorithm maturation and define clear requirements for simulation and testing to inform future developments.

**Description and Scope:** The goal of this topic is to integrate novel NG&C algorithms in representative flight-ready hardware, and to demonstrate the feasibility of these approaches in simulated environments. Strong proposals will show consideration toward future flight test opportunities. HWIL and simulation setups should account for computational constraints, harsh physical environments (vibration, shock, temperature, etc.) and relevant mission parameters, such as timing and accuracy requirements. Test setups should account



for algorithm robustness to uncertain hardware performance and changing parameters. Proposed efforts to this topic should select or develop a simulation environment representing relevant flight hardware, develop or select relevant NG&C algorithms, then validate system operation and define system performance using the constraints of the selected hardware system. Ideally, efforts would include the effects and mitigation of environmental factors. The overall end goal is the ability to quantifiably measure and validate system performance through experimental measurements of an integrated hardware/software package.

**Milestones / Deliverables:** The following milestones are examples of desired technical progress in this research area:

- Demonstration of NG&C software algorithms in a representative hardware system in a laboratory environment.
- Quantitative measurements of system performance with simulated mission and environmental parameters.
- A test plan summary that shows the added value of the project to maturing algorithm technology toward flight testing and insertion.

Milestones should be established that are commensurate with proposed schedule of deliverables. A successful technical outcome may lead to the opportunity to seek follow-on funding.

### 2.3 TOPIC 3: Controllable Propellants and Energetics

**Introduction:** The Joint Hypersonics Transition Office (JHTO) is soliciting innovative proposals in the development of propellants and energetics that can be tuned and controlled through chemistry, geometry, manufacturing processes, external stimuli, or a combination. The tuning effect should allow for improved control, extinguishing, or enhanced energy release of the energetic or propellant to achieve a desirable effect.

**Background:** Existing propellants and energetics are often designed to create the maximum effect for a given size or weight, but often lack ability to control the energy release rate of these materials. For the example of propellants, once they are ignited, they often release energy at a steady rate until the material is exhausted and the ability to throttle the output up or down is frequently limited. The ability to throttle and control the energy release, particularly for multimodal mission concepts would be highly beneficial. This capability could enhance maneuverability, fuel efficiency, and potentially even maximize output. For ordnance applications, the ability to tune energy release may enable multi-mission ordnance packages or maximize a desired blast effect for a given application.

**Description/Scope:** The intent of this topic is to seek innovative methods to control the energy release rate of propellants and energetics to enhance or throttle the output. Methodologies should consider the size, weight, and power (SWaP) requirements associated with the sensing, control, and actuation system. The methodology for control can be, but is not limited to, chemistry, architecture, electromagnetic, actuators, etc. Regardless of the chosen approach, efforts should include a combination of modeling and laboratory experimentation to demonstrate the feasibility of the approach. Approaches that demonstrate the ability to enhance or throttle the energy release are both valid although approaches that allow for maximum range of control are of the greatest interest. Strong proposals will show knowledge of the current state-of-the-art for system performance, and awareness of existing work in this topic. Desirable tuning concepts should be of reasonable cost, readily integrated, and use materials that can be domestically sourced. Ideally, the technical solution should not degrade current state-of-the-art performance in both propellants and explosives.

**Milestones / Deliverables:** The following milestones are examples of desired technical progress in this research area:

- Demonstration of a propellant or energetic control methodology with capacity to control output to achieve a desired effect.
- Characterization of energetic performance, storage, and handling characteristics.



Milestones should be established that are commensurate with proposed schedule of deliverables. A successful technical outcome may lead to the opportunity to seek follow-on funding.

#### 2.4 TOPIC 4: Low Cost Ground and Flight Testing Enablers

**Introduction:** The Joint Hypersonics Transition Office (JHTO) is soliciting innovative proposals in the topic area of novel, low-cost ground and flight testing approaches and enabling technologies. Novel test approaches and methodologies should facilitate the rapid technology maturation and insertion into weapon systems that is not possible today due to technical and access limitations for existing facilities.

**Background:** The hypersonics operating environment is particularly harsh and challenging to simulate. Often, testing approaches are only able to capture a subset of the representative environment for short durations and extrapolation of the results to real mission sets is challenging. Additionally, expense and access to testing facilities limits the capacity to generate data, further challenging the ability to develop a complete understanding of material, component, or system performance. These limitations create challenges downstream for the implementation of new designs and materials due to a lack of ability to validate their performance in representative environments.

**Description/Scope:** This topic seeks innovative approaches and technologies to enhance ground and flight testing capabilities or enable rapid, low-cost testing. Approaches that are of interest include new sensing and data gathering capabilities, novel sub-scale testing approaches, rapid and repeatable setups and instrumentation, standard interface architectures and integration enablers, and test setups that can be run without highly specialized facilities or highly trained and certified workforce. Also of interest are novel approaches that enable more efficient use of the data generated at existing facilities such as, methods that allow for efficiently combining test data between small screening facilities and large test and evaluation facilities, and identifying what makes data not comparable between different tests. Non-limiting examples of potential testing technologies of interest are weather testing, high-enthalpy materials and electronics testing, mid-pressure arc-jet test capability, non-intrusive diagnostic instrumentation of fluctuating flow field parameters, and enhanced dynamic balance technology. The proposed approach must identify a path to develop the testing technology or instrument and must also identify the existing state-of-the-art testing approaches and clearly explain how the new approach will mitigate risk or fill a gap for the community through enhanced performance or improved access.

**Milestones / Deliverables:** The following milestones are examples of desired technical progress in this research area:

- Test plan description that may include the test article geometry, required instrumentation, calibration procedure, data analysis, limitations, and integration requirements of the new testing approach.
- Demonstration of the test system performance and comparison to the state-of-the-art testing approach.
- Explanation of improvements to cost and access for testing stakeholders.

Milestones should be established that are commensurate with proposed schedule of deliverables. A successful technical outcome may lead to the opportunity to seek follow-on funding.

#### 2.5 TOPIC 5: Novel Aperture and Radome Designs for High-Mach Operation

**Introduction:** The Joint Hypersonics Transition Office (JHTO) is soliciting proposals for innovative designs that achieve increased aperture and radome performance and robustness in extreme environments or enable rapid development and testing of future designs.

**Background:** The extreme environment at the surface of a hypersonic system creates various challenges for material survivability and degradation and limits the capability of sensor systems. As apertures begin to degrade, it is important to understand and quantify the changes in real-time to better understand what the



seeker is detecting, the resulting distortions and how to correct for them, and the fundamental limitations of the degraded material. Extending the capacity for apertures and radomes to increased temperatures and extended durations could improve the suite of available missions for hypersonic vehicles including enhanced capability to engage with dynamic targets.

**Description/Scope:** The objective of this topic is to develop novel designs for apertures and radomes in high-Mach operation with a focus on leap ahead approaches that go beyond traditional materials. Of interest are approaches that could extend the operational capacity of visible, infrared, and radio frequency apertures and radomes in both operational temperature and duration. Strong designs would accommodate a variety of relevant geometries and integration approaches. In addition to material and geometric constraints, it is essential to develop an understanding of the degradation time scale and mechanism. It is expected that plans will include characterization of the time and temperature dependent changes in material properties including, but not limited to, yield and fracture strength and transmission losses or distortions. Designs may include novel methods of aperture protection, system integration, or environmental compensation. Other approaches of interest include development of instrumentation or test methodologies that eliminate or reduce the need to access long lead time tunnels or increase design and test efficiency for future developments. In addition to aperture material development, approaches may account for material changes overtime and compensate through software. Approaches that leverage non-conventional materials, such as metamaterials, are of interest if they can be demonstrated to enhance performance over conventional materials. It is envisioned that successful approaches to this topic will include system design, materials development, characterization, modeling, simulation of material degradation mechanisms and timescales, and/or development of adaptive software to account for materials changes while minimizing impacts to sensor performance. Desirable concepts should be of reasonable cost, readily integrated, and use materials that can be domestically sourced.

**Milestones / Deliverables:** The following milestones are examples of desired technical progress in this research area:

- Design and development of a relevant material or design test article.
- Modeling and quantification of material or design performance.
- Modeling and quantification of effects on sensor performance.
- New capabilities for designing and testing future relevant design articles.

Milestones should be established that are commensurate with proposed schedule of deliverables. A successful technical outcome may lead to the opportunity to seek follow-on funding.

### 3. GENERAL SUBMISSION REQUIREMENTS

#### 3.1 QUESTIONS

Questions regarding the Project Call may be emailed to [UCAH@tamu.edu](mailto:UCAH@tamu.edu) through **August 7, 2023 at 5:00 PM EST**. Answers to the questions will be posted on the UCAH website for this RPP Project Call. All questions and answers will be made available to all proposers, unless they involve proprietary or CUI material.

#### 3.2 SUBMISSION INSTRUCTIONS

Proposals shall be submitted through the UCAH website for this RPP Project Call. Proposals cannot be submitted before an organization is fully registered on the UCAH website. **The UCAH website is the single point for submission.**

#### 3.3 ELIGIBILITY

##### 3.3.1 NOTICE OF INTENT

In order to be eligible to submit a PPP for consideration, a PPP Notice of Intent (NOI) shall be submitted no later than **September 11, 2023 5:00 PM EST**, through the UCAH website for this RPP Project Call. The submitted NOI shall include, on a cover page, the Topic Number and a full list of participants to include: 1) each person anticipated to support the proposed project (listed with their name and current





institutions/organization), and 2) all institutions, organizations, laboratories, etc. anticipated to support the proposed project.

**3.3.2 PROTOTYPE PROJECT PROPOSALS**

PPPs shall be submitted through the UCAH website for this RPP Project Call and shall be received no later than **November 1, 2023 at 5:00 PM EST**. Submissions received after the deadline will not be considered. Each PPP is still limited to a maximum of four PIs. No university exceeds leading three PPPs.

TEES will assign a program specialist to assist each proposing University Consortium Member with the PPP documentation and submission process.

The PPPs shall follow the format described in Section 3.4 of this document and will be evaluated based on the criteria described in Section 4 of this document.

**3.4 FORMATTING**

PPPs shall be submitted in accordance with the instructions described in this document. All submissions shall be in English.

- A page is defined as one 8.5” x 11” electronic page with 1” margins.
- The font shall be Times New Roman single-spaced and no smaller than 11-point font size. NOTE: Smaller font size may be used in figures and tables but must be legible.
- Pages shall be in portrait orientation, except for figures, graphs, images, and pictures.
- Figures and tables shall be numbered and, when referenced in the text, shall be referenced by that number. Figures and tables shall be of a size that is easily readable and may be in landscape orientation.
- Pages shall be numbered sequentially and all major sections shall begin on a new page.
- All PPP documents, to include a PDF version of the budget spreadsheets, shall be submitted as one PDF file.

For PPPs, the budget spreadsheet shall also be submitted as an excel document with formulas left available for evaluation purposes.

No classified information shall be submitted with the proposal. All information that is considered to be a trade secret or proprietary information shall be marked as such. NOTE: Government support contractors, TEES’ personnel, and other Consortium Members may have access to this information for the purposes of administrative support and/or evaluation(s). Each evaluator will be required to complete a NDA and to certify they have no Conflict of Interest (COI) that might impact the review process.

**3.5 DOCUMENTS CONTENT**

The purpose of these instructions is to prescribe the structure of PPPs and describe the approach for the development and presentation of PPP information.

**3.5.1 PROTOTYPE PROJECT PROPOSAL SUBMISSIONS**

Use of the Proposal Template and RPP Budget Template provided on the UCAH website for this RPP Project Call is required. In accordance with the PPP templates, each PPP shall contain the following:

Cover Page (1 page maximum)

Participant List (1 page maximum)





The Participants List shall include the University Consortium Member Institution, Topic Number and a full list of participants to include: 1) each person included in the PPP (listed with their name and current institutions/organization) and 2) all institutions, organizations, laboratories, etc. included in the PPP. This is to help us screen for conflicts of interest in evaluations.

Table of Contents (1 page maximum)

The Table of Contents shall include all documents requested below in Volumes I-X below.

Volume I: Performance Work Statement (12 pages maximum)

- a. Abstract
- b. Objectives Statement
- c. Research Narrative
  - i. Background and Overview of Proposed Project
  - ii. Technical approach, including clearly defined prototype solution
  - iii. Schedule and Deliverables
- d. Place(s) of Performance
- e. Government Furnished Property/Equipment/Materials/High Performance Computing Requirements

Volume II: Bibliography and References (No page limit)

Volume III: Facilities (3 pages maximum)

The Facilities Volume shall address the following:

- a. Identify any facilities required for the proposed solution and whether those facilities are organic to project participants' organization(s) or must be leased or purchased.
- b. Indicate whether facility availability is likely to impact the project's cost/schedule/performance.

Volume IV: Key Participants (No page limit)

The Key Participants Volume shall address the following:

- a. A resume for all listed Key Participants.
  - i. Each resume shall be no more than two pages in length.
- b. Description of significant contribution(s) to the proposed solution and what makes each significant.
- c. The total level of effort, as a percentage of a 40-hour workweek, each participant will devote to this project.
- d. Include all current and pending sponsored research projects for each PI.
- e. Shall include a plan on how the candidate has addressed any potential or actual Conflicts of Interest.

Volume V: Security Requirements (No page limit)

The Security Requirement Volume shall address the following:

- a. All participating universities and institutions shall be fully compliant with the following requirements:
  - i. Capable of protecting CUI in accordance with the following DFARS clauses:
    1. DFARS 252.204-7012
    2. DFARS 252.204-7019
    3. DFARS 252.204-7020
    4. DFARS 252.204-7021
  - ii. Registered with the Directorate of Defense Trade Controls (DDTC).
- b. The PPP shall address any special security and classification requirements, as necessary. Awardees will have 90 days from the time the PSA is awarded to be fully compliant with applicable DFARS clauses.
- c. Provide a CUI/export control data management plan to include how the lead university will collaborate with all sub awardees.

Volume VI: Pricing (No page limit)



The Pricing Volume shall address the following:

- a. The proposed prices shall provide sufficient detail to substantiate that the prices presented in the proposal are reasonable and complete for the work proposed.
  - i. The burden of demonstrating price reasonableness rests with the proposer.
  - ii. An assessment that the proposal price is not reasonable may result in the proposal being non-selectable for award.
- b. The Pricing section shall also include a narrative to provide justification and formulae used in establishing the pricing.
- c. At least 51% of the estimated price shall directly fund Consortium Member(s).
- d. For all team members that do not have Government-approved rates, their proposed rates shall represent fair market value rates.
  - i. Labor Rates: Provide the basis for which the estimated total labor hours were calculated, including generic labor categories, estimated rates, and hours for those individuals.
  - ii. Fringe Benefits: Provide the rates and calculation of the costs.
  - iii. Annual Technology Review and Annual Forum: Provide the estimated costs for team travel for the Annual Technology Review and the Annual Forum.
  - iv. Travel: All travel, including the Annual Technology Review and the Annual Forum, shall align with the Joint Travel Regulation (JTR). The proposed travel cost shall include the following for each anticipated trip:
    1. The purpose of the trip.
    2. Trip origin and destination (if known).
    3. Approximate duration of the trip.
    4. The number of travelers.
    5. The estimated cost per trip (including mileage, parking, baggage costs, etc.).
  - v. Materials and Supplies: Provide a list of the materials/equipment required to meet the technical approach and the estimated cost.
  - vi. Sub-Agreements/Subcontracts: Provide a description of the work to be performed by the subrecipient/subcontractor and associated costs. For each PSA, a detailed cost proposal is required to be submitted by the subrecipient(s).
  - vii. Recipient Acquired Equipment or Facilities: Equipment and/or facilities are normally furnished by the Recipient. If acquisition of equipment and/or facilities is proposed, a justification for the purchase of the items shall be provided. Provide an itemized list of all equipment and/or facilities costs and the basis for the estimate (e.g., quotes, prior purchases, catalog price lists). Allowable items normally would be limited to research equipment not already available for the project. General purpose equipment (i.e., equipment not used exclusively for research, scientific or other technical activities, such as personal computers, laptops, office equipment) shall not be requested unless they will be used primarily or exclusively for the project. For computer/laptop purchases and other general-purpose equipment, if proposed, include a statement indicating how each item of equipment will be integrated into the program or used as an integral part of the proposed project.
  - viii. Other Direct Costs – Provide an itemized list of all remaining proposed other direct costs, such as laboratory fees, report and publication costs, and the basis for the estimate (e.g., quotes, prior purchases, catalog price lists).
  - ix. Indirect Costs: Provide an estimate of the total indirect costs and provide data supporting how the estimate was calculated, including any estimated costs other than the labor and material equipment, i.e., overhead, G&A, etc.

Volume VII: Milestone Payment Schedule (1 page maximum)

The Milestone Payment Schedule Volume shall address the following:

- a. Each PPP shall have a defined project schedule.
- b. The Milestone Payment Schedule shall include the payable events for the prototype project.
- c. Each event shall include a description and proposed price for the event.



Volume VIII: Affirmation of Business Status Certification (No page limit)

The Affirmation of Business Status Certification Volume shall address the following:

- a. A certification for each institution shall be included in the PPP.
  - i. Name of Business Entity
  - ii. Proposed NAICS Code
  - iii. Cage Code
  - iv. SAM Expiration Date
  - v. Address
  - vi. Business POC Name, Title, Phone and Email

Volume IX: Data Rights Assertions (No page limit)

The Data Rights Assertions Volume shall address the following:

- a. Identify any intellectual property, patents and inventions in the proposed solution and associated restrictions on JHTO/the Government’s use of that intellectual property, patents and inventions. If the offeror intends to provide IP without restriction and has no assertions, state no restrictions are being asserted for IP/Data Rights.
- b. The following information shall be presented for all assertions:
  - i. Technical data, computer software, or patents to be furnished with restriction (If the assertion is applicable to items, components, or processes developed at private expense, identify both the data and each such item, component, or process).
  - ii. Basis for assertion (Generally, the development of an item, component, or process at private expense, either exclusively or partially is the only basis for asserting restrictions on the Government's rights to use, release, or disclose Technical Data pertaining to such items, components, or processes. Indicate whether development was exclusively or partially at private expense. If development was not at private expense, enter the specific reason for asserting that the Government's rights shall be restricted).
  - iii. Asserted rights category (limited rights, restricted rights, Government purpose rights, special license, commercial license, or unlimited rights). For “special license” rights, please elaborate.
  - iv. Name of entity asserting restrictions (corporation, individual, or other person, as appropriate).

Volume X: Appendices (4 pages maximum)

The Appendices Volume shall address the following:

- a. Include any supplementary material that may be helpful in providing a more comprehensive understanding of the proposal. Information included in the appendices will not be used for evaluation purposes.

**4. AWARD**

**4.1 EVALUATION CRITERIA**

**4.1.1 Prototype Project Proposal Criteria**

PPPs will be evaluated using the criteria listed below.

Factor 1: Overall Scientific and Technical Merit

1. Innovativeness, feasibility, achievability, and completeness of the proposed project
2. Expertise and experience of the proposed technical team
3. Proposed deliverables and consistency with the requirements of the proposed project
4. Major technical risks; planned mitigation efforts; and feasibility of planned mitigation efforts



Factor 2: Potential Contribution and Relevance to the JHTO Mission

1. Proposed effort's contribution to advancing hypersonics technology
2. Level of collaboration between the various types of consortium members, including HBCUs, MSIs, and International Affiliate Universities
3. Incorporation of undergraduate and graduate student(s) into the project

Factor 3: Price

1. Realism, reasonableness, and/or completeness of the proposed price
2. Acceptability of proposed costs (including travel, materials, supplies, equipment, facilities and other direct costs, if applicable)
3. Distribution of funding to consortium members (i.e. at least 51% of the total proposed price)

**4.2 BASIS FOR AWARD**

**4.2.1 Prototype Project Proposal Evaluation Process**

PPPs will be evaluated independently, based on the evaluation criteria in Section 4.1.2 of this document, not against any other PPPs. The Government reserves the right to award all, some or none of the PPPs submitted. All submissions will be fairly evaluated; however, the Government reserves the right to limit the number of PPPs selected for PSA awards. Additionally, after evaluation, the Government may request and recommend a partnership between two or more submitted PPPs, which may include all elements or selected elements of those PPPs. Should the Government choose to do this, JHTO will provide direction that will enable the PPP leads to pursue a PSA that will meet the requirements of the technology area.

All PPP submissions will be valid for 365 calendar days. Upon completion of evaluations, the JHTO will notify the PPP lead that: (1) the proposed solution has been selected to pursue the award of a PSA, (2) the proposed solution is not of interest or (3) the proposed solution is of interest but has not been selected to pursue the award of a PSA and will be held for 365 days.

In the event additional funding becomes available, a PPP lead may be contacted within 365 calendar days from the PPP submission date with the possibility of a PSA. If after 365 calendar days from the PPP submission date (or earlier if notified by JHTO), the PPP lead has not been contacted to formally move to a PSA award, the PPP will no longer be eligible for an award under this RPP Project Call.