



**University Consortium for Applied Hypersonics:**

**PROJECT CALL**

**REQUEST FOR WHITE PAPER/PROTOTYPE PROPOSAL NUMBER:  
TEES/JHTO-RPP-2021-003**

Project Call Release Date	September 15, 2021
Request for White Paper Questions Cutoff	October 6, 2021
Notice of Intent Deadline	October 13, 2021 (5:00 PM CST)
Phase 1: White Paper Submission Deadline	October 20, 2021 (5:00 PM CST)
Notification of White Paper Evaluation Outcome	December 10, 2021
Request for Prototype Proposal Questions Cutoff	January 10, 2022
Phase 2: Prototype Proposal Submission Deadline	January 24, 2022 (5:00 PM CST)
Agreement Award Notifications	March 17, 2022
Anticipated Project Start Date	July 1, 2022
Period of Performance	3 Years
Agreement Ceiling	Approximately \$500,000 per award/per year
Expected Agreement Classification	Controlled Unclassified Information

TO APPLY TO THIS PROJECT CALL, YOUR UNIVERSITY'S AUTHORIZED ORGANIZATIONAL REPRESENTATIVE WILL NEED TO CREATE AN ACCOUNT AND SUBMIT PROTOTYPE PROPOSAL DOCUMENTS THROUGH THE UNIVERSITY CONSORTIUM FOR APPLIED HYPERSONICS WEBSITE: [HTTPS://HYPERSONICS.TAMU.EDU](https://hypersonics.tamu.edu).

PROTOTYPE 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 PROTOTYPE PROPOSALS MUST BE POSTED THROUGH THE UNIVERSITY CONSORTIUM FOR APPLIED HYPERSONICS WEBSITE ABOVE.



## CONTENTS

<b>CONTENTS .....</b>	<b>2</b>
<b>1. PROJECT OVERVIEW .....</b>	<b>3</b>
<b>2. PROJECT TOPIC DESCRIPTIONS .....</b>	<b>5</b>
<b>2.1 Proposal Project Calls.....</b>	<b>5</b>
<b>2.1.1 Technology Area 1: Materials, Structures and Thermal Protection Systems .....</b>	<b>5</b>
<b>Topic 1: Mechanical Interface between RF transparent nose material and typical high temperature body materials .....</b>	<b>5</b>
<b>2.1.2 Technology Area 2: Navigation Guidance Control and Sensing .....</b>	<b>6</b>
<b>Topic 2: Aero Parameter Estimator .....</b>	<b>6</b>
<b>2.1.3 Technology Area 3: Air Breathing Propulsion.....</b>	<b>6</b>
<b>Topic 3: Methods for Predicting High-Speed Airbreathing Propulsion Performance .....</b>	<b>6</b>
<b>2.1.4 Technology Area 4: Hypersonic Environments and Phenomenology .....</b>	<b>7</b>
<b>Topic 4: Hypersonic Materials Effects on Near-Field Phenomenology.....</b>	<b>7</b>
<b>2.1.5 Technology Area 5: Applied Aerodynamics and Hypersonic Systems .....</b>	<b>7</b>
<b>Topic 5: Uncertainty quantification for vehicle trade studies .....</b>	<b>7</b>
<b>2.1.6 Technology Area 6: Lethality and Energetics .....</b>	<b>7</b>
<b>Topic 6: System Level Simulations of Blast Energetics for Hypersonic Operations .....</b>	<b>7</b>
<b>Topic 7: The development of experimentally validated methods and models to advance understanding of multiphase blast properties and structural responses to structures .....</b>	<b>8</b>
<b>2.1.7 Workforce Development .....</b>	<b>8</b>
<b>Topic 8: Quantitative Progress on Hypersonic Workforce Development .....</b>	<b>8</b>
<b>3. PHASE 1: WHITE PAPER SUBMISSION AND EVALUATION .....</b>	<b>9</b>
<b>3.1 General Requirements .....</b>	<b>9</b>
<b>3.2 Format.....</b>	<b>9</b>
<b>3.3 Basis for Selection.....</b>	<b>11</b>
<b>4. PHASE 2: PROTOTYPE PROJECT PROPOSAL SUBMISSION AND EVALUATION .....</b>	<b>12</b>
<b>4.1 General Requirements .....</b>	<b>12</b>
<b>4.2 Format.....</b>	<b>12</b>
<b>4.3 Evaluation of Proposals .....</b>	<b>15</b>
<b>4.4 Potential for Follow-On Production .....</b>	<b>16</b>



## 1. PROJECT OVERVIEW

**Funding Opportunity Title:** University Consortium for Applied Hypersonics (UCAH) Project Call (TEES/JHTO-RPP-2021-003).

**Dates:** Questions regarding the Request for White Paper (RWP) may be emailed to [UCAH@tamu.edu](mailto:UCAH@tamu.edu) through **October 6, 2021**. Responses to the questions will be posted on the UCAH website (<https://hypersonics.tamu.edu>). Questions and responses to questions regarding White Papers (WPs) will be made available to all proposers, unless they involve proprietary or controlled unclassified information (CUI) material.

**Notice of Intent:** Notice of Intent to submit a WP is required in order to submit a WP. The deadline to submit is **5:00 PM (CST) on October 13, 2021**. Please provide the Topic Number and full list of participants (name and institution) through the project call webpage on the UCAH website.

**Phase 1:** Project WP submissions must be submitted through the UCAH website proposal call link and **must be received no later than October 20, 2021, at 5:00 PM (CST)**. Submissions received after the deadline will not be considered. The Government is interested in receiving top applied research proposals; hence WP submissions are limited to three per university<sup>1</sup>, and a maximum of seven Principal Investigators (PI) are authorized per proposal.

**Phase 2:** WPs will be evaluated and a Request for Prototype Proposal (RPP) may be issued to those which best meet the intent of the Office of the Under Secretary of Defense (OUSD), Research and Engineering (R&E) Joint Hypersonics Transition Office (JHTO), per Section 3.3 of this document. PIs whose WPs were not selected for continuation to the Prototype Project Proposal (PPP) phase will be notified. PPP submissions must be submitted through the UCAH website proposal call link and **must be received no later than January 24, 2022 at 5:00 PM (CST)**. Submissions received after the deadline will not be considered. Questions regarding the RPP may be emailed to [UCAH@tamu.edu](mailto:UCAH@tamu.edu) through **January 10, 2022 at 5:00 PM (CST)**. Responses to the questions will be posted on the UCAH website (<https://hypersonics.tamu.edu>). Questions and responses to questions regarding PPPs will be made available to all proposers, unless they involve proprietary or controlled unclassified information (CUI) material.

**Submission Instructions:** Proposal submission will be conducted utilizing the UCAH website. After creating an initial account (see <https://hypersonics.tamu.edu>), proposal teams can upload proposal documents. You should verify that the person authorized to submit proposals for your organization has completed registration well in advance of the submission deadline. To apply for grants on behalf of your organization, you will need the Authorized Organizational Representative role. Proposal submissions cannot be accomplished before your organization is fully registered. The portal is the single point for submission.

**Funding Opportunity Description:** The Joint Hypersonic Transition Office (JHTO), in partnership with Texas A&M Engineering Experiment Station (TEES) and the UCAH, is soliciting competitive WPs/PPPs supporting applied hypersonic research and technology, per the defined Statement of Need (SON) in [Section 2.1](#). JHTO reserves the right to fund none, some, or all of the submissions made in response to this RWP/RPP. Furthermore, JHTO may choose to fund a portion of a submission or a combination of submissions. Not all meritorious submissions will necessarily receive funding. TEES and JHTO will exercise their discretion in selecting submissions. TEES and the JHTO will provide no funding for direct reimbursement of WP/PPP development costs.

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<sup>1</sup> This does not preclude teaming between faculty members from different Universities, as long as no University exceeds the submission limit on which it is the lead.



**Estimated Project Ceiling:** Up to a three-year period of performance at \$500,000 per Project Sub-Agreement (PSA) per year. The JHTO reserves the right to approve projects that slightly exceed this level based on the technical strengths of the proposal and the reasonableness of the costs.

**Applicant Eligibility:** Applicant and any sub-institutions must be a university or affiliate UCAH Consortium Member by the time of proposal submission on January 24, 2022.

Except as addressed in the next paragraph, individuals supported by a Sub-Agreement awarded as a result of this RWP/RPP process must be United States (U.S.) citizens prior to award. Since research projects are expected to include CUI, International Traffic in Arms Regulations (ITAR) or Distribution Statement C information, the fundamental research exclusion (National Security Decision Directive 189) is not expected to apply. Universities responding to this RWP/RPP must be able to appropriately maintain and handle sensitive data. Hence, all publications will require review and approval.

Affiliate Consortium Members, including Industry, University Affiliated Research Centers (UARC)s, a University Affiliated Laboratory (UAL), and Federally Funded Research and Development Centers (FFRDCs), and universities (on a case by case basis) from Australia, Canada, New Zealand, and the United Kingdom, are not eligible to respond to this RWP/RPP but may team with an eligible principal bidder and be funded accordingly.

Teams are encouraged in all areas, to include:

- Other universities;
- Industry;
- UARC)s/FFRDCs;
- National Laboratories;
- Minority Serving Institutions;
- Nontraditional Members.

**Non-traditional Defense Contractor Participation of Cost-Share Commitment:**

- a. Agreement awards are made under 10 U.S.C. § 2371b, and as such all awardees must meet at least one of the following conditions:
  - i. There is at least one nontraditional defense contractor or nonprofit research institution participating to a significant extent in the prototype project.
  - ii. All significant participants in the transaction other than the Federal Government are small business (including small business participating in a program described under section 9 of the Small Business Act (15 U.S.C. 638) or nontraditional defense contractors.
  - iii. At least one-third of the total cost of the Prototype Project is to be paid out of funds provided by sources other than the Federal Government.
  - iv. The senior procurement executive for the Agency determines, in writing, that exceptional circumstances justify the use of a transaction that provides for innovative business arrangements or structures that would not be feasible or appropriate under a contract, or would provide an opportunity to expand the defense supply base in a manner that would not be practical or feasible under a contract.
- b. An NTDC is an entity that is not currently performing and has not performed, for at least one year preceding the issuance of a RPP, any contract or subcontract for the DoD that is subject to full coverage under the Federal Acquisition Regulation (FAR) based Cost Accounting Standards (“CAS”). A subsidiary or a division of a traditional defense contractor may still qualify as an NTDC.



- c. Significant participation is determined on a project basis and is based on the importance of the NTDC contribution to the overall execution or outcome of the proposed project. OT Authority statute does not prescribe a monetary threshold or percentage value to justify significance. Examples of “significant” participation are:
  - i. Supplying a new key technology or product, or unique capability;
  - ii. Causing a material and quantifiable reduction in the project cost or schedule;
  - iii. Causing a measurable increase in the performance of the prototype;
  - iv. Accomplishing a significant amount of the effort;
  - v. Value-added analysis not based on percentage of project work or value.
- d. Since contracts and subcontracts with small businesses are exempt from full CAS coverage, small businesses are deemed NTDCs under OT Authority. An entity is considered a small business based upon its applicable North American Industry Classification System (“NAICS”) designation (as described at 13 C.F.R. §121.201) for the specific nature of the work being proposed.

**Period of Performance:** Three-year with an anticipated start date of July 1, 2022.

**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 RWP/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).

## 2. PROJECT TOPIC DESCRIPTIONS

Section 2.1 identifies SON for each Prototype Project and the submission process will begin with the RWP. WPs shall follow the format described in [Section 3.2](#). Selection of WPs will follow the basis of selection summarized in Section 3.3. UCAH Consortium members are responsible for all expenses associated with responding to the RWP.

### 2.1 Proposal Project Calls

JHTO in partnership with the UCAH are interested in receiving WPs and PPPs for the following areas:

#### 2.1.1 Technology Area 1: Materials, Structures and Thermal Protection Systems

**Topic 1:** Mechanical Interface between RF transparent nose material and typical high temperature body materials

**Technology Discipline:** MSM - Materials, Structures, and Manufacturing

**Proposal Description:** The hypersonic regime for flight poses unique materials challenges, requiring structures that are both light and retain their strength at extreme temperatures. Weapon seekers typically have field of regard in front of the vehicle. Weapon nose cones are typically made from materials transparent to radar energy. These nosecone materials are often ceramic and join to metallic cylindrical bodies aft of the nose. For hypersonic vehicles, the problem is further complicated by the extreme heating of the materials that may require special treatment of the nose and leading edges of the vehicle. Hypersonic systems typically have non-cylindrical shapes, complicating the joint between the ceramics and metallic body. Additionally, some materials being used for hypersonic vehicle skins are carbon-carbon. The extreme temperature gradients, particularly in the nose region, the mismatch in material thermal expansion coefficients, and the non-cylindrical shapes of the joint between the ceramic nosecone and the downstream materials is the focus of this request.





Proposals are sought to explore the interaction between ceramic nose shapes and high temperature steel, titanium or ultra-high temperature ceramic (such as C/C, C/SiC, etc.) aft-body, particularly in non-cylindrical cross sections. The nose material should utilize ceramic materials and material systems with the potential to enable practical use of the portions of the RF spectrum relevant to radar. Particular attention should be applied to the mechanical interface of ceramic materials in the nose, with high temperature steel, titanium or ultra-high temperature ceramic aft-body shapes, in a non-conical/non-cylindrical outer mold line. Proposals shall also consider the thermal and mechanical properties required for the material, such as static load strength, coefficient of thermal expansion, and joint non-linearity needed to accommodate the thermal expansion mismatch. Temperatures greater than 1500 degrees Celsius should be considered.

## 2.1.2 Technology Area 2: Navigation Guidance Control and Sensing

### Topic 2: Aero Parameter Estimator

**Technology Discipline:** NGCS- Navigation GuidanceControl and Sensing

**Proposal Description:** Hypersonic vehicles experience significant changes in flight conditions and aerodynamics throughout the course of their flights. Onboard aerodynamic and environmental information used for stability calculations are typically based on pre-determined aerodynamic models and/or environmental models which may contain significant errors. These errors could adversely affect stability preventing the vehicle from completing its mission due to loss of control. To address aerodynamic errors, one may go to a wind tunnel. The drawback to this is that performing wind tunnel tests to reduce aerodynamic model errors is extremely costly and time consuming. Due to the high-speed nature of hypersonics, placing air data probes on the exterior of the vehicle is not feasible due to the extreme heat. Therefore, hypersonic vehicles currently face an issue of not having knowledge of the atmospheric conditions through which they fly through and the additional uncertainty of the pre-determined ‘aero’ tables used by the flight control laws.

Proposals are sought to develop potential solutions for an Aero Parameter Estimator that can be utilized to estimate Aerodynamic Coefficients, Atmospheric Parameters, and Air Data Parameters (Mach, Angle of Attack, and Sideslip Angle) for hypersonic vehicles. In this solicitation we are seeking solutions that will determine optimal data training methodologies to be used with algorithms designed to run on real time operating systems. The algorithms should be designed to run quickly and efficiently due to the need for low latency, high speed feedback required for hypersonic flight controls. Proposals should account all aspects of a hypersonic flight vehicles environment.

## 2.1.3 Technology Area 3: Air Breathing Propulsion

### Topic 3: Methods for Predicting High-Speed Airbreathing Propulsion Performance

**Technology Discipline:** PROP - Propulsion

**Proposal Description:** High-speed airbreathing engine performance has often been predicted with legacy one-dimensional design tools such as RJPA and others. There is a need to expand these types of tools to be applicable to any flowpath configuration with added sophistication utilizing current computation capabilities, not available in the decades past, increasing usability and efficiency for the propulsion community.

Proposals are being sought to develop the next generation of design tools suitable for rapid predictions of high-speed airbreathing engine performance parameters. New tools should be flexible for modeling different airbreathing applications, extendable to interface with higher-fidelity numerical modeling, and robust to explore further advancing hypersonic mission needs. These new tools should be accessible to the end user and be anchored in databases of high-fidelity computational predictions and test results, along with historical data on engine performance for various configurations.



#### **2.1.4 Technology Area 4: Hypersonic Environments and Phenomenology**

##### **Topic 4: Hypersonic Materials Effects on Near-Field Phenomenology**

**Technology Discipline:** ENV – Hypersonic Environments

**Proposal Description:** The interaction between the materials that make up a hypersonic vehicle and the high-temperature, high-pressure, dynamic environment produces a complex flowfield that may contain heat-shield ablation products and subsequent chemical reactions with the free-stream atmosphere. Obtaining a high-fidelity understanding of this interaction and its relationship to expected emissive phenomena is needed to improve sensing associated with hypersonics.

Proposals are sought to refine existing models and databases of typical hypersonic vehicle heat-shield materials ablative and optical properties, such as heat of pyrolysis, conductivity, specific heat, recession rates, density, max temperature, and emissivity (as a function of wavelength and temperature); to identify likely contaminants associated with these material types and their expected prevalence and reaction with the free-stream atmosphere; to refine the understanding of the physical extent of ablative products and subsequent reaction products in the flowfield as a function of flight regime; and to conduct experimental research using wind tunnel facilities to validate these models and theories

#### **2.1.5 Technology Area 5: Applied Aerodynamics and Hypersonic Systems**

##### **Topic 5: Uncertainty quantification for vehicle trade studies**

**Technology Discipline:** AERO - Applied Aerodynamics and Aerothermodynamics

**Proposal Description:** Hypersonic vehicles experience significant changes in flight conditions and aerodynamics throughout the course of their flights. Onboard aerodynamic and environmental information used for stability calculations are typically based on pre-determined aerodynamic models and/or environmental models which may contain significant errors. These errors could adversely affect stability preventing the vehicle from completing its mission due to loss of control. To address aerodynamic errors, one may go to a wind tunnel. The drawback to this is that performing wind tunnel tests to reduce aerodynamic model errors is extremely costly and time consuming. An alternative approach is uncertainty quantification (UQ) leveraging multi-fidelity analysis & simulation data.

UQ research is needed to incorporate strategies and visualization for uncertainty analysis into trade studies and optimization. Ultimately, every discipline's analysis needs to incorporate sensitivities, confidence metrics, and probabilities with their respective results. A holistic methodology is needed to characterize, quantify, propagate, and manage uncertainties that is applicable to each discipline.

Proposals are sought in two categories: specific UQ strategies for Aerodynamic prediction not limited to forces, moments, boundary layer profile, and moldline thermal contours, and a multi-disciplinary UQ strategy enabling uncertainty impacts on vehicle and performance parameters not limited to TOGW, range, speed, and survivability.

#### **2.1.6 Technology Area 6: Lethality and Energetics**

##### **Topic 6: System Level Simulations of Blast Energetics for Hypersonic Operations**

**Technology Discipline:** ORD - Ordnance

**Proposal Description:** To effectively attack certain targets, a blast explosive is the most optimum payload. This class of explosives are typically composed of molecular crystals (e.g. RDX/HMX) polymeric binders, metallic particles (e.g. aluminum (Al)) and oxidizers (e.g. ammonium perchlorate (AP)). A critical tool used in the design and optimization of hypersonic systems is computational modeling. For the warhead subsystem, most of the efforts have been put into modeling the detonation response. However, during hypersonic flight the thermal and mechanical loadings experienced may lead to changes in sensitivity. In addition, the presence of the AP and Al are found to produce differences in responses to shock and thermal loading as opposed to an energetic system containing only RDX or HMX. These differences in response



have been observed in cook-off testing as well as when detonated. This suggests that the response of this class of explosives during hypersonic operations may result in a non-ideal functioning of the system. While progress has been made into modeling at the crystal scale, there are no engineering scale models that could be used to perform full system level simulation of hypersonic weapons across the complete operational envelop.

Proposals are sought to develop engineering scale continuum models to accurately represent the response of the blast energetic to the loadings experienced during a hypersonic mission. This include thermal loading during flight, impact loading during penetration, and detonation when functioned as designed. The models should capture the dependence of the response on presence of various sources of heterogeneities such as defects (e.g. pores), metallic particles, oxidizers.

**Topic 7:** The development of experimentally validated methods and models to advance understanding of multiphase blast properties and structural responses to structures

**Technology Discipline:** ORD - Ordnance

**Proposal Description:** For hypersonic missiles, the kinetic energy of the warhead will usually exceed the chemical energy in the explosive. It is important to understand how the kinetic energy enhances the lethality of the warhead, so that this energy can be leveraged. To improve the effectiveness of explosive warheads, multiple blast warheads may have utility. A critical tool used in the design and optimization of hypersonic systems is computational modeling, and validation with intricate test rigs could provide useful to future development. During hypersonic flight the thermal and mechanical loadings experienced may lead to changes in sensitivity.

Proposals are sought to improve our understanding of how particle aerodynamics, gas dynamics, chemistry, and energy coupling to targets differs in hypersonic weapons, versus slower gravity-dropped weapons and static ground tests. Construction of physics models to understand the dynamic behavior of explosively dispersed particle fields originating from a high-speed moving source and the development of energy coupling and structural response models for the combined gas-phase and solid-phase blast impacting simple, generic targets. Candidate concepts should be evaluated and validated through rigorous ground experiments

### 2.1.7 Workforce Development

**Topic 8:** Quantitative Progress on Hypersonic Workforce Development

**Technology Discipline:** HWD - Hypersonic Workforce Development

**Proposal Description:** The hypersonic workforce is a key enabler to success in transiting relevant technologies to the warfighter and innovating of new ideas and technologies that advance hypersonics to the next level of technological superiority.

That workforce has seen a contraction and has been stressed while hypersonics has ebbed and flowed through the decades with the lack of sustained level of research and science and technology funding.

Recently, interest in hypersonics has increased and this is predicted to be sustained for several years. Many good ideas have been defined to improve our workforce outcomes to include the establishment of the University Consortium for Applied Hypersonics (UCAH) to help involve universities in applied research and strengthen the pipeline of qualified applicants.

Proposals are sought to investigate strategies to help take best in class programs, ideas, and strategies enacted over the past few years and make quantifiable and sustained progress in this area. Specifically, the government is looking for strategies that;

1. Define a baseline for the workforce to help focus future strategies. The JHTO has funded several surveys to obtain data to inform future investment and using this data suggest strategies and plans to improve the workforce demographics. Analysis of existing data and distillation into relevant





strategies is sought. Additionally, solutions are sought to develop methods to annually report on the workforce health and gaps that need to be addressed in a formal and documented manner.

2. Technology readiness levels, (TRL's) manufacturing readiness levels (MRL's) are common place in many industries. Solutions that further develop quantitative ways to measure progress in our strategies using the personnel readiness level (PRL) framework developed for the test community should be investigated.
3. Solutions are sought that create and disseminate curricula to include a hypersonics certificate program. Any suggested curricula program created should consider how to take advantage of multiple universities contributing to content with IP agreements and include the funding and availability strategies for students, industry/contractor workforce and government personnel.

### 3. PHASE 1: WHITE PAPER SUBMISSION AND EVALUATION

#### 3.1 General Requirements

WPs should adhere to the following:

- Section I of the WP should be no more than three pages in length.
- Figures and tables must be numbered and, when referenced in the text, be referenced by that number. They should be of a size that is easily readable and may be in landscape orientation. They must be formatted to print on an 8.5 x 11-inch paper size.
- WPs will be single-spaced with one-inch margins on all sides. Font should be Times New Roman font (11-point minimum). Smaller font may be used in figures and tables, but must be legible.
- WPs must be in portrait orientation except for figures, graphs, images and pictures.
- The WP documents should be submitted as one pdf document. Number pages sequentially within the proposal showing proposal section and page number.
- All major sections shall begin on a new page.
- Proposal language shall be English.
- No classified information shall be submitted with the proposal.
- All information that is considered to be a trade secret or proprietary information should be marked as such. Note that government support contractors, TEES personnel, and other Consortium members may have access to this information for the purposes of administrative and evaluation support. Consortium members that are proposing under this RWP/RPP, will not be reviewers within the topic area that they proposed in. These personnel will be required to complete a NDA and to certify that they have no conflict of interest that might impact the process.

#### 3.2 Format

Please use the WP templates provided on the [UCAH website](#). WPs should be formatted as follows:

**Cover Page.** The Cover page should include:

- Project Title
- Technical Area and Topic Number (from Section 2)
- Applicant Organization
- Primary Technical Point of Contact (POC), including name, address, phone and email contact information
- Co-PI(s) names and institutions
- Primary Business POC, including name, address, phone and email contact information
- Total Solution Rough Order of Magnitude (ROM) price
- Date of Submission



**Table of Contents.** The Table of Contents should include all of the documents requested in Sections I-VI.

**Section I: Technical Requirements** (3 pages maximum)

- a. Background and Benefits of Proposed Solution as related to the SON
- b. Technical Approach, including clearly defined prototype solution

**Section II: Bibliography and References Cited**

**Section III: Facilities** (2 pages maximum)

Identify any facilities required for the proposed research and whether those facilities are organic to project participants' organizations or must be leased or purchased. Note whether facility availability is likely to impact project cost/schedule/performance.

**Section IV: Key Personnel** (2 page maximum)

- a. Include a description of contributions and significance of each.

**Section V: Security Requirements**

- a. Address any special security and classification requirements, as necessary.
- b. Is your institution as well as those you are collaborating with capable of protecting CUI in accordance with the following Defense Federal Acquisition Regulation Supplement (DFARS) clauses?:
  - DFARS 252.204-7012? YES or NO
  - DFARS 252.204-7019? YES or NO
  - DFARS 252.204-7020? YES or NO
  - DFARS 252.204-7021? YES or NO
- c. Are they able to handle classified research? YES or NO
- d. Are they registered with the Directorate of Defense Trade Controls (DDTC)? YES or NO

**Section VI: Estimated Pricing**

The JHTO, as the final decision-authority in making WP selections, will consider affordability. Therefore, each WP shall include an estimated price required to meet the technical solutions described in the WP. Please use the below structure for your cost estimates.



<b>White Paper Estimated Pricing</b>	<i>Institution Name:</i>			
	<i>Solicitation Number:</i>	<b>TEES/JHTO-RPP-2021-003</b>		
	<i>Lead PI:</i>			
	<i>Lead Institution:</i>			
<b>Category</b>	<b>Year One</b>	<b>Year Two</b>	<b>Year Three</b>	<b>Total</b>
<b>A. Personnel Costs</b>				\$ -
Number of graduate students supported in this effort				
Number of undergraduate students supported in this effort				
<b>B. Travel</b>				\$ -
<b>C. Material / Supplies</b>				\$ -
<b>D. Subawards / Subcontracts</b>	\$ -	\$ -	\$ -	\$ -
<b>Institution #1: Fill In Name</b>				\$ -
<b>Institution #2: Fill In Name</b>				\$ -
<b>Institution #3: Fill In Name</b>				\$ -
<b>Institution #4: Fill In Name</b>				\$ -
<b>Institution #5: Fill In Name</b>				\$ -
<b>Institution #6: Fill In Name</b>				\$ -
<b>E. Equipment or Facilities</b>				\$ -
<b>F. Other Direct Costs</b>				\$ -
<b>G. Indirect Costs</b>				\$ -
<b>Total Project Costs:</b>	\$ -	\$ -	\$ -	\$ -

### 3.3 Basis for Selection

WPs will be evaluated against the stated criteria below:

- 1) Relevance of the proposed solution in addressing the SON.
- 2) Technical merit and feasibility of the proposed solution to address the SON.
- 3) Proposed solution's approach and/or underlying technology is innovative and is a compelling solution to the SON.

WPs will be evaluated on the basis of the merit of the proposed concept in addressing each SON, not against other WPs submitted in response to the same SON. Additionally, while not overtly stated, the Government's evaluation will consider whether the proposal increases the likelihood of accomplishing the aspects of JHTO's mission.

This UCAH routinely receives more WPs than has the resources to award. All submissions will be fairly evaluated, however, only a select few will be invited to submit a PPP. The government reserves the right to limit the number of RPPs. The government also reserves the right to select a portion of a WP as the basis for requesting a PPP. As such, a proposed solution may also be evaluated to be of merit, but not requested to submit a PPP. WPs that are chosen to submit a PPP will be notified in writing as soon as practicable.



If the WP is of interest, but not requested to submit a PPP due to availability of government resources, the WP lead may be contacted within 180 calendar days from the WP submission date with a RPP for the possibility of a PSA award. If after 180 calendar days from the WP submission date (or earlier if notified by JHTO), government resources are not identified to formally move to Phase 2, requesting a PPP, the WP lead will no longer be eligible for an award under this RWP/RPP.

#### 4. PHASE 2: PROTOTYPE PROJECT PROPOSAL SUBMISSION AND EVALUATION

Phase 2 of the award process, PPP submission and evaluation, will follow the evaluation process for Phase 1 as discussed in [Section 3](#). The intent of the PPP is to provide increased, contract-level fidelity to information provided in the previously-submitted WP.

JHTO will issue a RPP through TEES. TEES will assign a program specialist to assist each member with the proposal process and ensure that the required documents are completed properly. PPPs shall follow the format described in [Section 4.1](#) and [4.2](#) and will be evaluated by JHTO based on the criteria in [Section 4.3](#). UCAH Consortium members are responsible for all expenses associated with responding to the RPPs.

##### 4.1 General Requirements

PPPs should adhere to the following:

- Figures and tables must be numbered and, when referenced in the text, be referenced by that number. They should be of a size that is easily readable and may be in landscape orientation. They must be formatted to print on an 8.5 x 11-inch paper size.
- PPPs will be single-spaced with one-inch margins on all sides. Font should be Times New Roman (11-point minimum). Smaller font may be used in figures and tables, but must be legible.
- PPPs must be in portrait orientation except for figures, graphs, images and pictures.
- The proposal documents should be submitted as one pdf document. Number pages sequentially within the proposal showing proposal section and page number. The budget spreadsheets should also be submitted as an excel document with formulas left available for evaluation purposes.
- All major sections shall begin on a new page.
- Proposal language shall be English.
- No classified information shall be submitted with the proposal.
- All information that is considered CUI (formerly FOUO), should be marked as such and transmitted appropriately.
- All information that is considered to be a trade secret or proprietary information should be marked as such. Note that government support contractors, TEES personnel, and other Consortium members may have access to this information for the purposes of administrative and evaluation support. Consortium members that are proposing under this RWP/RPP, will not be reviewers within the topic area that they proposed in. These personnel will be required to complete an NDA and to certify that they have no conflict of interest that might impact the process.
- Letters of support are encouraged. They can be attached as an appendix to the proposal submission.

##### 4.2 Format

Please use the proposal templates provided on the [UCAH website](#). PPPs should be formatted as follows:

**Cover Page.** The Cover page should include:

- Prototype Project Title
- Technical Area and Topic Number (from [Section 2](#))



- Applicant Organization
- Primary Technical POC, including name, address, phone and email contact information
- Co-PI(s) names and institutions
- Primary Business POC, including name, address, phone and email contact information
- Facility Clearance Level (if required)
- Proposed Period of Performance
- Date of Submission
- Proposed Validity Date (must be valid for a minimum of ninety (90) days)

**Table of Contents.** The Table of Contents should include all of the documents requested in Sections I-X.

**Section I: Performance Work Statement** (12 pages maximum).

- Abstract
- Objectives Statement
- Research Narrative
  - Background and Benefits of Proposed Solution as related to the SON
  - Technical approach, including clearly defined prototype solution
  - Schedule and Deliverables
- Place of Performance
- Government Furnished Property/Equipment/Materials/High Performance Computing Requirements

**Section II: Bibliography and References Cited**

**Section III: Facilities**

Identify any facilities required for the proposed research and whether those facilities are organic to project participants' organizations or must be leased or purchased. Note whether facility availability is likely to impact project cost/schedule/performance.

**Section IV: Key Participants**

Use of 10 U.S.C. § 2371b prototype authority for this Prototype Project requires that proposals meet requirements for significant participation by a non-profit research institution or NTDC.

Include a description of contributions and significance of each such entity and indicate the percentage of their total available time each will devote to this project.

Participant	Business Status (Check one)	Participant Contribution and Significance to Overall Project
<i>[Insert separate row(s) for each additional participant. Delete row(s) as applicable if Participant is the only participant.]</i>  Name: Institution: Role: Time Commitment (%):	<input type="checkbox"/> Traditional <input type="checkbox"/> Nontraditional defense contractor <input type="checkbox"/> Nonprofit research institution <input type="checkbox"/> Small business	<i>[Insert detailed, quantifiable description which addresses the following:</i> <ul style="list-style-type: none"> <li>• What is this Participant's significant contribution?</li> <li>• Why is this Participant's contribution significant to the overall project?</li> <li>• How is this Participant uniquely qualified to provide this significant contribution? (Note: number of years of experience is not deemed a unique qualification.)] </li></ul>





Each participant resume shall be no more than two (2) pages in length. Current and pending sponsored research projects are requested for each PI.

### Section V: Security Requirements

- a. Address any special security and classification requirements, as necessary.
- b. Is your institution as well as those you are collaborating with capable of protecting CUI in accordance with following Defense Federal Acquisition Regulation Supplement (DFARS) clauses?:
  - DFARS 252.204-7012? YES or NO
  - DFARS 252.204-7019? YES or NO
  - DFARS 252.204-7020? YES or NO
  - DFARS 252.204-7021? YES or NO
- c. Are they able to handle classified research? YES or NO
- d. Are they registered with the Directorate of Defense Trade Controls (DDTC)? YES or NO

### Section VI: Pricing

The Price Section shall provide sufficient detail to substantiate that the overall proposed price is realistic, reasonable, complete for the work proposed and reflects the best price for the PPP. The Pricing Section shall also include a narrative explanation of proposed prices. For all team members that do not have Government-approved rates, their proposed rates shall represent the most favored customer rates.

- a. 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.
- b. Fringe Benefits: The proposal should show the rates and calculation of the costs.
- c. Travel: The proposed travel cost should include the following for each trip: the purpose of the trip, origin and destination if known, approximate duration, the number of travelers, and the estimated cost per trip (including mileage, parking, baggage costs, etc.) must be justified based on the organizations historical average cost per trip or other reasonable basis for estimation. Such estimates and the resultant costs claimed must conform to the applicable Federal cost principals. Proposed travel should include funds for a yearly Program Review.
- d. Materials & Supplies: Provide a list of the materials/equipment required to meet the technical approach and the estimated cost.
- e. Sub-Agreements/Subcontracts: Provide a description of the work to be performed by the subrecipient/ subcontractor. For each PSA, a detailed cost proposal is required to be submitted by the subrecipient(s).
- f. 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 must 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) should 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 research effort.
- g. Other Direct Costs – Provide an itemized list of all remaining proposed other direct costs, such as Graduate Assistant tuition, laboratory fees, report and publication costs, and the basis for the estimate (e.g., quotes, prior purchases, catalog price lists).
- h. 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.



You must provide a detailed budget justification for each year of the effort. You should clearly explain the need for each item. This section should include the budget, budget justification, copy of approved rate sheet, and any supporting documentation for the lead university and all sub-universities/PIs.

### **Section VII: Milestone Payment Schedule**

The Milestone Payment Schedule shall include the payable events for the Prototype Project. Each event shall include a description and proposed price for the event.

### **Section VIII: Affirmation of Business Status Certification**

Certifications for each participant shall be provided.

- a. Name of Business Entity
- b. Proposed NAICS Code
- c. Cage Code
- d. SAM Expiration Date
- e. Address
- f. Business POC Name, Title, Phone and Email

### **Section IX: Data Rights Assertions**

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. The following information shall be presented for all assertions:

- a. 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).
- b. 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 should be restricted).
- c. Asserted rights category (Enter asserted rights category (e.g., government purpose license rights from a prior contract, limited, or specifically negotiated licenses).
- d. Name of entity asserting restrictions (corporation, individual, or other person, as appropriate).

### **Section X: Appendices**

#### **4.3 Evaluation of Proposals**

JHTO will evaluate all PPPs submitted in response to this RPP, with the expectation that multiple PPPs may exist for a given SON. JHTO reserves the right to award all, some or none of the PPPs submitted. JHTO may also request and recommend a directed partnership between two or more submitted PPPs which may include all elements or selected elements of those PPPs. Should the JHTO choose to do this, it will provide direction that will enable the PPP leads, in conjunction with TEES, to pursue a PSA that will meet the requirements of the SON. TEES and the JHTO will provide no funding for direct reimbursement of PPP development costs. Technical and cost proposals (or any other material) submitted in response to this RWP/RPP will not be returned.

If, based on evaluation of a PPP, JHTO is interested in pursuing award, TEES will negotiate a PSA(s) with the selected UCAH consortium member.

PPPs will be evaluated against the stated criteria below:



- 1) Relevance of the proposed solution in addressing the SON;
- 2) Technical Merit and feasibility of the proposed solution to address the SON;
- 3) Proposed solution's approach and/or underlying technology is innovative and is a compelling solution to the SON;
- 4) UCAH consortium membership;
- 5) Student engagement in all phases of the proposed solution;
- 6) Proposed price;
- 7) Project schedule; and
- 8) Potential impact of data rights assertions.

PPPs will be evaluated on the basis of the merit of the proposed concept in addressing the SON and the factors above, not against any other PPPs held under the same SON. PPP submissions will be valid for 365 calendar days. Upon completion of evaluations, the government 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 to the government; or (3) the proposed solution is of interest, but not eligible for a PSA due to availability of government resources.

If the proposed solution is of interest, but not eligible for a PSA due to availability of government resources, the PPP lead may be contacted within 365 calendar days from the PPP submission date with a request to refresh their PPP for the possibility of a PSA award. If after 365 calendar days from the PPP submission date (or earlier if notified by JHTO), government resources are not identified to formally move to a PSA award, the PPP lead will no longer be eligible for an award under this RPP.

#### **4.4 Potential for Follow-On Production**

In accordance with 10 U.S.C. § 2371b, paragraph (f), a Prototype Project issued under the overarching Other Transaction (OT) Agreement<sup>2</sup>, if successfully completed and competitively awarded, may result in the award of a follow-on production contract or transaction without the use of competitive procedures. Success metrics for each PPP shall be defined in the individual Prototype Project and subsequent PSA(s).

Per DoD Policy, the following definition of “successfully completed” shall apply to any Prototype Project: ‘A transaction for a Prototype Project is complete upon the written determination of the appropriate approving official for the matter in question that efforts conducted under an OT-Prototype Project: (1) met the key technical goals of a project; (2) satisfied success metrics incorporated into the Prototype Project; or (3) accomplished a particularly favorable or unexpected result that justifies the transition to production. Furthermore, successful completion can occur prior to the conclusion of a Prototype Project to allow the Government to transition any aspect of the Prototype Project determined to provide utility into production while other aspects of the Prototype Project have yet to be completed.

All Prototype Projects issued under the overarching OT Agreement shall set forth the conditions for successful completion in the performance work statement.

The language of paragraphs 1 and 2 of this section shall be incorporated into all PSAs in order to allow for the option of non-competitive follow-on production contract(s).

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<sup>2</sup> The Agreement under which the UCAH is established and managed by TEES.