February 26, 2021

Industry may submit comments regarding this draft BAA to the BIDS administrators at BIDSHelp@cttso.gov or by using the Request Help link located on the BIDS Homepage until the first day of IWTSD's Industry Week on March 8, 2021. Comments will help IWTSD better prepare for questions that may arise during Industry Week. The Government will not provide responses to comments received on this draft BAA. See section 1.6 BAA Contractual and Technical Questions for guidance on how to submit questions once the final BAA is released.

IRREGULAR WARFARE TECHNICAL SUPPORT DIRECTORATE/ Technical Support Working Group (IWTSD/TSWG)

BROAD AGENCY ANNOUNCEMENT (BAA) 21S4370

Anticipated Due Date for Receipt of Phase 1 Quad Charts:

No Later Than TBD
All submissions are due by 3:00 p.m. Eastern Time (ET) on the above date

Advanced Analytics (AA)
Chemical, Biological, Radiological, Nuclear, and Explosives (CBRNE)
Expeditionary Force Protection (EFP)
Explosive Ordnance Disposal and Explosive Operations (EOD/EXO)
Forensic Exploitation and Identity Operations (FEIO)
Human Performance and Training (HPT)
Indirect Influence and Competition (I2C)
Protection, Survivability, and Recovery (PSR)
Surveillance, Collection, and Operations Support (SCOS)
Tactical Offensive Support (TOS)

****

The Broad Agency Announcement Information Delivery System (BIDS) is the system in which all submissions and communications will flow. Communications outside of BIDS may result in expulsion from the competition.

TABLE OF CONTENTS

Remainder of this page intentionally left blank.

1. INTRODUCTION.

This is an Irregular Warfare Technical Support Directorate (IWTSD) Broad Agency Announcement (BAA) issued under the provisions of paragraph 6.102(d)(2)(i) of the Federal Acquisition Regulation (FAR) to provide for the competitive selection of research proposals. Contracts based on responses to this BAA are considered to be the result of full and open competition and in full compliance with the provisions of Public Law (PL) 98-369 Section 2701, "The Competition in Contracting Act." **Awards for submissions under this BAA are planned for Fiscal Year (FY) 2022. No contract awards will be made until appropriated funds are available from which payment for contract purposes can be made.**

[NOTE: Persons submitting proposals are advised that only the Contracting Officer can obligate the Government to any agreement involving expenditure of Government funds.]

1.1. Approach.

A three-phased proposal selection process will be used for this BAA to minimize cost and effort for prospective offerors:

- Phase 1 will consist of the solicitation, receipt, and evaluation of a one-page Quad Chart and a one-page addendum.

- Phase 2 will consist of the solicitation, receipt, and evaluation of a White Paper and applies to only those submissions that have been accepted in Phase 1.

- Phase 3 will consist of the solicitation, receipt, and evaluation of a Full Proposal and applies to only those submissions that have been accepted in Phase 2. Based on the priority of critical requirements and the availability of funding, Phase 1 submissions can be selected for Phase 3 without a Phase 2 submission.

Clarifications to White Papers and Full Proposals may be requested.

1.2. Small Business Set Aside.

The Government encourages nonprofit organizations, educational institutions, small businesses, small disadvantaged business (SDB) concerns, Historically Black Colleges and Universities (HBCU), Minority Institutions (MI), women-owned businesses, and Historically Underutilized Business zone enterprises as well as large businesses and Government laboratories to submit research proposals for consideration and/or to join others in submitting proposals; however, no portion of the BAA will be set aside for these special entities because of the impracticality of reserving discrete or severable areas of research and development (R&D) in any specific requirement area.

1.3. Limitation of Funds.

The Government intends to incrementally fund Cost Reimbursement contracts awarded from this BAA as provided by FAR 52.232-22, "Limitation of Funds." Most contracts awarded are anticipated to be 12 to 24 months in duration and at times may include additional 6 to12 month option(s). To facilitate incremental funding, submissions shall include the cost and schedule by a task-phased structure with clear exit criteria, and shall be inclusive of all work to complete the

effort including any options. It is anticipated that the entire effort will be negotiated with the initial contract award.

[NOTE: Based upon the availability of funding, the Government may have to partially fund Fixed Price contracts in accordance with DFAR 252.232-7007, "Limitation of Government's Obligation." In such cases, milestone payments will need to be a part of the full proposal. Applicability of this issue will be stated in the email asking for a Phase 3 proposal.]

1.4. Technical Evaluation Support.

It is the intent of this office to use contractor support personnel in the review, evaluation, and administration of all submissions for this BAA. All contractor support personnel will have access to proprietary data and shall certify that they: (1) will not disclose any information pertaining to this solicitation including any submissions, the identity of any submitters, or any other information relative to this BAA; and (2) have no financial interest in any submissions evaluated, reviewed, and administered. Submissions and information received in response to this BAA constitutes permission to disclose that proposal data to certified evaluators under these conditions.

1.5. BAA Package Download.

This BAA Package can be downloaded electronically in its entirety from IWTSD BAA Information Delivery System (BIDS), https://bids.cttso.gov/, under Resources. Registration is not required to download the BAA package; however, BIDS registration is required to upload a response to the BAA.

1.6. BAA Contractual and Technical Questions.

All contractual and technical questions regarding this BAA, including the published requirements and instructions, must be posted via either the *BAA and Requirement Questions* feature, accessible from the BIDS homepage via *Have a Question?*, or emailed to BIDSHelp@cttso.gov. No other office personnel will acknowledge, forward, or respond to any inquiries received in any manner concerning the BAA. All questions must be received no later than 14 days after the release of the final BAA. Contractual questions and answers will be posted periodically under BAA Questions. Offerors are encouraged to periodically review *BAA Questions*, accessible from the BIDS homepage via *Have a Question?*.

1.7. BIDS Website Help Requests.

For technical help using BIDS, submit questions to BIDSHelp@cttso.gov or by using the button located under *Have a Question?*. Include a valid email address, your BIDS username, and a detailed description of the question or concern in the comments block. BIDS provides other valuable resources, such as *Doing Business with the Government*. Reference documents noted in this BAA, such as the Quad Chart Sample and IWTSD Cost Proposal Template, are available for download under *Resources* on the homepage menu bar.

A list of BIDS FAQs can be found in the *Have a Question?* section of BIDS.

2. GENERAL INFORMATION.

This section includes information applicable to all awards under this BAA.

2.1. Eligibility.

To be eligible for contract award, a responsible offeror must meet certain minimum standards pertaining to financial solvency and resources, ability to comply with the performance schedule, prior record of satisfactory performance, integrity, organization, experience, operational controls, technical skills, facilities, and equipment. See FAR 9.104.

- All offerors must be registered in the System for Award Management (SAM) database prior to award at https://www.sam.gov.

Other helpful information is provided under *Doing Business with the Government* on the BIDS homepage.

2.2. Procurement Integrity, Standards of Conduct, Ethical Considerations.

Certain post-employment restrictions on former federal officers and employees exist including special Government employees (Section 207 of Title 18, United States Code (U.S.C.)). If a prospective offeror believes that a conflict of interest exists, the offeror should make this known to the Contracting Officer for resolution before time and effort are expended in preparing a proposal.

2.3. Prohibition on Contracting for Certain Telecommunications and Video Surveillance Services or Equipment.

FAR provision 52.204-24 applies to all BAA requirements. The full text of FAR provision 52.204-24 is below. All contracts awarded from the BAA will include related FAR clauses 52.204-25 and 52.244-6.

52.204-24 Representation Regarding Certain Telecommunications and Video Surveillance Services or Equipment (AUG 2019)

(a) *Definitions.* As used in this provision-

Covered telecommunications equipment or services, *Critical technology*, and *Substantial or essential component* have the meanings provided in clause 52.204-25, Prohibition on Contracting for Certain Telecommunications and Video Surveillance Services or Equipment.

(b) *Prohibition.* Section 889(a)(l)(A) of the John S. McCain National Defense Authorization Act for Fiscal Year 2019 (Pub. L. 115-232) prohibits the head of an executive agency on or after August 13, 2019, from procuring or obtaining or extending or renewing a contract to procure or obtain, any equipment, system, or service that uses covered telecommunications equipment or services as a substantial or essential component of any system, or as critical technology as part of any system. Contractors are not prohibited from providing -

(1) A service that connects to the facilities of a third-party, such as backhaul, roaming, or interconnection arrangements; or

(2) Telecommunications equipment that cannot route or redirect user data traffic or permit visibility into any user data or packets that such equipment transmits or otherwise handles.

(c) *Representation.* The Offeror represents that -

It [ ] will, [ ] will not provide covered telecommunications equipment or services to the Government in the performance of any contract, subcontract or other contractual instrument resulting from this solicitation.

(d) *Disclosures.* If the Offeror has responded affirmatively to the representation in paragraph (c) of this provision, the Offeror shall provide the following information as part of the offer-

(1) All covered telecommunications equipment and services offered (include brand; model number, such as original equipment manufacturer (OEM) number, manufacturer part number, or wholesaler number: and item description, as applicable);

(2) Explanation of the proposed use of covered telecommunication equipment and services and any factors relevant to determining if such use would be permissible under the prohibition in paragraph (b) of this provision;

(3) For services, the entity providing the covered telecommunication services (include entity name, unique entity identifier, and Commercial and Government Entity (CAGE) code, if known); and

(4) For equipment, the entity that produced the covered telecommunications equipment (include entity name, unique entity identifier, CAGE code, and whether the entity was the OEM or a distributor, if known).

(End of provision)

2.4. Restrictive Markings on Proposals.

All proposals should clearly indicate content disclosure limitations. Submissions can be marked as “Proprietary” or words to that effect; however, markings such as “Company Confidential” or other phrases that could be confused with national security classifications shall not be used. All paragraphs that contain proprietary information must be clearly marked. The Contracting Officer may challenge proprietary markings if they are not substantiated.

2.5. Submission Handling/Rights in Technical Data and Computer Software/Patent Rights.

2.5.1. Procurement Integrity.

The Government shall comply with FAR 3.104 in its treatment of information submitted in response to this BAA solicitation and marked with the individual’s or company’s legend.

2.5.2. Submission Information and FOIA.

Records or data bearing a restrictive legend can be included in the proposal. However, the

offeror is cautioned that portions of the proposal are subject to release under the terms of the Freedom of Information Act (FOIA), 5 U.S.C. § 552, as amended. In accordance with FOIA regulations, the offeror will be afforded the opportunity to comment on, or object to, the release of proposal information.

2.5.3. Rights in Technical Data and Computer Software.

Rights in technical data and computer software and software documentation provided in the proposal are treated in accordance with the Department of Defense Federal Acquisition Regulation Supplement (DFARS) 252.227-7016, "Rights in Bid and Proposal Information." Rights in technical data, and computer software and computer software documentation in the resultant contract shall be in accordance with DFARS 252.227-7013 (regarding technical data) and DFARS Section 252.227-7014 (regarding computer software and software documentation). Both clauses (DFARS sections 252.227-7013 and 252.227-7014) will be included in any noncommercial contract exceeding the simplified acquisition threshold. Table 1 contains these and related clauses that may be included in the contract.

Table 1. Contract Clauses	
DFARS	**Title**
252.227-7013	Rights in Technical Data – Noncommercial Items
252.227-7014	Rights in Noncommercial Computer Software and Noncommercial Computer Software Documentation
252.227-7016	Rights in Bid and Proposal Information
252.227-7017	Identification and Assertion of Use, Release, or Disclosure Restrictions
252.227-7019	Validation of Asserted Restrictions - Computer Software
252.227-7025	Limitations on the Use or Disclosure of Government-Furnished Information Marked with Restrictive
252.227-7027	Deferred Ordering of Technical Data or Computer Software
252.227-7028	Technical Data or Computer Software Previously Delivered to the Government
252.227-7030	Technical Data - Withholding of Payment
252.227-7037	Validation of Restrictive Markings on Technical Data

2.5.4. Patents.

Patents in existence and patent applications pending at the time of the proposal, which relate to the proposed effort, shall be identified in the White Paper and Full Proposal in accordance with the clauses above.

2.6. Product and Deliverable Requirements.

All proposal phases shall include the costs for products and data deliverable requirements. Minimum data (report) requirements include Monthly Status Reports (MSRs), meeting minutes and a Final Technical Report even if the research is to be continued under a follow-on contract or contract option. MSRs document program, technical, and financial status. The Final Technical Report summarizes the project and associated tasks at the conclusion of each contract. Include

MSRs, the Final Technical Report, and any products and deliverables specific to the performance of the proposed effort (e.g., system specification). The Government will provide the offeror with a full listing of data deliverables (i.e., Contract Data Requirements List) in the request for Phase 3 Full Proposal. Additional products and deliverables could include prototype hardware, software, or systems; test plans; test and technical reports; technical data; specifications; requirements documents; computer programs or software; user manuals; drawings; or other products and data. The number, types, and preparation instructions for products and deliverables will be specified in the contract.

2.7. Distribution/Release Limitations.

The offeror should be aware that all resulting contracts or other awards will contain release limitations for all data resulting from the effort in accordance with DFARS 252.204-7000. This includes products, data, information, and services to be performed. The contractor shall protect all data and information from disclosure, and shall not release any data or information by any method of dissemination without prior Government approval.

2.8. Subcontracting.

Pursuant to Section 8(d) of the Small Business Act (15 U.S.C. § 637(d)), it is the policy of the Government to enable small business and small disadvantaged business concerns to be considered fairly as subcontractors to contractors performing work or rendering services as prime contractors or subcontractors under Government contracts, and to assure that prime contractors and subcontractors carry out this policy.

2.9. Animal or Human Testing Compliance.

The contractor shall comply with all laws and regulations governing the use of animals or human subjects in research projects. Information regarding compliance requirements for using humans and animals in testing is also available on BIDS under Resources.

2.9.1.Animal Testing.

Any contract resulting from this BAA that potentially involves the testing of animals shall include the following language:

> Any contractor performing research on warm blooded vertebrate animals shall comply with the Laboratory Animal Welfare Act of 1966, as amended, 7 U.S.C. §§ 2131 - 2159, and the regulations promulgated thereunder by the Secretary of Agriculture in 9 C.F.R. Parts 1 through 4, pertaining to the care, handling, and treatment of vertebrate animals held or used for research, teaching, or other activities supported by Federal contract awards. In addition, the contractor shall comply with the provisions of Department of Defense Instruction (DoDI) 3216.01, as implemented by SECNAVINST 3900.38C, and DFARS 252.235-7002, “Animal Welfare,” which is incorporated into this contract.

2.9.2. Human Subjects Testing.

Any contract resulting from this BAA that potentially involves the use of human subjects in the research or study shall include the following language:

The contractor shall comply with all regulations promulgated by the Office of the Secretary of Defense in 32 C.F.R. Part 219, pertaining to the protection of human subjects. In addition, the contractor shall comply with the provisions of DoDI 3216.02. If human subjects are to be used at any time during the project, the contractor shall have a Federal assurance that is acceptable to IWTSD before involving human subjects. Additionally, the protocol shall be approved by a Federally-assured Institutional Review Board (IRB) office named in the institution's assurance. The contractor shall prepare these documents and shall ensure that they are on file with IWTSD prior to the start of research involving human subjects. Collaborators with the contractor, to include IRBs, shall also comply with regulations to protect human subjects for both classified and unclassified research. The contractor shall report all changes in the protocol or consent form to the IWTSD Contracting Officer's Representative as they occur. Release of initial and follow-up funding will be contingent upon initial and continuing reviews, and to other IRB and component requirements.

2.10. Submission Document Language

All submission documents must be in English.

3. PROPOSAL PREPARATION.

This section provides information and instructions for the preparation and submission of all phases under this BAA. All submissions must meet these requirements including format, content, and structure, and must include all specified information to avoid disqualification, submission rejection, or delays in evaluation.

3.1. BAA Information Delivery System (BIDS).

BIDS at https://bids.cttso.gov/ is used: (1) to provide public access to the BAA package; (2) to collect all unclassified submissions; and (3) to collect placeholder records for all classified submissions. BIDS also provides submission progress tracking, evaluation comment collection, and results notification back to the submitter.

3.1.1. Submitter Registration.

A BIDS submitter registration is required to respond to this BAA. A new BIDS system was activated on February 15, 2020. All vendors who had register before this date, must re-register in the system. Registrations should reflect the offeror's contracting or business authority. The username, created by the offeror, must be unique and is used for BIDS log in and submission tracking. Registration acceptance for submitters is automatic, but takes several seconds to be recognized by BIDS. A success email will be sent to indicate that the username and account are accepted. BIDS is email dependent and uses the registration email as the single point of contact (POC) for all notifications associated with the BAA. This email address should be monitored frequently during the BAA process for the notices. Submitters should periodically check status in their account, not receiving a notification email does not constitute grounds to appeal an evaluation decision. Spam

blockers and other email security software may cause a notification email to be rejected; check your account. Email addresses included in the submissions or any other data field in BIDS will not be used for contact and notification purposes.

3.1.2. User Accounts and Password Resets.

Registration account information such as the POC, email, and password can be updated after log in. The *Forgot your Password?* link on the BIDS login page allows registered users with a valid username to automatically reset a password. The system will verify the account username and email and then send a new password to that email.

3.1.3. Registration and Account Help.

BIDS help requests can be emailed to BIDS administrators at BIDSHelp@cttso.gov or submitted via the button located on the *Have a Question?* page.

3.1.4. Document Identifier.

The offeror shall include the document identifier in the header of each submission. Document identifiers must match the BIDS submission record and should be constructed *before* upload to BIDS.

3.1.4.1. Constructing Document Identifiers.

Document identifiers, auto-generated in part by BIDS, are based on Subgroup, the requirement number, the username, and a Vendor Internal Tracking (VIT) number. The underlined portion of the sample shown in Table 2 depicts the segment automatically formed by BIDS.

Table 2. Sample Document Identifier and Components Definition

CB-1112-ABCCORP-10703JT-QC	
From Sample	**Document Identifier Component**
CB	subgroup designation - from BAA
1112	requirement number - from BAA
ABCCORP	username - from BIDS registration
10703JT-**QC**	VIT number - any alphanumeric combination (with no special characters or spaces) created by the submitter for (*submitter*) tracking purposes along with the **document type suffix**

3.1.4.2. Creating Vendor Internal Tracking (VIT) Numbers.

VIT numbers are unique identifiers created by submitters and entered in the submission record during the upload process. VIT numbers can be any alphanumeric combination (no special characters or spaces) chosen by the submitter plus a suffix indicating the document type. BIDS enforces unique VIT numbers and will not allow the submission record to be saved if the VIT number has already been used. Table 3 provides sample VIT numbering formats for each document type.

Table 3. Sample VIT Numbers for an Accepted Submission

Document Type	Auto-generated by BIDS	VIT#
Quad Chart +1-page addendum	CB-1112-ABCORP	10703JT-QC
White Paper	CB-1112-ABCORP	10703JT-WP
Full Proposal	CB-1112-ABCORP	10703JT-FP

Offerors uploading more than one submission to the same requirement shall create unique identifiers by adding a numbered sequence to the document type suffix. Table 4 offers sample VIT number formats for multiple submissions to the same requirement.

Table 4. Sample VIT Numbers for Multiple Submissions to the Same Requirement

Submission #	Auto-generated by BIDS	VIT# Sample 1	VIT# Sample 2*
Submission 1	CB-1112-ABCORP	10703JT-QC1	QC1
Submission 2	CB-1112-ABCORP	10703JT-QC2	QC2
Submission 3	CB-1112-ABCORP	10703JT-QC3	QC3
* NOTE: If the submitter does not require an internal tracking number, use the document type designation.			

3.2. BIDS Security and Access Control.

All data uploaded to BIDS is secure from public view and download. All submissions will be considered proprietary/source selection sensitive and protected accordingly. The documents can only be reviewed by the registrant and authorized Government and contractor representatives with no conflict of interest.

3.3. Submission Changes.

Changes to uploaded submissions are permitted up to the closing date and time. If a modification is required, update the original file in the source application and save. Convert to an acceptable format (detailed below) if applicable. In BIDS, open the submission record under **Previously Uploaded Proposals**. Only submissions with the **Update Proposal** status can be modified. Changes can be made after clicking on the submission link. Click on the trash icon to delete the old file. Use **Choose File** to select the revised document. Click **Save Proposal** to save the changes. Documents cannot be edited online through the BIDS interface. File names must contain no spaces or special characters. Ensure the file size does not exceed the prescribed limits. To completely remove a submission from consideration, select **Delete Proposal**. Changes after the submission due date and time are not permitted.

3.4. Special Handling Procedures for Classified Information.

If a submission contains classified information, the offeror must first create a placeholder record in BIDS with an unclassified cover page attachment. Identify in the placeholder document that the submission cannot be uploaded due to classification and include the method of delivery (hand-carried, secure fax, secure mail, etc.) as well as the tracking number, if applicable. The BIDS Document Identifier must be clearly identified on the mailed document(s). Classified responses (up to SECRET) must be appropriately and clearly marked (including all paragraphs

and pages containing the subject data), packaged, and shipped in accordance with classified material handling procedures and security regulations pertaining to the level of classification for that document. To obtain mailing instructions for classified submissions, email: BIDSHelp@cttso.gov.

Classified submissions must be received by the applicable due date and time. Classification in no way eliminates the offeror's requirement to comply with all BAA instructions.

3.5. Phase 1 Submissions.

Offerors shall prepare and upload a one-page Quad Chart and a one-page addendum in response to Phase 1 of this BAA. All pages shall be 8 ½ by 11 inches. Use Times New Roman font size 10 point or greater. Single spacing is preferred for the addendum. If more than two pages (i.e., the Quad Chart plus the addendum) are submitted, only the first two pages will be evaluated. Phase 1 submissions do not require a cover page.

3.5.1. Phase 1 Due Date and Time.

All unclassified Quad Charts *must be received electronically through BIDS* **no later than 1500 (3:00 p.m.) Eastern Time (ET) on the date specified on the cover of this document**. Likewise, classified submissions must be received by the same due date and time. Offerors must create a placeholder record in BIDS with an unclassified cover page attachment. Refer to section 3.4. of this BAA for instructions on classified submissions. BIDS does not allow proposals to be uploaded or classified placeholders to be created after the closing date and time. Any proposal, regardless of classification, submitted by any other means, **or that is late, will not be considered** by the Government. Avoid the last minute rush; submit early.

3.5.2. Electronic File Format.

The Quad Chart and addendum shall be submitted in a single file. This file must be in Portable Document Format (.pdf). Adobe Acrobat and MS Word can generate such files. The document must be print-capable, without password, and no larger than 1024 KB. File names cannot contain spaces or special characters. Apple users must ensure the entire file name and path are free of spaces and special characters. Submissions that cannot be opened, viewed, or printed will not be considered.

[NOTE: ZIP files and other application formats, such as Microsoft Office (.docx or .pptx) are NOT acceptable.]

3.5.3. Quad Chart and Addendum Content.

A Quad Chart conveys the essence of the proposed solution for a single requirement. When preparing a submission, the offeror shall ensure that the specific criteria of the requirement are addressed, the solution is clear, and can be accomplished with the proposed technology, cost, and schedule. The Quad Chart includes a document header and four quadrants. The Quad Chart format and sample are provided on BIDS under Resources.

3.5.3.1. Header Information.

Header information shall include the BAA number, the Document Identifier, and the Proposal Title. The date and company name should be included along with the appropriate document markings.

3.5.3.2. Top Left Quadrant, Graphical Depiction.
The top left quadrant is a graphical depiction, photograph, or artist's concept of the proposed solution or prototype. Include labels or brief descriptive text as needed for clarification. Ideally, this will convey the prototype concept, use, capability, and any relevant size or weight relationships based on the published requirement.

3.5.3.3. Top Right Quadrant, Operational and Performance Capabilities.
The top right quadrant contains the operational and performance capabilities summary. Describe any basic, new, or enhanced capabilities the system will provide to meet the published requirement. In bullet form, list key aspects of performance, capability, operational use, relevant software or hardware specifications, and planned interface and/or compatibility.

3.5.3.4. Bottom Left Quadrant, Technical Approach.
The bottom left quadrant contains the proposed technical approach. Specifically, describe the technology involved, how it will be used to solve the problem, actions done to date, and any related ongoing efforts. Briefly describe the tasks to be performed for each phase. A bulleted list is acceptable.

3.5.3.5. Bottom Right Quadrant, Cost and Schedule.
The bottom right quadrant contains the Rough Order of Magnitude (ROM) and Schedule, Products and Deliverables, and Corporate Contact Information. ROM and Schedule shall be proposed by phase and include the cost, period of performance (POP), and exit criteria for each phase. A total cost and POP that combines all phases, all applicable data requirements and minimum data report requirements (e.g., MSR, meeting minutes, Final Technical Report, etc.) shall also be included. Products and Deliverables shall include, by phase, a list of all prototype hardware and software along with the required data as described in "Product and Deliverable Requirements" in section 2.6. of this document. Corporate contact information shall include the submitter's company name, POC, phone number, and email address. Include any significant teaming partner (contact information) relevant to the evaluation.

[NOTE: The contact information in the BIDS registration is used for all notices and contact purposes.]

3.5.3.6. Addendum
The offeror shall use the addendum to describe the technical solution in greater detail.

3.5.4. Phase 1 Notification to Offeror.
The Government will notify the offeror when a submission has been accepted or rejected.

Notification of acceptance with a request to submit the next phase document will be emailed to the offeror's contracting authority as entered in the BIDS registration and will indicate the next submission type, clarification requests, and due date and time. Likewise, rejection notifications will be emailed to the address provided in the BIDS registration. **Debriefings for Phase 1 submissions will not be conducted due to the nature of BAAs.**

In general, submissions are not considered for further review when they do not meet the basic requirement, are too costly, or do not fit the mission. All Phase 1 submissions are evaluated in accordance with Section 4, Proposal Evaluation, of this BAA.

3.5.5. Phase 1 Status and Inquiries.
Phase 1 is complete when all submissions have been accepted or rejected in accordance with this BAA. Inquiries outside of the BIDS system (e.g., phone, email, etc.) concerning the status of Phase 1 submissions will not be accepted. After BIDS log on, submitters are able to check the status of their submission(s) under **Previously Uploaded Proposals.**

3.6. Phase 2 White Paper Submissions.

Offerors shall prepare and upload a White Paper with no more than twelve (12) pages plus a cover page in response to Phase 2 of this BAA. The cover page template is provided at the BIDS website under Resources. The cover page is excluded from the White Paper page count. All submission pages shall be 8 ½ by 11 inches, double-spaced with Times New Roman font no smaller than 10 point; all margins shall be one inch. Each page of the submission shall contain the document identifier in the document header. If the White Paper contains more than 12 pages including tables, charts, and figures, only the first 12 pages will be evaluated.

3.6.1. Phase 2 Due Date and Time.
All unclassified White Papers must be received electronically through BIDS no later than the due date and time specified in the Phase 1 Quad Chart acceptance email. Likewise, classified submissions must be received by the same due date and time; offerors must create a placeholder record in BIDS with an unclassified cover page attachment. Refer to section 3.4. of this BAA for instructions on classified submissions. BIDS does not allow proposals to be uploaded or for classified submissions to be created after the due date and time. Any proposal, regardless of classification, submitted by any other means, **or that is late, will not be considered** by the Government.

3.6.2. Electronic File Format.
The White Paper shall be submitted in a single file. This file must be in Portable Document Format (.pdf). Adobe Acrobat and MS Word can generate such files. The document must be print-capable, without password, and no larger than 2048 KB. File names cannot contain spaces or special characters. Apple users must ensure the entire file name and path are free of spaces and special characters. Submissions that cannot be opened, viewed, or printed will not be considered.

[NOTE: ZIP files and other application formats, such as Microsoft Office (.docx or .pptx)

are NOT acceptable.]

3.6.3. Phase 2 Document Upload.

To upload a next phase document use the link back to BIDS provided in the acceptance email, or log in to BIDS and navigate to **Requested Proposals** to open the accepted record. Review the checklist then click **Create Proposal** and follow the instructions.

3.6.4. White Paper Content.

White Papers shall provide a description of the technical approach, the specific tasks and deliverables by phase, schedule and cost estimate by phase, intellectual property and government rights, transition planning for production, and a capability statement. The offeror shall incorporate all clarification data requests from the acceptance email into the submission. Indicate clarification entries by footnote and reference the requested item(s) in the footer area. The following White Paper sections and details are required.

3.6.4.1. Cover Page.

A cover page template is provided BIDS under *Resources*. The cover page includes necessary contractual information including the offeror's contracting POC (name, telephone number, email address, facsimile number, mailing address) and business information (Data Universal Numbering System (DUNS) number, Commercial and Government Entity (CAGE) code, business type). Include the proposed contract type, total cost, and the duration of all phases/tasks. The cover page is excluded from the page count.

3.6.4.2. Technical Approach.

Describe the proposed solution relative to the requirement. Focus content on operational capabilities required to address the problem, the underlying theory that supports the operational capability, and suggested concept of operations. Identify end users that could be interested in the proposed solution and describe how the solution will be a benefit. Include drawings, diagrams, charts, and tables needed to explain the effort. Describe if, and where, the proposed technology/solution has been, or is being used. Identify sponsoring agency and funding resources; or if none, so state.

3.6.4.3. Tasks and Deliverables.

Identify the proposed tasks by phase in the order of occurrence. A phase must have clear exit criteria to serve as a "go" or "no-go" decision point to proceed to the next phase. Identify work that will be performed by other organizations or agencies. Identify anticipated technical risks along with planned mitigation efforts. Indicate any Government furnished material (GFM), equipment (GFE), or information (GFI) that will be required with the task and need date; or state if none. For each phase include the exit criteria and all products and deliverables as defined in section 2.6. of this BAA. State if a phase is proposed as an option.

3.6.4.4. Schedule.

Develop a master project schedule preferably in Gantt chart format. The schedule shall indicate the planned start and stop point for each phase with top level subordinate tasks, estimated delivery dates, and completion dates. Indicate the total project POP in months using March 30th as a notional start date through the completion date.

3.6.4.5. Cost.

Provide the proposed, task-phased budgetary estimate inclusive of any proposed options. At a minimum, this estimate shall detail estimated labor hours and costs, anticipated material costs, product and deliverable costs (see section 2.6. of this BAA), and other costs (e.g., subcontracts, indirect rates, profit or fee rate) for each phase/task. Costs allocated to other organizations (e.g., Government testing) shall be clearly shown; or state if none. Changes in cost from those proposed in the prior submission shall be explained.

3.6.4.6. Intellectual Property, Technical Data, and Software.

Disclose/discuss all intellectual property, technical data, and/or software rights that are intended to be used in connection with this submission. See section 2.5. of this BAA for additional information.

3.6.4.6.1. Patents and Patent Applications.

Identify any existing, applied for, or pending patents that will be used in the conduct of this effort. Provide patent number with date of issue and title or patent application number with filing date and title. Any patent or patent application that resulted from prior government funding should be identified. If no patents or patent applications are relevant, so state. See section 2.5. of this BAA for additional information.

3.6.4.6.2. Rights in Technical Data and Software.

Identify any technical data and/or computer software that will be delivered with less than unlimited rights as prescribed in DFARS 252.227-7013 and DFARS 252.227-7014. State if unlimited rights in technical data are proposed. See section 2.5. of this BAA for additional information.

3.6.4.7. Transition from Prototype to Production.

Describe the overall strategy to transition the results of this development effort to production once the funded effort is concluded. Briefly describe the overall strategy for transition, potential partners, transition issues to include any obvious regulatory, liability, interoperability, or financing issues. Discuss the interaction with representative users and the concept for test and evaluation by those users and follow on support of a product resulting from this effort.

3.6.4.8. Organizational Capability Statement.

Describe the offeror's capability and/or experience in doing this type of work. Identify technical team members or principal investigators and associated expertise. If applicable, include a description of co-participants' capabilities and/or

experience.State whether an agreement has been reached (or not) with the co-participants. The offeror is only required to submit past performance information in response to a request for Full Proposal.

3.6.5. Phase 2 Status and Inquiries.
Phase 2 is complete when all submissions have been accepted or rejected in accordance with this BAA. Inquiries outside of the BIDS system (e.g., phone, email, etc.) concerning the status of White Papers will not be accepted. After login to the BIDS website, submitters are able to check the status of their submission(s) under **Previously Uploaded Proposals.**

3.6.6. Phase 2 Notifications to Offeror.
The Government will notify the offeror when a submission has been accepted or rejected. Notification of acceptance with a request to submit the next phase document will be emailed to the offeror's contracting authority as *entered in the BIDS registration* and will indicate the next submission type, clarification requests, and due date and time. Likewise, rejection notifications will be emailed to the address provided in the BIDS registration. **Debriefings for White Papers will not be conducted due to the nature of BAAs**. In general, submissions are not considered for further review when they do not meet the basic requirement, are too costly, do not fit the mission, or funding is not expected. All White Papers are evaluated in accordance with section 4, Proposal Evaluation, of this BAA.

3.7. Phase 3 Full Proposal Submissions.
Offerors shall prepare and upload a Full Proposal, consisting of a Technical Proposal in **Portable Document Format (.pdf),** a completed IWTSD Cost Proposal template (using the Microsoft Excel format provided by IWTSD) along with a supporting Cost Narrative pdf, plus a cover page, in response to Phase 3 of this BAA. All pages shall be 8 ½ by 11 inches, double-spaced with Times New Roman font no smaller than 10 point; all margins shall be one inch. Each page of the submission shall contain the document identifier in the document header. The Technical Proposal must be no more than 50 pages including tables, charts, and figures. If the document contains more than 50 pages, only the first 50 pages will be evaluated. All paragraphs containing proprietary information must be clearly marked. The Cost Proposal has no page limit; however, unnecessarily elaborate or information beyond those sufficient to present a complete and effective response is not desired.

Disclaimer - To minimize the cost and effort for submitters, Phase 3, Full Proposals, will only be requested for qualifying solutions that have a high probability of award; however, the Government reserves the right to cancel requirements, or any request for proposals for this solicitation, at any time prior to award and shall not be liable for any cost of proposal preparation or submission.

3.7.1. Phase 3 Due Date and Time.
All unclassified Full Proposals must be received electronically through BIDS no later than the due date and time specified in the acceptance email. Likewise, classified

submissions must be received by the IWTSD Security Office by the due date and time; offerors must create a placeholder record in BIDS with an unclassified cover page attachment.Refer to section 3.4. of this BAA for instructions on classified submissions. BIDS does not allow proposals to be uploaded or classified placeholders to be created after the due date and time. Any proposal, regardless of classification, submitted by any other means, **or that is late, will not be considered** by the Government.

3.7.2. Electronic File Format.
The technical proposal must be submitted in in **Portable Document Format (.pdf).** The IWTSD Cost Proposal Template (MS Excel) must be completed and submitted with formulas visible and the document unlocked. A supporting cost narrative must be submitted in **Portable Document Format (.pdf).**

The document must be print-capable, without password, and no larger than 2048 KB. File names cannot contain spaces or special characters. Apple users must ensure the entire file name and path are free of spaces and special characters. Submissions that cannot be opened, viewed, or printed will not be considered.

3.7.3. Phase 3 Document Upload.
To upload a next phase document, locate and open the accepted record under **Requested Proposals**. Review the checklist then click **Create Proposal** and follow the instructions**.**

3.7.4. Full Proposal Components.
Full Proposal shall consist of three major sections (Technical Proposal and Cost Proposal with a supporting Cost Narrative) described in this document, and can be uploaded to BIDS as three separate files each limited to 2048 KB.

- The first section is the technical proposal and shall include all information related to the proposal as specified in this BAA including figures, charts, and tables plus the cover page.

- The second section is the cost proposal, which will show a breakdown of costs by CLIN as well as phase using the IWTSD Cost Proposal template. **This template is available on the Resources page of BIDS**.

    - Part of the cost proposal is a cost narrative that includes all cost data as well as an explanation of changes in cost from those proposed in the prior submission. Additionally, the offeror will include a cover page as follows:

      A cover page template is provided at the BIDS website under Reference Materials. The cover page includes necessary contractual information including the offeror's contracting POC (name, telephone number, email address, facsimile number, mailing address) and business information (DUNS number, CAGE code, business type). Include the proposed contract type, total cost, and the duration of all phases/tasks.

3.7.5. Technical Proposal Content.

The Technical Proposal shall provide a technically detailed solution of the problem addressed in the requirement and fully expand the technology proposed in the prior submissions. The following sections and associated data are required. The offeror shall incorporate all clarification data requests in the Phase 2 acceptance email. Indicate clarification entries by footnote and reference the requested item(s) in the footer area.

3.7.5.1. Table of Contents.

The technical proposal shall include a table of contents noting the page number of each section detailed below. The table of contents is excluded from page count.

3.7.5.2. Abstract.

The abstract is a one-page (or less) synopsis of the proposal that includes the title and the basic approach to satisfy the requirement. Describe the overall scope of work to be performed for the entire period of performance, inclusive of options. The abstract shall stand alone and be suitable for release under the Freedom of Information Act, 5 U.S.C. § 552, as amended.

3.7.5.3. Executive Summary.

An executive summary is a concise description of the technology and solution being proposed. Include key information that demonstrates how the proposed solution meets the published requirement. The executive summary should not introduce any new information not covered in the subsequent content.

3.7.5.4. Technical Approach.

Describe the technical approach for the proposed solution to meet the requirement. Include technical details of the solution and fully expand the technology proposed in the prior phase submission. Include the methodology, underlying theory, system components, and operational scenario for the intended users. Include drawings, diagrams, charts, and tables needed to explain the effort. Describe relevant prior application of the proposed technology and/or solution, how it is being used, and by whom. Identify sponsoring agency and funding resources; or if none, so state. If subcontractors are proposed, include a detailed description of the effort that they will be performing in support of or in addition to the prime.

3.7.5.5. Project Plan.

The project plan shall be organized by phase and describe the work to be performed along with all associated requirements to successfully complete the proposed effort. Include a summary of the individual phases to follow.

3.7.5.5.1. Phases.

Phases shall be defined by the subset of tasks to be performed, phase objectives to be accomplished, and the required POP to completion. Phases shall be listed in order of occurrence. Identify phases that are optional. Each phase must contain clear exit criteria that is measurable evidence of completion

and serves as a “go” or “no-go” decision point. Each phase shall include a total cost.

3.7.5.5.2. Tasks within a Phase.
For each task, provide a detailed description of the work to be performed. Identify any work that will be performed by other organizations or agencies; or if none, so state. Indicate if an agreement is in place for the resources.

3.7.5.5.3. Products and Deliverables.
Identify all deliverables - products as well as documentation and reports - for each Task/Phase. Refer to section 2.6. of this BAA for minimum reporting requirements, and additional products and deliverables in performance of the effort proposed.

3.7.5.6. Master Schedule.
Develop a master project schedule that includes phase start and stop dates as well as major milestones, critical tasks, and report and product delivery dates. Assume a start date of March 30th. Indicate any optional phases.

3.7.5.7. Government Furnished Equipment.
Reasonably identify all Government furnished equipment (GFE), materials, facilities, or information with the need date and suggested source at the time of proposal submission. GFE includes, but is not limited to: Government email accounts, SIPRNET access, Common Access Cards (CACs), and/or space at an IWTSD facility (e.g., permanent residence, temporary residence, or testing). Upon identifying GFE, if an offeror’s proposal is selected for contract award, the proposed GFE will be identified in the resulting contract. Failure to adequately identify necessary GFE may result in contract termination due to the offeror’s inability to perform under this competitive source selection. State if Government equipment, materials, facilities, or information are not required.

3.7.5.8. Project Risks and Mitigation.
Identify anticipated technical and management risks along with planned mitigation efforts. Indicate the risk assessment as high, medium, or low.

3.7.5.9. Organizational Capability Statement.
Include a brief description of the offeror’s organization. Describe the offeror’s capability and/or experience in doing the type of work being proposed. If applicable, include a description of co-participants’ capabilities and/or experience. State whether an agreement has been reached with the co-participants. Provide at least three references, to include points of contact, for like or similar work.

3.7.5.10. Organizational Resources.
Identify key technical personnel and principal investigator(s) including alternates and co-participants, if applicable. Include a brief biography, relevant expertise, and a list of recent publications for each. Identify any team members with potential

conflicts of interest. Possible conflicts of interest include personnel formerly employed by the federal Government within the past two years from the date of proposal submission. Provide name, duties, employing agency, and dates of employment; or state if none

3.7.5.11. Intellectual Property, Technical Data, and Software.
All anticipated intellectual property, technical data or software rights shall be disclosed. See section 2.5. of this BAA for additional information.

3.7.5.11.1. Patents and Patent Applications.
Identify any existing, applied for, or pending patents that will be used in the conduct of this effort. Provide patent number or application number and title. Any patent that resulted from prior Government funding should be identified. State if no patents or patent applications are relevant.

3.7.5.11.2. Rights in Technical Data.
State if unlimited rights in technical data are proposed. If not, identify any technical data and/or computer software that will be delivered with less than unlimited rights as prescribed in DFARS 252.227-7013 and DFARS 252.227-7014. When less than unlimited rights are proposed, a data rights assertion table shall be provided as prescribed in DFARS 252.227-7017.

3.7.5.12. Transition from Prototype to Production.
Describe the approach and issues related to transition or commercialization of the results of this effort to an operationally suitable and affordable product for the intended users to include the following. The cost to prepare the Transition Plan should be included in the proposed costs. The cost to prepare the Transition Plan should be detailed in the cost proposal. Additional information regarding the Transition Plan can be found in the IWTSD Technology Transition Handbook located on BIDS under Resources.

[NOTE: If the specific requirement will not reasonably result in a prototype (e.g., study, service requirement), state “Not Applicable to this Requirement” and justify why.]

3.7.5.12.1. Transition Strategy.
Provide the overall strategy for transition to production (licensing, partnering, or venturing) along with the associated timelines for actions associated with the transition. Describe the roles of current development partners, subcontractors, or other organizations that will be leveraged. If the offeror is not a commercial entity, indicate if a commercial partner has been identified. Discuss barriers to commercialization, such as anticipated regulatory issues (such as environmental, safety, health, and transportation), liability issues, interoperability, and financing, and planned steps to address these barriers.

3.7.5.12.2. Transition Approach.

Describe the type and level of effort envisioned to take the technology from its state at the end of the development effort to a production ready, affordable, operationally suitable product (such as size and/or weight reduction, packaging, environmental hardening, integration, additional test and certification). Provide an estimate of any costs to transition the prototype to low rate initial production. Provide the estimated production unit price for the end users.

3.7.5.12.3. Test and Evaluation.
Describe the plan to involve representative users during the design and development process and the general plan for test and evaluation by representative end users. If the phases of performance include representative user test and evaluation: (1) ensure coordination of user participation is thoroughly discussed in the technical approach; and (2) state "Representative User Participation will occur during contract performance."

3.7.5.12.4. Operational Support.
Describe the estimated level of training needed to prepare users to utilize the product in an operational environment. Discuss the anticipated support concept such as level(s) of repair, spare parts, warranties, operation and maintenance technical manuals, simulators, and other logistics considerations.

3.7.5.13. Human Subjects and Animal Testing.
The proposal shall provide a statement regarding the anticipated use of human subjects or animals in testing, or state if none. If yes, procedures for complying with all laws and regulations governing the use of animals or human subjects in research projects shall be included in the technical proposal. See section 2.9, "Animal or Human Testing Compliance" in this document for details.

3.7.5.14. Environmental Impact.
The proposal shall provide a statement regarding the impact of the work proposed on the environment. State if no impact exists.

3.7.5.15. Classification and Security.
If the offeror is proposing to perform research in a classified area, indicate the level of classification of the research and the level of clearance of the potential principal investigator and all proposed personnel. The contractor shall include facility clearance information. Also, the contractor shall indicate the Government agency that issued the clearances. State if the proposed effort is unclassified.

3.7.5.16. Subcontracting Plan.
If the total amount of the proposal exceeds $750,000 and the offeror is not a small business, the offeror shall submit a subcontracting plan for small business and small socially and economically disadvantaged business concerns. A mutually agreeable plan will be included in and made a part of the resultant contract. The contract cannot be executed unless the contracting officer determines that the plan

provides the maximum practicable opportunity for small business and small disadvantaged business concerns to participate in the performance of the contract. The Subcontracting Plan/information is excluded from page count.

3.7.6. Cost Proposal.

The offeror and each significant subcontractor, if any, shall fill out the IWTSD Cost Proposal Template (available on BIDS under Resources) and submit all supporting cost or pricing data along with any other supporting attachments. All prepared spreadsheet formulas must be accessible. As soon as practicable after agreement on price, but before contract award, the offeror shall submit a Certificate of Current Cost or Pricing Data for contracts exceeding $2,000,000 as prescribed by FAR 15.406-2.

[NOTE: To determine the reasonableness of the cost proposal, the Government may request additional supporting documentation for proposed costs.]

3.7.6.1. Cost Narrative.

Provide a narrative discussing/substantiating elements of the cost proposal. Provide a separate summary of the total cost for each phase and for the total of the entire effort proposed. Indicate optional phases. Explain changes in cost from those proposed in the previous submission. The Cost Narrative must be submitted in PDF (.pdf) format with Times New Roman font no smaller than 10 point.

3.7.6.1.1. Table of Contents.

The cost narrative shall include a table of contents noting the page number of each section detailed below.

3.7.6.1.2. Direct Labor Costs.

Detail the direct labor cost estimate by showing the breakdown of labor hours, rates, cost for each category, and furnish the basis for the estimates.

- *Labor Category.* Include a detailed description of the category.
- *Labor Hours.* Include a Basis of Estimate for the proposed hours. Detail hours to be worked by each labor category proposed per each task, per each fiscal year and cumulatively.
- *Labor Rates.* Rates shall be in accordance with established rate agreements. If no rate agreement exists, use payroll data with actual rates to substantiate the proposed rates. If fully loaded rates are proposed, the offeror shall identify the base rate and build up.
- *Escalation.* Identify the escalation rate, how the rate is applied, and provide justification for the rate used.

3.7.6.1.3. Indirect Costs.

Indicate how the offeror has computed and applied offeror's indirect costs (e.g., overhead, G&A, material burden). Indicate the rates used and provide an appropriate explanation.

3.7.6.1.4. Other Direct Costs.

Identify all other costs directly attributable to the effort and not included in other sections (e.g., special tooling, travel, computer and consultant services, preservation, packaging and packing, spoilage and rework) and provide the basis for pricing.

- *Travel.* The basis for travel estimates will include trip purpose, departure site and destination, number of persons traveling, number of days, ground transportation requirements, and detailed costs for airfare, hotel, rental cars, and per diem allowances per Federal Travel Regulations (FTR).
- *Materials.* Submit a detailed Bill of Materials identifying each discrete material component. **Backup documentation must be submitted to explain the basis of estimate for at least 80 percent of the total material cost proposed**. Backup documentation may include actual production costs, catalog listings, supplier quotes, actual invoices, or other documentation from a third-party source which verifies the proposed price.
- *Consultants.* If any consultants are to be used, the offeror shall submit consultant quotes for hourly rates, estimated number of hours required, and justification.
- *Subcontractors.* If any subcontractors are to be used, the offeror shall submit complete subcontractor quotes or proposals as part of the proposal. Subcontractor proposals will be evaluated along with the prime's proposal, and they are expected to contain the same level of detail as a prime proposal. Subcontractors providing commercial items may submit a commercial quote instead of a detailed proposal.
  [NOTE: In order to protect proprietary data, subcontractors may submit their detailed cost proposals directly to the Contracting Officer instead of submitting to the prime contractor. If this occurs, the prime is responsible for ensuring subcontractor's submission is timely and is completed in accordance with these instructions.]

3.7.6.1.5. Government Furnished or Contractor Acquired Equipment.
Identify the external property or materials required to perform the task in the summary. Separate items to be acquired with contract funds and those to be furnished by the Government. Reasonably provide the description or title and estimated unit and total costs of each item (i.e., manufacturer, catalog price, or previous purchase price). When such information on individual items is not available, the items should be grouped by class and estimated values indicated. In addition, the offeror shall include a statement of the extent to which the offeror is willing to acquire the items.

[NOTE: The FAR generally prohibits providing an industrial contractor with facilities (including plant equipment and real property) with a unit acquisition cost of less than $10,000.]

3.7.6.1.6. Profit or Fee.
Include the profit or fee proposed for this effort. State if no profit or fee is

proposed. Include a discussion, in the summary, of risk, technical difficulty, need for management/oversight, exceptional circumstances, etc.

3.7.6.1.7. Competitive Methods.
For those acquisitions (e.g., subcontract, purchase orders, material orders) over $250,000 priced on a competitive basis, also provide data showing degree of competition and the basis for establishing the source and reasonableness of price. For inter-organizational transfers priced at other than cost of the comparable competitive commercial work of the division, subsidiary, or affiliate of the contractor, explain the pricing method (See FAR 31.205-26(e)).

3.7.6.1.8. Established Catalog or Market Prices/Prices Set By Law or Regulation.
When an exemption from the requirement to submit cost or pricing data is claimed, whether the item was produced by others or by the offeror, provide justification for the exemption.

3.7.6.1.9. Royalties.
If more than $250, provide the following information on a separate page for each separate royalty or license fee:

- Name and Address of Licensor.
- Date of the License Agreement.
  [NOTE: A copy of the current license agreement and identification of applicable claims of specific patents shall be provided upon request by the contracting officer. See FAR 27.204 and FAR 31.205.37.)
- Patent numbers, patent application serial numbers, or other basis on which the royalty is payable.
- Brief description (including any part or model numbers of each contract item or component on which the royalty is payable).
- Percentage or dollar rate of royalty per unit.
- Unit price of contract item.
- Number of units.
- Total dollar amount of royalties.

3.7.6.2. Facilities Capital Cost of Money.
When the offeror elects to claim facilities capital cost of money as an allowable cost, the offeror must submit Form CASB-CMF and show the calculation of the proposed amount. See FAR 31.205-10.

3.7.6.3. Other Funding Sources.
The proposal shall provide the names of other federal, state, or local agencies, or other parties receiving the proposal and/or funding or potentially funding the proposed effort. State if no other funding sources or parties are involved.

3.7.6.4. Additional Information/Documents.
Additional information/documents to be included in the Cost Narrative:

- *Business/Cost Checklist.* The offeror shall complete and include a copy of the Business/Cost Checklist found at the BIDS website under Resources. Information and documents required in the Business/Cost Checklist shall be included in this proposal.
- *Terms & Conditions.* The offeror shall identify any anticipated/proposed contract terms and conditions in the proposal summary.
- *Proposal Validity.* The proposal shall remain valid for a period of no less than 180 days from submission.
- *Forward Pricing Rate Agreement.* If the offeror has an applicable rate agreement with DCAA (or another Federal Agency, e.g., HHS), please include a copy of the agreement and provide a point of contact to your cognizant DCAA office. If the offeror has not previously been audited by DCAA, the procuring office may request an audit to verify the proposal labor direct and indirect rates. This applies to both prime contractors and subcontractors.
- *ACH Form.* The offeror will submit a completed ACH Form. (Found on BIDS under Resources).
- *VETS-4212.* The offeror will submit the most recent VETS-4212 filing confirmation.
- *Subcontracting Plan.* If the offeror is a large business and work will be performed in the United States, a Small Business Subcontracting Plan shall be submitted if the contract is expected to exceed $700,000.
- *Past Performance.* The offeror shall provide information on previous Federal Government prime or subcontracts featuring endeavors relevant (i.e., within the past three years and of similar size and complexity) to the specific requirement.

3.7.7. Phase 3 Notifications to Offerors.
Notification of acceptance or rejection of a Phase 3 submission will be sent via email to the offeror's principal contact as entered in the BIDS registration. Acceptance of a Full Proposal does not guarantee a contract will be awarded. If the Government does not accept the Phase 3 proposal, the offeror may request a formal pre-award debriefing.

3.7.8. Phase 3 Protests.
Offerors are encouraged to see resolution within the agency before filing a protest. Offerors who choose to submit any protest, must do so directly to the IWTSD Contracting Officer. All such protests will be processed under procedures that depend on whether the protest is directed to the agency, or to the Government Accountability Office (GAO) or to the Court of Federal Claims. Should the offeror choose to submit a protest, the Offeror must clearly label whether such protest is to the agency, GAO or the Court of Federal Claims. The Government will deem receipt of the protest by the Contracting Officer as constituting receipt or purposes of determining timeliness. Addresses for receipt confirmation can be requested via the BIDS Help function.

3.7.9. Phase 3 Status and Inquiries.
Phase 3 is complete when the Government concludes technical evaluations of all submissions and awards any contracts considered under this BAA. Inquiries by phone concerning the status of Full Proposals will not be accepted. After log in to the BIDS website, submitters are able to check the status of any submission under **Previously Uploaded Proposals.**

3.8. Clarification Requests.
Should the offeror be asked to submit clarifications to a Phase 2 White Paper or a Phase 3 Full Proposal, the BIDS email from the Contracting Officer will contain instructions on the specific request and associated requirements. BIDS will use CL (Clarification) instead of WP (White Paper), or FP (Full Proposal) as the Document Identifier designation (e.g., ***CL*** CB-1112-ABCORP–xxxx-CL; where xxxx-CL is the VIT entered by the submitter). The request will contain the due date and time and *can be less than the standard 30-day response* time depending on the nature of the request.

3.9. Instructions for Offeror "No-bid" and Submission Withdrawal.
From time to time, an offeror decides not to submit a subsequent Phase 2 or Phase 3 submission. If this is the case, the offeror shall indicate in BIDS that they are not providing the subsequent submission. The offeror shall follow the steps identified in BIDS to upload a submission and attach a document to indicate the withdrawal of the previous submission(s) and the intent to not participate in further submissions. If possible, the Document Identifier should reflect the submission status (e.g., CB-1112-ABCORP–xxxx-WD or xxxx-NoBid). To withdraw a submission after the due date and time, notify the contracting officer at BIDSHelp@cttso.gov.

4. PROPOSAL EVALUATION.

This section describes the criteria that will be used to evaluate each submission. The phase of the submission will determine the extent that each criterion applies based on the information requirements described in Section 3. Criteria are not weighted, and submissions are not ranked.

4.1. Evaluation Criteria.
The criteria used to evaluate and select proposals for projects are described as follows. **Each proposal will be evaluated on its own merit** and relevance to the program requirements rather than against other proposals in the same general research area.

4.1.1. Basic Requirement.
The proposed solution must meet the letter and intent of the stated requirement; all elements within the proposal must exhibit a comprehensive understanding of the problem and the requirements of intended end users. The proposed solution must meet multiple user (U.S. Government or commercial) needs and be fully compliant with all elements of the solicitation including format, content, and structure as well as all BAA instructions.

4.1.2. Technical Performance.

The proposed technical approach must be feasible, achievable, complete, and supported by a proposed technical team that has the expertise and experience to accomplish the proposed tasks. Task descriptions and associated technical elements are to be complete and in a logical sequence. All proposed deliverables must clearly define a final product that meets the requirement and can be expected as a result of the award. The proposal must identify and clearly define technical risks and planned mitigation efforts. Those risks and the associated mitigation must be defined, feasible, and reasonable. The roles of the prime and other participants required must be clearly distinguished and pre-coordination with all participants (including Government facilities) fully documented.

The requirement for and the anticipated use or integration of Government Furnished Equipment/Information/Property (GFE/GFI/GFP) including all equipment, facilities, and information, must be fully described including dates when such GFE/GFI/GFP will be required. Intellectual property ownership and the planned transition to production must be adequately addressed, including a support concept for the product described. Similar efforts completed by the offeror in this area must be fully described including identification of other Government sponsors.

4.1.3. Cost.
The proposed costs must be both reasonable for the work proposed and achievable. The proposal must document all anticipated costs including those of associate, participating organizations. The proposal must demonstrate that the offeror has fully analyzed budget requirements and addressed resulting cost risks. The proposal must indicate all cost-sharing and leveraging opportunities explored and identified and the intellectual property expectations associated with that cost-sharing. Other sponsors who have funded or are funding this offeror for the same or similar efforts must be identified by agency, program manager name, phone number and email address.

4.1.4. Schedule.
The proposed schedule must be reasonable, achievable, and complete. The proposal must indicate that the offeror has fully analyzed the project's critical path and has addressed the resulting schedule risks.

4.1.5. Contractor Past Performance.
Past performance is a confidence assessment based upon the probability of successfully performing the requirement. The offeror's past performance in similar efforts must clearly demonstrate an ability to deliver products that meet the proposed technical performance requirements within the proposed budget and schedule. The proposed project team must have demonstrated expertise to manage the cost, schedule, and technical aspects of the project. At Phase 3, the Government's evaluation of past performance will rely on evidence provided directly by offerors as well as independent sources of information. If applicable, the offeror shall state if it has no relevant past performance.

[NOTE: Past performance information may be used in the technical evaluation if the vendor has relevant past performance with the Government. However, having no relevant

past performance with the Government will not be held against a vendor.]

Remainder of this page intentionally left blank.

5. TECHNOLOGY DEVELOPMENT REQUIREMENTS AND OBJECTIVES.

This section provides the requirement descriptions and overall technical objectives. The intent of this BAA is to identify technologies and approaches that provide solutions that enhance the capabilities for DoD to conduct Irregular Warfare (which includes missions of unconventional warfare (UW), stabilization, foreign internal defense (FID), counterterrorism (CT), and counterinsurgency (COIN)) against all adversaries and to deliver those capabilities to DoD components and interagency partners through rapid research and development, advanced studies, and technical innovation.

5.1. Advanced Analytics (AA)

R4558 Advanced Analytics for the Information Environment (Project Nemesis)

Currently, the Department of Defense does not have an artificial intelligence (AI) software that enables analysts to use dispersed applications from multiple independent platforms to conduct predictive analytics on a single application for strategic decisions. Current tools do not interface or leverage each other's unique capabilities or share data with one another. End users seek to integrate data streams and unify software capabilities into an easy to use workflow that supports analysis on the impacts of friendly and adversarial Operations in the Information Environment (OIE) from open source and publicly available information.

Develop an AI enterprise platform for Information Environment analysis that leverages best-of-breed analytical capabilities and harnesses multiple large datasets to expose relevant trends and connections, forecasts future OIE impacts for given scenarios or courses of action (COAs), and provides the user with confidence intervals and metrics to support forecasts. The system must support browsing, sorting, filtering, searching, flagging, decomposing, and comparing trends/metrics/analytics, and tagging for individual data items or clusters in user-created data subsets. The system must support analysis and fusion for DoD, interagency and open-source data repositories (e.g., C2IE, NSA Pulse, NGA Grid, CIAWire, MEDEX, DOCEX, CELLEX, GEC-IQ, VANE, SCRAAWL, GDELT, and START GTD). The system must automatically select datasets that are most relevant to the phenomena being analyzed from multiple data feeds available and support ingestion of common software formats (e.g., .doc, .docx, .pdf, .xml, .pptx). The system must have an interactive user interface for visualizations and data displays in operating centers and individual analyst workspaces. The user interface must support Geographic Information System (GIS) mapping to support geographic selection/highlighting /fencing for areas of interest, allowing users to identify emerging phenomena in the information environment (e.g., local trending topics, divisive issues, and indicators of unrest). System must display and export data in user-defined, multi-layer views including maps, heat maps, timelines, network graphs, PMESII/DIME tables, in order to make results easily accessible and understandable to a non-technical audience, and results should be exportable in common data formats (e.g., .xml, .csv, .json). This capability must be available at all classification levels via a CAC-enabled web portal.

R4559 Special Reconnaissance Environmental Analysis and Forecasting

DoD end users have identified a requirement for a tactical mobile mission planning assistant that supports Special Reconnaissance (SR) units while they are on mission. Existing manual tools in legacy platforms (e.g., Riverine or Avalanche kits) provide critical data measurements, but

require synthesis with forecast models to provide accurate analytical updates at the time of mission execution. Existing automated tools collect larger volumes of data and deliver more accurate analysis, but SR operators cannot access or ingest the data in remote locations during a mission, and the automated tools are not tailored to the operator's workflows. Reports for environmental analysis and forecasting are also still completed manually even with the onset of partially automated capabilities because the data outputs from multiple tools must be reviewed to consider their dynamic variables.

Develop, test, and evaluate an edge analytics mobile device and software suite that is tailored to Special Reconnaissance workflows, and can support manual and automated data entry. The capability must guide and automate the operator's workflow during pre-mission planning, pre-mission preparation, mission execution, and post-mission assessments, to identify all initial and recurring data requirements to generate reports on the operational environment of interest to combat leaders. The capability must ingest and analyze data inputs needed for weather models, as described in Air Force Manual 15-111 Surface Weather Observations (e.g., location, orientation, wind, visibility, sky condition, temperature, dew point, pressure, precipitation, and limited meta-data tagged imagery) from the USSOCOM proof of concept TAK Server and the Air Force 557th Air Force Weather Agency servers. The capability must also address guidelines for risk reports in Air Force Tactics, Techniques & Procedures (AFTTP) 3-3 Guardian Angel (GA) Annexes for Weather, and integrate historical data requirements (e.g., climatology, solar/lunar data, weather forecasts) to support mission planning analysis and forecasting in a disconnected environment. The capability must provide results within the operator's primary mission planning tool environment (e.g., Tactical Assault Kit - TAK), and support interaction with the existing current Combat Swim and Jumpmaster plug-ins. Data inputs must support Environmental Analysis Forecasting requirements outlined in the Battlefield Airman Operations Family of Systems Capability Development Document.

R000-AA-FY22 Unspecified Requirement - Big Data, AI/ML Applications, and Analytics for Operational Planners

Big Data and AI/ML Applications

1) Proposed solutions should take a step past the usual keyword, Social Network Analysis or Social Media Analysis, pattern-matching approaches, and be capable of leveraging, via big data and auto-inferencing, combinations of secondary and tertiary signatures that currently go unexploited. All manner of signatures should be considered – those retrieved directly from text, as well as those derived from other high volume, high velocity sources such as audio, video, messaging, broadcasting, and advertising. Methodologies to extract the specific data required (e.g., modeling) from "big data" are also of interest. Submitters to this area should have access to their own set of data. Follow on work may include ingestion of Government data. Specific focus should be in areas involving "Gray Zone" operations and Geopolitical Forecasting. "Gray Zone" refers to a space in the peace-conflict continuum.

Block-Chain Tools

2) Customizable block-chain tools that map elicit financing through an executive dashboard. These tools should support exploring global block-chain traffic, and identifying suspicious transactions and wallets. They should support clustering wallets and highlighting interactions

through a GIS-based UI. Other uses of block-chain like employment in supply chain management or secure communications are also of interest.

Internet-of-Things (IOT) and 5G Technology
3) Customizable tools that use the IOT and 5G technology to support analysis with or without connectivity to the cloud. Tools should be mobile, battery operated, should be capable of functioning in a hostile or denied environment without breaking OPSEC, and should leverage emerging capabilities frequencies in 450MHz - 6 GHz (LTE, 5G), 24.25 GHz to 52.6 GHz (mm waveform), and other designated 5G frequency bands.

Unspecified requirements (R000s) are for proposing unique innovations that have not been identified by IWTSD. If IWTSD evaluators determine an unspecified requirement submission is sufficiently promising to merit pursuit, funds may be identified at that point based on the prioritized needs of the interagency. Because proposed solutions from the unspecified requirements will be competing against proposed solutions for identified and prioritized Department of Defense and interagency requirements, IWTSD may not award any of the unspecified requirements.

Note: Quad charts submitted in response to a Subgroup's R000 may be shared with other IWTSD Subgroups if the submission demonstrates relevance to more than one focus area.

5.2. Chemical, Biological, Radiological, Nuclear, and Explosives (CBRNE)

R4617 All-Hazards Tactical Footwear

Advances in personal protective equipment (PPE) have improved operator effectiveness in hazardous environments, but these advances cannot be fully exploited without improving protective footwear that enables greater agility, fit comfort, and freedom of movement. More effective CBRN footwear is needed to address evolving requirements for protective ensembles that balance protection, ergonomics, and durability for extended use. This requirement is seeking the development of the All-Hazards Tactical Footwear.

The All-Hazards Tactical Footwear shall be compliant with the specifications of the footwear elements explained in Section 6.4 of the National Fire Protection Association (NFPA) 1994: *Standard on Protective Ensembles for First Responders to Hazardous Materials Emergencies and CBRN Terrorism Incidents*. The All-Hazards Tactical Footwear shall have a shelf-life of 5 years (Threshold (T)) with ideal candidates providing a shelf life of 10 years (Objective (O)) based on accelerated aging procedures specific to footwear materials.

The All-Hazards Tactical Footwear shall demonstrate physical protection according to the performance criteria specified in NFPA 1994 for Class 1 footwear (2018 edition):

- (T) Cut and puncture resistance (Section 7.1.4)
- (T) Slip and abrasion resistance for the footwear outer sole (Section 7.1.4)
- (T) Footwear toe impact, toe compression, and outer sole puncture resistance (Section 7.1.4)
- (T) Flame resistance of footwear upper materials (Section 7.1.2.5)

- (T) Liquid-tight integrity, per NFPA 1971: *Standard on Protective Ensembles for Structural Fire Fighting and Proximity Fire Fighting* (2018 edition)
- (O) Flash fire resistance of footwear, per NFPA 1994 (Section 7.8)

In addition, the All-Hazards Tactical Footwear physical protection performance described above shall be achieved after footwear undergoes pre-conditioning using standardized procedures:

- Exposure to temperature and humidity extremes (-32 to 49 degrees Celsius and 5% to 95% relative humidity conditions) per MIL-STD-810G
- Exposure to at least four Government-selected battlefield textile contaminants, per MIL-STD-810G (e.g., seawater, fuels, lubricants)
- Exposure to at least 3 test representative agents, selected by the Government, in the chemical battery used in the NFPA 1994 Class 3 (threshold) and Class 1 chemical battery (Objective)
- Exposure to standard military decontamination techniques, including ultraviolet radiation, bleach solutions, and fielded decontamination kits
- After being worn during strenuous physical activity, such as the Marine Corps Load Effects Assessment Program (MC-LEAP) and the Fire Recruit Physical Agility Test (FRPAT)

The All-Hazards Tactical Footwear's functionality and comfort shall be demonstrated for prolonged durations and through suitable ergonomic evaluation protocols (e.g., MC-LEAP or FRPAT) involving Government-selected end users. The All-Hazards Tactical Footwear shall be evaluated by Government-selected end users as part of two Government-selected ensembles: One commercially available NFPA 1994 Class 1 ensemble, and one Government-developed ensemble. The All-Hazards Tactical Footwear shall further demonstrate interoperability with the selected commercially available Class 1 ensemble by undergoing ensemble integrity testing, per the NFPA 1994 Class 1 requirements (Section 7.1.1).

During development, ten (10) pairs each of All-Hazards Tactical Footwear prototypes, in at least six unique sizes, shall be provided for operational test and evaluation, feedback, and modifications prior to obtaining certification. Upon completion development, ten (10) pairs each of certified All-Hazards Tactical Footwear, in at least six unique sizes, shall be provided as deliverables.

R4620 Reusable Sustainable Examination Gloves

Current medical exam gloves that are utilized to protect from biological hazards are disposable in nature and are in short supply. A sustainable, reusable, domestically-produced alternative is needed. This requirement is seeking the development of a reusable, sustainable examination glove that is durable enough to be decontaminated/disinfected and reused repeatedly, yet thin enough to provide the dexterity required to perform advanced examination procedures. The gloves shall be easy to don and doff, comfortable to wear for long operational periods, and have a cuff that will interface with a variety of personal protection equipment (PPE) suits (including currently fielded emergency management services (EMS) and Law Enforcement PPE) to eliminate potential ensemble vulnerabilities.

The gloves shall provide extended mission protection from exposure to the harmful effects of all traditional CB warfare agents and the toxic industrial chemicals listed in NFPA 1994 (Standard on Protective Ensembles for First Responders to Hazardous Materials Emergences and CBRN Terrorism Incidents) and be capable of integrating with a variety of protective ensembles.

The storage life of the component shall be a minimum of five (5) years (Threshold) to ten (10) years (Objective) when stored according to manufacturers' requirements. The ideal storage conditions include: 55 degrees Fahrenheit to 95 degrees Fahrenheit; 20% to 99% relative humidity; and no exposure to direct sunlight. Gloves shall be reusable after undergoing decontamination and must pass a simple leak check to verify they are free of punctures.

During development, thirty (30) pairs of glove prototypes for each glove size (small, medium, large, XL, and XXL) shall be provided for OT&E feedback and modification prior to obtaining certification. Upon completion of development, deliverables shall include right- and left-hand molds for each glove size: small, medium, large, XL, and XXL. Final deliverables shall also include fifty (50) certified pairs of gloves of each size: small, medium, large, XL, and XXL.

R4621 Underground Facility Rebreather

The current capability of a self-contained breathing apparatus (SCBA) allows 30 to 40 minutes of oxygen before a refill is needed, which does not provide significant time on target. Additionally, there are no known breathing apparatuses with rebreather capabilities rated for a chemical, biological, radiological, and nuclear (CBRN) environment. This requirement is seeking the development of an Underground Facility (UGF) Rebreather system which will extend the time of operation between refills to 3 to 4 hours. The system shall be certified for use in a CBRN environment under *NIOSH Self-Contained Breathing Apparatus (SCBA) with Chemical, Biological, Radiological and Nuclear (CBRN) Protection used to Protect Emergency Responders Against CBRN Agents in Terrorist Attacks* and *NIOSH 42 CFR 84 Respiratory Protective* Devices. The solution has to be protected and be able to withstand 1,000 degrees Fahrenheit or exposure to an exothermic torch in order to allow the operator to work safely. The rebreather system's consumables shall be able to be quickly and safely switched when needed.

The performer shall develop a system capable of the Key Performance Parameters below:

- On-target continuous operation of > 3 hours (threshold); > 3.5 hours (objective)
- Certify to *NIOSH 42 CFR 84 Respiratory Protective Devices*
- Certify to *NIOSH SCBA with CBRN Protection used to Protect Emergency Responders Against CBRN Agents in Terrorist Attacks*
- Test against *NFPA 1986 Standard on Respiratory Protection Equipment for Tactical and Technical Operations for CBRN Requirements*
- On-target maintenance of < 30 minutes refit (threshold); <15 minutes refit (objective)
- Post-target maintenance post target < 12 hours (threshold); < 24 hours (objective)

The prototype design shall measure no more than 23.5"L ×17.7"W × 7.3"D. The prototype end state shall weight less than 33 lbs (Threshold) and 30 lbs (Objective) capable for integration to PPE with immediate transition to a powered air-purifying respirator (PAPR) or air-purifying respirator (APR) based on operator needs. The system shall be compatible with current positive pressure sealing systems to facilitate isolation from contaminated environments Final per system

cost shall not exceed $13,000 (threshold); $10,000 (objective).

During development, four (4) UGF Rebreather prototypes shall be provided for OT&E feedback and modification prior to obtaining certification. Upon completion of development, twenty (20) certified UGF Rebreathers shall be delivered.

R4629 UAV Payload for Rapid Chemical Plume Detection, Identification, and Mapping
Situational awareness is crucial when responding to a chemical incident, but characterizing and mapping a chemical plume over a significant area can be prohibitively time consuming and labor intensive. This requirement is asking to develop an unmanned aerial vehicle (UAV) payload to automatically detect, identify, and map a chemical plume for situational awareness. The payload shall integrate into an existing unmanned aerial system (UAS). If the payload uses a direct measurement methodology, the payload will need to be robust enough to withstand decontamination. Otherwise, the payload will need to be inexpensive enough to be considered consumable. If the payload uses stand-off technology, then decontamination is likely not needed.

The payload shall include detection technology that is capable of identifying and quantifying chemical warfare agents (CWAs) and toxic industrial chemicals (TICs) at limits of detection at or below immediate environmental and human health impact levels (AEGL 1 concentrations). Below is a table of examples, but this is not a comprehensive list. The chemical identification, concentration estimates, and geolocation data shall be processed and transmitted to users on the ground in near real-time (< 5 minutes) to create a map of the plume for near real-time (< 5 minutes) situational awareness. The chemical analysis shall be automated and not require any additional human-in-the-loop processes. The chemical quantification shall provide a resolution of 1 m^2 and be able to characterize a plume located between ground surface and 5,000 ft above ground elevation.

The payload is intended to integrate into a variety of UAV platforms, specifically one that is capable of travelling to and from a location 500 miles away and performing data collection for at least 6 hours (endurance) while at the location without landing or launch from a centralized location and provide 24 hours of endurance while covering 650,000 mi^2. For the purposes of this requirement, the payload will be developed and demonstrated with a government-furnished UAS or with a UAS that the submitter already has access to or through simulation. No additional funding is anticipated for the procurement of a UAS. The system shall adhere to FAA and other federal agency guidance in regulations for tracking and monitoring of an unmanned autonomous platform.

The project end state shall include three (3) payload prototypes for operational test and evaluation purposes.

List of chemicals:

Priority Industrial and WMD Threat Chemicals for Detection Systems			
Acetic acid	Cumene	Isoprene	Phosphine
Acetone	Diborane	Isopropanol	Phosphorus Oxychloride
Acrolein	Dichlorodifluoromethane	Isopropyl Acetate	Propyl Acetate
Acrylic Acid	1,1-Dichloroethene	MAPP	Propylene
Acrylonitrile	Dichloromethane	Methanol	Propylene Oxide
Allyl Alcohol	1,1-Difluoroethane	Methyl Acetate	Silicon Tetrafluoride
Ammonia	Difluoromethane	Methyl Acrylate	Sulfur Dioxide
Arsine	Ethanol	Methyl Ethyl Ketone	Sulfur Hexafluoride
Bis-Chloroethyl Ether	Ethyl Acetate	Methyl Methacrylate	Sulfur Mustard
Boron Tribromide	Ethyl Formate	Methylbromide	Sulfuryl Fluoride
Boron Triflouride	Ethylacrylate	Methylene Chloride	Tetrachloroethylene
1,3-Butadiene	Ethylene	MTEB	1,1,1,-Trichloroethane
1-Butene	Formic Acid	Naphthalene	Trichloroethylene
2-Butene	Freon 134a	n-Butyl Acetate	Trichloromethane
Carbon Tetrachloride	GA (Tabun)	n-Butyl Alcohol	Triethylamine
Carbon Tetraflouride	GB (Sarin)	Nitric Acid	Triethylphosphate
Carbonyl Flouride	Germane	Nitrogen Mustard	Trimethyl Phosphite
Chlorodifluoromethane	Hexafluoroacetone	Nitrogen Trifluoride	Trimethylamine
Chloromethane	Isobutylene	Phosgene	Vinyl Acetate

R000-CBRNE-FY22 Unspecified Requirement

Develop new or improved technologies or emerging technological capabilities pertaining to CBRNE that may be of interest to IWTSD, but are not commercially available. Proposed projects shall be timely, relevant, and further irregular warfare efforts. Areas of particular interest include: crowded place/soft target detection systems for mass casualty threats; next generation materials for personal protective clothing; automated, sample preparation for biological agent detection; and methods for chemical and biological material attribution.

Medical applications (vaccines, pharmaceuticals, clinical diagnostics, and syndromic surveillance systems) and proposals related to COVID-19 will not be considered. These areas and other areas that do not directly relate to the CBRNE subgroup and will be rejected without consideration or comment.

Unspecified requirements (R000s) are for proposing unique innovations that have not been identified by IWTSD. If IWTSD evaluators determine an unspecified requirement submission is sufficiently promising to merit pursuit, funds may be identified at that point based on the prioritized needs of the interagency. Because proposed solutions from the unspecified requirements will be competing against proposed solutions for identified and prioritized Department of Defense and interagency requirements, IWTSD may not award any of the unspecified requirements.

Note: Quad charts submitted in response to a Subgroup's R000 may be shared with other IWTSD Subgroups if the submission demonstrates relevance to more than one focus area.

5.3. Expeditionary Force Protection (EFP)

R4580 Optical Radar-Based Interrogation and Targeting System (ORBITS)

Small units and forward operating bases have optical-based force protection and advanced fire control systems. With technology advancements, blending these two capabilities together and developing an autonomous tracking function mode is possible. Advancements in "on board" machine learning, laser target designation, multispectral capabilities, and inertial navigation systems will enable this technology to meet the requirements while reducing the number of personnel engaged in this critical force protection mission.

This requirement is for employment of advanced Type 163 device Laser Target Designation (LTD) capabilities, along with enhanced multi-spectral Electro-Optical/Infrared (EO/IR) devices supported via an inertial navigation system. The capability shall allow for more rapid target acquisition and improved lethality for threat resolution to protect forces in tactical combat outposts. This capability shall have robust, encrypted communication links and be fully integrated with current Android Tactical Assault Kit (ATAK) for combat situational awareness across mounted/dismounted tactical elements. Ultimately, this will reduce the number of personnel engaged in this critical force protection mission along with enabling a more rapid response to immediate and exigent threats identified in combat.

This system shall meet the below requirements (Threshold (T); Objective (O)):

1. Multi-spectral EO/IR capability (T)
    - 1.1 Middle Wavelength Infrared and Short Wavelength Infrared (T)
    - 1.2 Personnel sized threat – 6 km (T); 8 km (O)
    - 1.3 Vehicle sized threat – 10 km (T); 15 km (O)
2. CAT 2 Targeting (T)
    - 2.1 Type 163 LTD – Joint Terminal Attack Controller (JTAC)/Joint Fires Observer (JFO) type system
    - 2.2 Target Location Error (TLE), 7 m to 15 m – shall not exceed CAT 2
3. Inertial Navigation System (T)
4. Laser Range Finder (T)
5. Power supply – shore and renewable source (T)
    - 5.1 Continuous Operational Use – renewable source – 24 hours (T), 48 hours (O)
6. Tripod setup for dismounted operations and universal mount for mounted operations (short halt) (T)
7. Man-portable (T)
    - 7.1 Not to exceed five (5) medium size cases
        - 7.1.1 Each case weighing 50 lbs (T); 40 lbs (O)
8. Android Tactical Assault Kit/Team Awareness Kit compliant (T)
9. Communications
    - 9.1 Radio-based communication, radio type agnostic (T)
10. Open API type system for integration with existing capabilities (T)
    - 10.1 Provide software link or Interface Control Document (ICD) (T)
11. System Ambient Operating Temperature performance

11.1 -20 °F to 194 °F (T); -40 °F to 194 °F (O)

12. Ingress Protection Rating – IP67 or greater – all components (T)
13. Cyber security compliance (T)

Deliverables

- Two (2) prototypes for operational test and evaluation – base
- Up to ten (10) prototypes for operational test and evaluation – options

Submissions shall specify all components intended for integration, any required Government Furnished Equipment/Government Furnished Information necessary, and a risk matrix identifying any/all issues relative to developing this capability. Please be as detailed as possible with your submission.

A firm fixed price proposal is preferable with the possibility of a firm fixed incentive contract. Base contract period of performance less than twelve (12) months (O); less than eighteen (18) months (T).

5.4. Explosive Ordnance Disposal and Explosive Operations (EOD/EXO)

R4571 Mouse-hole Maker for Urban Breaching

Develop a reloadable explosive tool for rapidly breaching into and out of the exterior walls of residential and commercial buildings during combat in urban terrain. The overarching goal of the tool is to give soldiers the capability to move through buildings and across alleyways rather than moving down streets and alleys. The tool shall create a mouse-hole in exterior walls that allows for the movement of a single soldier at a time through the opening created. The explosive tool shall be able to create a minimum of a 30 inch-by-30 inch hole in exterior walls constructed of standard cinder-block, or brick construction (common for low-rise multi-family construction). The ideal solution shall be capable of being used in multiple configurations. In the first configuration, the tool shall be capable of being aimed and fired at a point target by an individual soldier at a minimum distance of 75 meters (threshold). In the second configuration, the tool shall be capable of being placed, aimed, and then fired remotely to provide the user with standoff from explosive effects. The remote firing system should be hard-wired and be able to provide a minimum of 30 meters standoff. The tool shall have an aiming device attached for shoulder/prone firing and an aim assist for remote firing. The overall system weight (including the explosive payload) shall not exceed 30 pounds (Threshold (T)); 20 pounds (Objective (O)).

Additional Requirements:

- Shall include a foldable bipod that can be detached
- Shall be ergonomically designed for dismounted carry
- Shall be accurate on a 2 m × 2 m target at a range of 75 m (T); 200 m (O)
- Shall have a carry length less than 40 inches
- Shall have a Picatinny Rail system for mounting top- and side-mounted optics/aiming devices

- Shall be ruggedized to withstand blast and fragmentation that will allow for firing inside of a building or structure
- Shall be designed for operation by no more than two personnel with the ability to operate by a single individual at a lower rate of fire
- Shall have a cartridge weight of less than 10 lbs
- Developer shall be able to conduct independent testing of the prototype and cartridges or be able to coordinate with appropriate agencies/organizations to allow for extensive testing

Note: The proposed solution will be required to create a mouse-hole in a wide range of materials. However, there is an expectation that certain materials will require more than one shot to create the required hole-size. The baseline for successful penetration will be a 30 in-by-30 in hole in 15 inches of brick (common low-rise construction) in a single shot.

Deliverables
Base Contract:

- Deliver ten (10) mouse-hole maker prototypes and one-hundred (100) cartridges for operational test and evaluation (OT&E)

Contract Options:

- Develop additional cartridges purpose-built to penetrate specific materials
- Deliver one-hundred (100) additional cartridges for OT&E
- Deliver ten (10) additional mouse-hole maker prototypes

A Firm Fixed Price proposal with a base contract period of performance of less than twenty-four (24) months is preferred.

R4572 Multi-angle Image Analytics Tool

Explosive Ordnance Disposal (EOD) technicians and other counter-IED (C-IED) operators need the ability to document and provide technical intelligence on first seen explosive hazards. To capture data on first seen or unique devices, operators must collect all pertinent information by hand. This is a protracted process, during which the operator is exposed to extreme hazards to life and health. The danger is often so great that the only data captured is in the form of hasty digital photographs. For this reason, IWTSD requires the development of a capability to process a collection of two-dimensional images of improvised explosive devices (IED), IED components, military ordnance, or any other object of interest encountered under field conditions, extract accurate (± 1 mm) parametric dimensions, and render a three-dimensional model of the object. The rendering shall be in a standard file format specifically to facilitate reproduction of the model using either additive or traditional automated manufacturing techniques. The reproduced models shall be used as device reproductions for technical intelligence and development of training aids. Convolutional neural networks (i.e., artificial intelligence) may be utilized to assist in filling in data for missing portions of images.

Note: The proposed solution shall not include a camera. There is an expectation that the capability will be a software solution. Any software, information system (IS) or platform information technology (PIT) developed shall comply with cybersecurity standards found in *DoD Instruction 8510.01, Risk Management Framework (RMF) for DoD Information*

Technology (IT).

Any web-based solution shall include one-year of administrative maintenance and technical support in the base contract, to begin when the capability is fielded, and a minimum of one additional option year of support.

R4573 Additive Manufactured VBIED Modular Overpressure Disruptor System (VMODS) Container Charge

Currently, there exists very few tools and techniques for the remote engagement and disruption of vehicle-borne improvised explosive device (VBIED) triggers that will not also significantly damage surrounding infrastructure. For this reason, IWTSD requires the development of a design for a VMODS (U.S. Navy Patent US8621974B1) container charge, optimized for additive and traditional manufacturing processes. The design shall be configured to match the performance of the factory loaded VMODS as closely as possible. The design shall incorporate a central burster tube which must be manually-loaded with military explosive, and outer container which must be manually filled with commercial fire retardant. The assembled charge shall be initiated by both military and civilian blasting cap initiators. The design shall be adequately tested to validate comparable performance to the factory-loaded VMODS. The design shall be optimized for material extrusion additive manufacturing devices using common extrusion materials (i.e., PLA, ABS, Nylon).

Deliverables

- Detailed test and evaluation reports demonstrating comparable performance to VMODS.
- Digital files for local fabrication of the VMODS Container Charge in a common file type (i.e., .stl, .obj).
- Twenty (20) 3D printed VMODS Container Charges for issue to end users performing operational evaluations.
- Detailed instructions for production, assembly, and use of the VMODS Container Charge.

A Firm Fixed Price proposal with a base contract period of performance of less than twelve (12) months is preferred.

R4574 RFID Targets for Mine Detector Training

Mine detection training materials take up large amounts of space in unit storage areas and the creation of training lanes is a time and labor intensive process, units that conduct mine sweeper training need a kit that will reduce lane setup time, while still providing valuable, realistic training. Develop a training set of RFID (or similar technology) chips that shall mimic buried ordnance items, IEDs, and IED components. The complete set shall include target training chips (TTCs), a chip reader device that can be mounted to all existing U.S. military mine detectors, and a display that provides feedback to the operator. The TTCs shall be passive (non-battery powered) RF targets that shall generate signals simulating various types of target items (e.g., ordnance, IEDs, etc.) that may be encountered by users in the field. TTCs shall be easily concealable by shallow-burial, and have a small form-factor. The light-weight, battery-powered chip reader shall be able to detect the TTC RF signal, and provide feedback to the operator in a manner that replicates the detector being used. The system shall supply the user with auditory, tactile, or visual feedback similar to that provided by the actual detector being used. The RFID

chips shall be environmentally sealed, and at a minimum, simulate various types of anti-tank and anti-personnel mines, ordnance, IEDs, and pressure-plates buried in sandy, loamy, and clay soils at several burial depths. In addition, several "anomaly chips" shall be included to simulate clutter that is often encountered in field environments. The developer shall develop a minimum of thirty (30) different TTCs that encompass threats and anomalies for the base contract. The detector shall not need to be powered on to operate this kit.

Deliverables
Base Contract:

- Deliver twenty (20) complete RFID mine detector training sets that include target training chips (TTCs), a chip reader device that can be mounted to all existing U.S. military mine detectors, and a display that provides feedback to the operator for operational test and evaluation (OT&E).

Contract Options:

- Develop twenty (20) additional target training chips that mimic different anomalies and real-world threats.
- Deliver ten (10) additional RFID mine detector training sets for OT&E.

A Firm Fixed Price proposal with a base contract period of performance of less than eighteen (18) months is preferred.

R4575 Sensor Search Tool
EOD operators need a tool that will detect and target "plug and play" detection and measuring sensors (microwave, active infrared, passive infrared, acoustic and LiDAR) that are available as hobby electronics but that are also showing up as device triggers in sophisticated improvised explosive devices (IEDs). For this reason, IWTSD requires the development of a hand-carried or robot-mountable sensor for use in security search and EOD reconnaissance operations, which can detect ultrasonic, microwave, active infrared, LiDAR and passive infrared (PIR) sensors. The use of machine learning algorithms shall be incorporated to visually detect and identify passive sensor components such as PIRs. The tool shall provide the operator with a warning when any of these motion- or distance-detecting sensors are encountered at minimum range of 25 feet. The solution shall be a single tool, rather than a suite of tools, and configured for one-handed operation while wearing a bomb suit or ballistic body armor. The tool shall be small enough to mount onto a MTRS II EOD robot platform without degrading its mechanical performance.

Deliverables
Base Contract:

- Five (5) Sensor Search Tool prototypes for operational test and evaluation (OT&E)

Contract Options:

- Deliver eight (8) additional Sensor Search Tool prototypes

A Firm Fixed Price proposal with a base contract period of performance of less than twenty-four (24) months is preferred.

R4576 Dynamic Area Scanning for Autonomous Navigation and Virtual Environment Reconstruction

EOD responders must drive robots manually from a staging area to an area of concern and perform site reconnaissance remotely. Visual feedback from these operations is limited to two-dimensional images and often causes significant cognitive load on the operator. IWTSD requires the development of a robot-mounted 3D perception and reconstruction systems sensor suitable for autonomous navigation, and virtual environment reconstruction in real-time encompassing the entire path travelled by the robot throughout the mission. The system shall be capable of operating in dynamic, unstructured environments and interact safely and effectively with humans. The sensor shall be able to continuously scan during dynamic movement of the robotic platform while simultaneously building a continuous, undistorted 3D point cloud of the operational environment. The platform shall incorporate autonomous navigation to and from the designated scan area from a safe operating deployment location a minimum distance of 50 meters from the scan area. The environmental scan area shall be defined by the system operator via a simple user interface with an LCD screen. The system shall be capable of scanning both unconstrained exterior environments and building interiors. The system shall also be able to complete a full scan of an area equal to 12,000 ft^2 (approximate area of once block of a standard city street to include sidewalks), to include time of travel to and from the scan area, in 30 minutes or less. The operator shall be able to immediately interrupt or terminate the autonomous scan at any point during the scan, and direct the platform to return to its starting location. Immediately upon return to the starting location, the system shall provide a complete, fully-indexed 3D model of the scanned area for use in emergency response planning and decision making.

Deliverables
Base Contract:

- Three (3) operational prototypes for operational test and evaluation (OT&E)

Contract Options:

- Deliver ten (10) additional operational prototypes

A Firm Fixed Price proposal with a base contract period of performance of less than twenty-four (24) months is preferred.

R000-EOD/EXO-FY22 Unspecified Requirement

Develop new technological capabilities that involve artificial intelligence, machine learning, deep learning, and computer vision and apply to the EOD/EXO Subgroup's Explosive Operations focus area. With this focus area, the EOD/EXO subgroup provides advanced technology solutions for explosive operations conducted across the full spectrum of irregular warfare activities. This includes tools and technologies that address explosive breaching capabilities; precision tunnel destruction; benefit capacity building for interagency and partner forces; and explosive operations in complex urban environments. Furthermore, this includes the development of non-conventional tools and technologies for access, terrain, and resource denial operations for explosive operators. The capabilities proposed for this unspecified requirement must be of interest to the EOD/EXO Subgroup, but were not specifically requested as a technology requirement by IWTSD end users, and are not commercially available.

Unspecified requirements (R000s) are for proposing unique innovations that have not been identified by IWTSD. If IWTSD evaluators determine an unspecified requirement submission is sufficiently promising to merit pursuit, funds may be identified at that point based on the prioritized needs of the interagency. Because proposed solutions from the unspecified requirements will be competing against proposed solutions for identified and prioritized Department of Defense and interagency requirements, IWTSD may not award any of the unspecified requirements.

Note: Quad charts submitted in response to a Subgroup's R000 may be shared with other IWTSD Subgroups if the submission demonstrates relevance to more than one focus area.

5.5. Forensic Exploitation and Identity Operations (FEIO)

R4560 Digital Forensics Examination and Technical Exploitation Repository (DFEATER)
The growing prevalence and importance of Internet of Things (IoT) and Industrial Control Systems (ICS) in DoD operations increases the need for digital forensic tools as these technologies become targets of attack against critical infrastructure and battle management systems.

Design and develop a system that shall allow federal, state, local, territorial, and tribal (FSLTT) organizations to submit, search, comment on, and rate forensic reports IoT and ICS devices. The required system shall be hosted on an existing U.S. Government information sharing platform (e.g., LEEP or HSIN) providing a secure online environment accessible to vetted/validated FSLTT organizations and personnel, that include DoD civilian and military users. The system shall provide users with a centralized repository to capture and share the forensic examination techniques used to exploit encountered devices and recognize the potential evidentiary/operational value from the acquired data. The required system shall enable users to search the repository for knowledge related to specific IoT or ICS devices and inform users of the potential probative/operational value of digital evidence on the device itself, on connected hubs/controllers, or stored on connected internet services. The system shall also provide content to instruct users how to forensically exploit the device and conduct a forensic examination of extracted data in order to find and use information of potential evidentiary/operational value. As the number and types of IoT and ICS devices continue to proliferate, FSLTT organizations require aenduring capability to inform forensic examiners, investigators, and operators of devices of interest to identify and acquire as they execute their missions. Information forensically derived from these devices has the potential to be of significant value such as corroborating involvement in criminal or terrorist activities; identifying accomplices/associates; or just identifying new leads to pursue.

The system shall:

1. Ingest forensic reports submitted by users in their original format (e.g., .pdf, .docx, .pptx, jpg, etc.);
2. Provide instructions on the level of content and detail expected for submitting forensic reports;

3. Identify forensic reports in the repository responsive to user searches of make, model, and other relevant characteristics of the device;
4. Allow users to download forensic reports relevant to end user queries;
5. Allow users to upload photographs to search for similarity between devices, chips or other components;
6. Support a self-moderating forum allowing end users to:
    a. Post comments or questions on submitted reports and provide peer review;
    b. Rate reports based on relevant criteria (e.g., accuracy, thoroughness, positive results, etc.); and,
    c. Average and display the user rating for each report.
7. Enable "moderators" with authorizations to edit and delete content;
8. Log and report relevant metrics concerning reports and queries;
    a. Number of reports submitted /by organization /by timeframe;
    b. Number of queries submitted /by organization /by timeframe;
    c. Number of responsive search results /by organization /by timeframe;
    d. Number of reports downloaded /by organization /by timeframe; and,
    e. Average rating of reports /by organization /by timeframe.
9. Allow users to subscribe to email notifications when:
    a. New reports are posted;
    b. Comments are added to reports posted by the user; and,
    c. Replies are made to comments made by the user.

Design and performance specifications:

1. The capability must be hosted on an existing U.S. Government information sharing platform that can limit access to vetted/validated organizations and personnel.
2. Maintenance of the content in the repository should require less than four hours per week for each submitting organization. The developer shall not be responsible for maintaining the capability.
3. The system must be intuitive and operable by a non-technical end user.
4. The capability shall process and store 0.5 TB per year for reports and comments/discussion on reports and shall be able to scale annually.
5. The capability shall be able to display a web page within 0.5 seconds and provide search returns to the user within 2 seconds.

Existing information sharing capabilities, other than those examples listed herein, may be considered if they also limit access to vetted/validated organizations and personnel with a need for this information. Submissions that propose to develop an information sharing platform or leverage non-U.S. governmental platforms shall be considered non-responsive to this BAA.

The Government may provide collected forensic reports/exemplars for this development effort. However, offerors must be capable of developing and delivering the required solution in the event government furnished information is unavailable.

The U.S. Government must receive unlimited intellectual property and use rights to the system, software, applications, and data developed or delivered during this project.

R4561 Image Clustering by Content

Across the US Government, agencies are responsible for examining images and videos in order to extract identifying information. Excessive volumes of multimedia data collections and submissions overwhelm analysts and examiners who must organize, triage, and manage the data to more effectively identify content of interest.

Develop a software algorithm capable of clustering and searching images and videos contained in large data sets (e.g. ~100,000 images and 10,000 videos, total volume of approximately 2 terabytes) based on their scene content utilizing general pattern matching. The software algorithm shall group together all images within a dataset or collection that appear to depict a similar scene and be identified as a point of focus for the forensic analyst or be discarded. The algorithm shall utilize perceptual hash functions, comparable to Microsoft's PhotoDNA, in order to detect and correlate near-duplicate images, such as images which have had only a small percentage of their image content modified or have been resized. The image clustering algorithm shall be developed to be incorporated into large scale processing systems and be optimized for OpenMPF and JanICE application programming interfaces (APIs) used by the Federal Bureau of Investigation, Department of Homeland Security and other federal agencies.

The algorithm shall meet the following threshold parameters:

1. Allow for manual editing of clusters including adding/deleting images to a cluster, merging clusters, and dividing clusters;
2. Leverage graphical processing unit (GPU) and central processing unit (CPU) hardware;
3. Process 40 frames per second (fps) on NVIDIA Titan RTX GPU (or comparable hardware), 20 fps on NVIDIA TX@ and 10fps on CPU hardware;
4. Achieve the following performance metrics for image clustering:
    a. Attain or exceed the clustering performance reported by Huang et al. (2020) against the ImageNet-10 dataset, (Deep Semantic Clustering by Partition Confidence Maximisation), https://openaccess.thecvf.com/content_CVPR_2020/papers/ Huang_Deep_Semantic_Clustering_by_Partition_Confidence_Maximisation_CVPR_2020_paper.pdf; and,
    b. In "search" mode, 99.9% "true positive" accuracy for the same image when the only modification to the image is a resizing ranging from 12.5% ($1/8^{th}$) to 400% or when only 5% or less of the image area (in pixels) differs between two equally sized images (i.e., only 5% or fewer of the pixels have been modified from one image to the other). This capability corresponds to the "PhotoDNA-like" application of the algorithm.
5. Achieve the following performance metric for searching: not exceed a 5% false positive rate for a threshold determined by the provider, while also achieving a false negative rate of 5% or less for that same threshold;
6. Be interoperable with leading artificial intelligence/machine learning frameworks (e.g., pyTorch, TensorFlow, TensorRT, Keras) to provide a robust capability that can be integrated into existing processing environments;
7. Integrate and optimize capabilities with the FBI Multimedia Processing Framework and DHS JanICE API and HORUS interface through the delivery of an OpenMPF analytic component;
8. Not rely on internet connectivity;

9. Be operational on both Linux and Microsoft systems; and,
10. Be compatible with Docker.

The algorithm may meet the following objective parameters:

1. Incorporate a watchlisting capability whereby ingested files shall automatically be compared against a pre-existing set of image and video files to detect duplicate or near-duplicate versions of these files;
2. Attain the "PhotoDNA-like" accuracy of 99.9% for the same image when the only modification to the image is a resizing ranging from 12.5% ($1/8^{th}$) to 400% or when only 5% or less of the image area (in pixels) is different between two equally sized images for the watchlisting capability; and,
3. Configure the watchlist for "white list" and "black list" functionality (i.e., highlight files of interest and deprecate files to be ignored).

The U.S. Government must receive unlimited intellectual property rights to the software algorithm, source code, and data developed or delivered during this project.

R4562 DoD Reference Swab Processing Instrument

DoD examiner technology does not exist for the mass processing of buccal swabs. Due to this lack of technology, the current laboratory workflows are slow, manually intensive and expensive.

Design, develop, and validate a device for cutting the tips of buccal swabs and automatically place the cut tip into a pre-designated well of a 96-well plate. The instrument shall have the ability to cut a reproducible swab size and cut several swabs without having to reload the device. The device shall only cut the tips of the swabs' head and place that swab cut into the 96-well plate for later analysis. The instrument shall only prepare the 96-well plate and shall not perform any chemical extractions or analysis. The instrument shall include a tracking software to create barcodes or a numbering program to identify which swab and swab cutting corresponds to which well on the 96-well plate. The software shall have the ability to import barcodes and other identifiers from the currently existing Laboratory Information Management System, such as Sample Tracking and Control Solutions. The final deliverable shall allow for rapid, upstream processing of large quantities of buccal swabs simultaneously.

Other required features and capabilities are:

1. The instrument shall function with a standard 96-well plate and a deep 96-well plate to ensure capability with currently existing downstream extraction instruments.
2. The instrument shall have the ability to cut the following swab head types:
    a. A cotton tip on a 6-inch wooden applicator (Puritan swabs);
    b. A cotton tip on a 6-inch plastic applicator;
    c. A foam tip on a 6-inch plastic applicator;
    d. A cotton tip on an 8-inch wooden applicator (Puritan Jumbo Swabs); and,
    e. A foam/wire bristle tip on a 6-inch plastic applicator.
3. The instrument shall cut between 1/8-1/4 of the swab tip and retain the rest of the swab for re-testing purposes.

4. The instrument shall have no cross contamination (i.e., preloading of swabs shall be in a sterile manner) and include a mechanism to sterilize the cutting apparatus between samples.
5. The tracking software must be compatible with Windows 10, and McAfee Anti-Virus and operate on a laptop or desktop computer system.
6. The software must also be Security Technical Information Guide and Federal Information Processing Standards compliant, accept Microsoft patches, and shall be Government approved.
7. The output file shall be a delimited file format (i.e., .xls, .xlsx, .csv, .pdf).
8. Both operations and maintenance manual(s) are required deliverables, to include a transfer protocol to a separate computer.
9. The instrument hardware and deck shall be able to withstand sterilization with common laboratory reagents such as 70% isopropanol or 10% bleach and ultraviolet light exposure.
10. The instrument shall function in a lab benchtop environment (both traditional and expeditionary) and encased for sterility, similar to the BSD600 Plus instrument.
11. The size of the instrument shall not exceed 5 feet (height) by 2 feet (depth) by 4 feet (length).
12. The preventative maintenance of the instrument by a layperson shall be minimal.
13. The instrument shall comply with forensic validation standards and adhere to FBI Quality Assurance System documents for DNA processing.
14. The final deliverable shall be compatible with instrumentation, reagents, and DNA kits that are generally accepted products; commercial-off-the-shelf products are encouraged to allow for easy implementation without extensive validation efforts.
15. The final deliverable shall not exceed 120 volts/10 amps and shall utilize a power cord that protects against electrical surges to support expeditionary sites.
16. Eight (8) reference swab processing instruments must be delivered at the conclusion of the project.

The U.S. Government must receive unlimited intellectual property rights to the instrument, software, applications, and any data developed or delivered during this project.

R4563 Identifying Altered Images/Videos

Benford's law has been used in forensic accounting to detect fake databases and statistics to determine fraudulent accounting and embezzling. DoD investigators and counter-intelligence agents require application of Benford's law to identify altered images and videos.

Design and develop software capable of detecting altered digital images and videos. The software design shall implement forensically validated procedures that utilize Benford's law to determine if an image/video, or set of images/videos, have been manipulated. The software shall be capable of identifying images/videos which do not follow Benford's law to determine the specific locations, frames, or areas that have been altered.

The software shall include the following features and capabilities:

1. Import and examine the following image file formats: .jpg, .bmp, .png;
2. Import and examine the following video file formats: .mp4, .mpg, .avi;

3. Generate reports in the following formats: .html, .pdf, .csv;
4. Operate on a laptop/desktop computer with one or more dedicated graphics card(s) as a stand-alone application;
5. Run on the Windows operating system;
6. Not rely on internet connectivity;
7. Process image and video/movie files in real time and have the ability to queue up to 100 files at a time; the software shall have the ability to queue batches of 100 files for up to a maximum of 10 batch loads;
8. Include an easy-to-use and intuitive graphical user interface (GUI) operable by a non-technical end user.
9. Provide software application installation, user manual, training, and technical support for end user agencies.

Benford's law, also known as the "Law of First Digits", states that in many naturally occurring datasets, the first digit is likely to be small. In datasets that obey the law, the number 1 appears as the leading significant digit more often than with the number 2. This follows, a number starting with 2 occurs more than a number starting with 3, and this pattern continues to 9. If the digits were distributed uniformly, they would each occur within a dataset equally. There have been several previous research efforts validating Benford's law to identify altered images.

1) https://arxiv.org/pdf/2004.07682.pdf
2) https://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.40.1840&rep=rep1&type=pdf
3) https://www.cambridge.org/core/services/aop-cambridge-core/content/view/D9862DD7219DDEDA606363504549029 5/S2048770314000195a.pdf/discriminating-multiple-jpeg-compressions-using-first-digit-features.pdf

Participating contractors and their subcontractors must be U.S. citizens.

The U.S. Government must receive and permanently retain unlimited intellectual property rights to all data, software, and source code created, produced, or developed as a result of this project.

R4564 Unified Orbit-Cylinder Interrogation Framework

DoD interviewers and interrogators lack comprehensive researched based techniques and any contemporary models for use in field operations. Most research based validated models are too narrow in their scope to adequately use in operational scenarios. Two validated models shown to be effective for operational information gathering are Observing Rapport-Based Interpersonal Techniques (ORBIT) and Cylinder. However, neither has yet achieved full potential to be operationally capable. To overcome these challenges, and because no contemporary single model exists, DOD users believe developing of both into a single overarching technique and model that is easier to employ, fully capable, and better suited to elicit more credible information during interviews and interrogations is critical.

Research and develop the optimized use of both the ORBIT and the Cylinder (Sensemaking)interviewing models in an interrogation setting. The ORBIT model, which had been validated using interviews with terrorist suspects, combines principles of motivational interviewing together with adaptive behaviors for interpersonal relations to foster an interview

environment that promotes information sharing. The Cylinder model, which has been tested in the crisis negotiation context, asserts that making sense of an interview subject's communication behavior and the underlying motivation should guide the interviewer's subsequent response to that behavior. The Cylinder model also asserts the appropriate response alignment throughout the interaction is key to effectively interview or interrogate a subject. Even though these two models were developed and validated separately and in different operational contexts, interrogators often use both in the same interrogation setting. Interrogators and analysts try to navigate between the two models to determine effective paths forward to gather information, but are only able to do based on anecdote. Examining and optimizing he combined use of these two models is imperative to determine if they can be used together in a way that is useful for effective in interrogative operational settings. If they can be combined, a comprehensive yet concise integrated interrogation model and set of procedures shall be developed. If they cannot be combined, an overall framework for when to use each model and how interrogators can determine which one to use shall be developed. This model and set of procedures must be an advancement in both ORBIT and Cylinder capabilities. The model must promote cooperation, effectively elicit the maximum amount of credible information in any interview or interrogation setting, and be easily applied in a practical, real-time setting. The resulting model must be rapport-based and non-coercive. Additionally, a validated training program to train practitioners in the application of the developed model and its techniques in scenarios relevant for the end users must be developed. If the research determines the models should not be combined, the research shall then focus on which contexts and scenarios one model is best used over the other. The training shall focus on understanding the contextual features of when to apply each model. The resulting model and techniques must be refined and validated by use of empirical evidence, available research literature, and original research on the ORBIT and Cylinder models and their associated principles.

Other features and components of the research and model must include the following:

1. The research methodology must be scientifically sound and have applications to operational scenarios relevant for the governments of the United States and the United Kingdom.
2. The operational scenarios and conditions shall be developed in coordination with both the U.S. and U.K. governments.
3. Appropriate statistical techniques must be applied to the research and model with documented results.
4. The research, methods, findings and results, and how the model and its techniques can be applied to relevant operational contexts must be documented and provided to the government.
5. A 2-3 day training course for approximately 25 students must be developed and validated to teach the optimal use of the model and its techniques to field operatives.
6. Instructor and student manuals for this training and all associated course documents/materials must be produced and delivered.
7. Two training sessions must be conducted for the government at locations to be determined with one held in the United States and the other held in the United Kingdom.

All techniques, procedures and tactics must be directly employable during investigative interviews. No proposal shall be accepted that does not grant to the U.S. Government unlimited

intellectual property rights to the all data, reports, results, and final deliverables.

R4565 Travel and Identity Document Reference Database

The U.S. has no accessible dataset of examplars that provide military and other federal activities with high resolution images of travel and identity documents that require visual verification during security, investigative, counterintelligence, and other identity operations.

Design, develop, and make operational a comprehensive high-resolution digital database of travel and identity documents that fulfill the following roles:

1. A reference library of imagery and document security features which can be used remotely by the military, law enforcement personnel, forensic examiners, or other government officials for the purpose of authenticating suspect documents in real time.
2. A high-resolution digital backup of the laboratory's physical library to be used as part of the organization's continuity of operations plan.
3. A digital library management system (library card catalog) which allows the check-in and check-out of physical documents and records their custodial possession.

The system shall be developed and integrated into an established U.S. government document repository located in McLean, VA that provides internet access to DOD and other federal agencies throughout the world. This repository includes genuine, counterfeit, and altered travel and identity documents along with reference material from more than 200 countries and independent territories with more than 332,000 records. The U.S. government shall provide access to this database and system to the selected developer.

The system shall provide access to the repository/database via internet connection from any location with internet access using a secure log-in procedure. Depending on the level of access granted, the user shall be able to access, at a minimum, a certain subset of the records and their associated imagery, up to and including the entire database and access to all features and capabilities that the system provides.

The selected offeror shall not be responsible for populating the database with images from the library. However, the offeror shall use sample images supplied by the HSI Forensic Laboratory for development purposes. The final installed version shall contain the legacy data from the previous database and accommodate uploads of new imagery.

The system shall have the following features and capabilities:

1. Access all legacy data from the old system and update each record to the new format at will. Legacy data shall be differentiated graphically from entries that have been updated to the new system requirements;
2. Support the data storage of millions of high-resolution images that can be immediately accessed by users via an intuitive interface;
3. Be designed as a web application accessed via browser and capable of supporting tens of thousands of geographically dispersed users via the internet;
4. Utilize advanced search capabilities to include keyword searches, filters, and sorting functions;

5. For each document (passport, driver's license, etc.) within the database, the system shall be capable of displaying multiple high-resolution images of associated security features, production methods, alternate light sources, and other traits;
6. Contain intuitive admin user interfaces (UI) that perform administrator functions such as catalog searches, indexing, setting changes, granting and revoking of access, and other admin interfaces;
7. Contain multiple intuitive UIs that allow a user to perform side-by-side forensic analysis between two identity documents, research the document's attributes, navigate to additional related documents as suggested by the system, and access other user interfaces;
8. Allow a security document such as a passport to be viewed virtually to include page turns, zooming, panning and selecting additional images that are specific to a particular page or portion of the page. This shall be accomplished using different viewing methods such as thumbnails within a filmstrip, grid, or list;
9. For documents that contain multiples of the same document type, allow one of the documents to be identified as the primary representative. For example, the primary document would be displayed prominently while others of the same type would be displayed less prominently (as thumbnails or some other method) but still accessible;
10. Be able to produce multiple types of reports in a variety of formats suitable for printing, email or other conveyance to an external entity;
11. Use automated capabilities that reduce manual input including the tagging of images through artificial intelligence (AI), image recognition, and optical character recognition where applicable;
12. Enable each document within the database to be tagged and keyworded so that the documents can be searched, sorted, filtered, and hidden (depending on user rights);
13. Depending on the role of the user, the software shall compartmentalize information and grant varying levels of access rights as well as the ability to limit the amount or resolution of images shown to user. This shall be done by assigning certain attributes to each document and/or image;
14. Incorporate the capability to share and control personally identifiable information within the access rights and levels;
15. Provide backup and restore capability;
16. Provide an easy means to upload scanned documents quickly into the system after scanning as well as functions for dragging and dropping images into the database files;
17. Include an interface that allows a regular user to submit digital content to the database after administrative approval;
18. Accept and store a hardware settings file so that scanning preferences can be replicated later;
19. Assign a unique database identifier and output that identifier as a printed barcode, radio frequency identification tag, or other technology for document location tracking;
20. Designate hierarchical, "parent/child" relationships between documents, subdocuments, document families, and other complex document relationships, so each document or group of documents shall be uniquely identified. Individual documents shall be referenced via document identifier and entire families can be referenced via family identifier;

21. Display related data associated with each document that is customizable by administrative users. This must include data fields such as type of document, unique identifiers, security features, document origin, authenticity, history, and more;
22. Display multiple common file types, such as static images, video content, animations, slide presentations, multipage documents;
23. Include user-defined dashboards that show statistics, the check-out status of documents, user history, and other user-specific data which are exportable;
24. Access help topics at any point when using the system;
25. Provide mobile access for smartphone and tablet devices;
26. Incorporate an interface that automatically scales to the screen size of the device;
27. Function fully on both server and cloud-based environments; and,
28. Use commercial off-the-shelf and standard plug-ins when possible.

Additionally, the system shall fully comply with the following:

1. Section 508-Accessibility for individuals with disabilities;
2. Federal Information Security Requirements for Moderate Level security requirements;
3. All Immigration and Custom Enforcement (ICE) identified Information Technology security requirements included in the DHS 4300 Security Guidelines and Policies or vulnerabilities identified by ICE;
4. FedRamp security requirements which shall be accomplished through collaboration with the Government Information System Security Officer and include completion of required information technology security documentation; and,
5. Information Systems Vulnerability Management patch notices.

The developer shall thoroughly and comprehensively test the software in realistic scenarios. It shall be provided to certain end users for a 60-day testing period before final delivery. Modifications based on the end user testing and evaluation shall be completed before final delivery.

The final deliverables shall include the following:

1. A thoroughly tested and completed Travel and Identity Document system that is installed at a specified U.S. government document repository located in McLean, VA;
2. A data migration plan, implementation of data archiving and retrieval capability, ensuring compliance with FedRamp certification requirement;
3. Source code, documentation, and written instructions for installation and use; and,
4. A full warranty of the final product for a one-year period from date of final delivery and acceptance.

The U.S. Government shall receive unlimited intellectual property rights for all deliverables developed in this project.

R4567 Audio Crawler

There are no automated audio collection techniques to identify persons of interest in the open and dark web that have any utility for digital and technical exploitation. Develop a search engine and web based archive modular service that monitors open/social media and the dark web to gather audio data. The service shall build and include a searchable database for the identification

of subjects of interest and interrelationships using speaker fingerprints.

The modular service shall be designed to add future capabilities and tools for data accuracy (music removal algorithms, sound identification, etc.). The software shall include privacy enhancing technology that encrypts the data and protects all queries made against the databases from viewing on the cloud infrastructure. The final deliverable must upload voiceprints and identifications (ID) relating to a voiceprint to check against a database for a positive result. Positive results shall enable the user to perform the following actions:

1. Allow local searching of databases or watchlist with return voice ID results;
2. Allow multiple IDs to be returned as a potential match;
3. Return metadata to help narrow down the search of the person;
4. Include audio data for metadata purposes to gather information on the externally hosted audio/video file;
5. Locally manage mapping of voice IDs to real identities; and,
6. Understand the quality of the match and the quality of the audio.

The software shall utilize the returned voice IDs from the search functions to build a graph of the voice IDs, the various posting or social sites of interests, and their relationships with other users through a graph maker software. The graph maker software shall highlight common language between those users and return any additional voice IDs for future searches. The software shall include a content notification service to alert users of any new audio content which matches a watchlist and includes all metadata for that content.

Other features and capabilities of the final deliverable shall include:

1. The web crawling element shall be configurable and controllable by the system administrator, which shall be protected with Privacy Enhancing Technology.
2. There shall be an access control system.
3. The software shall have an average equal error rate less than 10%. It shall include a mitigation mechanism for any mismatch identification results.
4. The software shall include Privacy Enhancing Technology to secure databases and hide queries from third parties.
5. The software shall detect voice signatures of a single person of interest in a multi-talker video/audio clip.
6. The software shall analyze multiple languages being spoken in the same audio track.
7. The search engine shall function under a modular architecture.
8. The system shall have the ability to have its use audited.
9. The software shall process audio and video files at a minimum of real-time and have the ability to process searches for various speech queries to identify subjects of interest.
10. The system shall be optimized for performance and consideration shall be given to reduce latency.
11. Search results shall be returned within less than one minute for an average of 10 or more concurrent queries.
12. The final deliverable shall be scalable for future modifications.

13. The final deliverable shall process all standard web audio and video formats (without conversion to a standard format of lower quality) and deliver results in the same format it was received in, with metadata displayed in a web interface and available as JSON.
14. The final deliverable shall be delivered in a containerized way, with a web interface which can be accessed by mainstream browsers and a RESTful API.
15. The final deliverable shall operate in a standard public cloud infrastructure such as AWS.
16. It is acceptable for the software to have a minimum length and quality for the analysis of audio signatures. This shall be configurable by the system administrator to reduce poor data quality.
17. The final deliverable shall provide the capability to store the crawled data for a system administrator configured period of time.

Additionally, the following capabilities are objective requirements:

1. Software that uploads a section of text or key phrases to search specified keywords in audio recordings.
2. Positive results that allow the end users to perform the following actions:
    a. Local searching of databases or watch list with return voice ID results.
    b. Return metadata to help narrow down the search of the person.
    c. Return multiple IDs as a potential match.
3. The final deliverable be privately hosted with stand-alone capability.

Any resulting contract may involve the use of and access to classified data and results and shall require classified facilities. Offerors must have a SECRET facility clearance and processing and storage capability. Some work relating to these efforts may be performed in a secure facility. Individuals working on these efforts must hold a final SECRET clearance.
The U.S. Government must receive unlimited intellectual property rights to the system, software, applications, and any data developed or delivered during this project.

R4568 Covert Mobile Multispectral Imaging System (COMMIS)
For covert forensic enabled activities, usable advanced technology to optically search physical targets in a stealthy manner and discreetly capture images and human traces with means such as alternative light sources (ALS) are non-existent.

Design

Detail Features and Capabilities of the System	Threshold/ Objective Requirements
Hardware	
The device must be a commercial-off-the-shelf compact device to reduce cost and allow for future upgrades to the device as needed.	Threshold
The device must provide WiFi and 4G internet connectivity.	Threshold
The device must house a camera that can capture high-resolution images at 800dpi minimum.	Threshold
The device must allow transmission of data via USB-C and Bluetooth.	Threshold
The device must offer full disk encryption by a PIN.	Threshold
The device must have an adjustable (reduce/increase light	Threshold

emission) 'ringlight' connected and powered via USB port.	
The device screen must have an optimum configuration to reduce/nullify glare.	Threshold
The device must offer 4× zoom capability.	Threshold
The device shall emit the following wavelengths: - dUV: 100-280 nm - UV: 360-370 nm - Violet: 405-425 nm - Blue: 440-455 nm - IR1: 720-745 nm - IR2: 840-865 nm	Threshold
The device offers onboard storage of 256 GB minimum.	Objective
The device weight not to exceed 600 grams	Objective
A battery life of 10 hours minimum (not continuous use).	Objective
Sufficient ruggedization of the device to meet IP54 and MIL-STD-810H standards.	Objective
Software/Application	
The application must offer a gallery style image capture capability.	Threshold
The application must be able to offer 1:1 image scaling or image calibration as set by user.	Threshold
The application must be compatible with standard image files: - raw; svg; jpeg; tiff; bmp	Threshold
The application must have an export functionality to allow for onward analysis (Photoshop, GIMP, etc.).	Threshold
The application shall include an onboard screen backlight option to reduce light signature.	Threshold
The user can interact with the GUI and access capabilities options with minimum amount of steps possible. (e.g., the user will not have the time to cycle menus for options.)	Objective

The U.S. Government shall receive unlimited intellectual property rights to the system, software, applications, and any data developed or delivered during this project. The submitter shall include more than one testing phase into their technical approach and allow for end user participation during those phases.

5.6. Human Performance and Training (HPT)

R4623 Global Special Operations Forces University

To overcome physical barriers to partner training and enhance existing training models, SOF requires an online platform to deliver educational materials, lessons, and engage in discussions and other training events with partner nations. This platform shall enable discussion boards, photo and video posting, educational content sharing, training and program of instruction (POI) module creation and utilization, video chats, and has potential for future virtual and augmented reality applications for 3D, immersive remote collaboration. While it shall run on local,

non-government supplied internet, the platform shall be secure. The Global SOF University shall provide the below features and capabilities:

- Aid user in organizing and distributing content, manage user information, course enrollment, and scheduling
- Video conferencing functionality, enabling instructors to lead live, remote training through the platform
- Ability for students and instructors to engage in two-way text communication and discussions both in and out of the class environment
- Ability for students and instructors to hold virtual one on one sessions, classes and seminars Course and Student Library – ability to file and share course and student specific content including documents, presentations, images, and videos
- Allow students to access and complete courses on phone or tablet
- Assistive translation tools to assist English authored content to a specified language, including near real time services to support chat and discussion board functionality
- Provide administrator account authorization, security, and user privileges to control access to, and protection of, the differing system functionality and course content.
- 256-bit encryption
- Meets International Traffic in Arms Regulations (ITAR) or Export Administration Regulations (EAR) for access to USASOC U.S. and foreign partners

The offeror shall deliver the Global SOF University in accordance with DoDI 8510.01 "Risk Management Framework (RMF) for DoD Information Technology (IT)," and DoDI 8500.01, "Cybersecurity." This shall include the initial Authority to Test, Authority to Operate, and an Authority to Connect integration into the USSOCOM Special Operations Forces Training Enterprise Network architecture. The offeror is encouraged to use services and software that have already received government Authority to Operate, for example, a plug-in for a TAK Server with student access via WebTAK.

The offeror shall support an evaluation of the prototype system by the Government on system usability and effectiveness in achieving the training objectives and make necessary updates and changes. The offeror shall work with the Government to coordinate instructor and student participation and developmental evaluation. The final product shall be delivered and installed by the offeror at the Government end user site with training on proper operation and maintenance of the system. Offeror shall provide the Government with training manuals, job-aids, and other reference materials for starting, running, maintaining, and storing the system.

At the conclusion of the contract, all software and hardware required to utilize and operate Global SOF University shall be transitioned to the Government.

The Government will provide subject matter experts for the duration of the project to guide the development and transition of the desired system.

R4625 Organically Designed and Built (ODB) sUAS Courses
SOF activities require the ability to organically design, build, test, operate, and train on

customized Group 1 small unmanned aerial systems (sUAS). Since SOF operates in numerous geographic locations, often by, with, and through partner forces (PF), these sUAS shall be designed for assembly using low-cost, commercial-off-the-shelf (COTS) hardware sourced and procured from local, regional, or international suppliers. Additionally, systems will utilize open source software for onboard autopilot and ground control systems obtained through publicly available online databases.

This effort is to design, develop, deliver, evaluate, and refine two ODB sUAS Courses: Initial Qualification Course and Master Trainer Course. The offeror shall be responsible for designing and developing a program of instruction (POI) for each, then refining the POIs in accordance with Government and end user feedback. The POIs shall be developed using the Analysis, Design, Development, Implementation, and Evaluation (ADDIE) or equivalent instructional systems design framework.

Initial Qualification Training (IQT)
Design and develop a POI that meets standards to safely certify students and standardize how to build Group 1 sUAS (Rotary Wing and Fixed Wing) tailored for specific mission needs. Coursework shall include, but not be limited to, the following:

- Methods for attaining COTS hardware and software to complete mission objectives. Proprietary methods, tools, and information should be minimized.
- How to analyze and make design decisions based on sUAS technical and operational requirements for a given mission. For example, understanding and thinking critically through trade-offs between air vehicle shape, size, overall air vehicle and system weight, useful payload capacity, flight time endurance, sensor and radio control frequency transceivers, etc.
- Once designed, students shall have the ability to select optimal components from available suppliers, procure these components, and perform mechanical and electrical fabrication, firmware/software installation, initial ground testing, and flight testing prior to operational use.
- How to design and build sUAS with ability to carry either COTS payloads (e.g., HDI camera, drop/delivery mechanism, etc.), as well as existing U.S. Government sUAS payloads.
- How to build sUAS control systems utilizing First Person View or video piloting.
- Students should have a Remote Pilot Certificate from the FAA (Part 107).
- IQT should not exceed 4 weeks in duration.
- Up to 15 students per course with a 5:1 student instructor ratio. First iteration of course will require a smaller class size of up to five (5) students with a minimum of 2 instructors.
- Courses and CULEX shall take place at a location identified by the Government.

Master Trainer Course (MTC)
Design and develop a POI that meets standards for providing instructor certification for the IQT. Coursework shall include, but not be limited to, the following:

- Certify students to provide IQT instruction on designing, building and operating sUAS, to include ground control systems, mission planning, simulations, orientation flights, and

proficiency evaluations
- At the conclusion of the Master Trainer Course, students will have the skills and knowledge necessary to conduct IQT. This shall be assessed on their ability to implement and manage a unit level training program, provide sUAS flight instruction, employ sUAS accident prevention strategies, and coordinate ongoing sustainment training.
- Students should have a Remote Pilot Certificate from the FAA (Part 107)
- Master Trainer Course should not exceed 2 weeks in duration
- Up to 10 students per course with a 5:1 student instructor ratio
- Courses and CULEX shall take place at a location identified by the Government

Curriculum shall be prepared and delivered to the Government for review and approval. The offeror shall deliver up to three (3) iterations of each course for evaluation. After gathering student, subject matter expert, instructor, and other U.S. Government customer feedback, the offeror shall refine and make improvements to the POI, training aids, equipment list, training environment, and evaluation methods. Each course shall include an evaluation of individual student capabilities using assessment measures both prior to (i.e., baseline) and after training. These student evaluations shall be compiled and included in an evaluation report.

If awarded, this contract may include options for additional courses conducted at various CONUS and OCONUS locations. Additionally, options may be included for development of POI variants.

The Government will provide students, subject matter experts, and necessary Government Furnished Information/Government Furnished Equipment throughout the effort to guide development and transition of the ODB sUAS Courses to an established Government training activity. At the conclusion of the contract, the POI, all equipment, training materials, and training aids required to plan, run, support, implement, and further develop the ODB sUAS Courses shall be transitioned to the Government.

R4627 Advanced Cyber Physical Testbed

U.S. Department of Defense (DoD) Cyber Operators require advanced knowledge of cutting edge smart technologies to achieve full spectrum cyber effects operations. Current Cyber Physical Testbeds (CPTs) need sophisticated, peer-level hardware and software necessary to ensure adequate skill development. The Advanced CPT (ACPT) will enable DoD to provide proficient cyber operators in conducting full spectrum cyber effects operations worldwide.

This effort is to design, develop, deliver, evaluate, and refine ACPTs that replicate four different operational environments listed below. ACPTs are real, physical, not virtualized, instantiations of cyber environments for use in training to prepare, understand and operate within commercial-off-the-shelf (COTS) cyber enabled technologies. The ACPT shall provide unclassified COTS hardware and software that replicates operational environments on land, in the air, and in maritime domains. ACPT shall allow for the testing and validation of cyber tactics, techniques and procedures that enable the evolutionary development of the testbed capabilities. Through use of the COTS hardware, the ACPT shall allow operators to physically see the real-time, true effects of a cyber operation.

The deliverables shall include the following:

- Minimum of four (4) ACPT kits, each replicating the following networked environments:
  - Maritime vessel control, navigation, and information systems.
  - Facility/building control systems.
  - Facility/building surveillance systems.
  - Towed trailer platform simulating wireless telecom 3G/4G/5G-network tower.

- ACPT kits for training, exercises, and mission rehearsal in the four listed environments:
  - Simulate the cyber connected environments and regions encountered worldwide.
  - Mobile and self-contained kits delivered in portable, shippable, hardened cases.
  - Operate off worldwide electrical power sources.
  - All devices shall be interconnected via a wireless router.
  - With applicable kits, devices shall have the ability to be managed/controlled through applications on a tablet and/or mobile device of choice.
  - Rapidly transition between target sets, including foreign languages.
  - Connects but is not dependent on the Joint Information Operations Range to enable distributed access, cyber environment providers and others to ensure effective routing, configuration, etc.

The offeror shall provide testbed engineering support to (1) conduct research of suitable hardware, (2) develop and capture associated cyber exploits, (3) provide standardized data reporting on exploitations to the Government and (4) coordinate technical configurations and management of the ACPT throughout development and in support of training.

The offeror shall provide cyber exercise planners to support test and evaluation of ACPT in the context of up to three (3) Government identified and approved training exercises. These training exercise locations may be austere working environments both CONUS and OCONUS, and may require 24/7 onsite support.

The offeror shall support Government evaluations of the ACPT kits for usability and effectiveness in achieving training objectives. The offeror shall make necessary updates and changes based on Government feedback. The offeror shall work with the Government to coordinate end user participation and developmental evaluations. The Government will provide subject matter experts and Government furnished information throughout the duration of the project to guide development and transition of deliverables to the Government.

Key personnel shall require access to classified information and have discussion up to the TS/SCI level. Contractor personnel shall be cleared up to TS/SCI. Storage and generation of classified information is required. Access to classified information technology systems is also required.

The final ACPT kits shall be delivered by the offeror and tested by the Government at the Government end user site. The offeror shall provide training on proper operation and maintenance of the ACPT, to include techniques for exploitation of the associated hardware. The offeror shall provide the Government with training manuals, job-aids, and other reference

materials for starting, running, maintaining, and storing the ACPT.

R000-HPT-FY22 Unspecified Requirement
The Human Performance and Training (HPT) subgroup focus is on addressing the most challenging problem sets associated with developing knowledge, skills, and abilities to deter, defeat, prevent, protect against, mitigate, and respond to combating terrorism and national security threats. This unspecified requirement (R000) seeks solutions to enhance the operational capabilities of our U.S. military, federal law enforcement, and interagency customers involved in combating U.S. adversaries by optimizing performance for significantly improved readiness and mission execution. All submissions shall identify the anticipated end user and/or endorsing organization.

Key overarching areas of interest based on HPT's focus areas are: Technology that allows a learner to seamlessly interact with, and become immersed in a learning environment. Tools, technologies, and techniques for improving the design and validation of interactive and immersive learning technology. The full range of performance gaps and interventions to improve and sustain human performance. Methods, technologies, and programs based on cognitive and physiological principles that will optimize operator training, enhance mental and physical skills, and improve mission performance. Training and educational programs that employ novel instructional design, delivery methods, and concepts to accelerate and enhance learning.

More specific areas of interest include:

- Monitoring and exploiting human performance data (e.g., physiological state) within a training environment
- Human performance data analytics
- Wearable technology for operator state assessment
- Measuring and mitigating stress and mental workload
- Novel applications of immersive technology including virtual reality, augmented reality, and mixed reality
- Natural language processing (e.g., conversational interaction) within immersive, simulation based training technology
- Cognitive skills development and assessment for those encountering complex problems and making high-risk decisions
- Human factors/usability for operational systems
- Human-machine teaming
- Subterranean detection and operations training, especially leveraging virtual, augmented, and/or mixed reality
- Nutritional ration alternative to Meals Ready to Eat (MREs) to reduce overall weight and preserve combat power in denied environments.
- Expeditionary equipment and protocols that reduce acclimation time to extreme elevations (over 15,000 feet)

Unspecified requirements (R000s) are for proposing unique innovations that have not yet been identified by IWTSD. Submissions against an unspecified requirement shall be responsive to the focus areas and topics noted. Proposed technologies from the unspecified requirements will be

competing against proposed technologies for identified and prioritized specified requirements. Because IWTSD does not budget for unspecified requirements, awards may not be made against them.

Note: Quad charts submitted in response to a subgroup's R000 may be shared with other IWTSD subgroups if the submission demonstrates relevance to that Program Manager's Focus Areas.

5.7. Indirect Influence and Competition (I2C)

R4604 Civil Knowledge Integration – Tactical Assault Kit (CKI-TAK)

Civil Affairs (CA) units currently lack the ability to develop and disseminate a clear and concise Civil / Influence layer to a Commander's Common Operating Picture (COP) that clearly shares information with other Special Operations Forces (SOF), conventional forces, the Interagency (IA) community, IA implementing partners, partner/proxy indigenous elements, and curated online news and information sources. The inability to manage civil information in a congested, contested, and degraded information environment adversely impacts the military's ability to answer information requirements. This includes identifying key terrain in the civil component, detecting hybrid threats, creating and corroborating situational understanding to react/respond to dynamic hybrid threats, analyzing regional/national civil networks, and making timely and informed decisions to maintain operational tempo.

Design and develop an application for the Tactical Assault Kit (TAK) that will allow users to share and visualize civil information across the Department of Defense (DoD), Department of State (DoS), the United States Agency for International Development (USAID), and the IA in all forms of regular and irregular warfare, conflict, and competition. Personnel will be able to view existing reports for a geographic area, and add updates in real-time on the ground. Integration of existing curated information sources, IA implementing partners, and partner/enabled force inputs will provide SOF Cross Function Teams (CFTs) greater situational awareness at all times. Key features include providing users with the ability to turn map layers on and off, search and select by key variables, and export the information in formats compatible with Combatant Command (COCOM) data repositories. The U.S. Government (USG) / U.S. Military (USMIL), and Five-Eyes (FVEY)-version of TAK will consolidate all inputs in one interface, while the lower-tier civilian and partner force version will provide the same function to partner/enabled forces and IA implementing partners, but will transfer all inputs one-way for aggregation and display on the USG/USMIL and FVEY version.

Specific CKI-TAK Requirements

1. Enable users to input Civil Knowledge information such as civil reconnaissance reports, engagement (meeting) notes, biographical and contact information, pictures, event icons, infrastructure information, and other common CA, DoS, USAID, and implementing partner reports on the TAK map overlay.
    a. See past and current reports from a selected area/timeframe on their device
    b. Build additional customized report formats or shells for IA and implementing partners' use
    c. Use talk-to-text functions to fill in text entry fields

d. Toggle on and off reports and layers by categories including but not limited to: military unit/component (CA, SF, PSYOP, etc.), IA users (DoS, USAID), IA implementing partners, partner/proxy/enabled forces, category of entry such as ASCOPE (areas, structures, capabilities, organizations, people, events) and PMESII (political, military, economic, social, information, infrastructure)
e. Toggle on or off additional data entries for labeling imagery/pictures. Where technically feasible, the information will auto-populate in the field when this option is turned on, or allow manual entry. Other fields will allow for free text manual entry by the user. The image data labels shall include:
    i. Date Time Group (DTG): Local, Zulu, etc.
    ii. Location: UTM/MGRS, or LAT/LONG
    iii. Orientation: Azimuth to object from photographer's location (Magnetic)
    iv. Distance: Straight line to object
    v. Altitude
    vi. PTR#: Picture numbers correspond to an associated report (i.e. 304A is the first picture relating to Report# 304)
    vii. The image label shall format as: DTG / LOC / ORIENT / DISTANCE / ALT / PTR#
f. Users shall be able to select one or multiple reports and export them into a ready-made briefing format in .ppt, .xls, and .pdf

2. View the information on their ATAK device before, during, and after missions, and ability to operate both with and without server connectivity.
3. Select a geographic area to view information when users don't have connectivity.
4. All information will be able to be entered without connectivity, and selected to either manually or auto-update to TAK server(s) once the user has connectivity in a secure location with enough bandwidth.
5. All entries can be saved in draft form and completed at a later date/time.
6. Toggle on or off auto-updating report draft and complete entries across meshed TAK devices when operating with or without server connectivity.
    a. To minimize battery consumption, the auto-update function will allow for a user-selected variety of latency (i.e., every 10s, 1min, 5min, 10min). Devices will prevent duplication of inputs when automatically or manually updated to the TAK server
7. The app will integrate information from LiveUA Maps (https://liveuamap.com/), (https://liveuamap.com/about) for supported OCONUS geographic areas, and clearly identify it as LiveUA Maps information.
8. A LiveUA Maps layer shall be developed specifically for training purposes. This layer shall enable end users to create and add LiveUA exercise injects in real time during training events when using the CKI-TAK app. It shall include the geographic territory of all FVEY partners, the continent of Europe, and other well-established geographic areas used by FVEY countries for regular training events.
9. The app shall incorporate ArcGIS data and geotagged reports from the Civil Affairs Survey Assistant (CASA) as a layer that can be toggled on/off. Users shall be able to add additional information to the CASA-derived reports.
10. To minimize data requirements in tactical environments, information shall be able to be toggled down to icons and basic text, and toggled on/off

11. The application shall be able to operate on the SOCOM Remote Advise and Assist kit (USSOCOM's Program of Record remote advise and assist kit) at the appropriate levels
12. Inputs can be selected and exported into generic data sheets for transfer to a desktop or email account to enable rapid upload to COCOM-specific servers and databases, such as CIDNE, Palantir, and FADE/MIST. The exportable formats will be consistent with existing data entry fields used in primary data repositories for each COCOM. Users can select which platform they want to export to from a menu, and have the exported input formatted for that database. Users shall be able to perform this operation in reverse by exporting reports from the databases in their generic data sheet format, and upload to CKI-TAK with correct TAK formatting.
13. Multiple inputs shall be able to be exported as a batch in the selected COCOM database format. This may be selected by mission, geographic area, time, or manually selected, and be toggled between automatic or manual export based on bandwidth/connectivity.
14. This application shall be available on lower-tier TAK versions with the same functionality, but without viewing any higher-tier (USMIL/USG, FVEY) entries unless shared.
15. USMIL/USG/FVEY users may select entries to be transferred down to the lower-tier TAK versions to share with partners. They shall be able to select specific data fields for redaction, and set a time/date limit on the entries viewing. Lower-tier entries may add information to the shared entries, but not change or delete higher-tier entries.
16. All lower-tier CKI-TAK entries will one-way transfer information up to the U.S. MIL/USG/FVEY version. This allows consolidation in one interface of all entries by partner or enabled forces, and IA implementing partners. Lower-tier entries shall be clearly indicated as such when viewed on the higher-tier version
17. Lower-tier versions available to partner forces will allow users to select the language displayed and input language. This shall include French, Spanish, Indonesian, Thai, Tagalog, Korean, Chinese Mandarin, Russian, Dari, Farsi, and Arabic. When displayed on the higher-tier versions viewable by US/FVEY users, the entries can be toggled between translation to English, or in their original input language
18. All entries shall list the DTG and unit that generated the report. Past reports will be able to be updated with additional information, with the DTG and unit listed for the new information. Updates/changes to reports will add to the original entry, maintaining a log to allow users to see any changes over time.
19. CKI-TAK shall be able to run on Android, Windows and iOS. Users are able to manage visible layers for enhanced COP and SA
20. Provide seamless communication between iOS, Android and Windows platforms via WLAN and designated TAK server access
21. 24 Android phones or iPhones shall be provided to support OT&E. This supports two (2) CA Companies (2x devices per team, 2x for HQ) allowing for one (1x) CA CO to employ it forward, and one (1x) CA CO to conduct OT&E in garrison.
22. The following Government Furnished Information (GFI) shall be provided to support the project:
    a. DoD: CA report formats
    b. DoS: implementing partners report formats
    c. USAID: implementing partners report formats
    d. TSOCs: Program of Record data repository formats:

i. Existing report entry formats compatible for import/export to each data repository

R4605 Civil Affairs in Irregular Warfare and Governance Support Courses

Develop two (2) programs of instruction (POIs) and supporting materials that shall draw upon, but are not limited to, existing courses and publications from U.S. Army Special Operations Command (USASOC), U.S. Army John F. Kennedy Special Warfare Center and School (USAJFKSWCS), Joint Special Operations University (JSOU), the Modern Warfare Institute at West Point and its podcasts, interagency courses, and open sources. This requirement seeks to advance these existing research efforts and amalgamate relevant publications from them into standardized, replicable, and broadly available POIs. The two (2) POIs shall be developed concurrently but delivered as two distinct deliverables: the Civil Affairs (CA) in IW Course, and the Governance Support Course.

Specific POI Requirements

1. The CA in IW POI shall consist of modules in the topic areas of Resiliency and Human Security; Irregular Warfare; Resistance Activities; Civil Network Development and Engagement; and Civil Reconnaissance. The course shall be a minimum of three weeks to maximum of ten (10) weeks.
2. The Governance Support POI shall consist of modules in the topic areas of Advising Governance Formation; Integrating Capabilities and Resources; and Advising Commanders on Governance Efforts. The course shall be a minimum of three (3) weeks to maximum of six (6) weeks.
3. A discovery period shall be conducted to identify existing doctrine, methods, and POI from military, government, academia, and other sources that can address the identified gaps. The end user shall provide a comprehensive list of publicly available resources to expedite the discovery period.
4. The government shall provide Government Furnished Information (GFI) from the USAJFKSWCS and JSOU in the form of existing POIs and course materials from select military courses, as well as non-publicly available military references.
5. The POI and course shall be developed for classroom and distance learning. Both unclassified and classified material shall be included, up to SECRET//NOFORN. To facilitate the distance learning modules, classified material shall be separate and distinct from the primary unclassified modules to enable maximal training using unclassified systems.
6. The offeror shall deliver the POI and conduct one (1) pilot course for each course at the end user's location. After the pilot courses are revised, a total of 3-4 iterations shall be conducted for each course.
    a. 1-2x courses shall be the complete POI, with future end user instructors present.
        i. Approximately 40-80 students will be present for each iteration of the CA in IW Course
        ii. Approximately 10-15 students will be present for each iteration of the Governance Support Course
    b. 1x course shall be team-taught by the end user instructors-in-training, and the offeror.
        i. Approximately 8-12 instructors-in-training will be provided for the CA in IW Course

ii. Approximately 4-6 instructors-in-training will be provided for the Governance Support Course

c. The final shall be led entirely by the end user instructors, with SME support on hand.

7. The digital distance learning for each POI will be formatted as stand-alone modules, and consist of the same training material as the in-person course.
8. The distance learning modules shall be capable of being hosted on various servers in a manner that enables accessibility from DoD and interagency networks both CONUS and OCONUS. The digital distance learning will be formatted in a manner that enables delivery to OCONUS locations with sub-optimal telecommunications infrastructure with low bandwidth.
9. The offeror shall develop educational materials to complement the CA in IW course. This includes but is not limited to handbooks or other materials developed by resistance movements that describe Tactics, Techniques, and Procedures (TTPs) used by undergrounds, auxiliaries, and public components. The offeror shall organize the collection of materials into logical sections to include nonviolent resistance and civil reconnaissance. These shall be provided in the target languages of French, Spanish, Indonesian, Thai, Tagalog, Korean, Chinese Mandarin, Russian, Dari, Farsi, and Modern Standard Arabic, where available from open sources.
10. Option: additional separate iterations of the CA in IW and Governance Support pilot courses, or team-taught courses as described above

CIVIL AFFAIRS IN IRREGULAR WARFARE COURSE

While each module will address the traditional underpinnings of the module title, primacy will be given to how the constructs, organization, analysis, methods, and training methodologies can be used to proactively shape the civil environment more favorable to U.S. interests in competition below the threshold of conflict, and to identify and analyze such activities by threat actors.

Introduction to Resiliency and Human Security

- Evolutionary Governance Theory (EGT), including EGT's main concepts, configuration of actors and institutions, configurations of power and knowledge, and select case studies
- Resiliency and Human Security: introduction to main concepts, analytical methods, and application to proactively shape or influence the civil environment in favor of U.S. interests across the continuum of competition and conflict. This shall include how the analytical methods can be applied to inform information and influence operations to identify, undermine, and exploit competitors and adversaries vulnerabilities and objectives
- The Joint Approach to Human Aspects of Military Operations (JC-HAMO), and applying its Operational Framework

Intro to Irregular Warfare for CA

- Introduction to IW and the IW Annex of the NDS to include IW activities, operations, planning, and execution including offensive IW and counter-IW across the interagency community
- Authorities, permissions, policies, and directives across the defense, diplomatic, development, and intelligence community related to the conduct of IW operations

- Baseline training in effective governance support, and support to civil society across all phases and methods of irregular warfare operations
- Specific actions and activities of SOF CA personnel during across IW. Special emphasis shall be given to Steady State and Preparation phases to support strategic-level decision making, contingencies, and planning that occurs throughout later phases of operations
- How Great Power Competitors compete below the threshold of War. China (Unrestricted Warfare, 3 Warfares Strategy) and Russia (Gerasimov Doctrine)

Resistance Activities

- Authorities, permissions, policies, and directives across SOF related to resistance
- The conceptual typology of resistance: ideology, actors, causes/origin, environmental factors, domestic and international organizations, and activities
- "The Resistance Operating Concept", including resilience as a foundation for resistance; interagency planning and preparation; and deterrence through resilience/national resistance
- Social movement theory: identity formation and social construction of reality
- Non-violent resistance to include: strategy, tactics, and methods; generating legitimacy
- Phases of contemporary resistance; underground, auxiliary, and public components; information technology in insurgencies and resistance; external actor influence; threshold of violence; transition from resistance to governance
- Human factor considerations of undergrounds and insurgencies to include underlying causes, undergrounds/resistance movements as organizations; motivations; and psychological operations
- Training and understanding of both violent and non-violent civil resistance and influence operations to include: state prevention and oppression of civil resistance, persuasion of adversary armed forces, forms and methods of external support, persuasion theory, and methods of non-violent resistance in the conduct of irregular warfare or statecraft

Civil Network Development and Engagement

- Authorities, permissions, policies, and directives across SOF related to network development and engagement, Civil Military Engagement, and Advanced Special Operations Techniques (ASOT)
- Overt, low visibility, and clandestine network analysis, design, and concept for undergrounds, auxiliaries, public components, and civil society organizations. This shall include but not be limited to the principles of network analysis; support networks such as logistics and finance, transportation, medical, communications, information, recruitment, governance, training and subversion; and operations, support, and influence networks
- How to analyze/assess the form, function, and logic of networks; the network development process
- How to manage relevant civil networks at echelon that can be leveraged to enable military operations
- How to plan, coordinate, synchronize, and support civil networks in a nodal system of civil administration and effective governance support through the Military Decision Making

Process that results in synchronized plans and orders that leverage civil component and civil affairs capabilities
- How to develop network member models, and spot and assess the model individuals and/or organizations in the conduct of civil reconnaissance and/or open source research

Civil Reconnaissance (CR)
- Authorities, permissions, policies, and directives for the conduct of Preparation of the Environment, open source research and use of publically available information, and digital reconnaissance
- Baseline training in virtual, physical and social science based civil knowledge reconnaissance fundamentals, planning, execution, and contingency planning; how CR can draw upon existing reconnaissance methods and scalable, rigorous and tested social science field methods to identify sources of instability affecting civil security and drivers of instability in support of military and interagency intelligence, diplomatic, and development operations and activities
- Civil Affairs Operations, Activities, and Investments (OAIs) conducted in support of, or directly for, Preparation of the Environment (PE) purposes; planning and execution of Operational Preparation of the Environment (OPE) to develop knowledge of the operational environment, establish human, cognitive and physical infrastructure to support decision makers understanding of the civil component
- How specified, targeted civil reconnaissance reporting supports future or ongoing overt, low visibility, or clandestine development of underground, auxiliary, or public component networks, or overt civil society organizations, necessary for irregular warfare operations

GOVERNANCE SUPPORT COURSE

Advising Governance Formation

The learning outcome objectives include: independently explain the factors needed for a governance entity to be considered legitimate and credible; analyze and compare governance functions and assess the functions that are needed for legitimacy; analyze existing governance functions and characterize shortfalls; analyze an existing governance structure and recommend factors to sustain or improve; and describe the historical and legal factors that limit NGO or partner nations from committing support.
- Introduction to governance vs governments, with regional examples
- Understanding principles of effective governance, including regional/geographic examples of governance based on historical case studies and best practices
- Common factors needed for a governance entity to be considered legitimate and credible
- Developing governance execution priorities for functions such as revenue, services, dispute resolution, and feedback mechanisms
- Principles of adapting governance advising and assisting to local population characteristics to analyze existing governance functions and characterize shortfalls
- Understanding research methods such as statistical analysis, anthropology, and geographic models and applying those methods towards governance implementation, to include resources in austere, developing, and developed environments.

- Case studies and exercises will be developed in collaboration with the government end user

Integrating Capabilities and Resources

The learning outcome objectives include: the ability to summarize relevant government agencies and their application in support of foreign governance; develop tailored engagement strategies to leverage available NGO support; construct logistics plans using local tools and consider options for outside support from aid or U.S. government organizations.

- U.S. government agencies and their application in support of foreign governance
- Review and provide overview of all relevant DoD directives / Law / Inter Agency Roles and responsibilities for Governance
- The Joint Concept for Integrated Campaigning (JCIC) and its process
- Understand logistics principles that extend across cultures, to include resources and mechanisms needed to move goods.
- Developing mechanisms that will prohibit and/or encourage involvement of western nations, NGOs, and aid organizations to support sponsored governances. This shall include historical tripwires that have limited NGO or partner nation involvement, and historical and legal factors that limit NGO or partner nations from committing support.
- Case studies and exercises will be developed in collaboration with the government end user

Advising Commanders on Governance Efforts

The learning outcome objectives include: the ability to produce a written governance plan based on a current political structure and the desired U.S. end state; describe how a government maintains its legitimacy independent of U.S. support; and compose a governance support plan that complements the military objectives. Students will be able to clearly and concisely convey their intent and convince military leaders to integrate their plan in the overall campaign.

- Methods for informing and advising commanders on governance initiatives (Executive Communication).
- Cable writing to link local (tactical level) resourcing to the national level as well as to establish legitimacy with the Interagency
- Assisting commanders in establishing balance between military and governance objectives, including adaptation of governance operations to integrate with the military end state, and the requirements for a political end state for a mechanism of stability
- Developing a governance support plan, to include continual tools and assessments a governance entity needs to continue legitimacy in the eyes of the population independent of U.S. support
- Case studies and exercises will be developed in collaboration with the government end user

R000-I2C-FY22 Unspecified Requirement – Enabling Indirect Influence and Competition

The Irregular Warfare Technical Support Directorate (IWTSD) seeks proposals for the research and demonstration of technically and operationally viable capabilities, methodologies and approaches to more effectively compete and achieve influence advantage across the informational, physical and cognitive arenas. Global adversaries of the United States and its partner nations employ a variety of tactics and strategies to wield power and exert influence over

target populations throughout the international arena. These activities may threaten the interests of the United States and its strategic advantage, requiring innovation to more effectively and efficiently shape and prevail in the competitive landscape.

Proposals shall include solutions that:

1) Develop, test and deploy new tools, capabilities and concepts for understanding target motivation, morale and behavioral effects in order to deliver precise and rapid influence at scale to relevant populations in the informational and physical domains
2) Apply AI/ML technologies to expedite analysis and/or execution of influence, information, or military deception operations
3) Proactive measures to undermine Great Power competitors' mis- and dis-information, deception and other (e.g., financial) coercion activities
4) Bolster the proactive mindset shift required to succeed through unified action in Irregular Warfare missions in order to compete more effectively against all adversaries in IW

These projects shall advance high-technology readiness level (> TRL 6) prototypes, demonstrate new concepts and solutions that reduce risk to the U.S. and partner forces while eroding adversary motivation and influence and disrupting their sanctuaries, organizations, and enterprises. A Firm Fixed Price proposal with a twelve (12) to (18) month base contract period of performance is preferred.

Unspecified requirements (R000s) are for proposing unique innovations that have not yet been identified by IWTSD. Submissions against an unspecified requirement shall be responsive to the topics noted in the requirement. Proposed technologies from the unspecified requirements will be competing against proposed technologies for identified and prioritized interagency requirements. Because IWTSD does not budget for unspecified requirements, awards may not be made against the unspecified requirements.

Note: Quad charts submitted in response to a Subgroup's R000 may be shared with other IWTSD Subgroups if the submission demonstrates relevance to more than one focus area.

5.8. Protection, Survivability, and Recovery (PSR)

R4595 Ceramic-faced Ballistic Plate Female Fit Body Armor

Female U.S. Department of Defense service members and female federal law enforcement officers require body armor that fits and provides RF III ballistic resistance to prevent injuries. Currently, no ceramic-faced ballistic plates properly fit female service members. Previous attempts to create tailored contoured plates have focused on additive manufacturing (3D printing) techniques that do not scale well. These technologies do not achieve full ceramic densification needed to optimize performance at comparable areal densities.

This requirement is seeking to develop a standard, ceramic-faced ballistic plate for use in female body armor. The prototype stand-alone plate system must use hot isostatic pressing for the plate design combined with a composite backing material. The plate system's performance will be subject to NIJ RF III standards. Offeror shall deliver eight (8) prototypes of female fit body

armor for operational test and evaluation.

R4596 Special Operations Forces Casualty Tracking and Monitoring System
During combat operations, Special Operations Forces (SOF) medical personnel are often called upon to perform damage control resuscitation and surgery in remote, austere, confined spaces, and on dynamic platforms. This medical care begins on the objective during combat operations and continues to the casualty collection point. Triage is a major determining factor of success where resources are limited. The prioritization of care evolves with reassessments of patients to save as many lives as possible. There is a need for improved automated tools to assist with patient tracking, monitoring vital signs, and maintaining records/record hand-off in a combat or mass casualty situation. Casualties are usually tracked and managed by medical personnel using pen and paper. This requirement is seeking to develop an unobtrusive, continuous, wireless patient monitoring device for use in resuscitation, critical care transport, prolonged care, mass casualty events, and evacuation through the continuum of care.

The SOF Casualty Tracking and Monitoring System shall baseline and track multiple elements of information (ex: body temperature, pulse rate, respiration, blood pressure, blood oxygen level) for six (6) or more casualties, and wirelessly provide continuous updates and trends for triage decisions. The system shall provide the option to input unstructured data, a secured means of transferring information between devices, be compatible with iOS and Android platforms, and integrate with current ATAK and BATDOK platforms. The user interface must be intuitive and not increase the cognitive load of the user. The devices must be ruggedized IP67 (Threshold (T)), IP68 (Objective (O)) for military use and meet military “safe to fly” requirements (MIL-STD-461 and 462). It must be lightweight - preferably less than 90 grams, unobtrusive, Night Vision Goggle (NVG) compatible, cyber-secure (AES-256 bit encrypted), and compatible with military uniform and equipment. The battery life shall meet a minimum of 120 hours of full continuous operation time. The battery must allow for uninterrupted operation and “hot-swap” of power source with no loss of data during battery replacement. The device and components shall be able to be secured in easily accessible anatomic locations (e.g., hand, wrist, forearm, arm, shoulder, foot, ankle, lower leg, thigh, hip, buttock, back, chest, neck, and head). Offeror shall deliver ten (10) SOF Casualty Tracking Monitoring Systems for operational test and evaluation.

R4597 Special Operations Forces Portable Sterilizer
There are many instances where Special Operations Forces **(**SOF) medical personnel are deployed far forward of traditional field hospitals and are without electrical power and typical support mechanisms. Currently, SOF medical personnel must carry all sterilized equipment they anticipate using in combat support operations. If the equipment is used, it must be re-sterilized. SOF medical personnel do not have the capability to sterilize equipment when deployed forward to austere environments. They rely on a “cold sterilization” technique that requires special fluids and reagents that can take up to 24 hours. The Special Operations Forces Portable Sterilizer shall:

- Be ruggedized for military use;
- Weigh less than 45 pounds;
- Have dimensions < 30 inches × 18 inches × 20 inches
- Fit within a 1660 Pelican Case;

- Sustain steam at 128 °C at two (2) atmospheres for at least 30 minutes (the minimum time required to sterilize a general surgical set);
- Include an option to use sustainable or novel power source (e.g., solar).

Offeror shall deliver six (6) Special Operations Forces Portable Sterilizers for operational test and evaluation.

R4599 Ballistic Helmet Testing Head Form

Soldiers and law enforcement officers need confidence in the protection afforded by ballistic-resistant helmets. This protection includes protection from penetration and blunt force trauma. Resistance to penetration (RTP) testing and backface deformation (BFD) testing of ballistic helmets in the U.S. is achieved with the helmet mounted on a clay-filled head form known as the "modified NIJ head form" or the "ATC head form". Since the late 2000s, the U.S. Army has developed another clay-filled head forms, but its use has been limited. All available head forms have significant limitations for assessing helmet performance. This effort shall develop a clay-filled head form to overcome the known limitations of existing head forms. These new head forms will enable RTP and backface deformation testing at any location on the helmet and for any size helmet. Research and testing will be required to link the performance of the new head form to historical data. The new or improved clay-filled head form (or suite of head forms) must:

- Be able to assess multiple sizes of helmets.
- Allow testing at any location on the helmet.
- Be applicable for any ballistic helmet design or style/cut.
- Be able to use temperature-conditioned Roma Plastilina #1 clay or Army Room Temperature Clay (ARTIC) (when available).
- Be able to have clay verified ready-for-use in the headform.
- Have recommended acceptance criteria (e.g., BFD validation depths).
- Have test data that links headform performance to historical modified NIJ headform performance.

Offeror shall deliver three (3) prototype Ballistic Testing Head Forms for Operation Test and Evaluation.

R4634 Advanced Transparent Armor for Non-Tactical Vehicles

The U.S. Department of Defense and U.S. VIP protective services currently field over 4,000 non-tactical armored vehicles around the world. These vehicles consist of non-standardized transparent armor varying widely in thickness and weight with a normal ballistic resistance rating of VPAM VR7 or VR9. The current service life of installed transparent armor is approximately two years, due to normal wear or delamination of the glass.

This requirement is seeking to develop and standardize the transparent armor across the fleet with a 30% reduction in weight and thickness while achieving a ballistic rating of VPAM VR9. The threshold thickness shall be 1.4 inches with an objective thickness of equal to or less than 1.25 inches. The threshold weight shall be 15 pounds per ft^2 with an objective weight equal to or less than 13.5 pounds per ft^2. The armor shall have improved delamination resistance with a threshold requirement of five years operational use. Armor will conform to ATPD 2352R and

have the ability to be fabricated with curvatures that can replicate the glass curvatures of civilian sedans, SUVs, and vans. This effort shall include third party ballistic, blast, and accelerated aging testing to demonstrate the Advanced Transparent Armor meets the above specifications. Following development of the Advanced Transparent Armor, the offeror shall deliver 5 prototypes for independent government test and evaluation. The prototypes shall be vehicle windshields fabricated for installation in a Toyota Land Cruiser 200 series or similar vehicles to be determined by the Government.

R4635 Non-pneumatic Limb Tourniquet Test Fixture

Active-shooter events and improvised explosive detonations are increasing within the U.S. Life-threatening blood loss from extremity wounds is a major concern in such events, and one of the most important tools in stopping is a non-pneumatic limb tourniquet. There are known incidents of tourniquets failing and reports of counterfeit tourniquets being sold. There is currently no standard by which to verify the performance of non-pneumatic limb tourniquets.

This requirement is seeking the development and validation of a standardized, low-cost test fixture and operating instructions to assess the performance and efficacy of non-pneumatic limb tourniquets. The test fixture must not leak any fluid medium that it may use to quantify the tourniquet performance. The test fixture must return to its original shape when the tourniquet is removed after the test. The text fixture must be capable of measuring occlusion pressures from 200 mmHg to 600 mmHg. All sensors and measuring devices used in the test fixture must be capable of calibration to ensure accurate test results. The test fixture must be capable of accepting and testing tourniquets covered in simulated blood or tourniquets at temperatures between -51 °C and 71 °C. The performance of the test fixture must be independent of the strap width of the tourniquets to be tested, providing accurate measurements regardless of strap width. The test fixture must be capable of testing two extreme sizes, simulating limb circumferences of 6.125 in to 27.75 in, respectively. Following the development of the Non-pneumatic Limb Tourniquet Test Fixture the offeror shall deliver three (3) complete, fully functional non-pneumatic tourniquet test fixtures.

R000-PSR-FY22 Unspecified Requirement

Significant technical progress has been made in the areas of R&D for ballistic protection materials and manufacturing techniques. Many times these advancements are unknown due to the specific nature of ballistic material acquisition. This unspecified requirement is meant to bridge the gap between end-user knowledge and vendor capability.

Develop novel solutions to enhance the survivability of personnel to include both military and civilian communities involved in Irregular Warfare. IWTSD is interested in any innovative technologies or capabilities that will enhance individual protection and survivability, which a vendor believes would be of interest to the Personnel Protection subgroup. Specific areas of interest for the PSR Subgroup are listed below but not limited too;

- New ballistic 3-D printing materials and or manufacturing techniques to improve ballistic and blast protection
- Reducing the aerial density of ballistic materials to optimize performance against the NIJ RFII and RFIII requirements
- Enhancing mechanical properties of materials for defensive applications

- Market Survey of performance levels and data collection on helmets that are available to law enforcement officers.

Unspecified requirements (R000s) are for proposing unique innovations that have not been identified by IWTSD. If IWTSD evaluators determine an unspecified requirement submission is sufficiently promising to merit pursuit, funds may be identified at that point based on the prioritized needs of the interagency. Because proposed solutions from the unspecified requirements will be competing against proposed solutions for identified and prioritized Department of Defense and interagency requirements, IWTSD may not award any of the unspecified requirements.

Note: Quad charts submitted in response to a Subgroup's R000 may be shared with other IWTSD Subgroups if the submission demonstrates relevance to more than one focus area.

5.9. Surveillance, Collection, and Operations Support (SCOS)

R4587 Vehicle Telematics Data Retrieval

U.S. Special Operations Forces (SOF) personnel and members of the Intelligence Community (IC) are seeking development of a small form factor USB stick-like capability to rapidly retrieve vehicle and user data from the vehicle infotainment system. All modern vehicles transfer data from a mobile device to the vehicle's internal storage. At this time, an operator must remove the storage modules, in a bench/lab environment, and connect the module(s) to unique equipment to retrieve user and vehicle data, which are both expensive and require extensive operator training. Proposed solution design shall improve retrieval time and ease of use for SOF operators without requiring technical knowledge of the vehicle or removal and disassembly of any vehicle components.

Proposed Specifications, threshold(s) and Key Performance Parameters:

1. Develop a USB stick like capability that will rapidly retrieve vehicle and user data held within vehicle storage modules with full and/or limited access to the vehicle infotainment system.
    1.1 Capability shall work on a wide variety of vehicle make, models and year(s).
    1.2 Proposed solution shall "do no harm" to the vehicles over all storage system(s).
    1.3 The proposed solution shall give the user a concrete sense that the vehicle storage data can neither be retrieved, or, if by some chance data is retrieved and the data cannot be reconstructed.
    1.4 Data does not need to be of forensic quality.
    1.5 Device shall not require technical expertise to employ.

2. Device shall be small form factor.
    2.1 Device shall be lightweight, weigh less than 1 kilogram.
    2.2 Device shall be small enough to fit into small carrying case or a military uniform pocket.
    2.3 Device shall use the USB (universal serial bus port) in the vehicle.
    2.4 Device shall have an ability to plug into both USB Type-A and USB Type-C ports.
    2.5 Device shall employ the USB 3.0 speed with backwards compatibility.

Key system attributes:

1. Device shall interface and be compatible with multiple vehicle Original Equipment Manufacturers.

2. Device shall not inhibit performance of interfaced equipment in any way, “do no harm.”

3. Device software and firmware shall allow use on multiple vehicles and allow storage of retrieved data sets.

A firm fixed price proposal is preferred, will accept cost plus proposals. Seeking a six (6) to eighteen (18) month base contract period of performance.

5.10. Tactical Offensive Support (TOS)

R4610 Multi-Role Field-Configurable Offensive small Unmanned Aerial System (sUAS) - (MRFCOS)

Tactical Operators require an affordable Multi-Role Field-Configurable Offensive small Unmanned Aerial System (sUAS) lethal precision strike system to engage near-peer/peer emerging threats in Irregular Warfare environments.

MRFCOS will provide the Small Tactical Team Operator an advanced modular kit capability to remotely detect, confirm and destroy a greater variety of targets using sUAS Vertical Take-Off and Landing (VTOL) multi-rotor platform and munitions technologies. Able to be hand launched from confined spaces, MRFCOS will search, identify, track and destroy elusive targets hiding behind cover, in defilade, surrounded by substantial vertical obstacles, and threats maneuvering in channelized areas that are found in complex urban terrain.

MRFCOS is primarily designed for re-use. Its multi-role methods of lethal attack include sUAS VTOL air delivery with accurate placement and remote detonation of munitions, accurate drop of munition with impact or height of burst detonation, accurately fired with impact detonation. However, as the situation on the ground dictates, it may also be command detonated, employing a directional munition while in flight. MRFCOS versatile methods of lethal attack will be rapidly selected and configured by the Tactical Operator in the field based on enemy targets encountered.

MRFCOS shall:

1. Be modular, with collapsible arms and wings, back packable with total weight less than thirty (30) pounds with battery (Threshold (T)); less than fifteen (15) pounds (Objective (O)). The platform air vehicle and lethal payload components, by design, can be separated for storage, transportation, and integration for training and operations.
2. Be transported by a maximum of two operators during a foot movement, hand launched and operated (T=O)
3. Be assembled and put into operation by two (2) trained personnel in three (3) minutes (T); two (2) minutes (O).
4. The operator shall have the ability in the field to separate and configure lethal payloads

from the air vehicle after returning from flight for reuse and repurposing (T=O)

5. Be compliant with American Security Drone Act (ASDA) and Department of Defense Instructions (DoDI) (T=O)
6. Fuze & Warhead must be of U.S.-origin and able to achieve U.S. Weapon Systems Safety Review Board approval (T=O); Vendor shall assist the Government with information and participation in obtaining Air Safety Release (ASR), Air Worthiness Release (AWR), Interim Flight Clearance (IFC) required for Government testing, training and employment in operations (T=O).
7. Have a total system (air vehicle, battery and lethal payload) endurance of 45 minutes (T); 75 minutes (O)
8. Have a dash speed of fifty (50) knots/fifty-seven (57) miles per hour (T); sixty-nine (69) knots/eighty (80) miles per hour (O)
9. Have a minimum range of ten (10) kilometers (T); twenty (20) kilometers (O)
10. Have the ability to launch from, fly through, and be recovered in complex urban terrain (T=O)
11. Have no component part longer than eighteen (18) inches in length (T=O)
12. Use rechargeable batteries and battery rechargers that are Commercial off-the-shelf (COTS) available that are Department of Defense (DoD) qualified and compliant (T=O)
13. Have Electro-Optical (EO) and Infrared (IR) sensors with the following performance:
    a. Has the ability to detect humans and vehicles in the open within a one (1) kilometer by one (1) kilometer area eighty percent of the time (T=O)
    b. Differentiate between unarmed and armed human target:
        i. Four-hundred (400) meters (T); six-hundred (600) meters (O) (Day)
        ii. Two-hundred (200) meters (T); three-hundred (300) meters (O) (Night)
    c. Differentiate between unarmed and armed mounted target:
        i. Eight-hundred (800) meters (T); fifteen-hundred (1500) meters (O) (Day)
        ii. Four-hundred (400) meters (T); seven-hundred fifty (750) meters (O) (Night)
    d. Has the ability to lock on and track man sized targets moving at (five) 5 mph (T); (twenty) 20 mph (O) in clear weather
    e. Has the ability to lock on and track moving vehicle targets at (fifty) 50 mph (T); (seventy) 70 mph (O) in clear weather
14. Communications, Command and Control (C2), Video and Data Link Radio
    a. Cyber Hardening (T=O)
    b. Mesh networked (T=O)
        i. Interoperable with currently fielded MANET radios
    c. Encryption:
        i. AES-256 (T); NSA Suite B (O)
    d. Frequency hop (T=O)
    e. Include Whip, Omni-directional and Directional collapsible antennas (T=O)
    f. Export video:
        i. To ATAK (T=O)
        ii. To separate End User Device (EUD) display (T=O)
        iii. To separate controller (T=O)
15. Provide Software Code Data Rights:

a. Pertaining to safety & vulnerability – Industry must provide to Government for safety review (T=O)
b. Submit rights assertion table for anything less than Unlimited Government Rights (T=O)

16. Include the following Global Positioning System (GPS) / Inertial Navigation System (INS) capabilities:
    a. Must operate in a GPS-denied environment (T=O)
    b. M-Code compliant (T=O)
    c. L1 & L2 band (T=O)
    d. SAASM (T=O)
    e. Inertial Measurement Unit (IMU) (T=O)
17. Have externally visible IR lights to assist pilot to determine flight aspect of platform (ingress, egress from pilot's position), for deconfliction (Identify Friend or Foe) and be able to be turned on/off as needed (T=O)
18. Be capable of remotely turning on/off an attachable/detachable external IR pointer that is DoD qualified to mark targets (T=O)
19. Include Ground Control Unit(s) with the following attributes:
    a. Two separate controllers (T):
        i. Pilot - Platform control & EO/IR sensors
        ii. Payload Control Lethality – Arm, Fire, Disarm
    b. One combined controller – Flight control & Firing (O)
20. Include field configurable multi-role lethal modes of attack (T=O):
    a. Accurate Munition PLACEMENT with Remote detonation – reload & reuse platform
    b. Accurate Munition DROP – remote detonation with selectable fuze function - reload & reuse platform:
        i. Height of Burst Detonation
        ii. Impact Detonation

    (Below applies to 14.a. and 14.b. above):

        1. Anti-personnel – 360 degrees personnel in the open, personnel in confined space
            a. Neutralization of Personnel in the open (Pk is probability of incapacitation): Single shot Pk of eighty percent (0.8) given three (3) personnel located in a circle thirty (30) feet (ft.) in diameter (T); Single shot Pk of one-hundred percent (1.0) given three (3) personnel located in a circle thirty(30) feet in diameter (O)
            b. Neutralization of Personnel in a confined space (Pk is probability of incapacitation): Single shot Pk of eighty percent (0.8) given three (3) personnel located in a confined space with dimensions twenty (20) ft × twenty (20) ft (T); Single shot Pk of one-hundred percent (1.0) given three (3) personnel located in a confined space with dimensions twenty (20) ft × twenty (20) ft (O)
        2. Anti-vehicular – soft-skinned vehicle (stationary and moving): Neutralization of Personnel in a soft-skinned vehicle (Pk is

probability of incapacitation: Single shot Pk of seventy percent (0.7) for two (2) personnel sitting in the front seat of a light-skinned vehicle (T); Single shot Pk of one-hundred percent (1.0) for two (2) personnel sitting in the front seat of a light-skinned vehicle (O)

c. Accurately Fire a Munition (for example; projectile, shotgun shell, rocket) - reload & reuse platform:
    i. Required accuracy for projectile one (1) ft Circular Error Probable (CEP) at a range of ten (10) meters (T); twenty (20) meters (O)
    ii. Required accuracy for shotgun shell three (3) ft CEP at a range of fifteen (15) meters; thirty (30) meters (O)
    iii. Required accuracy for unguided rocket one (1) ft CEP at a range of twenty (20) meters (T); one-hundred (100) meters (O)
d. Anti-Material
    i. The MRFCOS shall deliver warhead lethal effects to provide anti-material capabilities to disable targets to include, but not limited to, fluid tanks, radar domes, power and communication station critical components, and other structures (T=O)

21. Include a lethal payload, consisting of a Fuze Safe and Arm Device, dual detonation assembly, and warhead designed and constructed IAW DoD Weapon System Safety requirements compliant with Insensitive Munition military specifications (T=O)
22. Have an Electronic Fuze Safe & Arm Device (ESAD) that is MIL-STD-1316F compliant and include proximity, impact and command modes of detonation. The use of Micro Electro Mechanical Systems (MEMS) sensors and components is acceptable. The ESAD must include all sensors required for safe and effective operation. This includes proximity sensors enabling remote detonation at a stand-off distance. The ESAD must be capable of being returned to a SAFE condition if the lethal payload is not deployed during flight. Positive indication of ESAD state is required (T=O)
23. Have detonation components constructed using DoD qualified energetics (T=O)
24. Have a warhead consisting of a DoD qualified Insensitive Munitions fill, that maximizes target neutralization, which can be attached, safely removed, reattached to the VTOL as required throughout the duration of extended operations (T=O)
25. Have the ability to mark targets with an approved-for-use qualified IR pointer via external quick attachable/detachable module (T=O)
26. Ability to arm and disarm munition for return/reuse
    a. Externally visible indicator of arming status for pilot (e.g. green or red light, IR steady/flashing) (T=O)
        i. Mechanical stud showing red or green (T=O)
    b. Ditching – programmable offset (return to pre-designated ditch site) (T=O)
27. Signature Reduction
    a. Not visible by the unaided eye at four-hundred (400) meters (T); two-hundred (200) meters (O) (Day)
    b. Not detectable by thermal imaging devices at six-hundred (600) meters (T); three-hundred (300) meters (O)
    c. Not audible by the unaided human ear two-hundred (200) meters from target (T); one-hundred (100) meters (O)

28. Be able to operate within the following environmental conditions:
    a. Wind: thirty (30) mph (T), forty 40 mph (O)
    b. Temperature: -20 degrees Celsius (C) to 60 degrees C (T=O)
    c. Precipitation: 1/8 inch rainfall per hour (T=O)
    d. Altitude: From sea level through 12,000 ft above mean sea level (MSL)
29. Have the following durability:
    a. Ingress Protection of IP66 (T); IP67 (O)
    b. Induced Environments – The MRFCOS must be able to safety operate after exposure to all induced environments encountered during its life cycle:
        i. Vibration – common carrier, loose cargo, captive carry (platforms including UH-60, CH-47, CV-22, C-130) (T=O)
        ii. Mechanical Shock – 4 ft drop (T); 40 ft drop (safe to dispose of) (O)
        iii. Electromagnetic Environments – HERO/EMI/ESD (T=O)
    c. Modular Transport and Storage Hardened Tactical Carrying Cases (T=O)
30. Include in each kit the following:
    a. One complete (1) Ground Control Station (GCS)
    b. One (1) Tablet Computer and charger, programmed for use
    c. One (1) Tablet Hand Adapter (joystick)
    d. Two (2) Complete Airframes – all accessories as specified above
    e. Two (2) EO, IR and IR Pointer Payloads
    f. Four (4) Air Vehicle Rechargeable Batteries
    g. Two (2) Full Flight Battery Recharger Assemblies that can charge two (2) Air Vehicles and GCS simultaneously, multi-voltage compatible
    h. Two complete Lethality Packages (Placement, Drop, Fired Munition and Anti-Material)
    i. Cables and Programming Cable
    j. Container Transport Unit for shipping and storage
    k. Tactical Carrying Cases
    l. Spares kit – propeller assemblies, motors, arms/wings, landing gear, charge leads
    m. New Equipment and Video Simulation Training

Deliverables:

Base Contract:

Deliver eighteen (18) MRFCOS prototype kits for CONUS Safety Testing, New Equipment Training (NET) and Operational Test and Evaluation (OT&E)

Contract Options:

Deliver fifty (50) MRFCOS prototype kits for CONUS NET and OCONUS Combat Evaluations (CVs)

A Firm Fixed Price proposal is preferred; base contract will be executed in twenty-four (24) months period of performance (T); eighteen (18) months (O).

Responses to this requirement should include a proposed post-development end-unit ROM cost.

R4612 .338 Norma Magnum Signature-on-Target (SoT) Round

Crew-Served machine gunners require the ability to see the impact of their rounds fired day and night out to 2,500 meters to enable rapid adjustment of fires to the desired point of impact

without exposing their location. The development of a .338 Norma Magnum (.338NM) Lightweight Medium Machine Gun (LWMMG) Signature-on-Target (SoT) round will provide machine gun operators with this advanced capability increasing Small Tactical Team Lethality. .338 SoT Round shall:

1. Match the trajectory of .338NM General Purpose (GP) Round (i.e., SoT round impacts within beaten zone/cone of fire of other .338NM GP rounds).
2. Have a minimum mean muzzle velocity, from a 24-inch Barrel with brass cartridges conditioned at 70 °F ± 5 °F of 2,600 fps (T), 2700 fps (O). The standard deviation of the muzzle velocity at 70° ± 5° F shall not exceed 25 fps (T), 10 fps (O). Have a cartridge overall length of 3.600" ± .007" (T=O); projectile weight of 272gr (T=O); propellant SMP®OBP 718, 94.5gr (T=O) and conformal pressure at 70 °F ± 5 °F of ~54,000psi (T=O).
3. Be visible to the unaided eye out to 900 meters day, 1,500 meters night (T); 2,500 meters (O).
4. Be visible to the Night Vision aided eye out to 900 meters (T); 2,500 meters (O).
5. Be visible with Visual Augmentation Systems (VAS) - (daylight with ELCAN 6x Machine Gun Optic) 1,500 meters (T); 2,500 meters (O).
6. Provide Hard Target (e.g., vehicle, building) signature initiation of 90% (T); 100% (O).
7. Provide Soft Target (e.g., sand, dirt) signature initiation of 50% (T); 90% (O).
8. Have overall cartridge length not to exceed 338NM GP round (T=O).
9. Have no visual or NIR signature from muzzle exit until it strikes a target surface (no signature in flight) (T=O).
10. Be able to be fired from an open bolt, belt fed weapon system without inducing malfunctions (Weapon Compatibility) (T=O).

Deliverables:

- Base Contract: Phase 1: Deliver six thousand (6,000) .338NM Signature-on-Target (SoT) rounds for CONUS safety and operational testing and evaluation (OT&E).
- Contract Options:
- Phase 2: Deliver up to sixty thousand (60,000) additional .338NM Signature-on-Target (SoT) rounds (in groups of ten thousand (10,000) rounds) for CONUS safety certification, OT&E, and Combat Operational Evaluations (OPEVALs).
- Phase 3: Deliver up to ten (10) .338 NM LWMMG weapon system prototypes in groups of two (2) each.

A Firm Fixed Price proposal is preferred; ***base contract will be executed in eighteen (18) months period of performance (T); twelve (12) months (O).***

Responses to this requirement should include a proposed post-development end-unit ROM cost for weapons and SoT ammunition (per round).

R000-TOS-FY22 Unspecified Requirement

The Tactical Offensive Support (TOS) Subgroup develops, trains, and delivers advanced capability solutions in a rapid RDT&E cycle that can be used in the field by Small Tactical Teams conducting operations across the full spectrum of Irregular Warfare activities.

TOS invites industry to submit Artificial Intelligence (AI), Machine Learning (ML), and/or Computer Vision (CV) mature (TRL 7 or higher) innovative technologies that can be integrated and rapidly developed and delivered in twelve (12) to eighteen (18) months to substantially advance capabilities in the following TOS focus areas:

- Tactical Team Offensive Systems - Develop advanced equipment, capabilities, methods and techniques that increase the lethality and kinetic effectiveness of small tactical units engaged in direct action operations. Provide specialized weapons, munitions, detonators, distraction/diversion devices and other unique tactical offensive equipment.
- Tactical Team Communications - Develop advanced, flexible, full-spectrum communications capabilities specifically designed for tactical forces, with emphasis on reducing operational load while improving operator mobility and efficiency. Deliver assured low-visibility tactical communications connectivity in challenging geographic environments such as complex urban and maritime contested environments. Provide low probability of exploitation, cyber hardened encryption, compressed communications for command and control (C2) of small tactical team unmanned assets to defeat peer and near-peer emerging threats.
- Tactical Team Reconnaissance, Surveillance, and Target Acquisition Systems - Develop next generation organic capabilities for small tactical team operators conducting dismounted and mounted reconnaissance, surveillance, and target acquisition missions. Provide enhanced visual augmentation and imaging systems that improve tactical operator's perception and surgical strike targeting to minimize collateral damage in all conditions and environments.
- Specialized Tactical Team Infiltration, Access, and Exfiltration Systems - Develop advanced technologies to enhance tactical assault forces rapid insertion, access, and egress to and from objectives. Improve organic target analysis and evaluation of tactical options that support efficiency and stealth, reducing time on target, including remote operations. Provide enhanced means for small tactical team distraction and deception, biometrics defeat, improved methods of entry, next generation manual and dynamic breaching, and sabotage capabilities for small tactical assault teams.

Firm Fixed Price proposals are preferred with ***base contract executed in eighteen (18) months period of performance (T); twelve (12) months (O).***

Responses to this requirement should include a proposed post-development end-unit ROM cost for follow on deliverables.

Unspecified requirements (R000s) are for proposing unique innovations that have not been identified by IWTSD. If IWTSD evaluators determine an unspecified requirement submission is sufficiently promising to merit pursuit, funds may be identified at that point based on the prioritized needs of the interagency. Because proposed solutions from the unspecified requirements will be competing against proposed solutions for identified and prioritized Department of Defense and interagency requirements, IWTSD may not award any of the unspecified requirements.

Note: Quad charts submitted in response to a Subgroup's R000 may be shared with other IWTSD Subgroups if the submission demonstrates relevance to more than one focus area.