

**COMBATING TERRORISM TECHNICAL SUPPORT OFFICE/  
Technical Support Working Group  
(CTTSO/TSWG)**

**BROAD AGENCY ANNOUNCEMENT (BAA)  
17-S-4710**

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**Due Date for Receipt of Phase 1 Quad Charts:**

**No Later Than February 2, 2017  
All submissions are due by 1500; 3:00 p.m.  
Eastern Time (ET) on the above date**

- AAC – Advanced Analytic Capabilities**
- CBRNE – Chemical, Biological, Radiological, Nuclear, and Explosives**
- IDD/EC – Improvised Device Defeat/Explosives Countermeasures**
- IFS – Investigative and Forensic Science**
- IW/ET – Irregular Warfare and Evolving Threats**
- PP – Personnel Protection**
- PS – Physical Security**
- SCOS – Surveillance, Collection, and Operations Support**
- TOS – Tactical Operations Support**
- TTD – Training Technology Development**

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**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.**

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## 1. INTRODUCTION.

This is a Combating Terrorism Technical Support Office (CTTSO) 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) 2018. Funds may not be available for all requirements under this BAA. No contract awards will be made until appropriated funds are available from which payment for contract purposes can be made.**

### 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.
- 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. HBCU, MI, and 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. A goal of 2.5 percent of total dollars awarded will be considered for HBCU and/or MI, and a goal of 2.5 percent of total dollars awarded will be considered for small businesses for a total goal of 5 percent. The final determination will be made based on the individual technical merits of the proposal and budget constraints within the mission priorities. To ensure full consideration in these programs, registration in the BAA Information Delivery System (BIDS), <https://bids.cttso.gov/>, described later in this document, requires the appropriate business type selection as well as accurate up-to-date information.

### 1.3. Limitation of Funds.

The Government intends to incrementally fund Cost Reimbursable contracts awarded from this BAA as provided by FAR 52.232-22, “Limitation of Funds.” Most contracts awarded are

anticipated to be 6 to 24 months in duration. 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 III 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 the [BIDS Homepage](#) under BAA Information. Registration is not required to download the BAA package; however, a 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 Questions feature, accessible from the BIDS Homepage via [Online Help](#), or emailed to [BIDSHelp@cttso.gov](mailto:BIDSHelp@cttso.gov). No other office personnel will acknowledge, forward, or respond to any inquiries received in any manner concerning the BAA. Contractual questions and answers will be posted periodically under BAA Questions. All questions must be received at least 72 hours prior to close of the submission.

**1.7. BIDS Website Help Requests.**

For technical help using BIDS, submit questions to the BIDS administrators at [BIDSHelp@cttso.gov](mailto:BIDSHelp@cttso.gov) or by using the [Request Help](#) link located on the BIDS Homepage. Include a valid email address, your BIDS User Name, and a detailed description of the question or concern in the comments block. The BIDS Homepage provides other valuable resources under Useful Links, such as [Prerequisites for Working with the Government](#), and [Online Help](#). Reference documents including the *BIDS Submitter QuickCard* and *Quad Chart Sample* are available for download under [Reference Materials](#). Information regarding compliance requirements for using humans and animals in testing is also available under [Reference Materials](#).

**1.8. BIDS Frequently Asked Questions (FAQs).**

FAQs are a list of questions and associated responses for general and specific topics. Offerors are encouraged to periodically review BAA Questions, accessible from the BIDS Homepage via Online Help.

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

**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 at <https://www.sam.gov/portal/public/SAM/>.

These and other helpful links are provided under Prerequisites for Working with the Government located on the BIDS Homepage under Useful Links.

**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. Reserved.****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.

| <b>Table 1. Contract Clauses</b> |  |
|----------------------------------|--|
| <b>DFARS</b>                     | <b>Title</b>   |
| 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 Legends |
| 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) 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.

#### **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 Directive (DoDD) 3216.1, 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 CTTSO 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 CTTSO 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 CTTSO 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.

### 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. Existing BIDS accounts are acceptable for a new BAA *if the company contact information is the same* or is corrected. Registrations should reflect the offeror's contracting or business authority. The User Name, created by the offeror, must be unique and is used for BIDS login 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 User Name 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 login. The “Forgot Password?” link on the BIDS Homepage allows registered users with a valid email address to automatically reset a password. The system will verify the account User Name and email to 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](mailto:BIDSHelp@cttso.gov) or submitted via the [Request Help](#) link located on the [BIDS Homepage](#).

**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 or Mission Area, the requirement number, the user name, and a Submitter Internal Tracking (SIT) 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

| <b>CB-1112-ABCCORP-10703JT-QC</b> |   |
|-----------------------------------|---|
| <b>From Sample</b>                | <b>Document Identifier Component</b>  |
| <u>CB</u>                         | subgroup or mission area designation - from BAA   |
| <u>1112</u>                       | requirement number - from BAA   |
| <u>ABCCORP</u>                    | user name - from BIDS registration  |
| 10703JT-QC                        | SIT number - any alphanumeric combination (with no special characters or spaces) created by the submitter for ( <i>submitter</i> ) tracking purposes along with the <b>document type suffix</b> |

**3.1.4.2. Creating Submitter Internal Tracking (SIT) Numbers.**

SIT numbers are unique identifiers created by submitters and entered in the submission record during the upload process. SIT 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 SIT numbers and will not allow the submission record to be saved if the SIT number has already been used. Table 3 provides sample SIT numbering formats for each document type.

Table 3. Sample SIT Numbers for an Accepted Submission

| <b>Document Type</b> | <b>Auto-generated by BIDS</b> | <b>SIT#</b> |
|----------------------|-------------------------------|-------------|
| Quad Charts          | CB-1112-ABCORP                | 10703JT-QC  |
| White Papers         | CB-1112-ABCORP                | 10703JT-WP  |
| Full Proposals       | 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 SIT number formats for multiple submissions to the same requirement.

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

| Submission #  | Auto-generated by BIDS | SIT# Sample 1 | SIT# 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 if applicable. In BIDS, open the submission record, click **Edit Proposal**, and update the record information. Click on the trash can icon to delete the old file. Use **Browse** to select the revised document. Click **Submit Proposal** to save the changes. Documents cannot be edited online through the BIDS Web 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 requirement 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 comments section of the submission record 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: [BAASecurity@cttso.gov](mailto:BAASecurity@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 Quad Chart Submissions.**

Offerors shall prepare and upload a one-page (8 ½ by 11 inches) Quad Chart in response to Phase 1 of this BAA. Use font sizes of 10 point or greater. If more than one page is submitted, only the first page will be evaluated. Quad Charts 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 the "Special Handling Procedures for Classified Information" in this document 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 shall be submitted in Microsoft Office (Word or PowerPoint), or Adobe Acrobat (PDF – portable document format). ZIP files and other application formats are not acceptable. The document must be print-capable, without password, and no larger than 1024 KB. File names must contain the appropriate file name extension (.doc/.docx, .ppt/.pptx, or .pdf). File names cannot contain spaces or special characters. Apple/Macintosh 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.

#### **3.5.3. Quad Chart 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 at the BIDS website under Reference Materials.

##### **3.5.3.1. Header Information.**

Header information shall include the BAA Announcement 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. The offeror is only required to submit past performance information in response to a request for Full Proposal.

**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 bullet 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 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 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 that the contact information in the BIDS registration is used for all notices and contact purposes.)

**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 Quad Charts 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 Quad Charts are evaluated in accordance with Section 4, Proposal Evaluation, of this BAA. Unspecified requirements (R000s) are for proposing unique innovations that have not yet been identified by CTTSO. Submissions against an unspecified requirement should 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 CTTSO 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

CTTSO Subgroups if the submission demonstrates relevance to more than one focus area.

### **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 by phone concerning the status of Quad Charts will not be accepted. After login to the BIDS website, submitters are able to check the status of their submission(s) under **Check My Current 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. All submission pages shall be 8 ½ by 11 inches, double-spaced with fonts 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. All White Paper submissions must include a cover page. The cover page template is provided at the BIDS website under Reference Materials. The cover page is excluded from the White Paper page count.

#### **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 I 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 the “Special Handling Procedures for Classified Information” in this document 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.

#### **3.6.2. Electronic File Format.**

The White Paper shall be submitted in Microsoft Office (Word), or Adobe Acrobat (PDF– portable document format) format. ZIP files and other application formats are not acceptable. The document must be print-capable, without password, and no larger than 2048 KB. File names must contain the appropriate file name extension (.doc/.docx or .pdf). File names cannot contain spaces or special characters. Apple/Macintosh 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.

#### **3.6.3. Phase 2 Document Upload.**

To upload a next phase document use the link back to BIDS provided in the acceptance email, or login to BIDS under **Proposals Due** to open the accepted record. Select **Create Next Submission** 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 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 (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. Cover pages are 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 if none, so state. For each phase include the exit criteria and all products and deliverables as defined in "Product and Deliverable Requirements" in section 2 of this document. If a phase is proposed as an option, so state.

#### **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 January 2<sup>nd</sup> 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 General Information, "Product and Deliverable Requirements" in this document) and other



costs (e.g., subcontracts, indirect rates, fee rate) for each phase/task. Costs allocated to other organizations (e.g., Government testing) shall be clearly shown; or if none, so state. Changes in cost greater than 10 percent 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 General Information, “Submission Handling/Rights in Technical Data and Computer Software/Patent Rights” in this document. For additional information on this topic, see the DoD Intellectual Property Guide, available for download on the Technology Transition Web page at [www.cttso.gov](http://www.cttso.gov) and DFARS 252.227-7013 and DFARS 252.227-7014.

##### **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 General Information, “Submission Handling/Rights in Technical Data and Computer Software/Patent Rights” in this document.

##### **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. If unlimited rights in technical data are proposed, so state. See section 2 General Information, “Submission Handling/Rights in Technical Data and Computer Software/Patent Rights” in this document.

#### **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 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.

**3.6.6. Phase 2 Status and Inquiries.**

Phase 2 is complete when all submissions have been accepted or rejected in accordance with this BAA. Inquiries by phone 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 **Check My Current Proposals**.

**3.7. Phase 3 Full Proposal Submissions.**

Offerors shall prepare and upload a Full Proposal, consisting of a Technical Proposal and a Cost Proposal, plus a cover page, in response to Phase 3 of this BAA. All pages shall be 8 ½ by 11 inches, double-spaced with fonts 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 due date and time. Offerors must create a placeholder record in BIDS with an unclassified cover page attachment. Refer to the "Special Handling Procedures for Classified Information" in this document 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 Full Proposal shall be submitted in Microsoft Office (Word), or Adobe Acrobat (PDF – portable document format). The cost proposal may be submitted in Microsoft Office (Excel) format. ZIP files and other application formats are not acceptable. The document must be print-capable, without password, and no larger than 2048 KB. File names must contain the appropriate file name extension (.doc/.docx, .xls/.xlsx, or .pdf). File names cannot contain spaces or special characters. Apple/Macintosh 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 in BIDS and select **Create Next Submission**.

**3.7.4. Full Proposal Components.**

Full Proposals shall consist of two major sections described in this document, and can be uploaded to BIDS in two separate files each limited to 2048 KB each. 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 to include all cost data as well as an explanation of changes in cost greater than 10 percent 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. Reserved.**

**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 POP 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 document “Product and Deliverable Requirements” for the minimum report 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 January 1<sup>st</sup>. 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 a CTTSO facility (either 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. If Government equipment, materials, facilities, or information are not required, so state.

**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 if none, so state.

**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 General Information, "Submission Handling/Rights in Technical Data and Computer Software/Patent Rights" in this document.

**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.**

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 accordance with BAA Section 3.7.6.1. Additional information regarding the Technology Transition Guidance can be found at the [CTTSO website](#).

NOTE – If the specific requirement will not reasonably result in a prototype (e.g., study, service requirement) so 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 if none, so state. 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 \$700,000 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. The DoD goal for awarding subcontracts to Small Disadvantaged Businesses is 5%.

**3.7.6. Cost Proposal.**

The offeror and each significant subcontractor, if any, shall prepare and submit cost or pricing data, and supporting attachments in accordance with Table 15-2 of FAR 15.408. All spreadsheet formulas will 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 as prescribed by FAR 15.406-2 for contracts exceeding \$750,000.

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

**3.7.6.1. Cost Summary Section.**

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 greater than 10 percent from those proposed in the previous submission. The Cost Summary may be submitted in Microsoft Office Word or PDF with Font no smaller than 10 point.

**3.7.6.1.1. 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.

Additional information/documents to be included in the Cost Summary:

- *Business/Cost Checklist.* The offeror shall complete and include a copy of the Business/Cost Checklist found at the BIDS website under Reference Materials. 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 at the BIDS website under Reference Materials.)
- *VETS 100.* The offeror will submit the most recent VETS 100 certificate.
- *Subcontracting Plan.* If the offeror is a large business or other applicable entity operating in the United States, the offeror shall submit a Small Business Subcontracting Plan.
- *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.

**3.7.6.2. Detailed Cost Estimate.**

Provide, in table format, a detailed cost breakdown by phase, of all items identified in the technical portion of the proposal for the following cost elements. Include all options. Submission of Detailed Cost Estimate spreadsheets and tables shall be in Microsoft Office (Excel) format with Font no smaller than 10 point.

**3.7.6.2.1. 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.

#### **3.7.6.2.2. 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.

#### **3.7.6.2.3. 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).

#### **3.7.6.2.4. Materials and Subcontractors.**

- *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% 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.

#### **3.7.6.2.5. 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.

**3.7.6.2.6. Fee.**

Include the fee proposed for this effort. State if no fee is proposed. Include a discussion, in the summary, of risk, technical difficulty, need for management/oversight, exceptional circumstances, etc.

**3.7.6.2.7. Competitive Methods.**

For those acquisitions (e.g., subcontract, purchase orders, material orders) over \$150,000 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)).

**3.7.6.2.8. 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.

**3.7.6.2.9. 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 (*See Note 1 below.*)
- 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

**Note 1:** 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.

**3.7.6.2.10. 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.

**3.7.7. 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 in accordance with FAR 15.5.

**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 CTTSO Contracting Officer. All such protests will be resolved promptly in accordance with FAR 33.103. Should the offeror choose to submit a protest to the GAO, the Offeror must clearly label protests to GAO as such and submit only to the CTTSO Contracting Officer who will then transmit the protest to GAO. The Government will deem receipt of the protest by the Contracting Officer as constituting receipt by the GAO for 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 login to the BIDS website, submitters are able to check the status of any submission under **Check My Current 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 SIT 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 precoordination with all participants (including Government facilities) fully documented. The requirement for and the anticipated use or integration of Government Furnished Equipment/Information (GFE/GFI) including all equipment, facilities, and information, must be fully described including dates when such GFE/GFI 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 risk 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. The Government's evaluation, at all phases of the BAA, 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.

**Remainder of this page intentionally left blank.**

## 5. TECHNOLOGY DEVELOPMENT REQUIREMENTS AND OBJECTIVES.

This section provides the requirement descriptions and overall technical objectives. CTTSO is interested in submissions in the following mission areas of combating terrorism (CbT). The intent of this BAA is to identify technologies and approaches that provide near-, mid-, and long-term solutions that enhance the capabilities of the U.S. Government to combat or mitigate terrorism. The main objective is to provide rapid prototype development focused on current and future critical multi-agency counterterrorism and antiterrorism requirements. The level of detail and order of appearance for a given requirement are not intended to convey any information regarding relative priority.

### 5.1. Advanced Analytic Capabilities (AAC)

#### **R000 - AAC FY18 R000 ADVANCED ANALYTIC CAPABILITIES FY18 UNSPECIFIED REQUIREMENT**

Develop new or improved technologies or emerging technological capabilities pertaining to advanced analytics that may be of interest to CTTSO, but were not specifically requested in this BAA and are not commercially available. Proposals submitted shall be timely and relevant, and further combating terrorism.

Although not limited to the following concepts, the Government is interested in the following:

##### 1. 'Big Data' Applications for Operational Planners

Big data technology is rapidly maturing, and DARPA and others are demonstrating the technology's potential. However, the promise of this technology has not yet been realized in the end-user community. This R000 seeks to identify and implement new, possibly game changing applications for operators. Applications of particular interest are those that can inform end users of the presence of actual, emerging, and potential threats, and assist them in planning and executing counter-threat operations. The applications sought should take a step past the usual keyword, Social Network Analysis (SNA), Social Media Analysis (SMA), 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.

##### 2. Anticipatory Analytics

Simple, customized analytic tools that allow end-users to quickly compute and analyze information. Models should perform calculations during live transactions to evaluate the risk or opportunities of a given scenario or event, in order to guide a decision. 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 or other conflicts. "Gray Zone" refers to a space in the peace-conflict continuum.

While initial work may not be classified, inputs and outputs of efforts could become classified.

Vendors responding to this requirement must possess the capability to support classified work.

Unspecified requirements (R000s) are for proposing unique innovations that have not yet been identified by CTTSO. Submissions against an unspecified requirement should 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 CTTSO does not budget for unspecified requirements, awards may not be made against the unspecified requirements. Note: Quad charts submitted in response to this R000 may be shared with other CTTSO Subgroups if the submission demonstrates relevance to more than one focus area.

## **5.2 Chemical, Biological, Radiological, Nuclear, and Explosives (CBRNE)**

### **R000-CBRNE CBRNE FY18 UNSPECIFIED REQUIREMENT**

Develop new or improved technologies or emerging technological capabilities pertaining to CBRNE that may be of interest to CTTSO, but were not specifically requested in this BAA and are not commercially available. Proposed projects shall be timely, relevant, and further worldwide combating terrorism efforts. Areas of particular interest include: explosive detection technologies; next generation materials for personal protective clothing and respiratory protection; methods for chemical and biological material attribution; and explosives or biological detection systems utilizing orthogonal approaches.

Unspecified requirements (R000s) are for proposing unique innovations that have not yet been identified by CTTSO. Submissions against an unspecified requirement should 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 CTTSO does not budget for unspecified requirements, awards may not be made against the unspecified requirements. Note: Quad charts submitted in response to this R000 may be shared with other CTTSO Subgroups if the submission demonstrates relevance to more than one focus area.

### **R4121 DETECT-TO-WARN WEARABLE CHEMICAL SENSING PLATFORM**

Develop a wearable detector for immediate protective actions that is capable of rapidly distinguishing and alerting on aerosol and vapor chemical hazards, Lower Explosive Limit (LEL) hazards, and enriched or deficient oxygen levels from background. It shall have detection sensitivity levels at or close to permissible exposure limits (PEL) or acute exposure guideline levels (AEGl)-1. The system shall automatically detect and alarm to the chemical warfare agent (CWA) and toxic industrial chemical (TIC) vapors and aerosols. Chemicals of high interest include chlorine, hydrogen sulfide, ammonia, hydrogen cyanide, and sarin. The sensor response time shall be no greater than 30 seconds (Threshold) and 5 seconds (Objective). The wearable chemical sensor dimensions should not exceed 2 inches × 2 inches with a maximum of 0.5 inches in thickness. The sensor badge should have at least six months of shelf life and weigh less than 100 g including the batteries. The cost of the sensor and its components should be affordable enough to be used as a disposable badge.

**R4122 DETECT-TO-IDENTIFY WEARABLE CHEMICAL SENSING PLATFORM**

Develop a wearable detector for immediate protective actions that is capable of rapidly distinguishing and alerting on aerosol and vapor chemical hazards, Lower Explosive Limit (LEL) hazards, and enriched or deficient oxygen levels from background. It shall have detection range from immediately dangerous to life and health (IDLH) down to permissible exposure limits (PEL) or acute exposure guideline levels (AEGL)-1. The system shall automatically detect (with a goal to identify by chemical class of nerve, blister, or TIC and quantify) and alarm to the CWA and TIC chemical vapors and aerosols. Chemicals of high interest (Threshold) include chlorine, hydrogen sulfide, ammonia, hydrogen cyanide, and sarin. The sensor response time shall be no greater than 30 seconds (Threshold) and 5 seconds (Objective). The operating period is not expected to exceed 8 hours of continuous sampling per battery charge. The wearable chemical sensor dimensions should not exceed 3 inches × 2 inches with a maximum of 0.5 inches in thickness. The sensor components shall have at least six months of shelf life and the total system shall weigh less than 200 g including the batteries. The cost of the sensor and its components shall be less than \$500 per unit.

Additional chemicals of interest (objective) include phosphine, arsine, nitrogen dioxide, and carbon monoxide.

**5.3 Improvised Device Defeat/Explosives Countermeasures (IDD/EC)****R000 IDD/EC UNSPECIFIED REQUIREMENT**

Develop new or emerging technologies and capabilities pertaining to the Improvised Device Defeat/Explosives Countermeasures (IDD/EC) Subgroup that may be of interest to CTTSO, but were not specifically requested in the BAA, and are not commercially available. Proposed projects shall be timely, relevant, and further worldwide combating terrorism efforts. Areas of interest are limited to the following:

- 3D Printing Capabilities for Bomb Disposal – Many EOD units and Bomb Squads have access to low-end, desktop 3D printers, or higher-end 3D printers at local universities or commercial manufacturing facilities. IDD/EC is looking for capabilities that will assist the bomb disposal community in using these types of 3D printing technologies to speed up prototype development of render safe tools, and other bomb disposal equipment.
- Non-Explosive Render Safe Tools – Since the mid-1940s the bomb disposal community has relied on explosively-actuated tools to render safe suspect improvised explosive devices (IEDs). The IDD/EC Subgroup would like to investigate the feasibility of non-explosively-actuated tools to perform render safe procedures. Technologies of interest include lasers cutting tools, rail-guns, or pneumatically or hydraulically driven disruptors. It is critical that these tools be easily emplaced and actuated by a single bomb technician with minimal time on target (seconds to minutes, not tens of minutes).
- VBIED Robotics Capabilities – Completing a Vehicle-Borne IED incident from start to finish using robotic capabilities is not feasible at present. The IDD/EC Subgroup is looking for potential robotic technologies to be developed that will enhance a bomb technician's ability to remotely identify explosives and IED initiation systems, diagnose circuitry and firing chains, and render safe the device or device components. All aspects of the problem will be considered, from gaining access to the interior of vehicles, through



the entire identification, diagnostic, and render safe chain, to moving heavy barrels of potential sensitive explosives. For this specific area of investigation, tools, technologies and ground-based robotic platforms will be considered, as well as unmanned aerial vehicle capabilities.

Unspecified requirements (R000s) are for proposing unique innovations that have not yet been identified by CTTSO. Submissions against an unspecified requirement should 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 CTTSO does not budget for unspecified requirements, awards may not be made against the unspecified requirements. Note: Quad charts submitted in response to this R000 may be shared with other CTTSO Subgroups if the submission demonstrates relevance to more than one focus area.

**R4099 P2 VISION**

Develop a wearable visualization system for command post/up-range support that will allow the P2 (Person 2) to see what is transpiring down range, and assist the P1 (Person 1 – the person down range) with on-scene analysis. The capability should allow the P2, and preferably both P1 and P2 to interact with holograms in mixed reality, and enable operators to visualize and work with digital content as an overlay to the real world, without interfering with normal, real-world viewing and vision. The wearable device for the system must be a self-contained, holographic computer that enables the wearer to engage with digital content and interact with holograms. In addition, the wearable device must be able to be used without wires, external cameras, allowing the wearer to move freely around the safe area or incident scene. The system must be capable of recording incidents, and have multiple input feeds such as video, sensor data, and general communications. The visualization capability should not interfere with P2's ability to perform normal up-range responsibilities, and enable operator to interact with content and information in the most natural ways possible. Built-in sensors should allow the user to use his or her gaze to move a cursor in the mixed-reality environment to select holograms, and use simple hand gestures to open applications, select and size selected items, and drag and drop holograms in the mixed reality environment. The operator should also be able to use voice commands to navigate, select, open, command, and control applications. Special consideration will be given to developers who are able to also use the same technology for development of R4100 - Enhanced Spatial Awareness for Robotic Platforms, and submit to that requirement as well.

**R4100 ENHANCED SPATIAL AWARENESS FOR ROBOTIC PLATFORMS**

Develop an enhanced spatial awareness capability so robotic platforms can maintain 360-degree awareness of their surrounding environment using simultaneous localization and mapping through input from sensors such as cameras, laser-based technologies, and wheel odometer to figure out where the robot is within 3-dimensional space. Technology should include proximity sensing (e.g., distance measurements or other feedback) for improved operation near any potential obstacles (e.g., stairs, inclines, curbs, drop-offs, rugs, furniture, curtain, etc.), and a warning system for potential rollovers should be incorporated. Where practical, the system should be incorporated into the robot systems monitor (e.g., picture in picture), or operational control unit. Where not possible or practical, a stand-alone monitor should be included.

Alternatively, use of a wearable visualization system using mixed-reality and 360-degree field-of-view, or holographic cameras, will be considered. Special consideration will be given to developers who are able to also use the same technology for development of R4099 – P2 Vision, and submit to that requirement at well.

#### **R4101 PORTABLE CAMERA FOR BOMB SUIT OPERATIONS**

Develop a small, high definition, live streaming camera that displays images onto a bomb suit worn screen or heads-up display or some other wearable or easily visible screen for the bomb technician's situational awareness. The camera should be easily stored and deployed from the bomb suit. Camera must have a wide field of view. Camera should be able to capture images through individual focal length lenses firing simultaneously, and computationally fuse these images to create a single high-resolution, low-noise photograph up to 52 megapixels. Once captured, images should be able to be downloaded via standard connectivity ports, by transfer on standard image capture cards, or over wireless network to laptop, tablet, phone, or other Wi-Fi enabled device. Output file should include JPEG, TIFF, and DNG. Camera should be dust and water resistant, and produce 4K video at full frame equivalent. Camera should be able to be operated via a built-in touchscreen, or through attachment to a lightweight, extendable handheld pole. Pole should allow the user to control camera function through dedicated buttons for shutter release and video recording, and have joystick like controls to pan and tilt the camera after attached.

### **5.4 Investigative and Forensic Science (IFS)**

#### **R000-IS IFS UNSPECIFIED REQUIREMENT**

Develop new, advanced, or improved technologies or capabilities related to credibility assessment, criminalistics/forensic science, digital and multimedia forensics, and identity intelligence that may be of interest to IFS stakeholders, but which are not specifically requested in this BAA and are not commercially available. Any proposals shall be timely, relevant, "cutting edge", and directly relate to and advance domestic and allied (FVEY) combating terrorism efforts. These may include any one or more of the following focus areas:

##### Credibility Assessment (Detection of Deception and Intent)

Improve interviewing and interrogation methods, techniques, and technologies through behavioral/operational psychology advancements, in:

- Sensemaking, to better understand a subject's resistance and apply persuasive methods to make a resistant subject more cooperative (as opposed to avoidant) and decrease resistance.
- Forensic psycholinguistics, to include sociolinguistics, discourse analysis, and pragmatics.
- Cognitive interviewing, to apply evidence-based, cognitive processing interviewing techniques to elicit far more detailed information than current prescribed methods.
- Rapport-based interviewing, to apply and advance the clinical/therapeutic approaches of motivation interviewing to increase the interview yield and decrease any counter-interrogation tactics of suspects and detainees.
- Cognitive-based (as opposed to anxiety-based) credibility assessment, by applying science-based techniques, accounting for the different strategies and assumptions of truth-tellers and liars, and training interviewers to exacerbate this difference through cognitive interview methods. Any proposed methods shall increase the accuracy of custodial interviews to more than 65%.

- Insider threat predictive analytics, to detect and mitigate anomalous work behavior related to counterproductive work behavior, espionage, sabotage and potential threats of violence. This includes new research and development of algorithms and analytics to sort diverse data for meaningful connections.

#### Criminalistics / Forensic Science

- Faster benchtop and handheld instrumentation that decreases throughput time and automates (lights out) interpretation.
- Faster, more reliable, more widely applicable, more rugged, less costly, or less labor-intensive tools for identification, triage, documentation, collection, exploitation, forensic analysis, and preservation of evidence and actionable information from persons and items from incident scenes, sensitive sites and other locations where operations may be restricted for any reason. Of special interest are technologies involving the forensic analysis of homemade/improvised explosives, their materials and related trace evidence, their precursors, and pre-incident or post-blast residues.
- Advanced fieldable methods and systems for rapid DNA analysis or next generation sequencing. Examination and subsequent analysis of samples or evidence shall provide a DNA profile based on at least the twenty Combined DNA Index System expanded core loci.
- Higher fidelity instrumentation for deployable expeditionary shelters that provides more in-depth processing of collected data or samples with the ability to share data rapidly with others.
- New methods and technologies which permit shipborne forensic examination and analysis.

#### Digital and Multimedia Forensics

- More technically advanced or inclusive detection, retrieval, extraction, analysis, authentication, automated data aggregation, and interpretation of permanent, perishable, or temporary information and digital data within computer and automated systems, communication systems, embedded computer systems, and the cloud-based data and systems and their storage media.
- Faster, more effective, comprehensive, accurate, low-cost methods of video and audio forensic analysis which significantly advance present technological capabilities.
- Rapid data extraction and full imaging from portable electronic data devices and their storage media. Any proposed tool or technique shall fully function in austere, severe, or remote physical environments; be suitable for employment by covert entry personnel; be undetectable by the device user; and be compatible with commonly used digital forensic hardware and software platforms.
- Steganography.

#### Identity Intelligence

- Advanced scientifically validated technologies and processes for the collection, analysis, exploitation and management of identity attributes.
- Human signature exploitation, consisting of intelligence-driven identification, recovery, and analysis of forensic evidence. Documents electronic, physical or event signatures.
- Biometric-enabled and forensic-enabled data collection and integration with all-source intelligence to locate, track, and follow unidentified persons and activities geographically

and through cyberspace. This includes efforts to fuse biometric and forensic modalities (e.g., finger and palm prints; facial images; DNA; RNA; proteins; human scent; handwriting) with traditional intelligence sources to identify individuals or groups.

- Geolocation and geotagging, as derived/exploited from trace evidence as well as digital and electronic media and digital devices. Includes digital exploitation of the clues a suspect or target leaves behind in their regular activities on the net to compile biographic and biometric information” that can help “implement precision targeting.
- Improved accuracy, reliability and validity technology for pattern-based examination, as in imaging, visualization and visual comparison applications for microscopy, hyperspectral imaging, spectrochemical analysis, document analysis, and forensic anthropology.
- Advanced technologies and processes that reveal identification attributes, such as fingerprints, palm prints, iris, facial image(s), DNA, other phenotypical traits of individuals or groups which distinguish persons-of-interest, terrorists, criminals, and anyone posing a potential threat to the United States.
- Fast, low-cost methods for profiling and analyzing DNA, including nuclear DNA, mitochondrial DNA (mtDNA), rDNA, mini short tandem repeats (mini-STRs), Y-chromosomal, and single nuclear polymorphisms from mixed multiple or contaminated sources.
- Enhanced kinship analysis methods, means, and software that utilize DNA (i.e., STR and mtDNA) information as well as metadata (such as sex, date of last sighting, age, etc.)
- Non-DNA related technology that can identify, individualize, categorize, or compare biological evidence, materials, or organisms for forensic-enabled intelligence activities. Technologies are especially desired which provide information beyond that obtained from genomic methods including those related to proteomics.
- Deployable, ruggedized, rapid material solutions to collect, examine, process and share data from biometric collection; document exploitation, electronic media and digital device signatures; touch DNA; explosive residue sampling, or other rapid forensic processing capabilities.

Proposals pertaining to data mining; report writing; data compilation; detection of concealed bombs, explosives, or weapons; intrusion detection or access control; cybersecurity; or any other technical solutions that are not objective, repeatable, and verifiable should not be submitted to this requirement and will be rejected. Solutions and proposals which are proprietary and require the government to pay licensing fees are not desired and shall be rejected.

Unspecified requirements (R000s) are for proposing unique innovations that have not yet been identified by CTTSO. Submissions against an unspecified requirement should 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 CTTSO does not budget for unspecified requirements, awards may not be made against the unspecified requirements. Note: Quad charts submitted in response to this R000 may be shared with other CTTSO Subgroups if the submission demonstrates relevance to more than one focus area.

#### **R4083 UNCONSTRAINED SCALABLE FACIAL RECOGNITION**

Develop a robust face recognition application program interface (API) suite and graphical user

interface (GUI) environment (i.e., Face Recognition Environment (FRE)) that builds a government-provided face recognition algorithm into a flexible and customizable tool capable of scalable unconstrained face detection, clustering, and recognition for a variety of operational mission environments.

The government shall provide one or more algorithms or algorithm subcomponents (e.g., face detection, subject clustering, matching). The vendor shall develop an operationally focused FRE and integrate the government-of-the-shelf (GOTS) algorithm. The FRE source code shall be delivered ready to install on CentOS Linux or Windows. This requirement does not include the development of a vendor-owned detection, clustering, or matching algorithms. The end users of this technology will be United States Government federal agencies as well as state and local law enforcement and intelligence agencies. The government must receive at least Government Purpose Rights to all software and deliverables; unlimited rights are preferred. The government shall not accept a deliverable that requires any licenses on a per-subject or annual basis.

The GOTS algorithms that the government shall provide upon project start possesses the following characteristics:

- Capable of producing a single face representation template from multiple sources of media (still image and/or video).
- Performs face detection, subject clustering, 1:1 face verification, and 1: N face verification matching.
- Subject templates do not exceed 1 megabyte (MB) in size regardless of volume and number of source media.
- Time to create a template per central processing unit (CPU) core (i.e., 3.2 GHz) is one second or less.
- Time to match one query subject against a one million gallery of subjects does not exceed 10 seconds in a distributed environment.
- Compatible with the Intelligence Advanced Research Projects Activity (IARPA) Janus Test and Evaluation (T&E) API. The C++ API is open source and available for reference at <http://libjanus.org/>.
- At minimum, performs on the IARPA Janus Challenge Set 3 (CS3) test protocols as follows:
  - Janus CS3 1:1 mixed template verification: 83% true accept rate (TAR) at 0.1% false accept rate (FAR); 69% TAR at 0.01% FAR.
  - Janus CS3 1:N mixed template identification: 94% true match at Rank 20; 83% true match at Rank 1.

The FRE shall be composed of two separate components, a software development kit (SDK) or Web Service component which implements the GOTS algorithms and a GUI component that implements the developed SDK or web service.

The FRE SDK/Web Service Component shall implement the following:

- Support and expose all functionality included in the provided GOTS algorithms to include but is not limited to:
  - Input of streaming imagery to be converted into probe queries so as to facilitate real-time streaming of 1:N matching.

- Generation of single face representation templates from multiple sources of media (still image and/or video).
- Fine-tune training of algorithms through the ingestion of a small set of annotated data, such that a specific trained instance of the algorithm can be saved for later repeated enterprise use without the need to re-run fine-tune training.
- Sub-linear search through gallery indexing or hashing techniques.
- End-to-end media ingestion to matching process in an automated manner or as a sequential series of stages with user adjudication or involvement (e.g., face detection, subject clustering, and matching).
- Use of subcomponents as standalone tools (i.e., face detection, subject clustering).
- Maintain performance of the GOTS algorithms on Janus test datasets, as compared to the research version of any algorithms, with less than a 1% degradation in TAR at any FAR operating point from FAR = 10<sup>-5</sup> to 10<sup>-1</sup>, and less than 1% degradation in True Match Recall when returning Rank 1 up to Rank 50.
- Environment
  - Run on either distributed computing environments or standalone desktop computer.
  - Support the use of GPUs in both a central and distributed computing environment.
  - Ability to plug into an open cloud architecture including Amazon Web Services.
  - Compile on Linux platforms, including CentOS, and under a recent Windows OS.
  - Support algorithms that utilize CUDA-enabled GPUs.
  - Compatible with computer vision and biometrics open source libraries, such as OpenCV, CUDA, Dlib, and/or OpenBR.
  - Support both x64 and x86 architectures.
  - Support both Intel and AMD CPUs.
  - Support a plug-in architecture to allow integration and inclusion of algorithms conforming to the GOTS algorithm API to enable the inclusion of future algorithms.

#### **R4089 FIVE EYES FORENSIC AND TECHNICAL EXPLOITATION HANDBOOK**

Research, develop, and produce a comprehensive handbook to provide guidance and information on all aspects of forensic and technical exploitation of sensitive and other tactical sites. The handbook must be easy to read and understand and support military, intelligence, and law enforcement operations, missions, and tasks relating to forensic and technical site exploitation of improvised explosive, incendiary, or pyrotechnic threat devices; associated components; improvised weapons and systems; and instrumentalities of terrorism, insurgency, and irregular warfare.

The handbook shall support the Five Eyes (United Kingdom, Canada, Australia, New Zealand, and the United States) military and law enforcement communities and shall contain the most contemporary and updated information. The security classification and dissemination controls shall be at least “Unclassified // For Official Use Only – Law Enforcement Sensitive / Releasable to Five Eyes.”

The primary end users will be the five national organizations engaged in forensic and technical collection and exploitation processes at the site/tactical/operational/strategic levels. These end users shall include, but are not necessarily limited to: 1) formation/unit commanders; 2) staff

officers and planners; 3) exploitation specialists at all levels; 4) general purpose forces of the military and law enforcement; and, 5) partner nations (may require a section that is releasable).

The handbook shall address the subjects of training, equipment, personnel, information, doctrine and concepts, organization, infrastructure, logistics, and interoperability. It must include the following: 1) forensic and technical exploitation definition and objectives; 2) forensic and technical exploitation operating concepts (operations, employment, and use) across the range of military operations; 3) exploitation disciplines, capabilities, levels and organizations (tactical through to strategic); 4) exploitation outcomes; 5) integration with intelligence processes; and 6) partner nation development. The handbook shall also address the security and safety of the site/scene, visual and written, documentation of the site, search methods, collection of items and information, exfiltration, and analysis and exploitation of the materials and information.

The information, procedures, best practices, and guidelines within the handbook must support the operational missions and tasks from the tactical through strategic levels across the spectrum of conflict, to suppress unconventional warfare and terrorism. The handbook shall be researched to provide information and best practices which do not focus on any one nation and are representative of the perspectives of all Five Eyes nations. Differences between nations shall be annotated when significant and appropriate.

The final deliverable shall be available in electronic format and be easily printed in a hardcopy format. The handbook must be well organized and allow users to locate information quickly and easily. Each individual handbook shall not exceed 250 pages. Information contained in the handbook may be presented in a variety of formats, such as pullouts, trifold, charts, graphs, images, and text. An initial publication of 25 bound hardcopies of the handbooks shall be produced as an exemplar. The cost per unit of the hard copy shall not exceed \$40.00, preferred is \$25.00 or less.

#### **R4090 FORENSIC SPEAKER RECOGNITION APPLICATIONS**

Develop standard protocols, procedures, and best practices for forensic speaker comparison examiners to accomplish their analyses and examinations. Associated research and development shall advance, improve, and validate forensic capabilities in listener accuracy, measurement protocols, examiner training protocols, collection of speech in high emotion settings, collection of and access to operational data from actual investigative recordings, and privacy, law, and ethics. Any research and development under this project must focus on the type of speech heard and the associated recordings found in and worked in typical law enforcement and forensic casework. This shall include the tools, training, and data needed for conducting the mission related analyses and examinations.

The following must be researched and developed: 1) Standard tests to assess listener accuracy and forensic speaker comparison examiner capability, customized to categories of typical forensic conditions; 2) Training protocols for maintaining examiner proficiency and increasing examiner skills; 3) Guidance and protocols for how and when to use automation; 4) Development of standard reference speech datasets for system testing and calibration and other reference needs; 5) Pilot collection of speech in high emotion settings and its integration with the currently existing design activities; and 6) Tests to measure performance across an array of

stimuli.

A standard reference dataset that complies with institutional review and meets technical requirements shall be researched and developed so the data can be used for the following: 1) System evaluation and improvement directly focused on realistic forensic conditions; 2) System benchmarking; 3) Study of the scientific underpinnings of speaker recognition and comparison; and 4) Potential new discovery areas, for example, context detection and access to an examiner community with standard practices for regular benchmark tests.

All protocols, procedures and capabilities which are developed must have specifications and performance parameters that work with a broad variety of listener types across four operational conditions and compare listener accuracy alone and in conjunction with automated systems. To the maximum extent possible, data shall be used for which ground truth is known. All developed capabilities, protocols, and procedures must comply with the technical requirements of the forensic examiners, and ethical, privacy, and legal regulations.

#### **R4091 MINIATURE/BODY WORN AUDIO VIDEO TRANSMITTERS**

Design, develop, and produce a miniature radio frequency standalone transmitter that provides high performance, low power consumption embedded electronics that will allow for covert video surveillance operations. The physical size of the transmitter and the power consumption are two of the most important factors to consider. The device shall transmit live clandestine surveillance, intelligence, and security operations efficiently in body worn and difficult concealment applications. The device must be remotely configurable to meet the needs of the operation and shall allow for plug-in devices such as antenna, cameras, microphones, batteries and switches. The device shall be designed in such a way that it can be safely worn and operate normally without injury to subject and provide high performance video and audio during clandestine investigative operations.

The device shall have the following capabilities and features:

- The transmitters shall operate in the S-Band (2.2 GHz to 2.29 GHz) and/or C-Band (4.4 GHz to 4.8 GHz). Units may be single band to keep the overall physical size as small as possible.
- Physical size must be no larger than one inch by one inch by 3/8 inch; smaller is preferred. A battery pack can be a separate component; however, it must be powered by commonly available commercial type batteries.
- Transmitters must be capable of transmitting a minimum of 500 meters line-of-site with zero dB gain antennas. The system in the “transmit and receive” mode shall incorporate AES-256 encryption.
- The units shall include an antenna, camera, and microphone suitable for concealment purposes as well as the ability to operate from a battery source or small power supply.
- The “transmit and receive” units shall include commercially available onboard recording format that can either be downloaded or available on removable media. Recordings shall be protected in a manner to provide authenticity.
- The thermal efficiency without the aid of fans or heat sinks shall allow the units to be worn against the body or secreted in tight spaces without discomfort or burning.



- A camera microphone option shall provide a wireless capability to transport audio/video signals to the transmitter via low power signal.
- A receiver unit shall be provided that allows for remote viewing and monitoring and recording of the audio video signals.

The technology which is developed must be provided to the government with unlimited intellectual property rights.

#### **R4092 CREDIBILITY ASSESSMENT ALGORITHM DEVELOPMENT**

Design and develop advanced state-of-the art credibility assessment algorithms to be incorporated into existing credibility assessment systems currently being developed through efforts of the National Center for Credibility Assessment (NCCA) and Combating Terrorism Technical Support Office (CTTSO). The systems include an AVATAR comprised of an computer-generated agent that presents automated interviews by a thermal imager for non-contact measurement of a subject's state of credibility during live interviews, and the Ocular Credibility Assessment System (also known as the Head Mounted Credibility Assessment System). The algorithms must quickly analyze a variety of signals and information provided by the sensors and hardware of these systems acquired from humans during interviews. The input signals shall include infrared thermal imagery from the facial area, pupil dilation, breathing rate and depth, heart rate, and electrodermal activity. The software and associated algorithms shall ultimately determine the credibility of the interviewee with a high accuracy rate and low inconclusive rate under a variety of conditions and interview techniques. The types of interviews for which the algorithms shall be used include those of agencies within the federal law enforcement, military, and intelligence communities to make determinations of hostile intent, credibility assessments of suspects and witnesses in criminal investigations, intelligence gathering interactions, and security clearance verifications. The results provided by the algorithms shall provide a confidence level with its credibility assessment.

The developed algorithm and application must also have the following features and capabilities: 1) all aspects of data reduction, analysis, signal-noise and artifact reduction; 2) relevant feature extraction, graphical representation and algorithmic scoring of raw data files; 3) presentation or display of interviews and recorded physiology; and 4) credibility decision making in real time during an interview.

The development of the algorithms and software systems and their authentication must utilize data distributions, extraction of relevant features using robust and effective computer models, logistic regression, neural networks, decision tree, and support vector machine approaches. The results must be verified, whenever possible, against data for which ground truth is known. The vendors shall work closely with scientists from NCCA to develop the software and algorithms and shall test and evaluate them with actual interview data for which the ground truth is known.

#### **R4118 ANNUAL SECURITY APPRAISAL REPORTING TOOL**

Develop a system of investigative and personnel security related procedures and protocols to determine security risk of an employee who works at a site with classified information or systems. The United Kingdom's Annual Security Appraisal Report Tool shall be used and analyzed, expanded, improved upon and adapted to produce the final deliverable. The procedures

and protocols must be capable of being used annually to determine accurately who is vulnerable to compromise. Attention shall be given to employees' non-technical behavior within the organization associated with risk of betrayal, malicious behavior, and favorable and unfavorable life events including those which are random. The final product shall provide vetting officers a method of annually verifying continued eligibility to have a security clearance.

The developed investigative procedures must establish what security-relevant data are available in the workplace and their suitability to provide relevant and accurate assessments about persons who may be insider threats. Additionally, the developed protocols must provide a more robust data pool from which threat indicators and inhibitors can be better understood and interventions to mitigate insider threat can be implemented. The procedures must include the methods to collect, analyze, and process the data to make accurate assessments of the changing status of the security risks of persons in the workplace. The tool shall be designed to identify individuals who may be experiencing stress or dissatisfaction in the workplace that may affect their security reliability regardless of whether the stressor has caused a change in job performance. This shall focus on interpersonal stress, relationship loss, rejection, elderly and child care, employment dissatisfaction, loss of productivity, lack of promotion, change in work hours, and security compromises or disclosures. The government shall provide the United Kingdom's Annual Security Appraisal Report Tool after contract award. The government must receive full intellectual property rights to all deliverables.

### **5.5 Irregular Warfare and Evolving Threats (IW/ET)**

#### **R000 - AS R000 IWET -- AUTONOMOUS SYSTEMS AND CONCEPTS FOR DEMONSTRATIONS OF DISRUPTIVE TECHNOLOGY**

Hostile actors operating on the strategic, operational, and tactical level employ accessible, cheap, and ubiquitous technologies, both bespoke and commercial, to counter the U.S. military advantage in intelligence, operations, logistics, and communications. Hostile actors have developed new tactics, techniques, and procedures to execute operations using these technologies in unique and unexpected ways, often undetected by military sensors or obscured to collection assets, creating asymmetric advantage for their organizations. An efficient and effective response to the proliferation of technologies requires new concepts and/or prototypes for autonomous systems to identify, negate, disrupt, or otherwise affect the policies, doctrines, capabilities, and organization of hostile actors.

Experiments/prototypes would demonstrate clear value in current operationally challenging theaters, including, but not limited to: detecting and countering adversary information operations; enabling rapid decision making; affecting adversary decision-making by manipulating information and affecting the hostile actor's cognitive processes; processing and analyzing highly disparate and/or massive volumes of data, both structured and unstructured; integrating, synthesizing and displaying operationally relevant information; enabling action to disrupt complex interconnected networked objects in a battlespace ("the internet of things"); and/or conducting and displaying complex automated Intelligence, Surveillance and Reconnaissance (ISR) integration to provide a commander with immediate understanding of their battlespace. All solutions, at a minimum, must have outputs able to be used by non-autonomy literate operators and be robust enough to cope with the deployment of deception,

assault, and counter-autonomy technologies by adversaries.

The focus of these efforts will apply research and development processes in the fields of artificial intelligence and machine deep learning to enable Irregular Warfare (IW) in accordance with the DoD's 2014 Quadrennial Defense Review (QDR), DoD Directive 3000.07, the DoD's Strategy for Operations in the Information Environment (IE), and the IW Joint Operating Concept 2.0. These documents direct the DoD to apply IW in order to utilize full spectrum engagement that favors indirect and asymmetric approaches; inclusive of counter threat operations, shaping and influence operations, and stability operations, in order to erode an adversary's centers of power. The IW toolset includes strategic communications, information operations, civil/military operations, as well as support to law enforcement, intelligence, and counterintelligence operations in which the joint force may engage in to counter irregular threats.

The objective would be to disrupt, degrade, and/or defeat hostile actor strengths, so as to allow U.S. and partner forces to operate with an asymmetric advantage over the adversary. As no specific requirement for this wide ranging effort has been identified, end users would be dependent on the type of project accepted.

Submit under this number and title relevant strategic, operational, or tactical concepts and capabilities that are achievable within a constrained budget environment to enhance U.S. and partner nations' capability and capacity to conduct Irregular Warfare in support of the DoD mission.

Unspecified requirements (R000s) are for proposing unique innovations that have not yet been identified by CTTSO. Submissions against an unspecified requirement should 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 CTTSO does not budget for unspecified requirements, awards may not be made against the unspecified requirements. Note: Quad charts submitted in response to this R000 may be shared with other CTTSO Subgroups if the submission demonstrates relevance to more than one focus area.

#### **R000 - CVE/FIS COUNTERING VIOLENT EXTREMISM AND FOREIGN IDEOLOGICAL SUBVERSION**

Extremist organizations and nation-state proxies, through social and traditional media, and increasingly using automated and computationally enabled techniques, subvert sovereign governments by influencing and recruiting impressionable minds throughout the world, targeting the "psychological rear" of nation states, sewing confusion, discord and cynicism, and luring citizens to fight on battlefields against military personnel, or carry out lone wolf attacks against civilian populations. The USG requires novel capabilities and technologies to combat this persistent and evolving threat.

The Irregular Warfare and Evolving Threats Subgroup seeks novel solutions that enable the Department of Defense to develop creative and agile programs and strategies across all available media to most effectively reach target audiences, counter and degrade the ability of violent extremist groups and nation-state sponsored proxies to propagate their ideologies which allow

them to persuade, inspire, subvert sovereign governments and the rule of law, and recruit vulnerable populations. Submissions shall propose innovative new technologies, concepts, methodologies, and strategies for shaping and countering violent extremist narratives, subversion, recruitment, radicalization pathways and their ideologies.

The overall objective is the development of a creative project which will provide the USG and its partners new capabilities to blunt the ability of extremist groups to influence others, subvert sovereign governments and erode rule of law. The project would aim to restrict the flow of fighters and resources, while reducing the likelihood of an actor being exhorted to carry out a lone-wolf attack on a civilian population.

Unspecified requirements (R000s) are for proposing unique innovations that have not yet been identified by CTTSO. Submissions against an unspecified requirement should 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 CTTSO does not budget for unspecified requirements, awards may not be made against the unspecified requirements. Note: Quad charts submitted in response to this R000 may be shared with other CTTSO Subgroups if the submission demonstrates relevance to more than one focus area.

#### **R000 – IRREGULAR WARFARE AND EVOLVING THREATS UNSPECIFIED REQUIREMENT**

Contemporary national security challenges consistently and increasingly involve the information domain. This shift within the global web of terrorist and competitor nation-state activity necessitates novel approaches in the area of irregular warfare, including information operations (IO), information warfare, strategic communications, counter threat finance (including cryptocurrencies), and civil/military operations. The Irregular Warfare and Evolving Threats Subgroup seeks new capabilities that advance strategies, methodologies, and technologies to meet these challenges.

The focus of these efforts will support the priorities as defined in the DoD Strategy for Operations in the IE, DoD Directive 3000.07, the IW Joint Operating Concept 2.0, and the 2014 Quadrennial Defense Review. Proposals should include solutions not only to counter and degrade the ability for adversaries to influence, persuade, and recruit, but also to enhance the ability for operators at tactical and operational echelons to achieve mass and influence in the information environment. If pursued, these projects will improve IO efficacy, enhance interagency and partner nation engagement, and provide additional capabilities for the irregular warfare toolbox.

Unspecified requirements (R000s) are for proposing unique innovations that have not yet been identified by CTTSO. Submissions against an unspecified requirement should 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 CTTSO does not budget for unspecified requirements, awards may not be made against the unspecified requirements. Note: Quad charts submitted in response to this R000 may be shared with other CTTSO Subgroups if the submission demonstrates relevance to more

than one focus area.

## **5.6 Personnel Protection (PP)**

### **R3923 SMALL UNMANNED AIRCRAFT SYSTEM (SUAS) ENDURANCE**

Military operators and federal law enforcement agencies are increasingly turning to small unmanned aerial systems (sUAS) as force multipliers. However, mission times are severely restricted due to onboard power supply limitations. Operators must frequently land the sUAS to replace or recharge batteries, creating a gap in situational awareness and potentially compromising their ground position. Research and development has been conducted for alternative long endurance solutions such as fuel cells, extended life batteries, solar panels, and gas engines. Factors such as cost, limited energy storage capacity, limited weather environments, and audio signatures render these alternatives unsuitable for certain missions.

Develop a mechanism to wirelessly charge onboard power supplies for in-flight sUASs at a range of one (Threshold) to three (Objective) kilometers line-of-sight. The capability must be integrated with a fixed-wing air vehicle and a multi-rotor, vertical take-off and landing (VTOL) air vehicle in a manner that does not hinder aircraft performance. The government will provide the air vehicles for integration. Fixed-wing assets can be expected to fly a tight orbit during charging, while VTOL assets can be expected to hover in place to facilitate power transmission to the airframe-mounted receiver. The capability must enable persistent eyes on target for missions lasting 24 hours (Threshold) or more. The ground-based transmitter must be powered by silent generator, and both components must be packaged for transport via sport utility vehicle. The portable ground system must acquire and track the sUAS throughout the power transmission. The system must include safeguards to ensure there are no health hazards or interference with surrounding frequencies. Solutions including optical beams must cease transmission within one (Objective) to ten milliseconds (Threshold) in the event a foreign object approaches the beam. The system must also include a manual kill switch.

### **R3997 WIRELESS HEALTH MONITOR**

Attacks on embassies and other government facilities place quick reaction forces and personnel recovery teams in harm's way. Fire fights, severe injuries, and the need to maintain radio silence can leave operators unable to communicate their health and injury status to the command post.

Develop the ability to remotely monitor the vital status of incident responders. The contractor shall develop a wireless health monitor that provides a wearable sensor that provides heart rate, body temperature, pulse oximetry, respiration, and GPS location. The sensor shall be designed for placement without the need to remove clothing (Objective). The minimum lifetime of the sensor shall be twelve (Threshold) to twenty-four (Objective) hours without operator intervention. The system shall encrypt (minimum AES 128-bit) the health and two-dimensional GPS location information for responders. The system shall send health and two-dimensional GPS location information to a remote command center server (through specific IP address or domain name) (Objective). The system shall be compatible with the Android Tactical Assault Kit (ATAK). This message should be communicated primarily through satellite links (Iridium; Globalstar), with cellular links (2G; 3G; 4G/LTE) providing a secondary communications path. The device shall be certified for operation on the satellite and cellular networks. Command

center operators shall be able to view location data for selected personnel using third-party mapping software (e.g., Google Earth). The refresh rate shall be user programmable; however, the system shall be able to achieve a rate of once per minute. In the event communication networks are unavailable, the system shall begin reporting current health and GPS information once communications are restored. The system shall include a momentary switch that enables the operator to send an emergency alert (Objective). The tracker shall include LED indicators for tracker status (on; standby) and network status (reporting; connected but not reporting; not connected) (Objective). The use of short range wireless communications between the sensor and a secondary personal communications device is acceptable. The system shall not interfere with mission performance (e.g., movement and firing weapons) or personal protective equipment (e.g., body armor and communications). The base effort will include delivery of an Interface Control Document for sensor information and 10 wearable sensors and tracking devices. If the tracking device is separate from the sensor then delivery shall include enough tracking devices to support 10 wearable sensors. All software developed for this effort shall be delivered with unlimited Government rights.

#### **R4096 AIR-LAUNCHED FAST AUTONOMOUS RECONNAISSANCE SYSTEM (AFARS)**

Marine Corps assault teams conducting long range missions are inserted via the V-22 Osprey tilt rotor aircraft. These assault elements lack an organic intelligence, surveillance and reconnaissance (ISR) system capable of surveying the landing zone (LZ) in advance of their arrival. Due to rapid planning and execution timelines, long range reconnaissance assets are often not available to support these missions. There is therefore a need for a self-deployable or air deployable unmanned aerial system that is capable of dashing ahead of the V-22 en route to the objective area and provide at least 8.5 minutes of overhead ISR at the LZ prior to the team's arrival. This system must be able to deploy from the V-22 to provide near real time, in stride ISR to the assault team, be capable of all-weather, day/night operation, and autonomous, way-point-guided navigation. The system must be capable of launching at altitudes of 10,000 to 20,000 feet above sea level. The system must be fast enough so that the V-22 does not have to loiter outside the objective area before receiving video feedback. This system must be capable of one observation of a circular LZ with a radius of 1 km prior to the assault team's arrival. The system's audible and visible signature over the objective area should be minimized to the maximum extent practical. The system shall provide sufficient resolution to detect personnel and discern the difference between individual and crew served weapons. System demonstration must be conducted from a standard weapons pylon using a LAU-115 type rail launch system. The cost of the system must be low enough to be considered expendable/disposable, with full rate production cost not to exceed \$250,000. As such, the system must not contain sensitive components.

#### **R4104 ELECTROMYOGRAPHIC SENSOR APPLICATION DEVELOPMENT**

Electromyography (EMG) technology used to measure human muscle activity in the context of controlling robotic platforms/human augmentation platforms generally provides noisy signals (due to motion artifacts, cross-talk, external EMI, etc.). Current high-fidelity electrode designs rely on adhesive-backed gel electrodes, which are not as robust or suitable for tactical environments. Timely, accurate, and reliable prediction of intended human motion is essential for highly dynamic human augmentation systems.

This effort will involve designing, building, testing and the delivery of an EMG sensor system comprised of electrodes, sampling electronics, and processing electronics. The system must be robust and operable in highly active environments and for long-term service life. The electrodes and sample electronics shall be embedded into a wearable compression fabric and predict intended human motion with enough fidelity for high level control. The processing and required electronics must be capable of integration into a robotic/human augmentation platform, and provide a continuous value output of one or more control variables (i.e., joint torque, velocity, etc.).

The system must be easily donned and doffed without using electrode gels or adhesives (Threshold (T)). The power for the EMG sampling electronics shall be less than 250 mW (T) with a target of less than 100 mW (Objective (O)) per sampling node. The sampling nodes shall have a channel sample rate of at least 5 kHz (T) with a target of over 20 kHz (O). There shall be at least 12 bits of resolution per channel (T) with a target of 24 bits of resolution per channel (O). There shall be at least 4 bi-polar channels per sampling node (T) with a target of 8 bi-polar channels per sampling node (O). The system shall implement a standard differential communication interface that supports 6 foot (T) to 12 foot (O) runs between sampling electronics and processing electronics. The sampling electronics shall have dimensions no larger than a single 1" × 1" × 0.25" circuit board (T). The processing electronics (with enclosure) shall have dimensions no larger than 5" × 2" × 1" (T) with a target of 3" × 1" × 0.5" (O). The processing electronics shall support at least 4 sampling nodes (T) with a target of 8 sampling nodes (O). The power for the processing electronics shall be less than 10 W (T) with a target of less than 2 W (O). The system shall output a continuous value prediction for joint velocity and/or joint torques (T). The system's control output rate shall be at least 1 kHz (T). The predicted control outputs shall be experimentally demonstrated to achieve an R-squared value of 75% (T) with a target of 90% (O).

#### **R4117 ARMORED PASSENGER VEHICLE HANDBOOK UPDATE**

The current Armored Passenger Vehicle (APV) Handbook covers applicable guidelines and regulation areas for DoD agencies responsible for APV procurement and life cycle management. It is a comprehensive handbook containing guidelines for APV program information to include program funding, schedules and plans for replacement vehicles and vehicle maintenance, normal road usage, standards for vehicle disposal and more. Since the release of the first edition handbook, updates have been made to vehicles, procurement procedures, maintenance and other related APV information rendering the current handbook outdated. The APV handbook requires an update and release for use by applicable government agencies to reflect the current APV standards.

Update the APV Handbook with regards to the current management of government APV programs. Research the current updated industry standards, certification and procedures to update guidelines for projecting budget requirements; quality assurance/quality control procedures for commercial manufacturers; procurement guidelines; inventory control methods; vehicle and armor maintenance and replacement plans; driver training requirements; vehicle disposal guidelines; and other outdated information outlined in the handbook. If applicable, update any outdated guidelines and certifications for changing ballistic, blast, and automotive test protocols and performance guidelines included in the original handbook. Twenty-five (25)

hard copies and one (1) electronic copy on CD-ROM of the updated APV Handbook shall be delivered to the government (Threshold) with an objective of a viewable copy on a mobile application accessible through iPhone and Android operating systems (Objective).

#### **R4120 CONCEALABLE ARMOR PANELS**

Tactical operators, especially military Special Operations Forces, face ballistic threats that exceed the handgun projectiles typically seen by domestic law enforcement officers. Most combat environments present high power rifle rounds as the primary small arms threat. Special Forces, VIPs and other high value targets often encounter conditions in which discrete ballistic protection is required. There is a persistent need for standalone ballistic plates capable of defeating common high power rifle threats.

Develop standalone plates to defeat the 7.62 × 39 mm, 124 grain, mild steel core (MSC) projectile at 2,450 ft/s. The hard plates must be no thicker than 8 mm, be capable of complex curvature with a minimum bend radius no greater than 70 mm, and have an areal density no greater than 5 pounds per square foot. The plates must be standalone, requiring no additional layer of soft armor for fragmentation protection. The government will provide three dimensional models of the objective plate geometry in Step file and Solidworks part file format. All surfaces of the final plate geometry must lie within a 0.100” tolerance zone of those in the provided models.

#### **R4148 SUAS TO TACTICAL CLOUD INTEGRATION**

Current small unmanned aerial system (sUAS ) technology requires a ground control station (GCS) for each air vehicle. Each sUAS manufacturer has its own unique or proprietary GCS and communications configurations that require system-specific training for each sUAS. The GCS communicates with the air vehicle via line-of-sight (LOS) single-channel radio, and receives all data feeds for operator consumption, but has no inherent connectivity to tactical cloud networks for sharing intelligence, surveillance, and reconnaissance (ISR), weather, full-motion video (FMV), or telemetry data to support distributed situational awareness (SA), targeting, airspace management, or command and control at the congested tactical edge. The Tactical Assault Kit (TAK) is an operational C4I solution fielded via Android Tactical Assault Kit (ATAK) smartphone devices and applications supported by IP networks providing real-time SA through voice, text, video, pictures, and layered moving maps. The open architecture of ATAK allows for extensibility and rapid development of plug-ins to add functionality to the system.

Integrate various sUAS GCS data inputs and outputs with TAK networks for tactical cloud-enabled integration of FMV and telemetry for distribution of tactical ISR, and develop an ATAK plug-in to support exchange of GCS mission planning and navigation inputs from a standardized user interface for collaborative control of multiple sUAS platforms by multiple users across the TAK network. This system shall allow sUAS mission planning and operation through an enabled mobile device. The capability shall extend to all TAK devices including Android and Windows based devices. The system shall provide real-time video and telemetry from sUAS platforms across the TAK network.



## **5.7 Physical Security (PS)**

### **R4125 FORCED ENTRY RESISTANT ROLLER DOOR**

Design and develop a roller door that is forced-entry (FE) resistant and capable of meeting the State Department 15-Minute FE performance criteria in accordance with SD-STD-01.01, Revision G (amended). The roller door size shall be 12 feet wide by 16 feet high, and roll up into a compartment that is capable of mounting on the interior of the building. The door must operate as a normal roller door would, and shall be capable of being both electrically driven and manually driven. Maximum weight of the door shall not exceed 2,304 lbs.; this weight does not include the frame that is fixed to the wall. Current issues with other “security” roller doors are their susceptibility to a bottom attack, where the long unsupported edge of the doors are able to be leveraged, and the slack in the rest of the system that can be exploited to allow an attacker to gain entrance. The roller door shall not be directly attached to the foundation; all securing bolts and locks must be fixed to the frame/walls. The roller doors shall be mounted using traditional roller door and FE door techniques and capable of operator level maintenance (door adjustments, lubrication, etc.) that is typically conducted by local maintenance staff.

### **R4129 ROLLING FUEL TRANSPORTER**

USMC has a need to transfer fuel from ship to shore in an amphibious towable container while mitigating risk to personnel and fuel loss in event of an attack. Fuel containers will be stowed empty onboard a ship or seabase where they will be filled with fuel immediately prior to movement to shore. Specifications are as follows:

- Shall have a 350 to 500 gallon fuel capacity and be durable and lightweight.
- Shall be easily dismantled by no more than three (3) people without the need for specialized tools or heavy lift equipment.
- When not in use, multiple systems shall be contained into a platform not to exceed 20' flat-rack.
- Shall be towed by any program of record (POR), land vehicles such as the HMMWVs, MTRVs or MRAPs but specific emphasis needs to be placed on the amphibious vehicles during ship-to-shore movement (sea state 3).
- Shall accept and dispense fuel with a standard fuel pump; powered by NATO cable, and equipment such as D1 Nozzle, Elaflex ZV400 nozzle and sexless couplings.
- Shall be capable of traversing same surfaces as towing vehicle. (Prefer, but not required, to use POR tires such as 52x16.00R20 XZL Michelin tubeless (MTRV Tires) or similar, in order to streamline acquisition and leverage historical data.)
- Shall connect in series up to 5 containers for towing on land but engineered to minimize sway and drag.
- Shall not limit towing vehicle speed or mobility.
- Shall provide reliable fuel level indicator.
- Shall be able to be external sling loadable (hard points).
- Shall be emergency release capable.
- Shall provide the same road clearance as the prime mover.

### **R4130 TUNNEL COLLAPSE RESPONSE GUIDE**

Conduct a comprehensive study delineating measures for rescuing tunnel collapse victims inside OSHA-compliant and non-compliant tunnels to enhance their survivability. Produce an in-depth

guide of best practices for the subterranean scenarios typically encountered (U.S. Customs and Border Protection will provide the scenarios). The study shall consider the varying size, depth, configuration, and geologies of earthen tunnels (Threshold), and underground municipal infrastructure traversed by humans (Objective), encountered along the U.S. southwest border.

The study shall include, at a minimum, the following information:

- A list of all current technologies that exist concerning Tactics, Techniques and Procedures (TTPs) for rescue personnel responding to a subterranean structure collapse.
- A detailed explanation of the advantages and disadvantages of current technologies which addresses existing capabilities and capability gaps.
- A list of specialized equipment and training recommended for post-collapse personnel recovery.
- Operationally and fiscally achievable recommendations to aid in enhancing safety while executing the counter tunnel mission, or a rescue operation.

The expected format of the study will be digitally accessible in the English language. Currently CBP uses Windows-compatible software for viewing file formats.

#### **R4131 OFFSET DIRECTIONAL BORING**

Tunnels found crossing the borders are often in urban areas that are congested with subterranean municipal infrastructure (sewers, gas lines, storm drains, etc.) and above-ground infrastructures (private property, roads, buildings, power lines, etc.). The ability to access these tunnels from the surface in multiple locations is at times problematic due to many factors including: geology, infrastructure(s), limited technical means (e.g., sensor type, accuracy), and inability to safely traverse the tunnel path.

The requirement is to provide a stand-off system that is capable of guiding a drill head into the tunnel, safely avoiding surface and subsurface infrastructure, and push the drill head through the tunnel until it reaches the remediation point.

This requirement is looking for a technology able to perform activities as described below. Prior to using the technology, the U.S. tunnel point of discovery will be known.

- Identify and map the known infrastructure.
- Map the discovered tunnel (provide x,y,z location up to international border).
- System shall collect measurements to determine the height, width, and length of tunnel being investigated.
- Tool will generate and log data needed for a report that includes known tunnel specifications (path (x,y,z), etc.).

Potential Tunnel/Voids Characteristics:

- Ranging from 500 ft to 4,000 ft in length.
- Multiple configurations from straight to non-linear/multiple turns.
- Variable sizes ranging from 1 ft to 4 ft in diameter.
- Variable in depth ranging from 5 ft to 100 ft from the surface.
- Range of geologic conditions encountered along southwest border.
- Range of geologic features (e.g., canals, rivers, deserts).
- Filled with water, debris, railing systems, other infrastructure.

- Partially collapsed.

#### **R4132 TUNNEL BLOCK REMOTE SENSING**

This requirement is seeking a system that alerts end users if a secured tunnel has been accessed or there has been an attempt to access it. The system shall:

- Be easily installed/uninstalled (Threshold (T)) and reusable for future deployment (Objective (O)).
- Be sufficiently hardened to minimize the impacts of illicit tampering (e.g., drilling, cutting, use of hand tools such as hammers or pickaxes, etc.).
- Alerts end user via situational awareness tools within three seconds (T), one second (O) to facilitate an appropriate response.
- Operate continuously without operator intervention for 6 months (T), 1 year (O).
- Detect illicit tampering, motion, and other tunneling activity.
- Integrate a sensor to enable end user to visually verify human tampering (alert) (O).
- Function in operational environments typical of tunnels including conditions of high temperatures and humidity.

#### **R4133 REMEDIATED TUNNEL REMOTE SENSING SYSTEM**

Previously remediated tunnels have been used as structural framework for newly constructed illicit tunnels. This requirement seeks technology that will be emplaced (by person or machine) during remediation of a discovered tunnel to monitor for any new illicit tunnel activities. The system shall:

- Detect tunneling activity (e.g., construction, walking, crawling, talking, digging, etc.) in close proximity to the system.
- Detection range shall consist of a 3D surveillance area achieving the greatest range of surveillance in all directions from the point of installation.
- Report geo-referenced alerts in the x-y-z axes.
- Provide alerts with positional accuracy to within 10 ft (Threshold (T)), 3 ft (Objective (O)) of actual activity.
- Operate for 5 years (T), 15 years (O) without operator intervention.
- Discriminate from normally occurring environmental noise and clutter in urban areas.
- Differentiate between subterranean and surface activity.
- Operate in a range of specified geologic conditions where tunnels are discovered.
- Run self-diagnostics and report position on a periodic basis.
- Require no operator intervention to perform maintenance to operate for the five year expected useful life (T) or can be easily serviced to extend useful life (O).
- Be sufficiently redundant that an individual sensor failure/tamper would not result in mission critical failure.
- Communicate with end user situational awareness tools (e.g., ICAD) and GIS tools (e.g., ESRI).
- Provide means for the defined situational tools to store and automatically track targets-of-interest over time (O).

#### **R4135 NEXT GENERATION AIRBORNE IN-TUNNEL SURVEILLANCE**

Develop a small unmanned aerial system (sUAS) or a hybrid small unmanned aerial/ground system to safely conduct reconnaissance of discovered illicit tunnels and routine inspections of

underground municipal infrastructure (UMI). The system shall:

- Enter horizontally or vertically and navigate without degradation within structures with an opening diameter equal to 20 inches (Threshold (T)); 12 inches (Objective (O)).
- Within one deployment provide non-line-of-sight (NLOS) imagery from the point of insertion for distances greater than or equal to 250 feet one-way and 500 feet round trip (T), 500 feet one-way and 1,000 feet round trip (O).
- Provide imagery to enable operators to visually distinguish packaged contraband, people, and weapons within the tunnel or UMI.
- Be self-propelled, self-contained, and autonomously capable of traversing line-of-sight (LOS) and NLOS while avoiding collisions with walls or objects while in autonomous and user-controlled flight modes.
  - Enable both user-controlled and autonomous flight modes throughout the mission.
- The system shall store data for manual export (T), transmit the data in near real time (O).
- When operating in autonomous or user-controlled mode, the system shall not extend beyond an established boundary or predetermined distance (e.g., Federal Aviation Administration air space, U.S. border).
- Be capable of surviving and operating in environments where ambient and subterranean humidity range from 50 percent to 95 percent.
- The system shall be water resistant (T), waterproof (O).
- Have a vendor-defined graphical user interface (GUI) that is portable, ruggedized, and user friendly (e.g., smart-phone, tablet, or laptop).
- Be capable of continuous operations without scheduled maintenance for a minimum of 30 hours.
- Be protected against unauthorized access to the system and its data.
- The system set up, operation, and break down shall not require skill sets beyond those currently required for typical military and law enforcement personnel.
- Automatically return to the point-of-origin in both operating modes (autonomous or user-controlled) when approaching levels of limited power.

#### **R4136 THROUGH-THE-WALL/FLOOR VOID DETECTION**

Develop a self-contained, man-portable, non-intrusive inspection (NII) scanning system with the capability to detect and locate tunnel entrances/exits and other man-made voids (Threshold (T)); and drug and weapon caches concealed in the floors and walls of buildings and underground municipal infrastructure (UMI) (Objective(O)). The system will be used on routine UMI inspections, in confined spaces, and during intelligence-driven operations to locate concealed anomalies that may be indications of illicit tunneling activity. The system shall:

- Be operable by a single user and shall weigh no more than 15 pounds (T); shall weigh no more than 6 pounds (O).
- Scan and image an area of up to 9 ft<sup>2</sup> (i.e., 3 ft high by 3 ft wide) in less than 4 system sweeps (T); 1 system sweep (O) without performance degradation.
- Scan and image a continuous 10 foot long area-of-interest in 20 seconds (T), in 10 seconds (O) without performance degradation.
- Be equipped with a sweep speed and distance from surface indicator to facilitate effective quality data collection (e.g., smooth, consistent scan sweeps).
- Scan and image a maximum linear distance of up to 1,000 continuous linear feet.

- Provide the ability to stitch images together to create situational awareness beyond any singular scan (e.g., 1000 ft of continuous UMI, the entire floor) in post-processing (T), near real time (O).
- Penetrate man-made and natural debris and obstructions typically found in the operational environment (e.g., trash, dirt piles, differing types of rocky terrain).
- Penetrate construction materials typically found in the operational environment at the thicknesses listed below, operating at a standoff distance of 6 inches (T) or up to 12 inches (O).
  - Corrugated Steel Pipe 1/32”(T), 1/16” (O)
  - Concrete with and without rebar: 1” (T) , 8” (O)
  - Plywood: ½” (T), 1” (O)
  - Tile: 3/8 ” (T) , 1” (O)
  - Plaster: 1/2” (T) , 1” (O)
  - Natural Stone: 3/8 ” (T) , 1” (O)
  - Drywall: 1/2” (T) , 1” (O)

The quality of the visualization of these scanned areas at these standoff distances should enable the operator to discern a concealed entry or exit equal to 24 inch diameter (T).

- Display scanned area data in near real time as 2D (T); 3D (O).
- Display the system health and status to the operator.
- Have a viewable screen with no degradation to visibility in light denied conditions or full sunlight conditions (O).
- Enable users to flag and store scans-of-interest in near real time.
- Function in typical subterranean conditions including up to 95°F, 95% relative humidity, be water resistant (T), waterproof (O).
- Operate on battery power lasting 4 hours at 25% duty cycle (T), lasting 4 hours at 50% duty cycle (O).
- Protect against unauthorized system access (physical and wireless) and its data.
- Shall be safe for known operators and bystanders based on applicable Federal laws and regulations.

## **5.8 Surveillance, Collection, and Operations Support (SCOS)**

### **R4149 SMALL FORM FACTOR ELECTRONICALLY STEERABLE ARRAY (ESA)**

Develop a concealable, electronically steerable array antenna for operational use in denied environments. The proposed antenna shall be usable on newer Ka band commercial constellations such as INMARSAT 5 and O3B. Additionally, this array shall transmit and receive on the same aperture.

#### Proposed Specifications and Key Performance Parameters

1. Threshold:
  - a. Size: <25 cm in diameter, <645 cm<sup>2</sup>, <10 cm thick
  - b. Weight (Antenna): <5.44 kg
  - c. Weight (Total): <11.34 kg
  - d. Transmit Power: >20 watts
  - e. Modem Agnostic
  - f. Integrated BUC/LNB

- g. Temperature: -40°C to 60°C
- h. Power Input: 24 VDC-26 VDC/110 VAC-220 VAC
- i. Polarization: LHCP/RHCP switchable

- 2. Objective:
  - a. Size: <21cm in diameter, <451 cm<sup>2</sup>, <8 cm thick
  - b. Weight (Antenna): <4.5 kg
  - c. Weight (Total): <9.07 kg
  - d. All other objectives=threshold.

#### **R4150 FREE SPACE OPTICAL DATA TRANSMISSION**

Utilize gimbaled free space optics to develop a means of effective communications relay between ground stations and/or manned aircraft to effectively communicate beyond line of sight.

##### Proposed Specifications and Key Performance Parameters

- 1. Threshold:
  - a. Size: 4-5 inch gimbals in order to cover multiple areas/connections simultaneously
  - b. Weight: <13.61 kg (weight budget includes gimbal)
  - c. Power: 500 watts
  - d. Data Rate: 1 Gbps
  - e. Encryption: Type 1 (pass-through capable)
  - f. Laser Emissions: eye safe at approximately 500 ft
  - g. Reliability: 4pi steradian capability
  - h. Simultaneous Connections: 3
  - i. Range: Ground to Air/Air to Ground – 60 nautical miles; Air to Air – 80 nautical miles.
  - j. Interface: Ethernet preferred.
- 2. Objective:
  - a. Weight: <4.5 kg (weight budget includes gimbal)
  - b. Power: 300 watts
  - c. Data Rate: >10 Gbps
  - d. Simultaneous Connections: 5
  - e. All other objectives=threshold

Multiple gimbals likely needed to cover all 4pi steradians (spherical) coverage, as well as however many gimbals necessary to maintain multiple links in an orbit (which is the most likely the predominance of flight TTP). Ideally all gimbals required would be wrapped into the threshold/objective weight, but we understand the number of gimbals required is based on the number of links to be maintained simultaneously.

Encryption does not have to be accomplished by designed solution, but must be able to pass encrypted data (i.e., via a KG-250 passing encrypted Ethernet traffic).

#### **R4151 DISCREET PERSONNEL TRACKING IN COMPLEX ENVIRONMENTS**

Develop a capability for personnel tracking in difficult environments using discreet means and

without locally deployable infrastructure in GPS-disadvantaged environments.

#### Proposed Specifications and Key Performance Parameters

1. Wearable but unobtrusive such as a personal electronic device.
2. Sub 5 meter accuracy (Objective), sub 20 meter accuracy (Threshold), across the two hour mission endurance, of path taken with appropriate processing/local storage if communications exfiltration path not immediately available.
3. Ability to forward data using appropriate integral communications and/or use of any local communications infrastructure.
4. No reliance on any deployable RF infrastructure to carry out position finding.
5. No option to survey area in advance.
6. Output data to be compatible with local C2 mapping tools (e.g., Cursor on Target).
7. Able to operate for up to 2 hours in GPS-disadvantaged environments from the first initial loss of GPS or similar precision position fix.

#### **R4152 NEXT GENERATION HYPERSPECTRAL IMAGERY (HSI) AERIAL SENSOR**

Develop a Next Generation Hyperspectral Imagery (HSI) Aerial Sensor. Current HSI aerial sensor capability is limited to the Short-Wave Infrared (SWIR) spectrum and cannot collect against the full spectrum to include Long-Wave Infrared (LWIR) range. HSI aerial sensors in the SWIR require external light or thermal sources which limits collection to daytime operations.

#### Proposed Specifications and Key Performance Parameters

1. Modular and scalable sensor.
2. Interchangeable with multiple platforms.
3. Range: Functional altitudes up to 8 km Mean Sea Level (MSL) and standoff of 13 km
4. LWIR ranges (7,500 nm to 12,500 nm) to detect and identify gaseous, solid substance, differentiation vegetation density, and identify equipment.
5. Field calibration compliant.
6. SWIR and LWIR Full Motion Video (FMV) sensor to provide day/night detection capability.
7. Full Spectrum HSI aerial sensor SWIR to LWIR (7,500 nm to 12,500 nm) range to enable full analytical process providing reflective and emissive detection to minimize false detection.
8. Next Generation SWIR to increase the standoff capability with focal plane array for 4k High Definition FMV with a longer life expectancy than current stock.

#### **R4153 UNATTENDED CAMERA TRACKING**

Develop a low cost, low size, weight, and power (SWaP) unattended camera/sensor unit that can provide location data if moved.

#### Proposed Specifications and Key Performance Parameters

1. Trail Camera Tracking System (similar to existing commercial trail camera systems like the RECONYX SC950 and BUCKEYE X80).
2. Digital capture at a minimum of 3 megapixels with video.
3. Easily concealable with persistent collection capability.
4. Trigger/Tamper alert via accelerometer, geo-fencing or other similar technology.

5. Alert activates “beacon technology” (HF/TTL) and notification via cellular (GSM) with Wi-Fi option as an additional capability.
6. Notification when moved via email and/or Short Message Service (SMS).
7. Alerts are configurable for frequency (how often) with the ability to also “ping’ device in real time.
8. Minimum 12 to 24 hours of battery life for the beacon at a minimum ping rate of every 10 minutes.
9. Beacon must have separate power source from main unit. It is acceptable to use the main battery during normal operations to ensure a full beacon battery when camera goes into TTL mode.
10. Beacon should transmit SMS with Latitude/Longitude and be able to interface with common mapping software (Google, EGIS, Apple Maps, etc.).
11. A remote memory overwrite capability and a remotely activated IR Beacon mode is desired by not required.

**R000-SC SC UNSPECIFIED REQUIREMENT**

Any cutting-edge technologies or capabilities within the Surveillance, Collections, and Operations Support Focus Areas which a vendor believes would interest CTTSO. Focus areas include: Biometrics, Recognition, Identity Intelligence, Tracking, and Exploitation (BRITE); Cyber and Convergence Technologies; Human Language Technology and Media Exploitation; Surveillance/Counter-Surveillance; and Technical Collection/Special Communications. Additional area of emphasis includes Canine Advanced Technologies (CAT). Classified submissions are invited per BAA instructions.

Unspecified requirements (R000s) are for proposing unique innovations that have not yet been identified by CTTSO. Submissions against an unspecified requirement should 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 CTTSO does not budget for unspecified requirements, awards may not be made against the unspecified requirements. Note: Quad charts submitted in response to this R000 may be shared with other CTTSO Subgroups if the submission demonstrates relevance to more than one focus area.

**5.9 Tactical Operations Support (TOS)**

**R000-FY18-TOS TOS FY18 UNSPECIFIED REQUIREMENT**

Develop innovative technologies that enhance the capabilities of DoD and interagency special operations tactical teams engaged in finding, fixing, and finishing terrorists. This includes the development of capabilities for state and local law enforcement agencies to combat domestic terrorism.

Technologies for the following focus areas:

Offensive Systems

Develop advanced equipment and capabilities that enhance the effectiveness of small tactical units engaged in direct action operations. Develop specialized weapons, munitions, detonators,



distraction/diversion devices and other unique tactical equipment.

Unconventional Warfare, Counter-Insurgency Support

Develop advanced tools and equipment specifically for small tactical units conducting a broad spectrum of military, paramilitary, special warfare and digital operations focused on force protection, assisted and unassisted recovery, and operational preparation of the environment.

Tactical Communications

Develop flexible, enhanced, full spectrum communications capabilities specifically designed for tactical forces, with emphasis on reducing operational load while improving operator mobility and efficiency. Develop secure and assured tactical communications connectivity in challenging complex urban, subterranean, and maritime environments.

Tactical Reconnaissance, Surveillance, and Target Acquisition Systems

Develop technologies to assist small tactical teams in conducting organic reconnaissance, surveillance, and target acquisition missions by tactical operators. Develop systems that enhance the visual perception or other imaging capabilities of tactical operators in all conditions and environments.

Specialized Infiltration, Access, and Exfiltration Systems

Develop technologies that assist tactical assault forces in gaining rapid insertion, access and egress to and from objectives. Improve evaluation of tactical options, and support efficiency and stealth, including remote operations. Develop enhanced target analysis, manual and dynamic breaching technologies for small tactical assault teams.

Survivability Systems

Develop man portable tools and equipment to enhance operator survivability during the conduct of tactical missions.

Other areas of interest include:

- New and emerging advanced small caliber ammunition (to include 40mm grenades) and related equipment to include small arms fire-control, visual augmentation, small arms signature suppression, projectile technology, small arms enablers, ancillary equipment and training techniques. Quantifiable advances are defined as weight reduction, overmatch against threat capabilities, stand-off range, improved terminal effects at all ranges, blind-to-barrier technologies, increased accuracy, enhanced signature suppression, stand-off barrier breaching, and related focus areas.
- 21st century technology specific to digitally enhanced target cueing and acquisition, precision target identification and engagement, full firing solution technologies, automatic adjusted aiming points (disturbed reticles), surgical strike technologies, auto-target identification and tracking, non-traditional night observation and targeting technologies, shooter-to-shooter network target marking and hand-off applications, post-firing battle damage assessment, and other relevant technologies.

Unspecified requirements (R000s) are for proposing unique innovations that have not yet been identified by CTTSO. Submissions against an unspecified requirement should 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 CTTSO does not budget for unspecified requirements, awards may not be made against the unspecified requirements. Note: Quad charts submitted in response to this R000 may be shared with other CTTSO subgroups if the submission demonstrates relevance to more than one focus area.

#### **R4116 LIGHTWEIGHT INTERMEDIATE CALIBER CARTRIDGE INDIVIDUAL WEAPONS SYSTEM (LICC IWS)**

Tactical operators require an integrated, user-tailorable, lightweight shoulder-fired individual weapon and lightweight intermediate caliber cartridge (LICC) that can overmatch the current maximum effective range and terminal effects of peer, near peer and future threat individual weapons and ammunition, while also defeating current and emerging threat individual protective equipment. This weapons system shall be comprised of four main components: a lightweight .264 inch (6.5mm) intermediate caliber cartridge loaded in a lightweight polymer cartridge case; a lightweight purpose-built caliber .264 USA detachable box-magazine; a purpose-built lightweight modular weapon platform in three variants to meet various tactical roles; and a reduced back pressure signature suppressor that can be used at all times to mask weapon sound, flash, and blast firing signatures. The LICC IWS weapons system shall be developed, tested, and delivered for developmental and operational testing by a single contractor who shall develop/obtain and integrate all subcomponents into a fully mature, safe, and reliable system.

#### **LICC Ammunition**

The US Army Marksmanship Unit developed .264 USA (6.5x48mm) cartridge shall be used for LICC IWS development, test, and evaluation. This cartridge is available in a polymer case from MAC LLC in Bay St Louis, Mississippi. Four (4) lightweight .264 USA rounds shall be required as deliverables loaded with the following projectile types:

- 1) 108 grain Scenar Open Tip Match (OTM) round (Qty: 25,000 rounds) with a muzzle velocity from a 16.7" test barrel of 2780 feet per second (fps) (Threshold - T) 2875 fps (Objective - O) with an extreme spread of +/- 50 fps (T) 25 fps (O). 10-shot extreme spread dispersion from a 16.7" test barrel shall not exceed 2 Minutes of Angle (MOA) (T) 1.5MOA (O) at 100 meters (m) and 300m.
- 2) .264 USA Combat Barrier rounds loaded with Special Operations Science and Technology (SOST-style) projectiles (Qty: 25,000 rounds) (T).
- 3) US M855A1 Enhanced Performance Round (EPR-style) projectiles (Qty: 5,000 rounds) (O). The .264 USA Special Operations Science and Technology (SOST-style) and US M855A1 EPR-style Combat Barrier rounds shall continue on the original shot line after barrier penetration (T), shall be barrier blind to 225m (T) 450m (O), and shall limit fragmentation (T).

The .264 USA SOST-style and US M855A1 EPR-style Combat Barrier rounds shall penetrate No Less Than (NLT) 12" (T) of 10% ordnance gelatin at 800m (T); No Greater Than (NGT) 18" at 25m-150m (T); 25m-450m (O) when fired from a 14.5" barrel (T), 11.5" barrel (O). The .264 USA SOST-style and US M855A1 EPR-style Combat Barrier rounds shall be tested in accordance with current FBI Ballistic Research Facility (BRF) test protocol (T) shall pass all

current FBI Ballistic Research Facility (BRF) test protocol (O). A .264 USA MK255 MOD 1-style frangible training round with Reduced Ricochet Limited Penetration (RRLP) projectiles (Qty: 36,000 rounds) with non-toxic primer shall also be required (T). All .264 USA LICC ammunition shall be corrosion resistant (T); water proof (T); and loaded with reduced flash and temperature stable propellant (T) and non-toxic primer (O). Each .264 USA LICC round shall contain markings to include caliber, year of manufacture and manufacturer identification (T). All LICC ammunition should be packaged in 10-round stripper clips (O).

**LICC IWS .264 USA Detachable Box Magazine**

A purpose-built detachable box magazine holding NLT 25 rounds (T) > 25 rounds (O) shall be delivered with the .264 USA caliber LICC IWS (Qty: 238). The box magazine shall be no-longer-than the current US M4 5.56mm box magazine (T). The LICC IWS magazine shall utilize a self-lubricating non-tilt follower and high-quality corrosion resistant magazine spring (T). Each LICC IWS variant shall be provided with seven (7) magazines (T). The LICC IWS magazine should be fillable using ammunition on stripper clips (O) using speed loaders (O). Modular Lightweight Load-carrying Equipment (MOLLE) 2 and 3- magazine pouches shall be available for use with the LICC IWS magazine for operational evaluation (T).

**LICC IWS**

.264 USA caliber LICC Individual Weapons Systems shall be available in three (3) variants (T);

- 1) Close Quarter Battle (CQB) Carbine with 11.5 inch barrel and 5-position collapsible stock (Qty: 20);
- 2) Carbine with 14.5" barrel and 5-position collapsible stock (Qty: 10);
- 3) Recon "Recce" Rifle with 16.0" - 18.0" barrel and 5-position collapsible stock with adjustable cheek piece and butt plate (Qty: 4).

Barrel length changes shall be made by operator exchange of upper receivers (T) or by the exchange of barrels in a common receiver (O). Buttstock changes should be made by the operator within 120 seconds and without special tools (O). The weapon operating system shall be piston operation (T) and include an adjustable gas regulator (T) to optimize weapon function for ammunition, barrel and signature suppressor variables. The adjustable gas regulator should provide settings for off position (no gas), combat barrier ammunition, frangible training ammo and suppressed use (T). LICC IWS operating controls shall mirror those of the Colt Canada C8 Special Forces Weapon (SFW) (T) and shall be ambidextrous (T). LICC IWS trigger mechanisms shall provide semiautomatic and fully automatic modes of fire (T); provide a 2 stage consistently smooth and crisp 4.50 lb +/- .5 lb trigger pull (T). The safety/selector switch should move from safe to fully automatic position within 90° degrees of rotation (O). The bolt lock/release should be operable with the firing index finger with the firing hand on the pistol grip (O). Sight and accessory attachment at the 12 o'clock position shall be via a monolithic MIL-STD-1913 (Picatinny) rail that ends .39" from the rear edge of the flash suppressor (T) on all LICC IWS variants. Accessory attachment at the 9, 6, and 3 o'clock positions shall be via Modular Locking (M-Lok™) (T). The LICC IWS CQB Carbine variant shall weigh < 7.0 lbs (T) < 6.5 lbs (O) without sights, magazine or signature suppressor. The LICC IWS CQB Carbine variant should be no-longer-than the Colt Canada C8 Special Forces Weapon (SFW) with 11.5" barrel and Ops Inc. signature suppressor. The LICC IWS Carbine variant shall weigh < 8.0 lbs (T) < 7.0 lbs (O) without sights, magazine or signature suppressor. The LICC IWS Carbine

variant shall be no-longer-than the Colt Canada C8 SFW with 14.5" barrel and Ops Inc. signature suppressor. The LICC IWS Recce Rifle variant shall weigh < 9.0 lbs (T) < 8.0 lbs (O) without sights, magazine or signature suppressor. The LICC IWS Recce variant shall be no-longer-than the Colt Canada C8 SFW with 16.0" - 18.0" barrel and Ops Inc. signature suppressor. Each LICC IWS barrel shall be fitted with a flash suppressor for use with a quick connect/disconnect signature suppressor (T). The LICC IWS barrel shall be light weight in nature (T); employ lightweight materials or relieved (i.e., fluted, ball milled) profile (O). The LICC IWS should reduce felt recoil to the operator (O). The LICC IWS should reduce felt recoil to the operator to levels =< the 5.56mm Colt Canada C8 SFW (O). Reliability, durability and safety of the LICC IWS shall be equal to (T=O) better than the Colt Canada C8 SFW with 14.5" barrel fitted with Ops Inc. suppressor firing 5.56mm MK318 MOD 1 SOST ammunition. Each LICC IWS shall be provided with a field cleaning kit and operators manual in the English language (T).

### **LICC IWS Signature Suppressor**

A quick-connect/disconnect LICC IWS signature suppressor shall be provided with each LICC IWS variant (T). The LICC IWS signature suppressor shall be no-longer-than the US SOPMOD suppressor (T=O). The LICC IWS signature suppressor shall weigh no more than the US SOPMOD suppressor (T=O). When fitted to any LICC IWS variant the sound signature shall be no-greater-than 140 dB(A) (T) less than 140 dB(A) (O) when measured at the operator's ear firing .264 USA SOST-style ammunition. The LICC IWS signature suppressor shall reduce backpressure and blow-back into the weapon (T). The LICC IWS signature suppressor shall provide a minimal point-of-impact (POI) shift when mounted (T). The LICC IWS signature suppressor should provide no point-of-impact (POI) shift when mounted (O). The LICC IWS signature suppressor shall allow the firing of all LICC ammunition types to include USA MK255 MOD 1-style frangible training ammunition (T).

### **Documentation and Test Support Materials**

Each LICC IWS shall include an operators manual (in the English language) covering all subsystems within the weapons system (T). The vendor shall provide new equipment training (NET) for ten students each at two North America locations (T). The vendor shall provide armorers (maintenance and repair) training for five students at two North America locations (T). The vendor shall provide weapon and signature suppressor maintenance and repair manuals (English language) at the rate of one per every five weapons (T). The vendor shall provide .264 USA LICC cartridge and LICC IWS chamber drawings (i.e., Technical Drawings, Government preference for Unlimited Rights; vendor should identify intellectual property assertions and the technical drawing levels that they are willing to provide to the Government) (T), .264 USA LICC cartridge and LICC IWS specifications (T) and .264 USA LICC energetic data (T). The vendor shall provide test results on the LICC IWS barrel twist and bore profile as optimized and selected for LICC ammunition types (T). The vendor shall provide two LICC IWS Test Support Packages (TSP) each including enough spare parts, tools and gauges sufficient to support five weapons firing 10,000 rounds each, one 16.7" accuracy test barrel, one 16.7" pressure test barrel and two pressure transducers for the polymer-cased .264 USA LICC ammunition (T). The contractor will be responsible for obtaining U.S. Government approval for and exporting and delivering all test articles to the Department of National Defence of Canada (T).

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The vendor is responsible for delivering contractor test results for this effort after each spiral iteration (phase). Two phases of development are anticipated (Phase 1 - Proof of Concept, Phase 2 – Product Improvement). Government test and verification shall occur after receiving the final contractor test report and required documentation (T). No government furnished equipment shall be provided for this effort; however, Government furnished information can be provided. All ammunition should meet MIL-STD1461E, MIL-STD-1168, MIL-STD-709D, and MIL-STD-636 specifications (O). Post development and if the research, development, test, and evaluation effort is successful, the Government may also request the vendor to provide test articles and subject matter expert support, as required, in Government safety testing (field and deployment release) for transition under a contract modification.

A Firm Fixed Price proposal is preferred. Vendor should provide options in their proposal for economies of scale.

| Summary of Deliverables  | Quantity      |
|--|---------------|
| <b>CQB Carbine with 11.5" Barrel and 5-position collapsible stock</b>  | <b>20</b>     |
| <b>Carbine with 14.5" Barrel and 5-position collapsible stock</b>  | <b>10</b>     |
| <b>Recce Rifle with 16.0" - 18.0" Barrel and 5-position collapsible stock with adjustable cheek piece and butt plate</b> | <b>4</b>      |
| <b>LICC IWS Signature Suppressor</b>   | <b>8</b>      |
| <b>Rounds, Polymer, .264 USA 108 grain OTM (Scenar)</b>  | <b>25,000</b> |
| <b>Rounds, Polymer, .264 USA SOST MOD 1 Combat</b>   | <b>25,000</b> |
| <b>Rounds, Polymer, .264 USA EPR Combat</b>  | <b>5,000</b>  |
| <b>Rounds, Polymer, .264 USA MK255 MOD 1 RRLP Frangible</b>  | <b>36,000</b> |
| <b>LICC IWS .264 USA detachable box magazine</b>   | <b>238</b>    |
| <b>Test Barrel, 16.7" Accuracy Test</b>  | <b>1</b>      |
| <b>Test Barrel, 16.7" Pressure Test</b>  | <b>1</b>      |
| <b>Transducers, pressure</b>   | <b>2</b>      |
| <b>Armorers (maintenance and repair) training for five students at two North America locations</b>                       | <b>2</b>      |
| <b>Drawings, .264 USA LICC Cartridge (TAA for Canada)</b>  | <b>1</b>      |
| <b>Drawings, .264 USA LICC IWS Chamber (TAA for Canada)</b>  | <b>1</b>      |
| <b>Specifications, .264 USA LICC Cartridge and LICC IWS (TAA for Canada)</b>   | <b>1</b>      |
| <b>Data, .264 USA LICC Energetic Data</b>  | <b>1</b>      |
| <b>Test Support Package (10,000 round support)</b>   | <b>2</b>      |

**R4115 LIGHTWEIGHT AMMUNITION PACKAGING (“LAP”)**

Current tactical operators require lightweight weapons, small arms ammunition, and small caliber ammunition packaging to reduce the weight burdens on personnel and vehicles that must transport Class V (CL V) materials in the Global War on Terrorism. Lightweight weapons and polymer-cased ammunition are entering the battlefield and provide appreciable weight savings to the operator while facilitating viable solutions to address small arms capability gaps and potential overmatch by adversaries. Weight reduction improves mobility and thus enhances operator survivability and performance. However, this lightweight ammunition is being stored and transported in legacy packaging that is unsuitable for combat operations in austere environments or in heavy metal boxes (MB) that increase the overall system weight, transport costs, and ammunition costs. The tactical operator needs lightweight ammunition packaging (LAP) for small caliber ammunition, to include ammunition cans and pallets, which reduce packaging weight, thus improving operational and cost efficiency while eliminating unnecessary waste. LAP must also provide sufficient long-term ammunition protection-in-storage, robust durability, and longevity in all operational environments.

While desirable for all small caliber ammunition, the priority requirement is for lightweight ammunition packaging for heavy and medium machine gun ammunition, specifically linked 7.62x51mm NATO caliber, .50 Browning Machine Gun (BMG) caliber and .338 Norma Magnum (NM) caliber ammunition. The LAP shall consist of lightweight stackable inter-locking ammunition cans (Threshold - T), as well as lightweight pallets to efficiently, safely, and securely transport the individual ammunition cans. The 7.62x51mm NATO, .50 BMG, and .338 NM ammunition cans must fit within the current US and NATO-issue ammunition can cradles (MK93 MOD 1 and similar systems) that accommodate the US M2 series MB and US M19 series (T). The LAP ammunition can should be smaller than the current US M2 series MB and US M19 series (Objective - O). The LAP ammunition can shall weigh 30 % less than the US M2 series MB and US M19 series (T), 50% less than the US M2 series MB and US M19 series (O). The LAP ammunition can shall hold no-less-than 100 rounds of linked .50 BMG (T); 100 rounds of .338 NM ammunition (T); and 200 rounds of linked 7.62x51mm NATO (T); and more than 100-rounds of linked .50 BMG (O); more than 100 rounds of .338 NM ammunition (O) and more than 200 rounds of 7.62x51mm NATO (O) without exceeding the dimensions of the US M2 series MB and M19 series (T).

The linked ammunition shall be positioned within the LAP ammunition can perpendicular to the length of the LAP ammunition can (T). The LAP ammunition can shall include a top lid that is removable without tools (T), a stowable top side carrying handle on the lid (T), and a means to remove the LAP ammunition can from the ammunition can cradle/holder (MK93 MOD 1 or similar systems) when the top lid is not present (T). The lid of the LAP ammunition can should provide a visible means to see the ammunition inside through a translucent viewing window or translucent lid (O). The lid of the LAP ammunition can shall latch securely to the container body (T) and include the means to lock the lid to the ammunition can with a seal or padlock (T). The LAP ammunition can and pallet shall be of a non-reflective Olive Drab (OD) Green color (T). The LAP ammunition can should also be compatible and available with lids in assorted non-reflective colors to include dark blue, dark red, dark gray, dark brown, black, as well as other established munition marking colors common to US and NATO forces in order to quickly identify the ammunition type contained inside, as well as a means for identifying partial

containers in storage utilizing the standard orange print munitions container marking scheme (O). The exterior of the LAP ammunition can shall include identifying information to include quantity, caliber, nomenclature, description/configuration, DODIC, manufacture code and lot number in accordance with current legacy marking systems and ML-STD-129R (2014) (T). The LAP ammunition can lid should include a replaceable BAR Code or RFID (O). Identifying information should be easily editable/replaceable without degrading the container performance in order to facilitate logistical repack and recirculation by the ammunition support activity (O). The LAP ammunition can and pallet shall operate within a temperature range of -40 °F to 145 °F (T); -65 °F to 165 °F (O). The LAP ammunition can shall meet waterproof to one (1) meter of water (T) or the standard stated in MIL-STD-1904B (O).

The LAP pallet shall not exceed the dimensions of a 40"W x 48"L x 5.5"H common wooden pallet (T) and shall be accessible from four sides by the U.S. Army's VRRFTL 6k and ATLAS 10k material handling equipment (MHE), standard apparatuses common to smaller commercial forklift systems, and compliant with MIL-STD-1660A pallet requirements for fork dimensions (T). The LAP pallet shall weigh 15% less than current legacy (wooden) 40" x 48" x 5.5" pallets (T), 25% less than legacy (wooden) 40" x 48" x 5.5" inch pallets (O). Filled LAP ammunition cans shall stack together vertically, when creating a pallet unit load, one on top of the other (T) to a minimum height of four (4) filled LAP ammunition cans (T). The LAP pallet shall support no-less-than the weight of ninety six (96) LAP ammunition cans filled with linked .50 BMG ammunition (T) IAW legacy M2 series MB palletization and hundred sixty (160) ammunition cans filled with linked 7.62x51mm NATO ammunition (T) IAW legacy M19 series palletization (REF: Defense Ammunition Center (DAC) DRAWING 19-48-4116/14 / UTILIZATION PROCEDURES FOR BOXED AMMUNITION AND COMPONENTS ON 4-WAY ENTRY PALLETS. Note: Drawing represents forty eight (48) wooden crates each containing two (2) x M2 series MBs).

The LAP ammunition can shall protect the contents from damage caused by transport, rough handling, shock, drop and impact damage in a manner that preserves ammunition types, including polymer-cased ammunition, in a safe and serviceable condition utilizing protocols promulgated in ITOP 4-2-602 (Rough Handling Test) and ITOP 1-2-601 (Laboratory Vibration Schedules) (T) and should meet MIL-STD-1904B requirements (Test Method Standard Design and Test Requirements for Level A Ammunition Packaging) (O). The LAP ammunition can should be dust and waterproof to the same extent as the legacy MB (O) in accordance with MIL-STD-1904B and MIL-STD-1660A requirements. The LAP can may be integrated into an outer packaging, or other modular/sub-pack/intermediate container configuration, for theater logistical movement, in order to meet objective requirements IAW MIL-STD-1904B. Any modular or sub-component design must ensure that the stand alone LAP sub-pack(s) (individual) meets threshold requirements for ammunition preservation utilizing ITOP 4-2-602 and ITOP 1-2-601.

The LAP ammunition can and LAP pallet shall minimize the need for excessive intermediate packaging within the container or pallet stack (T). The LAP pallet with LAP ammunition can in single-pallet, unit load configuration shall be assembled with metal banding and adjustable strapping as per DAC drawings for general 1.4S munitions load-out (T), should be assembled without metal banding using reusable tensioning straps or mechanisms (O).

The LAP ammunition can and LAP pallet shall meet the performance and test standards as outlined in MIL-STD-1660A (T), should meet the performance and test standards as outlined in MIL-STD-1904B (O) in order to facilitate inter and intra theater movements of CL V utilizing established DoD assets and processes. The LAP ammunition can and pallet shall be fire resistant (T), fire proof (O). Both the LAP ammunition can and LAP pallet shall be easily destroyed in the field as required to facilitate quick and easy movement, transport logistics and prevent nefarious use by adversary forces (T), economically disposable to the same end (O).

The Government will require prospective vendors to submit concept drawings and price quotations for sufficient LAP ammunition can and pallets to pack and palletize 40,000 rounds each of linked .50 BMG and .338 NM ammunition (T) and 32,000 rounds for the linked 7.62x51mm NATO (T). Three (3) 100 & 200-round form/fit/function sample LAP ammunition cans, and related lightweight packaging where available, in caliber 7.62x51mm NATO, .50 BMG and .338 NM should be provided with vendor response to this BAA announcement (O).

Summary of Deliverables:

The Contractor shall deliver:

- 150 lightweight ammunition packaging cans for 7.62x51mm NATO for Government verification and qualification testing.
- 150 lightweight ammunition packaging cans for .50 BMG for Government verification and qualification testing.
- 150 lightweight ammunition packaging cans for .338 NM caliber ammunition for Government verification and qualification testing.

The Contractor shall deliver:

- 200 lightweight ammunition packaging can for 7.62x51mm NATO ammunition for Government end-user test and evaluation.
- 200 lightweight ammunition packaging can for .50 BMG ammunition for Government end-user test and evaluation.
- 200 lightweight ammunition packaging can for .338 NM caliber ammunition for Government end-user test and evaluation.

The Contractor shall deliver:

- 10 Lightweight pallets for Government verification and qualification testing.
- 10 Lightweight pallets for Government end-user test and evaluation.

A Firm Fixed Price proposal is preferred.

**R4005 HIGH FREQUENCY (HF) TRANSCIEVER CELL PHONE CAPABILITY**

Currently there are no low-profile High Frequency (HF) radios for tactical operators. Fielded HF radios have a significant physical signature, placing tactical operators conducting HF communications at risk. Tactical operators are seeking the development of a low-visibility form factor for an HF transceiver device and antenna package that is encrypted and controlled by an Android based application.

System Performance Specifications:



- Key performance parameter: The transceiver, antenna, and cabling should be innocuous in appearance during transport (Threshold); shall enable quick and easy assembly/disassembly/send/receive communication operations (Threshold).
- Functionality over deniability: Transceiver should be small enough to fit into a mold of a realistic peripheral device (Threshold=Objective), mold shall appear to function as peripheral device would (Threshold=Objective) (e.g., external hard drive, portable speaker, headphones, mouse, keyboard, etc.).
- Point to Point communications is required (Threshold); however, a hub and spoke architecture can also be provided in addition to Point to Point for additional capability.
- System shall be interoperable with military and commercial HF radios via a single channel point to point (Threshold).
  - Contractor should provide what waveforms / modes their end-unit device will be interoperable with (Objective).
  - System shall allow for both analog and digital signal processing to achieve interoperability (Threshold).
  - The Contractor shall deliver its waveform / modem to the Government as an open architecture that can be provided to other Contractors for interoperability (Threshold).
- Transceiver shall operate when connected to an Android device with associated Application (Threshold).
- Transceiver connection shall be a wired tether to Current Generation USB for Android (2.0 or higher) (Threshold); Bluetooth and/or NFC are desired (Objective).
- Transceiver shall be capable of skywave propagation (Threshold).
- Transceiver shall have a transmit power capable of reaching ranges of 250 km (Threshold); 1000 km or more (Objective).
  - Transmission power is determinate on meeting the ranges; lowest power possible to meet ranges is preferred.
- Transceiver shall transmit and receive in the frequency range of 3-30 MHz (Threshold).
  - System shall be capable of at least 30 kbps (text/GPS transmission capable) (Threshold).
- Transceiver dimensions should resemble those of a standard commercial external hard drive (Objective).
  - Transceiver dimensions shall not exceed 4" x 6" x 7" (Threshold).
  - The system antenna shall be designed to be transportable in an innocuous fashion to obfuscate its intended use (e.g., easily and quickly de-tractable/retractable capability for employment/storage) (Threshold).
- Transceiver shall be charged by USB (Threshold).
  - Transceiver shall operate at least four (4) hours (Threshold).
  - Transceiver shall not take more than one (1) hour to fully charge (Threshold).
- Transceiver shall weigh no more than 3 lbs (Threshold); 2 lbs (Objective).
- Transceiver shall be compatible with any Android type phone currently on the market (Threshold=Objective).
- Transceiver shall be Ingress Protection Rated 66 (Threshold).
- Transceiver shall be capable of withstanding a temperature range -10 °C to 50 °C (Threshold).

- Transceiver should meet drop test and shock/vibration testing in MIL-STD-810G and shock rating EIA-603-1992 (Objective).
- Transceiver shall pass a cursory inspection as determined by operational SMEs (Threshold).
- Transceiver shall pass through an X-Ray machine without damaging the system (Threshold).
- Android device shall host a simplified, intuitive Android Application for control of HF communications transceiver and encryption (Threshold).
- Application shall be capable of text messaging (Threshold);
- Application shall be able to push location data utilizing the phone's GPS to save cost on the transceiver (e.g., share my location capable) (Threshold).
- Application and/or transceiver shall generate and activate AES 256-bit encryption keys in accordance with NSA Suite B standard and National Information Assurance Partnership (NIAP) common criteria (CC) (Threshold); able to obtain approval for Commercial Solution for Classified (CSfC) / Type I encryption (Objective).
- Phone shall not be rooted to run application and transceiver (Threshold).
- Application should have capability of sharing AES 256-bit encryption keys with other Android devices with the same Application through direct link (e.g., USB, NFC, etc.) (Objective), Over The Air (Objective).
- Application should require a password in order to open and use (Objective).
- Application shall allow manipulation of transceiver to change power settings, burst settings, and frequency (Threshold).
  - Application shall provide the C2 for automatic link establishment (ALE) to the transceiver (Threshold).
  - Application shall allow for "auto-tuning" to give best frequency information for the transceiver (Threshold).
  - Application shall provide propagation charts (Threshold).
- The Contractor's Android C2 Application shall be delivered with unlimited rights and licensing to the Government (Threshold).
- Base effort shall deliver a quantity of at least six (6) (Threshold); twelve (12) (Objective) prototype kits.
  - Options for additional kits should be proposed.
- A kit shall consist of:
  - Transceiver with tuner
  - Android Galaxy S7 smartphone or better
  - Unlimited Licensing for Android C2 Application
  - Antenna
  - External USB Battery packs
  - All associated cabling and charging peripherals
  - Bill of Materials
  - Quick Reference Guide
  - Manuals
  - Program of Instruction for Training
- The Contractor is responsible for submitting all programmatic materials, testing, and required paperwork in accordance with DoD's Risk Management Framework (RMF),

Authority To Operate (ATO), and Information Assurance (IA) requirements (Threshold); as well as, Federal Communications Commission (FCC) and National Telecommunications & Information Administration (NTIA) requirements (Threshold).

A Firm Fixed Price proposal is preferred.

### **5.10 Training Technology Development (TTD)**

#### **R000 HP R000 FY18 UNSPECIFIED REQUIREMENT – IMMERSIVE LEARNING TECHNOLOGY AND HUMAN PERFORMANCE**

Develop tools and techniques to evaluate the effectiveness of human performance training and interventions via technology driven, realistic, immersive training and exercise environments. These tools and techniques shall allow users to approximate real world operational environments through cutting edge immersive training technology featuring multimodal interaction, measure cognitive and physiological human performance indicators within the environment, and assess learning and performance outcomes. The intended users include both military and civilian communities involved in combating terrorism. Areas of interest include:

- Virtual reality and/or mixed reality.
- Multimodal monitoring and assessment (i.e., simultaneous cognitive load and physiological monitoring).
- Multisensory monitoring and assessment.
- Brain imaging / neuroimaging methods for use in an immersive training and exercise environment (e.g., EEG, fMRI, TCD).
- Memory and decision-making monitoring and assessment.
- Skill and learning acquisition monitoring and assessment.

All submissions shall identify the anticipated end user and/or supporting organization. This information should be placed in the bottom right quadrant of the quad chart submission. Proposed technologies, models, architectures, software, hardware, tools, and other applications not directed toward a training/human performance need are not desired and will be rejected.

Unspecified requirements (R000s) are for proposing unique innovations that have not yet been identified by CTTSO. Submissions against an unspecified requirement should 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 CTTSO does not budget for unspecified requirements, awards may not be made against the unspecified requirements. Note: Quad charts submitted in response to this R000 may be shared with other CTTSO Subgroups if the submission demonstrates relevance to more than one focus area.

#### **R000 TRAINING R000 FY18 UNSPECIFIED REQUIREMENT – TRAINING AND HUMAN PERFORMANCE TECHNOLOGY DEVELOPMENT**

Develop training technologies and human performance improvement solutions to increase mission readiness and enhance the operational capabilities of all elements, to include both military and civilian communities involved in combating terrorism. The technologies shall provide valuable and innovative approaches to enhancing knowledge, skills, and abilities to

deter, defeat, prevent, protect, mitigate, and respond to terrorist threats. This includes the development of new or improved training technologies, performance support capabilities, computer-based training courses, programs of instruction on new concepts, training delivery architectures, training aids, devices and simulations. The proposed training and/or performance improvement technologies shall support the life cycle of research and development to include: analysis, research, design, development, implementation, evaluation, verification and validation testing, and technology transition.

All submissions shall identify the anticipated end user and/or supporting organization. This information should be placed in the bottom right quadrant of the quad chart submission.

Areas of interest include, but are not limited to:

- Training technologies used in support of allies, coalition, and/or host nation partners.
- Innovative instructional design and/or delivery methods.
- Mobile learning and performance support applications (apps) for operational users (military in theater (any/all AORs) and/or federal law enforcement and protective services domestically and internationally).
- Advanced performance support capabilities to include augmented reality and mixed reality.
- Performance support through wearable technology.
- Advancements in judgmental shooting simulations.
- Human factors / usability principles applied to training.
- Neuroergonomics.

Proposed technologies, models, architectures, software, hardware, tools, and other applications not directed toward a training / performance support need are not desired and will be rejected.

Unspecified requirements (R000s) are for proposing unique innovations that have not yet been identified by CTTSO. Submissions against an unspecified requirement should 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 CTTSO does not budget for unspecified requirements, awards may not be made against the unspecified requirements. Note: Quad charts submitted in response to this R000 may be shared with other CTTSO Subgroups if the submission demonstrates relevance to more than one focus area.

#### **R4146 AVATAR-BASED TRAINING VIDEOS FOR EXPLOSIVE ORDNANCE DISPOSAL**

Develop avatar-based training videos accessible via desktop PC and a mobile application for incorporation into an existing Explosive Ordnance Disposal personnel (EOD) Government training program. The videos shall be based on existing instructional videos and/or training objectives and will consist of a human-like avatar demonstrating applied skills (e.g., performing SCUBA pre-dive checks, performing an underwater emergency procedure, performing a reconnaissance on an unknown ordnance item, assembling an explosive tool in proper sequence, positioning a render safe tool or demolition charge, etc.).

The avatar-based video instruction will align with established training objectives and curricula

provided to the offeror by the Government at the start of the contract, which may cover subject matter in any of the following areas:

- Diving procedures
- Demolition Division procedures
- Tools and Methods Division procedures
- Core Division procedures
- Ground Ordnance Division procedures
- Air Ordnance Division procedures
- Improvised Explosive Devices (IED) Division procedures
- Biological/Chemical Division procedures
- Radiological/Nuclear Division procedures
- Underwater Ordnance Division procedures

The offeror shall conduct a needs analysis to inform video design and development. The offeror shall develop a minimum of five videos including storyboards, each video with a maximum length of approximately 10 minutes, or 10 videos with a maximum length of five minutes. At least two avatar characters shall be developed to demonstrate the concept. The videos shall be developed using existing game engine technology and accessible via desktop PC and mobile devices (Android OS and iOS). The videos shall support viewing a procedure from different perspectives (e.g., angles, level of zoom). Instructors shall be able to access the videos to use as instructional aids during classroom training at a Government site and students shall be able to access the videos outside of the classroom via a web-based application on their mobile device. The offeror shall develop the mobile application that allows users to access the videos. The ability to develop underwater productions is desired, but is not mandatory for this requirement. At least one of the video productions shall be developed and selectable in both English and a foreign language (e.g., Korean).

The offeror shall include a testing phase to ensure 100 percent functionality on Government Information Technology (IT) delivery platforms. The offeror shall support an evaluation period not to exceed three months to evaluate the video instruction in terms of instructor and student usability and perceived effectiveness for achieving learning objectives. The offeror shall work with the Government to coordinate instructor and student participation in the evaluation. The Government will provide Subject Matter Experts through the duration of the project to guide development and transition to desired IT delivery platforms. The Government will provide images of the items (e.g., physical tools, devices) to be replicated in the training videos where available, and access to the items for photographing when not available. At the conclusion of the contract, all video productions, the application, and all software required to access the videos shall be transitioned to the Government.

#### **R4147 DYNAMIC SOCIAL MEDIA FOR TRAINING AND EXERCISES**

Develop a training solution that replicates real-world social media (SM) to avoid the challenges associated with training on the open internet. The Dynamic Social Media for Training and Exercises (DSMTE) technology shall consist of a virtual environment that supports operator's collection, analysis and exploitation of social media during training and exercises. The DSMTE shall provide key features from at least five of the most popular SM sites (e.g., Facebook,

Twitter, Snap Chat, Instagram, and Tumblr). These features shall replicate the visual appearance, functional capability, and integration of tools found specific to each SM site as well as provide user-created interactive accounts.

The offeror shall develop four secure, fully integrated servers that house the DSMTE software accessible by participants via PC and mobile devices (iOS and Android). Each server will require “white care” access to restrict the content to participants and controllers only. The DSMTE shall be developed to support log-in with credentials as well as interaction with other users. The software and hardware shall support specific training and exercise objectives by providing all users with the same functionality to simulate the real-world SM typical of the open internet. The DSMTE shall allow for the construction of virtual audiences and associated algorithms to accommodate sentiment at the start of an exercise and shifting sentiments as dynamic injects are made. The DSMTE shall replicate the SM environment of the internet that would be prolific in the geographic region of the exercise, including the replication of associated adversarial SM players who are part of the scenario and allow for dynamic injects of content (via any SM source) in real time. The DSMTE must also provide a realistic web-search capability (e.g., Google, Bing, or Yahoo) with integrated web crawlers that allows for the conduct of internet searches which will return realistic search results. The offeror shall develop the DSMTE to support up to 500 users throughout a two (minimum) to six (maximum) weeks exercise and integrate specific COTS and/or GOTS collection and analysis tools.

The offeror shall include a testing phase to ensure 100 percent functionality on applicable systems within the training and exercise environment. The Government will provide Subject Matter Experts through the duration of the project to guide development and transition of the DSMTE. The offeror will have access to Government owned software to facilitate DSMTE development as Government Furnished Information. At the conclusion of the contract, all equipment and software required to run and support the DSMTE shall be transitioned to the Government.

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