



**Office of Naval Research (ONR)
Broad Agency Announcement (BAA) Number 11-023**

Autonomous Persistent Tactical Surveillance

INTRODUCTION:

This publication constitutes a Broad Agency Announcement (BAA) as contemplated in Federal Acquisition Regulation (FAR) 6.102(d)(2) and 35.016. A formal Request for Proposals (RFP), other solicitation, or additional information regarding this announcement will not be issued.

The Office of Naval Research (ONR) will not issue paper copies of this announcement. The ONR reserves the right to fund all, some or none of the proposals received under this BAA. ONR provides no funding for direct reimbursement of proposal development costs. Technical and cost proposals (or any other material) submitted in response to this BAA will not be returned. It is the policy of ONR to treat all proposals as sensitive competitive information and to disclose their contents only for the purposes of evaluation.

I. GENERAL INFORMATION

- 1. Agency Name** - Office of Naval Research
- 2. Research Opportunity Title** - Autonomous Persistent Tactical Surveillance
- 3. Program Name** - Mobile Autonomous Intelligence Surveillance and Reconnaissance (ISR) to Command and Control (C2) Synchronization
- 4. Research Opportunity Number** - 11-023
- 5. Response Date** –

White Papers: 7/13/2011
Full Proposals: 9/12/2011

6. Research Opportunity Description –

The Office of Naval Research is interested in receiving white papers and full proposals for both Applied Research and Advanced Technology Development that will forge major advancements towards a user oriented "World View" with varying degrees of fidelity for situational awareness and understanding for both Tactical and Strategic views. To achieve this vision, Intelligence Surveillance and Reconnaissance (ISR) products need to be synchronized with Command and Control (C2) for seamless mission prosecution. The program goals are to: 1) provide timely unified information support to the agile tactical user, and 2) develop autonomous mission focused sensing systems.

United States (US) Forces are being placed in environments where they are required to function with increased autonomy. The need is stronger than ever to be able to autonomously maintain persistent surveillance of activities and entities over a region of interest on a continuing (24 hrs / 7 days a week) basis, as well as automated tasking of these assets upon mission priority (e.g., Troops in Contact (TIC) versus Nation Building activities). In order to achieve this, an underlying context for real-time adaptive surveillance in support of tactical mission objectives is essential. The use of open architectures and compliance with industry standards is important for facilitating system integration and efficient sharing of information in an enterprise.

US Forces currently request and are allocated ISR assets during the mission planning process (e.g., Rapid Response Planning Process (R2P2)). However, quite often the low density of ISR assets necessitates the sharing of assets between units. This is especially true in the distributed environment related to Counter Insurgency (COIN) Marines operate in today. This means operations proceed without certainty that there will be sufficient ISR coverage. Operational staffs (especially Battalion level and below) are forced to work with limited situational awareness while providing support to units in the field (e.g., convoys, mobile and foot mobile patrols). This limits the overall ability of the unit to provide Command and Control (C2) because of the limited situational awareness. Automated mission focused autonomy for unmanned vehicles (UxVs) and subsequent real-time tasking of these assets by units in the field does not exist, but is necessary to reduce the manning required to operate sensors and make sensor placement decisions that can provide our Forces needed coverage.

Furthermore, the enormous volume of data produced by ISR assets necessitates the automation of data processing for transport (e.g., data compression, data orchestration for mediation) and to assist the warfighter in the conversion of the data into automation (e.g., searching high value target databases with information from image recognition algorithms run over the ISR feeds, algorithms that support data fusion across warfighting functions). Changing relevance of rural/urban data means that the data provided must have space-time and geo-cultural context to provide essential information to mobile users. Commanders need an Information Technology (IT) architecture that supports information sharing to efficiently utilize all resources across their domains including platforms, personnel, sensors, and networks to prosecute multiple missions.

Current capability limitations include the following:

- Ability to organize knowledge at both the tactical and strategic levels by unified information ontologies or data mappings.
- Ability to assess large quantities of imagery and full motion video information and determine potential threat activities using algorithms that work with limited IT assets (i.e., storage and processing).
- Ability to express the information needs of tactical missions and provide users relevant information through the enterprise.
- Ability to project the value of information versus location given mission plans and area events over time.
- Ability to align tactical and strategic analysis capabilities and sensor resources to current and future information requirements.

The BAA seeks to develop an ability to measure the value of information across an area as a function of time given knowledge of current and future missions and to measure the amount of known relevant information spatially organized as a function of time.

In addition to the limitations described above, a number of shortfalls exist which are to be addressed in this BAA. These shortfalls are briefly described below.

Mission Planning and Direction

The planning and direction of tactical and theater sensors are conducted within stovepipes. These stovepipes contain little tactical mission awareness. Manpower intensive sensor control limits the scope of sensor support. There is a lack of sharing knowledge of unfolding events across mission threads.

Data Processing and Exploitation

Analysis is manpower constrained on partial data sets. The Intelligence Preparation of the Battlespace (IPB) is a slow, manual, and inaccessible to the enterprise process. There is a lack of timely exploitation of useful theater and national sensor data. There are gaps in alerting Forces to danger.

Mobile Sensing and Production

Tactical users do not fully benefit from enterprise knowledge or effectively feedback observations to the operational view. There is a lack of mobile tools for field users to gather information. There is a lack of means for reporting soft biometric data on at-risk individuals or groups engaged in suspicious activity.

Dissemination and Utilization

Many sensors fail to deliver relevant information to users outside their stovepipes. The enterprise lacks flexibility to morph dynamically with changing tactical mission requirements. Wide area sensors support is available at command levels but is needed at unit level to counter irregular actors. Sensor data overwhelms the distribution, analysis, storage, and assimilation capabilities.

The three (3) Thrust Areas are described in further detail in the following sections.

Thrust Area 1 - Mobile Autonomous ISR to C2 Synchronization

The objective of this thrust is to extend the current baseline of the MAGTF C2 Software Architecture and its implementation (i.e., Tactical Service Oriented Architecture (TSOA)) to establish the necessary standards and patterns as well as provide a reference implementation for ISR and C2 that allows sensor and data analysis nodes to anticipate the information needs of the tactical warfighter. The approach should use open standards where possible (with reason provided why open standards did not suffice) as well as comply with Modular Open System Architecture (MOSA) principles and functions as diagramed below. A key challenge is the delivery of relevant information to mobile users (foot mobile and vehicle borne). This could be addressed through a cloudlet computing or other computing paradigm. The architecture should enable generation of simultaneous situational awareness for both the Marine Squad (foot mobile or vehicular borne on land or at sea) as well as their command and control agency (e.g., Combat Operations Center, Company Level Operations Center) with relevant data and alerts of potential danger.

Some technical issues that could be addressed are as follows:

- Provision of a common information space that provides a semantic model of individuals, groups and activities to enable the tracking of adversaries such as high value targets.
- Real-time task reorganization from the current organization (e.g., Air Tasking Order (ATO)) of shared ISR assets between units as missions progress and demand evolves..
- Use of network management tools to enable ISR to C2 synchronization of activity across the enterprise.
- Sharing of tactical knowledge, sensor and mission models and delivery in context relevant to user.

The result would be vehicles, watercraft, and individuals given protection by situational awareness provided by smart, coordinated, and mission aware sensors.

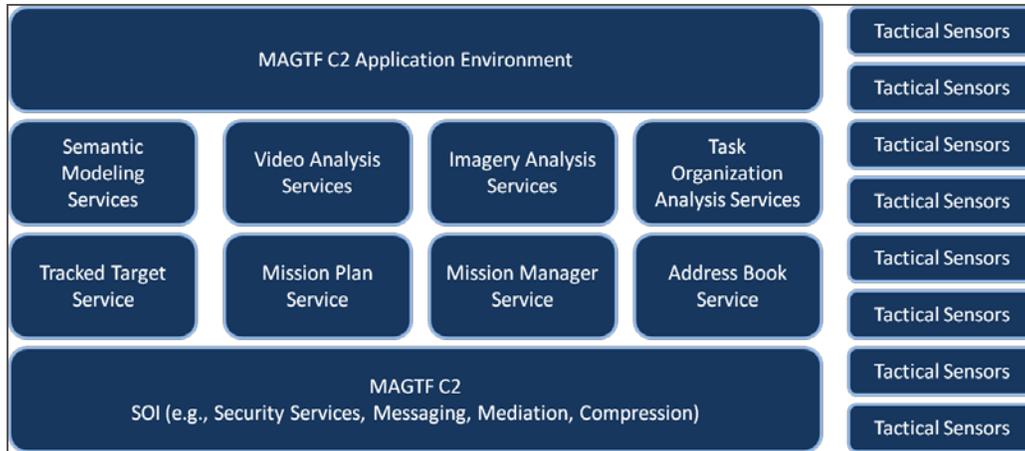


Figure 1: Reference Conceptual Architecture

This thrust area is focusing on the following S&T issues:

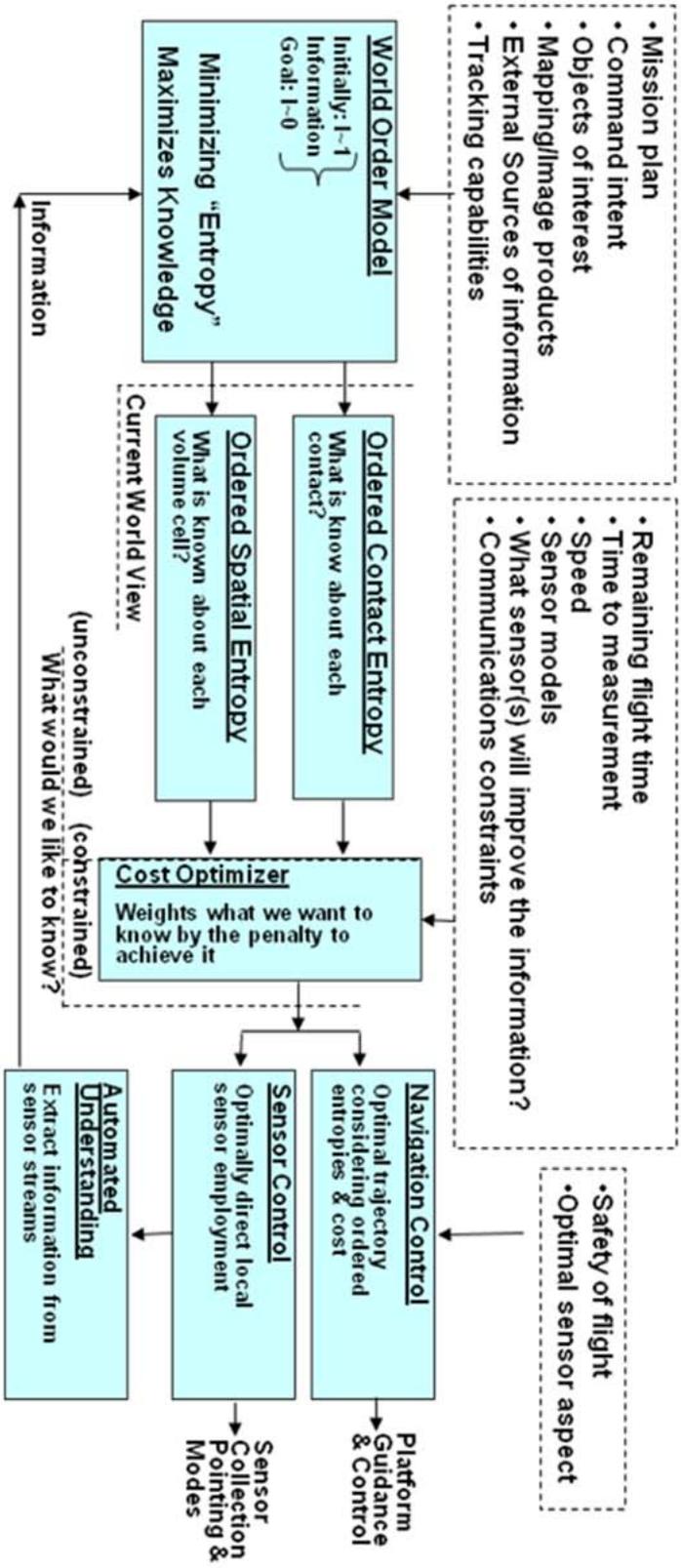
- Express mission and capabilities of a deployed unit to the network.
- Express tactical unit decision cycles (time/space constraints) to a network.
- Keep the delivery of actionable intelligence and the sensor management process in front of current tactical operations.
- Enable unit registration to a SOA enabled enterprise
- Improve translation of agile mission tracks to information requirements
- Useable and consistent data formats
- Automate mission aware tactical data analysis and sensor management to address anticipated information requirements
- In-line automated information processing
- Populate/dynamically maintain a tactical mission relevant IPB

The product developments could take the following:

- New architecture designs that are scalable, dynamic and distributed.
- Agent based modeling for distributed tracking units or capabilities.
- Semantic multi-INT knowledge stores with ontology (XML/ RDF).
- Automated data analysis aligned to current and projected mission needs.

Thrust Area 2 - Autonomous Information-Based Surveillance Control

The objective of this thrust area is to develop an autonomous sensing system that utilizes coverage history, data and context from available sources, along with, mission plan and routes to provide persistent surveillance over a large region of interest, typically 40 nmi by 40 nmi with multiple UxVs. This tactical information is to be provided from a group of UxVs operating in an autonomous mode.



The S&T investment in this thrust area focuses on automating the information-based control processes for a diverse set of sensors. These are to include:

- Recognizing and projecting information deficits and priorities based on commanders' mission requirements.
- Assigning information weights derived from multiple sources as a function of performance metrics, space and time.
- Optimize dynamic sensor allocation to mitigate information deficits, within sensor, vehicle, time and space constraints.
- Translation of collection hypotheses into open extensible multi-UxV primitives.
- Effective bandwidth-limited exploitation of multi-modal sensors.

The product developments could take the form of the following:

- Develop algorithms to automate entropy-based control of a diverse body of collection assets. These algorithms could feature recognition of mission information and enumeration of deficits; constrained information deficit mitigation; weighting of relative information value with time; real time optimization of path routing and collection in a dynamic environment.
- Develop algorithms for bandwidth-limited exploitation of multi-modal sensors across the distributed information space. These algorithms should provide an efficient means, in the construct of a distributed database, to store and forward content, exfiltrate highest tactical value first; reduce information flow offboard and recognize information by context.

Thrust Area 3 - Contextual Enterprise Information

The objective of this thrust area is to develop and exploit enterprise tools to:

- i.) Assess coverage of tactical sensors to identify gaps in coverage,
- ii.) Recognize contextual information needed to support tactical activities, and
- iii.) Satisfy the need for additional coverage or context, where feasible, through access to naval or other Service or Agency assets or archived information sources.

Contextual information provides the necessary constraints or conditional dependencies which enable processing algorithms to provide more accurate results. For algorithms to use contextual information in a disciplined manner, the contextual information must include the sensor data equivalent of error models to enable estimation of confidence or credibility. Disciplined methods and appropriate metrics to properly characterize contextual information are of interest.

The selection of relevant context and its use will depend on processor designs performed under Thrust areas 1 and 2. Relevant context may be divided into three categories, adversary physical information, adversary activities and behaviors, and adversary operating area environmental information. The table below provides examples and characteristics that may apply to each of these categories.

Table 1: Context Categories and Characteristics

<u>Adversary</u>	<u>Materiel Types</u>	<u>Description</u>	<u>Confidence</u>	<u>Inventory</u>
physical information	weapons, munitions, vehicles, communications	features, capabilities, imagery, common usage	Source, trust	numbers, locations
activities and behaviors	leadership, doctrine/history, culture, constraints	Social networks, relationships, tendencies, dependencies	Source, trust	
operating area environmental information	Weather, terrain, roads, seasonal impacts, infrastructure: power, water, sewage	Maps, data bases, reference points	Source, trust	Pointer (URL)

Development will be required to produce tools that identify and access contextual information required to meet tactical mission goals from planning to execution. Identification of relevant context will depend on information needs specified in the planning stage and on inferencing with regard to planned activities and operating area. Access to contextual information may require discovery or assessment: discovery will be required to determine if the required contextual information is available in naval enterprise data stores or in connected enterprises maintained by other Services or Agencies. If the information is not in enterprise stores, an assessment process (CT optimization) will be required to assess the potential of gathering the needed context, within the desired time, from available tactical platforms or from national collection assets.

Employment of contextual information in processing / exploitation algorithms enables the application of context-based constraints or of context-based conditionals (in the Bayesian) sense that will result in more accurate estimation products (position, location, behavior). Development of algorithms to take advantage of contextual information is seen as a challenge for path planning (routing, scheduling, re-planning) algorithms, and also for assessment of situations and threats prediction algorithms. Development of such algorithms to support such needs as tactical re-planning and assessment of behaviors based on operational area context is desired.

Products desired:

- Contextual information characterization,
- Inferencing to identify needed context,
- Discovery for efficient search of enterprise data stores (naval, other Service, Agency),
- Collection feasibility assessment for tactical or national assets, and
- Algorithms for path planning / re-planning, and fusion level 2/3.

Proposals should specify thrust area addressed, either Thrust Area 1, Thrust Area 2, or Thrust Area 3. A well written proposal will describe the technologies that will be developed. Rationale should be provided as to why the approach chosen offers promise to the warfighter. These can be focused to any particular level of command. Within the proposal, clearly state who the potential users will be that would benefit from this capability. To ensure that technology developments are compatible with DoD and information technology standards, proposals should also identify the format standards, protocol standards, display standards, etc. that will be used.

7. Point(s) of Contact -

Questions of a technical nature should be submitted to:

Thrust Area 1: Mobile Autonomous ISR to C2 Synchronization

Mr. Martin Kruger
Office of Naval Research
One Liberty Center
875 North Randolph Street, Suite 1160
ONR Code 30
Arlington, VA 22203-1995
Email: martin.kruger1@navy.mil

Thrust Area 2: Autonomous Information-Based Surveillance Control

Dr. Michael Pollock
Office of Naval Research
One Liberty Center
875 North Randolph Street, Suite 1126
ONR Code 312
Arlington, VA 22203-1995
Email: michael.a.pollock@navy.mil

Thrust Area 3: Contextual Enterprise Information

Mr. Gary Toth
Office of Naval Research
One Liberty Center
875 North Randolph Street, Suite 1181
ONR Code 311
Arlington, VA 22203-1995
Email: gary.toth@navy.mil

Questions of a business nature should be submitted to:

Primary Point of Contact:

Rebecca Foster
Contract Specialist
Contract and Grant Awards Management, Code BD251
Office of Naval Research
One Liberty Center
875 North Randolph Street, Suite W1272D
Arlington, VA 22203-1995
Email: rebecca.d.foster@navy.mil

Secondary Point of Contact

Vera M. Carroll
Acquisition Branch Head
Contract and Grant Awards Management, Code BD251
Office of Naval Research
One Liberty Center
875 North Randolph Street, Suite 1279
Arlington, VA 22203-1995
Email: vera.carroll@navy.mil

Any questions regarding this solicitation must be provided to the relevant Technical Point of Contact and the Business Point of Contact listed in this solicitation. All questions shall be submitted in writing by electronic mail.

Questions submitted within two (2) weeks prior to a deadline may not be answered, and the due date for submission of the white paper and/or full proposal will not be extended.

Amendments will be posted to one or more of the following webpages:

- Federal Business Opportunities (FEDBIZOPPS) Webpage - <https://www.fbo.gov/>
- ONR Broad Agency Announcement (BAA) Webpage - <http://www.onr.navy.mil/en/Contracts-Grants/Funding-Opportunities/Broad-Agency-Announcements.aspx>

Questions of a security nature should be submitted to:

Diana Pacheco
Industrial Security Specialist
Office of Naval Research
Security Department, Code 43
One Liberty Center
875 N. Randolph Street
Arlington, VA 22203-1995
Email Address: diana.pacheco@navy.mil

Any CLASSIFIED questions shall be handled through the ONR Security POC. Specifically, any entity wanting to ask a CLASSIFIED question shall send an email to the ONR Security POC with copy to both the Technical POC and the Business POC stating that the entity would like to ask a CLASSIFIED question. DO NOT EMAIL ANY CLASSIFIED QUESTIONS. The Security POC will contact the entity and arrange for the CLASSIFIED question to be asked through a secure method of communication.

8. Instrument Type(s) -

Awards will be issued as Contracts. ONR reserves the right to award a different instrument type if deemed to be in the best interest of the Government.

9. Catalog of Federal Domestic Assistance (CFDA) Numbers -

Not applicable.

10. Catalog of Federal Domestic Assistance (CFDA) Titles -

Not applicable.

11. Other Information –

Work funded under a BAA may include basic research, applied research and some advanced technology development (ATD). With regard to any restrictions on the conduct or outcome of work funded under this BAA, ONR will follow the guidance on and definition of "contracted fundamental research" as provided in the Under Secretary of Defense (Acquisition, Technology and Logistics) Memorandum of 24 May 2010.

As defined therein the definition of "contracted fundamental research", in a DoD contractual context, includes [research performed under] grants and contracts that are (a) funded by Research, Development, Test, and Evaluation Budget Activity 1 (Basic Research), whether performed by universities or industry or (b) funded by Budget Activity 2 (Applied Research) and performed on campus at a university. The research shall not be considered fundamental in

those rare and exceptional circumstances where the applied research effort presents a high likelihood of disclosing performance characteristics of military systems or manufacturing technologies that are unique and critical to defense, and where agreement on restrictions have been recorded in the contract or grant.

Pursuant to DoD policy, research performed under grants and contracts that are a) funded by Budget Category 6.2 (Applied Research) and NOT performed on-campus at a university or b) funded by Budget Category 6.3 (Advanced Research) does not meet the definition of "contracted fundamental research." In conformance with the USD(AT&L) guidance and National Security Decision Direction 189, ONR will place no restriction on the conduct or reporting of unclassified "contracted fundamental research," except as otherwise required by statute, regulation or Executive Order. For certain research projects, it may be possible that although the research being performed by the prime contractor is restricted research, a subcontractor may be conducting "contracted fundamental research." In those cases, it is the ***prime contractor's responsibility*** in the proposal to identify and describe the subcontracted unclassified research and include a statement confirming that the work has been scoped, negotiated, and determined to be fundamental research according to the prime contractor and research performer.

Normally, fundamental research is awarded under grants with universities and under contracts with industry. ATD is normally awarded under contracts and may require restrictions during the conduct of the research and DoD pre-publication review of research results due to subject matter sensitivity.

As regards the present BAA, the Research and Development efforts to be funded will consist of Applied Research and Advanced Technology Development. The funds available to support awards are Budget Activity 2 and Budget Activity 3 and not basic research.

FAR Part 35 restricts the use of the Broad Agency Announcements (BAAs), such as this, to the acquisition of basic and applied research and that portion of advanced technology development not related to the development of a specific system or hardware procurement. Contracts and grants and other assistance agreements made under BAAs are for scientific study and experimentation directed towards advancing the state of the art and increasing knowledge or understanding.

THIS ANNOUNCEMENT IS NOT FOR THE ACQUISITION OF TECHNICAL, ENGINEERING AND OTHER TYPES OF SUPPORT SERVICES.

II. AWARD INFORMATION

The amount and period of performance of each selected proposal may vary depending on the research area and the technical approach to be pursued by the selected offeror.

Anticipated Total Amount of Funding: The Office of Naval Research anticipates a total budget of approximately \$41,500,000, over a planned performance period of five (5) years,

using Applied Research funds (Budget Category 6.2) and Advanced Technology Development funds (Budget Category 6.3), subject to budget availability. However, lower and higher cost efforts will be considered. The amount and period of performance of the award(s) may vary depending on the research area and the technical approach to be pursued by the offeror(s).

Anticipated Number of Awards: One (1) or more awards per Thrust Area, as described in the Research Opportunity Description. An Offeror may propose in more than one Thrust Area.

Anticipated Range of Individual Award Amounts: As required to complete each Thrust Area. There may be more than one (1) performer per Thrust Area.

Anticipated Period of Performance: The period of performance may be up to five (5) years from date of award. No options are contemplated.

In the case of funded proposals for the production and testing of prototypes, ONR may during the contract period of performance add a contract line item or option for the provision of advanced component development or for the delivery of additional prototype units. However, such a contract addition shall be subject to the limitations contained in Section 819 of the National Defense Authorization Act for Fiscal Year 2010.

III. ELIGIBILITY INFORMATION

All responsible sources from academia and industry may submit proposals under this BAA. Historically Black Colleges and Universities (HBCUs) and Minority Institutions (MIs) are encouraged to submit proposals and join others in submitting proposals. However, no portion of this BAA will be set aside for HBCU and MI participation.

Federally Funded Research & Development Centers (FFRDCs), including Department of Energy National Laboratories, are not eligible to receive awards under this BAA. However, teaming arrangements between FFRDCs and eligible principal bidders are allowed so long as they are permitted under the sponsoring agreement between the Government and the specific FFRDC.

Navy laboratories and warfare centers as well as other Department of Defense and civilian agency laboratories are also not eligible to receive awards under this BAA and should not directly submit either white papers or full proposals in response to this BAA. If any such organization is interested in one or more of the programs described herein, the organization should contact an appropriate ONR POC to discuss its area of interest. The various scientific divisions of ONR are identified at <http://www.onr.navy.mil/>. As with FFRDCs, these types of federal organizations may team with other responsible sources from academia and industry that are submitting proposals under this BAA.

University Affiliated Research Centers are eligible to submit proposals under this BAA unless precluded from doing so by their Department of Defense UARC contracts.

Teams are also encouraged and may submit proposals in any and all areas. However, Offerors must be willing to cooperate and exchange software, data and other information in an integrated program with other contractors, as well as with system integrators, selected by ONR.

Some topics cover export controlled technologies. Research in these areas is limited to "U.S. persons" as defined in the International Traffic in Arms Regulations (ITAR) - 22 CFR § 1201.1 et seq. (See Section VII, Other Information).

IV. APPLICATION AND SUBMISSION INFORMATION

1. Application and Submission Process - White Papers, Oral Presentations, and Full Proposals

White Paper Submissions

White Papers are required prior to submitting a Full Proposal. The due date for White Papers is no later than 2:00 p.m. Eastern Daylight Time (EDT) on Wednesday, 13 July 2011. White Papers shall be submitted directly to the topic-specific Technical Point of Contact (TPOC) identified in paragraph 7. stated under Section I, entitled "GENERAL INFORMATION", above. Each White Paper will be evaluated by the Government to determine whether the technology advancement proposed appears to be of "particular value" to the Department of the Navy. The submitters of White Papers judged to be of "particular value" to the Navy will be so identified in the initial response, via E-mail, provided by ONR and encouraged to make an Oral Presentations of their White Papers. The process for an Oral Presentation is described below. E-mail notification will be issued on or about Wednesday, 3 August 2011. The submitter of any White Paper not judged by ONR reviewers as being of "particular value" to the Navy may still submit a Full Proposal by the date and time specified in the BAA, but the initial Navy response provided is a useful indicator of likely future project funding under this solicitation. Full Proposals will not be considered under this BAA unless a White Paper was received before the specified due date and time.

Oral Presentations

White Papers that have been identified as being of "particular value" to the Navy, will be the subject of a follow-on Oral Presentation on or about Friday, 12 August 2011. Any Offeror whose white paper was not determined to be of "particular value" to the Navy may contact the TPOC (identified in paragraph 7 of Section I above) to arrange an Oral Presentation along with the other scheduled Offerors.

A detailed format for the presentation will be provided in the E-mail notification. Each presentation will be no longer than thirty (30) minutes in duration. An additional ten (10) minutes will be allowed for questions (if any) from the panel of government reviewers. Those Offerors whose technology is still considered as having "particular value" to the Navy will be encouraged to submit detailed technical and cost proposals. However, such encouragement after oral presentations does not assure a subsequent award. The Office of Naval Research will not reimburse travel costs and time for potential bidders to brief their proposals.

Oral Presentations may be classified if the technology is sensitive and not releasable as unclassified or For Official Use Only (FOUO). Prior coordination with ONR's Program Office is required to present a classified presentation.

Full Proposal Submission

The due date for receipt of Full Proposals is 2:00 p.m. Eastern Daylight Time (EDT) on Monday, 12 September 2011. The only acceptable method for submission of full proposals for contracts is hard copy to the Technical Point of Contact by the United States Postal Service (USPS) with delivery confirmation, or via a commercial carrier (FedEx and UPS). **Full proposals sent by fax or email will not be considered.** Full Proposals will be reviewed by the Technical Point of Contacts and other evaluators. It is anticipated that final selections for awards will be made on or about Tuesday, 11 October 2011. As soon as the final proposal evaluation process is completed, each Offeror will be notified via E-mail or letter of its selection or non-selection for an award.

2. Content and Format of White Papers/Full Proposals –

White Papers and Full Proposals submitted under the BAA are expected to be unclassified; however, confidential/classified responses are permitted. If a classified response is submitted, the resultant contract will be unclassified.

Unclassified Proposal Instructions:

Unclassified White Papers shall be submitted in accordance with paragraph 1 above. Full Proposals shall be submitted in accordance with Section IV. Application and Submission Information.

Classified Proposal Instructions:

Classified White Papers and Full Proposals shall be submitted directly to the attention of ONR's Document Control Unit at the following address:

OUTSIDE ENVELOPE (no classification marking):

Office of Naval Research
Document Control Unit
ONR Code 43
875 North Randolph Street
Arlington, VA 22203-1995

The inner wrapper of the classified proposal should be addressed to the attention of Pollock, Michael (pollocm@onr.navy.mil), ONR Code 312 and marked in the following manner:

INNER ENVELOPE (stamped with the overall classification of the material)
Program: Autonomous Persistent Tactical Surveillance
Office of Naval Research
Attn: Dr. Michael Pollock
ONR Code: 312
875 North Randolph Street – Suite 1126
Arlington, VA 22203-1995

An 'unclassified' Statement of Work (SOW) must accompany any classified proposal. Proposal submissions will be protected from unauthorized disclosure in accordance with FAR Subpart 15.207, applicable law, and DoD/DoN regulations. Offerors are expected to appropriately mark each page of their submission that contains proprietary information.

IMPORTANT NOTE: Titles given to the White Papers/Full Proposals should be descriptive of the work they cover and not be merely a copy of the title of this solicitation.

a. **WHITE PAPERS**

White Paper Format

- Paper Size - 8.5 x 11 inch paper
- Margins - 1 inch
- Spacing - single spaced
- Font - Times New Roman, 12 point
- Max. Number of Pages permitted: 12 pages (excluding cover page, resumes, bibliographies, and table of contents)
- Copies - One (1) electronic copy in Adobe PDF or Word 2007 delivered via email. Electronic (email) submissions should be sent to the attention of the relevant technical POC identified above under Section I, paragraph 7. The subject line of the email shall read "ONR BAA11-023 White Paper Submission."

White Paper Content

- **Cover Page:** The Cover Page shall be labeled "WHITE PAPER", and shall include the BAA number, proposed title, Offeror's administrative and technical points of contact, with telephone numbers, facsimile numbers, and Internet addresses, and shall be signed by an authorized officer.
- **Technical Concept:** Max six (6) page or fewer technical section which clearly describes the objectives of the proposed effort, technical issues to be resolved to accomplish objectives, the technical approach proposed to resolve these issues, an assessment of the proposed new capability over the existing state of the art, and a comparison against competing technological developments.

- **Navy Relevance: (Max three (3) page)**
- **Operational Naval Concept (where applicable):** A description of the concept of operation for the new capabilities to be delivered and the expected operational performance improvements.
- **Operational Utility Assessment Plan (where applicable):** A plan for demonstrating and evaluating the operational effectiveness of the Offeror's proposed products or processes in field experiments and/or tests in a simulated environment.

- **Programmatic Section:** A one (1) page programmatic section that includes milestones and a timetable.

- **Resumes:** A single page (each) summary resume (including previous relevant experience and pertinent publications) for the Principal Investigator (PI) and other key personnel.

- **Deliverables:** A one (1) page list of proposed deliverables for the effort.

- **Cost:** A one (1) page summary of costs segregated by tasks.

b. FULL PROPOSALS

INSTRUCTIONS FOR CONTRACTS

NOTE: Submission instructions for BAAs issued after FY2010 have changed significantly from previous requirements. Potential Offerors are advised to carefully read and follow the instructions below. The new format and requirements have been developed to streamline and ease both the submission and review of proposals. Both the Template and the Spreadsheet have instructions imbedded into them that will assist in completing the documents. Also, both the Template and the Spreadsheet require completion of cost-related information – both documents must be fully completed to constitute a valid proposal.

All proposals must use ONR's Technical and Cost Proposal Template and Cost Proposal Spreadsheet. The Template can be found by following this link:

<http://www.onr.navy.mil/Contract-Grants/submit-proposal/contracts-proposal/cost-proposal.aspx>.

Please note that all the attachments listed in Section III.8 of the Template can be incorporated into the Template file for submission.

The Cost Proposal Spreadsheet can be found by following this link:

<http://www.onr.navy.mil/Contracts-Grants/submit-proposal/contracts-proposal/cost-proposal.aspx>. Click on the "proposal spreadsheet" link and save a copy of the spreadsheet. Instructions for completion have been embedded into the spreadsheet. Any proposed options

that are identified in the Technical and Cost Proposal Template, but are not fully priced out in the Cost Proposal Spreadsheet, will not be included in any resulting contract or other transaction. If proposing options, they **must** be separately priced and separate spreadsheets should be provided for the base period and each option period.

For proposed subcontracts or interorganizational transfers over \$150,000, Offerors must provide a separate fully completed Cost Proposal Spreadsheet in support of the proposed costs. This spreadsheet, along with supporting documentation, must be provided either in a sealed envelope with the prime's proposal or via e-mail directly to both the Program Officer and the Business Point of Contact at the same time the prime proposal is submitted. The e-mail should identify the proposal title, the prime Offeror and that the attached proposal is a subcontract, and should include a description of the effort to be performed by the subcontractor. Offerors should also familiarize themselves with the new subcontract reporting requirements set forth in Federal Acquisition Regulation (FAR) clause 52.204-10, Reporting Executive Compensation and First-Tier Subcontract Awards. From October 1, 2010 through February 28, 2011, any newly awarded subcontract must be reported if the prime contract award amount is \$550,000 or more. Starting March 1, 2011, any newly awarded subcontract must be reported if the prime contract award amount was \$25,000 or more. The pertinent requirements can be found in Section VII, Other Information, of this document.

Offerors should submit one (1) original, plus five (5) hard copies and one (1) electronic copy of CD-ROM. Offerors shall follow the Technical and Cost Proposal Template. The electronic Technical and Cost Proposal should be submitted in a secure, pdf compatible format, save for the electronic file for the Cost Proposal Spreadsheet which should be submitted in a Microsoft Excel 2007 compatible format. All attachments should be submitted in a secure, pdf compatible format.

The secure pdf compatible format is intended to prevent unauthorized editing of the proposal prior to any award. A password should not be required for opening the proposal document, but the Government must have the ability to print and copy text, images, and other content. Offerors may also submit their Technical and Cost Proposal in an electronic file that allows for revision (preferably in Microsoft Word) to facilitate the communication of potential revisions. Should an Offeror amend its Technical and Cost Proposal package, the amended proposal should be submitted following the same hard and electronic copy guidance applicable to the original proposal.

The electronic submission of the Excel spreadsheet should be in a "useable condition" to aid the Government with its evaluation. The term "useable condition" indicates that the spreadsheet should visibly include and separately identify within each appropriate cell any and all inputs, formulas, calculations, etc. The Offeror should not provide "value only spreadsheets" similar to a hard copy.

3. Significant Dates and Times –

Event	Date	Time
White Paper Due Date	7/13/2011	2:00 PM Eastern Daylight Time
Notification of White Paper Evaluation*	8/3/2011	
Oral Presentations*	8/12/2011	
Notification of Oral Presentation Evaluation*	8/15/2011	
Full Proposal Due Date	9/12/2011	2:00 PM Eastern Daylight Time
Notification of Selection: Full Proposals*	10/11/2011	
Awards*	2/15/2012	

**These dates are estimates as of the date of this announcement.*

NOTE: Due to changes in security procedures since September 11, 2001, the time required for hard-copy written materials to be received at the Office of Naval Research has increased. Materials submitted through the U.S. Postal Service, for example, may take seven days or more to be received, even when sent by Express Mail. Thus any hard-copy proposal should be submitted long enough before the deadline established in the solicitation so that it will not be received late and thus be ineligible for award consideration.

4. Submission of Late Proposals –

Any proposal, modification, or revision that is received at the designated Government office after the exact time specified for receipt of proposals is "late" and will not be considered unless it is received before award is made, the contracting officer determines that accepting the late proposal would not unduly delay the acquisition and:

- a. If it was transmitted through an electronic commerce method authorized by the announcement, it was received at the initial point of entry to the Government infrastructure not later than 5:00 P.M. one working day prior to the date specified for receipt of proposals; or
- b. There is acceptable evidence to establish that it was received at the Government installation designated for receipt of proposals and was under the Government's control prior to the time set for receipt of proposals; or
- c. It was the only proposal received.

However, a late modification of an otherwise timely and successful proposal that makes its terms more favorable to the Government will be considered at any time it is received and may be accepted. Acceptable evidence to establish the time or receipt at the Government installation

includes the time/date stamp of that installation on the proposal wrapper, other documentary evidence of receipt maintained by the installation, or oral testimony or statements of Government personnel.

If an emergency or unanticipated event interrupts normal Government processes so that proposals cannot be received at the Government office designated for receipt of proposals by the exact time specified in the announcement, and urgent Government requirements preclude amendment of the announcement closing date, the time specified for receipt of proposals will be deemed to be extended to the same time of day specified in the announcement on the first work day on which normal Government processes resume.

The contracting officer must promptly notify any offeror if its proposal, modifications, or revision was received late and must inform the offeror whether its proposal will be considered.

5. Address for the Submission of Full Proposals.

Hard copies of Full Proposals for Contracts should be sent to the relevant Program Manager within the Office of Naval Research as identified below:

Thrust Area 1	Thrust Area 2	Thrust Area 3
Office of Naval Research Attn: Mr. Martin Kruger ONR Department Code: 30 875 North Randolph Street Arlington, VA 22203-1995	Office of Naval Research Attn: Dr. Michael Pollock ONR Department Code: 312 875 North Randolph Street Arlington, VA 22203-1995	Office of Naval Research Attn: Dr. Gary Toth ONR Department Code: 311 875 North Randolph Street Arlington, VA 22203-1995

V. EVALUATION INFORMATION

1. Evaluation Criteria -

Award decisions will be based on a competitive selection of proposals resulting from a scientific and cost review. Evaluations will be conducted using the following evaluation criteria:

1. Overall scientific and technical merits of the proposal;
 1. The degree of innovation.
 2. The soundness of technical concept.
 3. The Offeror's awareness of the state of the art and understanding of the scope of the problem and the technical effort needed to address it.
2. Potential Naval relevance and contributions of the effort to the agency's specific mission.
3. The offeror's capabilities, related experience, facilities, techniques or unique combinations of these which are integral factors for achieving the proposal objectives;
 1. The quality of technical personnel proposed.
 2. The Offeror's experience in relevant efforts with similar resources.

3. The ability to manage the proposed effort.
4. Potential Naval relevance and contributions of the effort to the agency's specific mission;
and
5. The realism of the proposed costs and availability of funds.

Overall, the technical factors 1 - 4 above are significantly more important than the cost factor, with the technical factors all being of equal value. The degree of importance of cost will increase with the degree of equality of the proposals in relation to the other factors on which selection is to be based, or when the cost is so significantly high as to diminish the value of the proposal's technical superiority to the Government.

2. Partnering -

Industry-Government Partnering - ONR highly encourages partnering among industry and Government with a view toward speeding the incorporation of new science and technology into fielded systems. Proposals that utilize industry-Government partnering which enhances the development of novel S&T advances will be given favorable consideration

3. Commitment to Small Business –

The Office of Naval Research is strongly committed to providing meaningful subcontracting opportunities for small businesses, small disadvantaged businesses, woman-owned small businesses, historically underutilized business zone (HUBZone) small businesses, veteran-owned small business, service disabled veteran-owned small businesses, historically black colleges and universities, and minority institutions, and other concerns subject to socioeconomic considerations through its awards.

Awards made as contracts to small businesses at any value or to other than small businesses that are less than \$650,000, a 'statement of commitment to small business' will be evaluated to ensure that it supports this policy.

For proposed awards to be made as contracts that exceed \$650,000 to other than small businesses, the offeror is required to submit a Small Business Subcontracting Plan in accordance with FAR 52.219-9. As such, Subcontracting Plans will be evaluated to ensure that submissions are compliant with FAR Subpart 19.7.

For proposed awards to be made as contracts to other than small businesses, the socio-economic merits of each proposal will be evaluated based on the extent the offeror's commitment in providing meaningful subcontracting opportunities for small businesses, small disadvantaged businesses, women-owned small businesses, historically underutilized zone (HUBZone) small businesses, veteran-owned small businesses, service-disabled veteran-owned small businesses, and other concerns subject to socioeconomic considerations through its awards.

4. Evaluation Panel –

Technical and cost proposals submitted under this BAA will be protected from unauthorized disclosure in accordance with FAR 3.104-4 and 15.207. The cognizant Program Officer and other Government scientific experts will perform the evaluation of technical proposals. Restrictive notices notwithstanding, one or more support contractors may be utilized as subject-matter-expert technical consultants. However, proposal selection and award decisions are solely the responsibility of Government personnel. Each support contractor's employee having access to technical and cost proposals submitted in response to this BAA will be required to sign a non-disclosure statement prior to receipt of any proposal submissions.

VI. AWARD ADMINISTRATION INFORMATION

1. Administrative Requirements -

- The North American Industry Classification System (NAICS) code - The NAICS code for this announcement is "541712" with a small business size standard of "500 employees".
- Central Contractor Registration: All Offerors submitting proposals or applications must:
 - (a) be registered in the Central Contractor Registration (CCR) prior to submission;
 - (b) maintain an active CCR registration with current information at all times during which it has an active Federal award or an application under consideration by any agency; and
 - (c) provide its DUNS number in each application or proposal it submits to the agency.

NOTE: Central Contractor Registry (CCR), Subcontracting Plan requirements and Certification requirements are all set forth in the ONR Technical and Cost Proposal Template for those submitting contract proposals.

VII. OTHER INFORMATION

1. Government Property/Government Furnished Equipment (GFE) and Facilities

Government research facilities and operational military units are available and should be considered as potential government-furnished equipment/facilities. These facilities and resources are of high value and some are in constant demand by multiple programs. It is unlikely that all facilities would be used for any one specific program. The use of these facilities and resources will be negotiated as the program unfolds. Offerors submitting proposals for contracts, cooperative agreements and Other Transaction Agreements should indicate in the Technical and Cost Proposal Template, Section II, Blocks 8 and 9, which of these facilities are critical for the project's success. Offerors submitting proposals for grants should address the need for government-furnished facilities in their technical proposal.

2. Security Classification

In order to facilitate intra-program collaboration and technology transfer, the Government will attempt to enable technology developers to work at the unclassified level to the maximum extent possible. If access to classified material will be required at any point during performance, the Offeror must clearly identify such need by completing Section II, Block 11, DD 254 - Security Classification Specification in the technical and cost proposal template.

3. Use of Animals and Human Subjects in Research

If animals are to be utilized in the research effort proposed, the Offeror must complete a DoD Animal Use Protocol with supporting documentation (copies of AALAC accreditation and/or NIH assurance, IACUC approval, research literature database searches, and the two most recent USDA inspection reports) prior to award. For assistance with submission of animal research related documentation, contact the ONR Animal Use Administrator at (703) 696-4046.

Similarly, for any proposal for research involving human subjects, the Offeror must submit or indicate an intention to submit prior to award: documentation of approval from an Institutional Review Board (IRB); IRB-approved research protocol; IRB-approved informed consent form; proof of completed human research training (e.g., training certificate or institutional verification of training); an application for a DoD-Navy Addendum to the Offeror's DHHS-issued Federal wide Assurance (FWA) or the Offeror's DoD-Navy Addendum. In the event that an exemption criterion under 32 CFR.219.101 (b) is claimed, provide documentation of the determination by the Institutional Review Board (IRB) Chair, IRB vice Chair, designated IRB administrator or official of the human research protection program including the category of exemption and short rationale statement. This documentation must be submitted to the ONR Human Research Protection Official (HRPO), by way of the ONR Program Officer. Information about assurance applications and forms can be obtained by contacting ONR_343_contact@navy.mil. If the research is determined by the IRB to be greater than minimal risk, the Offeror also must provide the name and contact information for the independent medical monitor. For assistance with submission of human subject research related documentation, contact the ONR Human Research Protection Official at (703) 696-4046.

For contracts and orders, the award and execution of the contract, order, or modification to an existing contract or order serves as notification from the Contracting Officer to the Contractor that the HRPO has approved the assurance as appropriate for the research under the Statement of Work and also that the HRPO has reviewed the protocol and accepted the IRB approval or exemption determination for compliance with the DoD Component policies. See, DFARS 252.235-7004.

4. Recombinant DNA

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5. Department of Defense High Performance Computing Program

The DoD High Performance Computing Program (HPCMP) furnishes the DoD S&T and RDT&E communities with use-access to very powerful high performance computing systems. Awardees of ONR contracts, grants, and assistance instruments may be eligible to use HPCMP assets in support of their funded activities if ONR Program Officer approval is obtained and if security/screening requirements are favorably completed. Additional information and an application may be found at <http://www.hpcmo.hpc.mil/>.

6. Organizational Conflicts of Interest

All Offerors and proposed subcontractors must affirm whether they are providing scientific, engineering, and technical assistance (SETA) or similar support to any ONR technical office(s) through an active contract or subcontract. All affirmations must state which office(s) the offeror supports and identify the prime contract numbers. Affirmations shall be furnished at the time of proposal submission. All facts relevant to the existence or potential existence of organizational conflicts of interest (FAR 9.5) must be disclosed. The disclosure shall include a description of the action the offeror has taken or proposes to take to avoid, neutralize, or mitigate such conflict. In accordance with FAR 9.503 and without prior approval, a contractor cannot simultaneously be a SETA and a research and development performer. Proposals that fail to fully disclose potential conflicts of interests or do not have acceptable plans to mitigate identified conflicts will be rejected without technical evaluation and withdrawn from further consideration for award. If a prospective offeror believes that any conflict of interest exists or may exist (whether organizational or otherwise), the offeror should promptly raise the issue with ONR by sending his/her contact information and a summary of the potential conflict by e-mail to the Business Point of Contact in Section I, item 7 above, before time and effort are expended in preparing a proposal and mitigation plan. If, in the sole opinion of the Government after full consideration of the circumstances, any conflict situation cannot be effectively avoided or mitigated, the proposal may be rejected without technical evaluation and withdrawn from further consideration for award under this BAA.

7. Project Meetings and Reviews

Individual program reviews between the ONR sponsor and the performer may be held as necessary. Program status reviews may also be held to provide a forum for reviews of the latest results from experiments and any other incremental progress towards the major demonstrations. These meetings will be held at various sites throughout the country. For costing purposes, offerors should assume that 40% of these meetings will be at or near ONR, Arlington VA and 60% at other contractor or government facilities. Interim meetings are likely, but these will be accomplished via video telephone conferences, telephone conferences, or via web-based collaboration tools.

8. Executive Compensation and First-Tier Subcontract Reporting

Section 2(d) of the Federal Funding Accountability and Transparency Act of 2006 (Pub. L. No.

109-282), as amended by section 6202 of the Government Funding Transparency Act of 2008 (Pub. L. 110-252), requires the Contractor to report information on subcontract awards. The law requires all reported information be made public, therefore, the Contractor is responsible for notifying its subcontractors that the required information will be made public.

Unless otherwise directed by the Contracting Officer, by the end of the month following the month of award of a first-tier subcontract with a value of \$25,000 or more, (and any modifications to these subcontracts that change previously reported data), the Contractor shall report the following information at <http://www.fsr.gov> for each first-tier subcontract:

- (a) Unique identifier (DUNS Number) for the subcontractor receiving the award and for the subcontractor's parent company, if the subcontractor has one.
- (b) Name of the subcontractor.
- (c) Amount of the subcontract award.
- (d) Date of the subcontract award.
- (e) A description of the products or services (including construction) being provided under the subcontract, including the overall purpose and expected outcomes or results of the subcontract.
- (f) Subcontract number (the subcontract number assigned by the Contractor).
- (g) Subcontractor's physical address including street address, city, state, and country. Also include the nine-digit zip code and congressional district.
- (h) Subcontractor's primary performance location including street address, city, state, and country. Also include the nine-digit zip code and congressional district.
- (i) The prime contract number, and order number if applicable.
- (j) Awarding agency name and code.
- (k) Funding agency name and code.
- (l) Government contracting office code.
- (m) Treasury account symbol (TAS) as reported in FPDS.
- (n) The applicable North American Industry Classification System (NAICS) code.

By the end of the month following the month of a contract award, and annually thereafter, the Contractor shall report the names and total compensation of each of the five most highly compensated executives for the Contractor's preceding completed fiscal year at

<http://www.ccr.gov>, if -

- (a) In the Contractor's preceding fiscal year, the Contractor received -
 - (i) 80 percent or more of its annual gross revenues from Federal contracts (and subcontracts), loans, grants (and subgrants) and cooperative agreements; and
 - (ii) \$25,000,000 or more in annual gross revenues from Federal contracts (and subcontracts), loans, grants (and subgrants) and cooperative agreements; and
- (b) The public does not have access to information about the compensation of the executives through periodic reports filed under section 13(a) or 15(d) of the Securities Exchange Act of 1934 (15 U.S.C. 78m(a), 78o(d)) or section 6104 of the Internal Revenue Code of 1986. (To determine if the public has access to the compensation information, see the U.S. Security and Exchange Commission total compensation filings at <http://www.sec.gov/answers/execomp.htm>).

Unless otherwise directed by the Contracting Officer, by the end of the month following the month of a first-tier subcontract with a value of \$25,000 or more, and annually thereafter, the Contractor shall report the names and total compensation of each of the five most highly compensated executives for each first-tier subcontractor for the subcontractor's preceding completed fiscal year at <http://www.fsrs.gov>, if -

- (a) In the subcontractor's preceding fiscal year, the subcontractor received -
 - (i) 80 percent or more of its annual gross revenues from Federal contracts (and subcontracts), loans, grants (and subgrants) and cooperative agreements; and
 - (ii) \$25,000,000 or more in annual gross revenues from Federal contracts (and subcontracts), loans, grants (and subgrants) and cooperative agreements; and
- (b) The public does not have access to information about the compensation of the executives through periodic reports filed under section 13(a) or 15(d) of the Securities Exchange Act of 1934 (15 U.S.C. 78m(a), 78o(d)) or section 6104 of the Internal Revenue Code of 1986. (To determine if the public has access to the compensation information, see the U.S. Security and Exchange Commission total compensation filings at <http://www.sec.gov/answers/execomp.htm>).

If the Contractor in the previous tax year had gross income, from all sources, under \$300,000, the Contractor is exempt from the requirement to report subcontractor awards. Likewise, if a subcontractor in the previous tax year had gross income from all sources under \$300,000, the Contractor does not need to report awards to that subcontractor.

9. Disclosure of Information

Awards made under this BAA will contain DFARS Clause 252.204-7000 entitled "Disclosure of

Information”.

10. Other Guidance, Instructions, and Information

None