

First Responders Group BAA 18-02/ Call 0001 **Amendment 0005**

1. **Announcement Number:** BAA 18-02/Call 0001
2. **FBO Solicitation Number:** 70RSAT19RB0000002
3. **Solicitation Open/Close Dates:**
 - Opening Date – 1 April 2019
 - White Paper Due Date: 2 May 2019 at 12:00 p.m. EST
 - Notification of Encouraged Full Proposals: 27 June 2019
 - Proposal Due Date: **01 August 2019**
 - ~~Anticipated~~ Performer Technical Presentation dates: **7 September through 13 September 2019 and 7 October through 11 October 2019.**

Proposals are due by 4:00 p.m. EST time on the due date. There will be no exceptions to the time and date on which responses are due, unless determined otherwise by the Government. White Papers and Proposals received after the closing date/time will not be considered.

Once all white paper offerors have been notified whether or not they have been encouraged to submit a full proposal, Call 0001 will be amended to specify the exact Proposal Due Date.

4. **Solicitation Topics:** The following are the 12 intended topics, subject to change, under each Technical Topic Area (TTA). Please refer to the attached Statement of Objectives (SOOs) for detailed information.
 - **Hands-Free Presence-of-Life through Walls Detection, Localization, Alert, and Recording System (SOO A)**

Firefighters and law enforcement spend considerable time searching for people, but often for different purposes. While a firefighter may be trying to find a victim in a burning building, law enforcement officers might be searching an area for a suspect or preparing to breach a room in an active shooter situation. Certain presence-of-life technologies already help firefighters save lives. However, current iterations are deficient for most law enforcement purposes due to burdensome form factors, long measurement times, and inconsistent readings depending on the material the responder is attempting to “see through.”

Law enforcement officers require a reliable presence-of-life capability that is hands-free and with a quick or constant reading. The solution would be particularly helpful to SWAT teams as they enter or are inside a building in which an armed perpetrator’s whereabouts are uncertain. In this situation, the officer is vulnerable while turning a corner, breaching a room, or in an area with limited cover. The solution is also likely to be used in instances where officers search for victims of human trafficking or kidnapping in typical hiding areas such as behind false walls in large trucks or apartments. The capability to detect life behind walls, barricades, household objects, and closed doors will undoubtedly enhance an officer’s situational awareness. The solution will improve the safety of police officers, provide them with critical information that potentially enables

more tactical options, as well as increase the likelihood of them finding human trafficking and kidnapping victims.

- **Real-Time Indoor Visualization System for Low Visibility Fire Environments (SOO B)**

Firefighters are susceptible to disorientation and confusion when entering a structure with low visibility. Impaired vision in a high-stress environment endangers even the most experienced firefighters and decreases their response effectiveness. In areas of heavy smoke, firefighters might struggle to find unconscious victims, assist with the hand line, or have good situational awareness of their immediate environment. Generally, a firefighter might also be unsure of his or her next step, leading to longer fire suppression times and depleted air supplies. Gloves, self-contained breathing apparatuses (SCBAs), and masks diminish a firefighter's sense of touch, smell, taste, and hearing, but a blinded firefighter is most significantly compromised. It is imperative that firefighters retain visual fidelity.

Firefighters require a solution that visualizes the environment and shares critical information, but not in a distracting manner. The solution must be hands-free, able to operate in high heat and other hostile environments common to those firefighters are exposed to and cannot negatively impact the firefighter's physical behavior. The solution is expected to be integrated with commonly used gear and must not burden the firefighter with unusual or complicated attachments.

- **Gunshot Detection, Localization, Alert, and Recording System (SOO C)**

When a shooting occurs, responders generally rely on a nearby person to call 911 and notify them of the incident. However, witnesses do not always call 911 (especially in areas of extreme gun violence) or information shared with dispatch could be incorrect. Predictive policing is an increasingly popular alternative to stem gun violence but comes with significant policy hurdles. Responders need a simple technology that will alert them to more shooting incidents (near instantaneously), provide critical information ahead of their on-scene arrival (e.g. multiple types of gunshots could suggest there being multiple shooters) and record evidence that is useable in court. These three capabilities would improve the safety and effectiveness of responders to gun violence incidents.

- **Three Dimensional X-Ray (SOO D)**

Currently, bomb technicians do not have a three dimensional (3D) capability to identify potentially harmful contents in a container or space. Although 3D capability exists in the medical community, bomb technicians need a portable system that allows for clear identification of contents within a predetermined object or space. In addition, several obstacles—such as walls, boxes, and barriers—can prevent technicians from quickly identifying a potentially explosive substance and determining the proper course of action. When lives are on the line and every second counts, responders need a clear, concise 3D imaging tool that can give them an instant picture of the threat they are facing.

The technology solution should allow bomb technicians to rapidly generate 3D X-ray images of the inside of a suspicious container or barrier to ascertain precise positioning

information about potentially harmful entities, such as improvised explosive devices (IEDs), that may be encased in metal, shielding them from radio-frequency technologies. The proposed solution would then allow for the exported images to be manipulated, via a software package, to create a 3D model of the identified item.

- **Data Upload Mechanism for Sharing Floor Plans & Site Safety Data Easily (SOO E)**
First Responders lack the situational awareness capability to quickly assess the layout of a building upon entry. First responders currently carry binders of printed floor plans with them or respond to incidents blindly with no knowledge of building layouts. In many instances, this prevents them from taking necessary precautions, leaves them without necessary equipment and tools, and generally leaves them at a situational awareness disadvantage when arriving to a response scene.

First responder subject matter experts identified a need for a mechanism to access digital floor plans and other key safety data (e.g. standpipes, designated evacuation routes, secure facilities, hazardous materials (HAZMAT) locations, and gas or power panel locations). Information provided in advance by building owners and local jurisdictions could be extremely beneficial to the safety and efficiency of responders in the field.

This solution will provide baseline floor plans and site safety information to provide operational context for tracking systems, HAZMAT response, augmented reality and many other first response applications. From an operational perspective, this will allow first responders to be better aware and plan more effective responses to emergency situations.

- **GPS Tracker and Biometric Monitor for Detainees (SOO F)**
The capability to track and monitor detained personnel is limited to visual inspections at federal detention centers. A significant amount of staffing resources go towards the monitoring of detainee location and health. Currently, the primary way to determine the status of detainees is through visual inspection by the facility staff which is periodic and does not reflect real time status.

A device is required that will enable staff to locate and track of all detainees at a facility more efficiently and cost effectively. This technology could potentially reduce staffing needs and improve accountability at federal detainment facilities. The device can be activated at check-in and can also be used during transport between facilities.

- **Hazardous Crowd Dynamics Detection (SOO G)**
First responders lack the integrated technology to track hazardous behavior of individuals/groups during public events. First responder subject matter experts identified a need to detect hazardous behavior by people and crowds in public locations and during major events. Currently, personnel must manually review video streams and other visual data, if available, and typically are not doing so continuously throughout events.

This technology will detect adverse behavior displayed by individuals or groups of people (crowds), including unsafe crowd speeds, density pressures, directions and other

high risk behaviors that are synonymous with hazardous situations. In addition, the solution can leverage existing technologies to model safe crowd densities and likely crowd speeds overlapped from density and motion estimates from video analytics. It would need to dynamically account for barricades and security measures.

- **Improve Communications in High Loss Environments (SOO H)**

First responders lack the capability to effectively communicate in all high loss environments. Effective actions in emergency situations require clear and constant lines of communication. It is not uncommon for responders to find themselves in situations where the quality and speed of communication can be significantly impaired. Whether responders are deployed to limited-access locations (e.g. underground subway tunnel, rural community, areas affected by disasters) or locations where available signals are already strained due to high local demand (e.g. sports stadium), it is critical for them to maintain continuous lines of communication to enhance life safety and efficiency.

This technology will provide cellular and radio amplification to areas of degraded communication to assist first responder activities. This temporary solution will allow responders to work together in areas where they cannot currently communicate and provide the capability for radios to be operable on different channels.

- **Real-Time Electronic Data Sharing (SOO I)**

To more effectively manage emergency response, first responders serving in a leadership capacity need a tool that 1) maps out incident scenarios, 2) provides a visual overview of the location and progress of first responder teams on the ground in response to an incident, and 3) permits digital substitution for paper-based incident command decision-making tools. Additionally, non-leadership personnel, particularly those in the field, do not have the capability to 1) quickly inform higher levels of command during a response besides relaying information by radio or in-person, or 2) passively and continuously share their location, status, or the details of their surroundings. These issues negatively affect most first responder disciplines, particularly in environments with limited visibility, intricate architectures, or complex events. The technical solution shall be applicable to firefighters, Hazardous Materials (HAZMAT) teams, disaster response teams, and certain law enforcement personnel such as special operations units during unusual and complex incidents (e.g. riots). Simply being able to tell which floor a first responder is on in a high-rise, for example, provides invaluable geo-spatial awareness for incident command. A quicker response results in the increased likelihood of lives saved. Also, improved awareness of nearby first responders shall reduce the risk of friendly-fire. This component of the solution is expected to be the next generation precision outdoor and indoor navigation and tracking tool for first responders. However, the technical solution is also expected to provide the capability to electronically document, save, and share back to command center in real time data on incident planning, actions, and mapping.

- **Responder Early Identification (SOO J)**

In various types of emergencies, it would be valuable for responders to automatically be made aware of each other's arrival and location. This would enable them to better coordinate their actions. In order to plan collaborative response activities more safely and

effectively, first responder teams need a technology that will track team member locations in real-time. An example of when this would be useful is a situation involving an active shooter or other hostile actor. This technology will help responders to avoid harming each other in error.

This technology shall provide geolocation tracking of responders on the scene during an emergency and notify nearby responders of each other's presence and location. The system shall be easy to activate and use in an emergency situation and be able to incorporate responders from a range of services and levels of government. The system should be secure, and as part of registration users should list their qualifications and have them verified by their agency. The system should also be able to communicate across various platforms (e.g., web-based, Android OS, iOS).

- **Robotic Stereoscopic System (SOO K)**

Bomb technicians currently have a limited control of stereoscopic cameras mounted on robots to aid in activities related to rendering improvised explosive devices safe. The camera allows technicians to have a clear binocular perspective while performing their functions from a safe standoff distance. However, technicians encounter situations where the functionality of the robotic camera is limited due to the inability of the technicians to operate the camera independently of the robot. Technicians need the ability to operate and generate video feeds to an external display device independent of the robot and its feed.

This technology solution will allow for multiple options for the stereoscopic camera systems to be mounted on various areas of the robot, act independently of the robot (being controlled by the technician and produce independent video feeds) and transmit 1080p, three dimensional (#D) video feeds to a system independent of the robot camera itself. The proposed solution will result in a wider range of capabilities (depth perception) for the robot and increased functionality of the camera system.

- **Video and Sensor Data Reduction (SOO L)**

Filtering out the important data and creating an actionable process is not only an issue on a consumer level, but also in the first responder community. Several information feeds are available to first responders and public safety departments including: video surveillance streams, analytics, geo-alarms and Chemical, Biological, Radiological, Nuclear, and Explosives (CBRNE) sensors. With the constant influx of information occurring on a daily basis, first responder agencies are having a difficult time trying to determine what information is pertinent to their daily operations and what is not. In addition, this leads to longer response times and the inability to allocate the resources needed to respond to incidents effectively. The need to filter down to mission critical data which will create meaningful situational awareness (that can be shared) that triggers an actionable response is the dilemma that these agencies are facing.

This new technology will filter out uninformative video details (through machine interpretation) users classify as "unnecessary." It will result in smart reduction of both resolution and frame rates (to provide summary views of the video, such as in thumbnail

views) as well as entire clip censoring (if “nothing is happening here” on the video stream). Additionally, the technology will utilize video interpretation and filtering technologies that are currently on the market or that will be produced (those at a proof of concept stage or in development) in the near future. With the ability to filter out unnecessary visual data, this would substantially reduce the data overload sent to first responder agencies.

5. **Number of Awards:** It is anticipated that one (1) award will be made for each topic area. However, multiple awards or no award may be made for each topic area depending on the quality of the proposals, individual funding requests, and total availability of funds.
6. **Anticipated Ceiling:** See BAA 18-02, Section 3 – Award Information regarding anticipated ceiling.
7. **Award Type:** See BAA 18-02, Section 3 – Award Information regarding award types.
8. **Anticipated Award Dates:** The 4th Quarter of Fiscal Year 2019 is when the government anticipates making awards. However, the award date for each topic area may vary based on the quality of the proposals and the availability of funds.
9. **White Paper Instructions:** Offerors shall submit their white papers in accordance with BAA 18-02, Section 5- Application and Submission Information.
10. **Proposal Instructions:** Offerors shall submit their proposals in accordance with BAA 18-02, Section 5 – Application and Submission Information.
11. **Evaluation Criteria:** Proposals will be evaluated in accordance with the evaluation criteria contained in the BAA 18-02, Section 6 – Evaluation Information.
12. **Performer Technical Presentations Instructions:** Performer Technical Presentations will be held under this call and shall be in the format as contained in BAA 18-02, Section 5- Application and Submission Information. All offerors who submit full proposals shall be notified of their presentation date and time within 3 days of the proposal due date.
13. **Foreign Government Participation:** This BAA Call intends to have foreign government participation, to include review of both white papers and proposal submissions for purposes of determining possible joint-funding and to include joint participation in overseeing projects throughout the contract period of performance.

Foreign government participation will be determined by technical topic area based on DHS collaboration and may include any of the following international partners:

- 1) Canada
- 2) The United Kingdom
- 3) The European Union
- 3) Australia
- 4) Singapore

- 5) Mexico
- 6) Israel
- 7) New Zealand
- 8) Republic of Korea
- 9) Japan

Foreign government personnel from any one of the aforementioned countries may participate in the evaluation process as peer/scientific reviewers of submitted white papers and/or proposals. Once DHS has determined that foreign government personnel will participate, as peer/scientific reviewers or as joint participants in overseeing projects, under a specific TTA, each offeror who proposes under the specific TTA will be contacted by the Contracting Officer to obtain the offeror’s consent to sharing their white paper/proposal with a foreign government. Foreign government personnel will not access an offeror’s white paper or proposal unless DHS receives consent. In the event that foreign government personnel do participate in the evaluation process, foreign government personnel will not be permitted to release any information to third parties, including others in their organization.

14. Export Control Notification: All offerors are responsible for ensuring compliance with all export control laws and regulations that may be applicable to the export of and foreign access to their proposed technologies. Offerors should consult with the Department of State with any questions regarding the International Traffic in Arms Regulation (ITAR) (22 CFR Parts 120-130) and /or the Department of Commerce regarding the Export Administration Regulations (15 CFR Parts 730-774). If you are awarded a contract under this BAA, in the absence of available license exemptions/exceptions, you are responsible for:

- Obtaining any appropriate licenses or other approvals, if required, for exports of (including deemed exports) hardware, technical data, and software, or for the provision of technical assistance.
- Obtaining export licenses, if required, before utilizing foreign persons in the performance of a contract, including but not limited to instances where the work is to be performed on-site at any Government installation (whether in or outside the United States), where the foreign person will have access to export-controlled technologies, including technical data or software.
- All regulatory record keeping requirements associated with the use of licenses and license exemptions/exceptions.
- Ensuring that all applicable provisions herein apply to your subcontractors.

15. Questions: Any questions concerning this call must be submitted via email to the Contracting Officer at Amalia.Rodezno@hq.dhs.gov no later than **July 11, 2019 2:00 PM EST** in the following format:

Question #	Reference	Contractors’ Question
1	General (if there is no specific document reference)	

2	(Example) BAA 18-02, page 15, Section 5.2, first paragraph, second sentence	
3	(Example) BAA 18-02/Call 0001, page 2, Section 9, first sentence	
4	(Example) SOO C, page 2, Section 5.1, second paragraph, second sentence	

Please include “Questions for BAA 18-02 Call 0001/SOO No. x” in the subject line. All questions and responses will be posted on the Federal Business Opportunities website <https://www.fbo.gov> and on <https://baa2.st.dhs.gov>. Questions will only be accepted or answered electronically.

16. Attachments:

SOO No.	SOO/TTA Title
A	Hands-Free Presence-of-Life through Walls Detection, Localization, Alert, and Recording System
B	Real-Time Indoor Visualization System for Low Visibility Fire Environments
C	Gunshot Detection, Localization, Alert, and Recording System
D	Three Dimensional X-Ray
E	Data Upload Mechanism for Sharing Floor Plans & Site Safety Data Easily
F	GPS Tracker and Biometric Monitor for Detainees
G	Hazardous Crowd Dynamics Detection
H	Improve Communications in High Loss Environments
I	Real-Time Electronic Data Sharing
J	Responder Early Identification
K	Robotic Stereoscopic System
L	Video and Sensor Data Reduction

17. Additional Information: In the event that any of the information contained in the SOOs conflict with BAA 18-02 (for example, Government Furnished Equipment/ Information/Property) the individual SOO shall take precedence.