BROAD AGENCY ANNOUNCEMENT (BAA)

Explosives Division (EXD) BAA 13-03

Advanced Trace Detection Instrumentation and Methodologies

White Papers Due: See Anticipated Schedule of Events in section 4.6
Full Proposals Due: See Anticipated Schedule of Events in section 4.6

April 28, 2014
Amendment 2

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1 GENERAL INFORMATION

1.1 Introduction

This solicitation is a Broad Agency Announcement (BAA) issued under the provisions of paragraph 6.102(d)(2) of the Federal Acquisition Regulation (FAR) to provide for the competitive selection of research proposals. A formal Request for Proposal (RFP) will not be issued. The Department of Homeland Security (DHS) Science & Technology (S&T) Directorate is soliciting white papers which will be evaluated in accordance with this BAA. From the submitted and evaluated white papers, participants may be invited to submit full proposals under this BAA. 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, "The Competition in Contracting Act of 1984." Awards under this BAA are planned in Fiscal Year (FY) 2014. Currently no funds are committed for any contract awards that may be selected pursuant to this BAA. No contract awards will be made until appropriated funds are available from which payment for contract purposes can be made.

1.2 Agency Name

Department of Homeland Security
Science & Technology Directorate
Explosives Division
Washington, DC

1.3 Research Opportunity Title

Advanced Trace Detection Instrumentation and Methodologies

1.4 Program Name

Air Cargo and Next Generation Checkpoint

1.5 Research Opportunity Number

BAA 13-03

1.6 Solicitation and Response Approach

DHS S&T will not issue paper copies of this announcement. DHS S&T reserves the right to select for award and fund all, some, or none of the submissions received in response to this solicitation. No funding for direct reimbursement of proposal development costs will be allowed. White Papers, Full Proposals or any other material submitted in response to this BAA will not be returned. However, DHS S&T will adhere to FAR policy on handling source selection information and proprietary proposals in accordance with any and all markings on the proposal. It is the policy of DHS S&T to treat all proposals as sensitive competitive information and to disclose their contents only for the purposes of evaluation. All submissions should be unclassified. Documents containing sensitive information that are not suitable for uncontrolled public dissemination should be marked "For Official Use

Only" (FOUO). When transmitted electronically, FOUO proposals should be sent with password protection.

Award type is anticipated to be in the form of a Cost Reimbursement type contract or Other Transaction Agreement, if authorized at time of award. In the event an Offeror or subcontractor is a Federally Funded Research and Development Center (FFRDC), Department of Energy National Laboratory, or other Federally funded entity, DHS S&T will work with the appropriate sponsoring agency to issue an interagency agreement pursuant to the Economy Act (31 U.S.C. 1531) or other appropriate authority.

A two-step proposal selection process will be used for this solicitation to minimize the cost and effort for prospective offerors. Step 1 will consist of the solicitation, receipt, and evaluation of White Papers from offerors. Entries in the various sections of the White Paper should be concise and conform to the specified formatting limitations. No formal transmittal letter is required for the Step 1, White Paper submission.

An evaluation process will be conducted by DHS S&T and the Step 1 White Paper selectees will be encouraged to participate in Step 2, which will consist of the solicitation, receipt, and evaluation of a Full Proposal. The Full Proposals will be page limited as noted in section 4.4. The page count limit excludes the proposer's Formal Transmittal Letter, Cover Page and Table of Contents. The page limit exclusion also applies to resumes/biographical information, Teaming Agreements, Letters of Intent (LOI) and Memorandum of Agreement (MOA)/Memorandum of Understanding (MOU) and Assertion of Data Rights if and only if the main proposal write-up (within the page limitation) makes reference to the respective aforementioned items by referring to the appropriate appendix section containing the items.

1.7 Response Dates

White Papers Due: See Anticipated Schedule of Events in section 4.6.
Full Proposals Due: See Anticipated Schedule of Events in section 4.6.

1.8 Research Opportunity Description

1.8.1 Background

The Homeland Security Act of 2002 (Public Law 107-296) states that DHS S&T will "support basic and applied homeland security research to promote revolutionary changes in technologies; advance the development, testing and evaluation, and deployment of critical homeland security technologies; and accelerate the prototyping and deployment of technologies that would address homeland security vulnerabilities." [1] Pursuant to this mission, DHS S&T EXD is seeking to upgrade systems and/or further develop and transition systems and technologies that offer efficient trace detection of explosives.

[1] 6 U.S.C. § 187(b)(3)(A-C)

The DHS S&T Air Cargo and Next Generation Checkpoint Programs invest in the development and maturation of advanced technologies that demonstrate a potential to deliver solutions that address aviation security capability gaps in both air cargo facilities and at Transportation Security Agency (TSA) security checkpoints, respectively. Specifically, the air cargo program goal is to pursue technologies that identify, develop, test, and enhance the ability of screening systems and operators to detect explosives, including homemade explosives and their precursors, and improvised explosive devices (IEDs) components within cargo parcels and pallets. The next generation checkpoint program goal is to address TSA capability gaps in the detection, disruption, and mitigation of IEDs and other threats on passengers and in carry-on baggage, as well as other DHS component needs for advanced access control point credential authentication systems providing trace explosives detection.

As TSA is the DHS strategic sourcing lead for procurement of ETD[2] systems, TSA's system requirements along with their cost and operational models must be met as new trace explosive detection technologies, such as those pursued by this BAA, are developed. TSA has a Mission Needs Statement (MNS), Operational Requirements Document (ORD), and Functional Requirements Document (FRD) for ETD systems that will guide and frame the technology development on this BAA in order to successfully transition technology. Additionally, to meet the expanding needs of DHS S&T and its various customers (e.g., TSA, Customs and Border Protection (CBP), U.S. Secret Service (USSS), U.S. Coast Guard (USCG), Federal Protective Services (FPS), and First Responders, options for the inclusion of narcotics are desired. Access to the TSA documents will not be required by performers on this BAA; DHS S&T will provide the technical direction on key technologies and needs to the performers.

1.8.2 The Problem

The emergence of homemade explosive (HME) threats and their use by terrorists has placed many challenges on the security screening layers. ETD instruments have been presented with the need to detect a wide range of threats in a broad range of screening scenarios, including break-bulk cargo in air cargo facilities and baggage and passenger screening at aviation security checkpoints.

Technologies are needed that will provide enhanced trace detection capabilities, including increased throughput, increased percent detection (Pd) and decreased percent false alarm (Pfa) via specific identification of the threat with spiral up-gradable threat libraries, and sampling technologies to anticipate emerging threats while maintaining current ETD performance and life-cycle cost standards.

1.8.3 BAA Overview

[2] ETD: Explosives Trace Detection. TSA term for equipment used at security checkpoints that screens baggage and passengers for the presence of trace explosive residue. http://www.tsa.gov/about-tsa/security-technologies#etd

This BAA will consist of four technical areas:

Technical Area 1) Retrofit of ETD systems currently approved for air cargo transport screening, specifically those systems listed in the Qualified or Approved Technology sections of the TSA's Air Cargo Screening Technology List (ACSTL) as of January 2014. The retrofit should expand the library while improving detection capabilities and/or instrument reliability and maintainability.

Technical Area 2) Delivery of a desktop ETD system for cargo, baggage, and personnel screening in air transport environments that can selectively and sensitively identify threats from a significantly expanded library when compared to trace explosives detectors previously certified by TSA, and is structured to be modular in order to enable spiral upgrades as improvements in explosives detection are realized in the future.

Technical Area 3) Development of a portable ETD system that will advance threat detection capability while reducing the required footprint for ETD systems.

Technical Area 4) Research and development of various advanced trace explosives detection tools and methods, including signature analysis and data analytics and advanced sampling tools and methodology. All of which will foster spiral upgrades and enhance performance subsequent to the next generation desktop and portable ETD systems.

DHS S&T is interested in improvements that can be made to ETD systems currently approved for air cargo transport screening. The systems of interest should be listed in the Qualified or Approved Technology sections of the TSA's ACSTL as of January 2014, not devices listed in the Grandfathered Technology section. Selection of improved capabilities will be primarily linked to expanding the instrument library to meet new threat list requirements while also addressing one or more of the following:

a) improving throughput, and/or

b) improving Pd, and/or reducing Pfa, and/or

c) reducing life cycle costs, which may be associated with increased instrument availability (e.g., reduce mean time between failure (MTBF), reduce mean time to repair (MTTR)), or reducing physical resources and consumables, and/or

d) new or improved approaches to efficient Quality Assurance (QA) practices for systems currently in the field that will validate the system's capability to detect required threats at the specified level of detectability.

At the conclusion of the effort devices incorporating the proposed upgrades or improvements need to be ready for acceptance into the Air Cargo Screening Qualification Test (ACSQT).

The desktop ETD system will not only exhibit significant improvements above the current state of the art for explosives detection in air transport environments, but will also be structured as a desktop system that is modular in nature, thereby amenable to future technological improvements. Selection of an appropriate next generation ETD system will be primarily linked to:

a) The system's capability for monitoring multiple target analytes, simultaneously and selectively, within a complex background matrix of potential interferents,

b) Significant expansion of the system's library of target explosives and their precursors or degradation products beyond current state of the art detection systems utilized in homeland security screening,

c) The desktop system's modular construction that is amenable to simple inclusion of future advancements in sampling, analyte pre-concentration, analyte injection, separation, detection and signal processing algorithms, thereby advancing capabilities in trace explosives detection while minimizing the costs associated with implementing these new technologies, and

d) Quality assurance (QA) approaches, which provide a method to validate system performance in a cost efficient manner, e.g., executable with minimal training at a non-technical level and at the lowest cost for consumable QA related materials.

DHS S&T EXD is interested in advancing the state of the art with regards to miniaturizing ETD technologies to fit into a portable form factor. Such technologies will meet the technology improvements sought for the next generation desktop ETD system, but, additionally, reduce the required footprint for such ETD systems. These improvements will provide flexibility to the ETD system, allowing the instrument to be moved proximate to the surface of interest that may help facilitate non-contact sampling or direct contact sampling. Such portable systems must incorporate many operational constraints not currently applicable to desktop ETDs, including but not limited to a reduced form factor, lightweight, ruggedness to withstand rough handling while in operation, and reduced power consumption (improved efficiency) to allow for reasonable battery life.

DHS S&T EXD is also interested in enabling the development of significantly enhanced capabilities for new or existing sensors and detection instrumentation via the implementation of signature analysis, data analytics, information theory analysis, compressive measurement, sensor fusion, and algorithm development. A goal of this technical area is to define innovative measurement system architectures that jointly optimize the physical measurement system and mathematical processing framework to provide a unified or jointly designed acquisition, processing, and detection system. By advancing information theoretic analysis to foster new system architectures and measurement processes, spiral upgrades to current systems and implementation of new designs will promote the reduction of false alarm rates on an even wider suite of explosive

threats and threat classes, while simultaneously improving the percent detection, increasing screening throughput and reducing equipment life-cycle costs.

Sampling can severely limit the capability of ETDs, due to the inability to efficiently deliver trace explosive particles or vapor from passengers, baggage or cargo to the inlet of an ETD. The predominant mode of sample collection in airport security is via direct contact or the use of swabs. While direct contact has demonstrated broad utility in the sampling of explosive particles from laptops and baggage, it is currently limited by:

1) restriction to particle collection, not vapor,
2) less than 100% collection efficiency and/or desorption efficiency,
3) issues with sampling passengers' clothing or skin directly due to TSA restrictions with regards to direct contact with passengers,
4) limited area of sampling associated with the small size of the swab and time allotted to sampling, and
5) cost per sampling event due to swab consumables.

Direct contact methods may be improved by either developing improved swab materials or proposing new engineering methods, e.g., an improved wand to ensure optimal sample collection. Alternatively, non-contact methods of sampling for explosives have been investigated, including air pressure (trace portal machine), heat (IR), optical (laser desorption), and various vapor phase ionization methods (DESI, DART). Non-contact methods may potentially overcome direct contact sampling limitations, in some cases, by permitting larger sampling areas, amenability to direct passenger screening, applicability to vapor and particle sampling, and lower costs per sample. DHS S&T EXD is interested in advancing the state of the art with regards to sampling methodology for explosives trace detection as it pertains to both direct contact methods (materials and engineering advancements), as well as non-contact methods.

1.8.4 Technical Areas of Interest

1.8.4.1 Technical Area 1: Retrofit of Explosives Trace Detection Systems

The primary objective of this technical area is to retrofit Qualified and Approved Technology from TSA's ACSTL as of January 2014 to enable expanded library (with options to include narcotics trace detection) and/or improved throughput, and/or increased Pd, and/or reduced Pfa; instruments proposed for retrofit that are not on this list will be considered non-responsive to this technical area. The expanded library and/or improved throughput, and/or increased Pd, and/or reduced Pfa may be obtained through development of: software improvements (implementation of compressive, adaptive, or advanced mathematical algorithms, above and beyond simple refinement of current algorithms), hardware improvements, such as, but not limited to development of improved or more durable swabs/swab tools, improved desorption efficiency/techniques, and improved human factors engineering. Additionally, hardware improvements that seek to decrease system/life cycle costs are of interest. Such life cycle costs may be decreased through increased inherent availability, and/or reduction in physical resources and consumables.

This technical area also includes interest for efficient QA practices including associated consumable materials at the lowest cost, which would allow for field validation of the system to detect threat list materials at the Limits of Detection (LOD). TSA is interested in how potential offerors would propose to address QA in the event of follow-on acquisition of Retrofit ETD Systems.

The expected impact of the retrofit on current system metrics should be indicated via percent increase/decrease, e.g., increase throughput by X%, improve Pd by X%, reduce Pfa by X%, decrease life cycle costs by $X/system, increase inherent availability to X by reducing the MTBF by X hours and/or MTTR by X hours, etc.

The beginning Technology Readiness Level (TRL) level for the retrofit ETD system is anticipated to be about TRL 6. The final TRL level for the retrofit ETD system is anticipated to be about TRL 8. For full definition of TRL levels, refer to Appendix A.

1.8.4.2 Technical Area 2: Desktop Explosives Trace Detection Systems

The primary objective of this technical area is to develop advanced desktop ETDs suitable for cargo, baggage, or personnel screening in air transport environments. This advanced ETD must meet an expanded library requirement and be modular in design. The system should be capable of sampling, detecting, and identifying trace signatures from military, commercial, and homemade explosives, as well as precursors of homemade explosives.

Technologies for trace analysis of other chemical compounds such as environmental contaminants, forensic signatures, chemical weapons, and narcotics may be of interest if they can analyze a broad spectrum of explosive threats and their precursors. For the advanced explosives trace detectors that address the expanded libraries requirement, technologies under consideration include, but are not limited to, ion mobility spectrometers, mass spectrometers, and systems with multiple analyzers, filters, and/or separation technologies.

To achieve the desired specificity, a resolving power beyond single atomic mass unit (amu) may be required for detection of a minimum of 30 target analytes selected from a broad range of explosives formulations, including commercial and military explosives, homemade explosives, fuel/oxidizer mixtures, inorganic salts, and precursor compounds. Furthermore, a list of additional materials to be included in the algorithm is required. These additional materials may consist of benign substances and confusants common to homeland security screening environments for which the system will not generate an alarm and narcotics for which the system would generate an alarm.

This technical area also includes interest for efficient QA practices including associated consumable materials at the lowest cost, which would allow for field validation of the system to detect threat list materials at the LOD. TSA is interested in how potential offerors would propose to address QA in the event of follow-on acquisition of Desktop ETD Systems.

It is highly desirable that the desktop and portable ETD system not incorporate any components which require oversight by the Nuclear Regulatory Commission (NRC) in order to avoid issues associated with the implementation of radioactive sources.

The beginning TRL level for the desktop ETD system is anticipated to be about TRL 4. The final TRL level for the desktop ETD system is anticipated to be about TRL 7. For full definition of TRL levels, refer to Appendix A.

1.8.4.3 Technical Area 3: Portable Explosives Trace Detection Systems

The primary objective of this technical area is to develop a portable ETD suitable for security screening of cargo, baggage, or personnel. This miniaturized ETD must meet the expanded library requirement described above for desktop ETD systems while fitting within the approximate size constraints of a shoebox. The system should be capable of sampling, detecting, and identifying trace signatures from military, commercial, and homemade explosives, as well as precursors of homemade explosives. Technologies for trace analysis of other chemical compounds such as environmental contaminants, forensic signatures, chemical weapons, and narcotics may be of interest if they can analyze a broad spectrum of explosive threats and their precursors.

This technical area also includes interest for efficient QA practices with associated consumable materials at the lowest cost, which will allow for field validation of the system to detect threat list materials at the LOD. TSA is interested in how potential offerors would propose to address QA in the event of follow-on acquisition of Portable ETD Systems.

The beginning TRL level for the portable ETD system is anticipated to be about TRL 4. The final TRL level for the portable ETD system is anticipated to be about TRL 7. For full definition of TRL levels, refer to Appendix A.

1.8.4.4 Technical Area 4: Trace Explosives Detection Tools and Methods

The primary objective of this technical area is to advance ETD component technologies in order to a) define innovative measurement system architectures that jointly optimize the physical measurement system and mathematical processing framework to provide a unified or jointly designed data acquisition, processing, and detection system which will reduce false alarms rates while maintaining the percent detection, b) provide spiral upgrades in a modular approach to the desktop and portable ETD systems detailed in sections 1.8.4.2 and 1.8.4.3 via development of new sampling methods for trace explosives detection in cargo, checked baggage, and/or checkpoint screening in air transport environments.

The beginning TRL level for the trace explosives detection tools and methods is anticipated to be about TRL 3. The final TRL level for the trace explosives detection tools and methods is anticipated to be about TRL 6. For full definition of TRL levels, refer to Appendix A.

1.8.4.4.1 Signature Analysis

The primary objective of this technical area is to advance information theoretic analysis of signatures in order to promote the reduction of false alarm rates on an even wider suite of threats and threat classes, while, simultaneously improving the percent detection, increasing screening throughput and reducing equipment life-cycle costs (increasing inherent availability). The performer will develop mathematical approaches for incorporation of priors to provide enhanced detection capability in terms of performance (improved Receiver Operator Characteristic (ROC) curves), throughput and reduction of physical resources and system cost. Applicable approaches include, but are not limited to, signature analysis, compressive measurements, coded apertures, active learning, sensor or data fusion, principal components analysis, information theory analysis, adaptive or intelligent measurement approaches, and algorithm development. Examples of research thrusts include, but are not limited to:

1) Joint measurement strategies which include decision analytics that arise from multiple sensors of differing modalities.
2) Realizing drastic improvements in the quantity and quality of acquired information while simultaneously reducing the cost of deployed measurement resources. Approaches that result in less costly acquisition hardware are of interest.
3) Utilizing information theoretic analysis for data acquisition and classification approaches to determine the optimum or near optimal minimum required number and/or types of signatures to achieve specified detection performance (ROC curves) across the broad library of explosives required to meet TSA needs.
4) Adapting the measurement while the measurement process is ongoing to reduce the total time required to acquire the information and simultaneously improving the signal-to-noise ratio of the desired measurement.
5) Determining the number of unique or orthogonal signatures required to provide a significant enhancement of the ROC curves while maintaining or improving ETD throughput.
6) Understanding how additional sensing modalities and fusion can be employed and effectively integrated for maximal effect.

Focus will be to (a) provide high impact approaches that are capable for retrofitting into existing ETDs via critical spiral upgrades, or, alternatively, applicable to systems under active development, or (b) spurn the design of future, innovative, novel ETDs that will revolutionize explosives detection for security screening by significantly enhancing the state-of-the-art in delivered detection capability. A successful proposal must identify the ETD that the proposed signature analysis approach would apply to and its applicable TRL level; see Appendix A for a description of TRL levels. Further, a successful proposal must demonstrate that through the signature analysis advancement the ETD system would then meet or exceed the desktop and/or portable detection program metrics as detailed in sections 1.8.8.1 and 1.8.9.1, respectively.

1.8.4.4.2 Improved Trace Explosives Sampling Methods

The primary objective of this technical area is to develop new sampling methods for trace explosives detection in cargo, checked baggage, and/or checkpoint screening in air transport environments. These sampling methods should enhance the sensitivity of ETDs, improve screening time, enlarge the total surface area sampled, broaden amenability to variable surface types (including skin and clothing), promote reliability by minimizing downtime, enable widest sampling collection capability for all explosives types, and/or reduce cost per sample. Two separate areas of development are of interest: direct contact (e.g., improved/new swab materials and/or engineering advancements to improve the collection/desorption efficiency of swabs) and non-contact sampling. All aspects of sampling need not be addressed to be responsive to this BAA.

Areas of interest include, but are not limited to:

1) improved and/or new swab materials that are cost competitive to current sampling media,
2) improved wand or swab holder with the ability to improve collection efficiency,
3) novel approaches for sampling from human skin or clothing,
4) reliable air pulse sampling and collection techniques with minimal maintenance requirements,
5) capability to rapidly sample the entire exterior surface of carry-on baggage, checked baggage, or break bulk cargo,
6) rapid pre-concentration approaches,
7) complementary combination of direct contact and non-contact sampling to broaden sampling capability across different explosive families,
8) an upgradable non-contact trace hand-held sampling tool that will offer increased capability to respond to emerging threats, and
9) a cost-effective, rugged, ergonomic, "universal" trace collection swabbing tool supporting common ETD systems capable of providing users with feedback (e.g., green light or sound) with regards to reproducible and adequate pressure application to ensure proper operation.

Research must demonstrate a substantial improvement to those methods already used by TSA and be readily implemented in TSA's current Concept of Operations (CONOPS).

1.8.5 Statement of Work

This Statement of Work (SOW) sets forth the requirements to accomplish four primary technical objectives:

1) Retrofit of current ETD systems.
2) Development of a desktop ETD system.
3) Development of a portable ETD system.

4) Development of various trace explosives detection tools and methods. The fourth technical objective is further separated into the following technical objectives:
    a) Signature analysis and data analytics, and
    b) The development of new, improved methods of sampling for trace explosives on passengers, cargo or baggage via direct contact (e.g., swabbing) or non-contact approaches.

While these four primary technical objectives are complementary, a proposal need not address each objective in order to be responsive. In addition, while the fourth objective is further divided into several supporting components, a proposal need not address each supporting component in order to be responsive. A separate white paper or proposal should be submitted for each technical area, and/or sub-area in technical area 4. The identified requirements presented here have a direct impact on meeting the requirements outlined in the Aviation and Transportation Security Act of 2001, Public Law 107-71.

1.8.6 Program Management and Systems Engineering

Personnel provided by the Contractor(s) shall have the skills and technical background necessary to successfully complete the tasks described in subsections 1.8.7.2, 1.8.8.2, 1.8.9.2, and/or 1.8.10.2, including, but not limited to the following:

a.) The Contractor(s) shall host a Post-Award Conference (PAC) within one month after contract award. The Contractor(s) shall provide the Government with the meeting minutes for the PAC within 5 days after the meeting.
b.) The Contractor(s) shall conduct and administratively support Technical Interchange Meetings (TIMs). The Contractor and the Contracting Officer's Representative (COR) will mutually agree to the date, location and agenda of each TIM. The Contractor(s) shall provide the Government the meeting minutes for each TIM within 5 days after the meeting.
c.) The Contractor(s) shall submit Monthly Status Reports on the 15th of each month starting the first month after award date, or 30 days after award date, whichever comes second.
d.) The Contractor(s) shall submit Meeting Minutes within 5 days after each meeting for every meeting held in support of this effort.
e.) The Contractor(s) shall prepare and submit Briefing Charts no later than 1 day before any TIM and no later than 3 days before a design review.
f.) The Contractor(s) shall host visits at their facility periodically so the Government can observe work being performed (and/or provide a telecom bridge as required). These discussions may coincide with the execution of milestones and activities listed in timelines.

1.8.7 Retrofit of Explosives Trace Detection Systems Technical Area

1.8.7.1 Program Metrics

	Threshold	Objective

Performance Parameter	Expanded Libraries	• Detect and identify at least twenty (20) threat-related compounds, without compromising false alarm rate. As part of their Technical Proposal, Offerors will be required to submit the identity of the threats or threat markers that will comprise the total analytes being proposed, and these should be selected in a distributed and representative fashion across the range of aliphatic organic nitrates, aromatic organic nitrates, organic peroxides, inorganic salts, inorganic salt/fuel mixtures, plastic explosives, and precursors. • Provide a proposed list of twenty (20) benign substances and confusants, some of which are common in homeland security screening environments, for which the system will be tested and demonstrated to not generate alarms.	• Detect and identify at least thirty (30) threat-related compounds, simultaneously, without compromising false alarm rate. As part of their Technical Proposal, Offerors will be required to submit the identity of the threats or threat markers that will comprise the total analytes being proposed, and these should be selected in a distributed and representative fashion across the range of aliphatic organic nitrates, aromatic organic nitrates, organic peroxides, inorganic salts, inorganic salt/fuel mixtures, plastic explosives, and precursors. • Provide a proposed list of thirty (30) benign substances and confusants, some of which are common in homeland security screening environments, for which the system will be tested and demonstrated to not generate alarms. • Provide a proposed list of narcotics for which the system will be tested and generate alarms. As part of their Technical Proposal, if applicable, Offerors should submit the identity of the compounds that will comprise the total analytes being proposed, and these should be selected in a distributed and representative fashion

			across the range of Schedule I and II drugs[3] (opiates, hallucinogenic substances, depressants, stimulants, cannabimimetic agents, and immediate precursors).
	Throughput	• 50% reduction in total time for analysis (machine processing plus analysis time)	• 75% reduction in total time for analysis (machine processing plus analysis time)
	False Alarm Rate (Pfa)	• 50% reduction	• 90% reduction
	Detection Rate (Pd)	• For each individual threat, 25% reduction in false negatives	• For each individual threat, 50% reduction in false negatives
	Quality Assurance (QA)	• QA procedures for 4 different threats (an aliphatic organic nitrate, an aromatic organic nitrate, an organic peroxide, and a plastic explosive) at the instrument LOD.	• QA procedures for all threats the instrument is capable of detecting at the instrument LOD.
	Life cycle costs (including maintenance and consumables)	• 40% reduction	• 60% reduction

1.8.7.2 Tasks

The Contractor will perform the following tasks:

TASK 1: Design, Development, and Fabrication

Task 1 shall include the design, development, and fabrication of a retrofit ETD system that meets the program metrics listed above. The Contractor(s) will provide a Systems Requirements Review and Design Review, draft and final test plans, and three prototype retrofit ETDs. The Contractor(s) will provide technical reports, systems requirements documents, design review documentation, test plans, and other documentation for Government review and evaluation, and conduct a prototype test to assess the ability of the retrofit ETD to meet the threshold requirements. Task 1 will complete with the fabrication of three retrofit prototype ETDs.

It is anticipated that Task 1 will last no more than 3 months in duration.

TASK 2: Internal Testing, Delivery, and Testing Support

[3] As defined in section 1308 of the most recent issue of Title 21 Code of Federal Regulations (CFR) Part 1300 to end (21 CFR 1308) and the final rules which were published in the Federal Register subsequent to the issuance of the CFR. (See http://www.deadiversion.usdoj.gov/21cfr/cfr/2108cfrt.htm)

Task 2 efforts will include internal testing, delivery, and testing support of three prototype retrofit ETDs. Deliverables will include preliminary test results, field data acquisition and analysis, draft and final reports, and user and maintenance manuals for the retrofit ETDs. The Contractor(s) will prepare and submit a Vendor Data Package to include supporting laboratory and field test data no later than 30 days before delivery of the prototypes to the Government for testing. The Contractor(s) will assist in installation, training, and test support for the retrofit ETDs at the test location to be selected by DHS S&T. The Contractor(s) will perform remediation of capability gaps identified, and agreed upon by the Government, during Government testing. Task 2 will conclude with the resubmission of the retrofit ETDs for additional Government testing, Developmental Test and Evaluation (DT&E), Operational Test and Evaluation (OT&E), Readiness Test and Evaluation (RT&E), or Independent Test and Evaluation (IT&E), as determined by the Government.

It is anticipated that Task 2 will last no more than 6 months in duration.

The Government reserves the right to witness all Contractor-conducted test activities. The Contractor(s) shall provide the Government at least one week written notice prior to conducting the final factory test. Pursuant to FAR clause 52.245-1, the Government will own the prototypes or advanced technology systems (and have unlimited rights to the source and executable code developed using Government funding) after final delivery.

1.8.7.3 Key Milestones and Deliverables

Tasks	Major Sub-Tasks	Key Milestones and Deliverables
Retrofit ETD Technical Area Task 1: Design, Development, and Fabrication (month 1-3)	• PAC • Systems Requirement Review • Perform Design Review • Draft Test Plan • Build 3 Prototype retrofit ETDs, including upgrades to software and algorithms as required	• Meeting minutes, 5 working days after each meeting • Monthly Reports, no later than 15 days from month's end • TIMs, in coordination with monthly report submittal • PAC, no later than 1 month after award • System Requirements Review, due 1 month after award • Design Review, due 1 month after award • Draft Test Plan, 2 months after award • Final Test Plan, 3 months after award • Final Report for Task 1, due

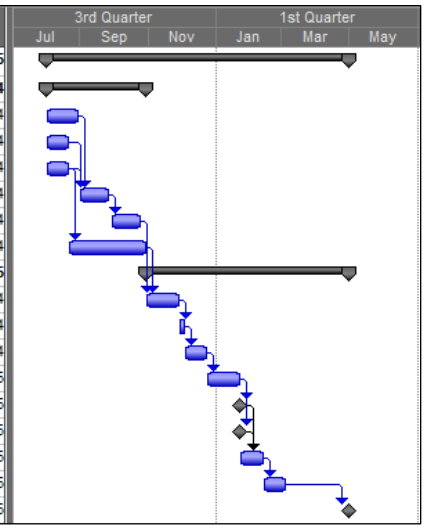
Tasks	Major Sub-Tasks	Key Milestones and Deliverables
		3 months after award
Retrofit ETD Technical Area Task 2: Test and Delivery (month 3-9)	• Laboratory data collection and analysis • Preliminary test results report • Field Data Acquisition and analysis • Prepare Vendor Data Package • Deliver to test site for DT&E • Support Testing • User manual and maintenance manual	• Meeting minutes, 5 working days after each meeting • Monthly Reports, no later than 15 days from month's end • TIMs, in coordination with monthly report submittal • Preliminary Test Results, 4.75 months after award • Readiness Test Data Package, including internal test results and instruction manuals, 7 months after award • Deliver three Prototypes, 8 months after award • Final Report, 9 months after award

Days/months for deliverables are measured after contract award date unless otherwise indicated.

1.8.7.4 Project Timeline

Below is a summary of the tasking timeline for this effort:

Task Name	Duration	Start	Finish
Retrofit Current ETD Systems	**273 days**	**Fri 8/1/14**	**Thu 4/30/15**
Phase 1: Design and Development of Retrofit ETD	**90 days**	**Fri 8/1/14**	**Wed 10/29/14**
Post-Award Conference	30 days	Fri 8/1/14	Sat 8/30/14
Systems Requirements Review	4 wks	Fri 8/1/14	Wed 8/20/14
Design Review	4 wks	Fri 8/1/14	Wed 8/20/14
Draft Test Plan	4 wks	Mon 9/1/14	Fri 9/26/14
Final Test Plan	4 wks	Mon 9/29/14	Fri 10/24/14
Retrofit Prototype	10 wks	Thu 8/21/14	Wed 10/29/14
Phase 2: Testing of Retrofit ETD	**183 days**	**Thu 10/30/14**	**Thu 4/30/15**
Laboratory Data Collection and Analysis	6 wks	Thu 10/30/14	Fri 11/28/14
Preliminary Test Results	1 wk	Sat 11/29/14	Wed 12/3/14
Field Data Acquisition and Analysis	4 wks	Thu 12/4/14	Tue 12/23/14
Readiness Test Data Package	6 wks	Wed 12/24/14	Thu 1/22/15
Delivery of Prototypes for DT&E	0 wks	Thu 1/22/15	Thu 1/22/15
User Manual and Maintenance Manual	0 wks	Thu 1/22/15	Thu 1/22/15
DT&E Testing	4 wks	Fri 1/23/15	Wed 2/11/15
DT&E Remediation	4 wks	Thu 2/12/15	Tue 3/3/15
Final Report	0 days	Thu 4/30/15	Thu 4/30/15



1.8.8 Desktop Explosives Trace Detection Systems Technical Area

1.8.8.1 Program Metrics

		Threshold	Objective
Performance Parameter	Broad spectrum threat detection library (including homemade explosives and their precursors)	• Detect and identify at least thirty (30) threat-related compounds, ***simultaneously***. As part of their Technical Proposal, Offerors will be required to submit the identity of the threats or threat markers that will comprise the total analytes being proposed, and these should be selected in a distributed and representative fashion across the range of aliphatic organic nitrates, aromatic organic nitrates, organic peroxides, inorganic salts, inorganic salt/fuel mixtures, plastic explosives, and precursors. • Provide a proposed list of twenty (20) benign substances and confusants, some of which are common in homeland security screening environments, for which the system will be tested and demonstrated to not generate alarms. • For all threats and threat markers, organic analytes must be detected with a sensitivity of ≤ 10 ng/cm^2 and all inorganic salts detected at ≤ 100 ng/cm^2.	• Detect and identify fifty (50) threat-related compounds, simultaneously, without compromising false alarm rate. As part of their Technical Proposal, Offerors will be required to submit the identity of the threats or threat markers that will comprise the total analytes being proposed, and these should be selected in a distributed and representative fashion across the range of aliphatic organic nitrates, aromatic organic nitrates, organic peroxides, inorganic salts, inorganic salt/fuel mixtures, plastic explosives, and precursors. • Provide a proposed list of thirty (30) benign substances and confusants, some of which are common in homeland security screening environments, for which the system will be tested and demonstrated to not generate alarms. • Provide a proposed list of narcotics for which the system will be tested and generate alarms. As part of their Technical Proposal, if applicable, Offerors should submit the identity of the compounds that will comprise the total analytes being proposed, and these should be selected in a distributed and

			representative fashion across the range of Schedule I and II drugs[4] (opiates, hallucinogenic substances, depressants, stimulants, cannabimimetic agents, and immediate precursors). • For all threats and threat markers, organic analytes must be detected with a sensitivity of ≤ 1 ng/cm^2 and all inorganic salts detected at ≤ 10 ng/cm^2.
	Algorithm Expansion Capability	• Raw data accessibility and portability off-system for further advanced analysis by Government authorized technical personnel. • Ability to be modified by a Government authorized trained technician to expand detection to include additional threats.	
	Interoperability	• Storage capacity for at least 5,000 storage events. • An Ethernet network interface with an RJ-45 connector that supports full/half duplex data rates of 10/100 mega-bits per second and Transmission Control Protocol/Internet Protocol (TCP/IP). • One (1) Universal Serial Bus (USB) 2.0 compatible ports for uploading and downloading. • Open network capability, i.e., proprietary software is not required.	
	Percent False Alarm (Pfa)	• Pfa ≤ 2%	• Pfa ≤ 1%
	Percent Detection (Pd)	• For each individual threat: Pd(individual) ≥ 80% • For all of the threats combined: Pd(overall) ≥ 90%	• For each individual threat: Pd(individual) ≥ 85% • For all of the threats combined: Pd(overall) ≥ 95%
	Quality Assurance (QA)	• QA procedures for 4 different threats (an aliphatic organic nitrate, an aromatic organic nitrate, an organic peroxide, and a plastic explosive) at the instrument LOD.	• QA procedures for all threats the instrument is capable of detecting at the instrument LOD.
	Sampling methodology	• Swabs or other mechanism compliant with current TSA CONOPS to sample particulate and/or vapor	• Non-contact sampling of particulate and/or vapor threats.

[4] As defined in section 1308 of the most recent issue of Title 21 Code of Federal Regulations (CFR) Part 1300 to end (21 CFR 1308) and the final rules which were published in the Federal Register subsequent to the issuance of the CFR. (See http://www.deadiversion.usdoj.gov/21cfr/cfr/2108cfrt.htm)

		threats.	
	Radioactive materials		• No components which require oversight by the NRC are permitted
	Throughput	• Machine processing and analysis time that does not exceed ten (10) seconds 99 percent of the time.	• Machine processing and analysis time that does not exceed five (5) seconds 99 percent of the time.
	Clear-down time after alarm	• Not to exceed two (2) minutes.	
	Inherent Availability [a]	• ≥ 0.98	
	Instrument Life Cycle	• 8-10 years	
	System robustness	• Storage cold start (when instrument is set-up after storage or shipping) less than 2 hours until system is ready to analyze samples. • Cold start (if system was powered down more than 30 minutes, but not moved) less than 30 minutes until system is ready to analyze samples. • Warm start (if system was powered down less than 30 minutes) less than 5 minutes until system is ready to analyze samples.	• Storage cold start (when instrument is set-up after storage or shipping) less than 30 minutes until system is ready to analyze samples. • Cold start (if system was powered down more than 30 minutes, but not moved) less than 5 minutes until system is ready to analyze samples. • Warm start (if system was powered down less than 30 minutes) less than 1 minute until system is ready to analyze samples.
	System footprint	• No greater than 22 in × 22 in, and not to exceed a height of 24 in	• No greater than 18 in × 18 in, and not to exceed a height of 24 in
	Power	• Must be compatible with a U.S. standard wall outlet, i.e. 110-120V, 15amp.	• Must be compatible with a U.S. standard wall outlet, i.e. 110-120V, 15amp. • Powered by an internal battery backup for 10 minutes in case of power loss.
	Weight	• ≤ 44 lbs	• ≤ 35 lbs
	Cost	• < $50K/unit	• < $35K/unit

[a] Inherent Availability is defined by Defense Acquisition University (DAU) as:

$$A_I = MTBF \div (MTBF + MTTR)$$

where MTBF is the Mean Time Between Failure and MTTR is the Mean Time To Repair.

1.8.8.2 Tasks

The Contractor will perform the following tasks:

TASK 1: Design and Development

Task 1 shall include the design and development of a desktop ETD system that meets the program metrics listed above. The Contractor(s) will provide a Preliminary Design Review (PDR), demonstrate the feasibility of the technical approach by generating preliminary data in a laboratory and field environment, and provide results of these studies during a Critical Design Review (CDR). The PDR and CDR are critical to establishing the path forward for meeting the specification needs of DHS and its various customers (e.g., TSA, CBP, USSS, USCG, FPS, and First Responders). In addition to the program metrics listed above, the environmental operating capabilities of the desktop ETD will be fully defined at the CDR as it pertains to, for example, a) temperature and temperature shock, b) humidity, c) moisture, dust and water protection, d) electrostatic discharge, e) radiofrequency susceptibility, f) magnetic fields, g) corrosion, h) mechanical drop and i) sand. The Contractor(s) will provide technical reports, PDR documentation, CDR documentation, test plans, test results, and other documentation for Government review and evaluation, and conduct a prototype test to assess the ability of the desktop ETD to meet the threshold requirements.

It is anticipated that Task 1 will last no more than 12 months in duration for the design and development of the desktop ETD system.

TASK 2: Fabrication, Test, and Delivery

Task 2 efforts will include the fabrication, test, and delivery of three prototype next generation desktop ETDs. Deliverables will include draft and final test plans, readiness test data package, user and maintenance manuals, draft and final reports. The Contractor will also prepare a System Design Document which will include (but is not limited to) physical designs, hardware, parts list, software, models, algorithms, source code, software tools, interfaces, testing, and test results. The Contractor(s) will prepare and submit a Vendor Data Package to include supporting test data no later than 30 days before delivery. The Contractor(s) will assist in installation, training, and test support for the desktop ETDs at the test location to be selected by DHS S&T. The Contractor(s) will perform remediation of capability gaps identified, and agreed upon by the Government, during Government testing. Task 2 will conclude with the resubmission and testing support of the desktop ETDs for additional Government testing, DT&E, OT&E, RT&E, or IT&E, as determined by the Government.

It is anticipated that Task 2 will last no more than 12 months in duration for the fabrication, test, and delivery of the desktop ETD system.

The Government reserves the right to witness all Contractor-conducted test activities. The Contractor(s) shall provide the Government at least one week written notice prior to conducting the final factory test. Pursuant to FAR clause 52.245-1, the Government will own the prototypes or advanced technology systems (and have unlimited rights to the source and executable code developed using Government funding) after final delivery.

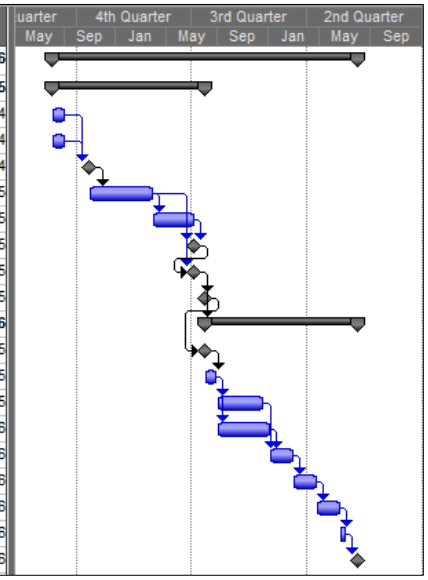
1.8.8.3 Key Milestones and Deliverables

Tasks	Major Sub-Tasks	Key Milestones and Deliverables
Desktop ETD Technical Area Task 1: Design and Development (month 1-12)	• PAC • System Requirements Review • Complete Preliminary Design • Perform PDR • Generate data demonstrating feasibility of system design • Perform CDR • Prototype Test	• Meeting minutes, 5 working days after each meeting • Monthly Reports, no later than 15 days from month's end • TIMs, in coordination with monthly report submittal • Quarterly Reviews/Reports, due every 3 months after award • PAC, no later than 1 month after award • PDR, due 2 months after award • Preliminary test results, due 11 months after award • CDR, due 11 months after award • Final report for Task 1, due 12 months after award
Desktop ETD Technical Area Task 2: Fabrication, Test and Delivery (month 13-24)	• Submit Final Design for Fabrication • Build 3 Prototype Advanced ETDs • Internal Testing • Prepare Vendor Data Package • Deliver to test site for DT&E • Support Testing	• Meeting minutes, 5 working days after each meeting • Monthly Reports, no later than 15 days from month's end • TIMs, in coordination with monthly report submittal • Quarterly Reviews/Reports, due every 3 months after award • Draft Test Plan, 12 months after award • Final Test Plan, 12.5 months after award • Readiness Test Data Package, 16.5 months after award • Deliver three Prototypes for testing, 17.5 months after award

Tasks	Major Sub-Tasks	Key Milestones and Deliverables
		• User and maintenance manual, 17.5 months after award • Deliver three Prototypes for testing, 21.5 months after award • Final Report, 24 months after award

1.8.8.4 Project Timeline

Task Name	Duration	Start	Finish
Desktop ETD System	**731 days**	**Fri 8/1/14**	**Sun 7/31/16**
Phase 1: Design and Development of Desktop ETD	**365 days**	**Fri 8/1/14**	**Fri 7/31/15**
Post-Award Conference	30 days	Fri 8/1/14	Sat 8/30/14
Systems Requirements Review	30 days	Fri 8/1/14	Sat 8/30/14
Preliminary Design Review	0 wks	Wed 10/29/14	Wed 10/29/14
Laboratory Data Collection and Analysis	30 wks	Thu 10/30/14	Sat 3/28/15
Field Data Acquisition and Analysis	20 wks	Sun 3/29/15	Mon 7/6/15
Preliminary Test Results	0 wks	Mon 7/6/15	Mon 7/6/15
Critical Design Review	0 wks	Mon 7/6/15	Mon 7/6/15
Go, No Go Decision Point	0 days	Fri 7/31/15	Fri 7/31/15
Phase 2: Testing and Delivery of Prototypes	**366 days**	**Fri 7/31/15**	**Sun 7/31/16**
Draft Test Plan	0 wks	Fri 7/31/15	Fri 7/31/15
Final Test Plan	1 mon	Mon 8/3/15	Fri 8/28/15
Readiness Test Data Package	4 mons	Mon 8/31/15	Fri 12/18/15
User Manual and Maintenance Manual	4.5 mons	Mon 8/31/15	Fri 1/1/16
DT&E Testing	2 mons	Mon 1/4/16	Fri 2/26/16
DT&E Remediation	2 mons	Mon 2/29/16	Fri 4/22/16
Delivery of Prototypes for Additional Testing	2 mons	Mon 4/25/16	Fri 6/17/16
Final Report	2 wks	Mon 6/20/16	Fri 7/1/16
End of Contract	0 days	Sun 7/31/16	Sun 7/31/16



1.8.9 Portable Explosives Trace Detection Systems Technical Area

1.8.9.1 Program Metrics

The portable ETD must meet all of the detection metrics previously defined for the Desktop ETD (section 1.8.8.1), except for the program metrics for system footprint, power, weight, and cost and the additional system robustness metric which are defined specifically for the portable ETD below.

		Threshold	Objective
	System Robustness	• System should have proper packaging to withstand rough handling (i.e., a 3ft drop onto tile) while in operation.	
	System footprint	• Comparable to the size of a shoebox, not to exceed 15”x 8” x 5” • May require a stationary recharge and/or battery swap station for internal batteries and tether to an external power source (U.S. standard wall outlet of 110-120V, 15amp).	

	Power	• System should operate for > 4 hours before a battery recharge is required and system will operate tethered to an external power source (standard U.S. wall outlet, 110-120V, 15amp). • Battery recharge must take less than the operational life of battery.	• System should operate for > 8 hours before a battery recharge is required.
	Weight	• ≤ 15 lbs with internal battery or ≤ 10 lbs with tethered power source.	• ≤ 10 lbs with internal battery or ≤ 7 lbs with tethered power source.
	Cost	• < $60K/unit	• < $35K/unit

1.8.9.2 Tasks

The Contractor will perform the following tasks:

TASK 1: Design and Development

Task 1 shall include the design and development of a portable ETD system that meets the program metrics listed above. The Contractor(s) will provide a Preliminary Design Review (PDR), demonstrate the feasibility of the technical approach by generating preliminary data in a laboratory and field environment, and provide results of these studies during a Critical Design Review (CDR). The PDR and CDR are critical to establishing the path forward for meeting the specification needs of DHS and its various customers (e.g., TSA, CBP, USSS, USCG, FPS, and First Responders). In addition to the program metrics listed above, the environmental operating capabilities of the portable ETD will be fully defined as it pertains to, for example, a) temperature and temperature shock, b) humidity, c) moisture, dust and water protection, d) electrostatic discharge, e) radiofrequency susceptibility, f) magnetic fields, g) corrosion, h) mechanical drop and i) sand. The Contractor(s) will provide technical reports, PDR documentation, CDR documentation, test plans, test results, and other documentation for Government review and evaluation, and conduct a prototype test to assess the ability of the portable ETD to meet the threshold requirements.

It is anticipated that Task 1 will last no more than 18 months in duration for the design and development of the portable ETD system.

TASK 2: Fabrication, Test, and Delivery

Task 2 efforts will include the fabrication, test, and delivery of three prototype portable ETDs. Deliverables will include draft and final test plans, readiness test data package, user and maintenance manuals, draft and final reports. The Contractor(s) will also prepare a System Design Document which will include (but is not limited to) physical designs, hardware, parts list, software, models, algorithms, source code, software tools, interfaces, testing, and test results. The Contractor(s) will prepare and submit a Vendor Data Package

to include supporting test data no later than 30 days before delivery. The Contractor(s) will assist in installation, training, and test support for the portable ETDs at the test location to be selected by DHS S&T. The Contractor(s) will perform remediation of capability gaps identified, and agreed upon by the Government, during Government testing. Task 2 will conclude with the resubmission and testing support of the portable ETDs for additional Government testing, DT&E, OT&E, RT&E, or IT&E, as determined by the Government.

It is anticipated that Task 2 will last no more than 18 months in duration for the fabrication, test, and delivery of the portable ETD systems.

The Government reserves the right to witness all Contractor-conducted test activities. The Contractor(s) shall provide the Government at least one week written notice prior to conducting the final factory test. Pursuant to FAR clause 52.245-1, the Government will own the prototypes or advanced technology systems (and have unlimited rights to the source and executable code developed using Government funding) after final delivery.

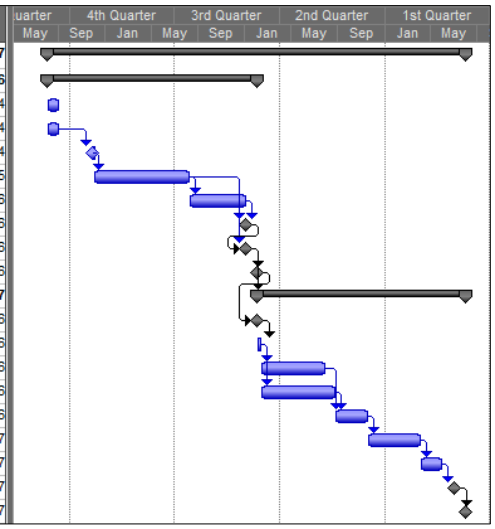
1.8.9.3 Key Milestones and Deliverables

Tasks	Major Sub-Tasks	Key Milestones and Deliverables
Portable ETD Technical Area Task 1: Design and Development (month 1-18)	• PAC • System Requirements Review • Complete Preliminary Design • Perform PDR • Generate data demonstrating feasibility of system design • Perform CDR • Prototype Test	• Meeting minutes, 5 working days after each meeting • Monthly Reports, no later than 15 days from month's end • TIMs, in coordination with monthly report submittal • Quarterly Reviews/Reports, due every 3 months after award • PAC, no later than 1 month after award • PDR, due 4 months after award • Preliminary test results, due 17 months after award • CDR, due 17 months after award • Final report for Task 1, due 18 months after award

Tasks	Major Sub-Tasks	Key Milestones and Deliverables
Portable ETD Technical Area Task 2: Fabrication, Test and Delivery (month 19-36)	• Submit Final Design for Fabrication • Build 3 Prototype Advanced ETDs • Internal Testing • Prepare Vendor Data Package • Deliver to test site for DT&E • Support Testing	• Meeting minutes, 5 working days after each meeting • Monthly Reports, no later than 15 days from month's end • TIMs, in coordination with monthly report submittal • Quarterly Reviews/Reports, due every 3 months after award • Draft Test Plan, 18 months after award • Final Test Plan, 18.5 months after award • Readiness Test Data Package, 24.5 months after award • Deliver three Prototypes for testing, 25.5 months after award • User and maintenance manual, 25.5 months after award • Deliver three Prototypes for testing, 33.5 months after award • Final Report, 36 months after award

1.8.9.4 Project Timeline

Task Name	Duration	Start	Finish
Portable ETD System	**1095 days**	**Fri 8/1/14**	**Sun 7/30/17**
Phase 1: Design and Development of Desktop ETD	**549 days**	**Fri 8/1/14**	**Sun 1/31/16**
Post-Award Conference	30 days	Fri 8/1/14	Sat 8/30/14
Systems Requirements Review	30 days	Fri 8/1/14	Sat 8/30/14
Preliminary Design Review	0 wks	Sat 11/29/14	Sat 11/29/14
Laboratory Data Collection and Analysis	36 wks	Mon 12/1/14	Fri 8/7/15
Field Data Acquisition and Analysis	21 wks	Mon 8/10/15	Fri 1/1/16
Preliminary Test Results	0 wks	Fri 1/1/16	Fri 1/1/16
Critical Design Review	0 wks	Fri 1/1/16	Fri 1/1/16
Go, No Go Decision Point	0 days	Sun 1/31/16	Sun 1/31/16
Phase 2: Testing and Delivery of Prototypes	**546 days**	**Sun 1/31/16**	**Sun 7/30/17**
Draft Test Plan	0 days	Sun 1/31/16	Sun 1/31/16
Final Test Plan	2 wks	Mon 2/1/16	Wed 2/10/16
Readiness Test Data Package	6 mons	Thu 2/11/16	Wed 7/27/16
User Manual and Maintenance Manual	7 mons	Thu 2/11/16	Wed 8/24/16
DT&E Testing	3 mons	Thu 8/25/16	Wed 11/16/16
DT&E Remediation	5 mons	Thu 11/17/16	Wed 4/5/17
Delivery of Prototypes for Additional Testing	2 mons	Thu 4/6/17	Wed 5/31/17
Final Report	0 days	Fri 6/30/17	Fri 6/30/17
End of Contract	0 days	Sun 7/30/17	Sun 7/30/17



1.8.10 Trace Explosives Detection Tools and Methods Technical Area

1.8.10.1 Program Metrics

1. Signature Analysis

		Threshold	Objective
Performance Parameter	False Alarm Rate (Pfa)	• ≥ 50% reduction	• ≥ 90% reduction
	Detection Rate (Pd)	• For each individual threat, ≥ 25% reduction in false negatives	• For each individual threat, ≥ 50% reduction in false negatives
	Throughput	• ≥ 50% reduction in total time for analysis (machine processing plus analysis time)	• ≥ 75% reduction in total time for analysis (machine processing plus analysis time)
	Inherent Availability	• ≥ 0.98	
	Life Cycle Costs	• ≥ 40% reduction	• ≥ 60% reduction

2. Improved Trace Explosives Sampling Methods

2a. Direct Contact Sampling Materials Development

		Threshold	Objective
Performance Parameter	Broad spectrum threat sampling capability	• Sampling capability for at least twenty (20) threat-related compounds; Offeror to provide list of compounds for which the system will be tested. • Threat sampling capability demonstrated in a distributed and	• Sampling capability for ≥50 threat-related compounds; Offeror to provide list of compounds for which the system will be tested. • Threat sampling capability demonstrated in a distributed and representative fashion

		representative fashion across the range of aliphatic organic nitrates, aromatic organic nitrates, organic peroxides, inorganic salts, inorganic salt/fuel mixtures, plastic explosives, and precursors.	across the range of aliphatic organic nitrates, aromatic organic nitrates, organic peroxides, inorganic salts, inorganic salt/fuel mixtures, including perchlorate or chlorate/fuel mixtures, plastic explosives, and precursors.
	Surface types to be sampled	• Nomex, Bytac, ABS plastic, vinyl, Teflon, packaging tape, cardboard, polyester, cotton, metal, plastic zipper	• Capability for handling all surface types associated with each TSA handling area, i.e., checkpoint screening, checked baggage, and cargo; this is to include skin and clothing.
	Collection efficiency	• In a direct comparison to swab materials and methods currently employed by TSA, new approaches must demonstrate improvements in the amount of material collected on the swab by ≥50% of the amount left uncollected on the surface area being sampled; for example, if 48 ng of a total of 80 ng threat present on a surface can be collected using traditional swab methods (collection efficiency of 60%), then an additional ≥50% of the remaining threat material should now be collected, giving a total of ≥64 ng collected and a collection efficiency of ≥80%.	• ≥ 90% collection efficiency of threat material using a single pass from a variety of common aviation surfaces.
	Desorption Efficiency	• ≥90% of threats desorbed from sample coupon during analysis	
	Desorption Time	• Should allow for a total desorption / analysis time of ≤5 sec	
	Sample swab temperature compatibility	• ≥220°C and compatible with thermal desorption units associated with units currently employed for airport screening	• Expanded temperature compatibility, ≥400°C, to be compatible with inorganic salts and future thermal desorption units.
	Collection efficiency reproducibility	• ±10%	

	Cost per sampling event (accounting for any intended reusability of sampling media)	• <$0.15	• <$0.10
	Shelf life of swabs	• One year when protected and stored in a cool, dry place	

2b. Direct Contact Sampling Engineering Advancements

		Threshold	Objective
Performance Parameter	Surface types to be sampled	• Nomex, Bytac, ABS plastic, vinyl, Teflon, packaging tape, cardboard, polyester, cotton, metal, plastic zipper.	• Capability for handling all surface types associated with each TSA handling area, i.e., checkpoint screening, checked baggage, cargo, including skin and clothing.
	Collection efficiency	• In a direct comparison to swab materials and methods currently employed by TSA, new engineering approaches must demonstrate improvements in the amount of material collected on current swabs by ≥50% of the amount left uncollected on the surface area being sampled; for example, if 48 ng of a total of 80 ng threat present on a surface can be collected using traditional swab methods (collection efficiency of 60%), then an additional ≥50% of the remaining material should now be collected, giving a total of ≥64 ng collected and a collection efficiency of ≥80%.	• ≥90% collection efficiency from a single swipe from a variety of common aviation surfaces.
	Temperature compatibility	• ≥220°C and compatible with thermal desorption units associated with IMS units currently employed for airport screening	• Expanded temperature compatibility, ≥400°C, to be compatible with inorganic salts and future thermal desorption units.
	Collection efficiency reproducibility	• ±10%	• ±1%
	Use Requirements	• The engineering advancement must be ergonomic and fit within current TSA CONOPS.	
	Weight	• < 0.5 lbs	• < 0.25 lbs

2c. Non-contact Sampling

		Threshold	Objective
Performance Parameter	Non-contact distance	• 2 in from the surface	• > 2 in from the surface with a variable distance allowable (i.e., may be 2-6 in from surface without changing settings on same device).
	Broad spectrum threat sampling capability	• Sampling capability for at least twenty (20) threat-related compounds; Offeror to provide list of compounds for which the system will be tested. • Threat sampling capability demonstrated in a distributed and representative fashion across the range of aliphatic organic nitrates, aromatic organic nitrates, organic peroxides, inorganic salts, inorganic salt/fuel mixtures, plastic explosives, and precursors. • Technique is applicable to either particulate or vapor trace.	• Sampling capability for at least fifty (50) threat-related compounds-related compounds; Offeror to provide list of compounds for which the system will be tested. • Threat detection capability demonstrated in a distributed and representative fashion across the range of aliphatic organic nitrates, aromatic organic nitrates, organic peroxides, inorganic salts, inorganic salt/fuel mixtures, including perchlorate or chlorate/fuel mixtures, plastic explosives, and precursors. • Techniques is applicable to both particulate and vapor trace.
	Surface types	• Nomex, Bytac, ABS plastic, vinyl, Teflon, packaging tape, cardboard, polyester, cotton, metal, plastic zipper	• Capability for handling all surface types associated with particular TSA handling area, i.e., checkpoint screening, checked baggage, or cargo; this is to include skin and clothing.
	Size of object sampled	• Focus may be on one of the following object scales: (1) localized region of passenger's body, (~450 cm^2, e.g., hand), (2) carry-on baggage (~1.3 m^2), (3) checked baggage (~0.82 m^2), or (4) break bulk cargo (~8.0 m^2)	
	Sampling efficiency	• Ability to deliver > 50% of the threat-related trace particulates to the sensor or sensing instrument when	• Ability to deliver without degradation > 50% of the threat-related trace particulates to the sensor or

		between 4 and 50 ng of the threat-related compound is present on a 450 cm^2 surface that is common to aviation security.	sensing instrument when between 4 and 50 ng of the threat-related compound is present on a 450 cm^2 surface that is common to aviation security.
	Sampling Time	• ≤5 sec per sampling event as described in the above section "Size of object sampled"	
	Substrate compatibility with sampling method	• Sampling results in no measurable impact (degradation or decomposition) to the surface of the object being screened	
	Clear-down time after alarm; cleaning time between samples to prevent memory effect	• Not to exceed two (2) minutes.	
	Reliability	• Minimal maintenance/downtime required, meeting reliability specifications required of ETDs	

1.8.10.2 Tasks

The Contractor will perform the following tasks:

TASK 1: Design and Development

Task 1 shall include the design and development of explosives trace detection technologies that include signature analysis and data analytics implementations, and/or an improved trace explosive sampling tool and/or method that meets the objectives listed above. The Contractor(s) will provide a Preliminary Design Review (PDR), demonstrate the feasibility of the technical approach by generating preliminary data in a laboratory environment, and provide results of these studies during a Critical Design Review (CDR). The Contractor(s) will provide technical reports, PDR documentation, CDR documentation, and other documentation for Government review and evaluation as appropriate, and conduct a prototype test to assess the ability of the tool or method to meet the threshold requirements.

It is anticipated that Task 1 will last no more than 18 months in duration for the design and development efforts.

TASK 2: Fabrication, Test, and Delivery

Task 2 efforts will include the fabrication, test, and delivery of a predetermined quantity of trace detection technologies such as signature analysis and data analytics implementations, and/or improved trace explosive sampling tools and/or methods. Deliverables will include design, draft and final test plans, readiness test data pack (if applicable), user and maintenance manual, and draft and final reports. The Contractor will also prepare a System Design Document which will include (but is not limited to) physical designs, hardware, parts list, software, models, algorithms, source code, software tools, interfaces, testing, and test results as appropriate. The Contractor(s) will prepare and submit a Vendor Data Package to include supporting test data no later than 30 days before delivery. The

Contractor(s) will assist in installation, training, and test support at the test location to be selected by DHS S&T. The Contractor(s) will perform remediation of capability gaps identified, and agreed upon by the Government, during Government testing. Task 2 will conclude with delivery of the trace detection technology prototypes, as agreed upon by the Government.

It is anticipated that Task 2 will last no more than 18 months in duration for the fabrication, test, and delivery efforts.

The Government reserves the right to witness all Contractor-conducted test activities. The Contractor(s) shall provide the Government at least one week written notice prior to conducting the final factory test. Pursuant to FAR clause 52.245-1, the Government will own the prototypes or advanced technology systems (and have unlimited rights to the source and executable code developed using Government funding) after final delivery.

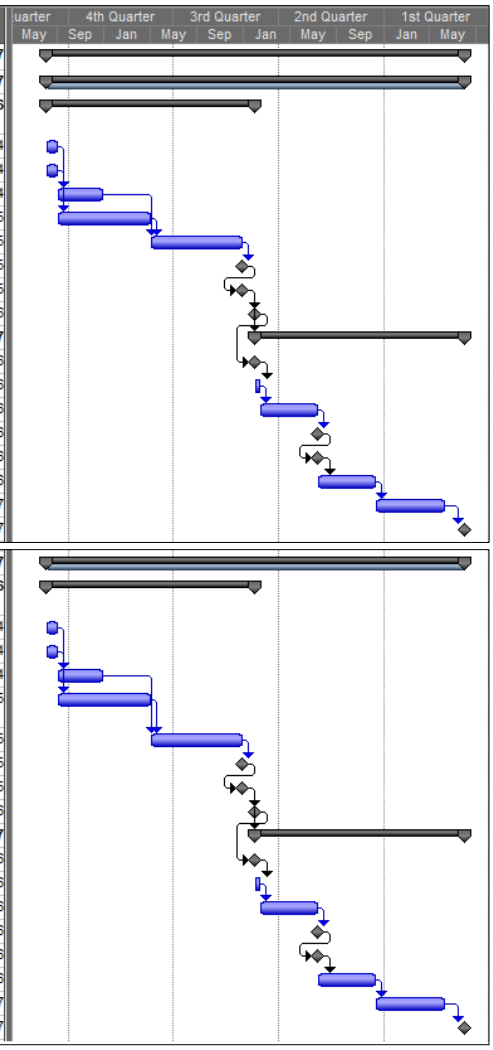
1.8.10.3 Key Milestones and Deliverables

Tasks	Major Sub-Tasks	Key Milestones and Deliverables
Explosives Detection Technical Area Task 1: Design and Development (month 1-18)	• PAC • System Requirements Review • Complete Preliminary Design • Perform PDR • Generate data demonstrating feasibility of system design • Perform CDR • Prototype Test	• Meeting minutes, 5 working days after each meeting • Monthly Reports, no later than 15 days from month's end • TIMs, in coordination with monthly report submittal • Quarterly Reviews/Reports, due every 3 months after award • PAC, no later than 1 month after award • Systems Requirements Review, due 1 month after award • PDR, due 4 months after award • Preliminary test results, due 17 months after award • CDR, due 17 months after award • Final report for Task 1, due 18 months after award

Tasks	Major Sub-Tasks	Key Milestones and Deliverables
Explosives Detection Technical Area Task 2: Fabrication, Test and Delivery (month 19-36)	• Submit Final Design for Fabrication • Build 3 Prototype Systems • Internal Testing • Prepare Vendor Data Package • Deliver to test site for DT&E • Support Testing	• Meeting minutes, 5 working days after each meeting • Monthly Reports, no later than 15 days from month's end • TIMs, in coordination with monthly report submittal • Quarterly Reviews/Reports, due every 3 months after award • Draft Test Plan, 18 months after award • Final Test Plan, 18.5 months after award • Readiness Test Data Package, 22.5 months after award • Deliver three Prototypes for testing, 23.5 months after award • User and maintenance manual, due with prototype delivery for testing • Final Report, 36 months after award

1.8.10.4 Project Timeline

Task Name	Duration	Start	Finish
Advanced Explosives Detection Tools & Methods	**1096 days**	**Fri 8/1/14**	**Mon 7/31/17**
Signature Analysis	**1096 days**	**Fri 8/1/14**	**Mon 7/31/17**
Phase 1 Design and Development of Signature Analysis	**546 days**	**Fri 8/1/14**	**Thu 1/28/16**
Post Award Conference	30 days	Fri 8/1/14	Sat 8/30/14
Systems Requirements Review	30 days	Fri 8/1/14	Sat 8/30/14
Preliminary Design Review	4 mons	Mon 9/1/14	Fri 12/26/14
Development of new signature analysis methods	8 mons	Mon 9/1/14	Thu 4/30/15
Application of signature analysis methods to field data	8 mons	Thu 4/30/15	Tue 12/29/15
Preliminary Test Results	0 wks	Tue 12/29/15	Tue 12/29/15
Critical Design Review	0 wks	Tue 12/29/15	Tue 12/29/15
Go, No Go Decision Point	0 days	Thu 1/28/16	Thu 1/28/16
Phase 2 Testing and Delivery of Prototypes	**550 days**	**Thu 1/28/16**	**Mon 7/31/17**
Draft Test Plan	0 days	Thu 1/28/16	Thu 1/28/16
Final Test Plan	2 wks	Thu 1/28/16	Thu 2/11/16
Readiness Test Data Package	5 mons	Thu 2/11/16	Tue 7/12/16
Delivery of Prototypes	0 wks	Tue 7/12/16	Tue 7/12/16
User Manual and Maintenance Manual	0 wks	Tue 7/12/16	Tue 7/12/16
Government Testing	5 mons	Tue 7/12/16	Fri 12/9/16
T&E Remediation	6 mons	Fri 12/9/16	Fri 6/9/17
Final Report	0 wks	Mon 7/31/17	Mon 7/31/17
Improved Trace Explosives Sampling Methods	**1096 days**	**Fri 8/1/14**	**Mon 7/31/17**
Phase 1: Design and Development of advanced sampling	**546 days**	**Fri 8/1/14**	**Thu 1/28/16**
Post Award Conference	30 days	Fri 8/1/14	Sat 8/30/14
Systems Requirements Review	30 days	Fri 8/1/14	Sat 8/30/14
Preliminary Design Review	4 mons	Mon 9/1/14	Fri 12/26/14
Development of New Swabs and/or Non-contact Trace Sampling Methods	8 mons	Mon 9/1/14	Thu 4/30/15
Application of signature analysis methods to field data	8 mons	Thu 4/30/15	Tue 12/29/15
Preliminary Test Results	0 wks	Tue 12/29/15	Tue 12/29/15
Critical Design Review	0 wks	Tue 12/29/15	Tue 12/29/15
Go, No Go Decision Point	0 days	Thu 1/28/16	Thu 1/28/16
Phase 2 Testing and Delivery of Prototypes	**550 days**	**Thu 1/28/16**	**Mon 7/31/17**
Draft Test Plan	0 days	Thu 1/28/16	Thu 1/28/16
Final Test Plan	2 wks	Thu 1/28/16	Thu 2/11/16
Readiness Test Data Package	5 mons	Thu 2/11/16	Tue 7/12/16
Delivery of Prototypes	0 wks	Tue 7/12/16	Tue 7/12/16
User Manual and Maintenance Manual	0 wks	Tue 7/12/16	Tue 7/12/16
Government Testing	5 mons	Tue 7/12/16	Fri 12/9/16
T&E Remediation	6 mons	Fri 12/9/16	Fri 6/9/17
Final Report	0 wks	Mon 7/31/17	Mon 7/31/17



1.9 Government Representatives

<u>Contracting Officer's Representative (COR):</u>
Laura Parker
Program Manager
Explosives Division
Science and Technology Directorate
Department of Homeland Security
Washington, DC 20528

<u>Contracting Officer:</u>
Duane Schatz
Contracting Officer
Science and Technology Acquisitions Division
Office of Procurement Operations
Department of Homeland Security
Washington, DC 20528

2 AWARD INFORMATION

2.1 Available Amount of Funding Expected to be Awarded Through this BAA

Although subject to official fiscal appropriation and availability, it is anticipated that DHS S&T will have approximately $10.5M for all awards to be made under this BAA for the base period of performance. Multiple awards may be made in each Technical Area and the Sub-areas within Technical Area 4. Additional joint-funding from the United Kingdom of Great Britain and Northern Ireland may further be provided, subject to their respective availability of funds, as well as interest in the particular proposal(s).

2.2 Limitation of Funds

The Government reserves the right to incrementally fund contracts awarded from this BAA as provided by the FAR 52.232-22, "Limitation of Funds".

2.3 Anticipated Number of Awards

DHS S&T expects to make multiple awards for each Technical Area (Technical Areas 1-4) and the Sub-areas within Technical Area 4 under this BAA.

2.4 Anticipated Award Types

Award type is anticipated to be in the form of a Cost Reimbursement type contract or Other Transaction Agreement, if authorized at time of award. To be eligible for such an award, the Offeror must have an adequate accounting system, in accordance with FAR 16.301-3(a)(3).

Evidence of an adequate accounting system would include a written opinion or other statement from the cognizant federal auditor (CFA) or the cognizant federal agency official (CFAO) that the system is approved or has been determined to be adequate. If available, the offeror shall provide the audit report number and date associated with the accounting system review. If the offeror does not have a copy of the report, the offeror may furnish a copy of the audit report number.

If the offeror does not have an accounting system that has been determined adequate by the CFA or CFAO, but believes its accounting system is adequate, the offeror shall so state in its proposal. As part of the pre-award evaluation process, the Government will obtain the necessary review by the CFA. The offeror will be required to allow the CFA to review the accounting system and correct (or have a timely action plan to correct) any issues identified as precluding the system from being adequate. The offeror will provide the CFA name, address and telephone number and the point of contact as part of its proposal.

Offers will be rejected if the offeror does not have an adequate accounting system unless the Government determines that the offeror‘s action plan for correcting the accounting system is timely and acceptable. However, no costs will be paid under the contract until the Contractor's system has been determined adequate.

2.5 Anticipated Period of Performance for New Awards

The overall period of performance, including option periods, is anticipated to be up to 9 months for Technical Area 1, up to 24 months for Technical Area 2, and up to 36 months for Technical Area 3 and Technical Area 4 and its sub-areas.

Offerors are encouraged to complete tasks within the suggested period of performance as indicated in each technical area. The Government is open to proposals that can reduce the overall schedule without a sacrifice in quality or BAA objectives.

Proposals that build on current or previous work are encouraged. If Offerors are extending work performed under other DHS projects or projects by other sponsors, the proposal must clearly identify the point of departure and what existing work will be brought forward and what new effort will be performed under this BAA.

2.6 Potential Within-Scope Changes to Any Resultant Awards

Types of possible within-scope changes to any resultant awards under this BAA include additional prototypes, additional testing, and collaboration with others.

3 ELIGIBILITY INFORMATION

This BAA is open to **ALL** responsible sources.

Offerors may include single entities or teams from academia, private sector organizations, Government laboratories, and FFRDCs, including Department of Energy National Laboratories and Centers. Teaming is highly encouraged.

3.1 Federally Funded Research & Development Centers

FFRDCs, including Department of Energy National Laboratories and Centers, are eligible to respond to this BAA, individually or as a team member of an eligible principal Offeror, so long as they are permitted under a sponsoring agreement between the Government and the specific FFRDC.

3.2 Nonprofit Organizations, Educational Institutions 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) (HBCU/MIs), women-owned businesses (WB), and Historically Underutilized Business (HUB) zone enterprises, as well as large businesses, academic institutions, 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 pursuant to FAR Part 19.502-

2, because of the impracticality of reserving discrete or severable areas of research and development in any specific requirement area.

To ensure full consideration in these programs, registration in the https://baa2.st.dhs.gov/ website, described later in this document, requires the appropriate business type selection as well as accurate up-to-date information.

3.3 Organizational Conflict of Interest

Organizational Conflict of Interest issues will be evaluated on a case-by-case basis, as outlined below. Offerors who have existing contract(s) to provide scientific, engineering, technical and/or administrative support directly to the DHS S&T Directorate will receive particular scrutiny.

HSAR 3052.209-72 Organizational Conflict of Interest
(a) Determination. The Government has determined that this effort may result in an actual or potential conflict of interest, or may provide one or more Offerors with the potential to attain an unfair competitive advantage.

(b) If any such conflict of interest is found to exist, the Contracting Officer may (1) disqualify the Offeror, or (2) determine that it is otherwise in the best interest of the United States to contract with the Offeror and include the appropriate provisions to mitigate or avoid such conflict in the contract awarded. After discussion with the Offeror, the Contracting Officer may determine that the actual conflict cannot be avoided, neutralized, mitigated, or otherwise resolved to the satisfaction of the Government, and the Offeror may be found ineligible for award.

(c) Disclosure: The Offeror must represent, as part of its proposal and to the best of its knowledge that: (1) It is not aware of any facts which create any actual or potential organizational conflicts of interest relating to the award of this contract; or (2) It has included information in its proposal, providing all current information bearing on the existence of any actual or potential organizational conflicts of interest, and has included the mitigation plan in accordance with paragraph (d) of this provision.

(d) Mitigation/Waiver. If an Offeror with a potential or actual conflict of interest or unfair competitive advantage believes it can be mitigated, neutralized, or avoided, the Offeror shall submit a mitigation plan to the Contracting Officer for review. Award of a contract where an actual or potential conflict of interest exists shall not occur before Government approval of the mitigation plan.

(e) Other Relevant Information: In addition to the mitigation plan, the Contracting Officer may require further relevant information from the Offeror. The Contracting Officer will use all information submitted by the Offeror, and any other relevant information known to DHS, to determine whether an award to the Offeror may take place, and whether the mitigation plan adequately neutralizes or mitigates the conflict.

(f) Corporation Change. The successful Offeror shall inform the Contracting Officer within thirty (30) calendar days of the effective date of any corporate mergers, acquisitions, and/or divestures that may affect this provision.

(g) Flow-down. The contractor shall insert the substance of this clause in each first tier subcontract that exceeds the simplified acquisition threshold.

4 APPLICATION AND SUBMISSION INFORMATION

4.1 BAA Package Download

This BAA package may be downloaded in its entirety from the FedBizOpps website http://www.fbo.gov or from https://baa2.st.dhs.gov .

Registration is not required to download the BAA package; however, a registration in https://baa2.st.dhs.gov/ is required to upload a response to the BAA.

4.2 Application and Submission Process

Submissions will not be accepted from organizations that have not registered. Any organization that wishes to participate in this solicitation must register at: https://baa2.st.dhs.gov/ . Interested parties are encouraged to register early in the process.

A White Paper must be submitted in response to this BAA. White Papers will be reviewed and Offerors notified if a White Paper is selected for encouragement of proposal submission. Full Proposals may be submitted in response to this BAA after notification by DHS S&T.

To submit a White Paper, select the appropriate submission button, fill out the requested fields, upload your files, and then submit. Users will receive confirmation of their submission via e-mail. The White Paper submission may be revised until the submission deadline. Failure to submit a White Paper will disqualify an Offeror from being requested to submit a Full Proposal.

In teaming situations, the lead organization must remain the same on both the White Paper and the Full Proposal submission. Any Full Proposal submitted by organizations that were not the lead organization for the White Paper submission will be considered non-responsive.

Only unclassified White Papers and Full Proposals will be accepted. White Papers or Full Proposals received with any classified information will be disqualified and not evaluated.

The DHS BAA website https://baa2.st.dhs.gov offers electronic access to BAA solicitations, frequently asked questions (FAQs), answers to FAQs, and hyperlinks to other useful information.

Please refer to the "Registration and Submission Training Guide", in the upper right hand corner of the FAQ page, for step-by-step instructions to register your company or organization and submit a White Paper and Full Proposal.

IMPORTANT: Before submitting a **White Paper and Full Proposal** for the first time, you must first register your organization and user account in the system at https://baa2.st.dhs.gov/. It is recommended that a Business Official, or an authorized representative designated by the Business Official, be the first person to register for your organization. The organization's Taxpayer Identification Number (TIN) is required during registration. (If your organization does not have a TIN, you can generate a unique ID by following the prompts provided in the system). After your organization is registered, other new users may register and associate their information with the organization's existing record. When registration is complete, users can submit and manage their proposals.

For White Paper Submission

IMPORTANT: User registration is **not sufficient** for registering the White Paper. To register your White Paper, you must log on with your credentials. Click the "Start New Proposal" button. When the Start New Proposal page displays, pick the solicitation and topic, and then enter the title of the White Paper / Proposal that you are submitting and Technical Area Number. When you have entered the title, click the "Add Proposal to Activity Worksheet" button. The Proposal Activity worksheet page lists your Proposal in the Proposals In Progress section of the page. Your White Paper is registered at this point. Repeat this step before the White Paper registration deadline for every White Paper you wish to register.

IMPORTANT: After you have completed the Coversheets and uploaded your White Paper document, **you must click on the "Submit White Paper**" button to submit the White Paper; simply uploading the document is not sufficient.

For Proposal Submission

After you have uploaded your Full Proposal documents, **you must click on the "Submit Proposal" button** to submit the Full Proposal; simply uploading the documents is not sufficient.

In summary, to submit your White Paper or Full Proposal, select the appropriate submission button, fill out the requested fields, upload your files, and **click on the "Submit" for White Paper or Proposal** button as appropriate. Users will receive confirmation of their submission via e-mail.

You may revise your Full Proposal submission until the deadline. To revise your Full Proposal, you'll need to call the DHS BAA Website Help Desk at 703-480-7676. The Help Desk will contact the Contracting Officer for approval. With that approval, the Help Desk will open up the Full Proposal for edits.

4.3 White Paper Format and Content

See the Anticipated Schedule of Events in **section 4.6** for the due date for the White Papers and for when notification of DHS S&T evaluation of White Papers will be issued via e-mail.

BAA#13-03 consists of four primary Technical Areas: 1, 2, 3, and 4. Technical Area 4 is further partitioned into sub-areas. White papers should be limited to a single sub-area or technical area element. If desired, a single offeror may submit multiple white papers to cover more than one sub-area or technical area.

White Papers may not be accepted after the published due date.

White Papers should capture the essence of a proposal. The Government will evaluate the White Paper submissions to determine offerors that will be encouraged to submit a full proposal.

The listed sections in Table 1 should be included in the White Paper adhering to the page count allocation.

Table 1. White Paper Sections and Page Count Allocation

Section Reference	Section Title	Page Count
A.	**Statement of Problem(s) to be Solved**	0.25
B.	**S&T and TSA Mission Relevance and Benefit**	0.25
C.	**Proposed Solution**	1.0
	Technical Concept	
	Technical Merit and Claims with Operational Benefit	
	Basis of Merit and Claims	
D.	**Detailed Technical Approach**	2.75
	Analytical, Experimental, Prototype Approach	
	Challenges, Risks and Mitigation	
	Test Plan Concept	
E.	**Key Staff, Team, Partnerships, Facilities and Equipment**	0.5
F.	**Cost Proposal**	0.25
G.	**References (no page limit)**	n/a
H.	**Figures and Tables**	2.0
I.	**Curriculum Vitae of Key Personnel (no page limit)**	n/a
	Total	7

White Papers shall include the following:

a) Clear statement of the problem, mission relevance, benefit of the proposed solution.

b) A solution description including the core technologies, innovation, proposed metrics and the unique capabilities those technologies bring to bear on the problem. Discuss how the task performance, goals, and metrics detailed in section 1.8 will be met, including any technical background necessary for understanding the key innovations.

c) A detailed technical approach that addresses the challenges and risks associated with this effort and methods for mitigating that risk. A description of any supporting technology in terms of whether or not the offeror is dependent upon others to provide that technology or expertise.

d) A description of the offeror's organization, team members, and partnerships, clearly identifying the lead organization and the roles/responsibilities of each team member. Also, detail the facilities and equipment to be utilized.

e) A rough order of magnitude (ROM) cost estimate allocated to tasks. Provide the basis for the ROM.

f) Note that references and curriculum vitae for key personnel are not included in the 7 page limit for the white paper.

Space permitting, the offeror may also address other elements of their technology and concept of operations.

Format and size limitations

White papers may include narrative, pictures, figures, tables, and charts in a legible size and may consist of not more than 7 (seven) pages (8.5" x 11"), excluding references and curriculum vitas, and must be accompanied by two quad chart pages (each 8.5" x 11"). Therefore, the entire White Paper submission shall not exceed 9 (nine) pages, excluding references and curriculum vitas. Except for text embedded in graphics or tables, all text must be no smaller than 12-point. Text embedded within graphics or tables in the body of the White Paper or the quad chart may not be smaller than 8-point. A White Paper shall consist of ONE (1) electronic file in portable document format (PDF).

Organization of Quad Charts to be submitted with White Paper

The Quad chart format and the required content is shown in Figure 1.

BAA Number & Technical Area #	Organization (of lead organization)
Title:	Date:
Proposed Concept of Solution [Provide: Diagram or illustration plus Description Provide a concise graphic with text that will convey the essential concept of the final capability/use/deployment and its key differentiating aspects (functional or technical performance metric relating to a delivered operational context and stated benefit)]	**SOW (work to be performed)** [Provide: Major tasks to be performed and performing organization. Include other key contributing organizations]
Problem Solved and Proposed Technical Approach [Provide: What is the problem? How will the problem be approached and solved? Technical basis for achieving metrics in Quad 1. Critical technical challenge(s). Describe tasks to be performed. Describe any ongoing related efforts by the offeror. Describe the technology involved and how it will be used to solve the problem. Describe key technical challenges.]	**Schedule, Cost, Major Deliverables & PI/PM Contact Info** [Provide: Summary of key schedule milestones, reviews & metric checks on critical path to reach delivery of solution. Note key GFE/GFI. Provide cost by quarter and total cost, segregating labor and non-labor. Show FTEs by quarter.]

Figure 1. Quad Chart One Format and Content

A second Quad chart using the same title block, should contain a) a CV summary of team, individuals and organizations, b) prior relevant experience, c) organization background and capability and d) other information as appropriate.

The Quad Charts shall not use any font smaller than 8-point and shall be organized as shown in Figure 1.

Export Control Marking

Offerors are advised that the export of any goods or technical data from the United States, and the disclosure of technical data to foreign nationals, may require some form of export license from the U.S. Government. Failure to obtain necessary export licenses may result in criminal liability of offerors under U.S. laws.

Offerors are responsible for ensuring compliance with the International Traffic in Arms Regulations administered by the U.S. Department of State (22 C.F.R. Parts 120 to 130), Export Administration Regulations administered by the U.S. Department of Commerce (15 C.F.R. Parts 730 to 774), and Foreign Assets Control Regulations administered by the U.S. Department of Treasury (31 C.F.R. Parts 501 to 598), as warranted, and with compliance with all recordkeeping requirements under U.S. export regulations. Offerors are responsible for compliance with any applicable export license, reporting, or other preapproval requirements by the U.S. Government. DHS neither represents that a license or preapproval shall not be required nor that, if required, it shall be issued. Nothing granted herein to offerors provides any such export license or other preapproval.

Offerors are asked to identify any anticipated export compliance issues in their response to this solicitation. Specifically, offerors are advised to include information in their response regarding any known equipment, software or technical data that will be developed as a result of work to be performed under this solicitation that is subject to export control restrictions.

To the extent that export-controlled information may be provided to DHS by offerors in response to a solicitation, offerors are responsible for ensuring that such information is appropriately marked, and are responsible for complying with all applicable export controls and regulations in the process of providing such information.

White Paper Preparation and Submission Guidelines

ONLY OFFERORS WHO SUBMIT A RESPONSIVE WHITE PAPER WILL BE CONSIDERED FOR FULL PROPOSALS. THE GOVERNMENT WILL ADVISE IN WRITING THOSE OFFERORS ENCOURAGED TO SUBMT FULL PROPOSALS. OFFERORS NOT ENCOURAGED TO SUBMIT A FULL PROPOSAL ARE NOT PROHIBITED FROM SUBMITTING A FULL PROPOSAL.

Feedback will not be provided to Offerors not encouraged to submit a Full Proposal.
Awards will be based on the Full Proposal.

Entries in the various sections of the White Paper should be concise. All pages shall be formatted as single-spaced on 8-1/2 by 11 inch paper with type not smaller than 12 point font. Other content such as figures, tables, diagrams and charts are encouraged and are not included in the font size limitation for the various sections of the White Paper. The font for figures, tables, diagrams or charts should have clearly legible fonts that are no smaller than 8-point font.

4.4 Full Proposal Format and Content

Full Proposals

See the Anticipated Schedule of Events in section 4.6 for the due date for receipt of Full Proposals. Receipt means the uploading of the Full Proposal to the DHS S&T BAA website and receiving confirmation of submission. Full Proposals may not be accepted after the published due date. Proposals that exceed the page limit will not have the extra pages reviewed, which may affect the proposal rating.

Full Proposal Format: Volume 1 Technical Proposal; and Volume 2 - Cost Proposal

Full proposals will consist of two volumes: a Technical Proposal volume and a Cost Proposal volume.

- Paper Size – 8.5-by-11-inch paper
- Margins – 1 inch
- Spacing – Single-spaced or double-spaced

- Font – Times New Roman, 12 point. Text embedded within graphics or tables in the body of the Project Description Form should be legible and not smaller than 8 point.
- Number of Pages –
    - Volume 1, Technical Proposal: The Official Transmittal Letter, as well as the Cover Page and the Table of Contents in the Full Proposal are not subject to the page limitation. The page limit exclusion also applies to resumes/biographical information, Teaming Agreements, Letters of Intent (LOI) and Memorandum of Agreement (MOA)/Memorandum of Understanding (MOU) and Assertion of Data Rights if and only if the main proposal write-up (within the page limitation) makes reference to the aforementioned items by referring to the appropriate appendix section containing them. Concise proposals with fewer pages than the page limit are acceptable and encouraged if the proposal is responsive to all the BAA solicitation requirements.
    - The suggested page count allocations per proposal section are shown in Table 2. Page counts may not exceed the section as grouped in column 4. Page count allocation changes in column 3 may be made **within** the section or grouping.
    - Volume 2, Cost Proposal: No page limitation.

- Copies – A proposal shall consist of one electronic file for the Technical Proposal volume and one electronic file for the Cost Proposal volume. Electronic files will be in portable document format (PDF). Each file size must be no more than 10 MB.

Table 2. Technical Proposal Sections and Page Count Allocation

Section Reference	Section Title	Page Count	
		Column 3	Column 4
A.	**Statement of Problem(s) to be Solved**	0.5	1
B.	**S&T and TSA Mission Relevance and Benefit**	0.5	
C.	**Proposed Solution**		4
C.1	Technical Concept	2.5	
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Full Proposal Content

Volume 1: Technical Proposal

Volume I of the Full Proposal shall be the Technical Proposal volume. Responsiveness to the order and content of sections listed in the following paragraph is important to assure a thorough and fair evaluation of proposals. Nonconforming proposals may be rejected without review. In particular, the Technical Proposal must cover the following points in more detail:

- Official Transmittal Letter: This is an official transmittal letter with an authorizing official signature. For an electronic submission, the letter can be scanned into the electronic proposal. The letter of transmittal shall state whether this proposal has been submitted to another government agency other than DHS S&T, and if so, the agency and date submitted.

- Cover Page: This should include the words "Technical Proposal" and the following information:
  1) BAA number
  2) Title of Proposal and BAA Technical Area or Sub-area Number
  3) Identity of prime Offeror and complete list of subcontractors, if applicable
  4) Technical contact (name, address, phone/fax, electronic mail address)
  5) Administrative/business contact (name, address, phone/fax, electronic mail address)
  6) Duration of effort (separately identify the basic effort and any options)

- Table of Contents

- Executive Summary: Summarize the Full Proposal and the expected benefits of the solution with a page limit of one page.

- Quad Charts: See Figure 1 for formatting and content. Revise with updates if there are changes from the prior White Paper submission.

- Proposal: This section describes the proposed work and associated technical and management plan and approach. Below are the general guidelines for writing the technical volume, but the Offeror should be aware that additional details or information may be required for a particular topic. The proposer shall reference the **BAA Technical Area title** and **Technical area or Sub-area number** in their response.

- Proposal Sections: The proposal **shall have the following sections by title and sequential order.** The proposal shall address and describe the following section topics in **adequate detail** for a full assessment of the submitted proposal.

A. Statement of Problem(s) to be Solved

Understanding the problem and the description of the problem or problem set being solved is central to the proposer's subsequent proposal section and narratives. The problem statement(s) must be clear in order to assess mission relevance and the applicability of the proposed solution and accompanying metrics. The problem(s) must be described in specific terms to permit rigorous evaluation of the proposed technology solution(s).

B. S&T and TSA Mission Relevance and Benefit

The problem and solution must have high mission relevance, operational context and benefit to the S&T and TSA stakeholders. The proposer shall describe why the selected problem(s) are important and the impact of the proposed solution along with the counter position of the impact if the proposed solution is not provided or not available to TSA.

C. Proposed Solution

C.1 Technical Concept

A concise description of the concept and proposed solution shall be provided and may include figures, diagrams, charts, equations, and other methods to ensure the essential concepts are well explained, in addition to a narrative description. Innovative aspects should be clear and describe why the concept is significantly better than alternatives.

C.2 Technical Merit and Claims with Operational Benefit

The technical merit in numeric terms should be provided along with functions and features anticipated when transitioned and deployed in aviation security. The technical benefits should be translated to operational benefit accompanied by numerical metrics if possible. Metrics shall be proposed that will be used for evaluation during the project at various milestones or phases. Metrics should be considered in the context of both equipment performance and operational benefit. Incremental advances to current state-of-the-art equipment are not being sought in this BAA. For some Technical Areas or Sub-areas, the Offeror is required to submit certain information described in sections 1.8.7.1, 1.8.8.1, 1.8.9.1, and/or 1.8.10.1 (Program Metrics). As stated in section 7.3, all proposal information must remain unclassified.

In cases where metrics or parameters are not easily quantifiable at the proposal submission stage, state what metric measures or categories will be used and when the numerical values or targets can be established. The proposed technical approach and plan should identify when and how the metric goals will be obtained along with how the proposed solution will meet the metric goals upon delivery.

C.3 Basis of Merit and Claims

The basis of merit, claims and metrics should be convincing, substantiated by appropriate methods and may contain the following items:

- A clear description of the scientific theory and technology. Include sufficient detail to show how the approach delivers enhanced capabilities.
- Corroborating technical materials. Feasibility calculations and simulations; a projection of cost, size and throughput and other practical considerations.
- A collection of engineering papers and/or patents related to the technology may be referenced that support the merit or claims
- Test data, if available, to demonstrate the method at a laboratory scale
- Identification of experts that have performed similar or related research in the field of study with positive results

Other examples could include analysis, models and simulation, prototyping and lab or field testing.

C.4 Competitive Analysis

Provide a competitive analysis addressing advantages/disadvantages of the proposed solution or technique over traditional approaches or other state-of-the-art methods. Results should be summarized in a comprehensive table of advantages and disadvantages relative to the intended application. Numeric metrics should be used when available. Risk and challenges should be noted.

C.5 Life-Cycle Cost Analysis

Provide a life-cycle cost analysis for the proposed solution. Include cost of consumables assuming that 2,000 samples are collected in an 8-hour period, with a sample collection time of 1 minute or less and an analysis time of 10 seconds or less. Provide estimates for the mean time between failure (MTBF) and mean time to repair (MTTR), thus instrument availability may be calculated. Instrument availability is calculated as: MTBF/(MTBF+MTTR)*100.

D. Detailed Technical Approach

D.1 Analytical, Experimental, Prototype Approach

The approach that will guide the proposed work and sequence of tasks should be discussed. The approach shall be described in adequate detail showing key components or modules, and techniques that may include software or hardware. All approaches or methods should detail the measurement or validation approach along with analysis techniques to ensure the technical concept can be demonstrated experimentally with sufficient fidelity to meet established and proposed metrics in order to meet the project goals. The approach should be relevant to the Offeror-provided targeted, priority threat list and the overall goals of this BAA.

D.2 Challenges, Risks and Mitigation

Proposers shall address challenges, risks and mitigation in responding to any BAA Technical Area with the appropriate risk metrics that include, but are not limited to, technical performance, schedule, cost (lifecycle or procurement) and security.

The Government understands that some risk is natural when striving for significantly enhanced metrics. The challenges, risks and possible alternatives for risk mitigation should be described. If adoption of alternatives from the proposed baseline approach becomes necessary, discuss impacts to metrics of the best alternative: e.g., if the performance metrics would be reduced with an alternative, provide the corresponding performance metric in the proposal risk statements. Risks may be characterized as High, Moderate, Low or Extremely Low with corresponding rationale and impact.

D.3 Test Plan Concept

Validation of proposed approaches, claims and metrics of the proposed solution are key to this BAA, therefore a test plan concept shall be included in the proposal to discuss the test and evaluation aspects of the proposed solution and deliverables.

A test plan concept shall be described in order to ensure the ability to adequately measure the required parameters and metrics at the required fidelity associated with the proposed task. The test plan will include generation of appropriate measurement metrics for test and evaluation (T&E) of the detection system, sample generator or sampling methodology. The plan should at a minimum describe test equipment needed, the plan for acquisition (if not already available) and supporting equipment, materials required and identified labs or test facility for experiments.

D.4 Statement of Work, Schedule and Deliverables

The Government's provided **SOW, Milestones and Deliverables** are outlined in this BAA for each Technical Area. The Government is receptive to proposed changes with adequate justifying rationale. Any exceptions to the suggested SOW tasks (omission), schedule/scheduled event (omission or date change) or deliverables (omission or date change) shall be clearly noted in the proposer's SOW.

The Government is open to proposals that can reduce the overall schedule without a sacrifice in quality or BAA objectives. The proposer shall provide an integrated

master schedule view in the proposer's SOW for the proposed research. In the document, the proposer should describe how each task will be performed and identify sub-tasks as appropriate. Task beginning and endpoints should be clear and at a time interval granularity permitting assessment of the technical and schedule risk for the proposed milestones and deliverables. The **critical path(s) should be noted** with a narrative explanation and possible mitigation.

Provide a detailed schedule showing task, subtask relationships, major milestones, reviews, demonstrations and all deliverables. Major decisions points affecting a change in path in the research or development should be highlighted. GFE and GFI should be noted with the required timeframe. The schedule will include various meetings with the Government including TIMs, industry days and various systems engineering technical reviews such as PDRs and CDRs. Documents requiring Government approval shall be noted, for example Test Plan submission and approval. In general, allow 30 calendar days for DHS S&T review and approval of submitted documents. If a period of performance or key milestones is shorter or longer than the suggested BAA schedule or period of performance, provide appropriate rationale.

The proposed SOW, Integrated Master Schedule (IMS) and Deliverable sections should be clearly marked as "SOW" and "Integrated Master Schedule" and "Deliverables" respectively. The SOW, Integrated Master Schedule and Deliverable sections (each) shall be severable, i.e., each will begin on a new page and the following section shall begin on a new page. It is anticipated that the proposed SOW, IMS and Deliverable sections will be incorporated as an attachment to the resultant award instrument.

In summary, proposals must include each independently, as severable self-standing SOW, Integrated Master Schedule and Deliverable sections without any proprietary restrictions, which can be attached to the contract or agreement award. The SOW, Integrated Master Schedule and Deliverable sections, each, must begin on a new page in the proposal. Any section following the proposed SOW, Integrated Master Schedule and Deliverable sections will begin on a new page.

Meetings, TIMs, Industry Days and Technical Reviews

Propose dates for the informal reviews, formal reviews, TIMs and presentation of results at an industry day using the suggested items from the BAA in sections 1.8.7, 1.8.8, 1.8.9, and 1.8.10. Some meetings and reviews can be combined for efficiency if occurring in a rational programmatic sequence. Additional reviews may be proposed with rationale. Any exception to the suggested reviews, either date slip or omission, shall be clearly noted. The Government is open to proposed changes with justifying rationale.

D.5 Key Subcontracts

Key subcontractors or subcontracts in the proposal should be identified. Key is defined as critical to the project in a developmental manner or critical supply chain component on the critical path from schedule or performance or if the subcontract is greater than 15% of the prime's proposed costs.

D.6 GFI, GFE

If GFI and/or GFE are required, provide a brief summary of the required GFI and/or GFE with rationale, date needed and duration. The list should be in table format.

D.7 Offeror's Capability

Proposing organizations should describe institutional capabilities relevant to this BAA and tasks proposed. A proposing organization should summarize research, development, and commercialization capabilities including key examples of successful commercialization of developed products and/or technologies relevant to this BAA and the proposed task(s). Proposers should also provide a corporate or institutional overview with commitment to commercialization of any proposed product or technology. Non corporate entities should provide a strategy and vision of commercialization and examples of successful transition or commercialization.

D.8 Key Staff, Team, Partnerships and Organizational Structure

Provide a short narrative for key staff along with a **TABLE** summarizing as a minimum, the Principle Investigator (PI), and Co-PIs (if applicable), other key staff, role, degree, expertise and responsibilities, tasks and percent time on the proposed project, notable awards and accomplishments and other relevant aspects. Provide resumes or *curriculum vitae* (CVs) for each of the key personnel listed in the TABLE in proposal Appendix A. These resumes and CVs do not count toward the proposal page limit and additional staff may be included that are anticipated to work on the proposed effort at level greater than 10% on an annual basis.

D.9 Facilities and Equipment

List the location(s) where the work will be performed along with the facilities and equipment to be used. Describe any specialized or unique facilities and equipment which directly affect the effort. Key facilities and equipment should also be provided for key subcontractor team members.

D.10 Security

All proposals must be unclassified. Performer security clearances may be necessary for this program and the requirement for access or generation of classified information will be evaluated on an individual offeror basis. If there are potential security issues, they should be noted.

D.11 Related Research and Development (R&D)

Highlight relevant research and development (R&D) to the proposed solution and/or other S&T/TSA projects or equipment. Outline the scope, innovation, status, outcomes and any publications or patents associated with the effort.

E. Management Plan and Reporting

Describe the management approach to include management and controls that will be in place to guide meeting performance, staffing, schedule, cost, milestones and deliverables. Describe the approach to ensure effective collaboration will be achieved across multi-disciplinary teams with monitoring of technical progress, risks and issue resolution.

Describe the proposed organizational structure and communications paths to key management with control of project resources in the performing organizations to include key subcontractors. Provide the name and position of the most senior executive(s) that will be monitoring the project along with the monitoring approach, communication and reporting path, form and frequency to the PI, program and/or project manager.

F. Cost Summary

The cost summary shall provide detail as a minimum to the work breakdown structure (WBS) and in adequate detail to assess the ability to meet the project objectives on a task, sub-task basis. Critical component, software, or equipment purchases shall be noted with delivery times and delivery time rationale. Long-lead items should be noted with anticipated delivery times and risk mitigation should dates not be met by suppliers.

The cost summary should be consistent with the proposed SOW. Activities such as demonstrations required to reduce the various technical risks should be identified in the SOW and reflected in the cost summary.

The cost summary section should be segregated in accordance with (IAW) options and option periods.

Options to the baseline SOW may be proposed.

G. Other DHS Support or Funding Support

In an Appendix, provide a list of any current or pending awards or proposals with DHS or other Government agencies that directly pertain to this BAA or your proposed work on this BAA. This section will not count towards the page limit.
The summary list shall contain the funding organization, contracting officer, contract number, role (prime or sub), period of performance, deliverables, current

status, name of Principal Investigator (PI) or Program Manger (PM). A clear description of delineation between the funded work and the proposed work must be provided in terms of scope and deliverables.

H. Assertion of Data Rights.

Include here a summary of any assertions to any technical data or computer software that will be developed or delivered under any resultant award. This includes any assertions to pre-existing results, prototypes, or systems supporting and/or necessary for the use of the research, results, and/or prototype. Any rights asserted in other parts of the proposal that would impact the rights in this section must be cross-referenced. If less than unlimited rights in any data delivered under the resultant award are asserted, the Offeror must explain how these rights in the data will affect its ability to deliver research data, subsystems, and toolkits for integration as set forth below. Additionally, the Offeror must explain how the program goals are achievable in light of these proprietary and/or restrictive limitations. If there are no claims of proprietary rights in pre-existing data, this section shall consist of a statement to that effect.

Proposals submitted in response to this BAA shall identify all technical data or computer software that the Offeror asserts will be furnished to the Government with restrictions on access, use, modification, reproduction, release, performance, display, or disclosure. Offeror's pre-award identification shall be submitted as an attachment to its offer and shall contain the following information:

(1) Statement of Assertion. Include the following statement: "The Offeror asserts for itself, or the persons identified below, that the Government's rights to access, use, modify, reproduce, release, perform, display, or disclose only the following technical data or computer software should be restricted:"

(2) If making such a Statement of Assertion in the proposal, Offerors are to fill in the following table:

Deliverable	Technical Data or Computer Software to be Furnished With Restrictions	Basis for Assertion	Asserted Rights Category	Name of Person Asserting Restrictions

(3) Identification of the technical data or computer software to be furnished with restrictions. For technical data (other than computer software documentation) pertaining to items, components, or processes developed at private expense, identify both the deliverable technical data and each such item, component, or process as specifically as possible (e.g., by referencing specific sections of the proposal or

specific technology or components). For computer software or computer software documentation, identify the software or documentation by specific name or module or item number.

(4) Detailed description of the asserted restrictions. For each of the technical data or computer software identified above in paragraph (3), identify the following information:

(i) Asserted rights. Identify the asserted rights for the technical data or computer software.

(ii) Copies of negotiated, commercial, and other non-standard licenses. Offeror shall attach to its offer for each listed item copies of all proposed negotiated license(s), Offeror's standard commercial license(s), and any other asserted restrictions other than Government purpose rights; limited rights; restricted rights; rights under prior Government contracts, including Small Business Innovation Research (SBIR) data rights for which the protection period has not expired; or Government's minimum rights.

(iii) Specific basis for assertion. Identify the specific basis for the assertion. For example:

(A) Development at private expense. For technical data, development refers to development of the item, component, or process to which the data pertains. For computer software, development refers to the development of the software. Indicate whether development was accomplished exclusively or partially at private expense.

(B) Rights under a prior Government contract, including SBIR data rights for which the protection period has not expired.

(C) Standard commercial license customarily provided to the public.

(D) Negotiated license rights.

(iv) Entity asserting restrictions. Identify the corporation, partnership, individual or other person, as appropriate, asserting the restrictions.

(5) Previously delivered technical data or computer software. The Offeror shall identify the technical data or computer software that are identical or substantially similar to technical data or computer software that the Offeror has produced for, delivered to, or is obligated to deliver to the Government under any contract or subcontract, as well as the Government agency, contract number, and Government point of contact information. The Offeror need not identify commercial technical data or computer software delivered subject to a standard commercial license.

(6) Estimated cost of development. The estimated cost of development for that technical data or computer software to be delivered with less than Unlimted Rights.

(7) Supplemental information. When requested by the Contracting Officer, the Offeror shall provide sufficient information to enable the Contracting Officer to evaluate the Offeror's assertions. Sufficient information must include, but is not limited to, the following:

(i) The contract number under which the data or software were produced;

(ii) The contract number under which, and the name and address of the organization to whom, the data or software were most recently delivered or will be delivered; and

(iii)Identification of the expiration date for any limitations on the Government's rights to access, use, modify, reproduce, release, perform, display, or disclose the data or software, when applicable.

Export Control Marking

Offerors are advised that the export of any goods or technical data from the United States, and the disclosure of technical data to foreign nationals, may require some form of export license from the U.S. Government. Failure to obtain necessary export licenses may result in criminal liability of offerors under U.S. laws.

Offerors are responsible for ensuring compliance with the International Traffic in Arms Regulations administered by the U.S. Department of State (22 C.F.R. Parts 120 to 130), Export Administration Regulations administered by the U.S. Department of Commerce (15 C.F.R. Parts 730 to 774), and Foreign Assets Control Regulations administered by the U.S. Department of Treasury (31 C.F.R. Parts 501 to 598), as warranted, and with compliance with all recordkeeping requirements under U.S. export regulations. Offerors are responsible for compliance with any applicable export license, reporting, or other preapproval requirements by the U.S. Government. DHS neither represents that a license or preapproval shall not be required nor that, if required, it shall be issued. Nothing granted herein to offerors provides any such export license or other preapproval.

Offerors are asked to identify any anticipated export compliance issues in their response to this solicitation. Specifically, offerors are advised to include information in their response regarding any known equipment, software or technical data that will be developed as a result of work to be performed under this solicitation that is subject to export control restrictions.

To the extent that export-controlled information may be provided to DHS by offerors in response to a solicitation, offerors are responsible for ensuring that such information is

appropriately marked, and are responsible for complying with all applicable export controls and regulations in the process of providing such information.

Ineligibility for award. An Offeror's failure to submit or complete the identifications and assertions required by this provision with its offer may render the offer ineligible for award.

It is anticipated that the proposed Assertion of Data Rights will be incorporated as an attachment to the resultant award instrument. To this end, proposals must include a severable self-standing Assertion of Data Rights without any proprietary restrictions, which can be attached to the contract or agreement award.

Volume 2: Cost Proposal

The Cost Proposal shall consist of a cover page and two parts, Part 1 and Part 2. Part 1 will provide a detailed cost breakdown of all costs by cost category by calendar/fiscal year and Part 2 will be a Cost breakdown by task/sub-task using the same task numbers in the SOW. Options must be separately priced and cost proposed. No rough order of magnitude estimations will be accepted.

- Cover Page: The use of the SF 1411 is optional. The words "Cost Proposal" should appear on the cover page in addition to the following information:

    - BAA number;
    - Title of Proposal; BAA Technical Area Number and, if applicable, Sub-area Number;
    - Identity of prime Offeror and complete list of subcontractors, if applicable;
    - Technical contact (name, address, phone/fax, electronic mail address)
    - Administrative/business contact (name, address, phone/fax, electronic mail address) and;
    - Duration of effort (separately price out the basic effort and any options)

- Part 1: Detailed breakdown of all costs by cost category by calendar/fiscal year. The offeror should provide a total estimated price for major demonstrations and other activities associated with the program, including cost sharing, if any. The offeror should state whether any Independent Research and Development (IR&D) program is or will be dedicated to this effort, or if IR&D is being pursued to benefit related programs as well. Any cost sharing estimates should include the type of cost share, i.e., cash or in-kind. If in-kind is proposed, the offeror should provide a discussion of how the cost share was valued.

    - **Direct Labor** - Individual labor category or person, with associated labor hours and ***unburdened*** direct labor rates
    - **Indirect Costs -** Fringe Benefits, Overhead, G&A, etc. (***Must show base amount and rate***)
    - **Travel -** Number of trips, destinations, durations, etc.

- **Subcontract** - A cost proposal ***as detailed as the Offeror's cost proposal*** will be required to be submitted by the subcontractor. The subcontractor's cost proposal can be provided with the Offeror's cost proposal or will be requested from the subcontractor at a later date
- **Consultant -** Provide consultant agreement or other document which verifies the proposed loaded daily/hourly rate
- **Materials -** Specifically itemized with costs or estimated costs. Include basis of estimate, such as vendor quotes, recent purchases of same or similar items, catalog prices, engineering estimate, etc.)
- **Other Directs Costs -** Particularly any proposed items of equipment or facilities. Equipment and facilities generally must be furnished by the contractor/recipient. Justifications must be provided when Government funding for such items is sought
- **Fee/Profit -** Including fee percentage

- Part 2: Time-phased cost breakdown by task/sub-task using the same task numbers in the SOW and WBS.

The Cost Proposal should be consistent with your proposed SOW. Activities such as demonstrations required to reduce the various technical risks should be identified in the SOW and reflected in the Cost Proposal. The offeror should provide a total estimated cost for the major Research, Development, Test, and Evaluation (RDT&E) activities associated with the program. Certified cost of pricing data may be required.

4.5 Protection of Information Uploaded to BAA Website

All data uploaded to https://baa2.st.dhs.gov/ is protected from public view or download. All submissions will be considered proprietary, source selection sensitive and protected accordingly. Documents may only be reviewed by the registrant and authorized Government representatives. Offerors submitting proprietary information should specifically mark or identify any information they perceive is proprietary for which they seek added protection. Submissions to this solicitation (e.g., white papers and full proposals) constitute the offeror's consent to access of this information by authorized Government representatives, assigned evaluators, and support contractors providing administrative support to the evaluators.

4.6 Significant Dates and Times

DHS S&T plans to review all White Papers and subsequent Full Proposals in accordance with the "Anticipated Schedule of Events" set forth in the table in this section, using the evaluation criteria described in section 5.1. After the White Paper reviews, DHS S&T will notify offerors whether or not they are encouraged to submit a Full Proposal. A Review Panel will evaluate the Full Proposals using the criteria specified under the evaluation criteria set forth in section 5.1. Following that review, Offerors will be notified whether or not their proposal has been selected for negotiation. It is anticipated that multiple awards may be made under this BAA and in each Technical Area.

The Government reserves the right to fund none, some, or all of the proposals received. It is the intention upon completion of the proposal evaluation to notify Offerors of an initiation of negotiation for awards or rejection of their proposal. Awards will be made based on the evaluation, funds availability, and other programmatic considerations.

Table 2. Anticipated Schedule of Events

Event	Due Date	Eastern Time
Industry Day	July 25-26, 2013	-
RFI for Rapid Improvement of ETD Systems for Air Cargo Screening Closed	July 31, 2013	-
Draft BAA Posted to Website	September 30, 2013	-
Pre-Solicitation Conference	October 28, 2013	-
BAA Posted to Website	April 8, 2014	-
Deadline for submissions of White Paper Questions	April 22, 2014	12:00pm
White Paper Registration Deadline	May 1, 2014	12:00pm
White Paper Due Date	May 8, 2014	12:00pm
Notification of Encouraged/Not Encouraged to Submit Full Proposals	June 16, 2014	-
Deadline for submissions of Full Proposal Questions	June 30, 2014	12:00pm
Full Proposal Due Date	July 28, 2014	12:00pm
Notification of Selection for Award Negotiations	September 15, 2014	-
Contract Awards Begin	October 2014 – January 2015	-
Kickoff Meetings Begin	2-4 weeks post award	-

4.7 Submission of Late Full Proposals

Full Proposals may not be accepted after the published due date.

4.8 Further Assistance Needed for this BAA

The applicable electronic address for all correspondence for this BAA is: BAA13-03@HQ.DHS.GOV.

For technical assistance with using the https://baa2.st.dhs.gov/ website, submit questions to the administrators at dhsbaa@reisystems.com , phone 703-480-7676.

4.9 BAA Contractual and Technical Questions

All contractual and technical questions regarding this BAA, including the published requirements and instructions, must be directed to the Contracting Officer at BAA mailbox: BAA13-03@HQ.DHS.GOV. The program and technical staff will not acknowledge, forward, or respond to any inquiries received in any other manner concerning this BAA. Contractual questions and answers will be posted periodically under the Frequently Asked Questions (FAQs) section on the www.fbo.gov and https://baa2.st.dhs.gov websites.

5 EVALUATION INFORMATION

5.1 Evaluation Criteria

The evaluation of White Papers and Full Proposals will be accomplished through a Peer or Scientific Review using the following criteria, which are listed in descending order of relative importance:

- **Specifications of Trace Detection System (Retrofit, Desktop, or Portable) and/or Advance Trace Detection Tools and Methods:** Meets the threshold for key requirements for the system performance. Depending upon the particular technical area or sub-area, this may include percent detection, percent false alarm, limit of detection, number of explosives detected, response time, etc.
- **Operational Environment:** Meets the threshold for key requirements and program metrics for operation in the deployed environment. Depending upon the particular technical area or sub-area, this may include throughput, temperature capability, system operation and reliability. Demonstrates the overall capability to be operated in a TSA field environment.
- **Integration:** Meets the threshold for key requirements and program metrics for the integration into the deployed environment. Depending upon the particular technical area or sub-area, this may include data management, dimensions, power requirements and operator console. Demonstrates the overall capability to be integrated seamlessly into the current operations.
- **Commercialization:** Demonstrated understanding and sound capability required to commercialize and transition the developed technology. Reasonable projected production unit cost, life cycle cost, and learning curve that meets specifications required.
- **Quality and Technical Merit:** Sound technical and managerial approach of the proposed work, including a demonstrated understanding of the critical technology challenges required to address the desired system performance parameters and a strategy to address those issues, including a risk mitigation strategy.
- **Cost Realism and Reasonableness:** Presentation of accurate, well-founded estimates of all costs related to performance of the proposed effort, including an appropriate allocation of labor resources and reasonable estimates of material, equipment, and travel.
- **Capability, Experience, and History of Performance:** Capability to perform proposed work and history of performance of the team and team members in developing related technologies and systems.

Evaluation of White Papers and Full Proposals will be based on an assessment of the proposed solutions which are most advantageous to the Government based on the aforementioned criteria. Awards will be made based upon Full Proposal evaluation, funds availability, and other programmatic considerations, including awards to lesser rated proposals where alternative approaches and technologies are deemed to be more technically or operationally advantageous.

NOTE: DHS S&T reserves the right to select for award and fund all, some, or none of the Full Proposals received in response to this announcement.

5.2 Evaluation Panel

All properly submitted White Papers and Full Proposals that conform to the BAA requirements will be evaluated by a review panel comprised of Government technical experts drawn from staff within DHS S&T and other Federal agencies. All Government personnel are bound by public law to protect proprietary information.

Non-Government personnel will only provide administrative support to the panel and will be bound by appropriate non-disclosure agreements to protect proprietary and source-selection information. They will not be permitted to release any source-selection information to third parties, including others in their respective organization. Submissions and information received in response to this BAA constitute permission to disclose that information to certified evaluators under these conditions.

5.3 Feedback

Due to the estimated number of White Papers likely to be submitted in response to this targeted BAA, the Government shall not provide feedback to Offerors not encouraged to submit a Full Proposal. The Government shall provide feedback on full proposals submitted, if requested by unsuccessful Full Proposal Offerors within three calendar days of being notified that their Full Proposal was not selected for an award.

6 AWARD ADMINISTRATION INFORMATION

6.1 Reporting

The following *minimum* deliverables will be required under traditional procurement contracts or Other Transactions Agreements awarded to those Offerors whose Full Proposals are selected for award. Additional task-specific reports are IAW with the individual Technical Areas (1-4) and the sub-areas associated with Technical Area 4, as described in this BAA section and shall be provided by the awardee.

<u>Monthly Project Status Report</u>
Reports of project status will be required on a monthly basis from all performers. A template of the Monthly Project Status Report will be provided to the performer upon contract award. These reports will be electronically submitted to the program manager within fifteen days after the last day of each month. The Monthly Project Status Report Forms provide a standardized format to collect the following information:

<u>Static Information (Information that does not change monthly over the project)</u>:

- Project Title
- DHS Project Control #
- Period of Performance

- Principal Investigator's Name, Telephone Number, E-mail and Unclassified/Secure Facsimile Number(s)
- Performer's Financial Contact Name and Telephone Number

Monthly Update Information to Be Provided in Bulleted or Short Narrative Format:

- Activity During the Past Reporting Period (month)
- Progress Achieved Against Deliverable(s) During Reporting Period
- Progress Achieved Against Project Milestones and Tasks During Reporting Period
- Deliverables Submitted This Period
- Milestones Reached/Achieved This Period
- Other Noteworthy Accomplishments (meetings, presentations, publications, patent filings, etc.)
- Topics of Concern/Slippage (Technical, Schedule and/or Cost)
- Recovery Plan (if needed)
- Explicit Plans for Next Month
- Project Budget Information (Amount Spent During Reporting Period in US dollars and labor hours, including any significant equipment or material purchases, Cumulative Amount Spent Since Project Inception, and Amount of Funding Remaining)

Performers are requested to provide monthly update information only in those sections of the form that are applicable to the activities performed during the reporting period. If there is no updated information to report in a section, it can be marked "N/A" for Not Applicable, or left blank.

The following deliverables, primarily in contractor format, are anticipated as necessary. However, specific deliverables should be proposed by each Offeror and finalized with the Contracting Officer:

- Monthly Project Status Reports
- Presentation Material
- Other Documents or Reports
- Final Report (suitable for publishing and peer review)

6.2 Project Meetings and Reviews

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 deliverables and major demonstrations. These meetings will be held at various sites throughout the country. For costing purposes, Offerors should assume that one of these one-day meetings will be at or near DHS S&T, Washington D.C., and one other meeting will be held at the contractor's facility or a near-by government facility. Additional task-specific reviews and meetings are IAW with individual technical areas as described in sections 1.8.7, 1.8.8, 1.8.9, and 1.8.10.

6.3 Additional Deliverables

Technical area-specific deliverables are IAW with individual technical areas as described in sections 1.8.7, 1.8.8, 1.8.9, and 1.8.10. Performers may propose additional task-specific deliverables as appropriate for the proposed approach. The following milestone reports will be required for all Technical Areas:

Milestone Reports will consist of the following:
Milestone reports should include a cover page and will be electronically submitted to the Program Manager 30 days after the scheduled milestone event. Example milestone events include the PDR and CDR. These reports will describe the activity surrounding the milestone, principals involved in the actual work of the period, technical progress achieved against goals, difficulties encountered, funds expended against, recovery plans (if needed), explicit plans from this milestone moving forward, and financial status.

Milestone Meetings (for example PDR and CDR) will consist of the following:
A milestone meeting will take place at the scheduled and proper time in the milestone event between Principal Investigator, DHS S&T Program Manager, DHS component representatives, and any additional staff needed. Example milestone events include the PDR and CDR. The PDR should occur when the offeror has completed the design tradeoff phase and is ready to recommend proceeding with a single design. The CDR will occur when the offeror has completed the final design and is ready to begin the build phase of the program. This meeting will discuss technical progress achieved against goals, difficulties encountered, recovery plans (if needed), plans for the next milestone, and financial status. Location of these meetings will be determined based on the nature of the milestone, but will most likely occur at a DHS facility, a performer facility or Government test site.

7 OTHER INFORMATION

7.1 Foreign Government Participation

This BAA intends to have foreign government participation, to include access to white papers and subsequent proposal submissions for purposes of determining joint-funding and to include joint participation in overseeing projects throughout the contract period of performance. In particular, this BAA may involve cooperative activities in accordance with 6 U.S.C. §195(c) and existing bilateral international agreements on cooperation that DHS has with the United Kingdom of Great Britain and Northern Ireland. Specific details regarding foreign government cooperation are provided throughout the BAA. To review the international agreement, see the section titled, "Cooperation in Homeland/Civil Security Matters" at the following link:
http://www.dhs.gov/files/international/counterterrorism.shtm.

Foreign government personnel from the United Kingdom of Great Britain and Northern Ireland, participating as outlined in paragraph above, are bound by the non-disclosure provisions covering the protection of "business confidential" information, as stated in their international agreements with the DHS and are not permitted to release any information to third parties, including others in their organization. By submission of a

White Paper and/or subsequent Proposal, offerors are hereby consenting access to financial, confidential, proprietary, and/or trade secret marked information in the White Paper and/or subsequent Proposal to these foreign government personnel.

7.2 Government Furnished Equipment (GFE), Government Furnished Information (GFI) and Facilities

The Government anticipates providing GFE and GFI as listed in each BAA technical area under the terms of each negotiated contract or agreement. The Government does not anticipate providing facilities under the terms of each negotiated contract or agreement.

7.3 Security Classification

No classified White Papers or Full Proposals (or portions of proposals) will be accepted.

The Contractor and its affiliates **shall not** be permitted to advertise or make endorsement claims of any kind relating to this procurement, the project sites, or the evaluated systems and processes, existing or proposed. The Contractor personnel and the Contractor shall sign non-disclosure agreements protecting all "official use only" and other sensitive aspects of the project from outside release upon contract award.

7.4 Information for White Paper and Full Proposal Respondents

This BAA is for planning purposes only. It will not be construed as an obligation on the part of the Government to acquire any products or services. No payment of direct or indirect costs or charges by the Government will arise as a result of submission of responses to this BAA and the Government's use of such information. Unnecessarily elaborate responses containing extensive marketing materials are not desired.

7.5 SAFETY Act

As part of the Homeland Security Act of 2002, Congress enacted the Support Anti-Terrorism by Fostering Effective Technologies Act of 2002 (the "SAFETY Act"). The SAFETY Act puts limitations on the potential liability of firms that develop and provide qualified anti-terrorism technologies. DHS S&T, acting through its Office of SAFETY Act Implementation (OSAI), encourages the development and deployment of anti-terrorism technologies by making available the SAFETY Act's system of "risk management" and "liability management." Offerors submitting proposals in response to this BAA are encouraged to submit SAFETY Act applications for their existing technologies. In addition, offerors may wish to apply for SAFETY Act protections for pilot studies, operational testing of prototypes, or eligible intellectual properties relating to the manufacture, sale, use, or operation of anti-terrorism technologies. Offerors may contact OSAI for more information at 1-866-788-9318 or helpdesk@safetyact.gov, or visit OSAI's Web site at www.safetyact.gov.

7.6 Subcontracting Plan

Successful contract proposals that exceed $650,000.00, submitted by all but small business concerns, will be required to submit a Small Business Subcontracting Plan in accordance with FAR 52.219-9, prior to award.

7.7 Certificate of Current Cost or Pricing Data

Successful contract proposals that exceed $700,000.00 may require the submission of a Certificate of Current Cost or Pricing Data in accordance with FAR 15.403-4(b)(2), prior to award.

7.8 Implementation of US/UK International Agreement

As noted in this BAA, resultant contract awards may involve joint, United States and United Kingdom of Great Britain and Northern Ireland funding, pursuant to each country's bilateral, international agreement. To ensure the rights of these international agreements are secured in any resultant joint-funded contract, the following terms and conditions will apply to each joint-funded contract awarded as a result of this BAA 13-03:

a. Limitation on Contractor's Use of Data. For the purposes of paragraphs (b)(2)(i) and (d) of the Rights in Data-General (FAR 52.227-14) clause of this contract, the Contractor shall not use, release to others, reproduce, distribute, or publish any data first produced or specifically used in the performance of this contract for private purposes (to include publications) without the prior, written approval of the Contracting Officer.

b. Publication of Research Results.

(1) For publication of materials based, in whole or part, on data first produced under this contract, the Contractor shall transmit a copy to the DHS Contracting Officer at least **sixty (60) days prior** to such desired publication for review and approval by DHS and the United Kingdom. If approved, the Contractor shall supply two copies of the final publications to DHS, as directed by the DHS Contracting Officer.

(2) Any copy of material published under this clause shall contain acknowledgment of DHS and the United Kingdom of Great Britain and Northern Ireland's sponsorship of the research effort and a disclaimer stating that the published material represents the position of the author(s) and not necessarily that of DHS or the United Kingdom of Great Britain and Northern Ireland.

(3) Publication under the terms of this clause does not release the Contractor from the obligation of preparing and submitting to the Contracting Officer a final report containing the findings and results of research, as set forth in the schedule of the contract.

7.9 Notice of Foreign Partner Requirements Regarding Intellectual Property Rights in BAA Contract Deliverables

As stated throughout this solicitation, DHS may provide your BAA submissions to its United Kingdom of Great Britain and Northern Ireland partner for potential, joint-funding. In turn, the United Kingdom has expressed its desire to have the same rights to intellectual property as those DHS will obtain in contract deliverables (in accordance with the funding instrument's contract clauses). Consequently, if a contract is negotiated for award under this BAA per the Federal Acquisition Regulation (FAR), 48 C.F.R. § 1 et seq., the following items may need to be added:

- FAR 52.227-11, Alts I and II = Pursuant to FAR 27.303(b)(3), DHS may need to add Alternate I and/or II to recognize the United Kingdom's international agreement with DHS and rights therein.

- FAR 52.227-14, Alt II = Pursuant to FAR 27.404-2(c)(1)(v), DHS may need to tailor the ALT II "Limited Rights Notice" to allow dissemination of such technical data (contract) deliverables to the United Kingdom.

- FAR 52.227-14, Alt III = Pursuant to FAR 27.404-2(d)(4), DHS may need to tailor the ALT III "Restricted Rights Notice" to allow dissemination of such computer software (contract) deliverables to the United Kingdom.

If a contract is negotiated for award under this BAA as an Other Transaction Agreement (OTA), 6 U.S.C. § 391, similar-like requirements to those above may be sought by DHS during negotiation (despite the FAR not being applicable to OTAs).

7.10 Solicitation Provisions and Clauses

FAR 52.222-54 Employment Eligibility Verification (Jan 2009).
(a) *Definitions*. As used in this clause—

"Commercially available off-the-shelf (COTS) item"—

(1) Means any item of supply that is—

(i) A commercial item (as defined in paragraph (1) of the definition at 2.101);

(ii) Sold in substantial quantities in the commercial marketplace; and

(iii) Offered to the Government, without modification, in the same form in which it is sold in the commercial marketplace; and

(2) Does not include bulk cargo, as defined in section 3 of the Shipping Act of 1984 (46 U.S.C. App. 1702), such as agricultural products and petroleum products. Per 46 CFR 525.1(c)(2), "bulk cargo" means cargo that is loaded and carried in bulk onboard ship without mark or count, in a loose unpackaged form, having homogenous characteristics. Bulk cargo loaded into intermodal equipment, except LASH or Seabee barges, is subject to mark and count and, therefore, ceases to be bulk cargo.

"Employee assigned to the contract" means an employee who was hired after November 6, 1986, who is directly performing work, in the United States, under a contract that is required to include the clause prescribed at 22.1803. An employee is not considered to be directly performing work under a contract if the employee—

(1) Normally performs support work, such as indirect or overhead functions; and

(2) Does not perform any substantial duties applicable to the contract.

"Subcontract" means any contract, as defined in 2.101, entered into by a subcontractor to furnish supplies or services for performance of a prime contract or a subcontract. It includes but is not limited to purchase orders and changes and modifications to purchase orders.

"Subcontractor" means any supplier, distributor, vendor, or firm that furnishes supplies or services to or for a prime Contractor or another subcontractor.

"United States," as defined in 8 U.S.C. 1101(a)(38), means the 50 States, the District of Columbia, Puerto Rico, Guam, and the U.S. Virgin Islands.

(b) *Enrollment and verification requirements.*

(1) If the Contractor is not enrolled as a Federal Contractor in E-Verify at time of contract award, the Contractor shall—

(i) *Enroll*. Enroll as a Federal Contractor in the E-Verify program within 30 calendar days of contract award;

(ii) *Verify all new employees*. Within 90 calendar days of enrollment in the E-Verify program, begin to use E-Verify to initiate verification of employment eligibility of all new hires of the Contractor, who are working in the United States, whether or not assigned to the contract, within 3 business days after the date of hire (but see paragraph (b)(3) of this section); and

(iii) *Verify employees assigned to the contract.* For each employee assigned to the contract, initiate verification within 90 calendar days after date of enrollment or within 30 calendar days of the employee's assignment to the contract, whichever date is later (but see paragraph (b)(4) of this section).

(2) If the Contractor is enrolled as a Federal Contractor in E-Verify at time of contract award, the Contractor shall use E-Verify to initiate verification of employment eligibility of—

(i) *All new employees*.

(A) *Enrolled 90 calendar days or more*. The Contractor shall initiate verification of all new hires of the Contractor, who are working in the United States, whether or not assigned to the contract within 3 business days after the date of hire (but see paragraph (b)(3) of this section); or

(B) *Enrolled less than 90 calendar days*. Within 90 calendar days after enrollment as a Federal Contractor in E-Verify, the Contractor shall initiate verification of all new hires of the Contractor, who are working in the United States, whether or not assigned to the contract, within 3 business days after the date of hire (but see paragraph (b)(3) of this section); or

(ii) *Employees assigned to the contract*. For each employee assigned to the contract, the Contractor shall initiate verification within 90 calendar days after date of contract award or within 30 days after assignment to the contract, whichever date is later (but see paragraph (b)(4) of this section).

(3) If the Contractor is an institution of higher education (as defined at 20 U.S.C. 1001(a)); a State or local government or the government of a Federally recognized Indian tribe; or a surety performing under a takeover agreement entered into with a Federal agency pursuant to a performance bond, the Contractor may choose to verify only employees assigned to the contract, whether existing employees or new hires. The Contractor shall follow the applicable verification requirements at (b)(1) or (b)(2), respectively, except that any requirement for verification of new employees applies only to new employees assigned to the contract.

(4) *Option to verify employment eligibility of all employees*. The Contractor may elect to verify all existing employees hired after November 6, 1986, rather than just those employees assigned to the contract. The Contractor shall initiate verification for each existing employee working in the United States who was hired after November 6, 1986, within 180 calendar days of—

(i) Enrollment in the E-Verify program; or

(ii) Notification to E-Verify Operations of the Contractor's decision to exercise this option, using the contact information provided in the E-Verify program Memorandum of Understanding (MOU).

(5) The Contractor shall comply, for the period of performance of this contract, with the requirement of the E-Verify program MOU.

(i) The Department of Homeland Security (DHS) or the Social Security Administration (SSA) may terminate the Contractor's MOU and deny access to the E-Verify system in accordance with the terms of the MOU. In such case, the Contractor will be referred to a suspension or debarment official.

(ii) During the period between termination of the MOU and a decision by the suspension or debarment official whether to suspend or debar, the Contractor is excused from its obligations under paragraph (b) of this clause. If the suspension or debarment official determines not to suspend or debar the Contractor, then the Contractor must reenroll in E-Verify.

(c) *Web site*. Information on registration for and use of the E-Verify program can be obtained via the Internet at the Department of Homeland Security Web site: http://www.dhs.gov/E-Verify .

(d) *Individuals previously verified*. The Contractor is not required by this clause to perform additional employment verification using E-Verify for any employee—

(1) Whose employment eligibility was previously verified by the Contractor through the E-Verify program;

(2) Who has been granted and holds an active U.S. Government security clearance for access to confidential, secret, or top secret information in accordance with the National Industrial Security Program Operating Manual; or

(3) Who has undergone a completed background investigation and been issued credentials pursuant to Homeland Security Presidential Directive (HSPDET) -12, Policy for a Common Identification Standard for Federal Employees and Contractors.

(e) *Subcontracts*. The contractor shall include the requirements of this clause, including this paragraph (e) (appropriately modified for identification of the parties), in each subcontract that—

(1) *Is for*—

(i) Commercial or noncommercial services (except for commercial services that are part of the purchase of a COTS item (or an item that would be a COTS item, but for minor modifications), performed by the COTS provider, and are normally provided for that COTS item); or

(ii) Construction;

(2) Has a value of more than $3,000; and

(3) Includes work performed in the United States.

(End of Clause)

HSAR 3052.209-70 Prohibition on Contracts with Corporate Expatriates (Jun 2006)
(a) Prohibitions.

Section 835 of the Homeland Security Act, 6 U.S.C. 395, prohibits the Department of Homeland Security from entering into any contract with a foreign incorporated entity which is treated as an inverted domestic corporation as defined in this clause, or with any subsidiary of such an entity. The Secretary shall waive the prohibition with respect to any specific contract if the Secretary determines that the waiver is required in the interest of national security.

(b) Definitions. As used in this clause:

Expanded Affiliated Group means an affiliated group as defined in section 1504(a) of the Internal Revenue Code of 1986 (without regard to section 1504(b) of such Code), except that section 1504 of such Code shall be applied by substituting `more than 50 percent' for `at least 80 percent' each place it appears.

Foreign Incorporated Entity means any entity which is, or but for subsection (b) of section 835 of the Homeland Security Act, 6 U.S.C. 395, would be, treated as a foreign corporation for purposes of the Internal Revenue Code of 1986.

Inverted Domestic Corporation. A foreign incorporated entity shall be treated as an inverted domestic corporation if, pursuant to a plan (or a series of related transactions)—

(1) The entity completes the direct or indirect acquisition of substantially all of the properties held directly or indirectly by a domestic corporation or substantially all of the properties constituting a trade or business of a domestic partnership;

(2) After the acquisition at least 80 percent of the stock (by vote or value) of the entity is held—

(i) In the case of an acquisition with respect to a domestic corporation, by former shareholders of the domestic corporation by reason of holding stock in the domestic corporation; or

(ii) In the case of an acquisition with respect to a domestic partnership, by former partners of the domestic partnership by reason of holding a capital or profits interest in the domestic partnership; and

(3) The expanded affiliated group which after the acquisition includes the entity does not have substantial business activities in the foreign country in which or under the law of which the entity is created or organized when compared to the total business activities of such expanded affiliated group.

Person, domestic, and foreign have the meanings given such terms by paragraphs (1), (4), and (5) of section 7701(a) of the Internal Revenue Code of 1986, respectively.

(c) Special rules. The following definitions and special rules shall apply when determining whether a foreign incorporated entity should be treated as an inverted domestic corporation.

(1) *Certain stock disregarded.* For the purpose of treating a foreign incorporated entity as an inverted domestic corporation these shall not be taken into account in determining ownership:

(i) Stock held by members of the expanded affiliated group which includes the foreign incorporated entity; or

(ii) Stock of such entity which is sold in a public offering related to an acquisition described in section 835(b)(1) of the Homeland Security Act, 6 U.S.C. 395(b)(1).

(2) *Plan deemed in certain cases*. If a foreign incorporated entity acquires directly or indirectly substantially all of the properties of a domestic corporation or partnership during the 4-year period beginning on the date which is 2 years before the ownership requirements of subsection (b)(2) are met, such actions shall be treated as pursuant to a plan.

(3) *Certain transfers disregarded*. The transfer of properties or liabilities (including by contribution or distribution) shall be disregarded if such transfers are part of a plan a principal purpose of which is to avoid the purposes of this section.
(d) *Special rule for related partnerships*. For purposes of applying section 835(b) of the Homeland Security Act, 6 U.S.C. 395(b) to the acquisition of a domestic partnership, except as provided in regulations, all domestic partnerships which are under common control (within the meaning of section 482 of the Internal Revenue Code of 1986) shall be treated as a partnership.
(e) Treatment of Certain Rights.
(1) Certain rights shall be treated as stocks to the extent necessary to reflect the present value of all equitable interests incident to the transaction, as follows:
(i) warrants;
(ii) options;
(iii) contracts to acquire stock;
(iv) convertible debt instruments; and
(v) others similar interests.
(2) Rights labeled as stocks shall not be treated as stocks whenever it is deemed appropriate to do so to reflect the present value of the transaction or to disregard transactions whose recognition would defeat the purpose of Section 835.
(f) *Disclosure.* The offeror under this solicitation represents that [Check one]:
__ it is not a foreign incorporated entity that should be treated as an inverted domestic corporation pursuant to the criteria of (HSAR) 48 CFR 3009.108-7001 through 3009.108-7003;
__ it is a foreign incorporated entity that should be treated as an inverted domestic corporation pursuant to the criteria of (HSAR) 48 CFR 3009.108-7001 through 3009.108-7003, but it has submitted a request for waiver pursuant to 3009.108-7004, which has not been denied; or
__ it is a foreign incorporated entity that should be treated as an inverted domestic corporation pursuant to the criteria of (HSAR) 48 CFR 3009.108-7001 through 3009.108-7003, but it plans to submit a request for waiver pursuant to 3009.108-7004.
(g) A copy of the approved waiver, if a waiver has already been granted, or the waiver request, if a waiver has been applied for, shall be attached to the bid or proposal.

(End of provision)

7.11 Acronym List

An acronym list is provided in Appendix D.

8 APPENDICES

Appendix A. Technology Readiness Levels

Table 2, DHS S&T Technology Readiness Levels

(TRLs are from DoD's *Technology Readiness Assessment Deskbook*)

Level	Hardware TRL	Description	Supporting Information
1	Basic principles observed and reported	Lowest level of technology readiness. Scientific research begins to be translated into applied research and development (R&D). Examples might include paper studies of a technology's basic properties.	Published research that identifies the principles that underlie this technology. References to who, where, when.
2	Technology concept and/or application formulated	Invention begins. Once basic principles are observed, practical applications can be invented. Applications are speculative, and there may be no proof or detailed analysis to support the assumptions. Examples are limited to analytic studies.	Publications or other references that outline the application being considered and that provide analysis to support the concept.
3	Analytical and experimental critical function and/or characteristic proof of concept	Active R&D is initiated. This includes analytical studies and laboratory studies to physically validate the analytical predictions of separate elements of the technology. Examples include components that are not yet integrated or representative.	Results of laboratory tests performed to measure parameters of interest and comparison to analytical predictions for critical subsystems. References to who, where, and when these tests and comparisons were performed.
4	Component and/or breadboard validation in a laboratory environment	Basic technological components are integrated to establish that they will work together. This is relatively "low fidelity" compared with the eventual system. Examples include integration of "ad hoc" hardware in the laboratory.	System concepts that have been considered and results from testing laboratory-scale breadboard(s). References to who did this work and when. Provide an estimate of how breadboard hardware and test results differ from the expected system goals.
5	Component and/or breadboard validation in a relevant environment	Fidelity of breadboard technology increases significantly. The basic technological components are integrated with reasonably realistic supporting elements so they can be tested in a simulated environment. Examples include "high fidelity" laboratory integration of components.	Results from testing a laboratory breadboard system are integrated with other supporting elements in a simulated operational environment. How does the "relevant environment" differ from the expected operational environment? How do the test results compare with expectations? What problems, if any, were encountered? Was the breadboard system refined to more nearly match the expected system goals?

Table continued: Hardware Maturity Levels

Level	Hardware TRL	Description	Supporting Information
6	System/subsystem model or prototype demonstration in a relevant environment	Representative model or prototype system, which is well beyond that of TRL 5, is tested in a relevant environment. Represents a major step up in a technology's demonstrated readiness. Examples include testing a prototype in a high-fidelity laboratory environment or in a simulated operational environment.	Results from laboratory testing of a prototype system that is near the desired configuration in terms of performance, weight, and volume. How did the test environment differ from the operational environment? Who performed the tests? How did the test compare with expectations? What problems, if any, were encountered? What are/were the plans, options, or actions to resolve problems before moving to the next level?
7	System prototype demonstration in an operational environment	Prototype near or at planned operational system. Represents a major step up from TRL 6 by requiring demonstration of an actual system prototype in an operational environment (e.g., in an aircraft, in a vehicle, in space).	Results from testing a prototype system in an operational environment. Who performed the tests? How did the test compare with expectations? What problems, if any, were encountered? What are/were the plans, options, or actions to resolve problems before moving to the next level?
8	Actual system completed and qualified through test and demonstration	Technology has been proven to work in its final form and under expected conditions. In almost all cases, this TRL represents the end of true system development. Examples include developmental test and evaluation (DT&E) of the system in its intended weapon system to determine if it meets design specifications.	Results of testing the system in its final configuration under the expected range of environmental conditions in which it will be expected to operate. Assessment of whether it will meet its operational requirements. What problems, if any, were encountered? What are/ were the plans, options, or actions to resolve problems before finalizing the design?
9	Actual system proven through successful mission operations	Actual application of the technology in its final form and under mission conditions, such as those encountered in operational test and evaluation (OT&E). Examples include using the system under operational mission conditions.	OT&E reports.

Table continued: Software Maturity Levels

Level	Software TRL	Description	Supporting Information
1	Basic principles observed and reported	Lowest level of software technology readiness. A new software domain is being investigated by the basic research community. This level extends to the development of basic use, basic properties of software architecture, mathematical formulations, and general algorithms.	Basic research activities, research articles, peer-reviewed white papers, point papers, early lab model of basic concept may be useful for substantiating the TRL.
2	Technology concept and/or application formulated	Once basic principles are observed, practical applications can be invented. Applications are speculative, and there may be no proof or detailed analysis to support the assumptions. Examples are limited to analytic studies using synthetic data.	Applied research activities, analytic studies, small code units, and papers comparing competing technologies.
3	Analytical and experimental critical function and/or characteristic proof of concept	Active R&D is initiated. The level at which scientific feasibility is demonstrated through analytical and laboratory studies. This level extends to the development of limited functionality environments to validate critical properties and analytical predictions using nonintegrated software components and partially representative data.	Algorithms run on a surrogate processor in a laboratory environment, instrumented components operating in a laboratory environment, laboratory results showing validation of critical properties.
4	Module and/or subsystem validation in a laboratory environment (i.e., software prototype development environment)	Basic software components are integrated to establish that they will work together. They are relatively primitive with regard to efficiency and robustness compared with the eventual system. Architecture development initiated to include interoperability, reliability, maintainability, extensibility, scalability, and security issues. Emulation with current/legacy elements as appropriate. Prototypes developed to demonstrate different aspects of eventual system.	Advanced technology development, stand-alone prototype solving a synthetic full-scale problem, or standalone prototype processing fully representative data sets.
5	Module and/or subsystem validation in a relevant environment.	Level at which software technology is ready to start integration with existing systems. The prototype implementations conform to target environment/ interfaces. Experiments with realistic problems. Simulated interfaces to existing systems. System software architecture established. Algorithms run on a processor(s) with characteristics expected in the operational environment.	System architecture diagram around technology element with critical performance requirements defined. Processor selection analysis, Simulation/Stimulation (Sim/Stim) Laboratory buildup plan. Software placed under configuration management. COTS/GOTS components in the system software architecture are identified.

Table continued: Software Maturity Levels

Level	Software TRL	Description	Supporting Information
6	Module and/or subsystem validation in a relevant end-to-end environment	Level at which the engineering feasibility of a software technology is demonstrated. This level extends to laboratory prototype implementations on full-scale realistic problems in which the software technology is partially integrated with existing hardware/software systems.	Results from laboratory testing of a prototype package that is near the desired configuration in terms of performance, including physical, logical, data, and security interfaces. Comparisons between tested environment and operational environment analytically understood. Analysis and test measurements quantifying contribution to system-wide requirements such as throughput, scalability, and reliability. Analysis of human-computer (user environment) begun.
7	System prototype demonstration in an operational high-fidelity environment	Level at which the program feasibility of a software technology is demonstrated. This level extends to operational environment prototype implementations, where critical technical risk functionality is available for demonstration and a test in which the software technology is well integrated with operational hardware/software systems.	Critical technological properties are measured against requirements in an operational environment.
8	Actual system completed and mission-qualified through test and demonstration in an operational environment	Level at which a software technology is fully integrated with operational hardware and software systems. Software development documentation is complete. All functionality tested in simulated and operational scenarios.	Published documentation and product technology refresh build schedule. Software resource reserve measured and tracked.
9	Actual system proven through successful mission-proven operational capabilities	Level at which a software technology is readily repeatable and reusable. The software based on the technology is fully integrated with operational hardware/software systems. All software documentation verified. Successful operational experience. Sustaining software engineering support in place. Actual system.	Production configuration management reports. Technology integrated into a reuse “wizard.”

Appendix B. PDR, CDR Summary Review Guidelines

I. **PDR.** PDR will follow the guidelines and best practices of DHS RDT&E, INCOSE, and DAU with tailoring as appropriate.

Anticipated items to be covered at PDR:

1. Requirements Review including CONOPS summary and External System Interfaces

Proposed system baseline in preliminary form to include:

2. Functional baseline, diagram and performance and functional interfaces with allocation to physical architecture (hardware and software subsystems)
3. Physical architecture, system block diagram to subsystem and card-level definition
4. System and subsystem packaging
5. Subsystem interfaces
6. Software system diagram to software subsystems and interfaces
7. Software operating system environment(s)
8. Interfaces, communications
9. Information security architecture
10. Functional allocation to physical architecture (H/W and S/W)
11. Performance review and analysis of key processing threads
12. Detection processes, photon budgets
13. Processing timeline budgets
14. System throughput budgets
15. Environmental specifications
16. Risk areas
17. Test and integration plan and procedure
18. ILS, RAM plan
19. QA plan
20. CCB plan
21. Compliance matrix of requirements
22. System specifications (as proposed for manufacturing)

II. **CDR.** CDR will provide the above PDR items in final baseline form and include the following:

1. Detailed designs of the hardware, software and packing. The detailed hardware designs will include signed-off drawings such that procurement orders can be placed if CDR passes Government review. Software designs should be to a completion level, such that detailed implementation or coding can begin if CDR passes Government review.

2. Performance reviews of key processing threads and system response timelines, for example:

    a. Detection processes, adequate signal-to-noise and dynamic ranges, discrimination of threats and clutter
    b. System throughput

c. Environment specs

End product achievement of the PDR-allocated budgets should be supported by detailed designs along with supporting analysis and/or experiments.

Appendix C. Reserved

Appendix D. Acronym List

ABS	Acrylonitrile butadiene styrene
ANFO	Ammonium nitrate/fuel oil
BAA	Broad Agency Announcement
CBP	U.S. Customs and Border Protection
CCB	Configuration Control Baseline/Configuration Control Board
CDR	Critical design review
CFR	Code of Federal Regulations
CFA	Cognizant Federal Auditor
CFAO	Cognizant Federal Agency Official
CONOPS	Concept of Operations
COR	Contracting Officer's Representative
COTS	Commercial-off-the-shelf
CV	*curriculum vitae*
DAU	Defense Acquisition University
DART	Direct analysis in real time
DESI	Desorption electrospray ionization
DHS S&T	Department of Homeland Security Science and Technology
DOE	Department of Energy
DT&E	Development, Test, & Evaluation
ETD	Explosive Trace Detection
EXD	Explosives Division
FAQ	Frequently asked questions
FAR	Federal Acquisition Regulation
FedBizOps	Federal Business Opportunities (www.fbo.gov)
FFRDC	Federally-Funded Research and Development Center
FOUO	For official use only
FPS	Federal Protective Services
FRD	Functional Requirements Document
FY	Fiscal year
G&A	General and Administrative
GFE	Government Furnished Equipment
GFI	Government Furnished Information
GOTS	Government-off-the-shelf
H/W	Hardware
HBCU	Historically Black Colleges or Universities
HME	Homemade Explosive
HSAR	Homeland Security Acquisition Regulation
HSPD	Homeland Security Presidential Directive
HUB	Historically Underutilized Business
IAA	Interagency Agreement
IAW	In accordance with

IED	Improvised Explosive Device
ILS	Integrated Logistics Plan
IMS	Integrated Master Schedule
IMS	Ion Mobility Spectrometry
INCOSE	International Council on Systems Engineering
IR	Infrared
IT&E	Independent Test and Evaluation
LOD	Limit of Detection
LOI	Letter of Intent
MI	Minority Institutions
MNS	Mission Needs Statement
MOA	Memorandum of Agreement
MOU	Memorandum of Understanding
MTBCF	Mean Time Between Critical Failures
MTBF	Mean Time Between Failure
MTTR	Mean Time To Repair
N/A	Not applicable
NDA	Non-disclosure Agreement
NRC	Nuclear Regulatory Commission
ODC	Other Direct Costs
ORD	Operational Requirements Document
OSAI	Office of SAFETY Act Implementation
OT&E	Operational Test and Evaluation
PAC	Post-Award Conference
Pd	Percent detection
PDF	Portable Document Format
PDR	Preliminary Design Review
PETN	Pentaerythritol tetranitrate
Pfa	Percent false alarm
PI	Principal Investigator
PL	Public Law
PM	Program Manager
PoP	Period of Performance
QA	Quality Assurance
R&D	Research and Development
RAM	Reliability, Availability, Maintainability
RDX	Cyclotrimethylenetrinitramine
RFP	Request for Proposals
ROC	Receiver Operator Characteristic
ROM	Rough Order of Magnitude
RT&E	Readiness Test and Evaluation
S/W	Software
SAFETY Act	Support Anti-Terrorism by Fostering Effective Technologies Act

SBD	Small Disadvantaged Business
SBIR	Small Business Innovation Research
SOW	Statement of Work
SSA	Source Selection Authority
STP	Standard temperature and pressure
T&E	Test and Evaluation
TATP	Triacetone triperoxide
TBD	To be determined
TIM	Technical Interchange Meeting
TIN	Taxpayer Identification Number
TNT	Trinitrotoluene
TRL	Technology Readiness Level
TSA	Transportation Security Administration
TSL	Transportation Security Laboratory
UN	Urea nitrate
USCG	U.S. Coast Guard
USSS	U.S. Secret Service
WB	Woman-owned business
WBS	Work Breakdown Structure