Broad Agency Announcement

Video and Image Retrieval and Analysis Tool (VIRAT)

DARPA INFORMATION PROCESSING TECHNIQUES OFFICE (IPTO)

BAA 08-20

03 March 2008

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Part One: Overview Information

- **Federal Agency Name** – Defense Advanced Research Projects Agency (DARPA), Information Processing Techniques Office (IPTO)
- **Funding Opportunity Title** – Video and Image Retrieval and Analysis Tool (VIRAT)
- **Announcement Type** – Initial Broad Agency Announcement
- **Funding Opportunity Number** – BAA 08-20
- **Catalog of Federal Domestic Assistance (CFDA) Number** – N/A
- **Key Dates** –
    - This BAA will remain open for a period of one year, 03 March 2008 to 03 March 2009.
    - Industry Day will be held on 27 March 2008.
    - Proposals are due at 1200 noon (ET), on 12 May 2008.
- **Anticipated Individual Awards** – Multiple awards are anticipated.
- **Types of Instruments That May Be Awarded** – Procurement contract or other transaction.
- **Agency Technical Point of Contact** –

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Part Two: Full Text of Announcement

I. FUNDING OPPORTUNITY DESCRIPTION

The Defense Advanced Research Projects Agency (DARPA) is seeking innovative solutions for the Video and Image Retrieval and Analysis Tool (VIRAT) program. The overall program goal is to develop and demonstrate a system for video data exploitation that enables an analyst to rapidly find video content of interest from archives and to provide alerts to the analyst of events of interest during live operations.

The use of a BAA solicitation allows a wide range of innovative ideas and concepts. The offeror(s) will have the flexibility to develop a tailored program plan that best advances the VIRAT program goals.

- **Program Overview**

The ability to quickly search large volumes of existing video data and monitor real-time video data for specific activities or events will provide a dramatic new capability to the US military and intelligence agencies. Currently, video analysis for Predator and other aerial video surveillance platforms is very labor intensive, and limited to metadata queries, manual annotations, and "fast-forward" examination of clips. The software tools developed under VIRAT will radically improve the analysis of huge volumes of video data by: 1) alerting operators when specific events or activities occur at specific locations or over a range of locations and; 2) enabling fast, content-based searches of existing video archives. DARPA is seeking innovative algorithms for activity representation, matching and recognition which can support both indexing and retrieval. The primary focus of VIRAT is activity-based and dynamic information. Object/scene matching and recognition are also of interest but only to the extent they support activity analysis.

The VIRAT program will not support the development of new algorithms for tracking, moving target detection and indication, image-based change detection, geo-registration, motion pattern learning, anomaly detection, and sensor fusion. While it is expected that such algorithms may be useful to VIRAT, the system will use existing capabilities in these areas and will not depend on anticipated advances. Face recognition, gait recognition, human identification, or any form of biometrics will not be funded or used in any way within this program. Proposals involving the development of these algorithms will be rejected by the DARPA Program Manager.

- **Background Motivation**

The US military and Intelligence communities have an ever increasing need to monitor live video feeds and search large volumes of archived video data for activities of interest due to the rapid growth in development and fielding of motion video systems. At the same time, the dynamics of an urban insurgency have resulted in a rapid increase in the number of activities visible in the video field of view. For current operations, the solution has been to assign more analysts to watch the same real-time video stream simultaneously. Each analyst is assigned a separate portion of the video and is given a list of activities and objects to be on the watch for. If any of the given activities or objects are spotted, the analyst issues an alert to the proper authorities. However, video or motion imagery analysts are a scarce resource within the military and intelligence communities. Also, future overhead motion imagery systems are expected to

have an even larger field of view (> 25 Km^2), making it even harder for a limited number of analysts to effectively monitor and scrutinize all potential activities within the streaming field of view. Clearly, applying automated activity search and detection capabilities could provide dramatic payoffs in the effectiveness and efficiency of these real-time alerting operations.

Any automated support must be able to perform searches, detect activities, and provide alerts with minimal delay. The probability of detection must be high since these are typically critical activities of interest. The false alarm rate needs to be low to minimize the delays, extra work and frustration that would be caused by responding to erroneous alerts.

Just as important as processing live, streaming video is the need to process archived video to find activities and objects of interest. In the last few years, the ability to search through archived video has become critical for both post-event analyses and pattern-of-life determinations. However, current search and retrieval methods must rely upon time and location data associated with the video, and any sparse annotations that might have been made during previous viewings. The videos must be manually reviewed, using normal fast forward and reverse controls, to try and find the activities and objects of interest. This process is so laborious and tools non-existent that very few archived videos are ever reviewed. Video libraries are currently being built to store and give worldwide access to the video and motion imagery data being captured today. Efforts are also underway to consolidate and make available years of video data that have been stored locally and regionally on tape and other media. There is a desperate need for some method to quickly and more effectively search these new libraries and retrieve video clips of interest. At the end of the program, the goal of the VIRAT system is to be able to search in minutes across a video repository containing thousands of hours of video data. The probability of detection must be high to ensure that all potential matches to activities of interest are found. Minimization of the false alarms is also important, but can be mitigated by using relevance ranking techniques (similar to online text searches).

The focus of VIRAT is down-linked aerial video, which should be carefully taken into account by proposed approaches. Spatial resolution is, at most, 10cm ground sample distance and more typically 20-30cm. The sensor is moving rapidly and is distant from the scene. Video quality can vary considerably due to sun angle, haze, rain and other environmental conditions. Sensor gimbal motion, sensor field of view changes, and sensor jitter will influence the presence and appearance of objects within each image. Obscuration and occlusion will vary with ground activity, changes in viewing perspective, and site-specific obstructions. Operational video sources may utilize visible or infrared wavelengths, with infrared display options including white-hot and black-hot settings.

- **Activities**

The VIRAT program is focused on exploiting video data, which inherently contains rich spatiotemporal structure. The emphasis is on representing, indexing, and retrieving operationally relevant activities, actions and events. In the context of the VIRAT Program, such items are defined as follows:

Action or Event	A single, low-level spatiotemporal entity that cannot be further decomposed (e.g., a person entering or exiting a car or building, a person walking or running, a person kneeling, jumping, bending).
Activity	A composition of multiple events or actions.

The program will focus on a set of actions, events and activities that are of priority interest to intelligence analysts. These include, but are not limited to, the following:

Single Person	Digging, loitering, picking up, throwing, exploding/burning, carrying, shooting, launching, walking, limping, running, kicking, smoking, gesturing
Person-Person	Following, meeting, gathering, moving as a group, dispersing, shaking hands, kissing, exchanging objects, kicking, carrying together
Person-Vehicle	Driving, getting-in (out), loading (unloading), opening (closing) trunk, crawling under car, breaking window, shooting/launching, exploding/burning, dropping off, picking up
Person-Facility	Entering (exiting), standing, waiting at checkpoint, evading checkpoint, climbing atop, passing thru gate, dropping off
Vehicle	Accelerating (decelerating), turning, stopping, overtaking/passing, exploding/burning, discharging, shooting, moving together, forming into convoys, maintaining distance
Other	VIP activities (convoy, parade, receiving line, troop formation, speaking to crowds), riding/leading animal, bicycling,

- **Technical Approach**

The desired final product of the VIRAT program is a system that can be transitioned to and integrated within an operational military system. The system concept offered below is strictly notional and is used to describe and discuss the functional capabilities desired and a potential delineation of tasks. One of the early tasks will be to formally develop the system concept.

- **Notional System Concept Description**

The VIRAT system will support two modes of operation: 1) analysis of real-time streaming video as it is received at a ground station; and 2) analysis of archived video from a variety of video libraries. A notional system concept is illustrated in Figure 1 below and is as an example. Offerors are free to develop their own system architecture based on their unique solution. Technology development under the VIRAT program will focus on the elements displayed in the light blue boxes. It is expected that other functions such as those shown in the green boxes (e.g.,

metadata processing, image stabilization, and geo-spatial registration) will use current state-of-the-art technologies. Any research or development in these latter areas will only address slight modifications to support integration into the VIRAT system.

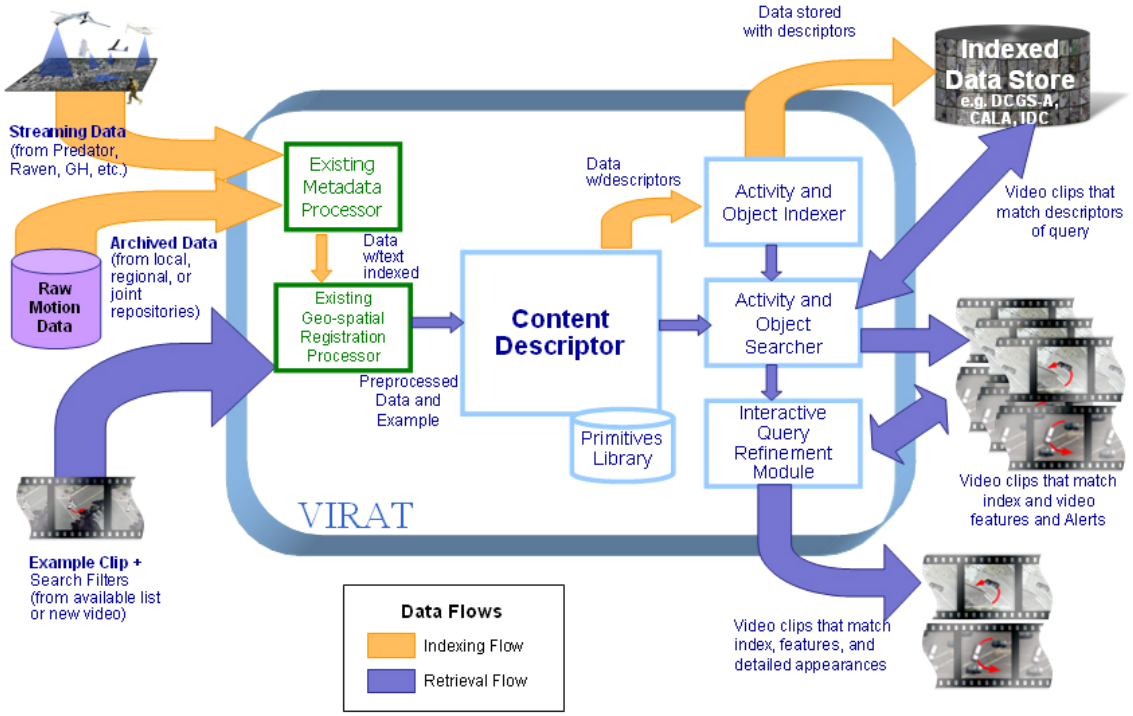

Figure 1 – Notional System Concept

The goal of the VIRAT system is to increase the effectiveness and efficiency of intelligence analysts by providing automated tools for tasks that are currently labor intensive. Today, the burden of detecting specific events in a streaming feed or searching for instances of an event in a video archive falls upon a scarce and precious resource: the time of an intelligence analyst. The sheer volume of video data being collected by various U.S. intelligence assets makes it very difficult to detect specific events in real time and too time intensive to search archived video. Using VIRAT, an analyst will be able to establish an automated alert on a streaming live feed for specific event occurrences thereby freeing their time and attention to simultaneously perform other tasks. Likewise, the analyst will be able to use VIRAT to query a video repository to search for past instances of a specific event. In this mode of operation, VIRAT provides the analyst with rapid access to the entire video database – a powerful new capability. Figure 2 illustrates the VIRAT system operational concept in the context of an example event: a car making a U-turn. As illustrated in this figure, the streaming and archival modes of operation are likely to share many underlying technology components (e.g., pre-processing, indexing, and similarity matching operations), and in both modes, relevance feedback from the analyst provides the basis for iterative refinement to increase system accuracy.

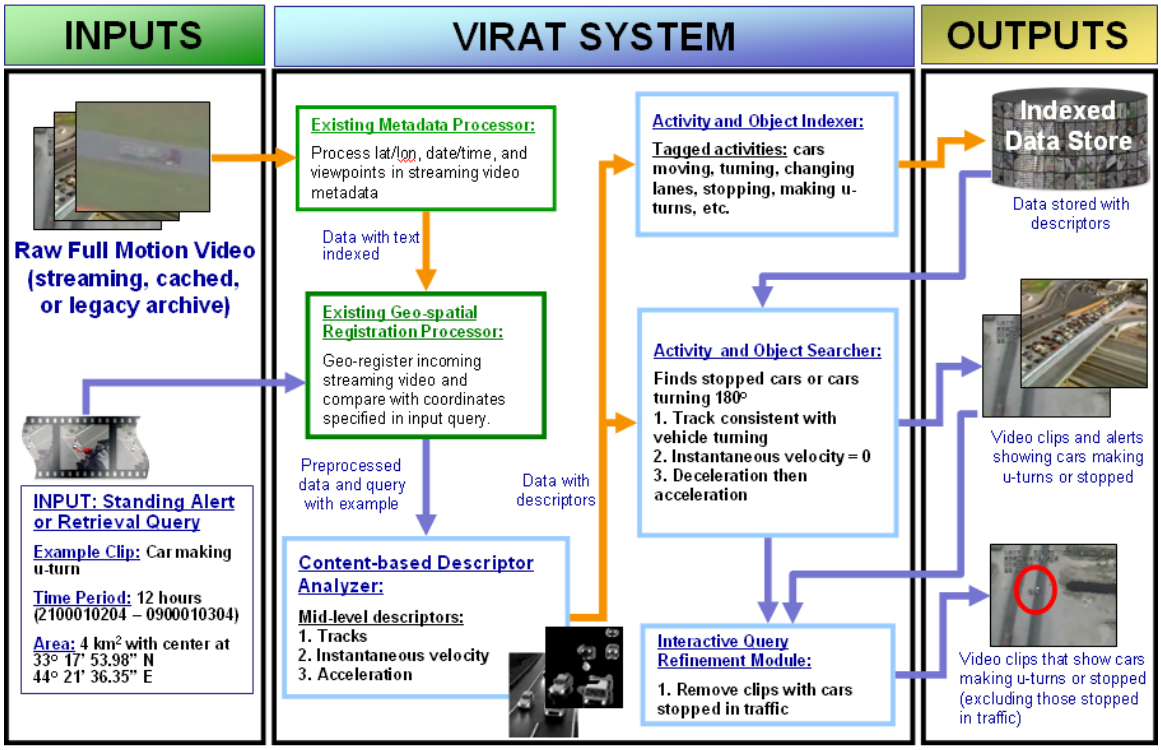

Figure 2 – An example operational concept

- **Technology Areas**

The VIRAT program seeks technical innovation in areas such as: robust representation of events and activities, efficient indexing of a full motion video archive, and interactive query refinement for archival retrieval. Each of these technical areas is described below.

1. Robust Representations of Events and Activities

The fundamental critical technology of the VIRAT program is the development of robust, digital representations of events and activities that can be used across multiple videos under varying conditions. These representations will form the technical core of VIRAT and are the enabling technology for both real-time alerts and archival retrieval of event occurrences. Proposed solutions must demonstrate effective performance under a wide range of variations. At a minimum, solutions should address how the following will be accommodated:

a. Changes in sensor configuration such as spatial and temporal resolution.
b. Changes in scene conditions across a wide variation in illumination conditions, weather, and atmospherics.
c. Ability of algorithms to operate on low resolution video (greater than 10 cm per pixel) from which identification of individuals is not possible.
d. Changes in platform range and viewpoint that affect dismount or vehicle appearance, size and pose
e. Variation in temporal dynamics of the events and activities themselves. Innovative techniques that accurately capture the

temporal extent of an event or activity and avoid fragmenting a single instance are desired.

f. Sporadic brief obscuration of event or activity elements by other scene entities

In addition, the overall context surrounding a portion of video data can be a rich source of additional information that aids in establishing robustness. This information could include geospatial information and platform and sensor metadata (e.g., viewpoint, scale, date/time, sun angle, weather).

VIRAT seeks any innovative approach to establishing robust event and activity representations. Potential enabling technologies may include, but are not limited to: employing intermediate-level descriptors to avoid dependence on a large number of object category models; robust human action representation and recognition methods utilizing space-time operators; track and motion descriptors for low-level events such as U-turns, parking, and explosions. Other advanced technologies may also be proposed as required to enable the offeror's unique solution.

2. Efficient Indexing of a Full Motion Video Archive

The large size of video repositories mandates extremely fast search mechanisms to enable retrieval times that are adequate to support end-user needs. This requires event and activity representations to be efficiently indexed while supporting approximate matching. The program seeks innovative dimensionality reduction methods, clustering techniques, similarity matching techniques, and data management strategies that support this capability. Of particular interest are novel strategies for indexing temporal data with rich dynamics. Proposed solutions must be capable of scaling to millions of observed events and activities across thousands of hours of video data. In addition, proposed indexing solutions must have a clearly articulated strategy for re-indexing the repository to accommodate new video data and any potential change or extension to the feature extraction process that may occur at a later time.

3. Interactive Query Refinement for Archival Retrieval

The VIRAT system will allow users to provide feedback on retrieved data. Users will be able to provide both positive and negative exemplars back to the system in a process of iterative query refinement. The VIRAT program seeks new approaches to incorporating this feedback in a manner that quickly converges to a high performance level. Of particular interest are refinement techniques that exploit the temporal nature of video.

- **Program Structure**

The VIRAT program has two task areas: 1) Algorithm Development and System Integration, and 2) Performance Evaluation. These task areas are described below.

Task 1 - Algorithm Development and System Integration:

Task 1 proposals must address all aspects of the VIRAT system. Task 1 offerors must form strong, multidisciplinary teams. The goal of teaming is to achieve faster, stronger progress through critical mass efforts and address all aspects of this program to produce a complete system. DARPA is only interested in full system solutions in response to this task. Technology

or algorithm developers with expertise in specific component technology areas are encouraged to team with an overall system developer.

This task is focused on creating an end-to-end system that integrates technology in the areas of robust event and activity representations, efficient indexing of full motion video archives, and interactive query refinement for archival retrieval to meet the objectives of the VIRAT program described above. Algorithms that generalize across both Day TV and IR data are desirable. A single query made to the system at a given time is expected to be comprised of only a single sensor type (either Day TV or IR, but not both).

Proposals for Task 1 must describe an overall system architecture for VIRAT and discuss system integration challenges/issues and their plans to overcome these. All proposals must clearly identify a System Integrator and discuss this role in the context of the broader team. In the course of the program, the System Integrator must be prepared to address systems engineering issues arising from algorithm developers, the VIRAT Performance Evaluation team, and transition partner end-users. Such issues may include, but are not limited to: input-output interfaces, state-of-the-art preprocessing of the data (e.g., stabilization and geo-registration), and the establishment of standards for data and algorithm interoperability.

Offerors should describe a self-evaluation plan consistent with, but not limited to, the criteria discussed in the Program Metrics section. In addition, Task 1 developers are expected to support the needs of the VIRAT Performance Evaluation team (see Task 2) by providing access to all developed system and component software; addressing software instrumentation needs; identifying failure causes, meeting required delivery dates to support evaluation events; and responding to any other test-related issues.

Day TV and IR data for designing, training, and self-evaluation will be provided as government furnished information. This data will include geo-registered video, ground truth annotations (as made by subject matter experts), terrain models, and platform and sensor metadata. Offerors may use other geo-spatial data and cartographic data such as road networks and building locations, if available.

Task 2 - Performance Evaluation:
Task 2 will fund an independent Performance Evaluation Team (PET) responsible for evaluating the systems and components developed under Task 1. This team will: 1) create a test environment that is capable of assessing, quantifying, and scoring all system and component software; 2) design the experimentation protocols used for testing; and 3) conduct the actual evaluations of all VIRAT software in an independent and objective manner. The PET will work in close coordination with Task 1 teams to define any necessary interface standards and to ensure system and component software operability within the test environment. The PET will be responsible for refining the system-level performance metrics (described in the Program Metrics Section below) as required, and translating them in to component-level metrics wherever possible. The PET may also construct or recommend problem sets for use by system and component developers to supplement their self-evaluation efforts.

DARPA plans two system evaluations during each phase. The first evaluation will be an interim status assessment that will occur roughly halfway through the phase. The main goal of this event will be to expose potential failures and identify potential causes and any other issues to Task 1 teams. The second evaluation will occur toward the end of each phase and will assess system performance against the Go/No-Go criteria and the additional performance metrics described in the Program Metrics section. During all evaluation events, the PET will methodically explore tradeoffs between the full set of performance metrics to ensure that a robust, optimized VIRAT system is achieved. To support each evaluation, the PET will be provided with: 1) an appropriate test data set as government furnished information, including ground truth annotations; and 2) access to all system and component software developed under Task 1. In addition, phase 3 of the program will also include a comparison of human effectiveness of actual analysts using the VIRAT system against analysts using current operational techniques. Since classified data will be used in the evaluation of the VIRAT program, the PET must be capable of handling, storing and processing classified electronic data.

A performer selected for Task 2 will not be eligible for selection as a Task 1 performer. If selected for Task 2, any other proposal(s) submitted by that organization will be considered "not selectable" even if they would have been considered "selectable" according to the evaluation criteria. This is to avoid organizational conflict-of-interest situations between technical/system integration, and evaluation efforts. The Government reserves the right to choose which task proposal to select and which not to select in cases where an offeror has submitted otherwise selectable proposals to multiple tasks.

- **Teaming Facilitation**

A website (www.csc-ballston.com/baa/VIRATteaming.htm) has been established to facilitate formation of teaming arrangements between interested parties. Specific content, communications, networking, and team formation are the sole responsibility of the participants. Neither DARPA nor the Department of Defense (DoD) endorses the destination web site or the information and organizations contained therein, nor does DARPA or the DoD exercise any responsibility at the destination. This website is provided consistent with the stated purpose of this BAA.

- **Program Phases**

The VIRAT program will be conducted in three phases. Each phase will successively mature the VIRAT component algorithms and system capability culminating in an integrated, end-to-end system that has clear and demonstrated value to military end-users. Tasks 1 and 2, as described above, will be pursued in each phase of the program with increasingly difficult metrics for each phase (see Table 2 below). Proposals shall address all three phases. Funding decisions for subsequent phases will be contingent upon the satisfaction of programmatic and technical Go/No-Go criteria for each phase, the availability of funds, and other program considerations.

Phase 1 - Prototype Algorithm Development and System Design:
The objective of Phase 1 is to conduct system design, prototype algorithm development, and assess the initial VIRAT system. To support algorithm development, the government will provide Day TV and IR data at the beginning of Phase 1 from a program controlled collection that has utilized Predator-type sensors. The Phase 1 system design must integrate prototype

software components into a coherent system architecture and be interoperable and compatible with the military systems employed by the program's transition partners. The PET will perform intermediate and final performance evaluations for the Phase 1 system. Performance goals for Phase 1 are described in the Program Metrics section and are focused on the accuracy of streaming alerts and archival retrieval. The VIRAT system functionality will also be assessed by end-users from potential transition partners. Feedback from military users and the PET will be incorporated into the development goals for Phase 2.

Phase 2 - Algorithm Refinement and Optimization and System Integration:
The objective of Phase 2 will be to improve on the accuracy and efficiency of the Phase 1 system while simultaneously accommodating a larger set of events and activities, an increased video rate, and an expansion of the archive size. Efforts from Phase 1 will be incorporated into a more stable and mature integrated implementation of an end-to-end VIRAT system. Performance goals for Phase 2 emphasize increasing the accuracy and speed of streaming alerts and archival retrieval toward operationally relevant values. This phase will include Day TV and IR data from program controlled collection efforts, as well as from actual operational data collected from multiple UAV platforms. The PET will perform intermediate and final performance evaluations for the Phase 2 system. Performance goals for Phase 2 are described in the Program Metrics section. The VIRAT system functionality will also be assessed by end-users from potential transition partners. Feedback from military users and the PET will be incorporated into the development goals for Phase 3.

Phase 3 - Integration, Demonstration, and Transition:
The objective of Phase 3 will be to improve upon the performance and accuracy of the Phase 2 system, demonstrate rapid refinement of query results and demonstrate the capability to accommodate complex searches that include multiple, dynamic events within a single query. The Phase 3 system must demonstrate performance and accuracy with a still larger data set, including: greater numbers of events and activities, a faster rate of streaming video, and a larger video archive. The PET will perform intermediate and final performance evaluations for the Phase 3 system. Performance goals for Phase 3 are described in the Program Metrics section Performance goals for Phase 3 will focus on accuracy and speed as well as satisfaction of end-user requirements. This phase will use actual operational Day TV and IR data from a wide range of UAV platforms. After the final PET evaluation event, the program will deliver the VIRAT software toolbox to transition partners. This phase of the program will also include a comparison of human effectiveness of actual analysts using the VIRAT system against analysts using current operational techniques.

- **Program Metrics**

The VIRAT program will be assessed near the end of each phase with the set of Go/No-Go metrics described in Table 1 below. These metrics will be used to gauge the progress of the program by DARPA management. Threshold criteria for these metrics are given for each phase of the program; these provide one of several bases for continuation of funding.

Metric	Phase 1	Phase 2	Phase 3
$P_{D\ Retrieval}$	85%	90%	95%
$FAR_{Retrieval}$	8 **(per hour per stream)**	4 **(per hour per stream)**	2 **(per hour per stream)**
SOR	60 sec	45 sec	30 sec
$P_{D\ Streaming}$	75%	85%	95%
$FAR_{Streaming}$	12 **(per hour per stream)**	6 **(per hour per stream)**	2 **(per hour per stream)**
Change Latency	1 sec	1 sec	1 sec
Addition Latency	10 min	5 min	1 min

Table 1 – Go/No-Go metrics for each program phase

Each proposal must address how it will ensure the attainment of the phase metrics specified in Table 1. Task 1 proposals will discuss how they will achieve these goals and Task 2 proposals will discuss how they will measure the achievement of these goals. The VIRAT Performance Evaluation team will design and conduct statistically significant experiments that quantitatively assess component and system performance in the middle and at the conclusion of each phase. VIRAT contractors will be responsible for conducting self-assessments throughout the project to ensure adequate progress is being made towards these goals. The following sections define these metrics and describe the test conditions for each phase.

Definition of metrics:
The Go/No-Go criteria include metrics for both modes of VIRAT operation: archival retrieval and alerts on streaming video. The definitions of metrics for assessing performance on archival retrieval are:

Probability of Detection ($P_{D\ Retrieval}$)	For a given target event or activity, the number of items retrieved correctly matching that target divided by the total number of correct instances within the archive. Higher $P_{D\ Retrieval}$ is better.
False Alarm Rate ($FAR_{Retrieval}$)	For a given target event or activity, the number of non-target items that are retrieved per archive source per hour. Lower $FAR_{Retrieval}$ is better.
Speed of Retrieval (SOR)	Time in seconds from query submission to completed retrieval. Lower *SOR* is better.

The definitions of metrics for assessing performance on streaming video are:

Probability of Detection ($P_{D\ Streaming}$)	For a given target event or activity, the number of correct alerts to the target divided by the total number of target items that streamed through the system. Higher $P_{D\ Streaming}$ is better.
False Alarm Rate ($FAR_{Streaming}$)	For a given target event or activity, the number of non-target instances that are alerted per hour per video stream. Lower $FAR_{Streaming}$ is better.

DARPA has also established two metrics to assess overall system flexibility and extensibility defined as follows:

Change Latency	Time to switch to another already identified query. The time in seconds to switch to a different target event or activity for query or alert. Lower *Change Latency* is better.
Addition Latency	Time to create a query for a new (previously unknown) event or activity. For a previously unknown and unrepresented event or activity, the time in minutes to be able to retrieve similar instances from the archive or to establish alerts against streaming data. Lower *Addition Latency* is better.

Test Conditions:
For each phase of the program, the VIRAT system will be assessed against a progressively more challenging workload level in terms of number of events and activities, rate of streaming video, and size of the video archive. DARPA has identified a key set of system parameters that will be used to set the workload level for the performance evaluations in each Phase. These include the following:

Activities	Number of events or activities available for querying/alerting
Sources of video	Day TV and IR sensor feeds that the system will be required to accommodate. Phase 1 will use data from a program controlled collection (Predator ball). Phase 2 will include both program collected and actual operational data from multiple UAVs. Phase 3 will use actual Day TV and IR data from a wide range of platforms
Size of Video Database	Size in hours of the archived dataset collection
Pixel Rate	Rate of video feed (in streaming video) in megapixels per second
Number of Alerts	Number of simultaneous alerts being run against a streaming video feed

Experimental designs created by the VIRAT Performance Evaluation team will support evaluations at different trade points between system workload (defined by these system parameters) and accuracy and performance measures. However, specific workload levels need to be established for each evaluation. Table 2 provides values for the system parameters determining workload for each program phase and shows that the workload level used during evaluation will increase as the program progresses.

	Phase 1	Phase 2	Phase 3
Activities	10	30	60
Sources of Video	Predator	Multiple UAVs	Ground based and all airborne
Size of Video Database	2 hours	20 hours	200 hours
Pixel Rate	4.5 MPixels/sec	9 MPixels/sec	58 MPixels/sec
Number of Alerts	1	3	5

Table 2 – System parameters for performance evaluation at the end of each phase

Other Performance Metrics:
In addition to the Go/No-Go criteria for moving between the phases of the program, the VIRAT Performance Evaluation team will also evaluate component and system performance for a number of additional key factors. For archival retrieval, these include:

Robustness	Range over which sensor factors and scene conditions can be varied while maintaining both precision and recall within 10% of their maximum. Wider ranges are better.
Compactness	Size of the representation for activities. Smaller is better.
Temporal Accuracy	The fraction of correct coverage of a returned event or activity interval relative to ground truth interval length minus a penalty term of the fraction of incorrect. Higher is better.
Archive Expansion	The percent change in system performance for an increase in the size of video repository. Lower is better.
Feature Set Extension	The amount of time it takes to re-index the repository after a change in the underlying feature extraction process that introduces new elements to index. Lower is better.
Relative Rank	The average similarity score of correct detections divided by the average similarity score of false alarms. Higher is better.
User Feedback Tuning	The number of iterations with the user needed to achieve criteria performance. Lower is better.

For alerts against streaming video, these include:

Robustness	Range over which sensor factors and scene conditions can be varied while maintaining P_D within 10% of its maximum. Wider ranges are better.
Latency to Alert	The time it takes for a correct alert to be raised. Faster is better.

- **Transition Goals and Issues**

A VIRAT software toolbox will be delivered at the end of each phase to the end-users of a transition partner. Feedback and comments on functionality, design, accuracy, and ease of use will be incorporated into the ongoing system development. End-users for transition partners will support quarterly meetings and design reviews and will assist the program in the development of concepts of employment and use cases.

II. AWARD INFORMATION

Multiple awards are anticipated. The amount of resources made available under this BAA will depend on the quality of the proposals received and the availability of funds.
The Government reserves the right to select for negotiation all, some, one, or none of the proposals received in response to this solicitation, and to make awards without discussions with offerors. The Government also reserves the right to conduct discussions if the Source Selection Authority later determines them to be necessary. If warranted, portions of resulting awards may be segregated into pre-priced options. Additionally, DARPA reserves the right to accept proposals in their entirety or to select only portions of proposals for award. In the event that DARPA desires to award only portions of a proposal, negotiations may be opened with that offeror. The Government reserves the right to fund proposals in phases with options for continued work at the end of one or more of the phases.

Awards under this BAA will be made to offerors on the basis of the evaluation criteria listed below (see section labeled "Application Review Information", Section V.), and program balance to provide overall value to the Government. Proposals identified for negotiation may result in a procurement contract or other transaction agreement depending upon the nature of the work proposed and other factors. **The Government reserves the right to choose the appropriate instrument.** Offerors should note that the required degree of interaction between parties, regardless of award instrument, will be high and continuous.

III. ELIGIBILITY INFORMATION

A. Eligible Applicants

All responsible sources capable of satisfying the Government's needs may submit a proposal that shall be considered by DARPA. Historically Black Colleges and Universities (HBCUs), Small Businesses, Small Disadvantaged Businesses and Minority Institutions (MIs) are encouraged to submit proposals and join others in submitting proposals; however, no portion of this announcement will be set aside for these organizations' participation due to the impracticality of reserving discrete or severable areas of this research for exclusive competition among these entities. Proposals listing Government/National laboratories as primes or subs may be subject to applicable direct competition limitations, though certain Federally Funded Research and Development Centers are excepted per P.L. 103-337§ 217 and P.L 105-261 § 3136. Proposers from Government/ National Laboratories must provide documentation to DARPA to establish that they are eligible to propose and have unique capabilities not otherwise available in private industry.

Foreign participants and/or individuals may participate to the extent that such participants comply with any necessary Non-Disclosure Agreements, Security Regulations, Export Control Laws, and other governing statutes applicable under the circumstances.

Task 2 performers will not be eligible for selection as Task 1 performers. If selected for Task 2, any other proposal(s) submitted by that organization will be considered "not selectable" even if

they would have been considered "selectable" according to the evaluation criteria. This is to avoid organizational conflict-of-interest situations between technical/system integration, and evaluation efforts.

1. Procurement Integrity, Standards of Conduct, Ethical Considerations, and Organizational Conflicts of Interest

Current federal employees are prohibited from participating in particular matters involving conflicting financial, employment, and representational interests (18 USC 203, 205, and 208.). The DARPA Program Manager for this BAA is Dr. Mita Desai. As of the date of first publication of the BAA, the Government has not identified any potential conflicts of interest involving this program manager. Once the proposals have been received, and prior to the start of proposal evaluations, the Government will assess potential conflicts of interest and will promptly notify the offeror if any appear to exist. (Please note the Government assessment does NOT affect, offset, or mitigate the offeror's own duty to give full notice and planned mitigation for all potential organizational conflicts, as discussed below.). The Program Manager is required to review and evaluate all proposals received under this BAA and to manage all selected efforts. Offerors should carefully consider the composition of their performer team before submitting a proposal to this BAA.

All Proposers and proposed subcontractors must affirm whether they are providing scientific, engineering, and technical assistance (SETA) or similar support to any DARPA technical office(s) through an active contract or subcontract. All affirmations must state which office(s) the Proposer supports and identify the prime contract numbers. Affirmations shall be furnished at the time of proposal submission. All facts relevant to the existence or potential existence of organizational conflicts of interest (FAR 9.5) must be disclosed. The disclosure shall include a description of the action the Proposer has taken or proposes to take to avoid, neutralize, or mitigate such conflict. In accordance with FAR 9.503 and without prior approval or a waiver from the DARPA Director, a Contractor cannot simultaneously be a SETA and Performer. **Proposals that fail to fully disclose potential conflicts of interests and/or do not have plans to mitigate this conflict will be returned without technical evaluation and withdrawn from further consideration for award.**

If a prospective Proposer believes that any conflict of interest exists or may exist (whether organizational or otherwise), the Proposer should promptly raise the issue with DARPA by sending Proposer's contact information and a summary of the potential conflict by email to the mailbox address for this BAA at BAA08-20@darpa.mil, before time and effort are expended in preparing a proposal and mitigation plan. If, in the sole opinion of the Government after full consideration of the circumstances, any conflict situation cannot be effectively mitigated, the proposal may be returned without technical evaluation and withdrawn from further consideration for award under this BAA.

B. Cost Sharing/Matching

Cost sharing is not required for this BAA; however, cost sharing will be carefully considered where there is an applicable statutory condition relating to the selected funding instrument (e.g., for any Other Transactions under the authority of 10 U.S.C. § 2371). Cost sharing is encouraged where there is a reasonable probability of a potential commercial application related to the proposed research and development effort.

IV. APPLICATION AND SUBMISSION INFORMATION

A. Address to Request Application Package

This solicitation contains all information required to submit a proposal. No additional forms, kits, or other materials are needed. This notice constitutes the total BAA. No additional information is available, nor will a formal Request for Proposal (RFP) or additional solicitation regarding this announcement be issued. Requests for same will be disregarded.

B. Content and Form of Application Submission

1. Proposal Information

Proposers are required to submit proposals by the time and date specified in Section IV.C. in order to be considered during the initial round of selections; however, proposals received after this deadline may be received and evaluated up to one year from date of posting on FedBizOpps. Proposals submitted after the due date stated in the BAA may be selected contingent on the availability of funds. While the proposals submitted after the initial deadline will be evaluated by a Government review panel, proposers should keep in mind that the likelihood of funding such proposals is less than for those proposals submitted in connection with the initial evaluation and award schedule.

The typical proposal should express a consolidated effort in support of one or more related technical concepts or ideas. Disjointed efforts should not be included into a single proposal.

Proposals not meeting the format described in the BAA may not be reviewed and rejected back to the submitter.

DARPA will employ an electronic upload process, the Technical Financial Information Management System (T-FIMS) proposal submission system, for proposal submissions under BAA 08-20. Those submitting proposals via T-FIMS should go to https://www.tfims.darpa.mil/baa/baalist.asp.

All proposals submitted electronically by means of the T-FIMS proposal submission system at http://www.tfims.darpa.mil/baa must be encrypted using Winzip or PKZip with 256-bit AES encryption. Only one zipped/encrypted file will be accepted per proposal and proposals not

zipped/encrypted will be rejected by DARPA. An encryption password form must be completed and emailed to BAA08-20@darpa.mil at the time of proposal submission. See https://www.tfims.darpa.mil/baa/ for the encryption password form. Note the word "PASSWORD" must appear in the subject line of the above email and there are minimum security requirements for establishing the encryption password. Failure to provide the encryption password may result in the proposal not being evaluated. For further information and instructions on how to zip and encrypt proposal files, see https://www.tfims.darpa.mil/baa/.

Organizations planning to submit proposals via T-FIMS must register for an account at https://www.tfims.darpa.mil/baa/baalist.asp. Only the lead or prime organization should register. One registration per proposal should be submitted. This means that an organization wishing to submit to multiple technical topic areas should complete a single registration for each proposal. By registering, the Proposer has made no commitment to submit.

If submitting a response to BAA 08-20 through T-FIMS, please go to https://www.tfims.darpa.mil/baa/proposer_instructions.pdf to view "Instructions for Proposers." A thorough read of this section guarantees successful submission to T-FIMS and explains all the necessary steps to submitting proposals through T-FIMS. **Since proposers using T-FIMS may encounter heavy traffic on the web server, and T-FIMS requires a registration and certificate installation for all proposers, proposers should not wait until the day the proposal is due to create an account in T-FIMS and submit the proposal.**

All administrative correspondence and questions on this solicitation, including requests for information on how to submit a proposal abstract or full proposal to this BAA, should be directed to BAA08-20@darpa.mil. Proposals may not be submitted by fax or e-mail; any so sent will be disregarded.

2. Proposal Format

All proposals must be in the format given below. Nonconforming proposals may be rejected without review. Proposals shall consist of two volumes. All pages shall be formatted for 8-1/2 by 11 inch paper with type not smaller than 12 point. The page limitation for proposals includes all figures, tables, and charts. Volume I, Technical and Management Proposal, may include an attached bibliography of relevant technical papers or research notes (published and unpublished) which document the technical ideas and approach upon which the proposal is based. Copies of not more than three (3) relevant papers can be included with the submission. The bibliography and attached papers are not included in the page counts given below. The submission of other supporting materials along with the proposals is strongly discouraged and will not be considered for review. **Except for the attached bibliography and Section I, Volume I shall not exceed 60 pages for proposals responding to Task 1 and 40 pages for proposals responding to Task 2.** All proposals must be written in English.

3. Volume I, Technical and Management Proposal

Section I. Administrative

A. Cover sheet to include:
   (1) Must include the words "Technical Proposal";
   (2) BAA number;
   (3) Must identify Task 1 or Task 2
   (4) Lead organization submitting proposal;
   (5) Type of business, selected among the following categories: "LARGE BUSINESS", "SMALL DISADVANTAGED BUSINESS", "OTHER SMALL BUSINESS", "HBCU", "MI", "OTHER EDUCATIONAL", OR "OTHER NONPROFIT";
   (6) Contractor's reference number (if any);
   (7) Contractor and Government Entity (CAGE) Code;
   (8) Other team members (if applicable) and type of business for each;
   (9) Proposal title;
   (10) Technical point of contact to include: salutation, last name, first name, street address, city, state, zip code, telephone, fax (if available), electronic mail (if available);
   (11) Administrative point of contact to include: salutation, last name, first name, street address, city, state, zip code, telephone, fax (if available), electronic mail (if available), total funds requested from DARPA, and the amount of cost share (if any); and
   (12) Date proposal was submitted.

B. Official transmittal letter.

Section II. Summary of Proposal

This section provides an overview of the proposed work as well as an introduction to the associated technical and management issues. Further elaboration will be provided in Section III.

A. Innovative claims for the proposed research. This section is the centerpiece of the proposal and should succinctly describe the uniqueness and benefits of the proposed approach relative to the current state-of-art alternate approaches.
B. Deliverables associated with the proposed research and the plans and capability to accomplish technology transition and commercialization. Include in this section all proprietary claims to the results, prototypes, intellectual property, or systems supporting and/or necessary for the use of the research, results, and/or prototype. If there are no proprietary claims, this should be stated.
C. Cost, schedule and milestones for the proposed research, including estimates of cost for each task in each year of the effort delineated by the prime and major subcontractors, total cost and company cost share, if applicable. Additional interim milestones are also highly encouraged at a regular interval.
D. Technical rationale, technical approach, and constructive plan for accomplishment of technical goals in support of innovative claims and deliverable production. (In the proposal, this section should be supplemented by a more detailed plan in Section III.)

E. General discussion of other research in this area.
F. A clearly defined organization chart for the program team which includes, as applicable: (1) the programmatic relationship of team member; (2) the unique capabilities of team members; (3) the task of responsibilities of team members; (4) the teaming strategy among the team members; and (5) the key personnel along with the amount of effort to be expended by each person during each year.

Section III. Detailed Proposal Information

This section provides the detailed discussion of the proposed work necessary to enable an in-depth review of the specific technical and managerial issues. Specific attention must be given to addressing both risk and payoff of the proposed work that make it desirable to DARPA.

A. Statement of Work (SOW) - In plain English, clearly define the technical tasks/subtasks to be performed, their durations, and dependencies among them. The page length for the SOW will be dependant on the amount of the effort. For each task/subtask, provide:
    - A general description of the objective (for each defined task/activity);
    - A detailed description of the approach to be taken to accomplish each defined task/activity);
    - Identification of the primary organization responsible for task execution (prime, sub, team member, by name, etc.);
    - The exit criteria for each task/activity - a product, event or milestone that defines its completion.
    - Define all deliverables (reporting, data, reports, software, etc.) to be provided to the Government in support of the proposed research tasks/activities.

Note: It is recommended that the SOW should be developed so that each Phase of the program is separately defined. **Do not include any proprietary information in the SOW.**

B. Description of the results, products, transferable technology, and expected technology transfer path enhancing that of Section II. B. above. Also see Section VI references within this BAA regarding "Intellectual Property."
C. Detailed technical rationale enhancing that of Section II.
D. Detailed technical approach enhancing and completing that of Section II.
E. Comparison with other ongoing research indicating advantages and disadvantages of the proposed effort.
F. Discussion of proposer's previous accomplishments and work in closely related research areas.
G. Description of the facilities that would be used for the proposed effort.
H. Detail support enhancing that of Section II, including formal teaming agreements which are required to execute this program. Offerors should describe their plan for sharing data and working with performers in the other task area. **Task 1 performers must explicitly state that they will share all system and component software with Task 2 performers.**
I. Cost schedules and milestones for the proposed research, including estimates of cost for each task in each year of the effort delineated by the primes and major subcontractors,

total cost, and any company cost share. Additional interim milestones are also highly encouraged at regular intervals. Where the effort consists of multiple portions which could reasonably be partitioned for purposes of funding, these should be identified as options with separate cost estimates for each. Additionally, proposals should clearly explain the technical approach(es) that will be employed to meet or exceed each program metric and provide ample justification as to why the approach(es) is/are feasible.

J. Organizational Conflict of Interest Affirmations and Disclosure: See Section III references within this BAA regarding "Organizational Conflict of Interest". **Proposals that fail to fully disclose potential conflicts of interests and/or do not have plans to mitigate this conflict will be returned without technical evaluation and withdrawn from further consideration for award.** If the offeror is not providing SETA or similar support to DARPA, then the offeror should state "NONE."

K. Intellectual Property: See Section VI references within this BAA regarding "Intellectual Property."

Section IV. Additional Information

A brief bibliography of relevant technical papers and research notes (published and unpublished) which document the technical ideas upon which the proposal is based. Copies of not more than three (3) relevant papers can be included in the submission.

4. Volume II, Cost Proposal – {No Page Limit}

Cover sheet to include:

(1) Must include the words "Cost Proposal";
(2) BAA number;
(3) Funds requested from DARPA for the Base Effort, each option and the total proposed cost;
(4) Lead Organization Submitting proposal;
(5) Type of business, selected among the following categories: "LARGE BUSINESS", "SMALL DISADVANTAGED BUSINESS", "OTHER SMALL BUSINESS", "HBCU", "MI", "OTHER EDUCATIONAL", OR "OTHER NONPROFIT";
(6) Contractor's reference number (if any);
(7) Other team members (if applicable) and type of business for each;
(8) Proposal title;
(9) Technical point of contact to include: salutation, last name, first name, street address, city, state, zip code, telephone, fax (if available), electronic mail (if available);
(10) Administrative point of contact to include: salutation, last name, first name, street address, city, state, zip code, telephone, fax (if available), and electronic mail (if available);
(11) Award instrument requested: cost-plus-fixed-free (CPFF), cost-contract — no fee, cost sharing contract – no fee, or other type of procurement contract (*specify*), other transaction;
(12) Place(s) and period(s) of performance;
(13) Total proposed cost with phase 1 as the base and phases 2 and 3 as options;

(14) Name, address, and telephone number of the offeror's cognizant Defense Contract Management Agency (DCMA) administration office (*if known*);
(15) Name, address, and telephone number of the offeror's cognizant Defense Contract Audit Agency (DCAA) audit office (*if known*);
(16) Any Forward Pricing Rate Agreement, other such Approved Rate Information, or such other documentation that may assist in expediting negotiations (if available);
(17) All subcontractor proposal backup documentation to include items (1) through (12) above, as is applicable and available;
(18) Date proposal was prepared;
(17) Dun and Bradstreet (DUN) Number;
(18) Taxpayer Identification Number (TIN);
(19) Contractor And Government Entity (CAGE) Code;
(20) Subcontractor Information; and
(21) Proposal validity period.

Detailed cost breakdown to include: (1) total effort cost broken down by major cost items (direct labor, including labor categories; subcontracts; materials; other direct costs, overhead charges, etc.) and further broken down by task and phase; (2) major program tasks by year; (3) an itemization of major subcontracts and equipment purchases; (4) an itemization of any information technology (IT) purchase[1]; (5) a summary of projected funding requirements by month; and (6) the source, nature, and amount of any industry cost-sharing; and (7) identification of pricing assumptions of which may require incorporation into the resulting award instrument (e.g., use of Government Furnished Property/Facilities/Information, access to Government Subject Matter Expert/s, etc.).

The prime contractor is responsible for compiling and providing all subcontractor proposals for the Procuring Contracting Officer (PCO). Subcontractor proposals should include Interdivisional Work Transfer Agreements (ITWA) or similar arrangements.

[1] IT is defined as "any equipment, or interconnected system(s) or subsystem(s) of equipment that is used in the automatic acquisition, storage, manipulation, management, movement, control, display, switching, interchange, transmission, or reception of data or information by the agency. (a) For purposes of this definition, equipment is used by an agency if the equipment is used by the agency directly or is used by a contractor under a contract with the agency which – (1) Requires the use of such equipment; or (2) Requires the use, to a significant extent, or such equipment in the performance of a service or the furnishing of a product. (b) The term "information technology" includes computers, ancillary, software, firmware and similar procedures, services (including support services), and related resources. (c) The term "information technology" does not include – (1) Any equipment that is acquired by a contractor incidental to a contract; or (2) Any equipment that contains imbedded information technology that is used as an integral part of the product, but the principal function of which is not the acquisition, storage, manipulation, management, movement, control, display, switching, interchange, transmission, or reception of data or information. For example, HVAC (heating, ventilation, and air conditioning) equipment such as thermostats or temperature control devices, and medical equipment where information technology is integral to its operation, are not information technology."

IT and Equipment Purchases

Contractors proposing the purchase of information technology (IT) resources and/or equipment MUST submit the following information:

- A letter on corporate letterhead signed by a senior corporate official and addressed to Dr. Mita Desai, Program Manager, DARPA/IPTO, stating that you either can not or will not provide the information technology (IT) resources and/or equipment necessary to conduct the said research;
- An explanation of the method of competitive acquisition or a sole source justification, as appropriate, for each IT resource item;
- If the resource is leased, a lease/purchase analysis clearly showing the reason for the lease decision; and,
- The cost for each IT resource item.

Provide supporting cost and pricing information in sufficient detail to substantiate the summary cost estimates, above. Include a description of the method used to estimate costs and supporting documentation. Note: "cost or pricing data" as defined in FAR Subpart 15.4 shall be required if the offeror is seeking a procurement contract award of $650,000 or greater unless the offeror request an exception from the requirement to submit cost of pricing data. "Cost or pricing data" are not required if the offeror proposes an award instrument other than a procurement contract (e.g., an other transaction.) All proprietary subcontractor proposal documentation (prepared at the same level of detail as that required of the prime) which cannot be uploaded to T-FIMS, shall be made immediately available to the Government, upon request, under separate cover (i.e., mail, electronic/email, etc.), either by the Proposer or by the subcontractor organization.

All proposers requesting an 845 Other Transaction Agreement for Prototypes (OTA) must include a detailed list of payment milestones. Each such payment milestone must include the following: milestone description, exit criteria, due date, milestone payment amount (to include, if cost share is proposed, contractor and government share amounts). It is noted that, at a minimum, such payable milestones should relate directly to accomplishment of program technical go/no-go criteria as defined in the BAA and/or the offeror's proposal. Agreement type, fixed price or expenditure based, will be subject to negotiation by the Agreements Officer; however, it is noted that the Government prefers use of fixed price payable milestones to the maximum extent possible. If the proposer requests award of an 845 OTA as a nontraditional defense contractor, as so defined in the OSD guide entitled "Other Transactions (OT) Guide For Prototype Projects" dated January 2001 (as amended) (http://www.dau.mil/pubs/Online_Pubs.asp), information must be included in the cost proposal to support the claim. Additionally, if the proposer plans requests award of an 845 OTA, without the required one-third (1/3) cost share, information must be included in the cost proposal supporting that there is at least one non-traditional defense contractor participating to a significant extent in the proposed prototype project.

C. Submission Dates and Times

The BAA will remain open for a period of one year, 03 March 2008 through 03 March 2009. The proposal must be submitted by 1200 noon (ET), 12 May 2008 (initial closing), in order to be considered during the initial evaluation phase. However, proposals may be submitted at any time from issuance of this announcement through final closing, 1200 noon (ET), 03 March 2009. Offerors are warned that the likelihood of funding is greatly reduced for proposals submitted after the initial closing date deadline. Submissions received after the closing date of this BAA will not be reviewed or evaluated.

DARPA will acknowledge receipt of complete submissions (proposal) via email and assign control numbers that should be used in all further correspondence regarding proposals.

Failure to comply with the submission procedures may result in the submission not being evaluated.

D. Intergovernmental Review - Not applicable

E. Funding Restrictions

The FY2008 Defense Appropriations Act caps indirect cost rates for any procurement contract or agreement using 6.1 Basic Research FY08 Funding at 35% of the total cost of the award. Total costs include all bottom line costs. Indirect costs are all costs of a prime award that are Facilities and Administration costs (for awardees subject to the cost principles in 2 CFR part 220) or indirect costs (for awardees subject to the cost principles in 2 CFR part 225 or 230 or 48 CFR part 32). If DARPA anticipates using 6.1 funding for this effort, the Contractor must be made aware that total negotiated indirect cost rates may not exceed 35% of the total cost of the award. The cost limitations do not flow down to subcontractors.

F. Other Submission Requirements - None

V. APPLICATION REVIEW INFORMATION

A. Evaluation Criteria

Evaluation of proposals will be accomplished through a scientific/technical review of each proposal using the following criteria, which are listed in order of descending importance: (a) Ability to Meet Program Go/No-Go Metrics; (b) Overall Scientific and Technical Merit; (c) Potential Contribution and Relevance to the DARPA Mission; (d) Realism of Proposed Schedule; (e) Proposer's Capabilities and/or Related Experience; (f) Plans and Capability to Accomplish Technology Transition; and (g) Cost Realism. The following are descriptions of the above listed criteria:

(a) Ability to Meet Program Go/No-Go Metrics

The feasibility and likelihood of the proposed approach for satisfying the program go/no-go metrics are explicitly described and clearly substantiated. The proposal reflects a mature and quantitative understanding of the performance go/no-go metrics, the statistical confidence with which they may be measured, and their relationship to the concept of operations that will result from successful performance in the program.

(b) Overall Scientific and Technical Merit

The overall scientific and technical merit must be clearly identifiable and compelling. The technical concepts should be clearly defined and developed. The technical approach must be sufficiently detailed to support the proposed concepts and technical claims. Proposal must clearly define metrics and evaluation plans. Offerors should apply new and/or existing technology in an innovative way that supports the objectives of the proposed effort. The proposed concepts and systems should show breadth of innovation across all the dimensions of the proposed solution.

(c) Potential Contribution and Relevance to the DARPA Mission

The potential contributions of the proposed effort with relevance to the national technology base will be evaluated. Specifically, DARPA's mission is to maintain the technological superiority of the U.S. military and prevent technological surprise from harming our national security by sponsoring revolutionary, high-payoff research that bridges the gap between fundamental discoveries and their military use.

(d) Realism of Proposed Schedule

The proposer's abilities to aggressively pursue performance metrics in the shortest timeframe and to accurately account for that timeframe will be evaluated, as well as proposer's ability to understand, identify, and mitigate any potential risk in schedule.

(e) Proposer's Capabilities and/or Related Experience

The proposer's prior experience in similar efforts must clearly demonstrate an ability to deliver products that meet the proposed technical performance within the proposed budget and schedule. The proposed team has the expertise to manage the cost and schedule. Similar efforts completed/ongoing by the proposer in this area are fully described including identification of other Government sponsors.

(f) Plans and Capability to Accomplish Technology Transition

The capability to transition the technology to the research, industrial, and operational military communities in such a way as to enhance U.S. defense, and the extent to which intellectual property rights limitations creates or may create a barrier to technology transition.

(g) Cost Realism

The objective of this criterion is to establish that the proposed costs are realistic for the technical and management approach offered, as well as to determine the proposer's practical understanding of the effort. This will be principally measured by cost per labor-hour and number of labor-hours proposed. The evaluation criterion recognize that undue emphasis on cost may motivate proposers to offer low-risk ideas with minimum uncertainty and to staff the effort with

junior personnel in order to be in a more competitive posture. DARPA discourages such cost strategies. Cost reduction approaches that will be received favorably include innovative management concepts that maximize direct funding for technology and limit diversion of funds into overhead.

Award(s) will be made to proposers whose proposals are determined to be the most advantageous to the Government, all factors considered, including the potential contributions of the proposed work to the overall research program and the availability of funding for the effort. Award(s) may be made to any proposer(s) whose proposal(s) is determined selectable regardless of its overall rating.

NOTE: PROPOSERS ARE CAUTIONED THAT EVALUATION RATINGS MAY BE LOWERED AND/OR PROPOSALS REJECTED IF SUBMITTAL INSTRUCTIONS ARE NOT FOLLOWED.

B. Review and Selection Process

It is the policy of DARPA to ensure impartial, equitable, comprehensive proposal evaluations and to select the source (or sources) whose offer meets the Government's technical, policy, and programmatic goals. Pursuant to FAR 35.016, the primary basis for selecting proposals for acceptance shall be technical, importance to agency programs, and fund availability. In order to provide the desired evaluation, qualified Government personnel will conduct reviews and (if necessary) convene panels of experts in the appropriate areas.

Proposals will not be evaluated against each other since they are not submitted in accordance with a common work statement. After selection and before award the contracting officer will negotiate terms and conditions to include cost/price. DARPA's intent is to review proposals as soon as possible after they arrive; however, proposals may be reviewed periodically for administrative reasons. For evaluation purposes, a proposal is the document described in "Proposal Information", Section IV.B. Other supporting or background materials submitted with the proposal will be considered for the reviewer's convenience only and not considered as part of the proposal.

Restrictive notices notwithstanding, proposals may be handled for administrative purposes by support contractors. These support contractors are prohibited from competition in DARPA technical research and are bound by appropriate non-disclosure requirements. Subject to the restrictions set forth in FAR 37.203(d), input on technical aspects of the proposals may be solicited by DARPA from non-Government consultants/ experts who are strictly bound by the appropriate non-disclosure requirements.

It is the policy of DARPA to treat all proposals as competitive information and to disclose their contents only for the purpose of evaluation. No proposals will be returned. Each proposal received will be retained at DARPA even after completion of the source selection process.

VI. AWARD ADMINISTRATION INFORMATION

A. Award Notices

As soon as practicable after the evaluation of a proposal is complete, the offeror will be notified that 1) the proposal has been selected for funding pending contract negotiations, or 2) the proposal has not been selected. These official notifications will be sent via US Mail to the Technical POC identified on the proposal coversheet.

B. Administrative and National Policy Requirements

1. Security

The Government anticipates that proposals submitted under this BAA will be unclassified. In the event that a proposer chooses to submit a classified proposal or submit any documentation that may be classified, the following information is applicable.

Security classification guidance on a DD Form 254 will not be provided at this time since DARPA is soliciting ideas only. After reviewing the incoming proposals, if a determination is made that the award instrument may result in access to classified information, a DD Form 254 will be issued and attached as part of the award. Proposers choosing to submit a classified proposal must first receive permission from the Original Classification Authority to use their information in replying to this BAA. Applicable classification guide(s) should be submitted to ensure that the proposal is protected appropriately.

Classified submissions shall be in accordance with the following guidance:

Collateral Classified Information: Use classification and marking guidance provided by previously issued security classification guides, the Information Security Regulation (DoD 5200.1-R), and the National Industrial Security Program Operating Manual (DoD 5220.22-M) when marking and transmitting information previously classified by another original classification authority. Classified information at the Confidential and Secret level may only be mailed via U.S. Postal Service (USPS) Registered Mail or U.S. Postal Service Express Mail. All classified information will be enclosed in opaque inner and outer covers and double wrapped. The inner envelope shall be sealed and plainly marked with the assigned classification and addresses of both sender and addressee. The inner envelope shall be address to:

Defense Advanced Research Projects Agency
ATTN: Dr. Mita Desai
Reference: BAA 08-20
3701 North Fairfax Drive
Arlington, VA 22203-1714

The outer envelope shall be sealed with no identification as to the classification of its contents and addressed to:

Defense Advanced Research Projects Agency
Security & Intelligence Directorate, Attn: CDR
3701 North Fairfax Drive
Arlington, VA 22203-1714

All Top Secret materials should be hand carried via an authorized, two-person courier team to the DARPA CDR.

Special Access Program (SAP) Information: Contact the DARPA Special Access Program Central Office (SAPCO) (703) 526-4052 for further guidance and instructions prior to transmitting SAP information to DARPA. Top Secret SAP, must be transmitted via approved methods for such material. Consult the DoD Overprint to the National Industrial Security Program Operating Manual for further guidance. *Prior to transmitting SAP material*, it is strongly recommended that you coordinate your submission with the DARPA SAPCO.

Sensitive Compartmented Information (SCI) Data: Contact the DARPA Special Security Office (SSO) at (703) 812-1994/1984 for the correct SCI courier address and instructions. All SCI should be transmitted through your servicing Special Security Officer (SSO). SCI data must be transmitted through SCI channels only (i.e., approved SCI Facility to SCI facility via secure fax).

Proprietary Data: All proposals containing proprietary data should have the cover page and each page containing proprietary data clearly marked as containing proprietary data. It is the Offeror's responsibility to clearly define to the Government what is considered proprietary data.

Offerors must have existing and in-place prior to execution of an award, approved capabilities (personnel and facilities) to perform research and development at the classification level they propose.

2. Intellectual Property

All software, software documentation, source code, and technical data developed under VIRAT will be provided to the government with a minimum of Government Purpose Rights. To the greatest extent feasible, therefore, offerors should not include background proprietary software and data as the basis of their proposed approach. Offerors expecting to utilize, but not to deliver, open source tools or other materials in implementing their approach must ensure that the government does not incur any legal obligation due to such utilization. All references to "unlimited" or "government purpose rights" are intended to refer to the definitions of those terms as set forth in the Defense Federal Acquisition Regulation Supplement (DFARS) Part 227.

a. Procurement Contract Proposers

i. Noncommercial Items (Technical Data and Computer Software)

Proposers responding to this BAA requesting a procurement contract to be issued under the FAR/DFARS shall identify all noncommercial technical data and noncommercial computer software that it plans to generate, develop, and/or deliver under any proposed award instrument in which the Government will acquire less than unlimited rights, and to assert specific restrictions on those deliverables. Proposers shall follow the format under DFARS 252.227-7017 for this stated purpose. In the event that proposers do not submit the list, the Government will assume that it automatically has "unlimited rights" to all noncommercial technical data and noncommercial computer software generated, developed, and/or delivered under any award instrument, unless it is substantiated that development of the noncommercial technical data and noncommercial computer software occurred with mixed funding. If mixed funding is anticipated in the development of noncommercial technical data and noncommercial computer software generated, developed, and/or delivered under any award instrument, then proposers should identify the data and software in question, as subject to Government Purpose Rights (GPR). In accordance with DFARS 252.227-7013 Rights in Technical Data - Noncommercial Items, and DFARS 252.227-7014 Rights in Noncommercial Computer Software and Noncommercial Computer Software Documentation, the Government will automatically assume that any such GPR restriction is limited to a period of five (5) years in accordance with the applicable DFARS clauses, at which time the Government will acquire "unlimited rights" unless the parties agree otherwise. Proposers are admonished that the Government will use the list during the source selection evaluation process to evaluate the impact of any identified restrictions and may request additional information from the proposer, as may be necessary, to evaluate the proposer's assertions. If no restrictions are intended, then the proposer should state "NONE."

A sample list for complying with this request is as follows:

NONCOMMERCIAL			
Technical Data Computer Software To be Furnished With Restrictions	Basis for Assertion	Asserted Rights Category	Name of Person Asserting Restrictions
(LIST)	(LIST)	(LIST)	(LIST)

ii. Commercial Items (Technical Data and Computer Software)

Proposers responding to this BAA requesting a procurement contract to be issued under the FAR/DFARS shall identify all commercial technical data and commercial computer software that may be embedded in any noncommercial deliverables contemplated under the research effort, along with any applicable restrictions on the Government's use of such commercial technical data and/or commercial computer software. In the event that proposers do not submit the list, the Government will assume that there are no restrictions on the Government's use of such commercial items. The Government may use the list during the source selection evaluation process to evaluate the impact of any identified restrictions and may request additional information from the proposer, as may be necessary, to evaluate the proposer's assertions. If no restrictions are intended, then the proposer should state "NONE."

A sample list for complying with this request is as follows:

COMMERCIAL			
Technical Data Computer Software To be Furnished With Restrictions	Basis for Assertion	Asserted Rights Category	Name of Person Asserting Restrictions
(LIST)	(LIST)	(LIST)	(LIST)

b. Non-Procurement Contract Proposers – Noncommercial and Commercial Items (Technical Data and Computer Software)

Proposers responding to this BAA requesting an Other Transaction shall follow the applicable rules and regulations governing these award instruments, but in all cases should appropriately identify any potential restrictions on the Government's use of any Intellectual Property contemplated under those award instruments in question. This includes both Noncommercial Items and Commercial Items. Although not required, proposers may use a format similar to that described above. The Government may use the list during the source selection evaluation process to evaluate the impact of any identified restrictions, and may request additional information from the proposer, as may be necessary, to evaluate the proposer's assertions. If no restrictions are intended, then the proposer should state "NONE."

c. All Proposers – Patents

Include documentation proving your ownership of or possession of appropriate licensing rights to all patented inventions (or inventions for which a patent application has been filed) that will be utilized under your proposal for the DARPA program. If a patent application has been filed for an invention that your proposal utilizes, but the application has not yet been made publicly available and contains proprietary information, you may provide only the patent number, inventor name(s), assignee names (if any), filing date, filing date of any related provisional application, and a summary of the patent title, together with either: 1) a representation that you own the invention, or 2) proof of possession of appropriate licensing rights in the invention.

d. All Proposers – Intellectual Property Representations

Provide a good faith representation that you either own or possess appropriate licensing rights to all other intellectual property that will be utilized under your proposal for the DARPA program. Additionally, offerors shall provide a short summary for each item asserted with less than unlimited rights that describes the nature of the restriction and the intended use of the intellectual property in the conduct of the proposed research.

3. Meeting and Travel Requirements

There will be a program kickoff meeting and all key participants are required to attend. Program-wide PI meetings will nominally occur at 6-month intervals at locations TBD. Major

performance evaluation events will also occur at 6-month intervals at locations TBD. Performers should also anticipate periodic site visits at the Program Manager's discretion.

4. Human Use

All research involving human subjects, to include use of human biological specimens and human data, selected for funding must comply with the federal regulations for human subject protection. Further, research involving human subjects that is conducted or supported by the DoD must comply with 32 CFR 219, *Protection of Human Subjects* (http://www.dtic.mil/biosys/downloads/32cfr219.pdf), and DoD Directive 3216.02, *Protection of Human Subjects and Adherence to Ethical Standards in DoD-Supported Research* (http://www.dtic.mil/whs/directives/corres/html2/d32162x.htm).

Institutions awarded funding for research involving human subjects must provide documentation of a current Assurance of Compliance with Federal regulations for human subject protection, for example a Department of Health and Human Services, Office of Human Research Protection Federal Wide Assurance (http://www.hhs.gov/ohrp). All institutions engaged in human subject research, to include subcontractors, must also have a valid Assurance. In addition, personnel involved in human subjects research must provide documentation of completing appropriate training for the protection of human subjects.

For all proposed research that will involve human subjects in the first year or phase of the project, the institution must provide evidence of or a plan for review by an Institutional Review Board (IRB) upon final proposal submission to DARPA. The IRB conducting the review must be the IRB identified on the institution's Assurance. The protocol, separate from the proposal, must include a detailed description of the research plan, study population, risks and benefits of study participation, recruitment and consent process, data collection, and data analysis. Consult the designated IRB for guidance on writing the protocol. The informed consent document must comply with federal regulations (32 CFR 219.116). A valid Assurance along with evidence of appropriate training all investigators should all accompany the protocol for review by the IRB.

In addition to a local IRB approval, a headquarters-level human subjects regulatory review and approval is required for all research conducted or supported by the DoD. The Army, Navy, or Air Force office responsible for managing the award can provide guidance and information about their component's headquarters-level review process. Note that confirmation of a current Assurance and appropriate human subjects protection training is required before headquarters-level approval can be issued.

The amount of time required to complete the IRB review/approval process may vary depending on the complexity of the research and/or the level of risk to study participants. Ample time should be allotted to complete the approval process. The IRB approval process can last between one to three months, followed by a DoD review that could last between three to six months. No DoD/DARPA funding can be used towards human subjects research until ALL approvals are granted.

5. Animal Use

Any Recipient performing research, experimentation, or testing involving the use of animals shall comply with the rules on animal acquisition, transport, care, handling, and use in: (i) 9 CFR parts 1-4, Department of Agriculture rules that implement the Laboratory Animal Welfare Act of 1966, as amended, (7 U.S.C. 2131-2159); (ii) the guidelines described in National Institutes of Health Publication No. 86-23, "Guide for the Care and Use of Laboratory Animals"; (iii) DoD Directive 3216.01, “Use of Laboratory Animals in DoD Program.”

For submissions containing animal use, proposals should briefly describe plans for Institutional Animal Care and Use Committee (IACUC) review and approval. Animal studies in the program will be expected to comply with the PHS Policy on Humane Care and Use of Laboratory Animals, available at http://grants.nih.gov/grants/olaw/olaw.htm.

All Recipients must receive approval by a DoD certified veterinarian, in addition to an IACUC approval. No animal studies may be conducted using DoD/DARPA funding until the USAMRMC Animal Care and Use Review Office (ACURO) or other appropriate DoD veterinary office(s) grant approval. As a part of this secondary review process, the Recipient will be required to complete and submit an ACURO Animal Use Appendix, which may be found at https://mrmc.amedd.army.mil/AnimalAppendix.asp.

6. Publication Approval

If DARPA determines that the research resulting from the proposed program will present a high likelihood of disclosing performance characteristics of military systems or manufacturing technologies that are unique and critical to defense any award resulting from such a determination will include the following requirement for DARPA permission before publishing any information or results on the program.

> When submitting material for written approval for open publication as described in subparagraph (a) above, the Contractor/Awardee must submit a request for public release to the DARPA TIO and include the following information: 1) Document Information: document title, document author, short plain-language description of technology discussed in the material (approx. 30 words), number of pages (or minutes of video) and document type (briefing, report, abstract, article, or paper); 2) Event Information: event type (conference, principle investigator meeting, article or paper), event date, desired date for DARPA's approval; 3) DARPA Sponsor: DARPA Program Manager, DARPA office, and contract number; and 4) Contractor/Awardee's Information: POC name, e-mail and phone. Allow four weeks for processing; due dates under four weeks require a justification. Unusual electronic file formats may require additional processing time. Requests can be sent either via e-mail to tio@darpa.mil or via
>
> 3701 North Fairfax Drive, Arlington VA 22203-1714, telephone (571) 218-4235. Refer to www.darpa.mil/tio for information about DARPA's public release process.

7. Export Control

Should this project develop beyond fundamental research (basic and applied research ordinarily published and shared broadly within the scientific community) with military or dual-use applications the following apply:

(1) The Contractor shall comply with all U. S. export control laws and regulations, including the International Traffic in Arms Regulations (ITAR), 22 CFR Parts 120 through 130, and the Export Administration Regulations (EAR), 15 CFR Parts 730 through 799, in the performance of this contract. In the absence of available license exemptions/exceptions, the Contractor shall be responsible for obtaining the appropriate licenses or other approvals, if required, for exports of (including deemed exports) hardware, technical data, and software, or for the provisio90n of technical assistance.

(2) The Contractor shall be responsible for obtaining export licenses, if required, before utilizing foreign persons in the performance of this contract, including instances where the work is to be performed on-site at any Government installation (whether in or outside the United States), where the foreign person will have access to export-controlled technologies, including technical data or software.

(3) The Contractor shall be responsible for all regulatory record keeping requirements associated with the use of licenses and license exemptions/exceptions.

(4) The Contractor shall be responsible for ensuring that the provisions of this clause apply to its subcontractors**.**

8. Subcontracting

Pursuant to Section 8(d) of the Small Business Act (15 U.S.C. 637(d)), it is the policy of the Government to enable small business and small disadvantaged business concerns to be considered fairly as subcontractors to contractors performing work or rendering services as prime contractors or subcontractors under Government contracts, and to assure that prime contractors and subcontractors carry out this policy. Each proposer who submits a contract proposal and includes subcontractors is required to submit a subcontracting plan in accordance with FAR 19.702(a) (1) and (2) should do so with their proposal. The plan format is outlined in FAR 19.704.

9. Central Contractor Registration (CCR)

Proposers selected, but not already registered in the Central Contractor Registry (CCR) will be required to register in CCR prior to any award under this BAA. Information on CCR registration is available at http://www.ccr.gov

10. On-line Representations and Certifications (ORCA)

In accordance with FAR 4.1201, prospective proposers shall complete electronic annual representations and certifications at http://orca.bpn.gov

11. Wide Area Work Flow (WAWF)

Unless using another approved electronic invoicing system, performers will be required to submit invoices for payment directly via the Internet/WAWF at http://wawf.eb.mil. Registration to WAWF will be required prior to any award under this BAA.

12. I-Edison

All required reporting shall be accomplished, as applicable, using the i-Edison.gov reporting website at http://s-edison.info.nih.gov/iEdison

C. Reporting

The award document for each proposal selected and funded will contain a mandatory requirement for 1) four Quarterly Status Reports each year, one of which will be an annual project summary and 2) monthly financial reports. Reports and briefing material will also be required as appropriate to document progress in accomplishing program metrics. A Final Report that summarizes the project and tasks will be required at the conclusion of the performance period for the award, notwithstanding the fact that the research may be continued under a follow-on vehicle. The reports shall be prepared and submitted in accordance with the procedures contained in the award document and mutually agreed on before award.

- **T-FIMS**

Reports will be electronically submitted by each awardee under this BAA via the DARPA Technical – Financial Information Management System (T-FIMS). The T-FIMS URL and instructions will be furnished by the contracting agent upon award.

VII. AGENCY CONTACTS

DARPA intends to use electronic mail and fax for correspondence regarding BAA 08-20, with the exception of selected/not-selected notifications. **Proposals may not be submitted by fax or e-mail; any so sent will be disregarded.** DARPA encourages use of the Internet for retrieving the BAA and any other related information that may subsequently be provided. Technical, contractual, and administrative questions, including requests for information on how to submit a proposal to this BAA, should be sent via e-mail to BAA08-20@darpa.mil. All requests must include the name, email address, and phone number of a point of contact.

VIII. OTHER INFORMATION

A. Industry Day

DARPA will hold an Industry Day as part of BAA 08-20 for the VIRAT program on Thursday, 27 March 2008, in Arlington, VA. The primary purpose of this briefing is to outline the problems to potential offerors within the BAA 08-20 technical areas. Attendance is not required to propose. Similarly, attendance will have no direct bearing on proposal evaluations. If you are interested in attending the Industry Day, please go to the following site, http://www.schafertmd.com/conference/VIRAT, for further information. All pertinent information and materials presented at the VIRAT Industry Day will be made available at http://www.darpa.mil/ipto/solicit/solicit.asp on Friday, 28 March 2008.

B. Teaming Information

A website (www.csc-ballston.com/baa/VIRATteaming.htm) has been established to facilitate formation of teaming arrangements between interested parties. Specific content, communications, networking, and team formation are the sole responsibility of the participants. Neither DARPA nor the Department of Defense (DoD) endorses the destination web site or the information and organizations contained therein, nor does DARPA or the DoD exercise any responsibility at the destination. This website is provided consistent with the stated purpose of this BAA.

C. Frequently Asked Questions (FAQs)

DARPA will host a website with FAQs. New responses will be posted at regular intervals. Offerors should check this site periodically for the latest information. The FAQ website can be reached at: http://www.darpa.mil/ipto/solicit/solicit.asp