

OVERVIEW INFORMATION:

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Dates: The following is a summary of the events and dates associated with the CAN CTA PA:

<u>EVENT</u>	<u>ESTIMATED DATE/TIMEFRAME</u>
DRAFT PA issued	5 Aug 2008
Opportunity Conference	27 August 2008
Final PA issued	02 February 2009
Proposals due	13 March 2009
Evaluation and Negotiations	March-May 2009
Final Proposals due	Early July 2009
Award	January 2010

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1. Purpose: The purpose of this United States Army Research Laboratory (ARL) **Cognition and Neuroergonomics (CAN) Collaborative Technology Alliance (CTA) Program Announcement (PA)** is to solicit offers that will help fulfill the research and development goals of the U.S. Department of the Army. The Army envisions that the Alliance will bring together government, industrial and academic institutions to address research and development to enable optimal soldier-system performance during tactical operations.

The objective of the Alliance is the development and demonstration of fundamental translational principles, that is, principles governing the application of neuroscience-based research and theory to complex operational settings. The Alliance is expected to perform enabling research and to transition technology to enhance soldier-system performance in complex operational settings by optimizing information transfer between the system and the soldier, identifying mental processes and individual differences that impact mission-relevant decision making, and developing technologies for individualized analyses of neurally-based processing in operational environments. To achieve this objective the Alliance is expected to implement computational modeling and to execute and link neuroscience-based research from multiple levels to produce advances in fundamental science and technology, demonstrate and transition technology, and develop research demonstrators for Warfighter experimentation. Responses to the PA should consider a neuroergonomic perspective carefully. Neuroergonomics is the merging of fields including modern neuroscience, human factors, psychology and engineering to enhance our understanding of brain function and behavior outside the confines of standard research laboratories. To address these issues the PA offers will be required to form consortia of up to seven Members.

2. Program Components: This CTA consists of two components: (1) the Fundamental Research Component; and (2) the Technology Transition Component. The Fundamental Research Component will provide for research, the results of which will be in the public domain. A fundamental research program is sought in three areas focused on *Soldier-System Information Exchange, Commander-Level Decision Making, and Individualized Assessment in Operational Environments*. The Alliance will be comprised of a Consortium, which consists of a maximum of seven (7) Members representing academic and/or industry concerns, and the US Army Research Laboratory (ARL) and other government agencies as appropriate. The Lead of the Consortium will be a Consortium Member and will ensure that the three research areas are integrated and that translational principles are demonstrated in relevant environments. The Lead of the Consortium may be an industrial or academic concern; however, it is expected that at least 70% of Fundamental Research Component funds go to academic institutions. The performance of collaborative (involving government, industrial and academic concerns) research is expected to result in integrated results and solutions. The Technology Transition Component will provide for the application of the fundamental research results to military and other Government applications.

3. Award Instruments: This PA will result in the award of two instruments: (1) a cooperative agreement as defined at 31 U.S.C. 6305 for the execution of the Fundamental Research Component; and (2) a procurement contract as defined in 31 U.S.C. 6303 for the execution of the Technology Transition Component. The cooperative agreement for the Fundamental Research

Component will be awarded to a Consortium consisting of the Lead of the Consortium and Members as necessary and appropriate to fulfill the goals of the CAN CTA Program. The Lead of the Consortium is expected (but not required) to be an industrial concern. The procurement contract will be awarded to the Lead of the Consortium. Individual tasks will be issued under the procurement contract as transition opportunities are identified from the research results under the cooperative agreement. **Under this PA, proposals are sought to select the consortium for the CAN CTA. Proposals must address all of the research areas described above.**

4. Articles of Collaboration: The Articles of Collaboration define the operational structure within the Consortium. Sample Articles of Collaboration for offerors to consider in preparing proposals are found on the CAN CTA website found at <https://www.arl.army.mil/www/default.cfm?Action=93&Page=393>. However, offerors are free to modify this document as necessary and appropriate to coincide with their proposal. The Articles of Collaboration included in the proposal will be evaluated under the Management evaluation factor. Proposals must include a copy of the offerors' proposed Articles of Collaboration, and signed by a duly authorized representative for each Consortium Member.

5. Period of Performance: Awards made as a result of this PA will provide for a period of performance of five years, with an optional five-year extension period.

6. Place of Performance: Performance for the Lead of the Consortium is limited to the U.S. to facilitate technology transition. Other Members and Subawardees, may perform at any location except that the Consortium will be required to position at least three (3) with a target of five (5) full-time or part-time researchers at ARL in Aberdeen Proving Ground, MD (APG) during the period of the agreement.

7. Funding: This PA is issued subject to the availability of funds. The PA provides the estimated funding levels for the Fundamental Research Component under the cooperative agreement. Funding for the research effort falls under the "6.1" category, which is defined in the Fundamental Research Component of this PA. ARL has submitted the requisite documents to request funding for the period covered by the cooperative agreement. However, offerors are reminded that this request is subject to Presidential, Congressional and Departmental approval. **The funding levels provided in the PA are for proposal preparation purposes only. The actual funding level of the cooperative agreement will be updated annually as part of the appropriation process.** Funding for the Technology Transition Component under the procurement contract is expected to be received from Government organizations as opportunities for transition of technology from the Fundamental Research Component are identified for specific military applications.

8. Profit/Fee: Profit/fee is not permitted under the cooperative agreement for the Fundamental Research Component. Profit/fee will be permitted under the Technology Transition Component for the specific transition tasks executed under the procurement contract. The rate of profit/fee will be negotiated on a task-by-task basis, in accordance with DFARS 215.404-4, based on the technical and performance risk associated with the specific task being executed.

I. FUNDING OPPORTUNITY DESCRIPTION

A. PROGRAM BACKGROUND

New realities demand innovative concepts to focus the talent of industry and academia on critical technology needs of the Army. Twelve years ago the ARL responded to the challenge by changing the way it did business. The new strategy focused in-house laboratory research on Army-specific business areas while establishing extramural centers of research in areas where state-of-the-art expertise could be leveraged to satisfy Army technology needs. The combination of a research triple composed of government in-house, industry, and academic components striving together for excellence created a new paradigm for Army research -- a "federated laboratory". The FedLab concept proved to be an overwhelming success, a "win-win" situation for all concerned – ARL, the private sector consortia members, and the Army system developers. It was awarded the Hammer Award for Reinventing Government by former Vice President Al Gore.

The CTA Program is the follow-on to the FedLab Program and, on 31 May 2001, and as a result of a competitive process, ARL established five CTAs in the areas of Advanced Sensors, Power & Energy, Advanced Decision Architectures, Communications & Networks, and Robotics. More recently, the ARL awarded the latest of the CTAs, the Micro Autonomous Systems and Technology (MAST) Collaborative Technology Alliance (CTA). The MAST CTA introduced a variation to the previous CTA model. In the MAST award, each Center within MAST was competed separately with a resultant single award that required all Centers to work collaboratively. The proposed CAN CTA is modeled after these original CTA models and continues the paradigm of collaborative work involving government, industry, and academia. ARL's strategy is to continue exploiting technology and expertise where it exists through the issuance of the awards resulting from this PA. This PA seeks to select an industrial and academic consortium that will work with ARL scientists and engineers to help fulfill critical military modernization objectives.

ARL and the Consortium selected for award, will establish one collaborative research Alliance to address the development of fundamental translational principles, i.e., principles governing the application of neuroscience-based research and theory to complex operational settings. The objective of the Alliance is to perform enabling research and transition technology to enhance soldier-system performance in complex operational settings by optimizing information transfer between the system and the soldier, identifying mental processes and individual differences that impact mission-relevant decision making, and developing technologies for individualized analyses of neurally-based processing in operational environments.

Additionally, other Government agencies will be invited to join this Alliance and to contribute, as appropriate, their technical expertise and personnel, and to participate in the CAN CTA. This intellectual synergy will include sharing equipment and facilities to promote efficiency. A significant goal of this effort will be to create a critical mass of private sector and Government scientists and engineers focused on solving the military technology challenges impacting soldier cognitive performance as well as supporting and stimulating dual-use applications of this

research and technology to benefit commercial use. To achieve this, the Alliance is expected to implement computational modeling and execute and link neuroscience-based research from multiple levels to produce advances in fundamental science and technology, demonstrate and transition technology, and develop research demonstrators for Warfighter experimentation.

B. RELATED PROGRAMS.

The CAN Consortium is expected to collaborate with other existing ARL programs, including ARL internal researchers and with the Army's University-Affiliated Research Centers. An example related program is provided below.

Potential Network Science CTA (NS CTA). This potential CTA focuses on developing a network science to allow humans to effectively engage and trust the network to exploit information for timely decision making based on a better understanding of objects, actions, patterns, behaviors, and relationships. Specific objectives are address issues within information networks, social/cognitive networks, and communications networks and the interactions between these three important areas. The NS CTA is envisioned to be a radical departure from current research models where each of these research areas proceeds independently. This potential CTA specifically emphasizes an integrated research program where researchers in all areas collaborate in cross-cutting themes to demonstrate network science as a multidisciplinary science. It is expected that there will be collaboration between the research in the CAN and research in the NS CTA.¹

C. FUNDAMENTAL RESEARCH COMPONENT

1. Introduction

The Fundamental Research Component will be funded under the 6.1 (Basic Research) budget category. The research proposed is expected to comply with the appropriate funding definition, from the DFAS-IN Manual 37-100-06, as follows:

Budget Activity 6.1 - Basic Research: Basic Research efforts provide fundamental knowledge for the solution of identified military problems. Includes all effort of scientific study and experimentation directed toward increasing knowledge and understanding in those fields of the physical, engineering, environmental, and life sciences related to long-term national security needs. It provides farsighted, high payoff research, including critical enabling technologies that provide the basis for technological progress. It forms a part of the base for (a) subsequent exploratory and advanced developments in Defense-related technologies, and (b) new and improved military functional capabilities in areas such as communications, detection, tracking, surveillance, propulsion, mobility, guidance and control, navigation, energy conversion, materials and structures, and personnel support.

It is the responsibility of the offerors to suggest how they would optimize the use of the available funds in order to further the CAN CTA objectives. It is the intent of this PA to solicit the most creative, innovative and flexible approaches to the ultimate goal of generating and exploiting

¹ The NS CTA is being solicited under a separate Program Announcement.

technology to solve pressing military and commercial sector problems. Therefore, while important research issues have been suggested below, offerors may propose to alter the suggested content to further the CAN CTA goals. An offeror may propose to investigate additional research issues, or to deemphasize research issues suggested in this PA. All results of the Fundamental Research Component must be publishable without constraint in the public domain.

ARL acknowledges that the focus of the Fundamental Research Component may change during the period of performance. Therefore, ARL reserves the right to withhold up to 10% of annual Alliance funding provided to ARL through the appropriation process to fund novel research projects related to the Fundamental Research Component. These novel research projects are expected to be funded under the CAN CTA cooperative agreement, and these projects may only be proposed and performed by entities not currently members of the Consortium. The primary focus of these projects will be targeted at single investigator projects.

2. Definition, Scope, and Rationale

In the past three decades, there have been explosive advances in technologies that have expanded to unprecedented levels not only the volume, type, and speed with which data can be made available but also the tools to transfer that data between humans and systems. Such advances provide incredible potential for enhancing soldier-system capabilities within the increased complexity of the current and future battlefield (e.g., advanced battlefield networks, integration of robotic systems, expanded mission profiles). However, for the individual soldier, they also threaten to outstrip their ability to adapt enough to fully exploit investments in new technologies to successfully complete mission tasks.

Concurrent with, and to a large extent because of, the explosion in computing and information technologies, there have been incredible advances in our scientific understanding of the capabilities and the limitations of the human nervous system. These advances, both in the neuroscientific knowledge base and in its related technologies, present remarkable possibilities for improving soldier technologies by keeping the capabilities and limitations of the nervous system at the forefront of human-in-the-loop system design and development. Specifically, the potential now exists for systems development that *exploits* the capabilities of nervous system structure and function, rather than simply depend on human adaptation, to improve and optimize soldier-system performance.

Neuroergonomics is the merging of fields including modern neuroscience, human factors, psychology and engineering to enhance our understanding of brain function and behavior outside the confines of standard research laboratories. A neuroergonomics approach is advocated to develop fundamental translational principles governing the relationship between a laboratory-based understanding of cognition and the cognitive performance observed within complex operational settings. The Alliance focuses on cognitive performance, which is generally considered the act of executing mental operations and is intrinsically dependent on task and environmental factors, in addition to the characteristics of the individual soldier. Specific objectives are to optimize information transfer between the system and the soldier, identify mental processes and individual differences that impact mission-relevant decision making, and develop technologies for individualized analyses of neurally-based processing in operational

environments. To achieve this objective the Alliance is expected to implement computational modeling and execute and link neuroscience-based research from multiple levels to produce advances in fundamental science and technology, demonstrate and transition technology, and develop research demonstrators for Warfighter experimentation.

In the following discussion, three task contexts or scenarios are discussed in which the demonstration of translational principles is advocated. For the first scenario, consider a mounted or dismounted soldier in an urban environment, who needs to sustain a real-time understanding of the battlespace local to himself and his platoon. The soldier will be expected to integrate direct vision, which in vehicles will be limited, with indirect vision systems driven by new sensor technologies to understand terrain for both mobility and security perspectives and identify threats such as rocket-propelled grenade or improvised explosive device ambushes. The soldier will also be faced with information in different reference frames (e.g., from sensors external to one's own platform) and must integrate local information with network information and overall mission objectives to navigate the battlespace and engage the enemy.

The second scenario involves the high operations tempo (optempo) movement of an infantry carrier vehicle (ICV) platoon through an urban environment, which requires the coordinated cognitive performance by teams of vehicle crew. The platoon leader will be required to determine routes and formations for ICVs and unmanned ground and air vehicles, maintain communications within the vehicles, with dismounting troops, and with higher-levels, maintain awareness of the broader battlefield, and respond to dynamically occurring events such as route blockages, changing mission requirements, or enemy activity. In this scenario, it will be critical for leaders to understand the changing capability of their soldiers to meet individual task demands and potentially re-task the team or the system (e.g., instantiate automations).

Similarly, cognitive performance will be critical for successful commander-level decision making, which is the final scenario. As a commander reacts to an unpredictable, dynamic, stressful situation, his performance will be affected by many factors. Some of these factors are external to him. For example, the size of the enemy forces, the time of day, and the quality and quantity of information provided by his equipment (among many others) potentially affect how successfully he and his unit perform. Some of the factors that affect his performance are internal. For example, his ability to communicate and lead his command, his personality, and fatigue will all influence his chances of success. Critical to his performance is how well he receives and "thinks" about the information in the situation and translates that thinking into appropriate behaviors.

Obtaining the understanding of the brain that is needed to enable such a vision of systems design is a formidable task. The complex, dynamic nature of Army operational tasks and environments will affect the human nervous system in ways that are significantly, if not fundamentally, different than those employed in laboratory studies. Understanding these differences in terms of soldier cognitive performance will elucidate how and where nervous system capabilities and limitations affect system designs, which is critical to achieving the translational goals of the CAN CTA. This issue belies the importance of the ability to assess and measure soldier sensory, perceptual, and cognitive behavior within realistic, Army operational environments. As such, it is expected that the Alliance will investigate techniques to identify and validate cognitive processes

as well as those factors such as emotion, fatigue, and individual differences that influence cognitive processing within military-relevant environments.

Enabling the cognitive performance reflected in the three scenarios above will require the development of fundamental principles relating neuroscience-based theory and findings to the military work environment. Example areas of translation include: visual processing into operational scanning, perceptual-motor processing into platform and payload control, multi-sensory integration and memory processing into situational awareness, executive function processes into multi-tasking behaviors, and resting state networks and cognitive style into decision making. Translation is also expected in factors that influence neural processing and behavior such as fatigue, stress, experience, and individual differences.

This PA identifies three technical areas of research; however the key to developing cognitive performance technologies is to consider the interplay between all of these. Responses to the PA should carefully consider this interplay. Radical design and science and engineering methodologies are envisioned in which the fundamental principles of transition and validation in operationally-relevant environments are emphasized over the strict laboratory study or non-neuroscience based systems development. The Lead of the Consortium will ensure that the three research areas are integrated and that translational principles are demonstrated in relevant environments.

The following represents a discussion of the three technical areas. It is important for offerors to note that proposals will be evaluated based upon their vision in an area and a measured approach to achieving this vision in the near-, mid-, and far-term. The example research topics within each area presented below are meant to be representative and not exhaustive. It is not necessary for offerors to address all or even any of these topics. Instead, offerors should consider the increasingly complex capabilities required in each of the scenarios described above and address the scientific and technological hurdles they feel need to be overcome. Offerors should convey a depth of understanding by addressing how these hurdles can be overcome in the near-, mid-, and far-term.

3. Soldier-System Information Exchange

This technical area (TA) centers on the exchange of information between the soldier, system, and environment. Information exchange includes information the soldier receives and transmits, as well as proprioceptive information. This TA also includes the impact of different information exchange configurations on sensory-motor coordination. A goal of this TA includes leveraging our understanding of central and peripheral nervous system functioning to maximize the effectiveness of information transfer between the soldier and the system. An additional goal is to understand the effects of military technology on sensory motor interactions, human motor control and coordination.

Sub Area 1: Information Transfer

Fundamental limits exist in human working memory capacity, attentional resources, and multi-source information tracking and integration abilities. Identifying where the critical bottlenecks and sources of interference arise between different cognitive and perceptual processes, as well as understanding the biological underpinnings of these processes (e.g., parvocellular vs.

magnocellular processing pathways, dorsal vs. ventral visual streams, subcortical vs. cortical integration, sensory overload), can be used to facilitate the development of better displays and augment local situation awareness. This is particularly important in situations that entail the integration of multiple sensor feeds (e.g., vehicle mounted cameras and aerial vehicle displays), particularly when these sources of information arrive at different times and in different reference frames (perspectives). Similarly, examination of differences in information transfer among different modes of display (e.g., passive vs. active/interactive, desktop vs. immersive), and its neurophysiological bases, is of interest.

Sub Area 2: Sensory-Motor Interactions, Human Motor Control and Coordination

Perception and higher-order cognitive processing rarely occur in isolation. Rather, they transpire in the presence of different sensory contexts and under varying motor demands. As such, the identical sensory feed (e.g., communication channel, terrain map) might be processed very differently depending on the physical context in which it is presented (e.g., might vary according to the mass properties of the system, dynamics of the environment, motor complexity of concurrent tasks). And, conversely, different methods of information presentation might have very different effects on critical perceptual-motor processes, such as aiming and shooting a rifle, maintaining one's spatial orientation in an urban environment, or attending haptic communication signals. This sub area is focused on understanding the underlying optimization criteria that influence human motor control strategies under various conditions. Recall scenario one, in which a dismounted soldier is in an urban environment. In every situation, the movement of the soldier through the environment will be affected by the environment, the equipment the soldier has, and the information provided to the soldier. The movement will be optimized based on a set of criteria. By understanding these criteria, systems can be designed that will enhance soldier-system performance.

This sub-area calls for an understanding of the integrated effects of physical and cognitive stressors on the soldier, the interactions between physical action and cognition, and the neurophysiological underpinnings of those interactions. Human motor control strategies may be manipulated by way of physical or cognitively perturbing the human or both. Physically perturbing the soldier may range from changing the mass properties of the equipment the soldier is using to adding a new information display to changing the dynamics of the environment the soldier is performing tasks in (i.e., stationary vs. moving vehicle). Cognitively perturbing the soldier may range from increasing the complexity of the environment (more buildings with windows, more alleys, etc.) to adding new information to a display. These lists of potential perturbations are not exhaustive and other candidates can be proposed by the offeror. Because this sub area is investigating the interaction between physical and cognitive stressors, optimality criteria should include physical and cognitive metrics, including but not limited to kinematics, energy expenditure, neural processing, etc.

4. Commander-Level Decision Making

The Commander-Level Decision Making TA will address numerous aspects of the decision-making process of military commanders. Decision making is the process of choosing actions based on a problem situation and a goal of resolving the problem. The focus of the TA is on *commander-level* decision making, which necessitates that problem situations that are considered

will have military relevance, are uncertain, ambiguous, complex, and involve the management of human and materiel resources. In this TA, commanders may be considered at the battalion, company or platoon leader levels. The decision-making process involves both representing the problem situation and sorting through information. Individuals may have more information than necessary or not enough information for making a decision, and they must sort through information for relevancy to the problem solution, and may find that there is not enough information and seek more information. Individuals must also choose actions and commands. Within this framework, this TA will focus on two overarching topics: The first topic covers the mental representation of information, including the representations of the problem situation and of the information that is connected to the problem situation, but may or may not be important to the decision-making process. The second topic area covers influences on the decision-making including strategies and heuristics.

Sub Area 1: The Problem Situation and Information Representation

This sub area focuses on the neural underpinnings of how individuals represent problem situations and the associated information needed or available for decision making. Individuals are taxed with gaining an awareness of what the problem entails and must direct attention to information sources that will specify the problem situation. How does a commander focus (i.e., one source) or divide (i.e., multiple simultaneous sources) attention to represent the problem? When information has been gathered, the commander must represent mission-relevant information. How is information represented both cognitively and neurally? Also, what individual differences exist that determine how the problem set is represented (e.g., experienced versus novice commanders)?

Different types of information or components of this information will differentially affect the decision-making process. One important aspect is the temporal aspect or the recency of information. Commander-level decisions are often performed in dynamic settings and more recent information may take higher value than older information. One example focus for research on temporal information is the brain imaging signatures from information that is either proximal or distal in time. The temporal aspect of information is only one aspect. Other examples include ambiguity, cost-benefit, or quality. For this technical area, research may address how a commander filters the information associated with the problem. Accepted information has varying levels of importance as assessed by the decision maker. An important question is: what factors impact how a commander prioritizes information in military decisions? A related question may be: what brain mechanisms are involved in how decision-making information is prioritized?

Sub Area 2: Influences on Decision Making: Strategies, Heuristics, and Stressors

This sub area will address the strategies and heuristics that influence the decision-making process. Commanders may use different strategies to achieve their objectives. Two possible research foci are to determine to what extent experienced commanders choose similar strategies for common military scenarios and how likely it is that novice commanders derive the same strategies for the same military scenarios as experienced commanders. Second, heuristics are preferences that are found across individuals and cause decision-making to be easier, but not necessarily more accurate. The availability heuristic, for example, refers to the effect of memory

on judgments about the relative frequency of an event wherein events that come to mind more easily are judged to be more likely than their actual frequency of occurrence.

Individual differences, including biases or personal preferences such as the tendency to conserve rather than use resources, may affect the ultimate chosen course of action. Research addressing biases may catalog biases or detail the effects of known biases. Different stressors may also affect decisions and is another important factor in how individuals choose a course of action. Stressors (e.g., time pressure, combat sounds, fatigue, ethical dilemmas) and their impact on the quality of decisions and the decision making process are key research foci. Information that can be classified as stressors and how it is represented mentally and neurally is of interest. Differences in individual capabilities may also change the impact of stressors, and may affect the way different commanders represent information. A possible research question is to what extent individual differences (e.g., cognitive style, biases, etc.) support information representations that lead to successful conclusions to military problem situations in the presence of specific or multiple stressors.

Across both sub-areas, it will be critical to study the neural processing associated with information representation in the decision-making process. The use of various brain measurement and imaging techniques (e.g., electroencephalography (EEG), functional magnetic resonance imaging (fMRI), functional near infrared imaging (fNIR), positron emission tomography (PET), or trans-cranial magnetic stimulation (TMS)) or other such methodologies may be appropriate depending on the research question. Other important research topics include: the location of brain activity while making command-level decisions, brain imaging signatures for experienced versus inexperienced commanders, and evoked-response potential (ERP) differences, for example, in the amplitude, timing, and spectral frequency of brain responses when confronted with different types of information (e.g., visual versus auditory).

5. Individualized Assessment in Operational Environments

Research in this TA will focus on understanding the individual operator within the operational context. Future translation of research results will focus on using an enhanced understanding of individual cognitive performance to optimize soldier and soldier-system performance. This optimization may be achieved through neurally-informed systems design and through brain-system interfaces that can adapt to the individual user. For example, understanding the impact of operational stressors on an individual's cognitive performance may be used to inform information display configuration or task loading. *A priori* assessments of an individual's neuro-cognitive capacities may be used to normalize system behavior in accounting for known behavioral variations among operators. Real-time assessment of cognitive state and performance might also be used to adapt displays or task loading based upon how an individual soldier will respond uniquely to the stressors of a given mission to optimize their system interactions before performance deterioration occurs, enhancing operational safety, survivability, and sustainability.

Sub-Area 1: Individual Differences and Cognitive Performance

This technical issue is focused on understanding the impact of individual differences on cognitive performance. It is increasingly clear that individual differences at every level of analysis will strongly affect task performance. For example, differences in individuals (e.g.,

personality, stress responses, learned coping strategies) will affect how they cope with mission task demands in the face of environmental stressors (e.g., heat, vibration, noise, operations tempo). Furthermore, understanding the dynamic relationship between individual differences in neural processing and cognitive performance in operational tasks and environments will be critical, as well as how such understandings can improve the resolution and reliability of assessments both between and within individuals. This technical issue will therefore require in-depth assessment of the impact of relevant battlefield or other stressors on neural processing as it relates to soldier cognitive performance. Computational modeling approaches that account for individual differences and can predict the performance impact on soldier-system interaction are expected. A challenge will be to integrate fundamental neural mechanisms into such modeling approaches.

Sub-Area 2: Methods for Assessing Individual Cognitive Performance in Military Environments

The second technical issue is focused on the development of novel methods for assessing individual cognitive performance in military environments. This development may be the result of leveraging/validating established laboratory measures as a path to operational assessment, and may include the identification of correlates between high-resolution, laboratory-based measurement technologies and neuro-cognitive measurement in operational environments to provide operationally-relevant indexes of individual soldier neuro-cognitive behavior. It may also include new sensor technologies that extend the state-of-the-art in providing enhanced measurement capabilities for capturing soldier neuro-cognitive task behavior, with the potential for future fieldable solutions or impact being an important criterion. Data mining and neuro-computational approaches to develop algorithms for sense-making across large-scale, multi-dimensional data arrays should also be considered. There are many different physiological parameters (e.g., heart rate, skin conductance, electrocortical activity, hemodynamics) that might be utilized to map an individual's neuro-cognitive behavior to their mission task performance. Identifying the necessary parameter mappings across the cognitive processes underlying operational tasks, and individual differences that lead to performance variability, will be critical.

The success of this technical area will be dependent on the development of algorithms that account for the variability in individual differences and environmental stressors and on the appropriate selection and integration of neurosensing techniques. Further refinement and enhancement of assessment techniques will be achieved through the integration of experimental results from the other technical areas into algorithms for experimentation. The end goal is to improve the match between the individual soldier and the system and to enhance soldier effectiveness in the complex battlefield.

6. Funding

The estimated funding for the Fundamental Research Component to be conducted under the Cooperative Agreement is \$5 million dollars per year from FY10 to FY14 totaling \$25 million with an option for \$5 million per years FY15 to FY19 (This includes all costs associated with the Cooperative Agreement, i.e. the research costs, costs to manage the program, etc.) It is expected that all three research areas receive approximately the same resources. As a reminder, the funding levels provided in this PA are for proposal preparation purposes. The actual funding levels for the Cooperative Agreement will be updated annually after the US appropriation

processes. Further, during performance, the funding levels between the three research areas may fluctuate slightly, as appropriate to meet the goals of the CAN CTA. It is expected that at least 70% of Fundamental Research Component funds go to academic institutions. It is recognized that award will be made to the Consortium that offers the best value to the Government. Thus, participation by the Members of the Consortium is considered extremely important during performance. However, Members must recognize and understand that there are no guarantees associated with the levels of funding for each Member during performance. All Members may be expected to compromise and sacrifice funding to their organization as necessary and appropriate to meet the goals and objectives of the CAN CTA as established through the collaborative planning process during performance.

ARL reserves the right to withhold up to 10% of annual Alliance funding provided to ARL through the appropriation process to fund novel research projects related to the Fundamental Research Component. These novel research projects are expected to be funded under the CAN CTA cooperative agreement, and these projects may only be proposed and performed by entities not currently members of the Consortium. The primary focus of these projects will be targeted at single investigator projects. That means for year FY11 and beyond, offerors proposals should include the use of proposed subawardees for 10% of the funding for the CAN CTA. It is recognized that as this 10% funding is for novel research projects, the identities and scope associated with such research projects may not be known beyond FY12. Thus, the cost proposal should show specifically proposed projects through FY12 and provide some general plans for FY13 and beyond based on previous experience and the offeror's proposed approach to the scope and research issues associated with the CAN CTA.

Initially, this agreement is expected to be funded with FY10 basic research funds. Both the Defense Appropriations Acts of 2008 and 2009 contained a provision such that no basic research funds made available under the acts could be used to pay indirect costs that exceed thirty-five percent of the total amount of the agreement for basic research. Further, the acts indicated that indirect costs exceeding thirty-five percent of the total amount to be reimbursed from that appropriation would be considered unallowable and would not be reimbursed. Further it stated that should subsequent audits indicate indirect costs exceeding thirty-five percent of the total amount paid from the appropriation were disbursed, the recipient would be required to refund the amount over the statutory limitation to the Government. While it is unknown whether such a provision will be included in the Defense Appropriation Act of 2010, offerors are to indicate in their cost proposals their plan for compliance with such a provision, should such be included in the Defense Appropriation Act of 2010.

D. TECHNOLOGY TRANSITION COMPONENT

This PA contains a requirement for a Technology Transition Component to augment the Fundamental Research Component. The results of the Fundamental Research Component will be transitioned under a procurement contract. This contract will be awarded to the Lead of the Consortium. The Lead is expected to subcontract with other entities (both Members of the Consortium and other organizations as appropriate) to achieve the technology transition efforts. A separate volume of the proposal for the Technology Transition Component is required to coincide with the proposed Fundamental Research Component. The following represents a

discussion of the Technology Transition Component that will be incorporated into the contract as the umbrella scope under which individual, specific tasks will be negotiated and issued when transition opportunities arise, and the appropriate type of funding for such is identified.

1. Background

The contract is intended to provide a contractual vehicle to exploit technology transition opportunities that arise from the Fundamental Research Component of the CAN CTA. This instrument will provide a mechanism to expeditiously transition the results of efforts performed under the Fundamental Research Component. The goal of the Technology Transition Component is to facilitate movement of the research further along the acquisition cycle toward specific applications.

2. Objective

The contractor shall support the CAN CTA in pursuing and performing technology transition efforts. Technology transition is the exploitation of results generated under the Fundamental Research Component in specific applications of interest to the Army. Specifically, the contractor shall perform individual tasks relating to the following objectives:

- To respond to ARL or other government customers who wish to alter, modify, augment, accelerate, and/or expand specific results of the Fundamental Research Component in order to fulfill a specific developmental requirement; and
- To respond to ARL or other government customers who have requirements for the expertise and/or results emerging from the Fundamental Research Component, and the integration of those results on the customer's application; and
- To join with ARL or other appropriate government customers in bringing technology from the Fundamental Research Component to a planned demonstration or exercise as appropriate.

3. Scope

The following describes a sampling of the types of technology transition tasks envisioned to support the objectives above:

- The contractor shall: (a) conduct specialized analyses, studies, simulations, and experimentation necessary to assess the applicability of technology; and (b) develop specific plans for the transfer of technology to targeted applications.
- The contractor shall: (a) prepare descriptive material that clearly details the scope, limitations, and requirements for implementing the specific technology; (b) provide an exemplar of the technology for incorporation into the target system for demonstration and/or experimentation as appropriate; and (c) assist in the integration of the technology into the test bed for demonstration and/or experimentation as appropriate.
- The contractor shall perform demonstrations and field experiments as required to promote transitioning of the technologies developed under the Fundamental Research Component. The statement of work for the tasks will be expected to define the mechanism for the demonstration or experiments as appropriate.

4. Reports

The following are examples of reports which may be required for a task: Technical Study Reports, Software Design Documentation, Software Systems Manuals, Interface Design Documentation, Interface Requirements, Database Design Documentation, Engineering Drawings, Engineering Specifications, Engineering Change Documentation, Journal Articles, Workshop and Conference Reports, Instructor/Lesson Guides, etc.

- The contractor shall submit performance and cost reports when required by the particular task that reflects the number of labor hours and labor costs charged against the task, cost of materials, travel, per diem, and total cost accumulated under the task. This report shall include the current status of the work, problem areas encountered, current projections of completion dates and estimated total cost to complete the order. Any changes to previous projections shall be explained.
- The contractor shall submit progress/meeting reports when required by the task.
- The contractor shall submit status reports when required by the task.
- The contractor shall submit technical progress reports when required by the task.

5. Funding

It is expected that ARL and appropriate Other Government Agencies/Departments (OGA/OGD), as well as other ARL customer organizations having appropriate and relevant taskings to be performed, will provide the funding to the Consortium for transitioning technology to specific applications under the contract. Full-scale transitions will be dependent on the success of the efforts under the Fundamental Research Component, as well as other events that may dictate the budgetary process. The ceiling amount for the potential ten-year period of performance for the contractor in connection with the contract to be awarded is \$80 million.

E. COLLABORATION

1. Background

Experience has shown that for many emerging technologies, high payoff is achieved through collaboration with a broad science and technology community. The US Army Collaborative Technology Alliances (CTAs), which were designed to encourage collaboration, are proving to be a successful model for collaborative technology development. The CAN CTA continues the ARL concept of an Alliance to facilitate a close relationship between ARL and its partners so that collaborative research can leverage and enhance individual efforts. It is ARL's strong belief that work conducted under the CAN CTA cannot be successful, either in whole or in part, without collaboration. That is, collaboration between the members of the Consortium and the Government Members of the Alliance is integral to the execution of the Fundamental Research Component. Creation of an environment that is conducive to collaboration is therefore a critical element in establishing the Alliance. This section describes potential means to establish a collaborative environment including outreach activities and an on-line presence wherein scientific ideas can be exchanged efficiently in an open environment among all the partners in the Alliance.

2. Collaboration Environment

The Lead must provide an environment that promotes the collaborative research and management of the Alliance. Such an environment might be a web-based, password-protected system. The Lead will provide an Internet secure environment for information sharing and interactive collaboration. An information repository will be maintained where ongoing research results, published papers and reports, biennial research plans, interactive file sharing, discussion groups, interactive calendars of events, and other information can be accessed to enhance communication. This environment should support collaboration among Consortium members and between the Consortium and the Government, and should support multi-level access control to protect sensitive information and intellectual property. The Consortium is expected to facilitate the integration and demonstration of integrated Alliance research results through this collaboration environment.

3. Lectures and Workshops

The Alliance (i.e., the Consortium and ARL) may hold, from time to time throughout the period of performance of the CAN CTA Program, technical lectures and workshops on mutually agreed upon topics. The lectures and workshops should be open to all appropriate personnel. The costs associated with the Consortium's efforts for these lectures and workshops will be funded under the Cooperative Agreement.

4. Education

As a means to foster the professional growth and technical strength of ARL and to provide a source for training personnel in fields underlying the Alliance, the Consortium will identify educational opportunities for Government scientists and engineers who perform research and

development in fields related to the Fundamental Research Component. These opportunities may include fellowship programs that lead to masters and doctoral degrees, and short courses (e.g., summer and intensive special topic courses in critical technology areas) that lead to the award of appropriate academic credit.

The Consortium will further consider means to foster collaboration with ARL technical staff through programs such as internships at ARL for graduate and undergraduate students, and sabbaticals and summer study for faculty. The costs associated with the Consortium's efforts to identify, prepare for and execute such educational opportunities will be funded under the Cooperative Agreement. The cost associated with salaries, travel, etc. for Government personnel will be the responsibility of the Government, and will not be funded under the Cooperative Agreement.

5. Staff Rotation

This CTA will require scientists and engineers from the Consortium to perform research full-time at ARL at APG. These scientists and engineers will be called staff scientists. The Lead shall administer the on-site Staff Scientists Program (SSP) at the ARL facility. Under the SSP, the staff scientist will conduct research in their respective areas as defined in the CAN Annual Program Plan and in collaboration with ARL researchers. The staff scientists may be required to travel to other designated sites for short or extended periods of time based upon mutual agreement between the Consortium and the Collaborative Alliance Manager (CAM). Staff scientists must either have PhD's in appropriate disciplines or possess a skill level commensurate with a PhD, subject to approval by the CAM. The requirement is that the Consortium has at least three (3), with a target of five (5), staff scientists performing at ARL within 12 months.

In addition to staff scientists at ARL, rotation of technical staff through short-term temporary assignments to ARL will be required. These staff rotations will be undertaken to foster and facilitate collaborative research where face-to-face interaction is advantageous, to enable a researcher to utilize unique facilities, and to facilitate the exchange of research results. In addition, this exchange, or cross fertilization, of personnel will provide Consortium personnel with insight into unique ARL requirements and will provide Government personnel with insight into commercial practices or the opportunity to pursue fundamental research with noted researchers. The success of these interactive and collaborative exchanges will be assessed by the quality of the collaboration as demonstrated by joint efforts such as progress reports, papers, patents, and presentations, and potential for technology transitions.

All salary and travel costs associated with the rotation of Government personnel will be borne by the Government. All salary and travel costs associated with the SSP and staff rotations of Consortium members will be funded under the Cooperative Agreement or may be provided by the Consortium member as cost share. There should be a balance of SSP and staff rotations across all the partners in the Consortium and across all the technical areas in the Alliance.

6. Demonstrations and Experimentation

A key aspect of collaboration between the Consortium, Government members of the Alliance, and other Government entities, is the ability for the Consortium to convincingly demonstrate and showcase technologies developed under the CAN CTA. Demonstrations of technical progress include experiments to measure parameters necessary to construct and validate models, such as simulations, emulations, field experiments, device fabrication, and hardware construction. Experimental demonstrations might be made to interested individual Government scientists and engineers, as well as to Army and DoD science and technology leaders with a need to understand the opportunities offered by the technologies under study in the CAN CTA. It is expected that demonstrations and experiments will be conducted at the ARL facility, but they may also occur at sites designated by the government for special purposes.

F. MANAGEMENT

During performance it is envisioned that there will be Consortium Members as well as Subawardees performing under the Fundamental Research Component. The Consortium Lead has specific leadership and management responsibilities and roles as outlined below. Consortium Members are expected to have significant involvement and input on a long-term basis as outlined below. While Subawardees are expected to fulfill short-term needs as outlined below, they are particularly expected to execute new and innovative research covered by the 10% of overall funding that the Government reserves the right to withhold for this purpose. Thus, offerors are expected to consider carefully the construct of their proposed Consortium and effectively engage the appropriate Membership and Subawardee performance to achieve the goals of the CAN CTA.

1. Background

It is critical that the Consortium be structured and managed to create and foster an open, collaborative research environment, and to facilitate the transition of technology. This section describes the Alliance, the Consortium, and their management. The Alliance is defined as the combination of the Consortium and appropriate government researchers also participating in collaborative research in the CAN CTA.

2. Overall Management Concept

ARL and the winning Consortium will establish one collaborative research Alliance to address issues concerning the CAN CTA. Additionally, other Government agencies may be invited to join this Alliance and to contribute, as appropriate, their technical expertise and personnel, and to participate in the CAN CTA. The Lead of the Consortium will be responsible for technical leadership in coordination with the other Members. In addition, the Lead will distribute the funding for the Fundamental Research Component to all Members of the Consortium. Subawardee funding will be provided to the Consortium Member with which the Subawardee has or will have a legal relationship.

3. Light Touch Leadership

A framework for agile and adaptive leadership should be utilized by the CAN management team for the projects and teams which are operating in the dynamic and complex environment of cognitive science and neuroergonomics. Most project managers work in a hierarchical organization where assignments come from the top down. In an agile and adaptive project leadership environment, this hierarchy is counterproductive. The concept of agile and adaptive leadership pivots on the idea that assignments and work flow should be determined by the highly skilled team members whose primary responsibility is to deliver customer value. Thus, agile and adaptive leadership focuses on people, strategies based on specific situations, and continuous feedback. Importantly, this leadership style calls for recognizing people as the ultimate source of value in an organization, and thus for managing them differently. To realize the agile and adaptive leadership style, a "Light Touch" leadership style that carries the potential for unleashing creativity and innovation is in order. This "Light Touch" leadership approach means managers must allow agile teams to have autonomy and flexibility without sacrificing control.

4. Technical Guidance and Oversight

The Alliance will be subject to the following technical guidance and oversight: (NOTE: Offerors may propose additional plans or mechanism for guidance and leadership that may be very beneficial to the Alliance. However, offerors are cautioned to ensure that any such plans or mechanisms (1) are not duplicative of the requirements below; and (2) would not be overly burdensome to the Alliance.)

- **Collaborative Alliance Manager (CAM).** The Fundamental Research Component executed under the CAN CTA will be considered an extension and integral part of the Army Research Laboratory (ARL) research program. As such, the program established under this PA will be planned, defended, executed, and reviewed as part of ARL's mission program. Overall technical management and fiscal responsibility for the CAN CTA will reside with a senior ARL technical manager, who will be designated the CAM for the CAN CTA under the cooperative agreement. The individual designated as the CAM will also be designated as the Contracting Officer's Representative (COR) for the contract for the Technology Transition Component. The ARL Grants Officer/Contracting Officer will receive recommendations from the CAM/COR and will be the ultimate legal authority empowered to make formal adjustments in the CAN CTA, for both the cooperative agreement and the contract.
- **Program Director.** The CAN Program Director is the Consortium's technical representative charged with the Consortium's overall responsibility for management and guidance of the cooperative agreement. The Program Director will be from the organization named as the Lead of the Consortium. The CAN CTA is expected to be the primary responsibility of the individual assigned as Program Director, and a commitment of time commensurate with this responsibility is also expected.
- **A Research Management Board (RMB)** will be established to identify and develop collaborative opportunities, advise and assist the CAM in setting research goals, and facilitate transition to development programs. The RMB will include representatives from Army and other service organizations and other government agencies with interest, expertise, or both, in

technologies related to the CAN CTA. Advisors from academic and industry concerns that are not funded under the CAN CTA may also be invited to participate on the RMB. The RMB will be invited to a CAN Annual Workshop and an Annual Technical Review.

- **Consortium Management Committee (CMC).** The CTA will have a Consortium Management Committee (CMC) that consists of one representative from each Member. The CAM participates as the *ex officio* member in all discussions except those that deal with purely internal Consortium matters. The CMC will be chaired by a representative from the Lead of the Consortium. Each Member will have one vote on the CMC to support programmatic and management-related activities and decisions. In the event of tie votes in the CMC, the matter will be referred to the ARL CAM to resolve the tie. The CMC will be responsible for the management and integration of the Consortium's efforts under the CAN CTA including programmatic, technical, reporting, financial, and administrative matters. The CMC makes recommendations that concern the membership of the Consortium, the definition of the tasks and goals of the participants, and the distribution of funding to the participants. Quarterly meetings will be conducted by the CMC.

5. Articles of Collaboration

The Articles of Collaboration define the operational structure within the Consortium. A sample for offerors to consider in formulating their proposals is provided on the CAN CTA website found at <http://www.arl.army.mil/www/default.cfm?Action=93&Page=393>. However, offerors are free to modify this document as necessary and appropriate to coincide with their proposal. The Articles of Collaboration included in the proposal will be evaluated under the Management evaluation factor. Proposals must include a copy of the proposed Articles of Collaboration, signed by a duly authorized representative for each Consortium member.

6. Initial Program Plan (IPP) and Annual Program Plan (APP).

Within 90 days after award, the Consortium (through the CMC) and the Government will jointly prepare an Initial Program Plan (IPP) to cover the first 12 months of performance. The IPP will be based substantially on the final proposals received by the Consortium prior to award of the Cooperative Agreement. The IPP will be accompanied by a five-year roadmap that describes the overall plan to be accomplished by the Consortium within the Alliance structure. This roadmap should provide the vision for grand challenges and crosscutting themes to be addressed in the first five years. The roadmap should provide a detailed description of a well-coordinated theory and experimental program for the first two years; it should present and justify an appropriate balance between theory and experimentation.

Eight months after award, the Consortium (through the CMC) and the Government will jointly prepare a proposed Annual Program Plan (APP) for the next annual period. The ARL reserves the right to withhold up to 10% of the funding for the CAN CTA and award those funds to single investigator projects selected from proposals submitted to the Government. An annual call for proposals will be issued by the Government to solicit these proposals. Proposals will be solicited only from organizations that are not currently Members of the Consortium. Proposals will be solicited that are high risk, high payoff and are innovative avenues of approach to all

research areas defined in this program announcement, including integration. Proposal evaluations will be conducted by an evaluation team consisting of both ARL and Consortium senior researchers. The evaluation team will be designated each year at the time the call for proposals is issued. This allows for flexibility both in topics announced and selection of qualified evaluation team members. These individual PI projects will be integrated into the Consortium's program plan. Through discussion among the Members, an APP will result that enables integration and execution of themes that strive to achieve CAN CTA objectives. The CAM will approve the APP and formally submit the approved APP to the Grants Officer for incorporation into the cooperative agreement. This process will continue throughout the life of the cooperative agreement.

The APP will cover a one-year timeframe, but may be altered, with the approval of the CAM and the Grants Officer, if research work requirements change. The APP will provide a detailed plan of research activities (including key personnel, educational opportunities, staff rotation, facilities, demonstrations and budget) that commits the Consortium to use their best efforts to meet specific research objectives. The APP will also describe the collaborative efforts with the Government. During the course of performance, if it appears that research goals will not be met, the CMC will provide a proposed adjustment to the APP for approval by the CAM. In addition, the CAM may from time to time request that additional research be added to the APP within the scope of the cooperative agreement. The Consortium, as an entity, will not solicit or accept funding from outside sources other than the U.S. ARL without the approval of the CAM and the Grants Officer.

During the course of performance, the Grants Officer, in coordination with the CAM, will have approval authority for certain specific changes to the IPP/APP including but not limited to:

- a. Changes in the scope or the objective of the program, IPP/APP, or research milestones;
- b. Changes in the key personnel specified in the IPP/APP;
- c. The absence for more than three months, or a 25% reduction in time devoted to the project, by the approved program director or principal investigator;
- d. The need for additional Federal funding; and
- e. Any sub-award, transfer, or contracting out of substantive program performance under an award, unless described in the IPP/APP.
- f. Award of single investigator projects within the scope of the CAN objectives as defined below.

The CAM, in coordination with the CMC and ARL management, will be responsible for integrating the IPP/APP into the overall respective research and technology programs including the single investigator projects defined below.

During the course of performance, the Grants Officer, in coordination with the CAM, will have approval authority for certain specific changes to the cooperative agreement including, but not limited to:

- Changes to the Articles of Collaboration, if such changes substantially alter the relationship of the parties as originally agreed upon;
- Solicitation or acceptance of funding under the agreement from sources other than ARL;
- Changes in Consortium membership; and
- Awarding single investigator projects.

7. Annual Workshop

The Alliance will be responsible for participating with ARL in an Annual Program Formulation Workshop to display and present the results of its previous year's research and describe plans for the next year. Program overviews, posters, and exhibits and demonstrations will be presented, displayed, or both to communicate the research products of the CAN CTA. The Workshop will foster interactions and collaborations among researchers. Planning for the Workshop will be executed through the Lead of the Consortium and the CAM. This workshop is distinct from the CAN Annual Workshop and Annual Technical Review.

8. Evaluation For Five-Year Extension

The CAN CTA will be awarded for a five-year period beginning in FY10. There will be an option to extend the CAN CTA for an additional five years. At the end of the fourth year, a program review will be conducted as directed by ARL. This review will consider cumulative performance metrics, the Consortium's vision for the additional five-year period of performance (to be submitted by the Consortium at the end of the fourth year), funding availability and the current fundamental research needs and goals of the US Army. Performance metrics are expected to include items that provide an indication of the CAN CTA's accomplishments, such as transitions, the number of refereed journal articles, invited presentations, relevance of the work to ARL, collaboration, staff rotation, education, management, etc. The decision as to whether to exercise the option is expected to be based on the results of the review and evaluation described above.

9. Tracking Technology Transition

While it is expected that each Principal Member will actively pursue technology transition to the Government as part of executing the Fundamental Research Component, it will be the responsibility of the Lead to briefly document and report to the Government on technology transition opportunities and events as they result from the Fundamental Research Component.

10. Distribution of Funding

The Lead of the Consortium will distribute the funding for the Fundamental Research Component to all Members of the Consortium. Subawardee funding will be provided to the Consortium Member with which the Subawardee has or will have a legal relationship.

II. AWARD INFORMATION:

Offerors selected for award will be notified by the Contracting/Grants Officer or his/her designee telephonically or via email. Once notified the selected offerors will be required to sign the Cooperative Agreement and the Procurement Contract. The award is not official until the offeror has signed the Cooperative Agreement and the Procurement Contract and the Contracting/Grants Officer has signed both documents.

III. ELIGIBILITY INFORMATION:

A. ELIGIBLE APPLICANTS

During performance it is envisioned that there will be a US industrial or academic Consortium Lead as well as U.S. industrial or academic non-lead members performing under the Fundamental Research Component.

1. Consortium Membership:

To be qualified, potential Consortium Members must:

- Be judged to have adequate financial and technical resources, given those that would be made available through the cooperative agreement, to execute the program of activities envisioned,
- Have no known recent record of lack of responsibility or serious deficiency in executing such programs or activities,
- Have no known recent record indicating a lack of integrity or business ethics,
- Be otherwise qualified and eligible to receive an award under applicable laws and regulations.

a. Lead of the Consortium: The Lead may be a US industrial or academic concern with significant existing operations in order to support research and transition activities associated with the CAN CTA. Significant operations are defined as having the ability to perform research and support activities, utilizing in-house engineers and scientists. The Lead of the Consortium has primary responsibility for articulating and executing a vision on cross-Consortium integration. This Member is expected to articulate and execute a vision for the CTA, promote collaboration among Consortium Members, and between Consortium Members and members of Alliance. The Lead is required to administer, integrate, and manage the Consortium, participate in the research, and promote the transition of technologies resulting from the Fundamental Research Component of the CAN CTA. This includes distribution of Government funding to Consortium Members in accordance with the approved IPP/APP under the agreement. The Lead should ensure the research conducted by the Consortium falls under the 6.1 category (as defined in the Fundamental Research Component of this document). Additionally, this Member is expected to contribute to the 6.1 research conducted in support of this effort. This contribution is expected to be in the form of collaboration with the Members on research projects that meet milestones for the APP or IPP. The Lead is required to administer, integrate, and manage efforts associated with the Technology Transition Component of the CAN CTA. Leadership from the

Lead is expected to enhance the potential for transition of the resultant technology into both the commercial and military marketplaces.

b. Members (Non-Lead): It is expected that no more than six Members (other than the Lead Member) will be identified. In order to meet the goals of the CAN CTA, it will be necessary to maintain a critical mass of research capabilities. However, an excess number of members in one research area may dilute the funding levels to the point that it renders the program goals unattainable. In order to be considered a Member: (1) a long-term relationship with the organization is envisioned under the CAN CTA, wherein researchers are substantially and meaningfully engaged in the Fundamental Research Component; (2) said organization's input is considered necessary and beneficial for the strategic planning associated with the Fundamental Research Component; and (3) said organization is expected to be involved in transition.

The consortium must have researchers on staff with a proven track record in theory, modeling, and experimentation related to the objectives of the three research areas of the CAN CTA. The consortium must include Members that are advanced, degree-granting educational institution under the Higher Education Act of 1965, as amended. Further, these Members must have doctoral-level courses of study in related scientific and technical areas that can result in the granting of a doctoral degree and are expected to participate in the Fundamental Research Component with their researchers being substantially and meaningfully engaged in the CAN CTA. These Members are also to promote the transition of technologies resulting from the Fundamental Research Component.

It is expected that at least 70% of fundamental research component funds go to academic institutions.

2. Historically Black College or University/Minority Institution (HBCU/MI) Members:

Army policy strongly encourages involvement of Historically Black Colleges and Universities (HBCU) or Minority Institutions (MI) in this effort. Accordingly, one or more Member must be an HBCU/MI. HBCU, as used in this PA, means institutions determined by the Secretary of Education to meet the requirements of 34 Code of Federal Regulations (CFR) Section 608.2. The term also means any nonprofit research institution that was an integral part of such a college or university before November 14, 1986. MI, as used in this PA, means institutions meeting the requirements of the Higher Education Act of 1965 as amended (20 U.S.C. 1067k(3)). The term also includes Hispanic-serving institutions as defined in such Act (20 U.S.C. 1101a). ***At least 10% of the total funding provided for academic institutions must be provided to HBCU/MI Member(s).***

3. Subawardees:

Members may be augmented, e.g. with academic or industrial concerns, as necessary and appropriate to meet the goals of the CAN CTA. Subawardees are not considered Members of the Consortium. Subawardees are organizations that (1) may not be involved long-term in the CAN CTA; (2) are not expected to provide strategic input concerning the goals and direction of the CAN CTA; and (3) are expected to have limited involvement in transition.

4. Federally-Funded Research and Development Centers (FFRDCs):

FFRDCs may participate as Members or Subawardees but may not function as the Lead. Further, FFRDCs must cost-share an amount equal to the funding to be provided to them under the CAN CTA.

5. Place of Performance for all Consortium Participants:

Performance by the Lead of the Consortium is limited to the U.S. to facilitate technology transition. Other Members and Subawardees, may be located and perform at any location. For example, a Member may be located and perform outside the US. As a reminder, at least three (3) with a target of five (5) full-time or part-time researchers are expected to be located at ARL APG during performance under the agreement.

B. COST SHARING OR MATCHING

Cost sharing is not required to be responsive to the PA. That is, no level of cost sharing is stipulated; however, cost sharing is encouraged. During the evaluation of proposals, cost sharing will be evaluated as it relates to the evaluation factors listed in the PA, based on the degree to which the proposed cost sharing enhances the proposal to result in added benefits to the CAN CTA Program. In order for the proposed cost sharing to receive appropriate credit during the evaluation process, the proposal should evidence **a firm commitment** to provide such cost share and also evidence **a process for integrating the cost share into the collaborative research program**.

IV. APPLICATION AND SUBMISSION INFORMATION

A. APPLICATION PROCESS

Proposals shall be submitted electronically through the www.grants.gov portal. Proposals sent by fax or e-mail will not be considered.

Registration Requirements for www.grants.gov: There are several one-time actions that an offeror must complete in order to submit an application through Grants.gov (e.g., obtain a Dun and Bradstreet Data Universal Numbering System (DUNS) number, register with the Central Contract Registry (CCR), register with the credential provider, and register with Grants.gov). See www.grants.gov/GetStarted to begin this process. Use the Grants.gov Organization Registration Checklist at www.grants.gov/assets/OrganizationRegCheck.doc to guide you through the process. Designating an E-Business Point of Contact (EBiz POC) and obtaining a special password called an MPIN are important steps in the CCR registration process. Applicants, who are not registered with CCR and Grants.gov, should allow at least 21 days to complete these requirements. It is suggested that the process be started as soon as possible.

Questions: Questions relating to the registration process, system requirements, how an application form works, or the submittal process must be directed to Grants.gov at 1-800-518-4726 or support@grants.gov.

B. CONTENT AND FORMAT OF APPLICATION SUBMISSION

NOTE: APPLICATION FORMS WILL NOT BE AVAILABLE IN GRANTS.GOV UNTIL THE FINAL PROGRAM ANNOUNCEMENT IS POSTED!

Application forms and instructions will be available at Grants.gov. To access these materials, go to <http://www.grants.gov>, select "Apply for Grants", and then select "Download Application Package." Enter the CFDA for Basic Scientific Research, 12.431, and the funding opportunity number, **W911NF-08-R-0014**.

NOTE: Compatible versions of Adobe Reader are currently 8.1.1 and 8.1.2. You will be asked to specify your Operating System (examples: Windows, Mac) and Version (examples: XP, Vista, 10.4.9) be sure to specify Adobe Reader Version 8.1.2 to get the compatible version to apply for grants on Grants.gov. Click here to download version 8.1.2 from Adobe Website: http://www.adobe.com/products/acrobat/readstep2_allversions.htm.

Offerors must complete the mandatory forms and any optional forms (e.g., SF-LLL Disclosure of Lobbying Activities) in accordance with the instructions on the forms and the additional instructions below. The required fields should be completed in accordance with the "pop-up" instructions on the forms. To activate the instructions, turn on the "Help Mode" (icon with the pointer and question mark at the top of the form). Files that are attached to the forms must be in Adobe Portable Document Form (PDF) unless otherwise specified in this announcement.

The following formatting rules apply for the file attachments:

Paper size when printed – 8.5 x 11 inch paper

Margins – 1 inch

Spacing – single

Font – No smaller than Times New Roman, 10 point

Form: SF 424 (R&R) (Mandatory) – Complete this form first to populate data in other forms. Authorized Organization Representative (AOR) usernames and passwords serve as “electronic signatures” when your organization submits applications through Grants.gov. By using the SF 424 (R&R), offerors are providing the certification required by 32 CFR Part 28 regarding lobbying.

Form: Research & Related Other Project Information - Complete questions 1 through 5 and attach files.

Project Summary/Abstract (Field 6 on the form) - The Project Summary should be a brief abstract that summarizes the content of the Fundamental Research Component of the proposal. The project summary must not exceed 5 pages. Pages in excess of the page limit may be removed for the evaluation of the proposal.

Project Narrative (Field 7 on the form) - Chapters and Numbers of pages – Field 7 is to contain the chapters set forth below and may not exceed the stipulated page counts for those chapters. Pages in excess of the page limits may be removed for the evaluation of the proposal. All chapters set forth below should be in a single PDF file.

- Chapter 1 - **Fundamental Research Component**. The pages included in Chapter 1 shall be numbered. Offerors are advised that Chapter 1 **shall not exceed 30 pages**, utilizing one side of the page.
- Chapter 2 - **Technology Transition Component**. The pages included in Chapter 2 shall be numbered. Offerors are advised that the Chapter 2 of the proposal **shall not exceed 20 pages**, utilizing one side of the page.
- Chapter 3 - **Program Management**. The pages included in Chapter 3 shall be numbered. Offerors are advised that Chapter 3 of the proposal **shall not exceed 20 pages**, utilizing one side of the page.
- Chapter 4 – **Biographical Sketches** - Biographical sketches shall be limited to two (2) pages per individual, with no limitation on the number of individuals.

Bibliography and References Cited (Field 8 on the form) - Attach a listing of applicable publications cited in above sections.

Facilities and Other Resources (Field 9 on the form) The offeror is to include a listing of facilities and other resources available to support the proposal. Any Government resources necessary for performance are to be clearly identified. Attach this information at Field 9.

Equipment (Field 10 on the form) - The offeror is to include a listing of equipment available to support the proposal. Any Government equipment necessary for performance is to be clearly identified. Attach this information at Field 10.

Other Attachments (Field 11 on the form)

1. Attached the completed Proposal Cover Sheet. (See Paragraph IV.F below.)
2. Attached the completed certifications. (See Paragraph VI.B below.)

3. Attach any exceptions or conditions to the Model Cooperative Agreement (See <http://www.arl.army.mil/www/default.cfm?Action=93&Page=393> for this document.)

4. Attach the executed Model Technology Transition Contract. (See <http://www.arl.army.mil/www/default.cfm?Action=93&Page=393> for this document.)

5. Attach the signed Articles of Collaboration for all Members. (See <http://www.arl.army.mil/www/default.cfm?Action=93&Page=393> for a sample document.)

6. Attach Cost Proposal. **Cost Proposal shall include the entire cost submission for the Fundamental Research Component for the first five years of performance. (The Consortium will be requested to provide a complete cost proposal for the optional five-year period of performance as part of the evaluation to be completed prior to making the decision concerning this optional period.)** The cost portion of the proposal shall contain cost estimates sufficiently detailed for meaningful evaluation. For budget purposes, assume a performance start date of **1 January 2010**. The proposed amounts shall not exceed the funding ceilings identified in **FUNDAMENTAL RESEARCH COMPONENT** of this PA. For all proposals, the elements of the budget should include:

NOTE: Initially, this agreement is expected to be funded partially with FY10 basic research funds. Both the Defense Appropriations Acts of 2008 and 2009 contained a provision such that no basic research funds made available under the acts could be used to pay indirect costs that exceed thirty-five percent of the total amount of the agreement for basic research. Further, the acts indicated that indirect costs exceeding thirty-five percent of the total amount to be reimbursed from that appropriation would be considered unallowable and would not be reimbursed. Further it stated that should subsequent audits indicate indirect costs exceeding thirty-five percent of the total amount paid from the appropriation were disbursed, the recipient would be required to refund the amount over the statutory limitation to the Government. While it is unknown whether such a provision will be included in the Defense Appropriation Act of 2010, offerors are to indicate in their cost proposals their plan for compliance with such a provision, should such be included in the Defense Appropriation Act of 2010.

- Direct Labor - Individual labor category or person, with associated labor hours and unburdened direct labor rates.
- Indirect Costs - Fringe benefits, overhead, G&A, etc. (must show base amount and rate). Justify.
- Travel - Number of trips, destination, duration, etc. Justify and include basis for costs.
- Subaward - A cost proposal, as detailed as the offeror's cost proposal, will be required to be submitted by each proposed subrecipient.
- (NOTE: A cost proposal is not required for subawardees after FY12; however, offerors are to provide some basis for the subawardee costs proposed after FY12.
- Consultant - Provide consultant agreement or other document that verifies the proposed loaded daily/hourly rate. Include a description of the nature of and the need for any consultant's participation. Provide budget justification.
- Materials - Specifically itemized with costs or estimated costs. An explanation of

any estimating factors, including their derivation and application, shall be provided. Include a brief description of the offeror's procurement method to be used (competition, engineering estimate, market survey, etc.). Justify.

- Other Directs Costs - Particularly any proposed items of equipment or facilities. Equipment and facilities generally must be furnished by the recipient (justifications must be provided when Government funding for such items is sought). Include a brief description of the offeror's procurement method to be used (competition, engineering estimate, market survey, etc.). Justify.

SF-LLL - Disclosure of Lobbying Activities

If applicable, attach a complete SF- LLL at Field 11 of the R&R Other Project Information form.

Applicability: If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the grant/cooperative agreement, you must complete and submit Standard Form - LLL, "Disclosure Form to Report Lobbying."

C. SUBMISSION DATES AND TIMES

Proposals are due by 3:00pm (local North Carolina time) on Friday, 13 March 2009.

After a proposal is submitted through Grants.gov, the Authorized Organization Representative (AOR) will receive a series of three e-mails. It is extremely important that the AOR watch for and save each of the e-mails. Offerors will know that the proposal has been properly received when the AOR receives e-mail Number 3. Retain the Submission Receipt Number (e-mail Number 1) to track a submission. The three emails are:

Number 1 – The applicant will receive a confirmation page upon completing the submission to Grants.gov. This confirmation page is a record of the time and date stamp for the submission.

IMPORTANT: Once email number 1 has been received, please forward this email to Mr. Chuck Elder of the U.S. Army RDECOM Contracting Center at chuck.elder@us.army.mil. This email may be used by the Government for verification of the timeliness of the proposal submission!

Number 2 – The applicant will receive an email indicating that the proposal has been validated by Grants.gov within a few hours of submission. (This means that all of the required fields have been completed.)

Number 3 – The third notice is an acknowledgment of receipt in email form from the designated agency within ten days from the proposal due date. The email is sent to the authorized representative for the institution. The email for proposals notes that the proposal has been received and provides the assigned tracking number.

Provisions for Late Submissions of proposals are included as part of the Federal Acquisition Regulation (FAR) provision at 52.215-1 (c)(3), incorporated by reference in the Model Contract (Solicitation).

D. INTERGOVERNMENTAL REVIEW - NOT APPLICABLE

E. FUNDING RESTRICTIONS - SEE PARAGRAPH I.C.6 ABOVE.

F. OTHER SUBMISSION REQUIREMENTS

The following Proposal Cover Sheet is required to be submitted by each offeror:

PROPOSAL COVER SHEET

1. Information concerning the Consortium Lead (points of contact (POC)):

Technical POC: _____
Phone No.: _____
Fax No.: _____
Email Address _____

Business POC _____
Phone No.: _____
Fax No.: _____
Email Address: _____

2. List the names and relationships of all organizations included in the proposal:

Lead _____

Consortium Member(s) _____

Subawardees/Subcontractors _____

3. Provide a point of contact for each organization included in the Cost Proposal. These individuals may be contacted for questions concerning the Cost Proposal:

Organization: _____
POC: _____
Phone No.: _____
Email Address _____

4. Signature of one person for the proposed Consortium Lead and all Non-Lead Members authorized to submit a proposal and bind that organization: (These signatures may be provided on separate sheets.)

Organization Name: _____

Signature: _____

Type Name/Title: _____

Date (Proposal): _____

5. Proprietary Cost Information

All entities, i.e. Consortium Members and Subawardees, included in the cost proposal for the Fundamental Research Component are to provide detailed information on all cost elements included in their proposed budgets as part of the proposal submission process. However, it is recognized that some entities may choose to submit their proprietary rate information directly to the Government in lieu of providing such information to the Consortium Lead for inclusion in the cost proposal submitted through grants.gov. In such a case, a separate submission can be made directly to the Government. Such a submission **MUST** include the PA Number, i.e. W911NF-08-R-0014, and the name of the Consortium Lead associated with the proposal on the mailing envelope submitted to the following address:

U.S. Army RDECOM Contracting Center
RTP Contracting Division
ATTN: W911NF-08-R-0014/BASSLER
4300 S. Miami Blvd.
Durham, NC 27703

NOTE: All such separate submissions must arrive NLT than the due date and time for the proposal submission through grants.gov to be considered. Further, for all such submissions summary cost information must be provided to the Consortium Lead for the grants.gov submission that is sufficient in detail for the Government to use in the evaluation of the cost proposal for cost realism, and can be clearly mapped to the proprietary rate information submitted directly to the Government.

V. APPLICATION REVIEW INFORMATION

A. CRITERIA

All information necessary for the review and evaluation of a proposal must be contained in the proposal. No other material will be provided to the evaluators. Proposals should contain sufficient technical detail to allow for in-depth technical evaluation.

An initial review of the proposals will be conducted to ensure compliance with the requirements of this PA. Failure to comply with the requirements of the PA may result in a proposal receiving no further consideration for award.

A Source Selection Evaluation Board (SSEB) will review the proposals. The SSEB, consisting of qualified groups of scientists, managers, and cost specialists, will evaluate each proposal and provide the results of that evaluation to the Source Selection Authority (SSA). The SSA will make decisions concerning the competitive range and award selection.

If negotiation discussions are held, ARL anticipates such to be located at the site of each offeror. Any such meetings will be coordinated with the offerors at the appropriate time.

Proposals submitted in response to this PA will be evaluated against the evaluation factors set forth below, using an adjectival and color rating system. Cost will be evaluated for realism, reasonableness, and affordability. Evaluators will identify strengths, weaknesses and clarifications concerning the proposal. Information from any and all proposal volumes may be used for any and all evaluation areas described above.

Fundamental Research Component

Proposals will be evaluated using Factors (a) through (h) as set forth below:

Factor (a): Technical Merit, Relevance, and Credentials for TA 1 Soldier-System Information Exchange. Evaluation of this factor will concentrate on the overall scientific and technical merit, creativity, military relevance, and innovation of the proposed research in light of the state-of-the-art of current related technologies and the U.S. Army's vision and the requirements to accomplish the Army's mission.² Further, evaluation of this factor will include the proposed vision in cognition and neuroergonomics and evidence of acumen in computational modeling, experimentation, and integration. The proposal should include a complete technical discussion stating the background and objectives of the proposed research, the technical approaches to be pursued, the parties involved and the level of effort to be employed (demonstrating that researchers are substantially and meaningfully engaged in the research efforts.) The proposal should clearly identify specific technical challenges that relate to fundamental understanding of the root cause of difficult military problems and should provide evidence that the proposed technical approaches can address these technical challenges in a measured approach across the near-, mid-, and far-term and relate these items to the Army's vision.

² The U.S. Army Vision may be found at the U.S. Army homepage: www.army.mil.

The qualifications, capabilities, availability, and experience of both the offeror's proposed research personnel (all proposed members and subawardees) individually and as a whole, their relevant past accomplishments, their ability to achieve the proposed technical objectives and their substantial and meaningful involvement will be evaluated. The proposal should include the names, brief biographies and availability of the key personnel who will be involved in the research. Such credentials, as documented on the biosketches, shall include, among others, a record of seminal publications in the scientific literature and a record of successful program deliverables and transitions.

Factor (b): Technical Merit, Relevance, and Credentials for TA 2 Commander-Level Decision Making. Evaluation of this factor will concentrate on the overall scientific and technical merit, creativity, military relevance, and innovation of the proposed research in light of the state-of-the-art of current related technologies and the U.S. Army's vision and the requirements to accomplish the Army's mission. Further, evaluation of this factor will include the proposed vision in cognition and neuroergonomics and evidence of acumen in computational modeling, experimentation, and integration. The proposal should include a complete technical discussion stating the background and objectives of the proposed research, the technical approaches to be pursued, the parties involved and the level of effort to be employed (demonstrating that researchers are substantially and meaningfully engaged in the research efforts.) The proposal should clearly identify specific technical challenges that relate to fundamental understanding of the root cause of difficult military problems and should provide evidence that the proposed technical approaches can address these technical challenges in a measured approach across the near-, mid-, and far-term and relate these items to the Army's vision.

The qualifications, capabilities, availability, and experience of both the offeror's proposed research personnel (all proposed members and subawardees) individually and as a whole, their relevant past accomplishments, their ability to achieve the proposed technical objectives and their substantial and meaningful involvement will be evaluated. The proposal should include the names, brief biographies and availability of the key personnel who will be involved in the research. Such credentials, as documented on the biosketches, shall include, among others, a record of seminal publications in the scientific literature and a record of successful program deliverables and transitions.

Factor (c): Technical Merit, Relevance, and Credentials for TA 3 Individualized Assessment in Operational Environments. Evaluation of this factor will concentrate on the overall scientific and technical merit, creativity, military relevance, and innovation of the proposed research in light of the state-of-the-art of current related technologies and the U.S. Army's vision and the requirements to accomplish the Army's mission. Further, evaluation of this factor will include the proposed vision in cognition and neuroergonomics and evidence of acumen in computational modeling, experimentation, and integration. The proposal should include a complete technical discussion stating the background and objectives of the proposed research, the technical approaches to be pursued, the parties involved and the level of effort to be employed (demonstrating that researchers are substantially and meaningfully engaged in the research efforts.) The proposal should clearly

identify specific technical challenges that relate to fundamental understanding of the root cause of difficult military problems and should provide evidence that the proposed technical approaches can address these technical challenges in a measured approach across the near-, mid-, and far-term and relate these items to the Army's vision.

The qualifications, capabilities, availability, and experience of both the offeror's proposed research personnel (all proposed members and subawardees) individually and as a whole, their relevant past accomplishments, their ability to achieve the proposed technical objectives and their substantial and meaningful involvement will be evaluated. The proposal should include the names, brief biographies and availability of the key personnel who will be involved in the research. Such credentials, as documented on the biosketches, shall include, among others, a record of seminal publications in the scientific literature and a record of successful program deliverables and transitions.

Factor (d): Collaboration. Evaluation of this factor will include evidence of previous successful collaborative efforts and the offeror's commitment and plans to collaboration under the CAN CTA. Evaluation of this factor will also include evidence of the offeror's ability to lead multi-disciplinary researchers as an integrated team working collaboratively. The proposal should include examples of how researchers have successfully collaborated previously in similar programs. Further, the proposal should include plans for how researchers will collaborate within the Consortium. This includes how the proposed research is expected to feed, be fed by, or in some other way link with, research being performed elsewhere within the Government (which includes ARL, other Army organizations, other military service organizations, and other government agencies.)

Factor (e): Facilities and Equipment. Evaluation of this factor will determine the extent to which the offeror's proposed facilities and equipment will contribute to the accomplishment of the proposed research and support demonstrations of the resulting technology. Thus, the proposal should include a description of the facilities to be used for the research and demonstrations, who will have access to these facilities, and how such will enhance the research efforts proposed.

Technology Transition Component

Factor (f): Past Performance and Plan to Execute. Evaluation of this factor will focus on the offeror's demonstrated ability and experience in transitioning technologies from the research stage into development programs as well as on the proposed plan to promote rapid transition of the research products into U.S. Army development programs and commercial applications. Thus, the proposal should include examples of successful past or current transitioning experience, and provide the contract number(s) and point(s) of contact (names, addresses, and telephone numbers) of Government personnel who can attest to the success of these examples. Offerors are encouraged to provide information on problems encountered on the identified contracts and the offeror's corrective actions. Offerors without a record of relevant past performance or for whom information on past performance is not available, will not be evaluated favorably or unfavorably for this evaluation factor.

Factor (g): Subcontracting. Evaluation of this factor will focus on the offeror's past performance in meeting subcontracting plan goals, including specifically their small business goals and their small disadvantaged business goals. Offerors should provide contract number(s) and point(s) of contact of Government personnel who can attest to this information. Offerors without a record of relevant past performance or for whom information on past performance is not available, will not be evaluated favorably or unfavorably for this evaluation factor. While the specific transition tasks to be performed are dependent on the results of the research program and are not yet known, evaluation of this factor will also include the offeror's plan for subcontracting, specifically identifying planned types of efforts to be performed by small businesses, small disadvantaged businesses and HBCU/MIs. With respect to the subcontracting evaluation factor, offerors that are small businesses will receive the highest rating.

Management

Factor (h): Management. Evaluation of this factor will focus on the offeror's plan to comply with the requirements of the overall management concept, programmatic details, and the leadership and management to be provided by the Program Director, timely submission of consortium invoices, and the establishment of tools to create a collaboration environment as set forth in **MANAGEMENT**. The proposal must include a plan for efficient management of the CAN CTA, and should show how the offeror proposes to work together with the Government to support the unity of vision to develop a coherent view of the CAN CTA.

Cost

While this area will not be weighted, evaluation of this area will consider cost realism, cost reasonableness, and affordability within funding constraints. The Government may make adjustments to the cost of the total proposed effort as deemed necessary to reflect what the effort should cost. These adjustments shall consider the task undertaken and technical approach proposed. These adjustments may include upward or downward adjustments to proposed labor hours, labor rates, quantity of materials, price of materials, overhead rates and G&A, etc.

Relative Importance of Evaluation Criteria

The relative importance of the evaluation factors within this PA are as set forth below:

The combined weight of the evaluation factors associated with the Fundamental Research Component is significantly more than the combined weight of the evaluation factors associated with the Technology Transition Component and Management. Within the Fundamental Research Component, Evaluation Factors (a) through (c) are of approximately equal importance and when combined are approximately one and a half times as important as Factor (d). Factor (e) is being approximately one-half as important as Factor (d). Within the Technology Transition Component and Management, Evaluation Factors (f) and (g) are approximately equal in importance and Factor (h) is approximately twice the value of (f).

Basis of Award

Proposals received in response to this solicitation will be evaluated using formal source selection procedures. Award will be based on an integrated assessment of each offeror's ability to satisfy the requirements of the PA. The Government anticipates that discussions with offerors will be conducted; however, the Government reserves the right to make award without discussions. A competitive range may be established for any discussions. If discussions are held, offerors in the competitive range will be invited to submit Final Proposal Revisions, which will be evaluated using the same procedures used with the initial proposals. The Government will make award to the Consortium that offers the best value to the Government, conforming to the PA, cost and other factors considered. Further, award may be made to other than the offeror who offers the lowest cost proposal.

VI. AWARD ADMINISTRATION INFORMATION

A. AWARD NOTICES

Should your proposal be selected for award, you will be contacted telephonically or via email by the Grants/Contracting Officer or his/her representative. At that time the offeror will be asked to execute both the Cooperative Agreement and the Contract. Award is not made until it each award document is signed by both the successful offeror and the Grants/Contracting Officer

B. ADMINISTRATIVE AND NATIONAL POLICY REQUIREMENTS

Offerors are to complete the following certifications to be submitted with the proposal:

1. CERTIFICATION REGARDING LOBBYING

This certification is required for an award of a Federal contact, grant, or cooperative agreement exceeding \$100,000 and for an award of a Federal loan or a commitment providing for the United States to insure or guarantee a loan exceeding \$150,000

The undersigned certifies, to the best of his or her knowledge and belief, that:

(1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of an agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

(2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form - LLL, "Disclosure Form to Report Lobbying," In accordance with its instructions.

(3) The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by section 1352, title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure

Organization (Offeror): _____

Signature: _____

Typed Name: _____

Title: _____ Date: _____

2. CERTIFICATION REGARDING DEBARMENT, SUSPENSION, PROPOSED DEBARMENT, AND OTHER RESPONSIBILITY MATTERS-PRIMARY COVERED TRANSACTIONS

(1) The prospective primary participant certifies to the best of its knowledge and belief, that it and its principals:

(a) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency;

(b) Have not within a three-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal,

State, or local) transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;

- (c) Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State, or local) with commission of any of the offenses enumerated in paragraph (1)(b) of this certification; and
- (d) Have not within a three-year period preceding this application/proposal had one or more public transactions (Federal, State or local) terminated for cause or default.

(2) Where the prospective primary participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

Organization (Offeror): _____

Signature: _____

Typed Name: _____

Title: _____ Date: _____

3. CERTIFICATION REGARDING DRUG-FREE WORKPLACE REQUIREMENTS

A. The recipient certifies that it will or will continue to provide a drug-free workplace by:

- (a) Publishing a statement notifying employees that the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance is prohibited in the grantee's workplace and specifying the actions that will be taken against employees for violation of such prohibition;
- (b) Establishing an ongoing drug-free awareness program to inform employees about –
 - (1) The dangers of drug abuse in the workplace;
 - (2) The recipient's policy of maintaining a drug-free workplace;
 - (3) Any available drug counseling, rehabilitation, and employee assistance programs; and
 - (4) The penalties that may be imposed upon employees for drug abuse violations occurring in the workplace;

- (c) Making it a requirement that each employee to be engaged in the performance of the grant be given a copy of the statement required by paragraph (a);
- (d) Notifying the employee in the statement required by paragraph (a) that, as a condition of employment under the cooperative agreement, the employee will –
 - (1) Abide by the terms of the statement; and
 - (2) Notify the employer in writing of his or her conviction for a violation of a criminal drug statute occurring in the workplace no later than five calendar days after such conviction;
- (e) Notifying the agency in writing, within ten calendar days after receiving notice under paragraph (d)(2) from an employee or otherwise receiving actual notice of such conviction. Employers of convicted employees must provide notice, including position title, to every grant officer or other designee on whose grant activity the convicted employee was working, unless the Federal agency has designated a central point for the receipt of such notices. Notice shall include the identification number(s) of each affected grant or cooperative agreement;
- (f) Taking one of the following actions, within 30 calendar days of receiving notice under paragraph (d)(2), with respect to any employee who is so convicted –
 - (1) Taking appropriate personnel action against such an employee, up to and including termination, consistent with the requirements of the Rehabilitation Act of 1973, as amended; or
 - (2) Requiring such employee to participate satisfactorily in a drug abuse assistance or rehabilitation program approved for such purposes by a Federal, State, or local health, law enforcement, or other appropriate agency;
- (g) Making a good faith effort to continue to maintain a drug-free workplace through implementation of paragraphs (a), (b), (c), (d), (e) and (f).

B. The recipient may insert in the space provided below the site(s) for the performance of work done in connection with the proposed cooperative agreement:

Place of Performance (Street address, city, county, state, zip code)

Check mark if there are workplaces on file that are not identified here.

Organization (Offeror): _____

Signature: _____

Typed Name: _____

Title: _____ Date: _____

C. REPORTING

Reporting requirements for the Cooperative Agreement are contained in the Model Cooperative Agreement - <http://www.arl.army.mil/www/default.cfm?Action=93&Page=393>) Reporting requirements for the Technology Transition contract will be contained in Task Orders issued under this contract.

VII. AGENCY CONTACTS

Questions or comments concerning this PA will be posted through the CAN CTA website at <http://www.arl.army.mil/www/default.cfm?Action=93&Page=393>. Questions and comments should be concise and to the point. In addition, the relevant part and paragraph of the PA should be referenced. Responses to questions received will be posted to the CAN CTA website for the benefit of all interested parties. Should an offeror have questions they believe are of a proprietary nature, the offeror must clearly state so in the question when posed. Answers to questions of a proprietary nature will be provided via email directly to the poser of the question. A location on the website will be provided for potential offerors to post their availability for teaming with others.

VIII. OTHER INFORMATION - NOT APPLICABLE