FEDERAL HIGHWAY ADMINISTRATION 2018 EXPLORATORY ADVANCED RESEARCH PROGRAM
BROAD AGENCY ANNOUNCEMENT PRESOLICITATION
No. 693JJ3-18-BAA-0001

This synopsis is issued in accordance with FAR Part 5.201 in response to the mandatory requirement for a pre-solicitation notification. The purpose of this synopsis is to announce the Federal Highway Administration's intent to issue a Broad Agency Announcement (BAA) for the Exploratory Advanced Research Program (EAR).

As a result of this BAA, the FHWA intends to award contracts and/or cooperative agreements. Offerors shall propose periods of performance based on individual proposed research efforts in accordance with the guidance in the BAA. The BAA is anticipated to be released on or about February 16, 2018 to close on April 5, 2018.

The Federal Highway Administration (FHWA) is soliciting for proposals under its EAR Program for research projects that could lead to transformational changes and truly revolutionary advances in highway engineering and intermodal surface transportation in the United States. This program supports scientific investigations and studies that advance the current knowledge and state-of-the-art in the sciences and technologies employed in the planning, design, construction, operation, maintenance and management of the nation's highways. Strategically, this research will enable and expedite the development of revolutionary approaches, methodologies, and breakthroughs required to drive innovation and greatly improve the efficiency of highway transportation.

The FHWA anticipates sponsoring research addressing the following three topics through the issuance of this BAA including the following:

Topic 1: Mobil Ad Hoc Networks (MANETs)
Mobile ad hoc networks are fluid wireless moving networks that can form independently on an ad hoc basis. The network is defined by mobile nodes (smart devices, vehicles, etc.) that receive and transmit data and require no fixed or dedicated infrastructure. This network paradigm lends itself well to fast moving, complex, and dynamic applications (e.g. Transportation System Management & Operations or wayfinding and navigation solutions). Nodes can move cognitively into and out of the network through physical movements or through devices turning on or off, thus re-defining the network's characteristics. The network can then re-configure itself to accommodate these changes. Mobile ad hoc network research and development generally has been for Defense Department and first responder communications system applications.

Why is this topic important to FHWA? There are applications where current dedicated short range communications and current or emerging cellular networks have the potential to fail or become oversaturated through a combination of high communications traffic volumes, limited signal penetration (e.g. indoors, canyons) or equipment failure. Mobile ad hoc networks could provide applications for these environments and situations.

Special capabilities: FHWA expects that research on this topic will require a multi-disciplinary team experienced with both the cyber and physical elements of intelligent transportation systems. Researchers are encouraged to partner with State Departments of Transportation or other system owners or operators to enable experiments.

Topic 2: Video Analytics
Rapid advances in video analytics techniques are emerging in multiple domains such as national defense, law enforcement, robotics, and vehicle automation.

Why is this topic important to FHWA? Advances in video analytic techniques could aid in increasing the level of automation for behavioral studies based on naturalistic driving video and roadway video data. Current data reduction techniques are predominately manual, which in the past have been adequate when behavioral studies included limited amounts of video data from driving simulators or test track experiments. With the magnitude of video data now available – over two petabytes in the case of the SHRP 2 NDS data – it is often impractical for researchers to continue to rely on manual processes.

In the longer-term, techniques developed for behavioral research has the potential to improve safety through real time control such as for crash avoidance through the identification, tracking, and prediction of pedestrians.

Special capabilities: FHWA expects that research on some portion of this topic will require a multi-disciplinary team experienced with computer science topics such as machine vision and video analytics and with highway safety topics like human factors research.

Topic 3: Artificial Realistic Data
There are no accepted methods for developing a simulation test-bed for highway safety models. Advances in manipulating diverse data and creating simulated worlds with greater veracity and with increased automation could allow for development of an artificial database against which various highway safety models can be tested.

Artificial realistic data provides a synthesized model taken from idealized conditions found in real-world data sets. The data include important factors and traits influencing accident frequency and severity relevant to road sections and geometric features. In general, crashes are rare events difficult to generalize. Creating realistic, artificial data could allow for more testing of safety countermeasures by considering multiple variables across large number of examples.

Special capabilities: FHWA expects that research for this topic will require a multi-disciplinary team experienced with data analytics, modeling and highway safety research experience.

The BAA will be released electronically via this Government Point of Entry (GPE) otherwise known as Federal Business Opportunities or www.fbo.gov. As such, no written, telephonic or other type of request for an advance copy of the announcement will be entertained at this time. Additional information along with instructions for submitting proposals/applications in response to the solicitation will be provided in the BAA.

Potential offerors/vendors are encouraged to register on www.fbo.gov to receive any further information in reference to the subject action inclusive of any announcements, and/or amendments to the solicitation after its release.

Any questions regarding this synopsis should be directed to the Contracting Officer, Robin Hobbs at Robin.Hobbs@dot.gov.