# BROAD AGENCY ANNOUNCEMENT 2007-1

# FUNDS AVAILABILITY FOR
# DEMONSTRATION PROJECTS AND TECHNOLOGY ADVANCEMENTS
# FOR FRA PTC/COMMUNICATION RESEARCH AND DEVELOPMENT PROGRAM

## BAA 2007-1 Proposal Preparation Package

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# PART I - INTRODUCTION

## BACKGROUND

Adoption and application of new technology in railroad services is a key focus in the FRA Research and Development program. Throughout the last few decades, FRA has provided funding and technical supports to search and stimulate development of new equipment, new infrastructure and new processes to enhance the safety, capacity and efficiency of both passenger and freight services in the railroad industry. One particular area of new development to help achieving this goal is in the advanced train control system, such as the new concept of Positive Train Control (PTC), which uses microprocessors, advanced navigation and tracking systems, and wireless technology to interconnect the various segments of railroad operation to virtually eliminate train to train collision and over-speed derailments, as well as to provide roadway worker protection.

## OBJECTIVE

This Broad Agency Announcement (BAA) is being made to solicit demonstrations of various technology advancements or techniques, related to advanced train control, dispatching system, and train operation, that can enhance the safety, capacity and efficiency of the rail service in the United States. To assure that the results of projects supported under this Broad Agency Announcement (BAA) are used to maximize public benefit, FRA intends to make the results of the work and projects awarded under the BAA available to all interested parties within the public domain.

Technologies most likely to help facilitate the improvement of railroad services are those which will:

- Improve safety by reducing human and technology failures;
- Bring about capital cost reductions and economy in producing equipment and facilities;
- Reduce operating costs of rail service by providing more efficient operations;
- Improve the reliability of equipment and infrastructure components by reducing failures and/or reducing false failure detections;
- Enhance the revenue-generating capability of high-speed operations by attracting greater ridership by reducing trip times, upgrading customer service quality, increasing reliability, or improving on time performance; and/or
- Enhance the social benefits and/or environmental aspects of high-speed rail.

## QUALIFYING PROJECTS

Enhance the implementation of Train Control Technology

Qualifying projects are those which could make a significant difference in the ability to implement the positive train control concept. Areas related to PTC development being focused

in FRA are those that will provide better accuracy and higher reliability of train tracking ,and communication schemes among various operation segments of the system to provide higher throughput and to minimize message loss. The focus of this BAA is not for a full system integration, but rather advance development of sub-systems or components that will provide substantial improvement in the reliability and vitality of any PTC systems. Projects which are related to grade crossing protection, dispatching, train network, train and track integrity will also be considered.

State of Development

The focus of this BAA is on technologies or methods that are ready, or nearly ready, for deployment; they may need some final development or modification for demonstration purposes, but would be ready to demonstrate with less than a year of further work. If technology validation by vigorous analysis and field data collection is necessary, they should be performed within that year prior to demonstration.

Innovation

The intent of the BAA is to identify technologies or methods which represent new approaches, or existing technologies which are applied in a new and usefully innovative manner.

## PART II - ADMINISTRATIVE GUIDELINES

### ELIGIBLE PARTICIPANTS

This is an unrestricted solicitation. Any responsible source may submit a proposal concept paper for consideration, including, but not limited to, states or local governments, or organizations of state or local governments, universities or institutions of higher education, hospitals, non-profit organizations, private individuals, corporations, businesses or commercial organizations, except that any business owned in whole or in part by the Federal Government is not eligible. Although businesses owned in whole or in part by the Federal Government are not eligible for funding under the Program, they may contract with eligible participants. Cooperative arrangements (e.g., joint ventures, limited partnerships, teaming arrangements, or collaboration and consortium arrangements) are permitted and encouraged.

Small, Small Disadvantaged (SD), and Service-Disabled Veteran-Owned Business Concerns, and Veteran-Owned (VO) and Woman-Owned (WO), and Historically Underutilized Business Zone (HUBZone) Small Business Concerns, and Historically Black Colleges and Universities (HBCU) and Minority Institutions (MIs) are encouraged to submit proposal concept papers on their own and/or in collaboration with others. However, no portion of this BAA will be set aside or reserved exclusively for Small, SD, or Service-Disabled Veteran-Owned Business Concerns, or for VO, WO, or HUBZone Small Business Concerns, or for HBCU and MIs.

### EXCHANGES OF INFORMATION

**Those interested in responding to this BAA are strongly encouraged to first call the primary technical point of contact, Mr. Terry Tse (Tel: 202/493-6335, Fax: 202/493-6333,**

**Email:** terry.tse@dot.gov**) to discuss the prospective idea, its potential responsiveness to the BAA and potential for FRA interest. Taking this action could forestall costly effort on the part of interested parties whose proposed work may not be of interest to the FRA under this BAA.**

Any exchanges of information must be consistent with procurement integrity requirements of section 27 of the Office of Federal Procurement Policy Act (41 U.S.C. 423, as amended) (see Federal Acquisition Regulation (FAR) 3.104).

Offerors are advised that an indication of interest, in the affirmative, is not meant to imply nor in any way imparts an obligation on the part of the Government that an award will be forthcoming for the offered work or project. All non-technical inquiries should be directed to the Grants/Contracting Officers, Mr. Robert Carpenter (Tel: 202/493-6153, Fax: 202/493-6171, Email: robert.carpenter@dot.gov) or Mr.. Charles Nurse (Tel: 202/493-6130, Fax: 202/493-6171, Email: charles.nurse@dot.gov ). After submission of proposals, all exchanges (both technical and non-technical) will be conducted through the Grants/Contracting Officers in accordance with FAR 15.306.

## BAA TIME LINE

**BAA 2007-1 will be open from the date of posting through September 30, 2008.** The FRA will accept proposal concept papers as of the posting date. Unless BAA 2007-1 is superseded or canceled, FRA will continue to accept concept submissions and inquires through September 30, 2008. Although the BAA is open for an extended period, interested parties would be well advised to submit proposals as early as possible. Reviews will be conducted continuously on receipt of concept papers. Offerers will be notified as soon as initial reviews are completed. FRA's target for initial review results is 60 days after submission.

## SOURCE FOR BAA DOCUMENTS

The BAA 2007-1 package may be downloaded or printed from the following Internet address: http://www.fra.dot.gov/, and then through the choices of "Research and Development" (from upper left home page menu), "Funds for Research" and then "Broad Agency Announcement." The FRA does not intend to make the BAA 2007-1 Package available in paper copy.

## FUNDING AUTHORITY AND RELATED INFORMATION

Funds for this program are appropriated in the Continuing Appropriations Resolution, 2007 (Public Law 109-289), as amended by the Revised Continuing Appropriations Resolution, 2007 (Public Law Number 110-5 (February 15, 2007)). FRA will make available up to $2.0 million under the BAA during fiscal year 2007(FY 07) and fiscal year 2008 (FY 08), through the BAA 2007-1 open period, for awards of proposal concept papers evaluated favorably and determined by the FRA to be consistent with the objectives of this BAA and of interest to the Government, and for which adequate funding exists. FY 07 awards are subject to the availability of FY 07 appropriations or the continued availability of unobligated FY 06 or other prior no-year funds. No funding provision or commitment can be made at the time of award for phased or expanded

work or projects beyond the initial or base phase funded at time of award that the applicant may propose in its submissions. In the event future appropriated funds are authorized for the Program, FRA may, at its discretion, provide additional funding for phased or expended effort under existing awards.

Project Funding Range

Awards may be of any dollar value (so long as those amounts do not exceed the total amount available under the BAA), but it is anticipated that most, if not all, individual awards (or that part of the Government's portion in a cost sharing arrangement) will have dollar values ranging between $25,000 and $500,000 each. Prospective offerors are advised that contract awards greater than $500,000 will generally require the awardee (except a small business concern) to already have in place or prepare, at or before the time of award, an acceptable plan to maximize the participation of small business enterprises to include separate goals for using small and SD businesses, and WO, VO, and HUBZone small businesses as subcontractors. Prospective offerors are advised that contract awards greater than $500,000 may require the submission and certification of cost and pricing data.

Cost Sharing

Although cost sharing by awardees is not mandatory under this BAA, because of the potential for long-term benefits to those firms or institutions involved in these research, development and demonstration activities, it is FRA's policy to obtain cost participation, whenever possible. This is preferred when FRA supports efforts where the principal purpose is ultimate commercialization and utilization of the technologies by the private sector, and when there are reasonable expectations that the offeror will receive present or future economic benefits beyond the instant contract/agreement as a result of the effort.

For the purposes of this BAA, cost participation is a generic term denoting any situation where the Government does not fully reimburse the offeror for all allowable costs necessary to accomplish the project or effort under the contract or other award instrument. The term encompasses cost sharing, cost matching, participation in-kind, or other investment of resources as a means of venture sharing in lieu of a formal cost sharing arrangement, third-party in-kind contributions, cost limitations (direct or indirect) and similar concepts. Generally, many forms of cost participation, by their very nature and definition, minimize or negate the opportunity for profit or fee.

Funding Mechanism for States and Local Governments

State or local government entities are only eligible for funding through a cooperative agreement resulting from this Broad Agency Announcement. The Federal government does not "contract" with a states or local government entities.

In compliance with the E-Government initiative of the President's Management Agenda, the Federal Railroad Administration will only accept applications for a cooperative agreement that are submitted electronically via the web site at www.grants.gov. The term "grant" on this web site includes cooperative agreements. Paper applications for a cooperative agreement will not be accepted. All organizations who may be interested in applying for a cooperative agreement

resulting from this BAA opportunity must register on the web site and should become familiar with its function. The web site provides clear guidance for the registration process. These preliminary steps are required before registering with and using the www.grants.gov web site:

**First**, a prospective grantee must have a Dun and Bradstreet number (DUNS). If your organization does not have a DUNS number, one can be obtained telephonically at (866) 705-5711 or be visiting https://eupdate/dnb.com.

**Second**, the organization must be registered in the Federal government's Central Contractor Registry (CCR) found at www.crr.gov. Please note, CCR registration cannot be completed without a DUNS number.

**Third**, to view grant application instructions and complete an application, you will also need to download and install Pure Edge Viewer available at: http://atweb.grants.gov/DownloadViewer. This small, free program will allow you to access, complete, and submit electronic applications through the secure web site.

Funding Mechanism for Other Than States and Local Governments

These can take the form of either a contract or a cooperative agreement, depending upon the nature of a particular project and discussions between the Federal Railroad Administration and the offerer.

To be eligible for award of a contract resulting from this solicitation, a contractor must be registered in the Federal Government's "Central Contractor Registration" (CCR), **AND** be registered in the Federal Government "Online Representation and Certifications Application" (ORCA). Both of these separate registrations can be accomplished through the following website: http://www.bpn.gov.

**NOTE**: When properly registered in each of these systems, the contractor will receive an automatic acknowledgement confirming successful registration in each system. Without such acknowledgements, the registrations are not complete.

Authorized Commitment From Government
Prospective offerors are cautioned that only the cognizant Grants/Contracting Officers can legally commit the Government to the expenditure of public funds under this BAA.

## PART III - TECHNOLOGY APPLICATION AND AREAS OF INTEREST

### TECHNOLOGY APPLICATION

Any technology forming the basis for a proposal must be capable of application to improve the ability to operate the railroad service at higher speed, to enhance the safety, to increase the capacity or to boost the efficiency. This may include improvements to the railroad capital equipment or infrastructure in train control and dispatching/traffic control systems, or to the

quality improvement of processes and procedures of train operation. New methodologies and analyses which can be used to improve the operation for safety, capacity and efficiency are to be considered too. However, validation by vigorous analysis or field tests, preferably applied to an existing system, is expected to be a part of the project to develop new methodologies and analyses. With the adoption of the new rule governing the Standards for Development and Use of Processor-based Signal and Train Control Systems final rule (PTC Rule), FRA emphasizes the use of safety analyses, hazard identification, risk assessment and mitigation, prior to deployment of a PTC system or its subcomponents.

The technology presented must possess the potential for performance improvement in one or more qualities, such as cost effectiveness, reliability, safety, availability, or maintainability. This may include adaptation, implementation, testing or demonstration of candidate technologies, which have been successfully applied in other industries, such as defense industries, and/or are near ready for direct application in the railroad industry. FRA also invites proposals for the integration and subsequent evaluation of multiple independent (commercial or non-commercial) technologies, where the integrated product may offer substantial advantage beyond that offered by the components.

FRA expects to emphasize generally mature technologies in its selection of proposals for award, but it may give consideration to less mature, but highly promising or unique technologies or innovations. Please note that in general, research studies or analyses which result only in research reports will not, for the purposes of this BAA, be of as great of interest to FRA as those that involve actual testing, demonstration or application of the proposed concept or technology. New methodology or analyses which aid a developer to have a better design or to perform the validation and verification process more thoroughly and more efficiently need to be applied to a real system that has been deployed or to be deployed.

## AREAS OF TECHNOLOGY INTEREST

Technologies that are high priority candidates for evaluation pursuant to this announcement include:

- **Grade crossing hazard mitigation systems.**
- **Positive Train Control systems**
- **Wireless communication system**
- **Train tracking systems**
- **Risk assessment and hazard analysis**
- **PTC/Communication Enabling projects**

### (1) Grade crossing hazard mitigation systems

Highway rail grade crossings are a major safety and investment issue in achieving increased train speeds. One of FRA's specific objectives is to reduce the number of injuries and deaths resulting from crashes at highway-rail crossings. This becomes especially important as more modern passenger train consists allow speed regimes to increase toward and above 110 mph. FRA is already pursuing several research, development and demonstration projects in this area,

but continues to be interested in all feasible technologies that will advance grade crossing safety. An objective for all of these technologies is to provide nearly the same security as grade separations but at much lower cost.

New technologies are needed which will protect both the rail and highway users without incurring the disruption of grade crossing closure or the cost of grade separation by bridge or tunnel. Specific issues include the design of highway warning and protection devices, train detection and communication, and grade crossing obstruction detection sensing and communication. Candidate technologies, some of which are already in place in other countries, include: inductive loops, ultrasonic, microwave or laser beams, and video surveillance. Numerous sensor and command-and-control technologies that have been developed for other usages could find ready application in the grade-crossing protection area. Many crossings on potential high-speed corridors are equipped only with passive crossbuck warning devices. Traffic density on many of these crossings may not warrant even conventional gates and lights, and alternative systems that can reliably warn highway users while protecting train operations are sought. Other areas of particular interest are train detection, intrusion alerts, constant-warning-time logic, train control interface, driver warning, and crossing malfunction response facilitation.

(2) **Positive Train Control systems**

Positive Train Control (PTC) systems are implementations of an advanced train control concept using new micro-processor based technology to improve safety in the three areas:

- Eliminate train to train collisions
- Reduce over-speed derailments
- Protect roadway workers

Besides safety, FRA has been promoting and sponsoring PTC development and demonstration with the following additional objectives:

- Fulfill regulatory requirement to allow high-speed passenger service above 79 mph in freight territories
- Improve signaling and train control infrastructure
- Promote enabled technologies such as train pacing and moving block operation to improve the operation efficiency and asset utilization

Briefly, major elements of communications-based train control systems are:

- position determination subsystems that automatically determine the exact location of a train on the rail network;
- a computer on-board the locomotive that receives and processes information from the dispatch center, a central office server for a office centric system, wayside devices, and other sources and enforces operating rules;

- digital or technologically advanced communication links between the train and central dispatching centers or other wayside facilities;
- software that aids dispatchers in planning the meeting and passing of opposing or faster trains while assuring the safety of authorized train movements; and
- capabilities that aid in the strategic planning of the rail network on a system scale.

FRA is already sponsoring or participating in several major demonstration projects in the area of advanced communications-based train control. The Incremental Train Control System (ITCS), which is now in revenue service operation on Amtrak-owned track in Michigan, taps into the existing signal system for status information, and then radios the status information to each train where an onboard computer combines the status, automatic location, and database information to inform the engineer of safe operating conditions. The onboard computer limits the speed and/or stops the train if unsafe operation is attempted. The Illinois DOT Positive Train Control (IDOT PTC) Project which was managed by the North American Joint Positive Train Control (NAJPTC) committee of the Association of American Railroads (AAR), Illinois Department of Transportation (IDOT), Union Pacific Railroad (UPRR) and FRA had some advancement in the development of a vital train control system. This system proved to be very complex and would require substantial further development for revenue service. The stakeholders decided to move this development in January 2007 to TTCI, which is a better controlled environment to develop such a system. FRA has sponsored with substantial cost sharing on the development of Electronic Train Management System (ETMS) on Burlington Northern Santa Fe Railway. In view of the demonstration activities already underway, it is not anticipated that the scope of projects under this BAA will permit development or demonstration of complete new PTC systems. However, FRA remains interested in additional new concepts, components and innovations that can reduce the cost of implementing these systems.

Train control systems when coupled with management information systems may be able to reduce congestion and increase track capacity, as well as facilitate a number of maintenance and operational activities. Major elements of the systems that increase the overall cost of train control are the individual cost of small elements, such as the onboard computer required on most of the locomotives operating in a corridor or the cost of wayside units that determine track, switch position or the state of some other feature and communicate this information to trains and central or regional centers. Also critical is the amount and timeliness of information and how this governs the communications requirements. These technologies will be further discussed in the following sections.

**(3) Wireless Communication System**

Wireless communication, especially for transmitting digital packets, is becoming a very important technology in the railroad operation. With the advent of microprocessors, digital communication is a natural application for communication of information and data among various segments of the operation. Its application extends from end-of-train devices, remote controlled locomotives to the complex systems such as PTC.

During development of ITCS and NAJPTC systems, wireless communication has been found to be one of the weakest links in the overall dependability of the systems. The old communication

industry standard, ATCS Spec 200, employing 900 Mhz and heavily overhead-burdened protocol, does not provide sufficient coverage or throughput for PTC application. While the systems were designed to be vital and fail-safe so that there is no safety concern when communication is lost or message does not go through, substantial train delays result because of the unreliable communication network. Realizing that communication will be a key element for the success of PTC deployment, FRA has sponsored a program with Railroad Research Foundation and TTCI to define and test a "higher performance digital radio."

PTC does not have a standard, but is defined as an implementation of using several new technologies to achieve the safety goals stated before to prevent train collisions, over-speed derailments and roadway worker injuries. Therefore, there is not a standard on the communication segment of any PTC implementation, in terms of both protocols and radio frequencies. In terms of radio frequency, various implementations have used the low band VHF, high band VHF and UHF, cellular and 2.4 GHz 802.11x. It is the desire of FRA, and the industry presumably, to have interoperable radio communication, especially in the train control functions. This will provide more seamless operation in the run-through train operation at interchange points, when PTC is more widespread. Some advancement in Communication Management Unit (CMU), which acts as a switch for the on-board system to communication from one network to another, has been achieved. Software defined radios are also designed to be used to allow interfacing with multi-networks of communication. However, more research and development is necessary in order to achieve full interoperability in radio communication.

**(4) Train Tracking Systems**

It is necessary to track the locations of the trains in the PTC system in order to determine what the correct behavior, e.g. speed, of the train should be. There are basically two methods of tracking employed by systems that have been deployed already: using track transponders and using Global Positioning System (GPS) signals. Track transponders planted in the track bed let the on-board systems know the discrete locations of the trains. On the other hand, GPS signals give the locations of the trains continuously. In order to perform some functions such as train pacing or moving block operation, continuous tracking is a must. Often, to enhance the reliability of the train tracking ability, on-board inertial navigation systems and axle alternators are used to supplement GPS signals. This improves the availability and accuracy of the trains' locations. To further increase the accuracy, differential stations are used to provide correctional factors on the GPS signals. Some systems use the national differential GPS network operated by the Federal government and some use their own differential stations.

Locations of the trains are important for a PTC system to enforce the speed limits, signal and form authorities, and work zone entries. Locations are also critical in determining the spacing of trains in moving block implementation, switch locations, and track discrimination algorithms. Ascertaining the track a train occupies involves complicated algorithm, but is a critical function in any vital PTC system. Recently, FRA and other agencies drive a development of high accuracy DGPS system, which potentially provides direct train position tracking accurate enough to be used to distinguish the track the train is on without implementing complex software algorithm or requiring additional system. The reduction of software complexity would in turn reduce the chances of coding errors and therefore would increase the overall integrity of the safety assurance. Regardless of the accuracy of the GPS scheme used, it is important to be able

to monitor he state of the tracking accuracy and declare a failure when this accuracy is outside the safety limit the system is designed for. Kalman filter is often used for this purpose.

**(5) Risk Assessment and Hazard Analysis**

The new PTC rule (49 CFR part 236, subpart H) adopted by FRA in March 2005 is a performance-based rule, and as such, applicants are required to perform hazard analyses and risk assessments as a part of the validation and verification process. The hazard analyses involves a preliminary hazard analysis, continued maintenance of a hazard log, detailed hazard analysis including identifying hazards relating to operation and support, and a hazard mitigation analysis. Risk assessment and the safety analysis required by this rule must establish with a high degree of confidence that introduction of the product will not result in risk that exceeds the previous condition. In some cases, an abbreviated risk assessment is allowed in lieu of the full risk assessment. For these abbreviated analyses, the applicants only need to show that MTTHE (Mean Time To Hazardous Event) for the proposed product is greater or the probability of failure for each hazard is acceptable by AREMA Manual Part 17.3.5. "Acceptable" here means more favorable than "undesirable" as defined in the AREMA Manual. In most cases, however, full risk assessment is required instead. As a final result, the full risk assessment has to reveal that the proposed system is equal to or better than the base systems in terms of damage and casualty cost per train mile or per passenger mile, with a high degree of confidence. The methodology for the full risk assessment has not been standardized, but any method used has to be approved by FRA's Office of Safety.

FRA Office of Railroad Development attempted to develop a comprehensive train movement model called ASCAP, which incorporated probabilities of incidents and failures as well as random events to predict the potential risks and consequences, as a cooperative effort with University of Virginia. There were mixed results of this effort. The project did illustrate that modeling the train movements with injection of failures and random events is perhaps an efficient way to perform risk assessment. FRA Office of Railroad Development is currently continuing this effort with Motion Analysis, Inc to improve upon the train movement algorithm by building time-domain simulation of trains traversing a rail line in time domain as if they were controlled by dispatchers. Using equations of motion and Davis equation to predict the acceleration, cruising, and braking of the trains, the meet and pass, switch traversing, and speed changes can be simulated quite accurately. Any of these events are potential exposures to hazardous incidents. The number of exposures can be input to a fault tree analysis which is built up with predicted probabilities. The exposures obtained from the modeling of train movement can translate into absolute number of events. Another possibility of using the model is to incorporate failures in some way so that the potential number of hazardous events can be predicted by the model itself. There can be other possible ways that the model of this kind can be used in the overall risk assessment.

**(6) PTC/Communication Enabling Projects**

Through several years of development and demonstration, it became obvious that in order for a PTC system to be effective, efficient and reliable, some technical and operational information need to be better controlled. Some other new technology or processes need also to be developed, in order to enable PTC to be operated and functioned as originally envisioned.

For a given train, the braking characteristics are generally difficult to predict unless the train type, car types, light weights, loaded tonnages, and type of airbrake equipment for each car are known and well specified. Given this uncertainly and the requirement not to over-run the authorities, conservative assumptions are always taken to over-estimate the braking distance of the trains, resulting in too early an application of penalty braking. In order to avoid penalty braking, engineers also tend to slow down or stop the trains earlier than they usually do. As a result, trains tend to run slower than necessarily and sometimes stop substantially short of the target. In some previous PTC tests, trains stopped occasionally 2000 feet in front of an intended target for a stop. Needless to say, the efficiency of the train operation that may affect the capacity of the line greatly suffered.

To implement the moving block operation as envisioned in the original concept of advanced train control system, accurate braking prediction is definitely a prerequisite. The associated problems of inaccurate train consist information extends beyond the difficult prediction of braking characteristics of a train. For moving block implementation, it is obvious that the length of the train has to be accurate so that the spacing between trains can be as close as possible without jeopardizing safety. The potential benefit of moving block operation is very substantial as it can greatly increase the line capacity without huge investment in infrastructure. Therefore, demand should be placed in research and development in accurate braking prediction and train consist so that the full implementation of moving block operation is possible.

Another benefit of PTC is to replace the physical infrastructure of signal system. Some of the signal systems in various rail lines are aging, and soon may need an overhaul or replacement. One inexpensive alternative is to implement PTC so that it can perform the signaling functions without the physical installations of conventional signal controllers and interlocking devices. Such a PTC system sometimes is termed as virtual signaling or communication based signaling. However, using PTC to replace signaling would lack a functionality of the signal system. PTC is mainly designed to direct and control train movements, but would not detect broken rails as a signaling system could. The conventional signaling system with its planted track circuits, usually about 2 miles long, can detect a broken rail based on the discontinuity of the track circuit. The discontinuity will result in a red or stop signal ahead of the train. In cab signal territory, the on-board signal will flip to a restricting signal immediately to alert the engineers of the broken rail problem. For virtual signaling without any track circuits, this type of warnings is absent, so some other means of detecting broken rails will need to be developed.

For PTC to reach its full potentials, additional developments may be needed to expand the versatility and functionality. Some examples are interfacing with dispatching system to provide train pacing, interacting with smart train technology to constant monitor and broadcast the health of locomotives and trains, better integration with other electronics tools used by the crew and workers for enhanced safety and productivity.

## PART IV - PROPOSAL CONCEPT PAPERS AND PREPARATION INSTRUCTIONS

**FUNCTION:** For the purposes of this BAA, proposal concept papers are considered offers and should contain the offeror's best terms from both a cost or price and a technical standpoint. Successful proposal concept papers may be used, in whole or in part, as the basis for award in

any ensuing contract or other award instrument as the scope of work, statement of objectives, or work statement, or they may be used as the basis for negotiations and subsequent award pending the submission of any additional or supplemental information or clarification, as requested.

**CONTENT AND FORMAT:** Proposal concept papers should be **twenty (20)** pages or less (except as otherwise noted), in letter print no less than 10 point type, on letter-size paper, numbered, and fully legible in all required copies.

Each concept should be submitted only once. An offeror's submission of substantially the same concept (under different topical Areas of Interest) will only be evaluated once. FRA will consider each proposal concept paper in the topical Area of Interest identified in the BAA that is most relevant and provides for the greatest opportunity or chance for award.

Proposal concept paper submissions should not include promotional brochures, advertisements, taped recordings, or other extraneous material.

Proposal concept paper submissions must contain a Technical Concept Section and a separate Cost or Pricing Section. A separate Past Performance Information Section is also required from all offerors other than states or local governments, or organizations of state or local governments, or universities or institutions of higher education where the total estimated project cost is $100,000 or greater. A separate *Optional* Phased or Follow-on Section is required for concepts involving phased or follow-on projects.

Offers (i.e., proposal concept papers) being pursued as cooperative agreements, or which FRA subsequently determines should be funded through a cooperative agreement, must include reference to appropriate registration and application information entered through the www.grants.gov web site (see Funding Mechanisms, pages 6-7).

Submissions that are incomplete, materially lacking, or not responsive to the technical requirements of this BAA, may be returned unevaluated, or evaluated as is, without further opportunity for revision, at the discretion of the Source Selection Authority.

To facilitate evaluation, proposal concept papers should fully address the content requirements described in this subpart and be formatted as follows:

**Section A - Technical Concept**

1. Title - Provide a working title descriptive of the research or technology advancement project being proposed.

2. Applicant/Offeror - Provide the name, address and telephone number, and ownership characteristics of the individual, company, state or local government, educational institution or non-profit organization submitting the proposal concept paper. In a proposed cooperative arrangement, one entity, by agreement, must be designated as the lead applicant/offeror (and prospective awardee, if selected). (Note: Letters or statements formally attesting to a cooperative arrangement need only be provided upon request.) The applicant/offeror should also identify (a) the principal investigator and/or

key persons; (b) one or more authorized negotiators for the applicant/offeror, (c) the official(s) with authority to legally bind the applicant/offeror to the terms of any award instrument; and (d) the participating entities in any proposed cooperative arrangement, subcontractors, or consultants. Identification for secondary organizations should include name and address. Identification for individuals should include name, title or functional role, telephone number, fax number and email address.

3. Capabilities - Describe the applicant's/offeror's relevant technological and scientific, railroad or other industrial or defense capabilities, experience, and resources (or those of its team members) that will serve to demonstrate its ability to successfully conduct the proposed research or technology advancement project. List or chart team members/partner's primary functions or areas of responsibility. Describe the applicant's/offeror's (or relevant team members/partners') familiarity with or position in the railroad community and access to necessary equipment or facilities. Describe the management processes that will be put in place for monitoring and controlling project implementation and ensuring that the triple constraints of performance/quality, cost/budget, and timeliness/delivery are fulfilled. For the principal investigator or key personnel (not to exceed four persons per proposal concept paper), the applicant/offeror should also submit a one to two page resume or curriculum vitae. (Note: The resume or C.V. will not count as part of the recommended 20-page limit.)

4. Objective - Describe the key objective(s) and scope of the proposed research or technology advancement project.

5. Potential Application - Explain, specifically, how the proposed technology or method enhances the ability to implement higher speed passenger operations; how it could be incorporated into existing railroad equipment, infrastructure, or operations (to include how major barriers, impediments or obstacles could be overcome or mitigated); and the interface modifications required to accomplish a demonstration. Also explain how its application will bring about an improvement to capital equipment or infrastructure, or operating methods, safety and/or performance improvements. Correlative benefits to general railroad operations, if any, should also be cited, since they can also enhance the feasibility of passenger service added to freight routes. Quantitative support should be provided for assertions made.

6. Maturity and Adaptation - Outline the current level of maturity of the proposed technology or method and the amount or type of development or modifications needed for high-speed rail adaptation and demonstration. Include necessary background information and how they are used in their current applications, and identify the area(s) of high-speed rail application, in both hardware and performance venues. Describe how the proposed research or technology is technically or scientifically innovative, either in itself or in its application to high-speed rail.

7. Project Description - Describe how the proposed technology or method will be demonstrated. The effort should be broken down into logical elements of work tasks and subtasks that support the approach or plan of action to achieve key milestones or interim objectives, and end objectives. Describe the steps/tasks/activities necessary to achieve

the desired result or successful project completion. Identify deliverables, presentations, and demonstrations.

8. Test Bed - Outline the test requirements, environments and methods needed to assess or demonstrate the suitability of the technology in the railroad environment and the success of the proposed project. **It is important to cite railroad companies or other rail-related organizations, such as railroad industry suppliers, that have expressed their willingness to permit and/or support such testing or demonstrations. (Note: Letters or statements attesting to an outside organization's interest or commitment to permit and/or support testing or demonstrations should be furnished with the proposal concept paper.** Such letters or statements will not count as part of the recommended 20-page limit. Such letters or statements, if not furnished with the initial submission, may be requested and shall be furnished to assist in the evaluation and selection process.)

9. Project Duration - Provide a realistic schedule that identifies and charts or tracks the target completion dates or time parameters to accomplish key milestones or interim objectives, and end objectives and the performance of demonstrations or presentation, or delivery of reports, data, models or other deliverables. Include in the schedule time required to complete any remaining development or required modification to the technology prior to readiness for demonstration. This should include an explanation of the relevant assumptions required for the stated schedule. For the purposes of this BAA, projects or phases of projects should generally be one to two years. For the specific project or project phase being proposed (and to be funded initially when follow-on or phased portions are proposed), include a chart or schedule of key milestones for completion. (See Part IV, Section D - Phased or Follow-on Research Projects, below.)

**Section B - Cost or Pricing**

The cost or pricing portion of the proposal concept paper should contain a cost estimate for the proposed effort to allow for meaningful evaluation and determination of price reasonableness and cost realism. Unless and until advised otherwise, cost information submitted with the concept paper will be considered "information other than cost or pricing data." The cost estimate may be prepared using the applicant's own format or as indicated in Table 15-2 of FAR 15.408. The cost estimate shall account for the entire cost of the project, inclusive of that portion of cost the applicant or other participants would bear in any proposed cost sharing arrangement or other investment of resources as a means of venture sharing in lieu of a formal cost sharing arrangement. The cost estimate shall be broken down for each year of the proposed work, and by all years combined. At a minimum, the cost estimate shall include the following information:

1. Labor - A breakdown of direct labor, by major tasks or milestones, identifying the labor categories or individuals and projected hours, and their associated subtotals.

2. Overhead and/or Fringe - Labor overhead and/or Fringe rate(s) and base(s), and cost outcome.

3. Materials, supplies, and equipment - Description and cost of materials, supplies, and equipment, to include the basis of the cost estimate (e.g., historical data, competitive market quotes, in house transfers, etc.). Specific mention should be made of any highly specialized or costly test equipment or supplies needed to accomplish the project.

4. Travel and transportation - Breakdown of travel and transportation costs.

5. Subcontracts - Breakdown of individual subcontracts. State the amounts of time of subcontractor/consulting services to be devoted to the project, including the cost to be charged to the proposed contract/agreement.

6. ODC - Breakdown of other direct costs (reproduction, computer time, consultants, etc.)

7. Misc. - Identification of any other direct or indirect cost elements not identified elsewhere. For each indirect rate (identified here or elsewhere), indicate if the proposed indirect rate and allocation base have been approved by a Government audit or cognizant agency for use in proposals and when the rate(s) was approved and the name of and telephone number of the cognizant auditor or approving official.

8. General and Administrative - G&A rate and base, and cost outcome.

9. Profit or fee - Generally, the FRA does not anticipate providing profit or fee under contracts awarded under the BAA, because of the potential for long-term benefits to those firms or institutions involved in these demonstration activities, the advanced stage of development and reduced level of risk associated with such projects, and the reasonable expectation that the performer will receive present or future economic benefits beyond the instant contract/agreement as a result of performance of the effort. However, profit or fee may be proposed, and if proposed, subject to final negotiations, may be allowed when the prospective offeror demonstrates to the satisfaction of the Grants/Contracting Officer that it has no commercial, production, educational, or service activities on which to use the results of the research and no means of recovering any cost participation (including relinquished profit or fee) from such projects for its financial gain. Under these circumstances, the Grants/Contracting Office may determine (on a case-by-case basis) that cost sharing or other cost participation does not apply, and further that fee may be applicable. The applicant/offeror should also specifically note if profit or fee is not sought/proposed.

10. Cost Sharing/Cost Participation - Identify extent of cost sharing/cost participation, if any (exclusive of the applicant's/offeror's prior investment), to include the actual dollars or the percentage of the cost share of the proposed research or technology project, to be provided by the applicant, or third party contributors or other Federal funding sources, if allowable; the type and extent of cost limitations (direct or indirect); or the specifics for and extent of similar concepts indicative of cost participation. (Note: The applicant may be required to certify that it has secured the appropriate cost share funding levels, and identify the source of funding. **Letters or statements attesting to an outside organization's intent to furnish funding or third-party in-kind contributions or the like should be furnished with the proposal concept paper.** Such letters or statements

will not count as part of the recommended 20-page limit. Such letters or statements, if not furnished with the initial submission, may be requested and shall be furnished to assist in the evaluation and selection process.) The value of any proposed cost participation in the form of participation in-kind or other investment of resources as a means of venture sharing in lieu of a formal cost sharing arrangement, or third-party in-kind contributions, must be assessed by the Government. (Note: These latter forms of cost participation are best suited for and may only be applicable as the applicant's cost share/match in a grant or cooperative agreement award.)

**Section C - Past Performance Information**

As a separately bound part of its proposal concept submission, the offeror (excepting states or local governments or organizations of state or local governments, or universities or institutions of higher education) is to provide past performance information in the form of a contract reference list and preliminary survey data for projects valued at $100,000 or more. (Note: The past performance information will not count as part of the recommended 20-page limit.)

Past performance information is relevant information, for source selection purposes, regarding a contractor's actions under previously awarded contracts. Past experience reflects ***whether*** the contractor has performed similar work before. Past performance, on the other hand, describes ***how well*** the contractor performed the work. Past performance information can be one important indicator of the offeror's ability to successfully perform a proposed contract. It includes for example, the contractor's record of conforming to contract requirements and to standards of good workmanship; its record of forecasting and containing costs; its adherence to contract schedules, including the administrative aspects of performance; its history of reasonable and cooperative behavior and commitment to customer satisfaction; and its business-like concern for the interest of the customer. It also includes the contractor's resourcefulness in overcoming challenges that arise in the context of contract performance.

1. Contract Reference List - The past performance information contract reference list shall include the identification of three (3) government (Federal, state or local) or commercial contracts/orders (each of which has/had an aggregate value of at least $25,000) that the offeror* has performed and asserts are relevant to the subject proposal concept and demonstrative of its capabilities to successfully perform substantially similar work. The greater the similarity in scope and complexity and technical nature of the referenced contracts/orders to the research project, technology advancement and/or demonstration being proposed under the subject BAA, the greater the perceived relevancy. The burden of proving acceptability of past performance is the responsibility of the offeror.

Contracts/orders advanced by the offeror should be either-

(a) on-going contracts/orders awarded within the last 3 years and in which the offeror has performed for at least six months, or
(b) contracts/orders that ended within the last 3 years, but in which some part or all of the performance occurred within the last 3 years from the date of proposal submission.

**For the purposes of this contracting action, relevant past performance under these contracts/orders may be that of the offeror itself (as a prime contractor or a subcontractor under the referenced action) and its key personnel, or that of a subcontractor, consultant or party to a cooperative arrangement who will be directly involved under the proposed research project, technology advancement and/or demonstration, provided that (1) the entity or individual will be performing the substantially same type of effort/requirement and in the substantially same capacity as that upon which the relevant past performance assertion is made, and (2) the entity or individual will be performing 50% or more of the effort involved, in terms of the estimated total contract cost.*

The contract reference list should recap, for each reference, the name of the awarding agency/firm, contract/order title, contract number, point of contact and telephone number, and email address, if available. The offeror must ensure that points of contact, telephone numbers, etc. for its listed contract/order references are current, complete and accurate. Significant problems encountered in checking references provided by the offeror will generally be considered a lack of due diligence on the part of the offeror and may be considered in the selection process.

If the offeror has received fewer than 3 contract awards within the last 3 years having an aggregate value of a least $25,000, the offeror should provide information on the number of contract awards available for referencing. If the offeror has not received any contract awards within the last 3 years having an aggregate value of a least $25,000, the offeror should state that fact.

2. Preliminary Survey Data - Preliminary survey data shall be comprised of the following- For each contract reference, the offeror shall complete and submit Part I - Administration and Part II - Relevancy/Perspective of the Contractor Past Performance Survey **(Appendix A)**. For **Part I** of the survey, the offeror will complete the identifying and administrative information sought for the specific contract in question. For **Part II**, the offeror will complete and insert a single page that addresses the following three areas of inquiry (as described in the survey): Description of Prior Contract Services, Relevancy, and Problem Resolution and Quality Honors. The text of the offeror's responses for all three inquiries combined shall not exceed one page.

3. As early as possible in the proposal preparation phase, offerors should send each of their references a copy of the Contractor Past Performance Survey (or advise them of its location on FRA websites) and a letter that, in effect, authorizes its private sector reference to provide past performance information, when and if requested by FRA, and alerts its government references that information may be requested from another government agency. Offerors should advise references that in addition to completing **Part III** of the survey (when and if requested), they may be contacted, at the Government's discretion, and asked to consent to a telephone interview, using the survey as the starting or focal point of the interview.

4. Offerors are advised that any relevant contractor performance/customer evaluations previously prepared within the last three years by the agency/firm (the reference), and

subsequent responses or rebuttals from the offeror/contractor, may be requested of the reference to augment or furnished in lieu of the survey or interview.

5. References should be advised that when and if they are requested to complete a survey by FRA, they are to send the completed survey directly to the FRA at the address(es) identified in the Survey and not to the offeror seeking a reference, nor are they return a duplicate to the offeror. This does not preclude the reference from advising the offeror that a survey was completed and submitted, or an interview conducted, if it so chooses.

6. To ensure frank and open evaluations and expressions of opinions by evaluators or others, all parties are advised that the identity of respondents completing the survey will be held in confidence and will not be released or disclosed to the offeror outside the Government. However, as specified under FAR 15.306, conditions may exist in which the offeror may be provided an opportunity to discuss adverse past performance information on which the offeror has not had a previous opportunity to comment.

7. Technically acceptable proposal concept papers that are considered realistic and reasonable, in terms of proposed cost, and fee, if applicable, will be subject to a review of past performance information provided by the offeror or obtained from sources other than those identified by the offeror, and used in assessing performance risk, making a responsibility determination, and making a best value decision. References provided by the offeror or sources other than those identified by the offeror may be contacted at this stage and advised of a specific date that completed surveys should be submitted to FRA. References will generally be allowed a minimum of 3 working days to respond by facsimile (with original to be provided upon request). Offerors are advised that time is of the essence, and that if Surveys are not received by the time specified or references otherwise do not avail themselves for an interview, the offeror may be assessed as an unknown performance risk and assigned a neutral performance rating.

8. Offerors are reminded that a past performance rating is not a precise mechanical process and will usually include some subjective judgment. It is a comparative evaluative process that seeks to identify the level of risk associated with contracting with each offeror. The resulting evaluation is a reflection of the degree of confidence the Government has in the offeror’s likelihood of success.

9. Upon request, past performance information may be made available to other Federal procurement activities. However, past performance information about an offeror shall not be provided, without the offeror's consent, to any private party, except where the agency determines such information must be released pursuant to the Freedom of Information Act.

10. On the rare occasion that there is no information on past contract performance, or no relevant past performance information, the offeror’s lack of past performance will be treated as an unknown performance risk. In such cases, past performance will be treated as “neutral,” that is to say the offeror will not be evaluated favorably or unfavorably on the factor of past contract performance. This will be accomplished by assigning the offeror(s) without a [relevant] performance record, the mid-range score available for any

numerical or quantitative rating used, or an equivalent value in any adjectival or qualitative rating used.

**Section D - Phased or Follow-on Projects *(Optional - For Informational Purposes Only)***

When a follow-on project phase is proposed which is beyond that project being advanced in the proposal concept submission (for initial funding), the applicant may include a separate, supplemental section outlining the follow-on work or phased project activities the applicant maintains would be necessary or beneficial to bring the research project to final completion. A realistic cost estimate for each additional phase or follow-on project should also be provided. Supplemental section submissions generally should not exceed 3 - 5 pages. (Note: This 3 - 5 page summary supplement will not be counted as a part of the recommended 20-page limit.) Applicants whose projects would not require additional phases or follow-on project activities beyond the activity in the project being advanced in the proposal concept submission (for initial funding), may disregard this section.

## PART V - EVALUATION CRITERIA, EVALUATION PROCESS, AND AWARDS

## EVALUATION CRITERIA

Proposal concept papers (and other submissions, if and when requested) will be evaluated using the following criteria, which are listed in descending order of relative importance:

**A. Technical Factor:**

1. *Responsiveness to BAA Intent and Requirements*: Degree to which proposal meets the conceptual intent and submission requirements of the BAA.

2. *Significance for Implementing High Speed Rail and Fit with FRA Mission*: Degree to which successful implementation of proposed idea would make higher speed rail more technically or economically practical; includes contribution to cost effectiveness, reliability, safety, availability, or maintainability, and fit within FRA mission.

3. *Technical Merit*: Degree to which proposed ideas exhibit a sound scientific and engineering basis; how well the proposed ideas could be practically applied in, and would be compatible with, the railroad environment; perceived likelihood of technical and practical success.

4. *Key Personnel and Supporting Organization*: The technical qualifications and demonstrated experience of key personnel proposed to lead and perform the technical efforts; qualifications of primary and supporting organizations to fully and successfully execute proposal plan within proposed time frame and budget.

5. *Cost and Relative Value*: Affordability and degree to which proposed effort appears to be a good value for the amount of funding requested, including extent of cost sharing.

**B. Cost/Price Factor:**

1. The reasonableness and realism of the proposed costs and fee (if any).

2. The extent of any proposed cost sharing/cost participation under the proposed effort (exclusive of the offeror's prior investment).

**C. Past Performance Factor:**

The extent or level of relevant corporate past performance, or relevant past performance by key personnel, or by subcontractors or parties to cooperative arrangements. (Note: Assessments of past performance will not be applicable to offers/applications from states or local governments or organizations of state or local governments, or universities or institutions of higher education.)

**EVALUATION PROCESS:**

All materially complete proposal concept papers submitted under this BAA will be subject to technical review in accordance with the established evaluation criteria.

Proposal concept papers which are evaluated favorably from a technical perspective and determined by the FRA to be consistent with the objectives of the BAA and of interest to the Government, and in which there are no significant or outstanding issues or areas for clarification, will be subject to a cost review.

Technically acceptable proposal concept papers that are considered realistic and reasonable, in terms of proposed cost, and fee, if applicable, will be subject to a review of past performance information provided by the offeror or obtained from sources other than those identified by the offeror (excepting those offerors previously identified as not being required to submit past performance information).

Proposal concept papers which are evaluated favorably from a technical perspective and determined by the FRA to be consistent with the objectives of the BAA and of interest to the Government, but in which there are outstanding issues or areas for clarification, from a technical, cost, or past performance perspective, must be resolved favorably before they can be advanced to each subsequent stage of consideration. In such cases, the Grants/Contracting Officer may contact the offeror and request additional or supplemental information or clarification to augment the initial submissions and assist in determining if the offer will receive further consideration.

In the case of proposal concept papers that are not evaluated favorably, contain material deficiencies or significant weaknesses, or are otherwise deemed unacceptable from a technical perspective, or that are not consistent with the objectives of the BAA or not of interest to the Government, proposers will not be afforded further opportunity to submit proposal information or revisions, will not be subject to cost or past performance review, and will be rejected/declined.

**AWARDS:**

An offer must be found acceptable under all applicable evaluation factors to be considered eligible for award.

All evaluation factors other than cost or price, when combined, are significantly more important than cost or price alone. Technical evaluation is appreciably more important than cost or price and, as such, greater consideration shall be given to technical excellence rather than cost or price alone. Cost or price is somewhat more important than past performance and, as such, greater consideration shall be given to cost or price rather than past performance alone. Tradeoffs, as described in FAR Part 15, are also allowed.

Awards will be made to those responsible offerors whose offers provide the best value to the Government, in terms of technical excellence, cost or price, and performance risk (as applicable), and other factors – to include consistency and accord with the objectives of the BAA and the FRA's mission and its interest in pursuing the proposed technology advancement and/or demonstration. Awards may take the form of contracts, grants or cooperative agreements.

Contracts will be used when the principal purpose is the acquisition of supplies or services (including research and development) for the direct benefit or use of the Federal Government.

- It is anticipated that most contracts resulting from this BAA will be cost-reimbursement type contracts (i.e., cost, cost-sharing, or cost-plus-fixed-fee). These types of contracts permit reimbursement of the actual cost of performing the contracted work, and may or may not allow for profit or fee. Cost-reimbursement contracts are suitable for use only when uncertainties in contract performance do not permit costs to be estimated with sufficient accuracy to use any type of fixed-price contract. Some contracts resulting from this BAA may be awarded on a fixed-price basis (e.g., firm-fixed price completion, or firm-fixed-price level-of-effort term contracts). Fixed-price contracts are used when the work effort can be estimated accurately and the services to be rendered are reasonably definite. Other contract types, as described in FAR Part 16, may also be used.

- To the maximum extent practicable, the Government will structure contracts awarded under the BAA using "Performance-based contracting" methods. As described in FAR Part 37.6, performance-based contracting methods are intended to ensure that required performance quality levels are achieved and that total payment is related to the degree that services performed meet contract standards. Performance-based contracts –

a) Describe the requirements in terms of results required rather than the methods of performance of the work;
b) Use measurable performance standards (i.e., terms of quality, timeliness, quantity, etc.) and quality assurance surveillance plans;
c) Specify procedures for reductions of fee or for reductions to the price of a fixed-price contract when services are not performed or do not meet contract requirements; and
d) Include performance incentives where appropriate.

- Because of the broad range and diversity of activities that may be proposed under the BAA, it does not lend itself to the use of a common work statement. As such, no single North American Industry Classification System (NAICS) code (formerly Standard Industrial Classification (SIC) codes), will be issued for the BAA. NAICS codes will be specific to each individual contract award, as determined by the type of activity in which the actual offeror will be engaged, and as a function of the ownership characteristics of the prospective offeror.

  Grants or cooperative agreements will be used when the principal purpose of the transaction is to stimulate or support research and development for public purposes.

When awarding federal financial assistance through a grant or a cooperative agreement, the most appreciable difference in choosing between the two forms will be the level of involvement between the FRA and the recipient when carrying out the activity contemplated in the agreement. Substantial FRA involvement is permitted in cooperative agreements.

- Offers (i.e., proposal concept papers) being pursued as (or which are subsequently determined by FRA as) Federal financial assistance (e.g., grants or cooperative agreements), must be accompanied by the appropriate application forms.

Applicants may include in their submissions for consideration an opinion on the type of award instrument they consider would be the most suitable or appropriate venue for their proposed technology advancements or demonstrations. This will normally also be reflected in the structure of the cost/price portion of the applicants' proposals.

All awards will be subject to the availability of funds. Prospective offerors are cautioned that only the Grants/Contracting Officer can legally commit the Government to the expenditure of public funds under this BAA.

## PART VI - MISCELLANEOUS

**Cautionary Note!** - Prospective offerors are cautioned that the proposal concept paper may contain data the offeror does not want disclosed to the public for any purpose, or used by the Government except for evaluation purposes. If the offeror wishes to restrict such data, the title page must be marked with the following legend (and relevant sheets marked as instructed):

> This proposal includes data that shall not be disclosed outside the Government and shall not be duplicated, used, or disclosed – in whole or in part – for any purpose other than to evaluate this proposal. However, if a contract is awarded to this offeror as a result of – or in connection with – the submission of these data, the Government shall have the right to duplicate, use, or disclose the data to the extent provided in the resulting contract. This restriction does not limit the Government's right to use information contained in these data if they are obtained from another source without restriction. The data subject to this restriction are contained in Sheets *[insert numbers or other identification of sheets]*.

To the extent that such restrictions on proprietary data or information would not interfere with the intent of the Government to make the results of the work and projects awarded under the BAA available to all interested parties, and if in conformance with the Freedom of Information Act (5 U.S.C. 552, as amended), the Government will honor those desires.

**Terms and Conditions** - Awards will generally contain, where appropriate, detailed provisions concerning patent rights, rights in technical data and computer software, data reporting requirements, and other terms and conditions which will be negotiated as part of the award process.

**Deliverables, Presentations and Demonstrations** - Any specific deliverables (e.g., hardware, models, data, etc.), presentations, and/or demonstrations to be provided or conducted during the course of, or at the conclusion of an awarded contract, will largely be a function of that presented in the offeror's proposal concept submission or as negotiated at time of award and specified in the resulting contract.

**Reporting Requirements** - The number and types of reports will be specified in individual award documents. Progress, and interim, draft and/or final reports will be prepared and submitted in accordance with FRA reporting requirements, which will be provided with the award documents.

## Internet Sites of Interest for Contracting with the Department of Transportation and the Federal Railroad Administration

U.S. Department of Transportation
Acquisition and Grants Home Page
http://www.dot.gov/ost/m60/

Contracting with DOT
http://osdbuweb.dot.gov/business/mp/miphtml1.html

DOT Office of Small and Disadvantaged Business Utilization
http://osdbuweb.dot.gov/

DOT OSDBU
Marketing Information Packet

http://osdbuweb.dot.gov/business/mp/mip.html

DOT Contracting Opportunities
http://osdbuweb.dot.gov/business/procurement/index.html

DOT Procurement Forecast
http://osdbuweb.dot.gov/business/procurement/forecast.html

Performance-Based Service Contracting
http://www.dot.gov/ost/m60/pbsc/

Federal Railroad Administration
Office of Acquisition & Grants Services
http://www.fra.dot.gov/us/content/389

Federal Acquisition Regulation (FAR)
http://www.arnet.gov/far

Office of Management and Budget Grants Management (Circulars/Forms)
http://www.whitehouse.gov/OMB/grants/

Federal Business Opportunities (FedBizOpps) (formerlyEPS)
http://www.fedbizopps.gov/

**PROPOSAL CONCEPT PAPER**
**Content Summary Recap**
*(The BAA 2007-1 Package must be read in its entirety. The following is for illustration purposes only.*)

**Section A - Technical Concept***
Title; Applicant/Offeror; Capabilities; Objective; Potential Application; Maturity and Adaptation; Test Bed; Project Description; and Project Duration.

**Section B - Cost or Price***
Labor; Overhead/Fringe; Materials, Supplies and Equipment; Travel and Transportation; Subcontracts; Other Direct Cost (ODC); Miscellaneous; G&A, Profit or Fee (if any); and Cost Sharing/Cost Participation.

**Section C - Past Performance Information** (N/A to State or Local Govt. or Univ.)
For projects $100K or more, the Offeror completes Appendix ASurvey Part 1 & Part 2 for each of 3 relevant contract references. Does not count in 20-page limit.

**Section D - Phased or Follow-on Work**
Optional Section not to exceed 3 - 5 pages. Do not furnish if project does not entail phased or follow-on work. Does not count in 20-page limit.

**Resumes/C.V.s**
1 to 2 pages per Key Person. Not to exceed 3 persons per concept paper.

Does not count in 20-page limit.

## Outside Support

Statements or letters of commitment from 3rd parties to support activities or share in project costs should be furnished or made available upon request. Does not count in 20-page limit.

## Application for Federal Financial Assistance

Offerors seeking to enter into a grant or cooperative agreement (usually States) must submit appropriate application forms. Otherwise disregard. Does not count in 20-page limit.

***Section A + Section B ≤ 20 pages**

## PART VII - SUBMISSION

In preparing proposal concept paper for submission to the FRA, offerors are reminded to carefully read this entire BAA and to comply with all content and format requirements.

For identification purposes, submissions should reference the BAA number and title (BAA 2007-1 - Funds Availability for Research Projects and Technology Advancements For FRA Research and Development Program) on the outer packaging and on the submission itself.

Offerors shall submit

- An original and four (i.e., a total of five) paper copies of each proposal concept paper and related materials; and

Offerors shall submit proposal concept paper and related materials via regular U.S. mail or express delivery to the following address:

Federal Railroad Administration
Office of Acquisition and Grants Services,
West Building, W34-302, Stop 50
Attention: Robert Carpenter
1200 New Jersey Avenue, SE
Washington, D.C. 20590

**Note: Neither facsimile nor other electronic submissions/applications/offers are authorized.**

**Submissions that are incomplete or materially lacking, pursuant to the instructions in the BAA 2007-1 Package, may be returned unevaluated, or evaluated as is, without further opportunity for revision, at the discretion of the Source Selection Authority.**

# Appendix A
# FEDERAL RAILROAD ADMINISTRATION
# CONTRACTOR PAST PERFORMANCE SURVEY

## INTRODUCTION

The Federal Railroad Administration (FRA) is currently conducting a competitive procurement solicitation entitled **"BROAD AGENCY ANNOUNCEMENT (BAA) 2007-1"** for which the prospective offeror/applicant (excepting states or local governments, or universities) has been requested to identify Government agencies or commercial business firms it has previously contracted with or to whom it is currently under contract, to serve as potential references on its past performance record. You are being asked to complete the attached Contractor Past Performance Survey. **Parts I and II** are to be completed and returned by the offeror/applicant with its submission. **Part III should be completed by the evaluator/respondent and forwarded directly to FRA (See Note below regarding Part III transmittal.)** You may also be contacted by an FRA procurement official to arrange a telephone interview, using the survey as the focal point of the interview.

To ensure frank and open evaluations and expressions of opinions by evaluators, all parties are advised that the identity of respondents completing the survey will be held in confidence and will not be released or disclosed to the contractor or outside the Government. However, as specified under Federal Acquisition Regulation 15.306, conditions may exist in which the contractor may be provided an opportunity to discuss adverse past performance information on which the contractor has not had a previous opportunity to comment. Any relevant contractor performance/customer evaluations previously prepared within the last three years by the agency/firm providing this reference, and subsequent responses or rebuttals from the contractor, may be requested to augment or furnished in lieu of this survey or interview.

**NOTE: Part III – "Evaluator's Assessment" of this survey should NOT be returned or furnished in a copy to the subject offeror/applicant. The evaluator/respondent should mail or FAX Part III directly to: Federal Railroad Administration, Office of Acquisition & Grants Services, W34-302, Mail Stop 50, 1200 New Jersey Avenue, SE, Washington, DC 20590. FAX to 202/493-6171.** If you have any questions, please contact Robert Carpenter, Tel: 202/493-6153, Email: Robert.Carpenter@fra.dot.gov; or Illona Williams, Tel: 202/493-6130, Email: Illona.Williams@fra.dot.gov.

## EVALUATION RATING GUIDELINES

**Exceptional (5) -** Performance in the respective area of evaluation, consistently and reliably *far exceeded standards* or expectations as set forth in the contract, or as prior experience and knowledge of the industry would suggest or dictate. There were essentially *no major problems*, weaknesses, or deficiencies of consequence, nor negative performances issues as it applies to the respective area of evaluation. The contractual performance of the element or sub-element being assessed was accomplished with *few minor problems* for which the contractor took *highly effective and timely corrective action.*

**Very Good (4)** -Performance in the respective area of evaluation, consistently and reliably *exceeded standards* or expectations as set forth in the contract, or as prior experience and knowledge of the industry would suggest or dictate. There were essentially *no major problems*, weaknesses, or deficiencies of consequence, nor negative performances issues as it applies to the respective area of evaluation. The contractual performance of the element or sub-element being assessed was accomplished with *some minor problems* for which the contractor took *effective and timely corrective action.*

**Satisfactory (3)** - Performance in the respective area of evaluation, consistently and reliably *met standards* or expectations as set forth in the contract, or as prior experience and knowledge of the industry would suggest or dictate. There were essentially *no major problems*, weaknesses, or deficiencies of consequence, nor negative performances issues as it applies to the respective area of evaluation. The contractual performance of the element or sub-element being assessed was accomplished with *some minor problems* for which the contractor took *competent and timely corrective action.*

**Marginal (2)** - Performance in the respective area of evaluation, *did not meet standards* or expectations as set forth in the contract, or as prior experience and knowledge of the industry would suggest or dictate. There were problems, weaknesses, or deficiencies of consequence, or negative performances issues as it applies to the respective area of evaluation. The contractual performance of the element or sub-element being assessed was accomplished with *some minor problems and one or more major problems* for which the contractor took *minimal or ineffectual and/or untimely corrective action.*

**Unsatisfactory (1)** - Performance in the respective area of evaluation, *failed to meet standards* or expectations as set forth in the contract, or as prior experience and knowledge of the industry would suggest or dictate. There were problems, weaknesses, or deficiencies of consequence, or negative performances issues as it applies to the respective area of evaluation. The contractual performance of the element or sub-element being assessed was accomplished with *numerous minor and numerous major problems* for which the contractor took *virtually no, or minimal or ineffectual, and/or untimely corrective action.*

## PART I - ADMINISTRATION – Contractor Past Performance Survey

*(To be completed by Offeror/Applicant and submitted with its Offer/Submission)*

| | |
|---|---|
| Name of Agency/Business<br>Reference Conducting Assessment: | |
| Name of Offeror/Applicant Making Submission Under **BAA-2007-1**: | Name of Organization/Person To Whom Reference Applies If Other Than Offeror/Applicant: |
| Contract or Project Title: | |
| Contract No. | Delivery/Task Order No. |
| Performance Period(s): Base Period- from to | & Base plus All Options - from to |
| Dollar Value(s): Base Period - | & Base plus All Options - |

Contract Type and Method of Contracting: (*Check all that apply*)

[ ] Full & Open Competition [ ] Other Than Full & Open Competition
[ ] Negotiated [ ] Sealed Bid [ ] Simplified Acquisition [ ] FSS/MAS [ ] 2-Step or Phased
[ ] Firm Fixed Price [ ] Other FP type _____ *(specify)*
[ ] Cost (no fee) [ ] Cost Plus Fixed Fee [ ] Other Cost Reimbursement type _____ *(specify)*
[ ] Other Contract type _____ *(specify)*
[ ] SBA 8(a) [ ] SBIR [ ] HUBZone Set-Aside [ ] SDB Price Adjustment [ ] Small Business Set-Aside

## PART II - RELEVANCY/PERSPECTIVE – Contractor Past Performance Survey

*(To be completed by Offeror/Applicant and submitted with its Offer/Submission)*

For Part II, the offeror shall complete and insert a single page that addresses the following three areas of inquiry: Description of Prior Contract Services, Relevancy, and Problem Resolution and Quality Honors. The text of the offeror's responses for all three inquiries combined shall not exceed one page.

| **Description of Prior Contract Services:** Provide a short description of supplies/services the offeror furnished in the referenced contract evaluated herein. *(Recommend 5 -10 lines.)* | **Relevancy:** Describe how the referenced contract evaluated herein is relevant (in terms of scope, magnitude, cost, human resources, or other aspects) to the research project, technology advancement and/or demonstration being proposed in the offeror's proposal concept paper submitted. Identify whether the offeror was the prime contractor or a major subcontractor (in terms of total contract cost, 25% or more), or served in some other capacity/role or relationship. Provide name, point of contact and phone number of prime contractor, if other than offeror. *(Recommend 20 -25 lines.)* | **Problem Resolution and Quality Honors:** The offeror may describe problems encountered in the identified contract and the demonstrated effectiveness of the offeror's corrective actions. Identify any Federal Government contracts/orders, of any type, at any dollar value, held by the offeror which were terminated for cause or for default (partial or complete) within the past three (3) years and subsequent corrective action. The offeror may also describe any specific quality awards or quality certifications received in connection with the referenced contract. *(Recommend 15 -20 lines.)* |
|---|---|---|

***NOTE:*** **Do not return or furnished a copy of this Part III to the subject offeror/applicant**. The evaluator/respondent should complete this part and **mail or FAX it directly to FRA, Office of Acquisition & Grants Services, W34-302, Mail Stop 50, 1200 New Jersey Avenue, SE, Washington, DC 20590. FAX number: 202/493-6171.** If you have any questions, please contact Robert Carpenter, TEL: 202/493-6153, Email: robert.carpenter@dot.gov ; or Charles Nurse, TEL: 202/493-6130, e-mail: charles.nurse@dot.gov.

## PART III - EVALUATOR/RESPONDENT'S ASSESSMENT

*(To be completed and signed by refererred Evaluator/Respondent for **BAA-2007-1**)*

Contractor: _____ Contract No. _____

**1. Quality of Product or Service** - The offeror is to be evaluated on its compliance with contract requirements, accuracy of reports, technical excellence to include quality awards/certificates, or other quality-related contract standards.

| | |
|---|---|
| Were services and/or deliverables in compliance with contract requirements or specifications? | [ ] yes - [ ] no - [ ] n/a *(Check one)* |
| Were the services/tasks performed and/or deliverables furnished in conformance with standards of good workmanship and otherwise acceptable? | [ ] yes - [ ] no - [ ] n/a *(Check one)* |

| QUALITY OF PRODUCT/SERVICE | Corresponding Adjectival & Numerical Ratings *(Circle one)* | | | | |
|---|---|---|---|---|---|
| | Unsatisfactory | Marginal | Satisfactory | Very Good | Exceptional |
| | 1 | 2 | 3 | 4 | 5 |

*Use remaining space (and additional cross-referenced sheets, as necessary) to–*
*(1) Explain the rationale for the assigned adjectival/numerical rating (i.e., recount specific extraordinary or poor contractor performance, or problems and responses that support assessment) , and (2) Describe the basis for any "no" responses to questions.*

**2. Timeliness of Performance** - The offeror is to be evaluated on meeting milestones, reliability, responsiveness to technical direction, deliverables completed on-time, adherence to contract schedules including contract administration, or other time-related contract standards.

| | |
|---|---|
| Were all deliverable(s) and/or report(s) furnished on or before the time/event specified in or agreed to pursuant to the contract? | [ ] yes - [ ] no - [ ] n/a *(Check one)* |
| Were contract schedules consistently met and adhered to, and were timely adjustments made in response to technical direction so as to stay on agreed schedule(s)? | [ ] yes - [ ] no - [ ] n/a *(Check one)* |

| TIMELINESS OF PERFORMANCE | Corresponding Adjectival & Numerical Ratings *(Circle one)* | | | | |
|---|---|---|---|---|---|
| | Unsatisfactory | Marginal | Satisfactory | Very Good | Exceptional |
| | 1 | 2 | 3 | 4 | 5 |

*Use remaining space (and additional cross-referenced sheets, as necessary) to–*
*(1) Explain the rationale for the assigned adjectival/numerical rating (i.e., recount specific extraordinary or poor contractor performance, or problems and responses that support assessment) , and (2) Describe the basis for any "no" responses to questions.*

Contractor: _____ Contract No. _____

**3. Cost Control** - The offeror is to be evaluated on its ability to perform within or below budget, use of cost efficiencies, relationship of negotiated costs to actuals, submission of reasonably priced change proposals, and providing current, accurate, and complete billing in a timely fashion. For fixed price contracts, this area assesses whether the contractor met the original price/cost estimated or needed to negotiate cost changes to meet program requirements.

| | |
|---|---|
| Did the contractor operate at or below budget, or at the stated, fixed price? | [ ] yes - [ ] no - [ ] n/a *(Check one)* |
| Were actual cost expenditures reported by the contractor generally in line with projected costs (including approved shifts in effort) for designated time frames or specific supplies/services? | [ ] yes - [ ] no - [ ] n/a *(Check one)* |

| | Corresponding Adjectival & Numerical Ratings *(Circle one)* | | | | |
|---|---|---|---|---|---|
| COST CONTROL | Unsatisfactory | Marginal | Satisfactory | Very Good | Exceptional |
| | 1 | 2 | 3 | 4 | 5 |

*Use remaining space (and additional cross-referenced sheets, as necessary) to–*
*(1) Explain the rationale for the assigned adjectival/numerical rating (i.e., recount specific extraordinary or poor contractor performance, or problems and responses that support assessment) , and (2) Describe the basis for any "no" responses to questions.*

**4. Business Relations** - The offeror is to be evaluated on its ability to provide effective management, meet applicable subcontractor and small, small disadvantaged, and women-owned business goals, cooperative and proactive behavior with the technical representative(s) and Contracting Officer, flexibility, responsiveness to inquires, problem resolution, and customer satisfaction with the overall performance, and final product or services.

| | |
|---|---|
| Was the contractor responsive to complaints and did the contractor commit adequate resources to meet contract requirements or otherwise provide effective solutions to solve problems as they arose? | [ ] yes - [ ] no - [ ] n/a *(Check one)* |
| Would you recommend or elect to contract with this contractor for future work of the same or substantially similar nature as that conducted under the contract evaluated in this survey? | [ ] yes - [ ] no - [ ] n/a<br>[ ] n/a to assessment period |

| | Corresponding Adjectival & Numerical Ratings *(Circle one)* | | | | |
|---|---|---|---|---|---|
| BUSINESS RELATIONS | Unsatisfactory | Marginal | Satisfactory | Very Good | Exceptional |
| | 1 | 2 | 3 | 4 | 5 |

*Use remaining space (and additional cross-referenced sheets, as necessary) to–*
*(1) Explain the rationale for the assigned adjectival/numerical rating (i.e., recount specific extraordinary or poor contractor performance, or problems and responses that support assessment) , and (2) Describe the basis for any "no" responses to questions.*

## 5. Evaluator's Identification/Signature

Contractor: _____ Contract No. _____

| | | |
|---|---|---|
| **Name of Evaluator/Respondent:**<br><br>**Position or Title:**<br>*(e.g., COTR, Task Monitor, Project Manager, etc.)*: | | |
| **Address of Activity/Business:** | | |
| **Telephone No.** | **Fax No.** | **Email Address:** |
| **Signature:** | | **Date:** |

*(To be completed by Gov't Interviewer only when survey is completed on behalf of Evaluator/Respondent. Otherwise leave blank.)*

| | | |
|---|---|---|
| Name of Interviewer: | | |
| Telephone No. | Fax No. | Email Address: |
| Signature: | | Date of Interview: |