The Pennsylvania Turnpike Commission will retain a systems integrator/engineering firm for an Open-End Contract for design and implementation of Intelligent Transportation Systems (ITS) along the Pennsylvania Turnpike System. The estimated amount and time for this Open End is $2,000,000 and a period of (3) years.

The ITS system projects proposed for design and integration will be initiated through work order assignments which are prioritized and implemented based on a number of factors, including: customer service and operational requirement priorities, Commission approved capital funding allocations for ITS, and obligated federal funding appropriations. The majority of ITS projects being proposed will involve Federal Funding Participation and will require detailed technical and cost proposals for each work order assignment in format acceptable to both the Pennsylvania Department of Transportation (PennDot) and the Federal Highway Administration (FHWA). Technologies, which achieve desired results, with cost saving potential and proven functionality may be considered as viable for project implementation. In addition, construction management and inspection, software and hardware acceptance testing and system acceptance testing shall be considered as part of each task assignment, as applicable. The Commission currently holds Consultant Services Agreements with other Consulting Engineering Firms, as well as other public entities, for the development of software integration and design services. Furthermore, the Commission anticipates entering into additional agreements in the future. It is possible that the CONSULTANT will be working on the same tasks with another consultant or public entity. The CONSULTANT shall coordinate activities with other consulting engineering firms or public entities for their contracts and projects under this AGREEMENT.

A partial listing and brief descriptions of ITS projects, which may be initiated under this open end agreement as follows:

**ITS Plan and Architecture** – Prepare a revised PTC ITS plan to permit systematic funding design and construction of ITS projects, which are needed, financially & resource achievable and maximize Federal Funding. Prepare a revised PTC ITS Architecture, which incorporates PTC ITS Architecture and Penn DOT Architectures in a comprehensive manner.

**Variable Message Signs** – Design and deployment of permanent and portable Variable Message Sign’s. The VMS system will provide traveler information to Turnpike customers at all pertinent locations within the Turnpike network. The ultimate VMS network will allow for information conveyance at all location-critical points within the Turnpike network including known incident problem areas, weather problem areas, tunnel areas and incident and congestion problem areas.

**Computer aided Dispatch System (CAD)** Through detailed coordination and Interviews with PTC and PSP staff, define the Operations Center Concept of Operations as it pertains to existing and future hardware and software requirements, Integration with PSP IIMS CAD deployment and Communications and information flow utilizing a Computer Aided Dispatch
System. A CAD is a data storage warehouse of all incident procedures, resources, pre-planned traffic diversion routes and incident documentation providing history trails. The CADS enables the Traffic Management Center to effectively dispatch the appropriate agencies in a timely manner using GPS and GIS mapping. The agencies can be tracked using Automatic Vehicle Location (AVL) and communicate via vehicles Mobile Data Terminal (MDT). The need for a complete CADS upgrade is required to prepare for the next phase of ITS. The Integration/Design team will be required to develop detailed functional requirements for the new CAD system, recommend procurement of CAD hardware and software, design and integrate CAD systems, develop enhancements to hardware and software to operate and integrate, test and deploy a new computer aided dispatch system. The system is the primary application used in the Turnpike Commission’s Operations Center and provides emergency services to Turnpike Customers through wireless and wire line communications with Pennsylvania State Police, contracted fire and rescue, and towing services integral to flow detection and incident response.

**Private Telecommunications Network (PTN)** - Using information from the Pennsylvania Turnpike Commissions Telecommunications Architecture Assessment provide wire-line, wireless, or a hybrid wire line/wireless design to cost effectively disseminate video, audio and data information between ITS field devices/locations and the Commissions Central Administration Building, Customers and Stakeholders.

Provide design to Transport all ITS voice, data, and video to a traffic management center(s) for remote monitoring, command, control, and redistribution. Provide this communication transport facility within the context of Telecommunications industry standards of reliability and maintainability.

**Traffic Flow Detection System (TFDS)** – Using a combination of transponder based (Short range RF technologies), radar, and cell phone technologies design a phased integrated TFDS to provide real-time traffic flow data to the Commission’s Traffic Operations Center (TOC) and to inform Turnpike travelers of current travel conditions via web speed map, which is currently in development. The sub-system designed will also provide a tool to examine incident management results, response procedures, and help develop future incident management plans. Finally the system will be utilized to identify queues and delays related to queues at all fare collection facilities, as well as provide a tool for toll collection auditing. The system will utilize a hybrid of vehicle detection technologies, including radar, toll tag detection and cellular to collect network system data.

**ITS Asset Management System** - This project will consist of two primary phases. The first phase will require a comprehensive inventory and maintenance plan for existing ITS components, sub-systems and related infrastructure by maintenance divisions. The maintenance plan will identify preventive maintenance procedures and schedules, spare part inventories and manpower resources required to maintain ITS equipment and components. The maintenance plan will also provide for service level agreements for hardware and software associated with ITS systems. The second phase will be an open-ended phase that will require periodic use by all maintenance personnel in order to maintain current and accurate data in the database. The asset manager will be used to track existing field equipments, maintenance of field equipment and provide a control mechanism for determining existing and future ITS needs. The system will identify the location of each inventory item by mile-marker, GPS position, offset from mainline and side of roadway. The asset manager will maintain a comprehensive listing of field components including installation date, recommended maintenance schedule and log of maintenance events. The asset manager will also provide a global perspective to all ITS components as a system, and provide automated system features such as maintenance tracking, data updates and performance analysis, and automatic message notification and forecasted expenditures.
External Agency Integration: This project will revisit previous studies to determine the Turnpike’s current and long-term external agency integration and information management requirements. The study will periodically address the specific agencies that need to be linked as well as an examination of the external data/information required to be exchanged. The data and communication sharing between the different agencies will be based on the information and architecture flows of the National ITS architecture based on the specific needs of the Turnpike and the region.

To be noted, this study is a companion study to the LRIP Gap Closing Project entitled “Coordinated Information Management” That study focuses on internal data/information required to be exchanged.

System Wide Detour Plan: This project will provide for periodic updates of detour plans to provide acceptable alternative routes, in cases where road closures are implemented in accordance with Plan X. These plans will allow traffic to be directed to exits off the Turnpike at specified interchanges, follow a certain route, and reenter the Turnpike at the next appropriate interchanges. The plan will identify alternative diversion routes for each road closure location.

Automatic Data Archiving/Data Analysis: This project will design and implement a data warehousing/data mining system that will collect, process, store and allow the retrieval of data generated by the Pennsylvania Turnpike ITS technologies and/or obtained from other internal or external stakeholder agencies in the region. The project will integrate the PTC data warehouse with other related data warehouses and transportation agencies for data sharing. In addition, the project will provide data mining capabilities to predict future trends and behaviors.

Truck Rollover Warning System: This project integrates speed and classification detection and information dissemination technologies to establish a vehicle rollover warning system for truck traffic on exit ramps. The system configuration will warn vehicles entering interchange deceleration areas traveling at unsafe speeds. Roadway sensors will send vehicle classification and speed data to the system controller where it is analyzed by specific algorithms to determine if present vehicle speeds are approaching or surpassing rollover thresholds. If the threshold is met, illuminated warning signs are triggered to alert the driver of unsafe speeds prior to the entrance into critical curve areas.

The ultimate condition Truck Rollover Warning System will implement an additional three sites for a total of four warning systems within the Turnpike network. Each site will provide standard warning system data including speed and classification, as well as send real time video; speed and classification data back to the traffic operations center.

511 Traveler Information System: This project will integrate Turnpike information dissemination operations with the Pennsylvania statewide 511- traveler information system being developed. The system provides comprehensive regional traveler information, including travel times, weather and road conditions as well as transit information via a voice and/or menu-driven route selection interface obtained through the three-digit phone code. The system will not only provide a powerful information dissemination tool for turnpike related travel, weather and road conditions data, but will also provide travelers with extensive information concerning travel times and incident information for intersecting, non-turnpike routes, providing insight into conditions that may be encountered once the traveler has exited the turnpike. The ultimate condition 511 system will collect, reduce and distribute the traveler information via an automated system. The data will be supplied by vehicle detection components.

Emergency call box Re-engineering: This project will systematically re-engineer the Turnpike’s Emergency Call Box sub system, implementing new technology and a more efficient
The primary focus of the project will be the implementation of new emergency call boxes and related system components, as well as the modification of existing methods of call box system operations at the traffic control center.

The ultimate condition of the new emergency call box system will streamline incoming call operations at the control center and provide turnpike travelers with a system that will allow for detailed incident descriptions and added traveler comfort. As an added benefit, the new system will also establish wireless data ports along the entire turnpike network. Because of the technology used for the new system, cellular communications will be available at each emergency call box location. The ultimate Emergency Call Box system will utilize cellular communications to provide a more concise method of relaying information from the field to the operations center.

Closed-Circuit Television System - This project will provide additional camera sites to supplement the existing closed circuit television network currently in use by the Turnpike. Upon completion of the network’s video surveillance system, the Turnpike will establish video coverage of all of the interchanges and all fare collection facilities. Camera sites will also be established at all tunnel entrances and exits and tunnel midpoints of each tube. Additional CCTV sites will be located at Road Weather Information System locations for data verifications purposes. Camera sites will also be located at the major bridges and at intermediate, location-critical points within the turnpike network. Finally, slip locations will have CCTV surveillance.

Highway Advisory Radio: This Project provides for the addition of portable and permanent Highway Advisory Radio sub-systems and system integration with the Variable Message Sign sub-system to provide full information dissemination to Turnpike travelers.

The ultimate condition of the HAR sub-system will establish one-way radio communications to travelers in areas where weather or traffic congestion is an issue. HAR broadcast sites will be located at all interchanges, service plazas and location-critical points within the Turnpike network and will also integrate portable HAR systems for construction and maintenance of traffic related information dissemination.

Flash-Beacon signs will identify all HAR broadcast sites. The signs will be required for notification of broadcast sites located on approach to interchanges, on roads approaching Turnpike interchanges, at sites located near the service plazas, and other critical locations within the Turnpike network.

Incident Response Vehicle: This project will develop a dedicated Incident Response Vehicle best suited for responding to major incidents within the Pennsylvania Turnpike network. The vehicle will centralize all on-site incident response and recovery operations and provide a real-time incident data source to the traffic operations center during incident management procedures. The vehicle will not only establish an incident response command post, but also be capable of providing incident recovery assistance with such procedures as vehicle relocation, incident video capture and dissemination, maintenance of traffic and preliminary roadway repairs. These capabilities will improve incident response times, and times associated with incident management and restoration of normal traffic flow.

Road Weather Information Systems: This project will expand the number of The Road Weather Information Systems (RWIS) on the Turnpike system. Each new RWIS will supply atmospheric and pavement surface data to the operations center and maintenance facilities where data reduction will be conducted and response schemes designed and implemented.

The ultimate condition of the RWIS sub-system will establish RWIS stations at all weather sensitive points within the Turnpike network. The ultimate RWIS system condition will allow for weather data sharing between local agencies, PennDOT, local media and other stakeholders to
develop a comprehensive statewide weather forecasting and monitoring system, and augment the turnpike’s available weather data pool.

Traffic Operations Center – Concept of Operations (TOC ConOps) - Utilizing the Commissions existing Operations Center Concept of Operations (In process), revisit and update the Traffic Operations Concept of Operations as new stakeholders and new technologies emerge Utilizing this information together with future TEA earmarks and appropriations; Interviews with Commission Departments and Executive staff; and revise and update the Commissions ITS Long Range Plan. This project will analyze and determine the Turnpike’s current and long-term traffic operations requirements utilizing current ATIS programmed equipment and systems to address specific operational information needs. The analysis will develop a Concept of Operations (CONOPS) work product and the following supporting areas:

- System Integration
- Data Fusion Activities
- Staffing Issues

Service Plaza Travel Boards – Integration of service plaza information dissemination devices is not currently programmed within the ATIS project framework. This project will integrate Turnpike plaza information dissemination operations as part of the traveler information system operated from the Turnpike Operations Center through the current ATIS Center software. Development of a comprehensive Service Plaza ATIS is dependant upon the capability to provide real-time information from the TOC and be able to reliably distribute the information through the ATIS central software.

Fog Detection – Design and develop fog detection systems in problem weather areas within the Turnpike network. This system will include surveillance, control, and driver information systems e.g., Closed Circuit Television, Traffic Sensors, Variable Message Signs, Variable Speed Limit Signs, Visibility Sensors and Roadway Weather Information Systems.

Backup TOC – Prepare a design and deployment plan for a backup TOC.
The Commission will consider the following factors during the evaluation of the firms submitting Statements of Interest for this project:

a. Specialized experience and technical competence of the development team (Team) consisting of the prime consultant and subconsultants. The Team must clearly demonstrate the following:

The ability to develop, business rules and functional requirements specification and system design for PTC software enhancements in compliance with ITS and USDOT National Architecture, PTC ITS Architecture, and in compliance with the standards adopted by the International Standards Organization (ISO) including but not limited to the National Transportation Communications ITS Protocol (NTCIP), where applicable.

The ability to document the development of these products in four major deliverables: System Development Plan, Detailed Requirements Specification, Acceptance Test Plan, and Detailed Design Document.

The ability to assist the PTC staff in understanding the capabilities that will be provided through at least three formal reviews: Preliminary Design Review, Requirements Walk-Through, and Critical Design Review.

The ability to integrate all required system components, and provide an operational system passing all required acceptance test procedures that is fully in conformance with the system design.

The expertise of the team in identifying current state of the art equipment and systems to implement and integrate the programs described in the ITS Long Range Plan.

Software licenses, warranty, support and upgrades provided for software developed or modified by the Integrator/Engineering firm.

b. Past record of performance with respect to cost control, work quality, ability to meet schedules and previous experience on similar projects. The members of each Team should identify similar projects that have been completed by that firm as the prime or subconsultant, the magnitude of the project, and the client.

c. The specific experience and number of individuals who constitute each firm on the Team.

d. Workload of the prime consultant and subconsultants for all Pennsylvania Department of Transportation and Pennsylvania Turnpike Commission projects. Other factors, if any, specific to the project.

Address these items and any necessary further details in a brief yet comprehensive manner in the statement of interest.

Questions and inquiries concerning this Project should be directed to Louis L. Cortelazzi at 717-939-9551 ext. 3450 or via e-mail at lcortela@paturpike.com. Direct contractual questions to George M. Hatalowich at 717-986-8737; or via e-mail at ghatalow@paturpike.com.
GENERAL REQUIREMENTS AND INFORMATION

Firms interested in providing the above work and services are invited to submit a Statement of Interest with the required information. The Statements of Interest must include the following:

1. One page transmittal letter clearly identifying the project reference number, brief description of the project from the advertisement, the firm’s federal identification number, the firm’s legal name, contact person or project manager, address of corporate office and project office. (If the firm has multiple offices, the location of the office performing the work must be identified).

2. A twenty (20)-page expression of interest on the advertised project. Each firm should demonstrate their ability to perform the specific requirements indicated for each project and provide explanation of the technical approach.

The following topics must be addressed:

Management and Experience (3 Pages maximum) - The Team shall present its experience and approach to the management of an incremental build process and experience with task order contracts. The development team certifications shall also be listed and discussed.

Basic System Architecture (5 Pages maximum) - The Team shall demonstrate substantive experience in developing and implementing similar systems and shall describe a basic architecture including: Hardware/Software Environment and Database Management System; Graphical User Interface Functionality; and the Integration of Existing ITS Subsystems.

Development Process (5 Pages maximum) - In this section, the Team shall describe the development process, how it will be controlled, tracked, and demonstrated. This must include: Requirements Tracking and Configuration Management; Rapid Prototyping; and Development Testing.

Training, Operations, and Maintenance (3 Pages maximum) - The Team shall demonstrate an understanding and an approach to performing the transition of the system to operations and maintenance. This should address: Acceptance testing; Training and Documentation; and Maintenance.

Other Qualifications (4 Pages maximum) - The firm may include additional qualifications materials demonstrating their experience and qualifications in this section.

3. An organization chart for the Project, identifying key personnel and any subconsultants and their roles. Any deviation from the sub consultant’s listed in the statement of interest will require written approval from the Commission.

4. Tabulation or listing of workload for the prime consultant and all subconsultants for all Pennsylvania Department of Transportation and Pennsylvania Turnpike Commission projects. Do not graphically represent the firm’s workload.

5. A Consultant Qualification Package similar to the one submitted to the Pennsylvania Department of Transportation for the current year or one that is best suited for this project. A copy of the Consultant Qualification Package printed directly from Penn Dot's ECMS website is acceptable.
The Consultant Qualification Package should contain at a minimum the following information for the prime consultant and all subconsultants and attached to the back of the statement of interest (subs to follow primes):

- ECMS General Information and Project Experience Forms or Standard Form (SF) 254 - Architect-Engineer and Related Services Questionnaire in its entirety, either not more than one (1) year old as of the date of the advertisement.

- Resumes of key personnel expected to be involved in the project. (Limit to two (2) 8 1/2 x 11 pages, per person). Only resumes of key personnel should be included.

- A copy of the Department’s DBE/WBE Certification, if applicable.

The goal of DBE participation in this contract will be 12%. Firms expressing interest in this project must agree to ensure that Disadvantaged Business Enterprise (DBE) firms as defined in the Transportation Equity Act for the 21st Century (TEA-21) and currently certified by the Department of Transportation shall have the maximum opportunity to participate in any subcontracting or furnishing supplies or services approved under Form 442, Section 1.10(a). The act requires that firms owned and controlled by women (WBEs) be included, as a presumptive group, within the definition of Disadvantaged Business Enterprise (DBE). Responding firms shall make good faith efforts to meet the DBE goal using DBEs (as they are defined prior to the Act, WBEs or combinations thereof). Proposed DBE firms must be certified at the time of submission of the Statement of Interest. If the selected firm fails to meet the established goal, it shall be required to demonstrate its good faith efforts to attain the goal.

"Certified" means a DBE certified by any of the following agencies: Allegheny County, Office of Minority, Women and Disadvantaged Business Enterprises; City of Philadelphia, Minority Business Enterprise Council; Pennsylvania Department of Transportation, Bureau of Equal Opportunity; Port Authority of Allegheny County, Office of Equal Opportunity; or Southeastern Pennsylvania Transportation Authority, Small & Disadvantaged Business Utilization Department. If further information is desired concerning DBE/MBE/WBE participation, direct inquiries Mr. U. Harold Levy, Business Enterprise and Compliance Specialist, at (717) 939-9551 Ext. 4251, or by e-mail at hlevy@paturnpike.com.

A firm that responds to this solicitation as a prime may not be included as a designated subconsultant to another firm that responds to the same solicitation. Multiple responses under any of the forgoing situations will cause the rejection of all responses of the firm or firms involved. This does not preclude a firm from being set forth as a designated subconsultant to more than one prime consultant responding to the project advertisement.

Firms interested in performing the above services are invited to submit one (1) copy of a statement of interest and required information to Mr. George M. Hatalowich, Manager, Contract Administration at the PA Turnpike Commission Administration Building located at 700 South Eisenhower Boulevard, Middletown, PA 17057 (Street address). Our mailing Address is P. O. Box 67676, Harrisburg, PA 17106-7676.

The statement of interest and required information must be received by 12:00 PM (noon), Local Time, Friday, May 14, 2004. Any statements of interest received after this date and time will be time-stamped and returned.

Based on an evaluation of acceptable statements of interest received in response to these solicitations, three or more firms will be shortlisted for this project. The shortlisted firms will be required to submit a Technical Proposal based on a more detailed Scope of work, which is being prepared for this project.
The selected firm will be required to provide a copy of the firm’s registration to do business in the Commonwealth as provided by the Department of State for firms with out-of-state headquarters or corporations not incorporated in Pennsylvania.

The Commission may revise a published advertisement. If the Commission revises a published advertisement less than ten days before the Statement of Interest due date, the due date will be extended to maintain the minimum ten-day advertisement duration if the revision alters the project scope or selection criteria. Firms are responsible to monitor advertisements to assure the Statement of Interest complies with any changes in the published advertisement.

The Commission reserves the right to reject all statements of interest, to cancel solicitation requested under this notice, and/or to re-advertise solicitation for the work and services.

Mitchell Rubin
Chairperson