REQUEST FOR PROPOSALS FOR

Next Generation Advanced Traffic Management System

ISSUING OFFICE

Pennsylvania Turnpike Commission
Traffic Engineering and Operations Department
and
Information Technology Department

RFP NUMBER

RFP-16-10400-7393

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TABLE OF CONTENTS

Part I - GENERAL INFORMATION FOR PROPOSERS 2

Part II - INFORMATION REQUIRED FROM PROPOSERS 10

Part III - CRITERIA FOR SELECTION 15

Part IV - WORK STATEMENT 17

Contractual Appendices:
APPENDIX A – STANDARD AGREEMENT
APPENDIX B – SPECIAL TERMS AND CONDITIONS
APPENDIX C – SERVICE LEVEL AGREEMENT
APPENDIX D – INSURANCE SPECIFICATION
APPENDIX E – DIVERSE BUSINESS (DB) REQUIREMENTS

Appendix Forms for Submission with Proposal:
APPENDIX F – PROPOSAL COVER SHEET
APPENDIX G – COST SUBMITTAL
APPENDIX H – SOLUTION CAPABILITIES MATRIX
APPENDIX I – ATMS DEVICE DRIVER MATRIX
APPENDIX J – PROPOSED ATMS SOLUTION TECHNICAL SUMMARY
APPENDIX K –PROJECT DELIVERABLE SCHEDULE FORM

Informational Appendices:
APPENDIX L – CONCEPT OF OPERATIONS
APPENDIX M – SOLUTION REQUIREMENTS
APPENDIX N – REQUREMENTS TRACEABILITY MATRIX
APPENDIX O – INTERFACE LIST AND DESCRIPTIONS
APPENDIX P – ITS EQUIPMENT INVENTORY
APPENDIX Q – NETWORK DIAGRAMS*
APPENDIX R – PTC DMS MESSAGE LIBRARY
APPENDIX S – RCRS DATA FEED SAMPLE
APPENDIX T – PROJECT DELIVERABLE REVIEW AND APPROVAL PROCESS
APPENDIX U – PAYMENT SCHEDULE
APPENDIX V – LIST OF ABBREVIATIONS
APPENDIX W – PROPOSAL QUESTION FORM

*Appendix Q is not included in the advertised RFP package. Appendix Q is available to interested Proposers by submitting a written request on company letterhead to the Contracts Administration Department (scanned letter via email is acceptable). Please see Section I-10 and/or I-12 for contact information to submit for Appendix Q.

PART I

GENERAL INFORMATION FOR PROPOSERS

I-1. Purpose. This request for proposals (RFP) provides interested Proposers with sufficient information to enable them to prepare and submit proposals for consideration by the Pennsylvania Turnpike Commission (Commission) to provide and implement the Next Generation Advanced Traffic Management System (ATMS) Solution. This will include services to design the solution, configure, develop, implement, test, host, maintain, and support an ATMS solution package that will control all existing and future Intelligent Transportation System (ITS) devices, data, and select subsystems that are currently operated by the Commission. The ATMS will:

- Facilitate consistent and strategic responses to planned and unplanned events;
- Collect, maintain, and display real-time data from field devices and external systems;
- Be capable of continuing operation even after the failure of any single component;
- Conform to federal ITS architecture and standards;
- Interface with the Commission's existing software and data systems;
- Provide the Commission the ability to administer the front end of the system;
- Provide an asset management component;
- Provide compatibility/integration with all existing and future Commission ITS devices and subsystems;
- Provide the ability to collect, maintain, and report operational response performance data;
- Provide a two-way interface with PennDOT's ATMS for event and ITS device coordination.

Additional detail is provided in Part IV of this RFP.

I-2. Issuing Office. This RFP is issued for the Commission by the Traffic Engineering and Operations Department and Information Technology Department.

I-3. Scope. This RFP contains instructions governing the proposals to be submitted and the material to be included therein; a description of the service to be provided; requirements which must be met to be eligible for consideration; general evaluation criteria; and other requirements to be met by each proposal.

I-4. Problem Statement. The Commission operates and maintains more than 550 miles of roadway. The Traffic Operations Center (TOC) located in Highspire, Pennsylvania facilitates coordinated response to all roadway incidents, supports maintenance and construction activities, coordinates planned and unplanned "Plan X" closures, and coordinates and supports major planned special events. The TOC operators are responsible for dispatching and coordinating with incident responders. The Commission currently operates more than 200 ITS devices including Closed Circuit Television Cameras (CCTV), Dynamic Message Signs (DMS), Roadway Weather Information System stations (RWIS), Highway Advisory Radio (HAR) transmitters, and various other subsystems. These devices and subsystems are of various age and manufacturer.

In the current operational environment, in order to operate and view the status of all ITS devices, a TOC operator must use multiple software tools. There are multiple data sources that must be viewed within

multiple tools to maintain situational awareness. This adds several inefficiencies to the current operational environment within the TOC. This project will help the TOC become substantially more efficient by integrating the various ITS devices, data, and subsystems into one system interface for operators.

Over the next five years, the Commission intends to add approximately 130 devices across the system. The growing number of devices to manage, coupled with the subsystems needed to operate them, has created inefficiencies in operation of devices, data management, incident response, and reporting of travel conditions to the employees and customers of the Commission.

I-5. Type of Contract. It is proposed that if a contract is entered into as a result of this RFP, it will be **deliverable based fee for services, and monthly fee for maintenance and support services**. Additional services including but not limited to major enhancements will be negotiated during the term of this agreement. The Commission may, in its sole discretion, undertake negotiations with Proposers whose proposals as to price and other factors show them to be qualified, responsible, responsive and capable of performing the work. A sample contractual agreement is included in **Appendix A – Standard Agreement.**

I-6. Contractor Integrity Provisions. Contractor Integrity Provisions will apply to this contract upon award and the awarded vendor may be required to complete a Background Qualifications Questionnaire prior to entering into an Agreement with the Commission and attend annual ethics training provided by the Commission. Proposers can find these two documents on the Commission's website at www.paturnpike.com (Doing Business, General Information, Integrity Provisions).

Include full disclosure of any potential conflict with the State Adverse Interest of State Advisor or Consultant Statute by the prime or any sub-consultant. If there is no adverse interest you shall include the following statement: "I have reviewed the State Adverse Interest Statute and determined that there is no adverse interest for anyone on this Agreement team." This information should be included in your proposal Statement of the Problem section as described in Part II, Section II-3.

I-7. Rejection of Proposals. The Commission reserves the right to reject any and all proposals received as a result of this request, or to negotiate separately with competing Proposers.

I-8. Subcontracting. Any use of subcontractors by a Proposer must be identified in the proposal. During the contract period use of any subcontractors by the selected Proposer, which were not previously identified in the proposal, must be approved in advance in writing by the Commission.

If a Joint Venture responds to this RFP, the Commission will not accept separate proposals from joint venture constituents. A firm will not be permitted to submit a proposal on more than one (1) joint venture for the same RFP. Also, a firm that responds to this RFP as a prime may not be included as a designated subconsultant to another firm that responds to the same RFP. 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 RFP.

I-9. Incurring Costs. The Commission is not liable for any costs the Proposer incurs in preparation and submission of its proposal, in participating in the RFP process or in anticipation of award of contract.

I.10. Questions and Answers. A Pre-proposal meeting will not be held for this RFP. Written questions may be submitted to clarify any points in the RFP which may not have been clearly understood. Proposers shall use the form provided in **Appendix W – Proposal Question Form** to submit the questions. Completed Proposal Question Forms should be submitted by email to RFP-Q@paturnpike.com with **RFP 16-10400-7393** in the Subject Line to be received no later than **2:00 PM** local time on **January 11, 2017**. All questions and written answers will be posted to the website as an addendum to, and become part of, this RFP.

I-11. Addenda to the RFP. If it becomes necessary to revise any part of this RFP before the proposal response date, addenda will be posted to the Commission's website under the original RFP document. It is the responsibility of the Proposer to periodically check the website for any new information or addenda to the RFP.

The Commission may revise a published advertisement. If the Commission revises a published advertisement less than ten (10) days before the RFP 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/addenda to ensure the submitted proposal complies with any changes in the published advertisement.

I-12. Response. To be considered, proposals must be delivered to the Pennsylvania Turnpike Commission's Contracts Administration Department, Attention: Wanda Metzger on or before **2:00 PM** local time on **February 22, 2017**. The Pennsylvania Turnpike Commission is located at 700 South Eisenhower Boulevard, Middletown, PA 17057 (Street address). Our mailing Address is P. O. Box 67676, Harrisburg, PA 17106.

Please note that use of U.S. Mail, FedEx, UPS, or other delivery method, does not guarantee delivery to the Contracts Administration Department by the above listed time for submission. Proposers mailing proposals should allow sufficient delivery time to ensure timely receipt of their proposals. If the Commission office location to which proposals are to be delivered is closed on the proposal response date, due to inclement weather, natural disaster, or any other cause, the deadline for submission shall be automatically extended until the next Commission business day on which the office is open. Unless the Proposers are otherwise notified by the Commission, the time for submission of proposals shall remain the same.

I-13. Proposals. To be considered, Proposers should submit a complete response to this RFP, using the format provided in PART II. Each proposal should be submitted in **eight (8)** hard copies of the Technical Submittal, **eight (8)** hard copies of the Diverse Business (DB) participation submittal, and **eight (8)** hard copies of the Cost Submittal. In addition to the hard copies of the proposal, two **complete and exact copies** of the Technical, Cost and DB submittals (as defined in Part II), along with all requested documents on CD-ROM or Flash Drive in PDF format. The electronic copy must be a mirror image of the hard copy. Proposer should ensure that there is no costing information in the technical submittal. The CD or Flash drive should clearly identify the Proposer and include the name and version number of the virus scanning software that was used to scan the CD or Flash drive before it was

submitted. The Proposer shall present the proposal to the Contracts Administration Department only. No other distribution of proposals shall be made by the Proposer. Each proposal page should be numbered for ease of reference.

An official authorized to bind the Proposer to its provisions must sign the proposal. If the official signs the Proposal Cover Sheet (**Appendix F** to this RFP) and the Proposal Cover Sheet is attached to the proposal, the requirement will be met. For this RFP, the proposal must remain valid for at least **180 days**. Moreover, the contents of the proposal of the selected Proposer will become contractual obligations if a contract is entered into.

Each and every Proposer submitting a proposal specifically waives any right to withdraw or modify it, except as hereinafter provided. Proposals may be withdrawn by written or fax notice (fax number (717) 986-8714) received at the Commission's address for proposal delivery prior to the exact hour and date specified for proposal receipt.

Overnight Delivery Address:
Contracts Administration Department
Attn: Wanda Metzger
PA Turnpike Commission
700 South Eisenhower Blvd.
Middletown, PA 17057

US Mail Delivery Address:
Contracts Administration Department
Attn: Wanda Metzger
PA Turnpike Commission
P.O. Box 67676
Harrisburg, PA 17106

However, if the Proposer chooses to attempt to provide such written notice by fax transmission, the Commission shall not be responsible or liable for errors in fax transmission. A proposal may also be withdrawn in person by a Proposer or its authorized representative, provided his/her identity is made known and he/she signs a receipt for the proposal, but only if the withdrawal is made prior to the exact hour and date set for proposal receipt. A proposal may only be modified by the submission of a new sealed proposal or submission of a sealed modification which complies with the requirements of this solicitation.

I-14. Economy of Preparation. Proposals should be prepared simply and economically, providing a straightforward, concise description of the Proposer's ability to meet the requirements of the RFP. The Technical Proposal shall be limited to 100 pages (**Parts II-3 to II-9**), any Proposer provided appendices to the Technical Proposal shall be limited to ten (10) pages, and key staff résumés shall be a maximum of two (2) pages each - all using 12 font size or larger. Proposal Cover Sheet, Résumés, Key Staff Commitment Letters, Financial Capabilities supporting documentation (See **Part II-8**), and required appendices (**Parts II-10 through II-13**), shall not count against the proposal or appendix page limits. All Proposal documents shall be on standard Letter size (8-1/2" by 11") sheets of paper. Tabloid (11"x17") sheets are allowed for graphics, charts, tables, etc. and shall count as two (2) pages per printed side. Tabloid sheets shall be folded neatly into the document.

I-15. Discussions for Clarification. Proposers who submit proposals may be required to make an oral or written clarification of their proposals to the Issuing Office through the Contract Administration Department to ensure thorough mutual understanding and Proposer responsiveness to the solicitation requirements. The Issuing Office through the Contract Administration Department will initiate requests for clarification.

I-16. Best and Final Offers. The Issuing Office reserves the right to conduct discussions with Proposers for the purpose of obtaining "best and final offers." To obtain best and final offers from Proposers, the Issuing Office may do one or more of the following: a) enter into pre-selection negotiations; b) schedule oral presentations; and c) request revised proposals. The Issuing Office will limit any discussions to responsible Proposers whose proposals the Issuing Office has determined to be reasonably susceptible of being selected for award.

I-17. Prime Proposer Responsibilities. The selected Proposer will be required to assume responsibility for all services offered in its proposal whether or not it produces them. Further, the Commission will consider the selected Proposer to be the sole point of contact with regard to contractual matters.

I-18. Proposal Contents. Proposals will be held in confidence and will not be revealed or discussed with competitors, unless disclosure is required to be made (i) under the provisions of any Commonwealth or United States statute or regulation; or (ii) by rule or order of any court of competent jurisdiction. All material submitted with the proposal becomes the property of the Pennsylvania Turnpike Commission and may be returned only at the Commission's option. Proposals submitted to the Commission may be reviewed and evaluated by any person other than competing Proposers at the discretion of the Commission. The Commission has the right to use any or all ideas presented in any proposal. Selection or rejection of the proposal does not affect this right.

In accordance with the Pennsylvania Right-to-Know Law (RTKL), 65 P.S. § 67.707 (Production of Certain Records), Proposers shall identify any and all portions of their Proposal that contains confidential proprietary information or is protected by a trade secret. Proposals shall include a written statement signed by a representative of the company/firm identifying the specific portion(s) of the Proposal that contains the trade secret or confidential proprietary information.

Proposers should note that "trade secrets" and "confidential proprietary information" are exempt from access under Section 708(b)(11) of the RTKL. Section 102 defines both "trade secrets" and "confidential proprietary information" as follows:

> Confidential proprietary information: Commercial or financial information received by an agency: (1) which is privileged or confidential; **and** (2) the disclosure of which would cause substantial harm to the competitive position of the person that submitted the information.
>
> Trade secret: Information, including a formula, drawing, pattern, compilation, including a customer list, program, device, method, technique or process that: (1) derives independent economic value, actual or potential, from not being generally known to and not being readily ascertainable by proper means by other persons who can obtain economic value from its disclosure or use; **and** (2) is the subject of efforts that are reasonable under the circumstances to maintain its secrecy. The term includes data processing software by an agency under a licensing agreement prohibiting disclosure.

65 P.S. §67.102 (emphasis added).

The Office of Open Records has determined that a third party must establish a trade secret based upon factors established by the appellate courts, which include the following:

the extent to which the information is known outside of his business;

> the extent to which the information is known by employees and others in the business;
> the extent of measures taken to guard the secrecy of the information;
> the value of the information to his business and to competitors;
> the amount of effort or money expended in developing the information; and
> the ease of difficulty with which the information could be properly acquired or duplicated by others.

See Crum v. Bridgestone/Firestone North Amer. Tire., 907 A.2d 578, 585 (Pa. Super. 2006).

The Office of Open Records also notes that with regard to "confidential proprietary information the standard is equally high and may only be established when the party asserting protection shows that the information at issue is either 'commercial' or 'financial' and is privileged or confidential, and the disclosure ***would*** cause substantial competitive harm." (emphasis in original).

For more information regarding the RTKL, visit the Office of Open Records' website at www.openrecords.state.pa.us.

I-19. Debriefing Conferences. Proposers whose proposals are not selected will be notified of the name of the selected Proposer and given the opportunity to be debriefed, at the Proposer's request. The Issuing Office will schedule the time and location of the debriefing. The Proposer will not be compared with other Proposers.

I-20. News Releases. News releases pertaining to this project will not be made without prior Commission approval, and then only in coordination with the Issuing Office.

I-21. Commission Participation. Unless specifically noted in this section, Proposers must provide all services to complete the identified work. The Commission will provide a Commission Project Manager that will coordinate project meetings with the Selected Proposer, facilitate deliverable reviews by Commission and consultant staff, and will act as the single point of contact for all project correspondence. Commission support staff will be provided and utilized in a timely manner, as required.

I-22. Cost Submittal. (See **Appendix G – Cost Submittal**)The cost submittal shall be placed in a separately sealed envelope within the sealed proposal and kept separate from the technical submittal.

I-23. Term of Contract. The term of the contract will commence on the Effective Date (as defined below) and will end five (5) years after that date with option to renew for an additional 10 years incrementally in one or more steps. The Commission shall fix the Effective Date after the contract has been fully executed by the Contractor and by the Commission and all approvals required by Commission contracting procedures have been obtained.

I-24. Proposer's Representations and Authorizations. Each Proposer by submitting its proposal understands, represents, and acknowledges that:

a. All information provided by, and representations made by, the Proposer in the proposal are material and important and will be relied upon by the Issuing Office in awarding the contract(s). Any misstatement, omission or misrepresentation shall be treated as

fraudulent concealment from the Issuing Office of the true facts relating to the submission of this proposal. A misrepresentation shall be punishable under 18 Pa. C.S. 4904.

b. The price(s) and amount of this proposal have been arrived at independently and without consultation, communication or agreement with any other Proposer or potential Proposer.

c. Neither the price(s) nor the amount of the proposal, and neither the approximate price(s) nor the approximate amount of this proposal, have been disclosed to any other firm or person who is a Proposer or potential Proposer, and they will not be disclosed on or before the proposal submission deadline specified in the response section of this RFP.

d. No attempt has been made or will be made to induce any firm or person to refrain from submitting a proposal on this contract, or to submit a proposal higher than this proposal, or to submit any intentionally high or noncompetitive proposal or other form of complementary proposal.

e. The proposal is made in good faith and not pursuant to any agreement or discussion with, or inducement from, any firm or person to submit a complementary or other noncompetitive proposal.

f. To the best knowledge of the person signing the proposal for the Proposer, the Proposer, its affiliates, subsidiaries, officers, directors, and employees are not currently under investigation by any governmental agency and have not in the last four (4) years been convicted or found liable for any act prohibited by State or Federal law in any jurisdiction, involving conspiracy or collusion with respect to bidding or proposing on any public contract, except as disclosed by the Proposer in its proposal.

g. To the best of the knowledge of the person signing the proposal for the Proposer and except as otherwise disclosed by the Proposer in its proposal, the Proposer has no outstanding, delinquent obligations to the Commonwealth including, but not limited to, any state tax liability not being contested on appeal or other obligation of the Proposer that is owed to the Commonwealth.

h. The Proposer is not currently under suspension or debarment by the Commonwealth, or any other state, or the federal government, and if the Proposer cannot certify, then it shall submit along with the proposal a written explanation of why such certification cannot be made.

i. The Proposer has not, under separate contract with the Issuing Office, made any recommendations to the Issuing Office concerning the need for the services described in the proposal or the specifications for the services described in the proposal.

j. Each Proposer, by submitting its proposal, authorizes all Commonwealth agencies to release to the Commission information related to liabilities to the Commonwealth including, but not limited to, taxes, unemployment compensation, and workers' compensation liabilities.

I-25. Indemnification. The Proposer shall be responsible for, and shall indemnify, defend, and hold harmless the Commission and its Commissioners, officers, employees, and agents from any claim, liability, damages, losses, causes of action, and expenses, including reasonable attorneys' fees, arising from damage to life or bodily injury or real or tangible personal property caused by the negligence or other tortious acts, errors, and omissions of Proposer, its employees, or its subcontractors while engaged in performing the work of the Agreement or while present on the Commission's premises, and for breach of the Agreement regarding the use or nondisclosure of proprietary and confidential information where it is determined that Proposer is responsible for any use of such information not permitted by the Agreement. The indemnification obligation shall not be limited in any way by any limitation on the amount or type of damages, compensation or benefits payable by or for Contractor or its subcontractors under Workers' Compensation Acts, Disability Benefits Acts, or other Employee Benefit Act.

I-26. Performance/Payment Bond. When awarded the contract, furnish a Performance Bond, with sufficient surety or sureties, in an amount equal to 100% of the contract price. Have the bond specify that the contracted work will be completed in a manner satisfactory to the Commission. Have the bond state that the Commission is not liable for any expenses incurred through the failure to complete the work as specified, nor liable for any damages growing out of the carelessness of the Contractor, the Contractor's employees, or subcontractors.

Also furnish a Payment Bond in the amount of 100% of the contract price. Have a corporate surety, legally authorized to transact business in the State and satisfactory to the Commission, execute both bonds. If the Commission decides the bond surety is unsatisfactory, promptly furnish any additional required security to protect the Commission's interests and the interests of all persons, firms, or corporations who/which have furnished material, provided equipment on rental, or supplied/performed labor or services on, or in connection with, the performance of the work for this contract.

Have participants in a joint venture submit a single Performance Bond and a single Payment bond, each signed by both the joint participants and by their surety. These bonds are to cover their joint and individual liability.

I-27. Insurance. Proposer will comply with the Insurance requirements as described in **Appendix D - Insurance Specification**.

I-28. Diverse Business (DB) Requirements. Proposer will comply with the DB Requirements as described in **Appendix E – Diverse Business (DB) Requirements**.

PART II

INFORMATION REQUIRED FROM PROPOSERS

Proposals must be submitted in the format, including heading descriptions, outlined below. To be considered, the proposal must respond to all requirements in this part of the RFP. Any other information thought to be relevant, but not applicable to the enumerated categories, should be provided as an appendix to the proposal. All cost data relating to this proposal and all Diverse Business cost data should be kept separate from and not included in the Technical Submittal. Each proposal shall consist of three separately sealed submittals:

1. Technical Submittal, which shall be a response to RFP **Part II, Sections II-1 through II-13;**

2. Diverse Business Participation Submittal, in response to RFP **Part II, Section II-14**; and

3. Cost Submittal, in response to RFP **Part II, Section II-15**.

The Proposer shall refer to **Part I-14 Economy of Preparation** for proposal page limitations. The Commission will select the proposed solution based solely upon the Criteria for Selection defined in **Part III** of this RFP.

The Commission reserves the right to request additional information which, in the Commission's opinion, is necessary to assure that the Proposer's competence, number of qualified employees, business organization, and financial resources are adequate to perform according to the RFP.

The Commission may make such investigations as deemed necessary to determine the ability of the Proposer to perform the work, and the Proposer shall furnish to the Issuing Office all such information and data for this purpose as requested by the Commission. The Commission reserves the right to reject any proposal if the evidence submitted by, or investigation of, such Proposer fails to satisfy the Commission that such Proposer is properly qualified to carry out the obligations of the agreement and to complete the work specified.

II-1 Proposal Cover Sheet (See Appendix F)

Show the name of the proposing firm, Federal I.D. number, address, name of contact person, contact person's email and telephone number date and the subject: Next Generation **Advanced Traffic Management System (ATMS), RFP 16-10400-7393.** Appendix F must be signed by an individual who is authorized to negotiate terms, render binding decisions and commit the proposing firm's resources**.** In addition it is required that all information requested in Appendix F be provided including information pertaining to location of office performing the work, contact information, listing of all Pennsylvania offices and total number of Pennsylvania employees, and location of company headquarters.

II-2 Table of Contents

Include a clear identification of the material by section and by page number.

II-3 Statement of the Problem

Summarize the understanding of the work to be done and make a positive commitment to perform the work necessary. This section should summarize the key points of the submittal. Include in this section a statement regarding full disclosure of any potential conflict with the State Adverse Interest of State Advisor or Consultant Statute as instructed in RFP **Section I-6 Contractor Integrity Provisions**.

II-4 Management Summary

Include a narrative description of the proposed effort and list of the items to be delivered or services to be provided, and roles and responsibilities of key personnel.

II-5 Work Plan

Describe in narrative form the technical plan for accomplishing the work. Use the task descriptions and deliverables in Part IV of this RFP as a reference point. Modifications of the task descriptions and deliverables are permitted; however, reasons for changes should be clearly marked and fully explained. Indicate the number of person hours allocated to each task. Include a Critical Path Method (CPM) schedule or similar type display, showing each event and time relation. The CPM schedule shall include, at a minimum, major tasks, milestones, and deliverables.

Note: The Commission is interested in completing this project as expeditiously as possible while minimizing risk and fully and completely meeting all contract requirements.

II-6 Prior Experience

Include experience specifically in Advanced Traffic Management Systems. Experience shown should be work done by individuals who will be assigned to this project as well as that of the proposing company. Clearly differentiate between what experience is individual and what is that of the proposing company. Company studies or projects referred to must be identified and the name of the customer shown, including the name, address, and telephone number of the responsible official of the customer, company, or agency who may be contacted. All referenced projects shall be of recent completion with an emphasis on projects completed within the last five (5) years.

II-7 Personnel

Provide a separate project organizational chart showing all Key Personnel, including team leads, management personnel and numbers of proposed staff that will be required to implement the proposed approach. Provide résumés for all Key Personnel. Describe key roles and responsibilities for all proposed Key Personnel and for lead or management personnel for essential functions, including roles and responsibilities of sub-consultants and vendors. Key Personnel positions shall remain identified as such until written approval from the Commission ATMS Project Manager provides approval to alter.

The Selected Proposer will staff the project with individuals who possess a significant depth of experience within their functional area of expertise and with projects of similar size and scope as the Commission's ATMS implementation. Proposed personnel should have experience in ATMS technical areas and/or project management areas to which they are assigned.

The Proposer shall include résumés in the appendix section of the technical submittal. Résumé pages shall not count toward the proposal or appendix page limits.

In addition, the Proposer must submit a Letter of Commitment for all Key Personnel that is signed by the individual stating his/her intention to work on the ATMS Project (if the contract is awarded to the Proposer). Letters of Commitment shall not count toward the proposal or appendix page limits.

Proposers must not make changes to Key Personnel without receiving written agreement of the Commission ATMS Project Manager. Changes to Key Personnel will come under the heading of a "substitution" or a "replacement". A "substitution" is defined as an individual temporarily filling-in for a permanent resource. A "replacement" is defined as an individual permanently replacing an already assigned resource. The Proposer must provide résumés for alternate resources and receive Commission approval prior to substitution or replacement. Any substitute or replacement staff for Key Personnel positions must have qualified background and qualified experience. To the extent possible, the replacement of Key Personnel shall be limited to personnel performance issues or circumstances beyond the Proposer's control including but not limited to death, long-term sickness, retirement, or subcontract default. On learning of the need of substitution or replacement, the Selected Proposer shall notify the Commission project manager immediately and a written key personnel replacement plan shall be submitted within ten (10) business days of notification. The plan shall outline the steps to be taken to fill the key position as expeditiously as possible. For any substitutions or replacements of Key Personnel for either Proposer or Subcontractor – the substitute candidate must have equal or better experience than the original person and the request must be submitted to the Commission ATMS Project Manager for approval ten (10) business days prior to new Key Personnel joining the ATMS project. The proposer is responsible for ensuring that knowledge transfer occurs between key personnel.

II-8 Financial Capability

Describe the proposing company's financial stability and economic capability to perform the contract requirements. Provide the proposing company's financial statements for the past three fiscal years. If the proposing company is a publicly traded company, please provide a link to financial records on the proposing company website; otherwise provide three (3) years of the proposing company's financial documents such as audited financial statements or recent tax returns. Financial statements must include the company's Balance Sheet and Income Statement or Profit/Loss Statements. Also include a Dun & Bradstreet comprehensive report if available. The supporting documents identified above shall be included as an appendix to the proposal and will not count towards the proposal or appendix page limits.

NOTE: DO NOT INCLUDE ANY INFORMATION IN THIS SECTION THAT REFERS TO THE PROPOSED COSTS THAT WILL BE PRESENTED IN THE COST SUBMITTAL. DOING SO WILL DISQUALIFY THE PROPOSAL.

II-9 Proposed Solution

Describe the proposed solution and how the solution meets the solution requirements. The Proposer may utilize this section to expand upon comments provide within Appendix H – Solution Capabilities Matrix, provide screenshots, graphics, user interfaces, system interfaces, etc. that are representative of the proposed solution. Additionally, the Commission encourages the Proposer to highlight any current capabilities or planned initiatives for the proposed solution related to innovative traffic and incident management solutions with respect to the potential future functionality identified in Appendix L – Concept of Operations - Phase 3.

II-10 Appendix H – Solution Capabilities Matrix provides a list of the system functional requirements. The Proposer must complete the form to indicate the Proposer's ability to meet each of the system requirements. The completed **Appendix H** must be included as an appendix to the Proposer's RFP proposal and will not be included in the page limit of Proposer's Appendices.

II-11 Appendix I – ATMS Device Driver Matrix provides a list of the Commission's existing devices. Proposers must complete the form to indicate the Proposer's need to develop a new device driver. Additional opportunity is provided to identify Proposer's existing developed device drivers that are not listed and that are included as part of the proposed ATMS solution. The completed **Appendix I** must be included as an appendix to the Proposer's RFP proposal and will not be included in the page limit of Proposer's Appendices.

II-12 Appendix J – Proposed ATMS Solution Technical Summary form is a list of technical summary questions regarding the proposal. A brief answer to each item as it relates to the proposed ATMS solution should be provided. The completed **Appendix J** must be included as an appendix to the Proposer's RFP proposal and will not be included in the page limit of Proposer's Appendices.

II-13 Appendix K – Project Deliverables Schedule Form includes a list of required deliverables as outlined in section IV-4 of this RFP. The Proposer shall complete **Appendix K** and include it as an appendix to the Proposer's RFP proposal and will not be included in the page limit of Proposer's Appendices. The Deliverable dates shall be reflected in the proposal as described in section II-5 of this RFP.

II-14 Diverse Business (DB) Requirements (Appendix E).
The Commission's Diverse Business (DB) Requirements for this procurement and a resulting contract are identified in **Appendix E**. There is no minimum participation level (MPL) for DBs established for this contract. However, the utilization of DBs are encouraged and will be considered as a criteria in the evaluation of proposals and may be considered as a factor in the Commission's selection of a firm for this contract.

The proposer must include in its DB participation submittal that it meets the requirements set forth in the Commission's DB Requirements - **Appendix E**. In particular, the proposer shall address the section of the DB Requirements labeled, "Actions Required by Proposer during the procurement/consultant selection phase". In addition, the DB participation submittal shall indicate the amount of DB participation incurred in the proposal in terms of dollars committed or percentage of total contract amount.

II-15 Cost Submittal (Appendix G)
The information requested in this section shall constitute the Proposer's cost submittal. **THE COST SUBMITTAL SHALL BE PLACED IN A SEPARATE SEALED ENVELOPE WITHIN THE SEALED PROPOSAL AND ON A CD-ROM, SEPARATE FROM THE TECHNICAL SUBMITTAL.**

Proposers should **not** include any assumptions in their cost submittals. If the proposer includes assumptions in its cost submittal, the Issuing Office may reject the proposal. Proposers should direct in writing to the Issuing Office pursuant to Part I-10, Questions and Answers of this RFP any questions

about whether a cost or other component is included or applies. All Proposers will then have the benefit of the Issuing Office's written answer so that all proposals are submitted on the same basis.

The Proposer must complete **Appendix G – Cost Submittal**. Proposer must provide information that identifies the Resources (by position) that will be devoted to the effort, the average loaded rate for those resources and the number of hours each will devote to the effort. The sum of the loaded rates times the number of hours for each position, plus the other direct costs must equal the total fixed price cost. Any costs not provided in the cost proposal will be assumed as no charge to the Commission.

The Selected Proposer shall only perform work on the Contract after the Effective Date is affixed and the fully-executed contract sent to the selected Proposer. The Commission shall issue a written Notice to Proceed to the Selected Proposer authorizing the work to begin on a date which is on or after the Effective Date. The Selected Proposer shall not start the performance of any work prior to the date set forth in the Notice of Proceed and the Commission shall not be liable to pay the Selected Proposer for any service or work performed or expenses incurred before the date set forth in the Notice to Proceed. No Commission employee has the authority to verbally direct the commencement of any work under the Contract.

PART III

CRITERIA FOR SELECTION

III-1. Mandatory Responsiveness Requirements. To be eligible for selection, a proposal shall be:

1. Timely received from a Proposer;
2. Properly signed by the Proposer;

III-2. Technical Nonconforming Proposals. The two (2) Mandatory Responsiveness Requirements set forth in Section III-1 above (1 and 2) are the only RFP requirements that the Commission will consider to be non-waivable. The Issuing Office reserves the right, in its sole discretion, to (1) waive any other technical or immaterial nonconformities in the proposal, (2) allow the Proposer to cure the nonconformity, or (3) consider the nonconformity in the evaluation of the proposal.

III-3. Proposal Evaluation. Proposals will be reviewed, evaluated, and rated by a Technical Evaluation Team (TET) of qualified personnel based on the evaluation criteria listed below. The TET will present the evaluations to the Professional Services Procurement Committee (PSPC). The PSPC will review the TET's evaluation and provide the Commission with the firm(s) determined to be highly recommended for this assignment.

The Commission will select the most highly qualified firm for the assignment or the firm whose proposal is determined to be most advantageous to the Commission by considering the TET's evaluation and the PSPC's determination as to each firm's rating. In making the PSPC's determination and the Commission's decision, additional selection factors may be considered taking into account the estimated value, scope, complexity and professional nature of the services to be rendered and any other relevant circumstances. Additional selection factors may include, when applicable, the following: geographic location and proximity of the firm, firm's Pennsylvania presence or utilization of Pennsylvania employees for the assignment; equitable distribution of work; diversity inclusion; and any other relevant factors as determined as appropriate by the Commission.

Award will only be made to a Proposer determined to be responsive and responsible in accordance with Commonwealth Management Directive 215.9, Contractor Responsibility Program.

III-4. Evaluation Criteria. The following criteria will be used, in order of relative importance from the highest to the lowest, in evaluating each proposal:

1. Technical Approach

- Soundness of proposed approach, methodology, and deliverables for the solution design, configuration, development, implementation, quality assurance, testing, maintenance, and support of a single ATMS software solution as they relate to the requirements discussed in Part IV of this RFP.
- Ability to meet the requirements as described in Part IV and Appendices attached to the RFP with minimal software customization and development.
- Ability of the Proposer to manage project risks.
- Innovative features to support the future of ATMS (e.g. connected vehicles, autonomous vehicles, Internet of Things)

- Responsiveness, organization, and clarity of Proposal.

2. Proposer and Personnel Qualifications

- Proposer's relevant experience and expertise in conducting the solution design, configuration, development, implementation, testing, maintenance, and support of a single ATMS software solution as they relate to the requirements discussed in Part IV of this RFP.
- Qualifications, experience and competency of professional personnel who will be assigned to the contract by the Proposer including tenure with firm, length of time in the industry and type of experience.
- Qualifications of the Proposer.
- Financial ability of the Proposer to undertake a project of this size.
- Response of references if the Commission elects to solicit them.

3. Cost

- Cost will be considered as a deciding factor; however cost will not be the sole deciding factor in the selection process. The Commission reserves the right to select a proposal based upon all the factors listed above, and will not necessarily choose the firm offering the best price. The Commission will select the firm with the proposal that best meets its needs, at the sole discretion of the Commission.

4. Commitment to Diversity and Inclusion

- This refers to the inclusion of DB firms, as described in **Part II-14**. Participation may be measured in terms of total dollars committed or percentage of total contract amount to certified DB firms.

PART IV

WORK STATEMENT

IV-1. Objectives.

a. General. The primary objective of this RFP is to select a Proposer to provide, maintain, and support a system-wide ATMS software solution that will allow control of all of the Commission's existing and future ITS devices across the state. Once implemented, the ATMS software solution will result in increased ease and efficiency of traffic incident management; improved coordination among the TOC and field staff, adjacent states, and other stakeholders; improved dissemination of traffic information to the traveling public; and enhanced gathering, quality verification, and analysis of traffic data for decision making.

The software solution will meet the objectives outlined below:

- The ATMS solution will facilitate the implementation of business processes to provide consistent responses to planned and unplanned events and will enable TOC operators to manage incident activities from detection through resolution. The ATMS solution will automatically alert operators via detection technologies and allow them to quickly and efficiently verify potential traffic problems using CCTV cameras. Traffic and equipment conditions will be viewable via a web based (thin client) graphical user interface (GUI) that is displayed with an interactive map.

- The ATMS solution will collect, maintain, and display real-time data from field devices and external sources. The Commission will disseminate traffic information to the traveling public via the Commission's existing Emergency Notification System (ENS), HAR, and DMS. The solution will also enable the Commission to provide partners with accurate real-time information to improve incident response and coordination. All collected, stored and archived traffic data will be easily accessible for traffic planning purposes and generation of performance metrics and reports.

- The ATMS solution must be robust, capable of continuing operation even after the failure of any single component. If a critical component fails, the fail over component will activate to continue operations. Data shall be stored redundantly in the case that a data storage device fails, operations will continue and data will not be lost. The solution shall be reliable, available per **Appendix C - Service Level Agreement**, scalable, redundant, flexible, and easy to maintain. It will be compliant with all of Commission's IT standards and guidelines. The solution will also enable the transfer of operational control between users and provide secure access for all approved users and stakeholders.

- To maximize the use of existing Commission software, the ATMS solution will interface with the Commission's existing software systems using well documented Application Program Interface(s) (API) that allow for integration with the following systems, such as, but not limited to, the ENS, Intergraph software Computer Aided Dispatch System (CADS), ESRI based

Geographic Information System (GIS) system, and ServiceNow. The ATMS software solution shall also be capable of presenting video available from the Video Management System (Genetec). All APIs must provide full access to all solution functionality and data.

- The Selected Proposer shall be responsible for performing solution backups, data archiving, and all other back-end administrative activities to maintain and support the system. The Commission shall be able to administer the solution, as required. This includes but not limited to: adding new devices, managing existing devices, and administering user groups. It is anticipated that functionality can be tailored to the needs of different user groups. The solution will utilize and fully integrate with the Commission's Active Directory Federation Services (ADFS) for user authentication, authorization, and user administration.

- The ATMS solution will include an asset management component and enable the Commission to view current and historical status of all field devices (e.g. CCTV, HAR, DMS, RWIS) and related components. In addition, the ATMS solution will report device and communication failures to the Commission's ServiceNow software, maintain a maintenance log, and the ability to log preventative maintenance activities.

- The ATMS solution will accept and monitor weather data from Roadway Weather Information System (RWIS) stations located across the state as well as third party Weather Forecast data (e.g. Accuweather and National Weather Service). The solution will utilize this data to alert users of potential dangerous conditions, incoming inclement weather, and to assist users in weather event management.

- The ATMS solution will manage construction and maintenance events that are entered into the solution through a Proposer provided web-based/mobile application, ENS, or directly into ATMS.

- It is critical that the ATMS software works with the Commission's existing field equipment. The Selected Proposer shall research and test compatibility with all ITS devices intended to be integrated into the ATMS software to assure dependable, consistent operation. ITS device drivers are identified in **Appendix I – ATMS Device Driver Matrix** and ITS devices in **Appendix P – ITS Equipment Inventory**.

- The Maintenance and Support Period will begin immediately following the post implementation test period, after successful solution deployment into the production environment, and Commission acceptance.

The Selected Proposer will meet the objectives for Enhancements, Maintenance, and Support outlined below:

- Continue to maintain, enhance and support the ATMS solution.
- Continue to operate, maintain, refresh and support the ATMS hosting environment.

- Offer expandability and extensibility to incorporate additional functionality. Anticipated and/or potential enhancements are identified in **Appendix L – Concept of Operations** and **Appendix M – Solution Requirements.** Examples of other enhancements include, but are not limited to:

    - New interfaces
    - New reports
    - Data feeds (e.g. XML, RSS, etc.)
    - Technology upgrades
    - Incorporation of new technologies
    - Predictive modeling
    - Additional solution functionality

The Commission reserves the right to request enhancements, to be completed in accordance with and as part of earlier releases, or concurrently with other phases of this project. In the event that enhancements do not fit into a release, the enhancement may be done in accordance with **Appendix B – Special Terms and Conditions**.

b. Specific. The anticipated services and project deliverables to be provided by the Selected Proposer are included in **Part IV-4 Tasks**.

IV-2. Nature and Scope of the Project. The Selected Proposer will:

- Design a solution utilizing Commercial-Off-The-Shelf (COTS) software(s)
- Configure and/or customize proposed solution modules
- Design and develop custom software modules where necessary to meet Commission Requirements
- Train Commission Personnel
- Deploy, test, maintain, administer, and support the solution in a hosted environment
- Enhance the ATMS solution

The project structure can be broken down into the following:

1. **Project Management** includes all project management activities and is further described in Section **IV-4 Tasks - Task A**. Project Management work will be completed throughout the entire term of the contract.

2. **ATMS Solution Design, Configuration, and Deployment** includes all solution design activities, software configuration, and deployment activities. The Commission requires the use of a staged approach to the solution design, configuration, and deployment of the ATMS software and shall occur in the following order:

    i. **Stage 1: ATMS Solution Design (Tasks B: High Level Solution Design, C: Detailed Solution Design, and D: Implementation Plan)**
        - Includes all ATMS solution design activities for Phase 1 functionality, with Phase 2 functionality considered, including:

- Analysis, understanding, and final documentation of: existing conditions, concept of operations, solution requirements, and network topology.

- Collaboration, determination, and documentation of: user process flows, GUI layout and navigation for Phase 1 functionality. The GUI will be revisited in Stage 3 for Phase 2 functionality.

- Determination and documentation of the proposed solution architecture and components (e.g. modules, database, security, internal and external interfaces).

- Determination and documentation of: the procurement plan, implementation plan, test plans, and training plans.

ii. **Stage 2: Deployment Phase 1 (Task E: Deployment Phase 1) -** Use Cases identified as Phase 1 in **Appendix L – Concept of Operations** and their respective requirements in **Appendix M – Solution Requirements** shall be deployed in this stage.

- Includes the configuration of one or more COTS software system(s) and any modifications required to create, test, and implement a completely functional, integrated ATMS software solution with respect to all Phase 1 functionality.

iii. **Stage 3: Solution Design and Deployment Phase 2 (Task F: Solution Design and Deployment - Phase 2) -** Use Cases identified as Phase 2 in **Appendix L – Concept of Operations** and their respective requirements in **Appendix M – Solution Requirements** shall be deployed in this stage.

- Includes all ATMS solution design activities for Phase 2 functionality including:

  - Collaboration, determination, and documentation of: user process flows, Graphical User Interface layout and navigation for the Phase 2 functionality.

  - Revisions to previously approved Solution Design documentation as required based on reevaluation of Phase 2 functionality and potential solution enhancements (e.g. Business Solution Design document, Detailed Solution Design Document, Concept of Operations, Solution Requirements).

- Includes additional configuration of the deployed system and any modifications required to create, test, and implement a completely functional, integrated ATMS software solution with respect to all Phase 2 functionality.

3. **Solution Enhancements** – includes the configuration and/or modification and deployment of additional solution functionality. This work is further described in **Section IV-4 Tasks – Task G: Solution Enhancements.** Solution Enhancements will be accomplished at any time from Notice to Proceed (NTP) through the end of the contract term; however, they will likely begin after the completion of Deployment - Phase 1. Use Cases identified in **Appendix L -**

Concept of Operations that are denoted as deployment Phase 3 are candidates to be included in the Solution Enhancements.

4. **Maintenance and Support** – includes work required to host, administer, maintain, and support the ATMS solution and to complete the successful turnover of the solution. This work is further described in **Section IV-4 Tasks – Task H Maintenance and Support.** Maintenance and Support will begin upon completion and acceptance of Deployment - Phase 1 through the end of the contract term. User and Support Documentation shall be submitted, reviewed (in accordance with **Appendix T – Project Deliverable Review and Approval Process**) logically through the deployment process as defined in **Section IV-4 Tasks – Task H-2 User and Support Documentation**.

Tasks are outlined in detail in section IV-4 of this RFP.

The assigned deployment phase for required functionality is defined in **Appendix L – Concept of Operations**. The Commission reserves the right to move functionality from one phase to another. All efforts will be made by the Commission to make any changes during the design phases to limit the impacts to schedule and cost. If functionality assignments are modified, the Commission is anticipating a simple shift in funding from one phase to another. If a modification to an assigned phase impacts the schedule or cost, the resulting impacts to schedule and cost shall be reviewed and negotiated at that time. Phase 2 may be the only phase that will be impacted by virtue of breaking down into sub phases; however this language applies to all phases.

For better understanding of the nature and scope of the project, Proposers are also referred to additional documentation contained in the RFP appendices:

- **Appendix O – Interface List and Descriptions** contains a list of the anticipated required system interfaces with a brief description of their anticipated purpose within the ATMS. It shall be the Selected Proposer's responsibility to coordinate and execute, in a timely manner, any and all Non-Disclosure Agreements (NDA) required by the equipment or software manufacturer to obtain required information to develop interfaces with any and all required systems.

  It is anticipated that modifications will be required to be made to the Commission's ENS system in order to accept data from the ATMS. The Commission will provide the services of Information Logistics, Inc. under a separate agreement to coordinate and facilitate changes to the ENS system and provide the information required for the Selected Proposer to develop a two-way interface that provides information to and receives information from the Selected Proposer's API.

- **Appendix P - ITS Equipment Inventory** contains the list of the existing and future ITS devices owned and operated by the Commission located on Commission property and other agency owned properties. This document also contains estimates on future deployments.

- **Appendix Q - Network Diagrams** contain information on the Commission's current TOC network architecture, consisting of ITS devices, communication technologies, and servers. Proposers wishing to receive the information provided in **Appendix Q - Network Diagrams** for the sole purpose of submitting a proposal in response to RFP 16-10400-7393 must request this Appendix from the Issuing Officer. Proposers must submit a written request on company letterhead to the Contracts Administration Department (scanned letter via email to RFP-Q@paturnpike.com is acceptable).

- **Appendix R – PTC DMS Message Library** is a document developed by the Commission to standardize DMS messaging for all scenarios. ATMS message library shall be populated with the DMS messages included in this document and ATMS message creation rules shall be based around this document.

- **Appendix S – RCRS Data Feed Sample** is a sample .xml feed from the existing Road Closure Reporting System (RCRS). This appendix is provided to assist the Proposer in estimating their effort to develop the required interface.

- **Appendix T – Project Deliverable Review and Approval Process** details the process for review and approval of each of the required deliverables.

- **Appendix U - Payment Schedule** contains the deliverable milestones and payment structure for each Project Task.

IV-3. Requirements.

In addition to the Tasks and Deliverables required to be completed as defined in section IV-4, the requirements for the ATMS solution are defined within this section.

a. **Appendix L - Concept of Operations** contains information on the existing TOC environment as well as how the ATMS solution shall be used from the operator's, maintainer's, and manager's perspectives. The Use Cases included in this appendix are to provide context to each of the solution requirements provided in **Appendix M – Solution Requirements** and are to be considered an extension of the solution requirements that the ATMS solution shall meet.

b. **Appendix M – Solution Requirements** details particular behaviors that the ATMS software shall perform, and includes solution requirements related to business processes and performance, GUI with a focus on the user experience, interfaces with other systems, data, and enabling requirements. The GUI will require a web based (thin Client) solution. The Proposers shall consider the requirements listed in **Appendix M - Solution Requirements** document to be core requirements.

c. **Appendix N – Requirements Traceability Matrix -** The Selected Proposer shall demonstrate, document, and track how the ATMS software will meet the **Appendix M - Solution Requirements** and trace back to the use cases developed in the **Appendix L -**

Concept of Operations through the use of a Requirements Traceability Matrix. This appendix is included as a starting point for the vendor and shall be updated through the design process.

d. **Project Staffing.** The Selected Proposer shall identify the name and qualifications of all professional personnel that will be directly involved in the completion of all specified tasks/work orders, including a Project Manager (PM). For all key personnel proposed, including the Project Manager, the Selected Proposer will include all employee names and, through a resume or similar document, indicate the assigned responsibilities each individual will have in this project and how long each has been with the company. The Selected Proposer shall also identify by name any subcontractors intended to be used and the services they will perform. Key personnel are defined as staff which will have an integral role in the management, design, deployment, and on-going maintenance and support of the solution.

   All project staffing changes must be approved by the Commission Project Manager.

   The Commission expects to have frequent interactions with key project personnel throughout the project. The Selected Proposer will illustrate where all personnel will be physically located during the time they will be engaged in the project. The Selected Proposer shall describe how frequently the personnel are expected to be working at Commission facilities and how personnel will handle work assignments and attend meetings. At Selected Proposer's request, the Commission will attempt to provide reasonable accommodations at Commission facilities to Selected Proposer's staff.

e. **Background Checks.** The Selected Proposer must, at its expense, arrange for a background check for each of its employees, as well as the employees of any subcontractors, who will have access to Commission IT facilities, either through on-site access or through remote access. National background checks are to be conducted via the procedure defined for an Federal Bureau of Investigation (FBI) Identity History Summary Check. The background check must be conducted prior to initial access and on an annual basis thereafter. Before the Commission will permit access to the Selected Proposer, the Selected Proposer must provide written confirmation that the background checks have been conducted. If, at any time, it is discovered that the Selected Proposer's employee has a criminal record that includes a felony or misdemeanor involving terrorist behavior, violence, use of a lethal weapon, or breach of trust/fiduciary responsibility or which raises concern about building, system or personal security or is otherwise job-related, the Selected Proposer shall not assign that employee to any Commission facilities, shall remove any access privileges already given to the employee and shall not permit that employee remote access unless the agency consents to the access, in writing, prior to access. If any such act is committed by an assigned individual at any time during the contract period, the subject individual shall be immediately removed from the project team and all access revoked. The Commission may withhold its consent in its complete discretion. Failure of the Selected Proposer to comply with the terms of this paragraph may result in default of the Selected Proposer under its contract.

f. **Commission Policies, Procedures, and Standards.** Prior to and during the execution of any design or development tasks involving Commission's existing system environments (e.g. CADS, ENS, RWIS) the Selected Proposer's design/development team must comply with the policies, procedures, and standards provided by the Commission department responsible for the support of the solution environment. This includes but is not limited to participation in a requirements phase, design phase, development phase, testing phase, and implementation phase as documented in the prevailing organization's software and application development standards.

g. **Industry Best Practices.** The Selected Proposer shall utilize industry best practices from the conception of the desired software to its implementation, periodic subsequent enhancement, and ongoing maintenance.

h. **Compatibility with Existing Commission Technical Environment.** To the maximum extent possible, the ATMS shall be built upon the hardware and software products already in use by the Commission. The Proposers may propose COTS solutions for all or some of the proposed functionality. All COTS products will be required to be compatible with Commission's existing technical environment. Any deviation to this requirement shall be explained in detail and should identify what additional infrastructure and costs are necessary to sustain the alternate approach.

i. **Workstation Information.** The proposed solution shall, at a minimum, be compatible with the following:
    - Operating Systems: Microsoft Windows (7, 8, 8.1, and 10)
    - Browsers: Internet Explorer 11, Edge, Google Chrome, and Mozilla Firefox
    - Mobile Platforms: Apple iOS and Google Android

j. **Commission Security**. The selected proposer shall adhere to all security requirements and provisions of **Appendix M - Solution Requirements**, Section 4.7 Vendor Hosting Requirements (VHR).

k. **Documentation Format.** The Selected Proposer shall provide electronic versions of all documentation in MS Office compatible or PDF format and employ change control processes and version control to ensure that it is kept current for the duration of the contract resulting from this RFP. Where appropriate, a table of contents, an index, and keywords shall be available for information searching. The Commission, at its discretion, may request or accept printed documentation on a case by case basis.

   All diagrams provided by the vendor shall be in an easy to update, Commission approved format (e.g. Microsoft Visio).

l. **Quality and Service**. The Selected Proposer will demonstrate a high level of quality control standards and service. The Selected Proposer is required to describe its quality standards and guarantees of service, background check processes and other quality assurance processes, and its

response to resources which are not performing to Commission's quality expectations. The Commission reserves the right to request that the Selected Proposer remove staff that is not performing to the standard of quality.

The Commission has set a high standard of quality expectations and expects high quality service and products—i.e., products that are professionally edited and responsive to both the intent and the specific requirements of the contract. It is expected that products will be error free and that commitments made by the Selected Proposer will be met.

m. **Service Level Agreements.** The Commission has developed a Service Level Agreement (SLA) document that will be utilized throughout the life of this contract to ensure that the Selected Proposer is providing the best possible service. The SLA can be found in **Appendix C – Service Level Agreement.**

n. **Interruptions to Normal Operations.** Any work that affects operations (such as live device testing, solution transitions, and software upgrades) must be planned and the Selected Proposer must receive written approval from the Commission to conduct such work. The work that affects operations must be performed during non-peak traffic times. Generally non-peak traffic times are considered to be Monday through Friday from 9:00 PM to 5:00 AM and weekends; however, these times are subject to holiday and other restrictions (such as weather, unplanned traffic events, planned special events). The Commission reserves the right to cancel any planned and approved work due to any unforeseen circumstances that may include, but are not limited to, weather and unplanned traffic events.

IV-4. Tasks and Deliverables.

This section of the statement of work describes the tasks and deliverables which shall be required to complete the ATMS implementation.

Some tasks below are described as critical milestones or checkpoints. If a deliverable is identified as a critical milestone and impacts other tasks, then the Selected Proposer must wait for Commission approval before proceeding to the next task. For all other deliverables, the Selected Proposer can continue work while the Commission is reviewing the previous deliverables.

The Commission has developed a review and approval process that will be utilized throughout this project; please refer to **Appendix T - Project Deliverables Review and Approval Process** for further details. All submissions and deliverables shall be reviewed in accordance with **Appendix T**. The Commission reserves 15 business days to review each submittal/deliverable.

Refer to **Appendix U – Payment Schedule** for details on payment milestones for each project task.

Task A: Project Management

Project management involves planning, organizing, and managing resources to bring about the successful completion of specific project goals and objectives. Project Management is composed of several different types of activities, including but not limited to:

a. Planning the work (tasks, subtasks, activities, milestones) needed to meet the project objectives, schedule and budget, and tracking to the baseline.
b. Executing a change control management plan.
c. Assessing/controlling issues and risks.
d. Estimating, allocating and monitoring activity of project resources.
e. Directing activity and controlling project execution.
f. Facilitating deliverable review and approval process.
g. Reporting status and tracking progress against the project plan.
h. Executing a communication plan.
i. Participating in After Action Reviews (AAR).

The Selected Proposer shall be responsible to complete all work and meet all requirements identified in the executed contract. The Selected Proposer shall be responsible to complete the work to conditions of satisfaction for quality, accuracy, and completeness to be approved by the Commission.

A-1 Develop and Execute the ATMS Project Management Plan

The Selected Proposer shall develop and maintain the ATMS Project Management Plan by incorporating input from all parties as deemed necessary to establish the overall direction and goals of the ATMS Project. At a minimum, Section IV-5 Reports and Project Controls shall be addressed and the following documents shall be incorporated into the ATMS Project Management Plan:

a. Project Charter/Scope Document
b. Commission expectations
c. Proposed status meeting schedule during each project phase
d. ATMS Project expectations, goals, and benefits
e. Project Staffing Plan
f. Quality Control Plan
g. ATMS Project Work Plan to include activities/tasks for:

    i. Issue Management
    ii. Risk Management
    iii. Change Control Management
    iv. Communication Management
    v. Project Execution
    vi. Emergency Preparedness
    vii. Project Close Out and Turnover

The Selected Proposer shall update the ATMS Project Work Plan as changes occur to the Project Work Plan activities to reflect project progress, to manage schedule and resource variances, and to take appropriate corrective action. Tasks, sub-tasks, activities or sub-activities should be measured in person-hours of effort.

The Selected Proposer shall prepare a complete Master CPM schedule in Microsoft Project format that adheres to and incorporates all contract requirements, shows work being completed on or before the Completion Dates, and meets any specified Milestone Date(s). The Selected Proposer shall incorporate in the schedule, coordination with all entities (e.g. subcontractors) and contracts that could impact the project schedule. It is critical that the master schedule includes consideration of any potential planned

construction activities that will require device integration. The schedule shall also indicate when any special materials and equipment are needed to allow for procurement planning, and will indicate restraints (i.e., dependency relationships) between activities. The Selected Proposer shall update and present the CPM schedule at each scheduled status meeting.

The Selected Proposer shall be responsible for managing the day-to-day operation of the project. This includes, but is not limited to the development, maintenance, and execution for the following activities:

- The Selected Proposer shall create, validate, maintain, manage, and execute a detailed ATMS project plan which incorporates Selected Proposer and Commission activities, sub-activities, milestones and assigned resources for the project.

Issue Management

Issue management is the systematic process of identifying and resolving project issues that may arise from any project activity. Action items may become issues if they are not resolved timely or effectively. Issues can affect the project work plans if not addressed properly and timely.

Issue Management Process includes:

a. Identify/define/document the issue
b. Log the issue for tracking
c. Identify severity/priority of the issue
d. Evaluate/document potential impact to project
e. Identify/document/present options for resolution
f. Identify pros/cons of proposed options for resolution
g. Identify a recommended option for resolution
h. Determine level of escalation required for resolution
i. Determine appropriate communication scope and strategy
j. Implement and document the resolution of the issue

The Selected Proposer shall document and manage all project issues across all project activities. The Proposer shall utilize a web-based tool to track bugs and other related issues and provide access to the Commission. The Selected Proposer shall be responsible for preparing and submitting a Monthly Performance Report as described in **Appendix C – Service Level Agreement**.

Risk Management

A risk is an event or action that has a chance of occurring which may result in a negative effect on the project. Risk Management is the systematic process of identifying, analyzing, and responding to project risk. Once an identified risk has occurred, it becomes an issue and is handled through the issue management process described earlier.

The objectives of Risk Management activity are to:

a. Develop an effective Risk Management strategy to identify, categorize, quantify, prioritize, and respond to project risks with mitigation strategies.
b. Select and execute risk responses.

c. Determine whether the implemented risk responses are achieving the desired objective and provide corrective action if necessary.

The Selected Proposer is responsible for developing and implementing a risk management strategy and managing risks for the ATMS project.

All risks and issues that have been encountered shall be included in the documentation provided for scheduled status meetings.

Change Control Management

Proactively managing scope is a critical element of effective project management. Scope creep (the gradual and incremental expansion of scope) is a common cause of project failure. The objectives of this activity are:

a. To define and manage the scope of project work so that it complies with the project requirements and budget
b. To establish the plan/process for change request evaluation with respect to impact on schedule, budget and resources, and project objectives
c. To develop, implement, manage, and monitor the processes for managing project issues and change requests
d. To provide a description of proposed change control tools
e. To establish an approach to change request implementation

Scope management, in addition to monitoring the scope of work of a project, also includes the maintenance and validation of contract terms and conditions. Changes to the project scope may in turn impact the project schedule, cost, quality, and approved work products.

The Selected Proposer is responsible for adhering to change control standards, policies, and procedures and effectively managing and coordinating project changes. All change requests will be reviewed, prioritized and approved or rejected by the Commission in accordance with **Appendix B – Special Terms and Conditions.**

Communications Management

The purpose of Communication Management is to create and implement a communications strategy and plan for the ATMS project. An effective Communication Management strategy involves the following:

a. Supporting communications principles and objectives
b. Conducting internal and external stakeholder analysis
c. Developing and delivering targeted project communications
d. Collecting, analyzing, and responding to feedback on Communication Management activities

The Selected Proposer is responsible for developing and implementing a communications management strategy and managing communications within the scope of the ATMS project.

Emergency Preparedness

To support continuity of operations during an emergency, including any type of disaster, acts of god, or public health emergencies; the Commission needs a strategy for maintaining operations for an extended

period of time. One part of this strategy is to ensure that essential contractors who provide critical business services to the Commission have planned for such an emergency and put contingencies in place to provide needed goods and services.

1. Describe how such crises will impact ATMS operation.
2. Describe the emergency response continuity of operations plan. Please attach a copy of the plan, or at a minimum, summarize how the plan addresses the following aspects of emergency preparedness:

    - Employee training.
    - Identification of essential business functions and key employees necessary to carry them out.
    - Contingency plans for staffing issues if a portion of key employees are incapacitated due to illness.
    - Communication with staff and suppliers when primary communications systems are overloaded or otherwise fail, including key contacts, chain of communications (including suppliers), etc.
    - Emergency plan testing.

Task A Deliverables Summary	
Task	**Deliverable**
A-1	ATMS Project Management Plan

The deliverable for this section is the ATMS project management plan. All project management products shall adhere to the Selected Proposer's quality of service standards and guarantees provided in response to this RFP. These deliverables will be reviewed in accordance with **Appendix T – Project Deliverables Review and Approval Process**.

All Plans, including the CPM schedule, shall be in accordance with **Appendix K - Project Deliverables Schedule Form**, which will take precedence in the case of any conflicts.

Task B: High Level Solution Design

B-1 Existing Conditions Reports

Proposers are referred to **Appendix P - ITS Equipment Inventory**, **Appendix L – Concept of Operations,** and **Appendix Q – Network Diagrams** to become familiar with the Commission's existing and planned ITS field devices and systems. The Selected Proposer shall verify all ITS system components and center to field communications. The purpose of the existing conditions report is to obtain a detailed understanding of the protocols and equipment used by the Commission, so that the Selected Proposer can efficiently deploy a fully functional ATMS solution.

The Selected Proposer is expected to schedule a TOC visit and coordinate the Existing Conditions documentation task immediately following NTP. The Commission will provide the Selected Proposer with contact information to schedule visits to the Commission TOC.

The Commission will provide existing documentation, answer questions, and provide contact information needed to schedule meetings.

B-1.1. Existing System and Facility Inventory Report

The Selected Proposer shall perform a thorough review of all ATMS related system components that exist at the Commission's TOC. System components include, but are not limited to, various computers, software, control hardware, communications equipment and field devices. The Commission will provide the Selected Proposer with existing documentation in various forms and media to support this task. The Selected Proposer shall verify and amend the existing documentation as needed, including any missing elements, to complete the existing system inventory.

B-1.2. Center to Field Protocol Inventory Report

The Selected Proposer shall develop a complete inventory and document the communication and control methods and protocols to the various devices that are of mixed generation and manufacturer. The Selected Proposer is fully responsible for generating software that uses the correct transmission speed, communication medium and protocol to each and every device. If protocol is not in the public domain, the Selected Proposer shall be responsible for coordinating and executing, in a timely manner, any Non-Disclosure agreements (NDA) required by the equipment manufacturers to obtain available protocol documentation. If protocol information is not available, the Selected Proposer shall be responsible to reverse engineer the protocol.

As part of the Center to Field Protocol Inventory Report, the Selected Proposer shall provide a listing of all device types and indicate which, if any, of the devices require development of custom drivers.

B-2 Business Requirements

Any existing requirements work products shall be reviewed and validated to ensure that the Selected Proposer fully understands the business and solution requirements. The Selected Proposer shall validate the business and solution requirements based on their previous implementation experience and with respect to industry best practices. The Selected Proposer shall also develop/enhance requirements documentation in order to configure, enhance and/or customize the ATMS solution. This will be accomplished by holding detailed requirements gathering sessions with the Commission business and technical personnel, and business partners where appropriate.

B-2.1. Validation of Existing Concept of Operations (ConOps) Document

The Selected Proposer shall review and deliver a final version of **Appendix L - Concept of Operations** (*ConOps*). The Selected Proposer will work with the business and technical personnel, and business partners where appropriate, to clarify and update the *ConOps* document. During the validation of the *ConOps*, the Selected Proposer will be provided the opportunity to demonstrate the as-is capabilities of the Selected Proposer's existing software and, to the extent possible, demonstrate how each scenario in the *ConOps* will be accomplished using the proposed software. The Selected Proposer shall also have an opportunity to propose minor modifications to the *ConOps* document; however, any proposed modifications will have to be approved by the Commission before inclusion into the final document. The updated *ConOps* submitted by the Selected Proposer and approved by the Commission will be considered final.

B-2.2. Validation of Existing Solution Requirements Document

The Selected Proposer shall review and deliver a final version of **Appendix M - Solution Requirements**. Any changes made to the *ConOps* document (task B-2.1) that impact solution

requirements shall be incorporated into the final *Solution Requirements* document accordingly. The Selected Proposer will work with the business and technical personnel, and business partners where appropriate, to clarify and update the current Solution Requirements document. The resulting document shall finalize the phasing of base and advanced functionality to be implemented in Deployment - Phase 1 and 2. The updated Requirements submitted by the Selected Proposer and approved by the Commission will be considered final.

B-2.3. Detailed Business Requirements Document

The Selected Proposer shall be responsible for a document that defines all business requirements and solution requirements for implementing the ATMS. The Detailed Business Requirements Document will build on the validated *Solution Requirements* document (task B-2.2) and will contain a list of functional and nonfunctional requirements that will be used as the basis for the solution design, customization/configuration and testing tasks. The document will also include Business Process Flows in a form of diagrams and descriptions to be used for the solution design and development/configuration tasks.

The detailed requirements development task includes, but is not limited to, the following activities:

- Meet with business program/technical experts to define and document detailed business, functional and technical requirements for each of the solution components.
- Perform requirements management, traceability, and source code management (if applicable).
- Obtain formal approval of requirements specifications from the business program area. When necessary, schedule, conduct and document requirements review sessions with appropriate business area managers to obtain approval.

These requirements will become the basis for solution design, software configuration, customization, and testing.

The Selected Proposer shall be responsible for maintaining solution requirements documentation for the duration of the contract. The completed solution requirements document and subsequent updates shall be provided to the Commission in an electronic format.

B-3 Detailed Business Solution Design

B-3.1 Detailed Business Solution Design Document

Building on the completed requirements (B-2.1, B-2.2, and B-2.3) documents, the Selected Proposer shall develop a detailed business solution design document. This document shall include a description of the primary components of the solution, along with block diagrams and illustrations. This document shall clearly present the details and facts of the proposed solution and the Selected Proposer's plan to meet the functional requirements.

The Selected Proposer shall meet with Commission business and technical staff to create a high-level design of the business processes. Screens and screen flows, interface specifications, and solution business rules will be developed collaboratively with Commission technical staff. The Business Solution Design Document shall also include all aspects of the user interface including navigation rules, exception handling, reports and business rules. Any business requirements not previously identified shall be documented and incorporated into the design, as appropriate.

The Business Solution Design shall include, but not be limited to:

- User Interface Specifications and Business Rules
  i. User Interface Scenarios (Screen layouts, flows, functionality and navigation)
  ii. Business rules by screen
  iii. Validation rules for data
  iv. Preliminary user group identification for role mapping
  v. Identification of associated business process changes for future training development

- Output General Specifications
  i. Report requirements, specifications and mockups
  ii. Solution Notification rules, requirements, specifications and mockups

- Data processing and Interface General Specifications
  i. Data processing – business functionality, data involved and frequency
  ii. Interface – business functionality, data exchanged, direction, frequency and systems involved

The Selected Proposer will provide sample screens and a draft user manual to demonstrate how the ATMS solution will look and function.

B-3.2 Requirements Traceability Matrix

The Selected Proposer shall develop and validate a requirements traceability matrix that will map all S*olution Requirements* to the *Concept of Operations* documents. This includes all requirements developed by the Commission for this RFP and those developed by the Selected Proposer as part of this contract. **Appendix N – Requirements Traceability Matrix** can be used as a starting point for this deliverable.

The Traceability Matrix shall show the traceability of the detailed requirements contained in the *Detailed Business Solution Design document*. The Traceability Matrix will be used to verify that all business solution requirements are mapped to solution component designs. It will also be used to identify the source of requirements from a design perspective.

The Selected Proposer is responsible for the development, delivery and maintenance of the Traceability Matrix. The Selected Proposer shall validate the Traceability Matrix to confirm that business/solution requirements are complete. The Selected Proposer shall confirm that requirements are mapped all the way to solution design elements.

The Selected Proposer shall also be responsible for updating the Traceability Matrix as required under subsequent solution design and testing deliverables.

Task B Deliverables Summary	
Task	**Deliverable**
B-1	Existing Conditions Report • *Existing System and Facility Inventory Report* • *Center to Field Protocol Inventory Report*
B-2	Business Requirements • *Concept of Operations (Final)* • *Solution Requirements (Final)* • *Detailed Business Requirements Document*
B-3	Detailed Business Solution Design • *Detailed Business Solution Design Document* • *Requirements Traceability Matrix*

Task C: Detailed Solution Design

C-1 User Interface Configuration

C-1.1 User Interface Demonstrations
The Selected Proposer will provide user interface demonstrations to allow operators to visualize how the various sections of solution will work together. These demonstrations will provide the Commission with an additional opportunity to comment on how the solution will function. As part of the initial User Interface Demonstration, the Selected Proposer shall walk through the final *Concept of Operations - Use Cases* and fully demonstrate how the ATMS software addresses each function. It is understood that the demonstrations will generate ideas, suggestions and potential changes. As a result, the Selected Proposer shall plan on hosting at least three (3) interactive demonstration sessions. The design and development of the User Interface shall consider all solution requirements and functionality as defined in *Solution Requirements* and *Concept of Operations* finalized in Task B.

Five (5) business days prior to each User Interface Demonstration, the Selected Proposer shall provide draft user interface design documents. Following each demonstration, the Selected Proposer shall provide meeting minutes that capture comments provided at the demonstrations.

C-1.2 User Interface Configuration Document
Upon acceptance of the demonstrated user interface, the Selected Proposer shall submit a User Interface Configuration Document describing how the software will function. This document shall be developed to the level that each graphical user interface (GUI) element (e.g. fields, buttons, map, menus) are described with detailed text that identifies the functionality of each element. The text should describe not only how each element works, but also the expected behavior. It shall be considered a draft user manual and provide the Commission a final opportunity to comment on the proposed user interface.

C-2 Detailed Solution Design Document

The ATMS Detailed Solution Design Document will consist of several items. This document, including block diagrams, inputs, outputs, illustrations, and fold-outs; shall present the details and facts of the proposed solution design. It shall provide details of the solution described in the proposal. As part of this

task, the Selected Proposer shall determine, and document detailed solution specifications for all module configuration and custom coding components including, but not limited to:

- Architectural Design (Top Level Design)
- Module Design (High Level Functionality of each module)
- Key Function Design (Brief description of major functions in each module in sufficient detail for customization or development)
- Database Design
- Data elements and data models
- Message layouts and data exchange
- Transactions
- System security
- Middleware configurations
- External interfaces

The design and development of the Detailed Solution Design Document shall be focused on Phase 1 functional requirements while considering the potential impacts of the Phase 2 functional requirements as defined in *Solution Requirements* and *Concept of Operations* finalized in Task B.

Additional information regarding intellectual property rights are found in **Appendix B – Special Terms and Conditions**. While the Selected Proposer is not expected to provide a detailed design for third party products, the Selected Proposer must fully disclose interface documentation and provide the full API. Documentation of interfaces and APIs will also include sample code, which demonstrates how the interfaces could be utilized.

Software developed under this contract is subject to intellectual property rights outlined in **Appendix B – Special Terms and Conditions**. Detailed software design documentation must be provided for all code developed for the Commission under this Contract. The Detailed Solution Design Document shall include a list of all software components and tools to be delivered in accordance with **Appendix B – Special Terms and Conditions** (Section 2 – Ownership Rights).

The software configuration and customization cannot proceed until the concepts presented in the Detailed Solution Design Document are reviewed in accordance with **Appendix T – Project Deliverable Review and approval Process**.

C-3 Network Topology Report

The Selected Proposer shall submit a network topology diagram and an associated explanation document illustrating anticipated network connectivity, bandwidth requirements, firewall rule requirements, hardware placement and connections. The report shall include details hosting system network architecture, Commission network architecture, and identify the respective components (e.g. servers, domain controller, switches). The *Network Topology Report* will be submitted to the Commission to be reviewed in accordance with **Appendix T – Project Deliverable Review and approval Process**.

Task C Deliverables Summary	
Task	**Deliverable**
C-1	User Interface Configuration • *User Interface Demonstrations* • *User Interface Configuration Document*
C-2	Detailed Solution Design Document
C-3	Network Topology Report

Task D: Implementation Preparation

D-1 Procurement Plan

The Commission shall only be responsible to procure hardware and/or software required for connectivity to the existing Commission network and required to be installed on Commission property. All other ATMS solution hardware and software required will be provided, operated and maintained by the Selected Proposer in a hosted environment, and shall meet the hosting requirements and level of service defined in the *Solution Requirements* document and SLA (**Appendix C**).

The *Network Topology Report* completed and approved in Task C-3, will identify the proposed hardware required to support the ATMS solution. The Selected Proposer shall compile a list of detailed specifications for all hardware and/or software that shall be procured by the Commission to facilitate connectivity to the Commission network. While the Commission will procure the items, it is the Selected Proposer's responsibility to ensure that all recommended items include detailed specifications to identify the correct materials and that enough notice is given to the Commission to procure this equipment in accordance with the Selected Proposer's CPM schedule. To ensure the timely completion of this project, the Selected Proposer should assume that it will take 120 calendar days to purchase items. Any hardware or software not identified to be procured by the Commission shall be procured by, and the responsibility of, the Selected Proposer.

The deliverable for this task is a *Procurement Plan* to be reviewed in accordance with **Appendix T – Project Deliverable Review and approval Process**. Upon approval of the plan, the Selected Proposer shall work with the Commission to implement the plan.

D-2 Implementation Plan

The Selected Proposer shall develop an implementation plan, which will describe the overall approach to the ATMS solution deployment. At a high level the plan will describe the method and timing of the installation and cutover for the TOC.

At a minimum, the implementation plan shall describe an approach to:

- Deployment and production check out tasks.
- Solution Rollback Plan. The Selected Proposer shall describe procedures to remove software, a patch, or software update if required. This plan will contain a detailed description of the steps

that would be necessary should this be required. The rollback plan shall also address data preservation including the method of restoring database backups if required.

- Transition Plan. The Selected Proposer shall describe how they plan to transition the TOC to the new ATMS solution with minimal interruptions to normal operations.
- Decommissioning existing software and equipment. The Selected Proposer shall describe the timing and procedure that will be used to remove unneeded equipment and software. While the Selected Proposer is required to identify unneeded equipment, it is Commission's responsibility to remove the equipment.
- Implementation planning coordination with appropriate Commission support teams.
- Post implementation support.

The Selected Proposer will include descriptions of approaches to any other relevant implementation activities, based on industry standards, best practices, and Selected Proposer experience. The deliverable for this task is an *Implementation Plan* to be reviewed in accordance with **Appendix T – Project Deliverable Review and approval Process**.

D-3 Test Plan

The Selected Proposer shall develop a plan that will describe an approach to ATMS solution testing and present the acceptance test plans and procedures for Deployment - Phase 1. At a high level the plan will describe the methods and timing of software testing at all appropriate solution development and deployment stages based on industry standards, best practices and Selected Proposer experience.

At a minimum, the test plan shall address the following requirements:

- The Selected Proposer shall develop detailed test plans and test procedures for each scenario and solution requirement.
  - Each test procedure shall list the testing objective for the requirement(s) that are being verified along with pass/fail criteria for each.
  - Each test procedure shall list the specific steps that should be followed to test the requirement(s).
  - Each test procedure shall list the expected results for each step of the test.

- All ATMS solution, enhancements and upgrades shall be tested in the Selected Proposer's internal development environment prior to being tested in the staging environment.

- All ATMS solution, enhancements and upgrades shall be tested in a staging environment prior to being deployed in the production environment. The staging environment will mirror the production environment. The User Acceptance Test (UAT) Plan shall be created and executed to address all Solution Requirements and will be conducted in the staging environment.

- The Selected Proposer shall complete an ATMS performance test to determine average and peak system loads based on the sizing and volume information gathered from stakeholders.
  - Test scripts/load simulations will be developed to test the ATMS infrastructure at the estimated speed and transaction rate.
  - The ATMS performance statistics related to network and server utilization will be collected and documented during test runs to determine the overall level of solution

performance. These statistics will be used to size and tune the ATMS solution, or infrastructure components, to meet estimated ATMS usage.

- The test plan shall also address the testing of devices that have communications directly to the TOC.
  - If any testing is required against devices in production, the Selected Proposer will have to coordinate the testing with the Commission IT and TOC to minimize downtime and disruptions to normal operations. This may involve testing during off-peak hours (9 pm to 5 am) or configuring additional equipment to isolated devices for testing.
  - The Selected Proposer is responsible for returning the devices/system to complete operation after testing.

- Solution Acceptance Test Plan. The Test Plan shall include a Solution Acceptance Test Plan to ensure that solution functions as designed and agreed upon by the Commission. This test plan shall be executed and signed off on by the Commission prior to starting the *Sixty (60) Day Test Period*.

While performing testing the Selected Proposer shall, at a minimum:

- Use a consistent, representative test data set.
- Ensure that all functionality of each of the components and the remaining functionality of the solution and subsystem processes correctly after the implementation of each new component.
- Ensure that each component meets the desired performance level based on anticipated and peak number of users utilizing the solution.
- Ensure that all security measures within the system release components are functioning properly. This includes user authentication and user authorizations.
- Perform solution testing, including but not limited to, execution of the test plan, loading and maintaining test data, verification of expected results, and tracking pass/fail metrics for test scripts.
- Track defects that are found during all phases of testing, assess severity, priority, corrective action, level of effort, and impact on schedule.
- Provide a weekly solution test status report including pass/fail rate, number of defects by severity code, status of re-work and re-test, and compliance with planned schedule.
- Perform regression testing to ensure that previously identified deficiencies are not re-introduced into the solution as new features are added.
- Perform security and vulnerability testing for each software release.

The Selected Proposer must complete a solution test which meets the established exit criteria in order to proceed to UAT.

The Selected Proposer shall be required to monitor and document any changes to the ATMS solution throughout the duration of the project. The Selected Proposer is required to employ a Software Version Control process and identify the versions provided to the Commission to ensure that all systems are running at the same development iteration. This includes, but is not limited to, applying version control process to configuration files and settings.

The Commission reserves the right to audit the Selected Proposer's work to ensure that the documentation and software are being managed as described.

The deliverable for this task is a *Test Plan* to be reviewed in accordance with **Appendix T – Project Deliverable Review and approval Process**.

D-4 Training Plan

The Selected Proposer will be required to provide training and training materials to the anticipated ATMS users. The training will be held at the Commission's Turnpike Industrial Park (TIP) Building. The Commission anticipates that training will be needed for TOC operators, Traffic Engineering and Operations personnel, and IT users.

The Commission also anticipates that a select group of ATMS users will need to be trained to become the Commission trainers for future user groups. The Selected Proposer shall incorporate "Train the trainer" sessions in the training plan to meet this need. The Selected Proposer shall be prepared to hold multiple training sessions to facilitate normal business hours staff, as well as off-hours, night shift staff.

The Commission estimated ATMS user group sizes are:

- Up to 25 users with view only and limited functional capabilities (Radio Operators)
- Up to 8 users with full functional capabilities (Duty Officers)
- Up 5 users with full functional capabilities with a focus on TOC Management (TOC Managers)
- Up to 15 users with view only capabilities (Traffic Engineering and Operations Staff)
- Up to 10 users with administrative capabilities (IT staff)
- Up to 5 Trainers for Train-the-Trainer roles

At a minimum, the Selected Proposer shall plan to provide detailed user manuals for training materials. Taking into consideration the user groups and S*olution Requirements* approved by the Commission, the Selected Proposer will develop an all-inclusive training plan. The Selected Proposer shall incorporate industry standards, best practices, and Selected Proposer experience when developing the training plan. The Commission reserves the right to record (video) training session(s) for future use.

D-5 ATMS COTS Software Licenses

If the Selected Proposer provides proprietary software as a component of the functionality for the ATMS solution, they shall provide to the Commission all licenses needed to deliver a complete solution in accordance with **Appendix B – Special Terms and Conditions**.

The Selected Proposer shall indicate in the technical proposal how many licenses will be provided as part of the ATMS solution and whether the license agreement is site-based or user-based. The Selected Proposer shall document the cost for the initial license(s) and all subsequent license(s) and renewal(s) that are not provided as part of the initial solution in the cost submittal (**Appendix G – Cost Submittal**). Task D-5 ATMS COTS Software Licenses will be paid separately from the rest of Task D and in conjunction with the software license agreement.

Task D Deliverables Summary	
Task	**Deliverable**
D-1	Procurement Plan
D-2	Implementation Plan
D-3	Test Plan
D-4	Training Plan
D-5	ATMS COTS Software Licenses

Task E: Deployment – Phase 1

Deployment – Phase 1 will result in a deployed and accepted ATMS with all base (Phase 1) functionality as defined in the *Solution Requirements* in context of the *Concept of Operations* finalized in Task B. Advanced (Phase 2) functionality as defined in the same documents shall be reserved for deployment in Deployment - Phase 2 (See Task F).

E-1 Deployment – Phase 1, Part 1

E- 1.1. Equipment Installation
The Selected Proposer shall coordinate with the Commission's IT department to install and configure any hardware or software identified in the Procurement Plan and procured by the Commission to facilitate connectivity to the Commission's network.

E-1.2. Configuration, Customization, and Testing in the Development Environment
The Software Deployment process requires a phased installation of software through a minimum of three environments: development, staging and production.

- All ATMS solution, enhancements and upgrades shall be tested in the Selected Proposer's development environment prior to being tested in the staging environment.
  - The Commission is not responsible for any aspect of the purchase, installation, configuration, support or maintenance of the Selected Proposer development environment.

- The ATMS solution, enhancements and upgrades shall be tested in a staging environment prior to being deployed in the production environment. Staging environment will mirror the production environment.

While configuring/customizing the ATMS solution, the Selected Proposer shall, at a minimum:

- Configure any COTS solutions to meet Commission specific requirements
- Customize any programs and logic according to the specifications contained within the technical solution design documents

- Configure, customize or create designed components of the user interface based on the screen mock-ups and descriptions presented in the *User Interface Design document* approved by the Commission
- Work with internal Commission staff to establish database sizing and space estimates for all tables and supplementary data sources
- All setup, configuration, and population of Commission specific data in the ATMS for the initial release including but not limited to:
  - Create new and import existing DMS (text and graphics) and existing HAR messages into the ATMS solution, including standard messages and templates (approximately 1000 total DMS messages, 400 total HAR messages)
  - Setup and configure "recommended response plan" rules
  - Setup and configure initial travel time links and up to 200 Origin/Destination travel times
  - Setup, configure, and populate contacts lists
  - Setup, configure, and populate all devices
  - Setup, configure, and populate the system map
- Setup and configure middleware, application security, and database tables
- Define and execute all appropriate tests
- Document and maintain all test plans and logs
- Develop and maintain detailed system documentation
- Implement a source management model for source code control

To the extent possible, pre-deployment testing will be conducted at the Selected Proposer's location, followed by testing in the Staging Environment. The Commission reserves the right to witness and participate in any testing sessions.

E-1.3. Software Installation into the Staging Environment
The Selected Proposer must supply a complete, compiled version of the ATMS software to be deployed in the staging environment in the form of an executable program(s) with all associated files and data.
The Selected Proposer is responsible to install, configure and support servers and associated operating systems directly related to the ATMS solution in the staging and production environments. The Commission is responsible to support the Commission's network and network equipment relative to the ATMS solution.

The Commission shall be notified prior to installation of any software.

E-2 Deployment Phase 1, Part 2

E-2.1. Training
The Selected Proposer shall conduct the training in accordance with the approved *Training Plan*.

E-2.2. User Acceptance Testing
Utilizing the approved test scripts developed under the *Task D-3 Test Plans*, the Selected Proposer shall coordinate and document formal UAT in the staging environment. At a minimum, UAT will include:

- Assist the Commission's business program areas with the planning and preparation (including training) for UAT.

- Oversee and support the execution of the UAT plan, including loading and maintaining test data, executing batch streams, assisting with the verification of expected results, and the tracking of defects/incidents discovered during the UAT.
- Track defects that are found during all phases of testing, assess severity, priority, corrective action, level of effort, and impact on schedule.
- Correct, retest, and migrate remediation of defects through the normal development environments, prior to redeploying them in the UAT environment.
- Provide a regular UAT status report including pass/fail metrics, number of defects by severity code, status of rework and re-test, and compliance with planned schedule.
- Facilitate completion of the UAT to meet the established exit criteria in order to proceed to production deployment.
- Obtain sign-off authorization from the business program area and the Commission Project Manager prior to deploying to production.

In addition to using testing scripts, the Commission intends to perform *ad hoc* testing to verify solution functionality.

E- 2.3. Software Installation into the Production Environment

Following the success of User Acceptance Testing in the hosted staging environment and approval from the Commission, the Selected Proposer will install the latest version of the ATMS software in the hosted production environment and complete all subsystem and device migration.

The latest version installed in the production environment will be tested as prescribed in the *Test Plan (Acceptance Testing).*

E-2.4. Acceptance Testing

Acceptance Testing will be completed to ensure that all functionality previously tested in the staging environment has been transferred successfully to the production environment. The Selected Proposer shall utilize the approved test scripts developed under the *Task D-3 Test Plans* to demonstrate full functionality as described in the *Concept of Operations* and *Solution Requirements*. This shall include, but not be limited to, a demonstration of all solution requirements, confirmation and validation of metrics tracking and reporting. The Selected Proposer shall oversee and support the execution of the Acceptance Test plan. At a minimum, Acceptance will include:

- Assist the Commission's business program areas with the planning and preparation (including training) for Acceptance Testing.
- Oversee and support the execution of the Acceptance Testing plan, including assisting with the verification of expected results, and the tracking of defects/incidents discovered during the testing.
- Track defects that are found during all phases of testing, assess severity, priority, corrective action, level of effort, and impact on schedule.
- Correct, retest, and migrate remediation of defects through the development and staging environments. Obtain sign-off authorization from the business program area and the Commission Project Manager prior to redeploying the corrected code.

- Provide a regular testing status report including pass/fail metrics, number of defects by severity code, status of rework and re-test, and compliance with planned schedule.
- Facilitate completion of the Acceptance Test to meet the established criteria.

E- 2.5. Post Implementation Status Report

After implementation the Selected Proposer shall develop and submit a Site Specific Post-Implementation Status Report. At a minimum, this report will accomplish the following objectives:

- Document, log and categorize post-implementation defects
- Post-implementation status report will be provided within the timeframe defined in the implementation plan

E- 2.6 Sixty (60) Day Test Period

Following the successful *Acceptance Testing*, the Commission will have sixty (60) calendar days to identify any ATMS software errors and deficiencies that materially impact the operation of the solution, as defined in the solution requirements and design documentation delivered to and approved by the Commission (Tasks B and C). Errors reported by the Commission and/or proactively identified by the Selected Proposer during this period shall be corrected by the Selected Proposer at **no cost to the Commission**. At the Commission's sole discretion, depending on the frequency and the level of severity of the error or deficiency, the Sixty (60) Day Test Period may be suspended or stopped and restarted pending a resolution of the issue. The Test Period will remain in suspension/stopped until the issue that prompted a suspension has been resolved. Upon successful resolution of such issue, the solution will be monitored for a period of 72 hours to verify the solution is stable and is performing as defined in the solution requirements and design documentation delivered to and approved by the Commission. After demonstrating that the solution is operating properly, the Sixty (60) Day Test Period will resume from the suspension point or from day zero (0), based on the Commission's decision at or before the end of the 72 hour monitoring period.

The Commission will issue a formal letter notifying the Selected Proposer of Phase 1 Deployment Acceptance at the later date of either: a) the end of the sixty (60) calendar days or b) when all reported errors and deficiencies have been corrected. Any time during which the Sixty (60) Day Test Period is suspended shall not count toward the sixty (60) calendar day period.

E- 2.7. Post Implementation On-Site Support

The Selected Proposer must provide on-site support starting immediately following Deployment Phase 1. The on-site support is intended to address solution troubleshooting needs and general questions about software functionality that may arise during the on-site support period for Commission staff working with the new solution. Refer to **Task H: Maintenance and Support** for additional details.

Task E Deliverables Summary	
Task	**Deliverable**
E-1	Deployment – Phase 1, Part 1 • *Equipment Installation* • *Coding and Testing in the Development Environment* • *Software Installation into the Staging Environment*
E-2	Deployment – Phase 1, Part 2 • *Training* • *User Acceptance Testing* • *Software Installation into Production Environment*

	• *Acceptance Testing* • *Post Implementation Status Report* • *Sixty (60) Day Test Period* • *Post Implementation On-Site Support*

Task F: Solution Design and Deployment - Phase 2

Solution Design and Deployment - Phase 2 will result in a deployed and accepted ATMS with all base (Phase 1) functionality and advanced (Phase 2) functionality as defined in *Solution Requirements* in context of the *Concept of Operations* finalized in Task B.

F-1 High Level Solution Design – Phase 2

F-1.1 Update Detailed Business Solution Design
The Selected Proposer will schedule a maximum of 2 meetings to revisit the Detailed Business Solution Design with respect to the Phase 2 functionality to be deployed in this Task. These meetings are intended to provide the Commission an opportunity to realign any Business Requirements related to the Phase 2 functionality. Any requirements removed or added at this time shall be negotiated as required. Net positive (additional) requirements shall be negotiated and paid using solution enhancement hours (See Task G for additional detail).

The Selected Proposer shall update the Solution Design documentation (e.g. *Concept of Operations, Solution Requirements, Detailed Business Solution Design, Traceability Matrix*) as required. Required changes to this document resulting from this task shall be incidental to this task and at no additional cost to the Commission.

F-2 Detailed Solution Design – Phase 2

F-2.1 User Interface Demonstrations
The Selected Proposer will provide a second round of demonstrations to review the User Interface aspects that are associated with the advanced (Phase 2) functionality to be deployed in Deployment - Phase 2. A maximum of two (2) User Interface Demonstrations shall be held.

Five (5) business days prior to each User Interface Demonstration, the Selected Proposer shall provide draft user interface design documents. Following each demonstration, the Selected Proposer shall provide meeting minutes that capture comments provided at the demonstrations.

F-2.2 User Interface Configuration Document
Upon acceptance of the demonstrated user interface, the Selected Proposer shall submit a supplement or revision to the *Detailed Design Document* describing any resulting changes or additions attributed to the Phase 2 functionality of the software will function. This document shall be developed to the level that each graphical user interface (GUI) element (e.g. fields, buttons) are described with detailed text that identifies the functionality of each element. The text should describe not only how each element works, but also the expected behavior. It shall be considered a draft user manual and provide the Commission a final opportunity to comment on the proposed user interface.

F-2.3 Update Detailed Solution Design

The Selected Proposer shall update the Solution Design documentation (e.g. *Detailed Solution Design Document*) as required. As changes and additions to this document are anticipated with the additions the Phase 2 functionality to the GUI, required changes to this document resulting from net positive (additional) functionality Task F-1.1 and F-2.2 shall be incidental to this task and at no additional cost to the Commission.

F-3 Training and Test Plans – Phase 2
The Selected Proposer shall submit, for review in accordance with **Appendix T**, updated training and test plans for Deployment – Phase 2 functionality in accordance with the requirements set forth in tasks D-3 Test Plan and D-4 Training Plan.

F-4 Deployment – Phase 2, Part 1

The following deliverable shall be repeated as defined in Task E-1 and as modified in the descriptions below.

F-4.1. Equipment Installation
This deliverable is reserved for the installation of equipment as defined in *E-1.1. Equipment Installation* for any additional equipment that may be required as part of Deployment - Phase 2 that was not already procured and installed in Deployment – Phase 1.

F-4.2. Configuration, Customization, and Testing in the Development Environment
The completion of this deliverable for Deployment – Phase 2 shall be in accordance with the process described in *E-1.2. Configuration, Customization, and Testing in the Development Environment.*

F-4.3. Software Installation into the Staging Environment
The completion of this deliverable for Deployment – Phase 2 shall be in accordance with the process described in *E-1.3.Software Installation into the Staging Environment.*

F-5 Deployment – Phase 2, Part 2

The following deliverable shall be repeated as defined in Task E-2 and as modified in the descriptions below.

F-5.1. Training
The completion of this deliverable for Deployment – Phase 2 shall be in accordance with the process described in *E-2.1. Training.*

F-5.2. User Acceptance Testing
The completion of this deliverable for Deployment – Phase 2 shall be in accordance with the process described in *E-2.2. User Acceptance Testing.*

F-5.3. Software Installation into the Production Environment
The completion of this deliverable for Deployment – Phase 2 shall be in accordance with the process described in *E-2.3. Software Installation into the Production Environment.*

F-5.4. Acceptance Testing

The completion of this deliverable for Deployment – Phase 2 shall be in accordance with the process described in *E-2.4.Acceptance Testing.*

F-5.5. Post Implementation Status Report
The completion of this deliverable for Deployment – Phase 2 shall be in accordance with the process described in *E-2.5. Post Implementation Status Report.*

F-5.6 Sixty (60) Day Test Period
Following the successful *Acceptance Testing*, the Commission will have sixty (60) calendar days to identify any ATMS software errors and deficiencies that materially impact the operation of the solution, as defined in the solution requirements and design documentation delivered to and approved by the Commission (Tasks B and C). Any errors and deficiencies identified in this period are not limited to Deployment – Phase 2 functionality. Any Errors reported by the Commission and/or proactively identified by the Selected Proposer during this period shall be corrected by the Selected Proposer at **no cost to the Commission**. At the Commission's sole discretion, depending on the frequency and the level of severity of the error or deficiency, the Sixty (60) Day Test Period may be suspended or stopped and restarted pending a resolution of the issue. The Test Period will remain in suspension/stopped until the issue that prompted a suspension has been resolved. Upon successful resolution of such issue, the solution will be monitored for a period of 72 hours to verify the solution is stable and is performing as defined in the solution requirements and design documentation delivered to and approved by the Commission. After demonstrating that the solution is operating properly, the Sixty (60) Day Test Period will resume from the suspension point or from day zero (0), based on the Commission's decision at or before the end of the 72 hour monitoring period.

The Commission will issue a formal letter notifying the Selected Proposer of Solution Acceptance at the later date of either: a) the end of the sixty (60) calendar days or b) when all reported errors and deficiencies have been corrected. Any time during which the Sixty (60) Day Test Period is suspended shall not count toward the sixty (60) calendar day period.

F-5.7 Post Implementation On-Site Support
The Selected Proposer must provide on-site support starting immediately following Deployment Phase 2. The on-site support is intended to address solution troubleshooting needs and general questions about software functionality that may arise during the on-site support period for Commission staff working with the additional functionality provided in Deployment Phase 2. Refer to **Task H: Maintenance and Support** for additional details.

Task F Deliverables Summary	
Task	**Deliverable**
F-1	High Level Solution Design – Phase 2 • *Update Detailed Business Solution Design*
F-2	Detailed Solution Design – Phase 2 • *User Interface Design Demonstrations* • *User Interface Design Document (Supplement or Revision)* • *Update Detailed Solution Design*
F-3	Training and Test Plans – Phase 2

F-4	Deployment – Phase 2, Part 1 • *Equipment Installation* • *Configuration, Customization, and Testing in the Development Environment* • *Software Installation into the Staging Environment*
F-5	Deployment – Phase 2, Part 2 • *Training* • *User Acceptance Testing* • *Software Installation into Production Environment* • *Acceptance Testing* • *Post Implementation Status Report* • *Sixty (60) Day Test Period* • *Post Implementation On-Site Support*

Task G: Solution Enhancements

This task is reserved for Solution Enhancements to be assigned by the Commission. The Commission reserves the right to request enhancements, to be completed in accordance with and as part of earlier releases, or concurrently with other phases of this project. In the event that enhancements do not fit into a release, the enhancement may be done in accordance with **Appendix B – Special Terms and Conditions – Additional Work**. The Commission has included 3,000 hours for Solution Enhancements. The Proposer shall provide a blended rate for each year of the contract period within **Appendix G – Cost Submittal**. The Solution Enhancements are anticipated to be completed in years three (3), four (4), and five (5) of the contract however, the Commission reserves the right to utilize these hours for enhancements to be implemented in Deployment - Phases 1 and 2. The total amount of Enhancement hours shall be negotiated and agreed upon for each enhancement task prior to the start of work and will not be billed to the Commission without approval.

Anticipated and/or potential enhancements are identified in **Appendix L – Concept of Operations** and **Appendix M – Solution Requirements.** Examples of other enhancements include, but are not limited to:

- New interfaces
- New reports
- Data feeds (e.g. XML, RSS, etc.)
- Technology upgrades
- Incorporation of new technologies
- Predictive modeling
- Additional solution functionality

The Commission will work with the Selected Proposer to determine which items will fit in the scope of each release based on the assignments. The deliverables for each enhancement release will be based on a management plan that is established at the start of the enhancement effort. The Selected Proposer will prepare and execute an enhancement management plan for each assigned enhancement or group of enhancements. These plans shall respond to the following requirements:

- Requests submitted by the Commission will be used to prioritize and determine scope for a release
- Forecast resource demands for both Proposer and Commission resources
- Leverage and employ application development best practices used with similar solutions and processes in industry
- Provide accurate level of effort and resource estimates
- Ensure testing and implementation support activities are clearly defined
- Prepare, maintain and report on a baseline work breakdown structure for each enhancement release

The Proposer shall provide detailed release documentation with each ATMS software enhancement and upgrade. The Proposer shall assume that all the deliverables listed below will be required for each release. The size and complexity of the requested enhancements will determine the level of detail required for the deliverables listed below. If approved by the Commission Project Manager, some deliverables may be waived for a specific release depending on the scope of the release.

- Release Management Plan
- Detailed Requirements
- Detailed Business Solutions Design
- Detailed Technical Design
- Unit Test Plan & Testing
- Solution Test Plan & Testing
- User Acceptance Test Plan and Testing. (Obtain sign-off authorization from the affected business program area and the Commission Project Manager prior to deploying to production.)
- User Training Plan, materials and training
- User Documentation Update
- Implementation Plan
- Post-implementation status report
- Technical support training plan and training
- Knowledge transfer

Thirty (30) Day Test Period

Following the successful enhancement release implementation, the Commission will have thirty (30) calendar days to identify any ATMS software errors and deficiencies that materially impact the operation of the solution, as defined in the solution requirements and design documentation delivered to and approved by the Commission (Tasks B and C). Any errors and deficiencies identified in this period are not limited to the subject enhancement release. Any errors reported by the Commission and/or proactively identified by the Selected Proposer during this period shall be corrected by the Selected Proposer at **no cost to the Commission**. At the Commission's sole discretion, depending on the frequency and the level of severity of the error or deficiency, the Thirty (30) Day Test Period may be suspended or stopped and restarted pending a resolution of the issue. The Test Period will remain in suspension/stopped until the issue that prompted a suspension has been resolved. Upon successful resolution of such issue, the solution will be monitored for a period of 72 hours to verify the solution is stable and is performing as defined in the solution requirements and design documentation delivered to and approved by the Commission. After demonstrating that the solution is operating properly, the Thirty

(30) Day Test Period will resume from the suspension point or from day zero (0), based on the Commission's decision at or before the end of the 72 hour monitoring period.

The Commission will issue a formal letter notifying the Selected Proposer of Solution Acceptance at the later date of either: a) the end of the thirty (30) calendar days or b) when all reported errors and deficiencies have been corrected. Any time during which the Thirty (30) Day Test Period is suspended shall not count toward the thirty (30) calendar day period.

The Commission reserves the right to specify an alternative test period duration (increased or decreased) based on the scope of the subject enhancement(s). Any adjustment to this period shall be made during the negotiations and prior to approval of the enhancement task.

Task H: Maintenance and Support

Maintenance and Support activities (Task H-1, H-3 and H-4) shall begin upon the completion and acceptance of Deployment – Phase 1, *E.2.6. Sixty (60) Day Test Period.* Solution software, hardware, and all functionality deployed at the completion and acceptance of Deployment – Phase 2 or any subsequent enhancements as a result of Task G: Solution Enhancements will be subject to Maintenance and Support activities described in this section. The maintenance and support of the solution prior to Phase 1 Deployment acceptance shall be the Selected Proposer's responsibility and all shall be incidental to Task E – Deployment – Phase 1.

H-1 On-Site Support
On-Site support staff shall report to the Commission's Turnpike Industrial Park building in Highspire, PA. The support person's duties include but are not limited to: assisting users, answering ATMS questions, provide front end administration support, assist in the adding of devices, creation of messages, and troubleshooting of any issues.

The Selected Proposer shall be required to provide on-site, forty (40) hours per week support with a minimum of one (1) technically qualified staff member for the entirety of the *Sixty (60) Day Test Periods* of *Deployment Phase 1 and 2*. An additional thirty (30) calendar days of on-site, forty (40) hours per week support shall be provided starting after solution acceptance of *Deployment - Phase 1*; and thirty (30) calendar days of on-site, forty (40) hours per week support shall be provided starting after solution acceptance of *Deployment - Phase 2*. The forty (40) hours per week will be provided during normal business hours.

The Proposer shall document the cost to provide on-site support for the required periods following the *Sixty (60) Day Test Periods* within **Appendix G – Cost Submittal**. On-site support during the *Sixty Day Test Periods* shall be considered incidental to the Deployment - Phases 1 and 2. The Selected Proposer will not be paid for the period of on-site support during the *Sixty Day Test Period* for Phase 2, as on-site support during this period is incidental to the deployment phases. Refer to **Appendix U – Payment Schedule** for on-site support payment milestone details. The Commission reserves the right to extend the On-Site support period. Any additional cost due to the extension of this period will be based on the Selected Proposer's submitted cost proposal for **H-1 On-Site Support**.

H-2 User and Support Documentation

H-2.1. User Documentation

The Selected Proposer shall produce comprehensive user documentation for ATMS. User documentation shall include but not be limited to:

- User manual
- Solution operations and maintenance manual
  - Operations manual document shall include all installation, support and configuration documentation for any and all necessary input and/or output interfaces required to collect and/or send data and/or control commands to and/or from any ITS device currently operating within the TOC
- Solution administration manual

Documentation shall be available electronically (rather than in binders) to users and support staff, with the ability to print all or selected sections as needed. User documentation shall be available in the document repository, which is created and administered by the Commission, and from the ATMS application.

Documentation shall include but not be limited to the below elements:

- A table of contents, an index, and keywords for information searching
- Data dictionary
- Glossary of terms
- List of reports, description, sample layout, and input parameters
- An online help facility providing:
  - Help at the data element level
  - Help at the process or topic level
  - Search capability at the data element, process or topic level
  - Print capability at the data element, process or topic level

The Selected Proposer shall turn the documentation over for ongoing updates by Commission staff, as indicated in the Turnover Plan (H-5).

H-2.2. Troubleshooting Guide

The Selected Proposer shall produce a troubleshooting guide with recommendations for resolving potential problems that may occur with the software. This matrix should include step-by-step recommendations, preferably depicted in a process flow diagram that allows basic users the ability to resolve problems as quickly as possible. The recommendations will also indicate what steps the Commission staff is expected to take before contacting the Selected Proposer for support. The Selected Proposer will assist the Commission in documenting the issue escalation procedures within the Commission, based on the user group privileges defined during solution design and with consideration of skill sets needed to provide support.

It is expected that draft documents for User and Support Documentation (Task H-2) shall be produced under the solution design, development and training tasks for Deployment - Phase 1. The deliverable for task H-2 shall be comprehensive, final documentation that shall be provided following Deployment - Phase 1 solution implementation, and updated following Deployment - Phase 2.

Updates to the User and Support Documentation shall then be provided and updated as needed under the *Routine Maintenance and Support* and *Solution Enhancements* tasks.

H-3 Routine Maintenance and Support

Selected Proposer will be responsible to maintain and support the ATMS solution and associated software running on the workstations and servers as well as all hardware provided by the Selected Proposer, in a hosted environment, for the entire contract term. The Commission IT department shall be responsible for all aspects of the support and maintenance pertaining to the Commission's network, and related hardware procured by the Commission to support the network connectivity of the solution. Remote administration access shall be available and will be initiated by the Selected Proposer and facilitated by Commission network engineers.

Routine maintenance will address solution issues that prevent the solution from functioning as designed and routine service requests. Examples include, but are not limited to:

- Service failures
- Bug fixes
- Data fixes
- Screen element malfunctions
- Spelling mistake corrections
- Special reports and data extracts
- User and technical documentation updates
- Proactive identification and mediation of potential issues that may result from system changes due to required technology upgrades (e.g. patches, version upgrades)
- Answering general questions about solution functionality
- Providing solution administration assistance to the Commission for the ATMS software and associated equipment
- Assisting the Commission in troubleshooting ATMS software issues including instances where the software issues may be related to the network and the field devices
- Coordinating emergency changes/releases with the Commission project manager
- Implementing emergency changes/releases

Starting with the solution acceptance of *Deployment - Phase 1*, the Selected Proposer shall provide the routine maintenance and support activities to support the ATMS solution, consistent with the requirements described under this task.

As ITS systems are closely tied with the networking infrastructure, detailed troubleshooting of the entire solution related systems may be required by the Selected Proposer. Ultimately, it will be the Selected Proposer's responsibility to ensure that the ATMS software solution remains in operation. The Selected Proposer will establish an 800 number and provide 24/7/365 remote support for the solution and provide service in accordance with **Appendix C - Service Level Agreement**.

At a minimum, the Commission expects the Selected Proposer to complete the following steps when resolving service failures:

- Respond to all service failure events within SLA guidelines
- Communicate periodic status updates during service failure response
- Maintain detailed service failure records
- Provide a quick assessment of criticality, impact to business, risks and options
- Restore application service
- At the request of the Commission, provide a root cause analysis report within two (2) business days of service failure. The report will include:
  - Chronology analysis in support of problem resolution
  - Documentation of all emergency changes
  - Description and schedule for any follow-up changes
  - Identification of the root cause of the service failure
- At the request of the Commission, document additional corrective action necessary to prevent future reoccurrence of the problem within five (5) business days of service failure.
- At the request of the Commission, implement and document changes in supporting environments within two (2) business days of the conclusion of corrective maintenance activities.

The Selected Proposer shall recommend and complete any additional steps required to successfully resolve service failures, based on industry standards, best practices and Proposer experience.

The Selected Proposer shall provide monthly performance reports to demonstrate compliance with the SLA. The Commission will work with the Selected Proposer to identify the report format.

The Proposer shall document the cost to provide Routine Maintenance and Support within **Appendix G – Cost Submittal**. Routine Maintenance and Support shall begin on the completion and acceptance of *Deployment - Phase 1, Sixty (60) Day Test Period.* Routine Maintenance and Support task is an ongoing task that shall continue throughout the duration of the Contract or until the Commission determines the routine maintenance services are no longer needed, whichever occurs first. The Commission has included 42 months of Routine Maintenance and Support services within **Appendix G – Cost Submittal.** Refer to **Appendix U – Payment Schedule** and **Appendix C – Service Level Agreement** for payment milestones and service level requirements. Routine Maintenance and Support shall not be paid during the *Deployment - Phase 2, Sixty (60) Day Test Period*; Routine Maintenance and Support during this period of time shall be considered incidental to Deployment – Phase 2.

H-4 Hosting Service

The Selected Proposer shall be responsible to provide, maintain, and support a hosted environment to meet the hosting requirements defined in **Appendix M – Solution Requirements** and to maintain the Level of Service defined in **Appendix C – Service Level Agreement**.

The Commission has included 42 months of hosting service within **Appendix G – Cost Submittal**. The Commission will begin payment for hosting services on completion and acceptance of *Deployment Phase 1, Sixty (60) Day Test Period.* All hosting costs prior to the aforementioned acceptance shall be incidental to Task E: Deployment Phase 1. Refer to **Appendix U – Payment Schedule** for additional details. This Task shall only include costs associated with the facilitation of the hosted environment; costs associated with the routine maintenance, administration and support of the solution shall be included in **Task H-3 – Routine Maintenance and Support**.

H-5 Escrow Agreement

If any portion of the software solution is proprietary, the Selected Proposer shall establish an escrow account and deposit the ATMS solution source code into the escrow account. The Selected Proposer shall propose an Escrow Agent and shall enter into a three party escrow agreement with the Commission and a mutually agreed upon Escrow Agent.

The escrow agreement shall be executed in time for the final solution acceptance of the final deployment. The Proposer will be required to deposit the final accepted version of the software code into the escrow account and have a validation test performed by the escrow agent to prove usability of the deposited software code (in a production setting or similar environment) before payment for the completion and acceptance of *Deployment – Phase 2, Sixty (60) Day Test Period*.

The Proposer shall keep the validated version of the software code in an escrow account and shall deposit any updated versions of the software code into the account as updated versions become available. The escrow account shall be maintained for the duration of the contract. At the Commission's discretion, a validation test shall be performed by the escrow agent to prove usability of the deposited software code at least once a year.

The Proposer shall indicate in the technical proposal the approach to establishing and maintaining an escrow agreement. Minimally, the escrow agreement shall:

1) Contain a provision under which the Proposer and escrow agent will indemnify and hold harmless the Commonwealth of Pennsylvania and the Commission at all times
2) Be interpreted in accordance with and fully comply with Pennsylvania law
3) Provide adequate protections to permit the Commission to access the escrowed source code under all circumstances, during regular business hours
4) Fully comply with the Commonwealth of Pennsylvania's contracting procedures and protocol, which includes but it not limited to standard contract provisions, such as the Contractor Responsibility Provisions; Contractor Integrity Provisions; Commonwealth Nondiscrimination/Sexual Harassment Clause; offset provision; Provisions Concerning the Americans with Disabilities Act; and the Right-to-Know Law Provisions

The escrow agreement shall not:

1) Require the Commission to indemnify any party
2) Require the Commission to agree to pay any attorneys' fees, late fees, interest or similar charges
3) Conflict with applicable Commonwealth of Pennsylvania laws and policies

The Proposer shall document the cost to establish the escrow agreement and all subsequent renewals in the **Appendix G – Cost Submittal**. This deliverable is not required for Proposer(s) who do not propose a COTS solution(s). All software developed by the Proposer and/or its subcontractors as a result of this contract shall be considered Developed Works Materials.

Task H Deliverables Summary

Task	Deliverable
H-1	On-Site Support
H-2	User and Support Documentation • *User Documentation* • *Troubleshooting Guide*
H-3	Routine Maintenance and Support
H-4	Hosting Service
H-5	Escrow Agreement

Task I: Turnover

The Selected Proposer shall produce a complete solution component inventory of components to be turned over at the completion of the project. Depending on the solution that is proposed in response to this RFP, the Commission may choose to maintain some of the solution components (e.g. custom developed components). The Commission will work with the Selected Proposer to determine who is responsible for maintaining each of the solution components.

The Commission must be able to use, support, maintain, and enhance any custom developed functionality that is turned over to the Commission. The Selected Proposer shall complete turnover services when the Commission is intended to take over a component and/or when the Commission initiates steps to rebid all or part of the tasks included in this contract. The Selected Proposer will first develop a turnover plan and follow the steps described in the plan at the predefined triggers during the turnover process.

I-1 Turnover Plan
Turnover may occur at the identified milestone(s) agreed upon by the Selected Proposer and the Commission and/or at the end of the contract. The turnover plan must identify the critical tasks that need to occur to provide a smooth and orderly turnover of functions to the Commission or to another Commission specified entity.

The work activities associated with this task include, but are not limited to, the following:

- Activities necessary to turn over the business application functions in an orderly manner
- Specialized technical transition of application(s)
- Knowledge transfer activities
- Solution turnover objectives and work plan activities on a chart, including activity time frames and responsibilities
- Resources required, including those from the Commission, the Selected Proposer, and any new contractor
    - For each component that is turned over to the Commission for maintenance, the Selected Proposer shall complete a comprehensive component maintenance assessment. The assessment must include the component name, technology, a level of effort (LOE) estimate and a skill set description needed to maintain the component

This turnover plan must be submitted to the Commission for final review and approval. The Turnover Plan shall be submitted for review within the fourth year of the contract and approved by the Commission, at a minimum, six (6) months prior to the end of the contract term.

I-2 Service Turnover
Once the service turnover is initiated, the Selected Proposer is responsible for delivery of the following:

- Services to ensure a smooth and orderly transition of functions, programs, responsibilities, services and systems to the Commission or to another entity specified by the Commission
- Transitioning the business applications, providing the updated versions of solution documentation, and completing knowledge transfer activities according to the approved turnover plan.
- Turning over the following documents/information:
  - Production program documentation and any updated procedures
  - Any/all data stored, in production or archive
  - All non-proprietary source code
  - Final user and solution documentation
  - All assets and artifacts in a neatly organized, easily navigable and normalized taxonomy
  - References and operational instructions to technology assets
  - General procedures for updating computer programs, data and reference files, all other documentation
  - Any information that is currently in use to support the application(s)

During the turnover activities, the Selected Proposer must submit weekly Turnover Progress Reports and at the end of the turnover period, the Selected Proposer must prepare a report that documents the completion of turnover activities, and provides status of each high-level task and activity that took place during the full service period.

The deliverable for this task shall be weekly Turnover progress reports and a successful completion of the approved Turnover Plan.

Task I Deliverables Summary	
Task	**Deliverable**
I-1	Turnover Plan
I-2	Service Turnover

Task J: PennDOT

Task J is reserved for PennDOT to deploy the Commission's Next Generation ATMS Software or secure services to maintain and enhance existing ATMS Software at a PennDOT facility or facilities or at the facilities of such other Commonwealth agency or entity authorized to collect tolls on roadways and highways in the Commonwealth of Pennsylvania as agreed to by the parties (PTC, Selected Proposer, and one or more of the Commonwealth agencies or entities). Task J may include any of the work (e.g. software solution design, development, implementation, testing, maintenance and support, and enhancement deliverables) that is part of this procurement. The Commission and the Selected Proposer reserve the right to mutually agree upon the scope, specific tasks, and schedule for completion of Task J. For any work

originating from this Task, PennDOT (or other Commonwealth agency as defined above) and Selected Proposer would negotiate a separate agreement, in accordance with the applicable IGA Agreement, between themselves with the provision that the schedules of those agreements would not delay the schedule in any Commission contracts. PennDOT (or other Commonwealth agency as defined above) shall administer this work, shall be invoiced directly for payment, and shall handle all disputes for this work directly with the Selected Proposer. The Commission shall not incur any additional administrative overhead as a result of work originating from this Task.

IV-5 Reports and Project Control

The Selected Proposer must provide reports including but not limited to, the following:

Weekly ATMS Status Meetings and Reports
The Selected Proposer shall schedule and attend weekly ATMS Status meetings and submit a Status Report to Commission Project Manager at least one business day in advance of the Status Meeting. All reports shall be delivered on time and shall contain accurate information.

Regular Status Reports
The Selected Proposer shall submit regular Status Reports that shall be integrated into the weekly ATMS Status Reports. The Status Reports shall include, but will not be limited to, the following:

a. Project dashboard that shows current status of all project activities, tasks, milestones
b. Updated ATMS Project Work Plan and CPM schedule
c. Review/update action items from last meeting
d. Planned tasks/activities to be completed during the next week
e. Review of project budget
f. Issues, risks, and proposed changes
g. Monthly Performance Report (**See Appendix C – Service Level Agreement)** starting after Deployment Phase 1

All reports shall be delivered on time and shall contain accurate information.

APPENDIX A

STANDARD AGREEMENT

AGREEMENT

This **AGREEMENT** is made this _____ day of _____, 2016, between the **Pennsylvania Turnpike Commission ("COMMISSION")**, an instrumentality of the Commonwealth of Pennsylvania, with principal offices at 700 South Eisenhower, Blvd., Middletown, Pennsylvania 17057 (mailing address: P. O. Box 67676, Harrisburg, PA 17106-7676);

AND

(*name of contractor)* **("CONTRACTOR")**, a (*state)* corporation, with its principal office at **(*address)*.**

WITNESSETH:

WHEREAS, the **COMMISSION** desires to satisfy a need for the (*name of solicitation*);

WHEREAS, by Act No. 211 of the General Assembly of the Commonwealth of Pennsylvania, approved May 21, 1937, and its amendments, the **COMMISSION** is authorized and empowered to enter into an Agreement with the **CONTRACTOR**;

WHEREAS, the **COMMISSION** desires to retain the services of **CONTRACTOR** upon the following terms; and

NOW, THEREFORE, in consideration of these mutual covenants, and intending to be legally bound, the parties agree as follows:

Contractor's Scope of Work

The **CONTRACTOR** will perform the work described in (*solicitation identification, i.e. RFP number*) dated (*date of solicitation*), titled (*Title of solicitation*) and the **CONTRACTOR'S** proposal dated (*date of contractor's proposal*). These documents are made a part of this Agreement by reference.

Commission's Responsibilities

(*As defined in Section I of the RFP, "Commission Participation"*)

The **COMMISSION** shall furnish the **CONTRACTOR** access to key personnel, relevant documents, and adequate workspace for completing the work.

Compensation

For the work, services, and material as defined in this Agreement, the **CONTRACTOR** shall be paid a not-to-exceed amount of **(*agreement dollar value*).**

The **CONTRACTOR** agrees that the **COMMISSION** may set off the amount of any state tax liability or other obligation of the **CONTRACTOR** or its subsidiaries to the Commonwealth against any payments due the **CONTRACTOR** under any contract with the **COMMISSION**.

Duration of Agreement

The term of this Agreement shall be for a period of (*agreement term*) and shall commence on the Effective Date as defined below.

The Effective Date shall be fixed by the **COMMISSION** after the Agreement has been fully executed by the **CONTRACTOR** and by the **COMMISSION**, and after all approvals required by the **COMMISSION** contracting procedures have been obtained.

This Agreement will not terminate until the **COMMISSION** accepts all work as complete and tenders final payment to the **CONTRACTOR**.

Termination

Either party may terminate this Agreement at any time upon thirty- (30) calendar days written notice. If this notice is given, the **CONTRACTOR** shall be paid only for the services already rendered upon the date of the notice and for the services rendered to the date of termination, subject to all provisions of this Agreement. The notice will be effective on the date of receipt. The right to cancel may be exercised as to the entire project, or as to any particular phase or phases, part or parts, and upon one or upon several occasions, but any termination may not be revoked except upon written consent of the parties through a supplemental Agreement to this Agreement.

Insurance

The **CONTRACTOR**, prior to execution of this Agreement, shall furnish to the **COMMISSION** the certificates of insurances as required in attached **Exhibit "X"** and made a part of this Agreement.

Diverse Business (DB) Requirements

The **CONTRACTOR** agrees to comply with the requirements set forth in the **COMMISSION'S** DB Requirements **- Exhibit X**, attached and made part of this Agreement. In particular, the **CONTRACTOR** agrees to comply with section (d) Consultant Requirements During Performance of Services.

Assignment and Delegation

The **CONTRACTOR** may not transfer, assign, or delegate any terms of this Agreement, in whole or in part, without prior written permission from the **COMMISSION**.

Governing Law

This Agreement will be interpreted according to the laws of the Commonwealth of Pennsylvania.

Observance of Laws

The **CONTRACTOR** agrees to observe all relevant federal, state, and local laws and to obtain in its name all necessary permits and licenses.

Work for Hire

Except for hardware, third party licensed software, and software previously developed by **CONTRACTOR,** all Deliverables, including but not limited to source code, software, specifications, plans, designs and engineering, drawings, data, information or other written, recorded, photographic, or visual materials, trademarks, service marks, copyrights or other Deliverables produced by **CONTRACTOR** or any supplier in the performance of this Agreement shall be deemed "Work Product". All Work Product shall be considered services for hire. Accordingly, except as set forth earlier in this paragraph, all Work Product shall be the exclusive property of the **COMMISSION**.
The **CONTRACTOR** agrees to notify the **COMMISSION** in writing before using any of **CONTRACTOR's** previously developed software for services provided under this Agreement.
The **CONTRACTOR** and the **COMMISSION** will honor all applicable preexisting licenses, copyrights, trademarks, service marks, and patents. If as part of an expense item under this Agreement, the **CONTRACTOR** purchases the right to any license, the agreements for the use or ownership of such license will be placed in the name of the **COMMISSION** along with all other rights and obligations. In addition, the **CONTRACTOR** will mark all Turnpike content or previously unprotected work product designated by the **COMMISSION** with a notice as follows: "Pennsylvania Turnpike Commission, (Year)".

Virus, Malicious, Mischievous or Destructive Programming
Licensor warrants that the licensed product as delivered by Licensor does not contain any viruses, worms, Trojan Horses, or other malicious or destructive code to allow unauthorized intrusion upon, disabling of, or erasure of the licensed products (each a "Virus").

The Commission's exclusive remedy, and Licensor's sole obligation, for any breach of the foregoing warranty shall be for Licensor to (a) replace the licensed products with a copy that does not contain Virus, and (b) if the Commission, has suffered an interruption in the availability of its computer system caused by Virus contained in the licensed product, reimburse the Commission for the actual reasonable cost to remove the Virus and restore the Commission's most recent back up copy of data provided that:

- the licensed products have been installed and used by the Commission in accordance with the Documentation;
- the licensed products has not been modified by any party other than Licensor;
- the Commission has installed and tested, in a test environment which is a mirror image of the production environment, all new releases of the licensed products and has used a generally accepted antivirus software to screen the licensed products prior to installation in its production environment.

Under no circumstances shall Licensor be liable for damages to the Commission for loss of the Commission's data arising from the failure of the licensed products to conform to the warranty stated above.

Audit/Retention of Records

CONTRACTOR and its subcontractors shall maintain books and records related to performance of this Agreement or subcontract and necessary to support amounts charged to the **COMMISSION** in accordance with applicable law, terms and conditions of this Agreement, and generally accepted accounting practice. **CONTRACTOR** shall maintain these books and records for a minimum of three (3) years after the completion of the Agreement, final payment, or completion of any contract, audit or litigation, whichever is later. All books and records shall be available for review or audit by the **COMMISSION,** its representatives, and other governmental entities with monitoring authority upon reasonable notice and during normal business hours. **CONTRACTOR** agrees to cooperate fully with any such review or audit. If any audit indicates overpayment to **CONTRACTOR,** or subcontractor, the **COMMISSION** shall adjust future or final payments otherwise due. If no payments are due and owing to **CONTRACTOR,** or if the overpayment exceeds the amount otherwise due, **CONTRACTOR** shall immediately refund all amounts which may be due to the **COMMISSION.** Failure to maintain the books and records required by this Section shall establish a presumption in favor of the **COMMISSION** for the recovery of any funds paid by the **COMMISSION** under this Agreement for which adequate books and records are not available to support the purported disbursement.

Dispute Resolution

All questions or disputes regarding any matter involving this Agreement or its breach shall be referred to the Board of Claims of the Commonwealth of Pennsylvania pursuant to 62 Pa.C.S.A. § 1701 *et seq*. If the Board of Claims either refuses or lacks jurisdiction, these questions or disputes shall proceed as provided in 42 Pa.C.S.A. § 7301 *et seq*. (Statutory Arbitration).

The panel of arbitrators will consist of a representative of each of the parties and a third party chosen by the representatives, or if the representatives are unable to choose, by the American Arbitration Association.

Indemnification

The **CONTRACTOR** shall be responsible for, and shall indemnify, defend, and hold harmless the **COMMISSION** and its Commissioners, officers, employees, and agents from any claim, liability, damages, losses, causes of action, and expenses, including reasonable attorneys' fees, arising from damage to life or bodily injury or real or tangible personal property caused by the negligence or other tortious acts, errors, and omissions of **CONTRACTOR**, its employees, or its subcontractors while engaged in performing the work of this Agreement or while present on the **COMMISSION**'s premises, and for breach of this Agreement regarding the use or nondisclosure of proprietary and confidential information where it is determined that **CONTRACTOR** is responsible for any use of such information not permitted by this Agreement. The indemnification obligation shall not be limited in any way by any limitation on the amount or type of damages, compensation or benefits payable by or for Contractor or its subcontractors

under Workmen's Compensation Acts, Disability Benefits Acts, or other Employee Benefit Act.

Contractor Integrity Provisions

The Contractor Integrity Provisions are attached as **Exhibit X** and made a part of this Agreement.

Confidentiality Provisions

1. As a consequence of the performance of its duties with the **COMMISSION**, **CONTRACTOR** may learn, be given, or become aware of certain information, including, but not limited to, matters pertaining to internal communications, information, proprietary information, individually identifiable health information, trade practices, business operations, or other sensitive information collectively known as Confidential Information. Regardless of how transmitted or received by **CONTRACTOR**, whether by receipt, sending, or merely becoming available to **CONTRACTOR** through its relationship to the **COMMISSION**, **CONTRACTOR** agrees to maintain and treat as proprietary and confidential to the **COMMISSION** all such Commission Confidential Information, and shall not discuss, reveal, or use for any purpose outside the performance of its contract with the **COMMISSION** such Commission Confidential Information.

2. With respect to its employees, **CONTRACTOR** agrees to:

a) require all of its employees to maintain confidentiality;

b) take appropriate action against its employees, officers, and subcontractors for any and all violations of this Agreement;

3. With respect to any subcontractors that **CONTRACTOR** wishes to employ to perform any of its obligations under any agreement with the **COMMISSION**, **CONTRACTOR** agrees to require any such approved subcontractor to execute written confidentiality agreements that require each such **CONTRACTOR** and its employees to comply with all the requirements set forth above.

4. **CONTRACTOR** agrees that any breach of these Confidentiality Provisions may result in civil and/or criminal penalties, for **CONTRACTOR**, its officers and employees, and subcontractors.

5. Notwithstanding any other provision to the contrary, **CONTRACTOR** agrees that these provisions shall survive the termination of this and any and all agreements between the **CONTRACTOR** and the **COMMISSION**.

6. **CONTRACTOR** agrees to treat the information in the same way **CONTRACTOR** treats its own most confidential information and to inform each such person of these provisions.

7. **CONTRACTOR** agrees to immediately notify the **COMMISSION** of any information which comes to its attention which does or might indicate that there has been any loss of confidentiality or information.

8. **CONTRACTOR** shall return to the **COMMISSION** upon demand any and all Confidential Information entrusted to it by the **COMMISSION** pursuant to this Agreement (including any and all copies, abstracts, compilations or analyses thereof and memoranda related thereto or incorporating the Confidential Information) or the **CONTRACTOR** may request permission from the **COMMISSION**, which permission may be granted or denied in the **COMMISSION**'s sole discretion, to destroy all such Confidential Information and provide a certificate of destruction to the **COMMISSION** signed by the **CONTRACTOR**. The **CONTRACTOR** further agrees that neither itself nor its employees or representatives will copy, in whole or in part, any such Confidential Information without the prior written consent of the **COMMISSION**.

9. **CONTRACTOR** agrees that if they have had or will have an SSAE16 audit that they will comply with and abide by the findings of such audit to protect **COMMISSION** information.

Entire Agreement

This Agreement, together with any writings either attached as exhibits or incorporated by reference, constitutes the entire understanding between the parties and there are no other oral or extrinsic understandings of any kind between the parties.

Modification

This Agreement may be modified only by a writing signed by both parties.

[SIGNATURES ARE SET FORTH ON THE NEXT PAGE]

IN WITNESS WHEREOF, the **Pennsylvania Turnpike Commission** and **(*Contractor Name*)** have executed this Agreement by their duly authorized officers on the date written above.

ATTEST: PENNSYLVANIA TURNPIKE COMMISSION

_____	_____	_____	_____
Ann Louise Edmunds Assistant Secretary-Treasurer	Date	Sean Logan Chairman	Date

APPROVED AS TO FORM AND LEGALITY:

_____	_____	_____	_____
Albert C. Peters II General Litigation & Contracts Counsel	Date	Pennsylvania Attorney General	Date

ATTEST: (*Contractor Name*)

Signature_____	_____	Signature_____	_____
	Date		Date
Name_____		Name_____	
Title_____		Title_____	

Federal Tax ID No._____

CONTRACTOR INTEGRITY PROVISIONS

It is essential that those who seek to contract with the Pennsylvania Turnpike Commission ("Commission") observe high standards of honesty and integrity. They must conduct themselves in a manner that fosters public confidence in the integrity of the Commission contracting and procurement process.

I. DEFINITIONS. For purposes of these Contractor Integrity Provisions, the following terms shall have the meanings found in this Section:

a. **"Affiliate"** means two or more entities where (a) a parent entity owns more than fifty percent of the voting stock of each of the entities; or (b) a common shareholder or group of shareholders owns more than fifty percent of the voting stock of each of the entities; or (c) the entities have a common proprietor or general partner.

b. **"Consent"** means written permission signed by a duly authorized officer or employee of the Commission, provided that where the material facts have been disclosed, in writing, by prequalification, bid, proposal, or contractual terms, the Commission shall be deemed to have consented by virtue of the execution of this contract.

c. **"Contractor"** means the individual or entity, that has entered into this contract with the Commission, and "Contractor Related Parties" means any affiliates of the Contractor and the Contractor's executive officers, Pennsylvania officers and directors, or owners of 5% or more interest in the Contractor

d. **"Financial Interest"** means either:

i. Ownership of more than a five percent interest in any business; or

ii. Holding a position as an officer, director, trustee, partner, employee, or holding any position of management.

e. **"Gratuity"** means tendering, giving, or providing anything of monetary value including, but not limited to, cash, travel, entertainment, gifts, meals, lodging, loans, subscriptions, advances, deposits of money, services, employment, or contracts of any kind. See Commission Policy 3.10, Code of Conduct.

f. **"Non-bid Basis"** means a contract awarded or executed by the Commission with Contractor without seeking bids or proposals from any other potential bidder or offeror.

II. In furtherance of this policy, Contractor agrees to the following:

1. Contractor shall maintain the highest standards of honesty and integrity during the performance of this contract and shall take no action in violation of state or federal laws or regulations or any other applicable laws or regulations, or other requirements applicable to Contractor or that govern contracting or procurement with the Commission.

2. Contractor shall establish and implement a written business integrity policy, which includes, at a minimum, the requirements of these provisions as they relate to Contractor activity with the Commission and Commission employees and which is made known to all Contractor employees. Posting these Contractor Integrity Provisions conspicuously in easily-accessible and well-lighted places customarily frequented by employees and at or near where the contract services are performed shall satisfy this requirement.

3. Contractor, its affiliates, agents, employees and anyone in privity with Contractor shall not accept, agree to give, offer, confer, or agree to confer or promise to confer, directly or indirectly, any gratuity or pecuniary benefit to any person, or to influence or attempt to influence any person in violation of the Public Official and Employees Ethics Act, 65 Pa.C.S. §§1101 et seq.; the State Adverse Interest Act, 71 P.S. §776.1 et seq.; Commission Policy 3.10, Code of Conduct or in violation of any other federal or state law in connection with performance of work under this contract, except as provided in this contract.

4. Contractor shall not have a financial interest in any other contractor, subcontractor, or supplier providing services, labor, or material under this contract, unless the financial interest is disclosed to the Commission in writing and the Commission consents to Contractor's financial interest prior to Commission execution of the contract. Contractor shall disclose the financial interest to the Commission at the time of bid or proposal submission, or if no bids or proposals are solicited, no later than Contractor's submission of the contract signed by Contractor.

5. Contractor certifies to the best of its knowledge and belief that within the last five (5) years Contractor or Contractor Related Entities have not:

a. been indicted or convicted of a crime involving moral turpitude or business honesty or integrity in any jurisdiction;

b. been suspended, debarred or otherwise disqualified from entering into any contract with any governmental agency;

c. had any business license or professional license suspended or revoked;

d. had any sanction or finding of fact imposed as a result of a judicial or administrative proceeding related to fraud, extortion, bribery, bid rigging, embezzlement, misrepresentation or anti-trust; and

e. been, and is not currently, the subject of a criminal investigation by any federal, state or local prosecuting or investigative agency and/or civil anti-trust investigation by any federal, state or local prosecuting or investigative agency.

If Contractor cannot so certify to the above, then it must submit along with its bid, proposal or contract a written explanation of why such certification cannot be made and the Commission will determine whether a contract may be entered into with the Contractor. The Contractor's obligation pursuant to this certification is ongoing from and after the effective date of the contract through the termination date thereof. Accordingly,

the Contractor shall have an obligation to immediately notify the Commission in writing if at any time during the term of the contract if becomes aware of any event which would cause the Contractor's certification or explanation to change. Contractor acknowledges that the Commission may, in its sole discretion, terminate the contract for cause if it learns that any of the certifications made herein are currently false due to intervening factual circumstances or were false or should have been known to be false when entering into the contract.

6. Contractor shall comply with the requirements of the Lobbying Disclosure Act (65 Pa.C.S. §13A01 et seq.) regardless of the method of award. If this contract was awarded on a Non-bid Basis, Contractor must also comply with the requirements of the Section 1641 of the Pennsylvania Election Code (25 P.S. §3260a).

7. When Contractor has reason to believe that any breach of ethical standards as set forth in law, Commission Policy 3.10, Code of Conduct, or these Contractor Integrity Provisions has occurred or may occur, including but not limited to contact by a Commission officer or employee which, if acted upon, would violate such ethical standards, Contractor shall immediately notify the Commission contracting officer or the Chief Compliance Officer in writing.

8. Contractor, by submission of its bid or proposal and/or execution of this contract and by the submission of any bills, invoices or requests for payment pursuant to the contract, certifies and represents that it has not violated any of these Contractor Integrity Provisions in connection with the submission of the bid or proposal, during any contract negotiations or during the term of the contract, to include any extensions thereof. Contractor shall immediately notify the Commission in writing of any actions for occurrences that would result in a violation of these Contractor Integrity Provisions. Contractor agrees to reimburse the Commission for the reasonable costs of investigation incurred by the Chief Compliance Officer for investigations of the Contractor's compliance with the terms of this or any other agreement between the Contractor and the Commission that results in the suspension or debarment of the Contractor. Contractor shall not be responsible for investigative costs for investigations that do not result in the Contractor's suspension or debarment.

9. Contractor shall cooperate with the Chief Compliance Officer in investigating any alleged Commission agency or employee breach of ethical standards and any alleged Contractor non-compliance with these Contractor Integrity Provisions. Contractor agrees to make identified Contractor employees available for interviews at reasonable times and places. Contractor, upon the inquiry or request of the Chief Compliance Officer, shall provide, or if appropriate, make promptly available for inspection or copying, any information of any type or form deemed relevant by the Chief Compliance Officer to Contractor's integrity and compliance with these provisions. Such information may include, but shall not be limited to, Contractor's business or financial records, documents or files of any type or form that refer to or concern this contract. Contractor shall incorporate this paragraph in any agreement, contract or subcontract it enters into in the course of the performance of this contract/agreement solely for the purpose of obtaining subcontractor compliance with this provision. The incorporation of this provision in a subcontract shall not create privity of contract between the Commission and any such subcontractor, and no third party beneficiaries shall be created thereby.

10. For violation of any of these Contractor Integrity Provisions, the Commission may terminate this and any other contract with Contractor, claim liquidated damages in an amount equal to the value of anything received in breach of these Provisions, claim damages for all additional costs and expenses incurred in obtaining another contractor to complete performance under this contract, and debar and suspend Contractor from doing business with the Commonwealth. These rights and remedies are cumulative, and the use or non-use of any one shall not preclude the use of all or any other. These rights and remedies are in addition to those the Commission may have under law, statute, regulation, or otherwise.

APPENDIX B

SPECIAL TERMS AND CONDITIONS

Appendix B
Special Terms and Conditions

1. FEDERALLY FUNDED CONTRACTS

In the event that Federal funding is used to support the work governed by this Contract, the following provisions apply:

A. **Federal Representative**
All references to the Federal Representative in this Contract apply. The Federal Highway Administration (FHWA) is referred to as the Federal Representative.

B. **Federal Nondiscrimination Clauses**
CONTRACTOR agrees to comply with the Federal Nondiscrimination and Equal Employment Opportunity Clauses, dated January 1976, which are attached to and made a part of this Agreement.

C. **Certification of Contractor**
CONTRACTOR hereby certifies that CONTRACTOR has not employed or retained for a commission, percentage, brokerage, contingent fee, or other consideration, any firm or person (other than a bona fide employee working solely for CONTRACTOR) to solicit or secure this Contract.

CONTRACTOR further certifies that CONTRACTOR has not agreed, as an express or implied condition for obtaining this Contract, to employ or retain the services of any firm or person in connection with carrying out this Contract. CONTRACTOR has not paid, or agreed to pay, to any firm, organization, or person (other than a bona fide employee working solely for CONTRACTOR) any fee, contribution, donation, or consideration of any kind for, or in connection with, procuring or carrying out this Contract. No member or delegate to the Congress of the United States shall be admitted to any share or part of this Contract or to any benefit arising therefrom.

D. **Federal Disadvantaged Business Enterprise Assurance**
CONTRACTOR shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. CONTRACTOR shall carry out applicable requirements of 49 C.F.R. Part 26 in the award and administration of United States Department of Transportation-assisted contracts. Failure by CONTRACTOR to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy as the PA TURNPIKE COMMISSION (COMMISSION) deems appropriate. If CONTRACTOR is providing services or supplies for the COMMISSION pursuant to this contract, it must include this assurance in each subcontract that it signs with a subcontractor. If CONTRACTOR is a grantee or other recipient of funds from the COMMISSION, it must include this assurance in each contract into which it enters to carry out the project or activities being funded by this contract.

E. **Review Rights**
The COMMISSION and the Federal Representative, if appropriate, have the right to review and inspect all project activities at any time. The COMMISSION retains the right to conduct security audits.

2. OWNERSHIP RIGHTS

a) Ownership of Properties

1. All "Developed Works" shall be owned according to the provisions set forth in this Section 2.

2. All software owned by the COMMISSION or its licensors ("Commission Software") as of the Effective Date, shall be and shall remain the exclusive property of the COMMISSION or its licensors, and CONTRACTOR shall acquire no rights or interests in the Commission Software or Tools or that of its licensors by virtue of this Contract except as described in this Section or in another provision set forth in this Contract. The CONTRACTOR shall not use any Commission Software, Commission Tools or software or tools of its licensors for any purpose other than for completion of work to be performed under this Contract. In the use of Commission Software, Commission Tools or software or tools of its licensors, CONTRACTOR will be bound by the confidentiality provisions of this Contract.

b) Definitions

1. Software—For the purposes of this Contract, the term "software" means a collection of one or more programs, databases or microprograms fixed in any tangible medium of expression that comprises a sequence of instructions (source code) to carry out a process in, or convertible into, a form executable by an electronic computer (object code).

2. Data—For the purposes of this Contract, the term "data" means any recorded information, regardless of form, the media on which it may be recorded, or the method of recording.

3. Technical Data—For purposes of this Contract, the term "technical data" means any specific information necessary for the development, production or use of the Commission Software.

c) Commission Property—Non-Exclusive, License Grant and Restrictions

During the term of this Contract, the COMMISSION grants to CONTRACTOR for the limited purpose of providing the Services covered under this Contract, a limited, nonexclusive, nontransferable, royalty-free right (subject to the terms of any third party agreement to which the COMMISSION is a party) to do the following:

1. Obtain access to and use of the Commission Software in accordance with the terms of this Contract.

2. Reproduce the Commission Software for archival purposes or for other purposes expressly provided for under this Contract.

3. Modify the Commission Software consistent with the terms and conditions of this Contract provided that CONTRACTOR agrees to assign to the COMMISSION, its rights, if any, in any derivative works resulting from CONTRACTOR's modification of the Commission Software. CONTRACTOR agrees to execute any documents required to evidence this assignment and to waive any moral rights and rights of attribution provided for in Section 106A of Title 17 of the United States Code, the Copyright Act of 1976.

4. Allow the CONTRACTOR's subcontractors approved by the COMMISSION to obtain access to the Commission Software for the purposes of complying with the terms and conditions of this Contract; provided, however, that neither CONTRACTOR nor any of its subcontractors may decompile or reverse engineer, or attempt to decompile or reverse engineer, any of the Commission Software. COMMISSION hereby represents that it has the authority to provide the license grant and rights set forth in this Section.

5. To the extent that CONTRACTOR uses Commission Software, Commission Tools or software or tools of its licensor, CONTRACTOR agrees to protect the confidentiality of these works and maintain these proprietary works with the strictest confidence.

d) Impact of Third Party Agreements

Subject to the terms of any third party agreement to which the COMMISSION is a party, (i) the COMMISSION shall, at no cost to CONTRACTOR, provide CONTRACTOR with access to the COMMISSION Software in the form in use by COMMISSION as of the Effective Date of this Contract and, (ii) CONTRACTOR, as part of the Services to be rendered under this Contract, shall compile and, as changes are made, update a list of all of the Commission Software then in use by CONTRACTOR or any of its subcontractors in connection with CONTRACTOR's performance of the Services required by this Contract.

e) Reservation of Rights

All rights, not expressly granted here to CONTRACTOR on a nonexclusive basis, including the right to grant non-exclusive licenses and other rights are reserved by the COMMISSION.

f) Termination of Commission License Grant

Upon the expiration or termination for any reason of CONTRACTOR's obligation to provide the Services under this Contract, all rights granted to CONTRACTOR in this Section shall immediately cease. CONTRACTOR shall, at no cost to COMMISSION, deliver to COMMISSION all of the Commission Software and Tools (including any related source code then in CONTRACTOR's possession or under its control) in the form in use as of the Effective Date of such expiration or termination. Within fifteen (15) calendar days

after termination, CONTRACTOR shall provide the COMMISSION with a current copy of the list of Commission Software in use as of the date of such expiration or termination. Concurrently therewith, CONTRACTOR shall destroy or erase all other copies of any of the Commission Software then in CONTRACTOR's possession or under its control unless otherwise instructed by COMMISSION, in writing; provided, however, that CONTRACTOR may retain one archival copy of such Commission Software and Tools, until final resolution of any actively asserted pending disputes between the Parties, such retention being for the sole purpose of resolving such disputes.

g) Effect of License Grant Termination

Consistent with the provisions of this Section, CONTRACTOR shall refrain from manufacturing, copying, marketing, distributing, or use of any Commission Software or any other work which incorporates the Commission Software. The obligations of this Section shall survive any termination of this Contract.

h) Use of Contractor-Owned Software

All software owned by CONTRACTOR (Contractor Software) and tools owned by CONTRACTOR (collectively "Contractor Tools," as defined in paragraph (i) below) prior to the Effective Date of this Contract shall be and shall remain the exclusive property of CONTRACTOR. The COMMISSION shall acquire no rights or interests in the Contractor Software or the Contractor Tools by virtue of this Contract except as set forth below (in the form of a license).

i) Definition of Contractor Tools

Contractor Tools is defined as any tools, both in object code and source code form, which CONTRACTOR has previously developed, or which CONTRACTOR independently develops or licenses from a third party, excluding any tools that CONTRACTOR creates pursuant to this Contract. Contractor Tools includes but is not limited to, methodologies, information, concepts, toolbars for maneuvering between pages, search engines, and ActiveX controls.

j) Required Reports, Records and Inventory of Contractor Tools and Contractor Software

1. CONTRACTOR must provide a list of all Contractor Tools and Contractor Software to be delivered in connection with the deliverables or Developed Materials prior to commencing any work under the Contract. All Contractor Tools and Contractor Software necessary to use deliverables or Developed Materials shall be delivered to the COMMISSION along with the license set forth in subsection (k). CONTRACTOR may amend these lists from time to time while the Contract is being carried out or upon its completion. In the event that the CONTRACTOR fails to list a Contractor Tool, but can demonstrate that such tool was independently developed by CONTRACTOR prior to the Contract on which it was used, CONTRACTOR shall nevertheless retain complete ownership of such Contractor Tool that is necessary to use the deliverables or Developed Materials, provided that notice is given to the COMMISSION prior to its use on the

Contract. Any Contractor Tools or Contractor Software not included on the lists will be deemed to have been created under this Contract.

2. As part of its response to a RFP, the CONTRACTOR will provide a list of all software and tools that are commercially available and which are required to support the deliverables or Developed Materials. (Appendix J – Proposed ATMS Solution Technical Summary)

3. During the term of this Contract, CONTRACTOR shall maintain at its principal office books of account and records showing its actions under this Contract. Upon reasonable notice by COMMISSION, CONTRACTOR shall allow COMMISSION to inspect these records and accounts for purposes of verifying the accuracy of such accounts and records.

4. In the event that CONTRACTOR fails to list a Contractor Tool or Contractor Software, but is able to demonstrate that such tool or software was independently developed by CONTRACTOR prior to the Effective Date of this Contract, CONTRACTOR shall retain complete ownership of such Contractor Tool or Contractor Software that is necessary to use the deliverables or Developed Works, provided that notice is given to the COMMISSION prior to use on the Contract.

k) Expiration or Termination Non Exclusive License Grant—Non-Commercial Contractor Tools and Software

Upon the expiration or termination for any reason of CONTRACTOR's obligation to provide the Services under this Contract, and/or at the request of the COMMISSION, CONTRACTOR shall (i) grant to COMMISSION a paid-up, nonexclusive, nontransferable license to use, modify, display, prepare derivative works and sublicense grant to third parties engaged by COMMISSION (by contract or otherwise) the right to use, modify, and prepare derivative works based upon all or any portion of the non-commercially available Contractor Software and the non-commercially available Contractor Tools owned by CONTRACTOR and used by CONTRACTOR in connection with the Services, the foregoing rights being granted to the extent reasonably necessary to facilitate COMMISSION's or such third party's completion of and maintenance of the Services to be provided by CONTRACTOR under this Contract immediately prior to such expiration or termination and (ii) deliver to the COMMISSION the object code version of such non-commercially available Contractor Software and such non-commercially available Contractor Tools in the form used by CONTRACTOR in connection with the Services immediately prior to such expiration or termination to allow the COMMISSION to complete and maintain such work. If COMMISSION enters into a contract that allows for the use of the Contractor Software or Contractor Tools for which a license is granted under this Section, the COMMISSION will include a provision in that contract that limits the use of the Contractor Software or Contractor Tools as delineated in this Section.

l) Rules of Usage for Developed Works

1. If Developed Works modify, improve, or enhance application software programs or other materials generally licensed by the CONTRACTOR, then such Developed Works shall be the property of the CONTRACTOR, and CONTRACTOR hereby grants

COMMISSION and any third party acting on its behalf, an irrevocable, nonexclusive, worldwide, fully paid-up license (to include source code and relevant documentation) in perpetuity to use, modify, execute, reproduce, display, perform, prepare derivative works from and distribute, within the COMMISSION, of such Developed Works. For purposes of distribution under the license grant created by this section, the term "COMMISSION" includes any government agency, department, instrumentality, division, unit or other office that is part of the Commonwealth of Pennsylvania, together with the State System of Higher Education (including any of its universities), any county, borough, commonwealth, city, municipality, town, township special purpose district, or other similar type of governmental instrumentality located within the geographical boundaries of the Commonwealth of Pennsylvania. If federal funds are used in creation of the Developed Works, the COMMISSION also includes any other state government as well as the federal government.

2. If Developed Works modify, improve, or enhance application software or other materials not licensed to the COMMISSION by the CONTRACTOR, then such modifications, improvements and enhancements shall be the property of the COMMISSION and its licensor. To the extent the COMMISSION owns the software or other materials, it hereby grants to CONTRACTOR an irrevocable, nonexclusive, worldwide, fully paid-up license to use, modify, execute, reproduce, display, perform, prepare derivative works from, and distribute copies of such Developed Works. To the extent the COMMISSION has a license to the software or other materials, and to the extent that it, in its sole discretion determines it is able to do so the COMMISSION will grant to CONTRACTOR an irrevocable, nonexclusive, worldwide, fully paid-up license to use, modify, execute, reproduce, display, perform and distribute copies of such Developed Works.

3. If Developed Works have been funded by COMMISSION, to any extent, with either COMMISSION or federal funds, and the Developed Works do not include pre-existing materials generally licensed by the CONTRACTOR, then the COMMISSION shall have all right, title, and interest (including ownership of copyright and trademark) to such Developed Works and the COMMISSION hereby grants to CONTRACTOR an irrevocable, nonexclusive, worldwide, fully paid-up license to use, modify, execute, reproduce, display, perform, prepare derivative works from, and distribute copies of such Developed Works. The COMMISSION shall exclusively own all software products first developed under the terms of this contract by the CONTRACTOR, its subcontractors or other third party vendors that are specifically developed for, engineered and integrated into the Developed Works.

4. When the Developed Work is a report provided by a research company that was provided under this Contract, but which was not developed specifically for the COMMISSION under this Contract, the ownership of the Developed Work will remain with the CONTRACTOR, provided, however, that the COMMISSION has the right to copy and distribute the Developed Work within the COMMISSION.

m) Copyright Ownership—Developed Works developed as part of the Scope of Work for the Project, including Developed Works developed by Subcontractors, are the sole and exclusive property of the COMMISSION and shall be considered "works made for hire" under the United States Copyright Act of 1976, as amended, 17 United States Code. In the

event that the Developed Works do not fall within the specifically enumerated works that constitute works made for hire under the United States copyright law, CONTRACTOR agrees to assign and, upon their authorship or creation, expressly and automatically assigns all copyright interests, proprietary rights, trade secrets, and other right, title, and interest in and to such Developed Works to the COMMISSION. CONTRACTOR further agrees that it will have its Subcontractors assign, and upon their authorship or creation, expressly and automatically assign all copyright interest, proprietary rights, trade secrets, and other right, title, and interest in and to the Developed Works to the COMMISSION. The COMMISSION shall have all rights accorded an owner of copyright under the United States copyright laws including, but not limited to, the exclusive right to reproduce the Developed Works in multiple copies, the right to distribute, copies by sales or other transfers, the right to register all copyrights in its own name as author in the United States and in foreign countries, the right to prepare derivative works based upon the Developed Works and the right to display the Developed Works. The CONTRACTOR further agrees that it will include this requirement in any subcontractor or other agreement with third parties who in any way participate in the creation or development of Developed Works. Upon completion or termination of this Contract, Developed Works shall immediately be delivered by CONTRACTOR to the COMMISSION. CONTRACTOR warrants that the Developed Works are original and do not infringe any copyright, patent, trademark, or other intellectual property right of any third party and are in conformance with the intellectual property laws of the United States.

n) Patent Ownership

1. CONTRACTOR and its subcontractors shall retain ownership to patentable items, patents, processes, inventions or discoveries (collectively, the Patentable Items) made by the CONTRACTOR during the performance of this Contract. Notwithstanding the foregoing, the COMMISSION shall be granted a nonexclusive, nontransferable, royalty free license to use or practice the Patentable Items. The COMMISSION may disclose to third parties any such Patentable Items made by CONTRACTOR or any of its subcontractors under the scope of work for the Project that have been previously publicly disclosed. The COMMISSION understands and agrees that any third party disclosure will not confer any license to such Patentable Items.

2. CONTRACTOR shall not use any computer program, code, or any works developed by or for CONTRACTOR independently of this Contract (“Pre- Existing Materials”) in the performance of the Services under this Contract, without the express written consent of the COMMISSION. Any Pre-Existing Materials used by CONTRACTOR for performance of Services under this Contract without COMMISSION consent shall be deemed to be Developed Works as that term is used in this Section. In the event that COMMISSION provides such consent, CONTRACTOR shall retain any and all rights in such Pre-Existing Materials.

o) Federal Government Interests

It is understood that certain funding under this Contract may be provided by the federal government. Accordingly, the rights to Developed Works or Patentable Items of Contractors or subcontractors hereunder will be further subject to government rights as set forth in 37

C.F.R. Section 401, and other applicable statutes. (p) Usage Rights for Know-How and Technical Information Either Party, in the ordinary course of conducting business, may use any ideas, concepts, know-how, methodologies, processes, components, technologies, algorithms, designs, modules or techniques not otherwise covered by this Section relating to the Services which CONTRACTOR or COMMISSION (alone or jointly with the COMMISSION) develops or learns in connection with CONTRACTOR's provision of Services to the COMMISSION under this Contract.

p) Usage Rights for Know-How and Technical Information

Either Party, in the ordinary course of conducting business, may use any ideas, concepts, know-how, methodologies, processes, components, technologies, algorithms, designs, modules or techniques not otherwise covered by this Section relating to the Services which CONTRACTOR or COMMISSION (alone or jointly with the COMMISSION) develops or learns in connection with CONTRACTOR's provision of Services to the COMMISSION under this Contract.

q) Commission Intellectual Property Protection

CONTRACTOR acknowledges the COMMISSION's exclusive right, title and interest, including without limitation copyright and trademark rights, in and to Commission Software, Commission Tools and the Developed Works developed under the provisions of this Section, shall not in any way, at any time, directly or indirectly, do or cause to be done any act or thing contesting or in any way impairing or tending to impair any part of said right, title, and interest, and shall not use or disclose the Commission Software, Commission Tools, or the Developed Works without COMMISSION's written consent, which consent may be withheld by the COMMISSION for any reason. Further, CONTRACTOR shall not in any manner represent that CONTRACTOR has any ownership interest in the Commission Software, Commission Tools, or the Developed Works. This provision is a material part of this Section.

r) Contractor Intellectual Property Protection

COMMISSION acknowledges that it has no ownership rights in the Contractor Software or Contractor Tools other than those set forth in this Contract, or as may be otherwise granted in writing.

s) Source Code and Escrow Items Obligations

Simultaneously with delivery of the Developed Works to the COMMISSION, CONTRACTOR shall deliver a true, accurate and complete copy of all source codes relating to the Developed Works. To the extent that the Developed Works include application software or other materials generally licensed by the CONTRACTOR, then the source code shall be placed in escrow, subject to the terms and conditions of an Escrow Agreement to be executed by the Parties and an Escrow Agent that is acceptable to the COMMISSION. (RFP Task H-5 Escrow Agreement).

t) Contractor's Copyright Notice Obligations

CONTRACTOR will affix the following Copyright Notice to the Developed Works developed under this Section and all accompanying documentation: "Copyright © [year] by the Pennsylvania Turnpike Commission. All Rights Reserved." This notice shall appear on all tangible versions of the Developed Works delivered under this Contract and any associated documentation. It shall also be programmed into any and all Developed Works delivered hereunder so that it appears at the beginning of all visual displays of such Developed Works.

u) Commercial Software

If a product or deliverable under this Contract is commercially available software or requires commercially available software for use, the CONTRACTOR hereby agrees that it will enter into a software license agreement with the COMMISSION that provides the COMMISSION (and third parties acting on behalf of the COMMISSION) with, all rights set forth in the above section labeled "Rules of Usage for Developed Works.". If the CONTRACTOR is not the licensor of the software, CONTRACTOR hereby agrees that it will inform the licensor of the software that it will be required to enter into a license agreement with the COMMISSION (which shall also address third parties' rights, while acting on behalf of the COMMISSION, to utilize the licensed software).

v) Perpetual License Requirement

The CONTRACTOR hereby agrees that all COTS software and solutions shall be provided to the COMMISSION by way of a perpetual, royalty-free license to the COMMISSION including, but not limited to, non-expiring usage to current and future versions, released during the contract term, as explained above in subsection (u), *Commercial Software*.

3. PUBLICATION RIGHTS AND/OR COPYRIGHTS

a) Except as otherwise provided in this Section, the CONTRACTOR shall not publish any of the results of the work without the written permission of the COMMISSION. The publication shall include the following statement: "The opinions, findings, and conclusions expressed in this publication are those of the author and not necessarily those of the Pennsylvania Turnpike Commission." The CONTRACTOR shall not include in the documentation any copyrighted matter, unless the CONTRACTOR provides the COMMISSION with written permission of the copyright owner.

b) Except as otherwise provided in Paragraph 5, Confidentiality, the COMMISSION shall have unrestricted authority to reproduce, distribute, and use any submitted report or data designed or developed and delivered to the COMMISSION as part of the performance of the Contract.

c) Rights and obligations of the parties under this Section survive the termination of this Contract.

4. CONFIDENTIALITY

a) The CONTRACTOR agrees to protect the confidentiality of the COMMISSION's confidential information and the COMMISSION will take all reasonably necessary measures to ensure the confidentiality of the CONTRACTOR's information that it designates as confidential in accordance with this paragraph. In order for information to be deemed confidential, the party claiming confidentiality must designate the information as "confidential" in such a way as to give notice to the other party (notice may be communicated by describing the information, and the specifications around its use or disclosure, in the SOW). Neither party may assert that information owned by the other party is such party's confidential information. The parties agree that such confidential information shall not be copied, in whole or in part, or used or disclosed except when essential for authorized activities under this Contract and, in the case of disclosure, where the recipient of the confidential information has agreed to be bound by confidentiality requirements no less restrictive than those set forth herein. Each copy of such confidential information shall be marked by the party making the copy with any notices appearing in the original. Upon termination or cancellation of this Contract or any license granted hereunder, the receiving party will return to the disclosing party all copies of the confidential information in the receiving party's possession, other than one copy, which may be maintained for archival purposes only, and which will remain subject to this Contract's security, privacy, data retention/destruction and confidentiality provisions (all of which shall survive the expiration of this Contract). Both parties agree that a material breach of these requirements may, after failure to cure within the time frame specified in this Contract, and at the discretion of the non-breaching party, result in termination for default, in addition to other remedies available to the non-breaching party.

b) Insofar as information is not otherwise protected by law or regulation, the obligations stated in this Section do not apply to information:

1. already known to the recipient at the time of disclosure other than through the contractual relationship;
2. independently generated by the recipient and not derived from the information supplied by the disclosing party;

3. known or available to the public, except where such knowledge or availability is the result of unauthorized disclosure by the recipient of the proprietary information;
4. disclosed to the recipient without a similar restriction by a third party who has the right to make such disclosure; or
5. required to be disclosed by the recipient by law, regulation, court order, or other legal process.

There shall be no restriction with respect to the use or disclosure of any ideas, concepts, know-how, or data processing techniques developed alone or jointly with the COMMISSION in connection with services provided to the COMMISSION under this Contract. Notwithstanding the foregoing, confidential information may be the subject of a request under the Pennsylvania Right-to-Know Law, 65 P.S. § 67.101 *et seq*, and the CONTRACTOR shall comply with the Right-to-Know Law Provisions set forth in the COMMISSION's Policy Letter 10.01 (Right to Know Law Information Request) and the COMMISSION's "Right to Know Request" web site link.

5. ADDITIONAL WORK

As part of this design, build and implementation project the need for some additional work not yet anticipated or defined within specified Tasks, but within the Contract scope, may be identified by the COMMISSION or the CONTRACTOR. In the event that such additional work is identified, the CONTRACTOR shall propose the level of effort, any associated costs and a schedule for completion.

The agreement for inclusion of the additional work, associated costs and completion schedule, or any such change that results in an increase or decrease in the total value of the Contract, shall be formalized in writing by an exchange of letter signed only by both parties, COMMISSION's Director of Traffic Engineering and Operations or Chief Information Officer.

APPENDIX C

SERVICE LEVEL AGREEMENT

Appendix C
Service Level Agreement

The COMMISSION expects that the CONTRACTOR will demonstrate a high level of service and quality control standards. The CONTRACTOR is required to maintain high quality standards and provide quality assurance in order to meet or exceed the service levels outlined below. In addition, the CONTRACTOR shall take timely and appropriate action in response to resources that are not performing to the COMMISSION expectations.

The COMMISSION has developed a base Service Level Agreement (SLA) that is set forth herein for the purpose of measuring CONTRACTOR performance throughout the life of the Contract, and any renewals. The SLA will go into effect on acceptance of Deployment - Phase 1.

A monthly performance report will be submitted by the CONTRACTOR beginning after acceptance of Deployment - Phase 1. Monthly performance reports will be reviewed to enable the COMMISSION to evaluate the CONTRACTOR on a variety of performance criteria, including, but not limited to, the SLA established. If any service deficiencies are identified across the entire contract, the CONTRACTOR and the COMMISSION representatives will determine a corrective action plan to ensure that the level of service improves. Failure to correct service deficiencies may be considered an event of default. The COMMISSION reserves the right to hold monthly review meetings to review the CONTRACTOR'S level of service and discuss improvements to the SLA described below.

As a part of process improvement, throughout the life of the contract, improvement to existing SLA's and\or additional SLA's are to be presented at the monthly review meeting. The COMMISSION recommends that the CONTRACTOR utilize survey tools to periodically gather customer satisfaction feedback from a randomly selected group of the COMMISSION users who utilize the CONTRACTOR service desk. Changes and\or additions to SLA's resulting from the process improvement efforts will be agreed upon by the CONTRACTOR and the COMMISSION.

(a) **Reporting**

The CONTRACTOR shall provide all performance reports, delivered to the Project Manager on or before the 5th calendar day of each month for the immediate preceding month to verify the fulfillment of the service level requirements The CONTRACTOR shall furnish the COMMISSION with a monthly report on all service request activity in an electronic format agreed upon by the COMMISSION and will provide access to all the data used to generate these reports.

Credits: If any performance report is not delivered to The COMMISSION's Project Manager on or by the 5th calendar day of each month, the CONTRACTOR shall apply credit in the amount as described below to the full monthly invoice amount for Task H-3, Routine Maintenance and Support. The credit shall be applied to the monthly service invoice of the affected month.

Performance Reports	Credits (per report)
All reports received on or by the 5th calendar day of the month	No credits applied
Any report received after the 5th calendar day of the month	$50 (per day)

(b) **System Availability**

This metric is established to track system availability from an end users' perspective. The intent is to assure system availability at or above 99.95% for 24 hours, 7 days a week, 365 days a year continuous system operation. The goal is to have minimal or no unplanned outages that impact the end users.

System availability refers to the time the system is functional, accessible and capable of meeting the contracted performance requirements. The System will be deemed unavailable if the TOC is not able to access ATMS or not able to operate one or more core ATMS modules. A core module is defined as a module with functionality directly related to the response to an incident (e.g. DMS, HAR, Recommended Response Plan). Downtime calculation shall include all downtime from start to finish. The system availability metric applies to the CONTRACTOR provided **software** for the ATMS solution.

The CONTRACTOR will be responsible for reporting on system availability monthly. Downtime shall be calculated from the time when the COMMISSION notifies the CONTRACTOR of the unavailability to when the CONTRACTOR notifies the COMMISSION of restoration of availability and in turn, validated by the COMMISSION.

NOTE: The COMMISSION **approved** downtime due to **planned** ATMS system maintenance will not count towards total system downtime; **approved** downtime shall be counted as time the system is available.

The calculation for **Percent Uptime** shall be as follows:

Percent Uptime = (**System availability** – **Downtime**) / (**System availability**) *100

- **System Availability** = number of minutes a system is fully functional and accessible base on normal hours of operation (24/7/365) for the reporting month.
- **Downtime** = number of minutes a system is unavailable for the reporting month (applies only to unplanned outages).

Credits: If the reported monthly system availability is below 99.95%, the CONTRACTOR shall apply credit in the amount as described below to the full monthly invoice amount for Task H-3, Routine Maintenance and Support. The credit shall be applied to the monthly service invoice of the affected month.

Monthly System Availability Performance (Effective Period - downtime in any month)	**Credits**
99.95% to 100% (0 – 22 mins)	**No credits applied**
99.9% to 99.94% (22 mins – 44 mins)	**5%**
98% to 99.8% (44 mins – 14 hrs)	**15%**
95% to 97.9% (14 – 36 hrs)	**25%**
90% to 94.9% (36 – 72 hrs)	**50%**
75% to 89.9% (72 – 180 hrs)	**75%**
Less than 75% (Greater than 180 hrs)	**100%**

(c) **Service Request Management**

The CONTRACTOR shall produce a troubleshooting guide with recommendations for resolving potential problems that may occur with the software (See Task H-2.2). This matrix shall include step-by-step recommendations that allow basic users the ability to resolve problems as quickly as possible. The recommendations will also indicate what steps the COMMISSION staff is expected to take before contacting the CONTRACTOR for support. All service requests escalated to the CONTRACTOR for resolution shall be resolved according to the parameters established within this Section. The resolution time requirements include any required travel time.

The hours indicated in the response and resolution timeframes shall be interpreted as consecutive hours within a 24 hour period, except where specifically noted as *business* hours. Business Hours are: Monday - Friday, 8AM - 5PM. The following table explains Severity Levels of service requests. **The COMMISSION will determine the severity level assigned to requests.**

Severity Matrix			
The following are examples of COMMISSION determined severity levels:			
Severity 1	**Severity 2**	**Severity 3**	**Severity 4**
• Complete or substantial loss of service or severe degradation of the system that makes the system unusable. • Inability to use a mission-critical application	• Multiple users are affected by a service degradation or out-of-service condition. • Significant loss of service or high business impact. • Any service that affects certain key officials (executive personnel). • Failure of a redundant system component	• An individual line or port is out of service, or limited features for a small number of users (one to three) are not functioning. • Minimal business impact, problem may be bypassed. • Some loss of service or other specific functionality is lost. • Non Service Affecting Alarms	• An informational request or a fault that has no business impact

Credits: If any of the Service Request/Response targets are not met, the CONTRACTOR shall apply credit in the amount as described below to the full monthly invoice amount for Task H-3, Routine Maintenance and Support. The credit shall be applied to the monthly service invoice in

which the resolution occurred. Time interval for each service request shall begin from the time notification is received and shall end when the request is resolved and the system is returned to proper operating condition and confirmed by the COMMISSION.

The following table explains the activities, performance standards and credits for **all service requests**.

<table>
<tr><th colspan="6">Routine Maintenance and Support
Service Request Management – All Requests</th></tr>
<tr><th>Activities</th><th>Measure</th><th colspan="2">Performance Requirement</th><th colspan="2">Credit</th></tr>
<tr><td>a) <u>Respond to service request:</u>
- Answer the call or call back to user,
- Confirm Severity,
- Establish Priority</td><td>Response Time</td><td colspan="2">For every 10 minutes past initial notification</td><td colspan="2">$50</td></tr>
<tr><th colspan="6">All Requests</th></tr>
<tr><th>Activities</th><th>Measure</th><th>Performance Requirement</th><th colspan="3">Credit (Per Request)</th></tr>
<tr><td rowspan="4">b) <u>Resolve service request:</u>
- Restore application service in the event of a service failure.
- Resolve service requests with high business impact (such as urgent data fixes, special reports, etc.)
- Resolve service requests with minimal business impact (such as non-urgent data fixes, non- urgent special reports and data extracts, user and technical documentation updates, etc.)</td><td rowspan="4">Time to Resolution</td><td>Severity 1 = resolve within 2 consecutive hours from initial notification</td><td>Every 30 minute interval past 2 hours</td><td>.5%</td></tr>
<tr><td>Severity 2 = resolve within 4 consecutive hours from initial notification</td><td>Every 30 minute interval past 4 hours</td><td>.5%</td></tr>
<tr><td>Severity 3 = resolve within 8 consecutive business hours from initial notification</td><td>Every 1 business hour past 8 business hours</td><td>.5%</td></tr>
<tr><td>Severity 4 = resolve within 24 consecutive business hours from initial notification</td><td>Every 1 business hour past 24 business hours</td><td>.5%</td></tr>
<tr><th colspan="6">All Requests</th></tr>
<tr><th>Activities</th><th>Measures</th><th>Performance Requirement</th><th colspan="3">Credits (Per Request)</th></tr>
<tr><td>c) <u>Communicate periodic status updates</u> during service request response.</td><td>Intervals through resolution</td><td>Hourly updates (For severity 1 & 2)</td><td>For each hourly update missed</td><td>$50</td></tr>
</table>

The table below outlines additional activities applicable only to **service requests related to service failures**:

Routine Maintenance and Support Service Request Management – Service Failures				
Activities	**Measure**	**Performance Requirement**	**Credit**	
d) Complete/Document Root Cause Analysis (RCA) (for severity levels 1 and 2)	Time to Completion	Submit within 2 business days of service failure	For each business day late	$50
e) Document additional corrective action necessary to prevent future reoccurrence of the problem (For severity levels 1 and 2)	Time to Completion	Submit within 5 business days of service failure	For each business day late	$50
f After-Action Review report after completion of corrective action. (For severity levels 1 and 2)	Time to Completion	Submit within 10 business days after corrective action is complete	For each business day late	$50

The COMMISSION reserves the right to require the completion of c through f activities for severity levels 3 and 4 as needed, provided that the COMMISSION notifies the CONTRACTOR of such intent.

Example Calculations for Response and Resolution Activities for a given month:

- Day 3: The COMMISSION contacts the CONTRACTOR for a severity 1 incident. The CONTRACTOR returns call in 45 minutes and resolves the issue within 2 hours 45 minutes from the COMMISSION's first call to the CONTRACTOR.
  Calculation:
  - Call returned in 45 minutes = $200 Credit
  - Severity incident restored in 2 hours, 45 minutes = 1% Credit

- Day 11: The COMMISSION contacts the CONTRACTOR for a severity 4 incident. The CONTRACTOR answers call immediately. The CONTRACTOR resolves the incident within 37 business hours from the COMMISSION's first call to the CONTRACTOR.
  Calculation:
  - Call answered immediately = $0 credit
  - Severity 4 incident restored in 37 hours = 6.5% Credit

- Monthly Report: the COMMISSION contacts the CONTRACTOR for 20 service requests within a month of which 15 are severity 1 or 2. All calls were responded to with 10 minutes. However, the CONTRACTOR fails to communicate periodic status updates on 2 of the severity 2 incidents. Each incident of these took 4 hours to resolve.

  Calculation:
  - Call answered within 10 minutes = $0 Credit
  - Severity 2 incidents restored within 4 hours = 0% Credit
  - Periodic status updates not done hourly

- 2 incidents x 3 hourly updates = 6 hourly updates missed
- 6 updates missed x $50 = $300 Credit

(d) **Miscellaneous**

In the event that the Credits exceed the regular monthly charge, at the COMMISSION's discretion, the difference in amounts shall be deducted from the next monthly invoice or shall be remitted directly to the COMMISSION after the COMMISSION's invoicing.

In the event there is no applicable regular monthly charge, the amount of the credit shall be remitted directly to the COMMISSION after the COMMISSION's invoicing.

APPENDIX D

INSURANCE SPECIFICATION

Prior to the commencement of any work and until completion and final payment is made for the work / final acceptance of the work, the Professional Service Contractor (Contractor) will provide and maintain the following minimum levels of insurance at Contractor's own expense. The cost of the required insurance shall be included in the Contractor's cost proposal and no adjustment shall be made to the contract price on account of such costs. Contractor shall furnish Certificates of Insurance evidencing and reflecting the effective date of coverage as outlined below. In no event shall Work be performed until the required evidence of Insurance is provided in accordance with the terms of the contract. Contractor shall be responsible for ensuring that all Sub-contractors are properly insured in accordance with the limits and terms described herein. Contractor shall not permit any Sub-contractor to commence work hereunder until such evidence has been provided to the Contractor.

a) All insurance shall be procured from insurers permitted to do business in the State in which the project is taking place and having an A.M. Best Rating of at least "A-, Class VIII".

b) Contractor shall not have a Self-Insured Retention (SIR) on any policy greater than $50,000, which is the responsibility of the Contractor. If Contractor's policy(ies) has a Self-Insured Retention exceeding $50,000 on any policy, approval must be received from the Commission prior to starting work. In the event any policy includes an SIR, the Contractor is responsible for payment within the SIR of their policy(ies) and the Additional Insured requirements specified herein shall be offered within the SIR amount(s).

c) All insurance required herein, with the exception of the Professional Liability Insurance, shall be written on an "occurrence" basis. Claims-Made coverage must include:

   i. The retroactive date must be on or prior to the start of work under this contract; and
   ii. The Contractor must purchase "tail coverage/an extended reporting period" or maintain coverage for a period of three years, subsequent to the completion of their work / final payment.

d) The Contractor's insurance carrier (s) shall agree to provide at least thirty (30) days prior written notice to the Commission in the event coverage is canceled or non-renewed, unless cancellation is for non-payment of premium. In the event of cancellation or non-renewal of coverage(s) for any reason, it is the Contractor's responsibility to replace coverage to comply with the Contract requirements so there is no lapse of coverage for any time period.

   In the event the insurance carriers will not issue or endorse their policy(s) to comply with the above it is the responsibility of the Contractor to report any

notice of cancellation or non-renewal at least thirty (30) days prior to the effective date of this notice.

e) Contractor shall provide the Commission with Certificates of Insurance, evidencing the insurance coverages listed below prior to the start of work of this Project and thereafter upon renewal or replacement of each coverage. The Contractor shall not begin any work until the Commission has reviewed and approved the Certificate of Insurance.

Failure of the Commission to demand such certificate or other evidence of full compliance with these insurance requirements or failure of the Commission to identify a deficiency from evidence that is provided shall not be construed as a waiver of Contractor's obligation to maintain such insurance.

f) The Commission, and its Commissioners, officers, employees, and agents shall be added as ADDITIONAL INSUREDS on all liability policies (except Workers' Compensation and Professional Liability Policy, where applicable), for ongoing operations and completed operations on a primary noncontributory basis. Coverage should be provided for a period of three years subsequent to the completion of work/final payment.

The Commission reserves the right to require Contractor to name other parties as additional insureds as required by the Commission.

g) Waiver of Rights of Subrogation: Contractor shall waive all rights of recovery against the Commission and all the additional insureds for loss or damage covered by any of the insurance maintained by the Contractor.

h) The amount of insurance provided in the aforementioned insurance coverages, shall not be construed to be a limitation of the liability on the part of the Contractor.

i) The carrying of insurance described shall in no way be interpreted as relieving the Contractor of any responsibility or liability under the contract.

j) Any type of insurance or any increase in limits of liability not described above which the Contractor requires for its own protection or on account of statute shall be its own responsibility and at its own expense.

k) Contractor shall promptly notify the Commission and the appropriate insurance company(ies) in writing of any accident(s) as well as any claim, suit or process received by the insured Contractor arising in the course of operations under the contract. The Contractor shall forward such documents received to his insurance company(ies), as soon as practicable, or as required by its insurance policy(ies).

REQUIRED COVERAGES - the following may be provided through a combination of primary and excess policies in order to meet the minimum limits set forth below:

1. **Workers' Compensation and Employer's Liability:**
   Provided in the State in which the work is to be performed and elsewhere as may be required and shall include:

   a) Workers' Compensation Coverage: Statutory Requirements

   b) Employers Liability Limits not less than:

Bodily Injury by Accident:	$500,000 Each Accident
Bodily Injury by Disease:	$500,000 Each Employee
Bodily Injury by Disease:	$500,000 Policy Limit

   c) Includes sole proprietorships and officers of corporation who will be performing the work.

   d) Where applicable, if the Contractor is lending or leasing its employees to the Commission for the work under this contract, it is the Contractor's responsibility to provide the Workers Compensation and Employer's Liability coverage and to have their policy endorsed with the proper Alternate Employer Endorsement.

2. **Commercial General Liability:**
   Provided on standard ISO forms or an equivalent form including Premises - Operations, Independent Contractors, Products/Completed Operations, Broad Form Property Damage, Contractual Liability, and Personal Injury and Advertising Injury.

   a) Occurrence Form with the following limits:

(1)	General Aggregate:	$2,000,000
(2)	Products/Completed Operations Aggregate:	$2,000,000
(3)	Each Occurrence:	$1,000,000
(4)	Personal and Advertising Injury:	$1,000,000

3. **Automobile Liability:**

   a) Coverage to include All Owned, Hired and Non-Owned Vehicles (or "Any Auto"), if you do not have any Owned Vehicles you are still required to maintain coverage for Hired and Non-Owned Vehicles as either a stand-alone policy or endorsed onto the Commercial General Liability policy above

   b) Per Accident Combined Single Limit $1,000,000

4. Commercial Umbrella Liability:

a) Policy(ies) to apply on a Following Form Basis of the following:
   (1) Commercial General Liability,
   (2) Automobile Liability, and
   (3) Employers Liability Coverage.

b) Minimum Limits of Liability

Occurrence Limit:	$4,000,000
Aggregate Limit (where applicable):	$4,000,000

5. Professional Liability Insurance:

a) Minimum Limits of Liability

Per Claim Limit:	$5,000,000
Aggregate Limit:	$5,000,000

b) The Definition of "Covered Services" shall include the services required in the scope of this contract.

6. Cyber & Privacy Liability:

a) Professional Service Contractor shall maintain coverage for third party liability arising out of breach of privacy, inclusive of confidential and proprietary business information, HIPAA violations and other breaches of personally identifiable information and/or protected health information that may arise from their work with this contract.

b) Minimum Limits of Liability:

Per Claim:	$5,000,000
Aggregate:	$5,000,000

c) Privacy Breach Notification and Credit Monitoring: $250,000 Per Occurrence

APPENDIX E

DIVERSE BUSINESS (DB) REQUIREMENTS

APPENDIX E

Pennsylvania Turnpike Commission
DIVERSE BUSINESS (DB) REQUIREMENTS

Diverse Business Participation. The Commission is committed to Diverse Business (DB) participation on competitive contracting opportunities. Firms or entities that have not previously performed work or provided services to the Commission are encouraged to respond to the solicitations. RFPs may include DB participation as part of the criteria for the evaluation of proposals, and the Commission may consider DB participation as a selection factor.

Minimum Participation Level (MPL). The minimum participation level (MPL) for the inclusion of DBs will be established in the RFP/advertisement as a percentage.

(a) General Requirements. Section 303 of Title 74 of the Pennsylvania Consolidated Statutes, 74 Pa.C.S. § 303, requires proposer on contracts funded pursuant to the provisions of Title 74 (Transportation) and 75 (Vehicle Code) administered and issued by the Commission to make Good Faith Efforts to solicit subonsultants that are Diverse Businesses (DBs) as defined in Section 303. The DB requirements of Section 303 apply to this contract.

Section 303 requires proposers to make Good Faith Efforts, as described below, to solicit subconsultants that are DBs during the proposal process to maximize participation of DBs in competitive contracting opportunities.

The Commission is committed to participation by DBs and will enforce the requirements of Section 303 and this section. Failure to make Good Faith Efforts and demonstrate such Good Faith Efforts in the solicitation of subconsultants may result in the proposer being declared ineligible for the contract.

Proposers shall document and submit to the Commission all Good Faith Efforts, as described in this section, to solicit subconsultants that are DBs during the solicitation process.

Proposers are encouraged to utilize and give consideration to consultants offering to utilize DBs in the selection and award of contracts.

Proposers shall not discriminate on the basis of gender, race, creed or color in the award and performance of contracts in accordance with 62 Pa.C.S. §3701.

Failure to comply with the requirements of Section 303 or this specification may result in the imposition of sanctions as appropriate under section 531 of the Procurement Code, 62 Pa.C.S.§ 531 relating to debarment and suspension.

The Commission's Director of the Office of Diversity and Inclusion, or designee, is designated the Responsible Official who shall supervise the DB program and ensure that the Commission complies with the DB program.

(b) Definitions. The following definitions apply to terms used in this specification:

1. Disadvantaged Business – A business that is owned or controlled by a majority of persons, not limited to members of minority groups, who are subject to racial, social, ethnic prejudice or cultural bias.

2. Diverse Business – A disadvantaged business, minority-owned or women-owned business or service-disabled veteran-owned or veteran-owned small business that has been certified by a third-party certifying organization.

3. Minority-owned Business – A business owned and controlled by a majority of individuals who are African Americans, Hispanic Americans, Native Americans, Asian Americans, Alaskans or Pacific Islanders.

4. Professional Services – An industry of infrequent, technical or unique functions performed by independent contractors or consultants whose occupation is the rendering of the services, including: (1) design professional services as defined in 62 Pa.C.S.§ 901 (relating to definitions); (2) legal services; (3) advertising or public relations services; (4) accounting, auditing or actuarial services; (5) security consultant services; (6) computer and information technology services; and (7) insurance underwriting services.

5. Pro Forma Effort-The act of completing a form or document identifying efforts to solicit DBs for a project in order to satisfy criteria with little or no expectation that the DBs contacted or identified will perform any of the work.

6. Service-Disabled Veteran-Owned Small Business – A business in the United States which is independently owned and controlled by a service-disabled veteran(s), not dominant in its field of operation, and employs 100 or fewer employees.

7. Subconsultant- Any individual, partnership, firm, or corporation entering into a contract with the prime consultant for work under the contract, including those providing professional and other services.

8. Third-party Certifying Organization – An organization that certifies a small business, minority-owned business, women-owned business or veteran-owned small business as a diverse business. The term includes: (1) the National Minority Supplier Development Council; (2) the Women's Business Development Enterprise National Council; (3) the Small Business Administration; (4) The Department of Veteran Affairs; (5) the Pennsylvania Unified Certification Program.

9. Veteran-owned Small Business –A small business owned and controlled by a veteran or veterans.

10. Women-Owned Business – A business owned and controlled by a majority of individuals who are women.

(c) Actions Required by Proposer during the procurement/consultant selection phase

1. Submission Requirements – Consultant Responsiveness.

a. **Minimum Participation Level (MPL) Documentation -** If the documentation submitted with the proposal demonstrates that the proposer has identified DBs sufficient to meet the MPL established for this contract, the proposer will be deemed to have satisfied the DB requirement during this phase. The proposer is required to provide the business name and business address of each DB and supporting documentation that includes proof of certification.

If the consultant's proposal demonstrates the consultant's inability to meet the MPL established for this contract, the proposer shall demonstrate Good Faith Efforts with its proposal. Failure to submit the required documentation demonstrating Good Faith Efforts as further described below with the proposal may result in a rejection of the proposal.

b. If no MPL has been established for this contract, the proposer is required to either provide a statement of intent that it will self-perform 100% of the work for the agreement, or demonstrate Good Faith Efforts to solicit subconsultants that are DBs. In either case documentation shall be provided with the proposal.

Failure to submit the required information identified above with the proposal may result in a rejection of the proposal.

2. Good Faith Effort Requirements: The documentation of Good Faith Efforts must include the business name and business address of each DB considered. Supporting documentation must also include proof of certification and any explanation of Good Faith Efforts the proposer would like the Commission to consider. Any services to be performed by a DB are required to be readily identifiable to the agreement. Good Faith efforts are demonstrated by seeking out DB participation in the project given all relevant circumstances. The Commission requires the proposer to demonstrate more than Pro Forma Efforts. Evidence of Good Faith Efforts includes, but is not limited to:

a. Consultant solicits through all reasonable and available means the interest of all certified DBs with the capacity to perform the scope of work set forth in the agreement.
b. The proposer must provide written notification at least 5 business days before proposals are due to allow the DBs to respond to the solicitation.
c. The proposer must determine with certainty if DBs are interested by taking appropriate steps to follow up initial solicitations.
d. The proposer must make efforts to select portions of the work to be performed by DBs to includes, where appropriate, breaking out contract work into economically feasible units to facilitate DB participation;
e. It is the proposer's responsibility to make a portion of the work available to DBs and, to select those portions of the work, so as to facilitate DB participation.
f. The proposer shall provide evidence of such negotiations that include the names, addresses, and telephone numbers of DBs considered; A description of the information provided regarding the required work and services for the work selected for subconsultants; and evidence as to why additional agreements could not be reached for DBs to perform the work.
g. Proposers cannot reject or withhold solicitation of DBs as being unqualified without sound reasons based on a thorough investigation of their capabilities.
h. The DB's standing within its industry, membership in specific groups, organizations or associations and political or social affiliations (for example union v. non-union employee status) are not legitimate causes for the rejection or non-solicitation of proposals in the proposer's efforts to meet the Good Faith Efforts requirement.
i. Efforts to assist interested DBs in obtaining bonding, lines of credit or insurance.

3. Actions Taken by the Commission. As part of the proposal review process, the Commission will review the submissions to determine whether the proposer has complied with Section 303 and this requirement in the selection of DB subconsultants. The Commission will determine whether the proposer has either met the MPL or provided acceptable documentation as noted above. The Commission reserves the right to contact proposers for clarification during the review and negotiation process.

If the Commission determines that the proposer has failed to either meet the MPL or provide acceptable documentation as noted above, the proposal may be rejected.

(d) Consultant Requirements During Performance of Services.

1. Replacement of a DB Subconsultant. Consultant must continue good faith efforts through completion of the contract. The obligation to make Good Faith Efforts to solicit subconsultants for any type of service extends to additional work required for any service which is identified to be performed by a DB. If at any time during the performance of the work, it becomes necessary to replace or add a subconsultant that is a DB, the consultant, as appropriate, shall immediately notify the Commission and seek approval in writing in accordance with the Agreement of the need to replace the DB, which notice shall include the reasons for the replacement. If a prime consultant who originally indicated that it would self-perform all work subsequently decides to use a subconsultant for any work under the contract, the consultant must submit documentation of all Good Faith Efforts as to the work for which a subconsultant is obtained.

2. Records. Maintain project records as are necessary to evaluate DB compliance and as necessary to perform the reporting function addressed below. Maintain all records for a period of 3 years following acceptance of final payment. Make these records available for inspection by the Commission, its designees or agents. These records should indicate:

2.a. The number of DB and non-DB subconsultants and the type of services performed on or incorporated in this project.

2.b. The progress and efforts made in seeking out DB subconsultant organizations and individual DB consultants for work on this project to increase the amount of DB participation and/or to maintain the commitments made at the time of the proposal to DBs.

2.c. Documentation of all correspondence, contacts, telephone calls, and other contacts made to obtain the service of DBs on this project.

3. Reports. Maintain monthly reports and submit reports as required by the Commission concerning those contracts and other business executed with DBs with respect to the records referred to in subsection (e)2. above in such form and manner as prescribed by the Commission. At a minimum, the Reports shall contain the following:

3.a The number of Contracts with DBs noting the type of services provided, including the execution date of each contract.

3.b The amounts paid to each DB during the month, the dates of payment, and the overall amounts paid to date. If no payments are made to a DB during the month, enter a zero ($0) payment.

3.c Upon request and upon completion of individual DB firm's work, submit paid invoices or a certification attesting to the actual amount paid. In the event the actual amount paid is less than the award amount, a complete explanation of difference is required.

4. Subconsultant Contracts

4.a. Subcontracts with DB firms will not contain provisions waiving legal rights or remedies provided by laws or regulations of the Federal Government or the Commonwealth of Pennsylvania or the Commission through contract provisions or regulations.

4.b. Prime consultant will not impose provisions on DB subconsultants that are more onerous or restrictive than the terms of the prime's contract with non-DBs.

4.c. Executed copies of subcontracts/purchase orders are to be received by the Commission before the commencement of work by the DB.

5. Payments to DB Subconsultants. Payments to DBs are to be made in accordance with the prompt payment requirements of Chapter 39, Subchapter D of the Procurement Code, 62 Pa.C.S. §3931 et seq. Performance of services by a DB subcon sultant in accordance with the terms of the contract entitles the subconsultant to payment.

(e) Actions to be Taken by Commission After Performance of Services. Following completion of the Consultant's services, the Director of the Commission's Office of Diversity and Inclusion or his/her designee will review the overall DB participation to assess the Consultant's compliance with Section 303 and this contract. Appropriate sanctions may be imposed under 62 Pa.C.S. § 531 (relating to debarment or suspension) for a Consultant's failure to comply with Section 303 and the requirements of the contract.

APPENDIX F

PROPOSAL COVER SHEET

PROPOSAL COVER SHEET
Pennsylvania Turnpike Commission
Next Generation ATMS

RFP# 16-10400-7393

Enclosed in three separately sealed submittals is the proposal for the Proposer identified below for the above referenced RFP:

Proposer Information:	
Proposer Name	
Proposer Mailing Address	
Proposer Website	
Proposer Contact Person/Title	
Contact Person's Phone Number	
Contact Person's Fax Number	
Contact Person's Email Address	
Proposer Federal ID Number	
Location of Headquarters	
Location of Office(s) Performing the Work	
Listing of all Pennsylvania Offices and Total Number of Pennsylvania Employees	

Submittals Enclosed and Separately Sealed:
☐ Technical Submittal ☐ Diverse Business Participation Submittal ☐ Cost Submittal
Signature
Signature of an official authorized to bind the Proposer to the provisions contained in the Proposer's proposal: _____
Print Name
Title

An official authorized to bind the Proposer to its provisions must sign the proposal. If the official signs this Proposal Cover Sheet and the Proposal Cover Sheet is attached to the proposal, the requirement will be met.

INSTRUCTIONS FOR APPENDIX G - COST SUBMITTAL

Overall:

1. Although formulas are imbedded in all sheets of this workbook, it is the Proposer's responsibility to verify that all amounts are accurate.
2. Please Contact the issuing office for any questions.
3. The Proposer shall complete and submit all worksheets with the exception of the "Instructions" worksheet.
4. The Cost Submittal shall be submitted in a separate sealed envelope as described in the RFP.

Labor Rates:

1. Populate the unshaded cells as needed for all proposed positions.
2. Input Escalation percentages for each of the five (5) years, and for each position.

Itemized Cost:

1. The Proposer shall only Populate the unshaded cells on this worksheet.
2. List all Licenses and associated costs that shall be required to be purchased by the Commission for the ATMS COTS Solution.
3. Fill in the System Enhancements blended rate costs.
4. Fill in the Routine Maintenance and Support costs.
5. Fill in the Hosting Services costs.
6. Fill in the Escrow Agreement costs.

Task Costs:

1. The "Specified Postion", "Company", and "Hourly Rate" fields will populate from the "Labor Rates" sheet. The "Costs" Fields will calculate.
2. For each Task and Specified Position, fill in the "Hours" for each of the five years in the unshaded cells.
3. Some lines will automatically populate from the "Itemized Cost" sheet.

Summary:

This sheet is populated by your input on the "Itemized Costs" and "Task Costs" sheets. This sheet calculates the cost of a resulting contract by using your rate card multiplied by the hours you propose for the completion of each of the tasks. The "Total Cost" for all five years will be used as the subject value when evaluating Proposer's Cost Submittals.

Appendix G - Cost Submittal
Labor Rates

Proposer Name:	
Date:	
Completed By:	

Instructions: Fill in the unshaded cells only. The remaining cells will populate automoatically.

Labor Rate Breakdown

Position Number	Specified Position	Company	Base Rate	Overhead & Profit*	Total
			$/Hr	$/Hr	$/Hr
Example	*Project Manager*	*PA Turnpike*	*$ 65.00*	*$ 75.00*	*$ 140.00*
1					$ -
2					$ -
3					$ -
4					$ -
5					$ -
6					$ -
7					$ -
8					$ -
9					$ -
10					$ -
11					$ -
12					$ -
13					$ -
14					$ -
15					$ -
16					$ -
17					$ -
18					$ -
19					$ -
20					$ -

*Includes all direct and incidental costs e.g. travel, meals, lodging

Rate Card

#	Year 1	Year 2	Year 3	Year 4	Year 5
	$/Hr	$/Hr	$/Hr	$/Hr	$/Hr
	Escalation%	2.00%	2.50%	3.00%	2.00%
	$ 140.00	*$ 142.80*	*$ 146.37*	*$ 150.76*	*$ 153.78*
1	Escalation%				
	$ -	$ -	$ -	$ -	$ -
2	Escalation%				
	$ -	$ -	$ -	$ -	$ -
3	Escalation%				
	$ -	$ -	$ -	$ -	$ -
4	Escalation%				
	$ -	$ -	$ -	$ -	$ -
5	Escalation%				
	$ -	$ -	$ -	$ -	$ -
6	Escalation%				
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7	Escalation%				
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18	Escalation%				
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19	Escalation%				
	$ -	$ -	$ -	$ -	$ -
20	Escalation%				
	$ -	$ -	$ -	$ -	$ -
Blended Rate	$ -	$ -	$ -	$ -	$ -

Next Generation Advance Traffic Management System
RFP#16-10400-7393

Appendix G - Cost Submittal
Itemized Cost Worksheet

Task D-5: ATMS COTS Software License(s)

Instructions: Use the fields below to identify the licensing costs associated with the purchase and use of the ATMS COTS software package. Fill in only the cells that are not highlighted. All calculations are complete and locked. This sheet requires the entry of data for all five years.

Year 1		Year 2		Year 3		Year 4		Year 5	
Year 1 Total Fees	$ -	Year 2 Total Fees	$ -	Year 3 Total Fees	$ -	Year 4 Total Fees	$ -	Year 5 Total Fees	$ -
License Name	Fee	License Name	Fee	License Name	Fee	License Name	Fee	License Name	Fee

Task G: System Enhancements

Instructions: Use the fields below to indentify the blended hourly rate for Task G: System Enhancements. Populate the blended hourly rates for each year of the contract. The hourly rate shall reflect the cost of one (1) hour of Proposer staff time and shall be inclusive of all overhead and profit costs. Fill in only the unshaded cells for each of the five years.

Year 1		Year 2		Year 3		Year 4		Year 5	
Blended Rate:		Blended Rate:		Blended Rate:		Blended Rate:		Blended Rate:	

Task H-3: Routine Maintenance and Support

Instructions: Use the fields below to identify the costs associated with establishing, maintaining, and providing monthly maintenance and support as described in the RFP. For the purpose of this cost proposal, the Proposer shall provide the monthly cost of routine maintenance and support for six (6) months in year two, twelve (12) months in years three, four, and five. Fill only the cells that are not highlighted. All calculations are complete and locked. See Appendix V - Payment Schedule for details on payment for this work. This cost shall be all inclusive to cover all services described in the Task H-3 in the RFP.

Year 2		Year 3		Year 4		Year 5	
Monthly Cost		Monthly Cost		Monthly Cost		Monthly Cost	
Months	6	Months	12	Months	12	Months	12
Year 2 Total	$ -	Year 3 Total	$ -	Year 4 Total	$ -	Year 5 Total	$ -

Task H-4: Hosting Services

Instructions: Use the fields below to identify the costs associated with hosting the ATMS Software system. For the purpose of this cost proposal, the Proposer shall provide the monthly cost for hosting of the system six (6) months in year two, twelve (12) months in years three, four, and five. Fill only the cells that are not highlighted. All calculations are complete and locked. See Appendix V - Payment Schedule for details on payment for this work. This cost shall be all inclusive to provide a hosted system.

Year 2		Year 3		Year 4		Year 5	
Monthly Cost		Monthly Cost		Monthly Cost		Monthly Cost	
Months	6	Months	12	Months	12	Months	12
Year 2 Total	$ -	Year 3 Total	$ -	Year 4 Total	$ -	Year 5 Total	$ -

Task H-5: Escrow Agreement

Instructions: Use the fields below to identify the costs associated with establishing and maintaining an Escrow Agreement that is required if a COTS solution is proposed for ATMS. Escrow Agreement will include an option to request a validation test to be performed by the escrow agent to prove usability of the deposited software code (usability test). Fill in only the cells that are not highlighted. All calculations are complete and locked. This sheet requires the entry of data for all five years.

Year 1		Year 2		Year 3		Year 4		Year 5	
Escrow Account Fee		Escrow Account Fee		Escrow Account Fee		Escrow Account Fee		Escrow Account Fee	
Usability Test Fee		Usability Test Fee		Usability Test Fee		Usability Test Fee		Usability Test Fee	

Appendix G - Cost Spreadsheet
Task Costs

Instructions: The "Specified Positions", "Company Name", and "Hourly Rates" on this sheet automatically reflect those identified on the "Labor Rates" sheet. Proposer shall complete "Hours" only. All other cells and columns will calculate automatically.

			Year 1			Year 2			Year 3			Year 4			Year 5		
Task	**Specified Position**	**Company Name**	**Hourly Rate**	**Hours**	**Cost**	**Hourly Rate**	**Hours**	**Cost**	**Hourly Rate**	**Hours**	**Cost**	**Hourly Rate**	**Hours**	**Cost**	**Hourly Rate**	**Hours**	**Cost**
A-1: ATMS Project Management Plan	0	0	$ -		$ -	$ -		$ -	$ -		$ -	$ -		$ -	$ -		$ -
	0	0	$ -		$ -	$ -		$ -	$ -		$ -	$ -		$ -	$ -		$ -
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B-1: Existing Conditions Reports	0	0	$ -		$ -	$ -		$ -	$ -		$ -	$ -		$ -	$ -		$ -
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B-2: Business Requirements	0	0	$ -		$ -	$ -		$ -	$ -		$ -	$ -		$ -	$ -		$ -
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Appendix G - Cost Spreadsheet
Task Costs

			Year 1			Year 2			Year 3			Year 4			Year 5		
Task	**Specified Position**	**Company Name**	**Hourly Rate**	**Hours**	**Cost**	**Hourly Rate**	**Hours**	**Cost**	**Hourly Rate**	**Hours**	**Cost**	**Hourly Rate**	**Hours**	**Cost**	**Hourly Rate**	**Hours**	**Cost**
B-3: Detailed Business Solution Design	0	0	$ -		$ -	$ -		$ -	$ -		$ -	$ -		$ -	$ -		$ -

Appendix G - Cost Spreadsheet
Task Costs

			Year 1			Year 2			Year 3			Year 4			Year 5		
Task	**Specified Position**	**Company Name**	**Hourly Rate**	**Hours**	**Cost**	**Hourly Rate**	**Hours**	**Cost**	**Hourly Rate**	**Hours**	**Cost**	**Hourly Rate**	**Hours**	**Cost**	**Hourly Rate**	**Hours**	**Cost**
C-3: Network Topology Report	0	0	$ -		$ -	$ -		$ -	$ -		$ -	$ -		$ -	$ -		$ -

Appendix G - Cost Spreadsheet
Task Costs

			Year 1			Year 2			Year 3			Year 4			Year 5		
Task	**Specified Position**	**Company Name**	**Hourly Rate**	**Hours**	**Cost**	**Hourly Rate**	**Hours**	**Cost**	**Hourly Rate**	**Hours**	**Cost**	**Hourly Rate**	**Hours**	**Cost**	**Hourly Rate**	**Hours**	**Cost**
D-3: Test Plan	0	0	$ -		$ -	$ -		$ -	$ -		$ -	$ -		$ -	$ -		$ -
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D-4: Training Plan	0	0	$ -		$ -	$ -		$ -	$ -		$ -	$ -		$ -	$ -		$ -
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D-5: ATMS COTS Software License(s)	License Fee				$ -			$ -			$ -			$ -			$ -

Appendix G - Cost Spreadsheet
Task Costs

			Year 1			Year 2			Year 3			Year 4			Year 5		
Task	**Specified Position**	**Company Name**	**Hourly Rate**	**Hours**	**Cost**	**Hourly Rate**	**Hours**	**Cost**	**Hourly Rate**	**Hours**	**Cost**	**Hourly Rate**	**Hours**	**Cost**	**Hourly Rate**	**Hours**	**Cost**
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E-2: Deployment - Phase 1, Part 2	0	0	$ -		$ -	$ -		$ -	$ -		$ -	$ -		$ -	$ -		$ -
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Appendix G - Cost Spreadsheet
Task Costs

			Year 1			Year 2			Year 3			Year 4			Year 5		
Task	**Specified Position**	**Company Name**	**Hourly Rate**	**Hours**	**Cost**	**Hourly Rate**	**Hours**	**Cost**	**Hourly Rate**	**Hours**	**Cost**	**Hourly Rate**	**Hours**	**Cost**	**Hourly Rate**	**Hours**	**Cost**
F-2: Detailed Solution Design - Phase 2	0	0	$ -		$ -	$ -		$ -	$ -		$ -	$ -		$ -	$ -		$ -
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F-3: Training and Test Plans - Phase 2	0	0	$ -		$ -	$ -		$ -	$ -		$ -	$ -		$ -	$ -		$ -
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Appendix G - Cost Spreadsheet
Task Costs

			Year 1			Year 2			Year 3			Year 4			Year 5		
Task	**Specified Position**	**Company Name**	**Hourly Rate**	**Hours**	**Cost**	**Hourly Rate**	**Hours**	**Cost**	**Hourly Rate**	**Hours**	**Cost**	**Hourly Rate**	**Hours**	**Cost**	**Hourly Rate**	**Hours**	**Cost**
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	0	0	$ -		$ -	$ -		$ -	$ -		$ -	$ -		$ -	$ -		$ -
G: System Enhancements			$ -	0	$ -	$ -	0	$ -	$ -	1000	$ -	$ -	1000	$ -	$ -	1000	$ -
H-1: On-Site Support	0	0	$ -		$ -	$ -		$ -	$ -		$ -	$ -		$ -	$ -		$ -
	0	0	$ -		$ -	$ -		$ -	$ -		$ -	$ -		$ -	$ -		$ -
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	0	0	$ -		$ -	$ -		$ -	$ -		$ -	$ -		$ -	$ -		$ -
H-2: User and Support Documentation	0	0	$ -		$ -	$ -		$ -	$ -		$ -	$ -		$ -	$ -		$ -
	0	0	$ -		$ -	$ -		$ -	$ -		$ -	$ -		$ -	$ -		$ -
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Appendix G - Cost Spreadsheet
Task Costs

			Year 1			Year 2			Year 3			Year 4			Year 5		
Task	**Specified Position**	**Company Name**	**Hourly Rate**	**Hours**	**Cost**	**Hourly Rate**	**Hours**	**Cost**	**Hourly Rate**	**Hours**	**Cost**	**Hourly Rate**	**Hours**	**Cost**	**Hourly Rate**	**Hours**	**Cost**
H-3: Routine Maintenance and Support	Monthly Rate							$ -			$ -			$ -			$ -
H-4: Hosting Services	Monthly Rate							$ -			$ -			$ -			$ -
H-5: Escrow Agreement	Escrow Account Fee				$ -			$ -			$ -			$ -			$ -
	Usability Test Fee				$ -			$ -			$ -			$ -			$ -
I-1: Turnover Plan	0	0	$ -		$ -	$ -		$ -	$ -		$ -	$ -		$ -	$ -		$ -
	0	0	$ -		$ -	$ -		$ -	$ -		$ -	$ -		$ -	$ -		$ -
	0	0	$ -		$ -	$ -		$ -	$ -		$ -	$ -		$ -	$ -		$ -
	0	0	$ -		$ -	$ -		$ -	$ -		$ -	$ -		$ -	$ -		$ -
	0	0	$ -		$ -	$ -		$ -	$ -		$ -	$ -		$ -	$ -		$ -
	0	0	$ -		$ -	$ -		$ -	$ -		$ -	$ -		$ -	$ -		$ -
	0	0	$ -		$ -	$ -		$ -	$ -		$ -	$ -		$ -	$ -		$ -
	0	0	$ -		$ -	$ -		$ -	$ -		$ -	$ -		$ -	$ -		$ -
	0	0	$ -		$ -	$ -		$ -	$ -		$ -	$ -		$ -	$ -		$ -
	0	0	$ -		$ -	$ -		$ -	$ -		$ -	$ -		$ -	$ -		$ -
	0	0	$ -		$ -	$ -		$ -	$ -		$ -	$ -		$ -	$ -		$ -
	0	0	$ -		$ -	$ -		$ -	$ -		$ -	$ -		$ -	$ -		$ -
	0	0	$ -		$ -	$ -		$ -	$ -		$ -	$ -		$ -	$ -		$ -
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	0	0	$ -		$ -	$ -		$ -	$ -		$ -	$ -		$ -	$ -		$ -
	0	0	$ -		$ -	$ -		$ -	$ -		$ -	$ -		$ -	$ -		$ -
	0	0	$ -		$ -	$ -		$ -	$ -		$ -	$ -		$ -	$ -		$ -
I-2: Service Turnover	0	0	$ -		$ -	$ -		$ -	$ -		$ -	$ -		$ -	$ -		$ -
	0	0	$ -		$ -	$ -		$ -	$ -		$ -	$ -		$ -	$ -		$ -
	0	0	$ -		$ -	$ -		$ -	$ -		$ -	$ -		$ -	$ -		$ -
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	0	0	$ -		$ -	$ -		$ -	$ -		$ -	$ -		$ -	$ -		$ -
	0	0	$ -		$ -	$ -		$ -	$ -		$ -	$ -		$ -	$ -		$ -
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Next Generation Advanced Traffic Management System
RFP#16-10400-7393

Appendix G - Cost Submittal
Cost Summary

Costs will be evaluated based on the total deliverable costs for all five years.

	Year 1		Year 2		Year 3		Year 4		Year 5	
Deliverables	**Total Hours**	**Total Cost**	**Total Hours**	**Total Cost**	**Total Hours**	**Total Cost**	**Total Hours**	**Total Cost**	**Total Hours**	**Total Cost**
A-1: ATMS Project Management Plan	0	$ -	0	$ -	0	$ -	0	$ -	0	$ -
B-1: Existing Conditions Reports	0	$ -	0	$ -	0	$ -	0	$ -	0	$ -
B-2: Business Requirements	0	$ -	0	$ -	0	$ -	0	$ -	0	$ -
B-3: Detailed Business Solution Design	0	$ -	0	$ -	0	$ -	0	$ -	0	$ -
C-1: User Interface Design	0	$ -	0	$ -	0	$ -	0	$ -	0	$ -
C-2: Detailed Solution Design Document	0	$ -	0	$ -	0	$ -	0	$ -	0	$ -
C-3: Network Topology Report	0	$ -	0	$ -	0	$ -	0	$ -	0	$ -
D-1: Procurement Plan	0	$ -	0	$ -	0	$ -	0	$ -	0	$ -
D-2: Implementation Plan	0	$ -	0	$ -	0	$ -	0	$ -	0	$ -
D-3: Test Plan	0	$ -	0	$ -	0	$ -	0	$ -	0	$ -
D-4: Training Plan	0	$ -	0	$ -	0	$ -	0	$ -	0	$ -
D-5: Software License for ATMS COTS Package		$ -		$ -		$ -		$ -		$ -
E-1: Deployment - Phase 1, Part 1	0	$ -	0	$ -	0	$ -	0	$ -	0	$ -
E-2: Deployment - Phase 1, Part 2	0	$ -	0	$ -	0	$ -	0	$ -	0	$ -
F-1: High Level Solution Design - Phase 2	0	$ -	0	$ -	0	$ -	0	$ -	0	$ -
F-2: Detailed Solution Design - Phase 2	0	$ -	0	$ -	0	$ -	0	$ -	0	$ -
F-3: Training and Test Plans - Phase 2	0	$ -	0	$ -	0	$ -	0	$ -	0	$ -
F-4: Deployment - Phase 2, Part 1	0	$ -	0	$ -	0	$ -	0	$ -	0	$ -
F-5: Deployment - Phase 2, Part 2	0	$ -	0	$ -	0	$ -	0	$ -	0	$ -
G: System Enhancements	0	$ -	0	$ -	1,000	$ -	1,000	$ -	1,000	$ -
H-1: On-Site Support	0	$ -	0	$ -	0	$ -	0	$ -	0	$ -
H-2: User and Support Documentation	0	$ -	0	$ -	0	$ -	0	$ -	0	$ -
H-3: Routine Maintenance and Support				$ -		$ -		$ -		$ -
H-4: Hosting Services				$ -		$ -		$ -		$ -
H-5 Escrow Agreement		$ -		$ -		$ -		$ -		$ -
I-1 Turnover Plan	0	$ -	0	$ -	0	$ -	0	$ -	0	$ -
I-2 Service Turnover	0	$ -	0	$ -	0	$ -	0	$ -	0	$ -
Totals	**0**	**$ -**	**0**	**$ -**	**1,000**	**$ -**	**1,000**	**$ -**	**1,000**	**$ -**

	All 5 Years	
	Total Hours	**Total Cost**
Grand Totals	**3,000**	**$ -**

Offeror Name:	
Date:	
Completed by:	

INSTRUCTIONS FOR APPENDIX H - SOFTWARE CAPABILITIES MATRIX

FUNCTIONAL REQUIREMENTS TAB:

Using the codes below, indicate the software solution's ability to meet each of the listed functional and supplemental requirements. These requirements are detailed in Appendix M - Solution Requirements. The PTC has established the following response codes that shall be used. When responding to each requirement, the Proposer shall note that the requirements are to be taken in context of the Operational Use Cases (i.e. must meet the intent) described in Appendix L - Concept of Operations. Traceability between Functional Requirements and their referenced Use Cases can be Found in Appendix N - Requirements Traceability Matrix.

OB - Requirement is fully met "out of the box", requiring no configuration or change to the base source code.
CO - Requirement is fully met through minor software configurations, requiring no changes to the base source code.
DT - Requirement is fully met using proposed development tools to extend existing capabilities, allowing upgrades and full product suppor
CU - Customization, requiring changes to the base source code, will be required to meet the requirement.
TP - Meeting requirement fully will require integration with a third party solution.
FR - Requirement cannot be met at this time, but is anticipated to be accommodated as part of a planned future release.
NA - Not Available - Requirement cannot be met through customization or integration with a third party solution.

The Proposer shall select only one response code per requirement on the following tables. Any requirement that is responded to in another way, will be considered as having responded "NA". Any response that is considered to be contradictory to information provided in other areas of the proposal will also be considered as having responded "NA".

The Proposer is required to provide clarification comments in the provided cells for all requirements responded to with codes other than "OB", providing a clear description of the customization required to meet the referenced requirement. Any responses of "CO", "DT", "CU", "TP", or "FR" that do not include clarification, will be considered as an "NA" response. The proposer is allowed to provide clarification comments to any "OB" responses at their discretion, but it is not required.

SUPPLEMENTAL REQUIREMENTS TAB:

Using the provided drop down menu, indicate the software solution's ability to meet each of the listed supplemental requirements by indicating "YES" or "NO". These requirements are detailed in Appendix M - Solution Requirements. When responding to each requirement, the Proposer shall note that the requirements are to be taken in context of the Operational Use Cases (i.e. must meet the intent) described in Appendix L - Concept of Operations.

The Proposer shall select only one response code per requirement on the following tables. Any requirement that is responded to in another way, will be considered as having responded "NO". Any response that is considered to be contradictory to information provided in other areas of the proposal will also be considered as having responded "NO".

Additional cells have been provided for the Proposer to include clarification comments for any answer provided.

ID	Requirement Definition	Existing Capability	Clarification Comments
SYSTEMS ADMINISTRATION (SA) REQUIREMENTS			
SA-1	The ATMS solution shall provide the ability to assign specific users with Administrative privileges.		
SA-2	The ATMS solution shall provide the ability for an Administrator to create custom user groups, assign users, and assign access privileges to each group and customize these privileges to users within the groups.		
SA-3	The ATMS solution shall provide the ability for an ATMS user with sufficient privileges to add new users and to edit user information and privileges.		
SA-4	The ATMS solution shall provide the ability for an ATMS user with sufficient privileges to edit user attributes. The software shall allow the editing of multiple users simultaneously, as applicable.		
SA-5	The ATMS solution shall provide the ability for an ATMS user with sufficient privileges to disable or remove (decommission) users.		
SA-6	The ATMS solution shall provide the ability for an ATMS Administrator to send email messages to individual users, user groups, or all users.		
SA-7	The ATMS solution shall allow an ATMS user with sufficient privileges to add ITS devices. The system shall provide the ability to populate all device information in a single screen or collection of tabbed screens intended to logically organize attribute fields for ease of entry.		
SA-8	The ATMS solution shall provide the functionality for an ATMS user with sufficient privileges to copy the base attributes of an existing device to create a new device.		
SA-9	The ATMS solution shall allow an ATMS user with sufficient privileges to add “phantom” devices to the system. A “phantom” device is defined as a device with a location near Commission facilities that is owned and operated by an adjacent agency.		
SA-10	The ATMS solution shall allow “phantom” devices to be recommended for and associated with an Event to be “activated” through contacting the owner of that device. Contact information shall be made available to the user to activate/deactivate a phantom device.		
SA-11	The ATMS solution shall allow an ATMS user with sufficient privileges to edit ITS device attributes and information.		
SA-12	The ATMS solution shall allow an ATMS user with sufficient privileges to disable ITS devices.		
SA-13	The ATMS solution shall allow an ATMS user with sufficient privileges to remove (decommission) ITS devices.		
SA-14	The ATMS solution shall allow an ATMS user with sufficient privileges to create and store custom messages and message templates in a DMS message library.		
SA-15	The ATMS solution shall allow an ATMS user with sufficient privileges to organize the DMS message library into folders and subfolders.		
SA-16	The ATMS solution shall allow an ATMS user with sufficient privileges to edit/delete existing DMS messages and templates from the DMS message library.		
SA-17	The ATMS solution shall allow an ATMS user with sufficient privileges to assign and edit priority levels to DMS messages. A default priority level will be assigned if not assigned by a user at the time of creation.		
SA-18	The ATMS solution shall allow an ATMS user with sufficient privileges to create and store custom messages and message templates in a HAR message library.		
SA-19	The ATMS solution shall allow an ATMS user with sufficient privileges to organize HAR message library into folders and subfolders.		
SA-20	The ATMS solution shall allow an ATMS user with sufficient privileges to edit/delete existing HAR messages.		
SA-21	The ATMS solution shall allow an ATMS user with sufficient privileges to assign and edit priority levels to HAR messages. A default priority level will be assigned if not assigned by a user at the time of creation.		
SA-22	The ATMS solution shall provide a user with sufficient privileges with the ability to add to and edit business rules (e.g. look up tables, settings) used to provide the device selection logic for Recommended Response Plans.		
SA-23	The ATMS solution shall provide a user with sufficient privileges with the ability to add to and edit business rules (e.g. look up tables, settings) used to provide the message selection logic for Recommended Response Plans.		

ID	Requirement Definition	Existing Capability	Clarification Comments
SA-24	The ATMS solution shall provide a user with sufficient privileges with the ability to edit the assigned default device and message selections for all of the prepopulated diversion routes (Plan X's).		
SA-25	The ATMS solution shall provide a user with sufficient privileges with the ability to add and edit contacts in the system contact list. The user shall also have the ability to edit rules for assigning a contact to an Event Notification List. The ATMS shall have the ability to integrate with Microsoft Exchange to manage contacts lists and distribution lists.		
SA-26	The ATMS solution shall allow the ATMS users with sufficient privileges to edit map settings. At a minimum, configurable map settings shall include: • Ability to modify device icon placement • Ability to customize/change device icon images • Ability to configure device status colors and display characteristics • Ability to enable/disable mouse over display per device type		
SA-27	The ATMS solution shall allow the ATMS users with sufficient privileges to configure map layers. At a minimum configurable map settings shall include: • Ability to enable/disable map layers • Ability to customize default map layers • Ability to customize base (always on) layers • Ability to create and modify layer groups • Ability to update/modify base layers (e.g. update GIS mapping data) • Ability for layer customization to be retained by each user account		
SA-28	The ATMS solution shall provide an area within the GUI for the ATMS Administrator to access all system settings. The setting shall be logically organized for ease of user navigation.		
SA-29	The ATMS solution shall allow the ATMS user with sufficient privileges to manage and configure all visual and audible system alarm and alert settings and thresholds. At a minimum, configurable alarm and alert settings shall include: • Ability to enable/disable all alerts and alarms. • Ability to modify all alert and alarm triggers or thresholds. • Ability to enable/disable visual alert and alarm notifications. • Ability to enable/disable audible alert and alarm notifications. • Ability to customize/change audible sounds.		
SA-30	The ATMS solution shall allow the ATMS user with sufficient privileges to manage and configure all Lane Conflict Monitor (UC16) and nearby event conflict (UC5g) settings. At a minimum, configurable Lane Conflict Monitor settings will include: • Ability to configure restricted holiday hours and lane charts. • Ability to configure conflict thresholds. (e.g. distance between Events) • Ability to clear false alerts or alarms. • Ability to configure email/text message recipients list for conflict notifications.		
SA-31	The ATMS solution shall allow the ATMS user with sufficient privileges to manage and configure all incident detection settings and thresholds. At a minimum, configurable incident detection settings shall include: • Ability to enable/disable roadway segments from monitoring for incidents. • Ability to configure speed data detection thresholds for individual roadway segments or ranges based on various baselines, such as posted speed limit, historical speed data, etc. • Ability to enable/disable incident detection from individual sources (speed data, WAZE, RCRS, etc.), either globally or configured to specific roadway segments. • Ability to manage alerts and alarms. • Ability to define the off-system roadways (PennDOT facilities), distance from the Turnpike, and direction of travel for filtering applicable incident alerts from any of the applicable incident data sources.		
SA-32	The ATMS solution shall allow the ATMS user with sufficient privileges to manage and configure all travel time engine settings and thresholds. At a minimum, configurable travel time engine settings shall include: • Ability to configure travel time refresh rate settings. • Ability to configure thresholds to trigger warning messages. • Ability to configure the traffic data level of confidence needed for travel time posting. • Ability to configure the thresholds for automatic disabling/enabling of travel time messages if traffic data level of confidence falls below/rises above the required level.		

ID	Requirement Definition	Existing Capability	Clarification Comments
SA-33	The ATMS solution shall allow the ATMS user with sufficient privileges to manage and configure all Weather Event setting and thresholds. At a minimum, configurable Weather Event setting shall include: • Ability to configure RWIS data alert threshold levels • Ability to configure RWIS data alert automatic notification list • Ability to configure Weather Event forecast alert settings • Ability to configure Commission Weather Level settings and thresholds • Ability to enable/disable/configure AVL device activation settings		
SA-34	The ATMS solution shall allow the ATMS user with sufficient privileges to manage and define all default values that prepopulate fields that require an input. E.g. the default scheduled event reminder time.		
INCIDENT AND TRAFFIC MANAGEMENT (ITM) REQUIREMENTS			
ITM-1	The ATMS solution shall have the ability to process real time traffic probe data against historical traffic data to detect roadway congestion and alert the user of a potential incident.		
ITM-2	The ATMS solution shall have the ability to receive an alert from a video analytics detection system and alert the ATMS user of a potential incident.		
ITM-3	The ATMS solution shall have the ability to receive WAZE data and alert the ATMS user of a potential incident. These Alerts shall be configurable based on type, rating level, confidence level, and/or reliability level.		
ITM-4	The ATMS solution shall have the ability to receive PennDOT RCRS data and alert the ATMS user of an incident.		
ITM-5	The ATMS solution shall have the ability to sound a visual and/or audible alarm if the user has not acknowledged the alert in a configurable period of time.		
ITM-6	When a potential incident is detected through any of the incident detection methods (traffic speed data, video analytics, WAZE, RCRS), the ATMS solution shall have the ability to highlight the nearby CCTV video feed on the video wall with a flashing red border or similar.		
ITM-7	The ATMS solution shall interface with the existing Commission Computer Aided Dispatch (CAD) System (Intergraph) to receive a live incident feed (xml).		
ITM-8	The ATMS solution shall automatically generate an Event using incident data from the CADS interface and populate and update Event data fields with data passed through the interface. Passed data to be displayed will be coordinated with the Commission.		
ITM-9	The ATMS solution shall have the ability to filter specific incident types to trigger the creation of an Event. These incident types are discernable through specific data fields in the CADS data feed (xml). The system administrator shall have the ability to configure the incident type filter.		
ITM-10	The ATMS solution shall refresh all Event data from updated CADS data (xml) and create all new Events from CADS data (xml) within 1 second of the update being made to the xml.		
ITM-11	The ATMS solution shall not allow an ATMS user to edit data fields that are being updated by the CADS interface.		
ITM-12	The ATMS solution shall recognize the failure of the CADS interface through recognition of a timeout period (configurable) and/or monitoring CADS error log files. If the interface fails during an open Event that had been generated by the interface, the ATMS shall recognize the failure and allow the ATMS user to edit those fields.		
ITM-13	In the case of a CADS interface failure of any length of time, when the interface is restored, the ATMS shall reconcile all new (filtered) CADS events with any active (non-CADS interface generated) ATMS Events. The user must confirm the pairing of the CADS Event and ATMS Events. For new CADS generated Events that are not paired, a new ATMS Event shall be created.		
ITM-14	The ATMS solution shall allow authorized users to manually disable the CADS interface at any time. If the interface is disabled during an open Event that had been generated by the interface, the ATMS shall allow the ATMS user to edit those fields.		
ITM-15	If the CADS interface has failed, or been manually disabled, the ATMS solution shall allow authorized users to create and manage ATMS Events.		
ITM-16	The ATMS solution shall automatically generate a unique ID number for all Events. The format of this number shall be coordinated with the Commission.		

ID	Requirement Definition	Existing Capability	Clarification Comments
ITM-17	The ATMS solution shall display the CADS incident ID number within the interface generated Event.		
ITM-18	The ATMS solution shall allow a user with sufficient privileges to create an Event.		
ITM-19	The ATMS solution shall keep record of all data field updates, by whom, and when the update was made within the Event.		
ITM-20	The ATMS solution shall have the ability to immediately alert the ATMS user (visually and/or audibly – configurable) that an Event has been created by the CADS interface and alert the user (visually and/or audibly - configurable) if the event is not acknowledged in a configurable period of time.		
ITM-21	The ATMS solution shall provide the ability to view a searchable DMS list and message library, HAR list and message library, and contact list from within an Event window to select devices and contacts for the Event.		
ITM-22	The ATMS solution shall provide the ability to create and save a DMS message or HAR message directly from an Event and to use in an Event.		
ITM-23	The ATMS solution shall provide the ability for the user to view an Event map view. This view shall display all devices currently active (or queued) under the Event as well as devices not associated with the Event to allow the user to identify any devices that were missed. The view shall denote devices that are active under the Event but are currently queued behind higher priority messages. This map view shall be a resizable window or similar to provide a user with a visual aid to show current device activations for an any single event, separate from the system map.		
ITM-24	The ATMS solution shall allow a user to remove devices from an Event. If the device is activated under that Event, the ATMS shall prompt the user to confirm the action and shall deactivate the associated device and message.		
ITM-25	The ATMS solution shall allow a user to activate the devices and messages in an Event all at once, some, or individually.		
ITM-26	The ATMS solution shall allow a user to deactivate the devices in an Event all at once, some, or individually.		
ITM-27	The ATMS solution shall allow a user to change the message currently playing on a device within an Event.		
ITM-28	The ATMS solution shall present the notification list within the Event. Each contact added to the list shall have a check box (or similar) located next to the contact for the user to “check off” when a notification has been made.		
ITM-29	The ATMS solution shall allow a user to send notifications via email or text to the contacts populated onto the notification list. When the email or text notification is sent by the user, the ATMS shall automatically check the box (or similar) next to the contact in the notification list, and shall record when and what message was sent to the contact and display the information within the notification list.		
ITM-30	The ATMS solution shall allow a user to check a check box (or similar) next to a contact for notifications made manually (by phone/radio/other). The user shall have the ability to enter text with details of the notification within the notification list. The ATMS will record when this action was completed and will display the timestamp in the notification list.		
ITM-31	The ATMS solution shall provide the ability for a user to send an Event update message the existing Commission Emergency Notification System (ENS). The ATMS will prepopulate the message by concatenating Event details into a sentence. The user can send the message to the ENS system as is or modify. The ATMS shall keep record of each of these sent messages, the user who sent the message, and the time at which it was sent.		
ITM-32	The ATMS solution shall display within an Event, each of the messages sent to the ENS system with a timestamp to assist the user in managing the updates to ENS.		
ITM-33	The ATMS solution shall provide the ability to close an Event. When an Event is closed, all messages currently being played (or in a device queue) will be deactivated (removed from the queue).		
ITM-34	The ATMS solution shall automatically update all external interfaces with device message and status information. (e.g. ENS will need to have live device status (active or inactive) and message playing to update external traveler information systems (TripTalk, Commission webmap, 511, etc.).		
ITM-35	The ATMS solution shall provide a history of all DMS messages and HAR messages that have been posted by each individual sign, including when they were posted, when they were deactivated, by whom, and the associated Event number under which it was activated.		

ID	Requirement Definition	Existing Capability	Clarification Comments
ITM-36	The ATMS solution shall have the ability to generate a recommended response plan based on populated Event information. A recommended response plan shall consist of recommended DMS and HAR devices (including phantom devices) , recommended device messages, and a notifications list of contacts from the contact list selected automatically by the ATMS based on configurable business rules and current populated Event information.		
ITM-37	The ATMS solution shall allow a user to click to generate or update a recommended response plan for an Event. If devices had already been added to an Event, via a previously generated response plan or added by the user, the newly generated response plan shall not remove those devices and associated messages from the list of devices.		
ITM-38	The ATMS solution shall automatically execute the generation of a recommended response plan in an Event that has been generated by the CADS interface.		
ITM-39	The ATMS solution shall have the ability to store pre-defined diversion routes and configurable template response plans (Plan X) to populate an Event. • Diversion route (Plan X) information will be provided. • The template response plan shall be configurable (e.g. devices and messages, and notification list) for each diversion route (Plan X). • The ATMS shall store supporting reference documentation (.pdf, .tiff, .jpeg, .doc, etc.) for each diversion route (Plan X). • A graphical representation highlighting the roadway shall be created for each diversion route (Plan X) to be displayed on the ATMS map.		
ITM-40	The ATMS solution shall allow the user the ability to activate a diversion route (Plan X) within an Event. When a diversion route (Plan X) is activated, the route will be shown on the map as active.		
ITM-41	The ATMS solution shall alert the users when an Event is in proximity or in conflict (configurable) with a currently active Event. This includes construction and maintenance Events and planned events (configurable on subtype).		
ITM-42	The ATMS solution shall allow the user to link one or more Events to manage concurrently, while maintaining separate database records of each Event.		
ITM-43	The ATMS solution shall allow the user to manage the linked Events' information separately (e.g. make notifications, update Event details, notes) and combine management of the linked Events' devices.		
ITM-44	The ATMS solution shall log activations/deactivations for the devices managed within a linked event separately in each of the database records for each individual Event and also track the linked status of the Events.		
ITM-45	The ATMS solution shall allow the user to close or unlink individual Event(s) in a linked Event. The software shall maintain an accurate and consistent Event and Device history in the records.		
ITM-46	The ATMS solution shall track and manage the priority of all messages that have been sent to be displayed on devices.		
ITM-47	When a message is sent to a device for activation (or deactivation) from an Event, the ATMS shall keep record that the device and message was activated (or deactivated) at that time regardless of whether the message was displayed or placed in the queue behind higher priority message (Device activation logs). Additionally, the ATMS shall keep record of the messages that were displayed on each device, times/duration, priority level, and from which Event (Device display logs).		
ITM-48	The ATMS solution shall automatically play a message of higher priority on a device. The lower priority message shall be moved into the queue for that device.		
ITM-49	If two message of the same priority are assigned to the same device, and both messages are single page messages; with user approval - the ATMS shall automatically combine the two single page messages into two page message.		
ITM-50	If two messages of the same priority are assigned to the same device, and one (or both) of the messages has two pages, the ATMS shall prompt the user to resolve the conflict. Until the conflict is resolved, the message that was first assigned shall continue to be displayed.		
ITM-51	On the deactivation of a message on a device from an Event, the ATMS solution shall update the device to play the next highest priority message in the queue or remove that message from the queue.		

ID	Requirement Definition	Existing Capability	Clarification Comments
ITM-52	When a device message is deactivated through an Event or Event closure, the ATMS solution shall notify the user that the device is being activated with the next message from the queue. The notification shall detail the new message and the Event ID from which it was assigned. The user shall be able to click on the event ID to open the event.		
ITM-53	The ATMS shall not recommend devices that have a disabled or off-line status. However, the ATMS shall prompt the user if a device would become enabled and is in the recommended response area		
ITM-54	The ATMS shall provide the ability to view the message queue for all applicable devices.		
ITM-55	The ATMS solution shall have the ability to calculate and display backlog per Event based on inputted Event data, historical and/or live traffic data.		
ITM-56	The ATMS solution shall display calculated backlog information (For each applicable Event) in the form of countdown time until a 3 mile backlog, 5 mile backlog, and/or when the backlog is anticipated to reach an interchange. This information shall be displayed in each active Event window.		
ITM-57	The ATMS solution shall maintain a history of calculated backlog data for each Event. The stored history shall be consistent with the Commission's data retention policy.		
ITM-58	The ATMS solution shall allow the ATMS User the ability to create and edit a Planned Event for scheduling device activations/deactivations, contact notifications.		
ITM-59	The ATMS solution shall allow the user the ability to input start and end time and date of the Planned Events. The Planned Event can be open ended.		
ITM-60	The ATMS solution shall allow the user the ability to save a planned event in the system for future/repeated use or as a template.		
ITM-61	The ATMS solution shall allow the user to schedule device activations/deactivations for a set duration (time/date to time/date) or on a Time of Day (TOD) schedule.		
ITM-62	The ATMS solution shall allow the user to schedule a custom notification time (reminder) to be presented to the user before the scheduled activation of the Planned Event. A minimum/maximum configurable notification time shall be configurable by a System Administrator.		
ITM-63	The ATMS solution shall provide the ability to edit, cancel, or close a Planned Event regardless of the status of the Planned Event.		
ITM-64	The ATMS solution shall have the ability to allow the ATMS User the ability to send traveler information to multiple external systems.		
ITM-65	The ATMS shall interface with the ENS system to share device and Event data.		
ITM-66	The ATMS shall have the ability to export device activation/deactivation and message data to ENS in real-time.		
ITM-67	The ATMS shall have the ability to export Event update messages to ENS in real-time.		
ITM-68	The ATMS shall expose data (input and output) through Web services and a well-defined API for use by other Commission systems, external partners and systems.		
ITM-69	The ATMS shall share information to and from PennDOT's ATMS system.		
DEVICE CONTROL AND MONITORING (DCM) REQUIREMENTS			
DCM-1	The ATMS solution shall allow Commission operators to filter ITS device/vehicle data based on device/vehicle type, identifier, or location.		
DCM-2	The ATMS solution shall provide users the capability to generate a list of equipment and their status (e.g. successful or not successful) and equipment health for a selected date or date range. This can be user activated or scheduled, and must be confirmed by the user.		
DCM-3	The ATMS solution shall allow for monitoring and remote diagnostics of field equipment.		
DCM-4	The ATMS solution shall display any device/vehicle error when selecting the device/vehicle from the list or map.		
DCM-5	Device/vehicle icons shall be colored or otherwise highlighted in such a way as to identify devices that are in error.		
DCM-6	The ATMS solution shall allow for authorized users to share or hand-off control of ITS devices within the TOC i.e. a device shall not be locked into control by a single user at any time.		
DCM-7	The ATMS solution shall display vehicle location data in real time.		
DCM-8	The ATMS solution shall allow operators to view all AVL-equipped Commission vehicles at any time via a list and icon on the map. Map icons shall be configurable based on vehicle type.		
DCM-9	Map icons shall indicate vehicle location in real time.		

ID	Requirement Definition	Existing Capability	Clarification Comments
DCM-10	The ATMS solution shall provide vehicle type, vehicle identifier, GPS location, time of data collection, vehicle status, and any other data transmitted through the AVL system to operators. This information shall be available by hovering over the vehicle icon on the map or selecting the vehicle from a list.		
DCM-11	The ATMS solution shall allow authorized users to configure system timeouts for static vehicles. Administrators shall have the ability to remove static vehicles from maps or lists of active vehicles.		
DCM-12	The ATMS solution shall record and archive historical vehicle location data.		
DCM-13	The ATMS solution shall be capable of providing an AVL data feed to external software programs.		
DCM-14	The ATMS solution shall provide operators the ability to access CCTV video feeds through both a list or by clicking on an icon on the map.		
DCM-15	The ATMS solution shall provide operators the ability to manually control CCTV cameras by panning, tilting, and zooming the camera, accessing preset positions, and adjusting the camera's focus and iris settings. These functions shall be performed with no discernable lag in the response of the camera.		
DCM-16	PTZ control of CCTV cameras shall be accomplished through either the use of a keyboard, or virtual joystick within the ATMS solution.		
DCM-17	The ATMS solution shall allow authorized users the ability to select preset camera views.		
DCM-18	The ATMS solution shall allow the configuration of up to six preset views for each CCTV camera.		
DCM-19	The ATMS solution shall allow authorized users to create and modify video tours and camera sequences.		
DCM-20	The ATMS solution shall allow the customization of video tours and sequences by number of cameras/views and transition rates between cameras and views.		
DCM-21	The ATMS solution shall allow authorized users to tile images from multiple camera feeds in a separate window to create a virtual video wall. Creation of the virtual video wall tiled display have a drag-and-drop capability.		
DCM-22	The ATMS solution shall provide the user the ability to configure virtual video walls to display from one to up to 9 simultaneous tiled camera streams.		
DCM-23	The ATMS solution shall allow users to save virtual video wall layouts as favorites which can be accessible locally to the user as well as globally.		
DCM-24	The ATMS solution shall allow authorized users to share video feeds and virtual video walls with other authorized users.		
DCM-25	The ATMS solution shall allow authorized users to take and save snapshots from video feeds or camera layouts.		
DCM-26	The ATMS solution shall allow authorized users to push CCTV snapshots to the PA 511 website as well as ENS.		
DCM-27	The ATMS solution shall display the current DMS message when selecting a DMS from a list or by hovering over a DMS icon on the map.		
DCM-28	Within the system map and device lists, the ATMS shall identify DMS that are within transmission range of an HAR transmitter.		
DCM-29	The ATMS solution shall provide all DMS diagnostic data (e.g. errors, temperature, settings) when selected.		
DCM-30	The ATMS solution shall provide authorized users the capability to create and display messages on DMS.		
DCM-31	The ATMS solution shall associate each DMS activations with an Event. Multiple DMS activations can be associated with a single Event.		
DCM-32	The ATMS solution shall allow the user to select DMS to activate from the map, from a list, or from within an Event.		
DCM-33	The ATMS solution shall not allow authorized users to create messages that fall outside of the allowable parameters of the individual device (e.g. number of characters, number of lines, font/image constraints). A WYSIWYG style input shall be used by the user to create the message. The WYSIWYG screen shall not allow the user to enter message outside of the constraints defined above.		
DCM-34	The ATMS solution shall allow authorized users to select from a pre-populated library of messages for each sign type. The authorized user shall have the ability to modify or copy (for editing new) pre-populated messages based on library rules.		
DCM-35	Authorized users shall have the ability to modify or copy (for editing new) pre-populated messages based on library rules.		

ID	Requirement Definition	Existing Capability	Clarification Comments
DCM-36	Custom Messages (Free-formatted messages entered by the user) shall not be automatically saved in the message library.		
DCM-37	The ATMS solution shall allow authorized users to select from a pre-populated library of graphics for each sign.		
DCM-38	The ATMS solution shall have a conflict monitor to verify selected fonts, text, and graphics are appropriate for a given sign type and sign location. For example, users shall not be able to select a message with 6” characters for a roadway where MUTCD requirements dictate a character height of 12” or 18” characters.		
DCM-39	If multiple messages are sent to a sign for posting, the ATMS shall queue the message based on the assigned message priority.		
DCM-40	If multiple messages of the same priority are assigned to a sign for posting, the user will be provided with an alert and prompted to select the desired message.		
DCM-41	“Blank” shall be a user-selectable command that overrides all messages in the queue.		
DCM-42	The ATMS solution shall maintain a list of forbidden words and prevent a message with a forbidden word from being posted to a DMS. This list shall be configurable by a systems administrator.		
DCM-43	The ATMS solution shall require the operator to identify a priority for each message based on a selectable list. If no priority is manually assigned, the message will be automatically given a priority level defined by a systems administrator.		
DCM-44	The ATMS solution shall allow authorized users to manually activate and de-activate messages on DMS through the map, list, or Event.		
DCM-45	The ATMS solution shall allow authorized users to manually adjust the brightness of each DMS.		
DCM-46	The ATMS solution shall provide the ability to post a message to multiple DMS simultaneously.		
DCM-47	The ATMS solution shall provide the ability to remove messages from multiple DMS simultaneously.		
DCM-48	The ATMS solution shall provide confirmation once a message has been sent to a DMS, sent a command to remove from a DMS, or if a queued DMS message has posted.		
DCM-49	The ATMS solution shall alert the operator if a message failed to post due to a communications or other error, or if a message of higher-priority is already posted to the sign.		
DCM-50	The ATMS solution shall provide the ability to automatically update DMS messages when inputted data changes (e.g. travel time, temperature).		
DCM-51	The ATMS solution shall not allow a message to be posted to a DMS that has pixel errors exceeding a pre-defined threshold, however the user may override and post the message. These manual overrides shall be logged by the ATMS.		
DCM-52	The ATMS solution shall provide a history of all DMS messages that have been posted by each individual sign, including when they were posted, when they were deactivated, by whom, and the associated Event number under which it was activated. The stored history shall be consistent with the Commission’s data retention policy.		
DCM-53	The ATMS solution shall utilize and prioritize all Commission traffic data sources for the purpose of generating travel times.		
DCM-54	The ATMS solution shall only utilize real-time data for the generation of travel times. If real-time data is not available, travel times will not be generated for the specific Origin-Destination link.		
DCM-55	The ATMS solution shall consolidate vehicle detection/speed data into travel time segments and aggregate travel time segments into user defined Origin/Destination routes for display through the ATMS solution and posting to DMS.		
DCM-56	Travel time links and routes shall be configurable and customizable through the ATMS solution. Routes shall be auto-aggregated based on user-defined origins and destinations.		
DCM-57	The ATMS solution shall display all travel time routes through a list display.		
DCM-58	The ATMS solution shall facilitate the automated display of travel times on DMS.		
DCM-59	Automated travel time messages shall have a predetermined DMS message priority.		
DCM-60	The ATMS solution shall allow the deactivation of travel time messages through the posting of a higher-priority message, or a manual blanking of the sign.		
DCM-61	The ATMS solution shall automatically update the travel times displayed on DMS as they change. The update interval shall be configurable.		
DCM-62	Travel times which would correlate to a travel speed exceeding the posted speed limit shall not be posted. Example: If calculated travel times exceed a correlated travel speed of 60 miles per hour, a travel time corresponding to a travel speed of 60 miles per hour shall be displayed on the DMS (e.g. no less than 20 minutes for a 20 mile link). However this shall also be configurable as a system administrative setting.		

ID	Requirement Definition	Existing Capability	Clarification Comments
DCM-63	The ATMS solution shall alert operators if a travel time along a link or route exceeds a user-defined threshold. The intent of this alert is to notify operators of potential incidents or non-recurrent congestion.		
DCM-64	If travel time exceeds a user-defined threshold, the ATMS solution shall have the ability to post an auto-generated message to the DMS approaching/within the affected area. Messages, thresholds, and affected areas shall be administrator configurable and selectable. For example, if a user sets up a 15 minute travel time threshold for a five mile O-D link, and that threshold is exceeded, the DMS will automatically post a message similar to the following “Incident I-476 NB / Expect Delays”.		
DCM-65	The ATMS solution shall not post travel times to DMS if any segment as part of a defined route has no real-time data or if real-time data falls below a specified confidence level.		
DCM-66	The ATMS solution shall not post/repost travel times to DMS until user specified threshold of consecutive real-time data reports are met to ensure that real-time data will be maintained.		
DCM-67	The ATMS solution shall associate all travel time message DMS activations with an Event. Multiple travel time DMS activations can be associated with a single Event.		
DCM-68	The ATMS solution shall provide a history of all travel time DMS messages that have been posted by each individual sign, including when they were posted, when they were deactivated, by whom, and the associated Event number under which it was activated. The stored history shall be consistent with the Commission’s data retention policy.		
DCM-69	The ATMS solution shall record and archive historical travel time data.		
DCM-70	The ATMS solution shall directly interface with the HAR field devices or through software to software integration with the existing Platinum SIM.		
DCM-71	The current HAR message shall be displayed when selecting a device from a list or by hovering over an icon on the map.		
DCM-72	The ATMS solution shall provide the ability for authorized users to create, manage, and post messages to HAR transmitters and activate HAR beacon signs.		
DCM-73	The ATMS solution shall associate all HAR activations with an Event. Multiple HAR activations can be associated with a single Event. These associations shall only include Event-specific activations and not default HAR safety messages.		
DCM-74	The ATMS solution shall allow authorized users to select from a pre-populated library of messages for each HAR. Authorized users shall have the ability to modify or copy (for editing new) entire pre-populated messages based on library rules.		
DCM-75	Authorized users shall have the ability to modify or copy (for editing new) entire pre-populated messages based on library rules.		
DCM-76	Custom Messages (Free-formatted messages entered by the user) shall not be automatically saved in the message library.		
DCM-77	The ATMS solution shall support the importing of existing Commission HAR dictionaries and message libraries.		
DCM-78	The ATMS solution shall support text-to-voice HAR message creation as well as audio recording. The current text-to-voice software used by Platinum shall be used in ATMS, unless otherwise approved by the Commission.		
DCM-79	The ATMS solution shall provide the ability to post a message to multiple HAR stations simultaneously through the map, list, or Event.		
DCM-80	The ATMS solution shall provide the ability to remove messages from multiple HAR simultaneously.		
DCM-81	The ATMS solution shall provide the ability for users to listen to the advisory messages both before and after the message is posted to the HAR device. After posting, the message that is heard shall be direct from the HAR device.		
DCM-82	HAR beacon activation/deactivation shall be automatically tied to HAR message activation/deactivation.		
DCM-83	The ATMS solution shall provide confirmation once a message has been sent to a HAR, sent a command to remove from a HAR, or if a HAR message has automatically changed.		
DCM-84	The ATMS solution shall alert the operator if a message failed to post due to a communications or other error.		
DCM-85	The ATMS solution shall support the use of auto-generated messages to be posted to one or many HARs, including weather messages.		

ID	Requirement Definition	Existing Capability	Clarification Comments
DCM-86	The ATMS solution shall support the synchronization of multiple HAR devices broadcasting the same messages.		
DCM-87	The ATMS solution shall have the capability to assign message speeds to HAR devices.		
DCM-88	The ATMS solution shall maintain a history of all HAR messages that have been broadcasted by each individual device, including when they were broadcasted, when they were deactivated, by whom, and the associated Event under which it was activated. The stored history shall be consistent with the Commission's data retention policy.		
DCM-89	The ATMS solution shall be capable of providing an HAR data feed to external software programs.		
DCM-90	The ATMS solution shall generate user alarms when RWIS stations have detected the low visibility and DMS will be automatically activated (See Fog Detection System operation details).		
DCM-91	The ATMS solution shall facilitate the automated display of fog detection messages on DMS following the notification from a linked RWIS device. DMS messages will be configured to display based on reported visibility from the attached RWIS devices (See Fog Detection System operation details).		
DCM-92	The ATMS solution shall support the automatic updating of DMS based on configurable visibility reading and polling thresholds from attached RWIS devices.		
DCM-93	Automated fog warning messages shall have a predetermined DMS message priority.		
DCM-94	The ATMS solution shall allow the deactivation of fog warning messages through the posting of a higher-priority message, or a manual blanking of the sign.		
DCM-95	The ATMS solution shall automatically generate an Event for the fog detection system DMS activation(s). All DMS message activations during the fog event shall be associated with the same Event until the fog event has ended.		
DCM-96	The ATMS solution shall maintain a history of all fog detection activations and the associated Event (automatically generated by the ATMS) under which it was activated. The stored history shall be consistent with the Commission's data retention policy.		
DCM-97	The ATMS solution shall support the integration of temporary Smart Work Zone devices.		
DCM-98	The ATMS solution shall allow for full integration of all supported Smart Work Zone CCTV into the ATMS CCTV module.		
DCM-99	The ATMS solution shall allow for full integration of all supported Smart Work Zone DMS into the ATMS DMS module.		
DCM-100	The ATMS solution shall allow for full integration of all supported Smart Work Zone vehicle detection into the ATMS travel time and Incident Detection Modules.		
DCM-101	The ATMS solution shall receive alerts from the Smart Work Zone indicating when traffic speeds have reached a configurable threshold.		
DCM-102	The ATMS solution shall archive all Smart Work zone activities and interactions.		
DCM-103	The ATMS solution shall be sufficiently modular and scalable such as to provide for the future integration and management of connected vehicle data.		
DCM-104	The ATMS solution shall be sufficiently modular and flexible such as to allow for conformance to forthcoming connected vehicle data and software standards.		
CONSTRUCTION AND MAINTENANCE MANAGEMENT (CMM) REQUIREMENTS			
CMM-1	The ATMS solution shall maintain a real time schedule of all construction and maintenance lane closure activities. The scheduled closures shall be viewable by the user and shall be sortable/filterable on all attribute fields.		
CMM-2	The ATMS solution shall populate a real time schedule with construction and maintenance lane closure activities by interfacing with a ATMS C&M (Construction & Maintenance) Application.		
CMM-3	The ATMS C&M Application shall be accessible via username and password.		
CMM-4	The ATMS C&M Application shall support multiple mobile platforms. (Android/iOS)		
CMM-5	The ATMS shall monitor and identify conflicts between scheduled lane closure activities. If a conflict is present, a "red flag" alert will be sent to personnel as defined by the System Administrator.		
CMM-6	The ATMS C&M Application shall support 50 concurrent users.		
CMM-7	The ATMS shall allow users to create a draft Event for each scheduled lane closure activity so that a response plan (custom or recommended) can be pre-populated and ready to utilize upon the activation of the lane closure.		

ID	Requirement Definition	Existing Capability	Clarification Comments
CMM-8	The ATMS shall move the draft Event to active, or create an Event, for each lane closure activity type (configurable) when the lane closure is activated by the user. Note: The activation of a lane closure is currently preempted by a notification phone call from the contactor or maintenance personnel on the start of closure.		
CMM-9	The ATMS shall allow users to delete or edit draft Events at any time prior to activation.		
CMM-10	The ATMS shall provide the ability to classify a lane closure activity and/or associated draft Event as a planned Plan X (diversion route). The draft Event can be pre-populated with default or custom Plan X response plans. The classification will also allow the user to create or/set a reminder to create an Event to manage pre-Plan X notifications and device activations.		
CMM-11	The ATMS shall keep record of the relationship of the pre-Plan X Event and planned Plan X Event for metrics and reporting purposes.		
CMM-12	The ATMS shall provide notification/reminders to ATMS users for upcoming scheduled lane closures. The notifications/reminders will be configurable on time of day or time in advance of the schedule activity and closure type (e.g. shoulder - off shoulder work, shoulder closed, left/right/center lanes closed, all lanes closed)		
ASSET MANAGEMENT (AM) REQUIREMENTS			
AM-1	The ATMS shall maintain an ITS asset database that can be edited and expanded as new assets (devices) are added to the system.		
AM-2	The ATMS shall allow a user to add devices to the ATMS system with detailed information about the device that shall be stored in the ITS asset database. The ATMS shall require the user to enter a set of required attribute fields in order to add a device.		
AM-3	The ATMS shall allow a user to edit the attributes of any asset.		
AM-4	The ATMS shall monitor the status of all ITS assets and keep record of these statuses for purpose of issuing service tickets, generating performance metrics and reports, and maintaining a history of maintenance activities.		
AM-5	The ATMS shall alert the user to device errors and failures visually and/or audibly (configurable).		
AM-6	The ATMS shall integrate with Service Now to create and track service tickets for devices, interfaces and system failures and errors.		
AM-7	The ATMS shall automatically disable devices from use that have been found to be in failure, and automatically enable devices when working condition has been restored.		
AM-8	The ATMS shall interface with Orion to verify communication failures. e.g. If the ATMS identifies a communication failure, the ATMS shall ping Orion to verify the failure. If Orion does not have the same determination, the system administrator shall be notified to troubleshoot the discrepancy.		
AM-9	The ATMS shall provide the ability to view a list of all current device errors and failures.		
AM-10	The ATMS shall provide the ability to document and report device outage trends across both individual devices as well as device types.		
AM-11	The ATMS shall allow users to record preventative maintenance activities for all ITS devices		
AM-12	The ATMS shall display the status of a device on ATMS Map.		
REPORTING (RR) REQUIREMENTS			
RR-1	The ATMS shall provide an area within the GUI to select and generate reports.		
RR-2	The ATMS shall allow a user to create custom system data reports utilizing data collected by the ATMS system. The user shall be able to select a custom period of time and data to be outputted. System data reports shall include but not be limited to: • Shift Hand Off Report o Open Events o Active Lane Closures o Scheduled Lane Closures (next shift) o Active Devices • Device Activation Logs • Event Logs • Real-Time Traffic Data Reports • User Activity Reports		

ID	Requirement Definition	Existing Capability	Clarification Comments
RR-3	The ATMS shall allow a user to run custom performance measure reports utilizing data collected by the ATMS system. The user shall be able to select a custom period of time and data sets to be outputted. Reports can be created and sorted by year, month, day, shift, district, contract, PSP, staff, etc. Performance measure reports shall include but not be limited to: • Event Response Reports o Device Activation Time o Incident Notification Time o Event Clearance Time • Device Uptime/Availability • Device Utilization • Device Reliability • Traffic Flow Statistics • Activation/Notification Statistics by User • Month over Month, Year over Year Comparative Analysis • Custom Combined Reports		
RR-4	The Selected Proposer shall work with the Commission to create a total of 25 canned report types.		
RR-5	The ATMS shall provide the ability to output and save reports in various file types (e.g. .pdf, .xlsx, .xml)		
RR-6	The ATMS shall provide the ability to create and save reports using industry standard tools (e.g. Crystal Reports)		
RR-7	The ATMS shall allow a user to schedule reports to be created and delivered via email to user specified recipients.		
WEATHER EVENT MANAGEMENT (WEM) REQUIREMENTS			
WEM-1	The ATMS shall accept data from external weather forecast data sources: Accuweather and National Weather Service or an equivalent weather forecast provider.)		
WEM-2	The ATMS shall monitor imported data from the external sources for each of the Commission's 4 geographical weather regions.		
WEM-3	The ATMS shall alert the user of inclement weather forecasts (by county) for each weather region based on predefined thresholds and prompt the user to create an Event for the respective region. The ATMS shall consider counties that are in one or more weather regions as a county in each regions in which it is geographically included. e.g. if County A is part of Region 1 and 2, County A data will be monitored for both Region 1 and 2.		
WEM-4	The ATMS shall manage weather data alerts on a region by region basis. e.g. The ATMS shall alert the user of the first weather advisory level for a county in a region, but not for subsequent advisories of the same severity for counties in the same region. The same logic shall apply for elevation or de-elevation of advisory levels. e.g. The ATMS shall alert the user for the first elevation in advisory level, or shall alert the user of the last de-elevation of advisory level. Regardless of the user alerting, the ATMS shall track and display the advisory levels for each county in each weather region.		
WEM-5	The ATMS shall automatically populate the region weather Event with all DMS and HAR in the weather region with recommended messages based on the imported data and populate the notification list with contacts from the contact list for each region.		
WEM-6	The ATMS shall allow users activate/deactivate devices, edit messages, and manage and make Event notifications to contacts throughout the life of the Event.		
WEM-7	The ATMS shall monitor real-time weather data (RWIS data) for potentially dangerous scenarios (e.g. precipitation at high rates, icing conditions). On detection of such scenarios, the ATMS shall alert the user and automatically send an email/text alert to the respective maintenance personnel based on the location of the RWIS station. e.g. The ATMS identifies an RWIS station with data reports approaching a freezing condition with current precipitation, the ATMS shall alert the user and send the alert email/text to the responsible maintenance personnel with relevant information.		
WEM-8	The ATMS shall have the ability to automatically change DMS messages based on the locations and/or status (plowing/salting/etc.) of AVL equipped vehicles. e.g. An AVL equipped snow plow travels near a DMS sign. The ATMS recognizes the proximity of the plow to a DMS and posts a message to alert drivers to snow plow activities. The ATMS will then deactivate that message once the plow has left a predefined proximity.		

ID	Requirement Definition	Existing Capability	Clarification Comments
WEM-9	The ATMS shall display the current Commission weather level based on current weather conditions and input from the user for each region. The ATMS shall have the capability to automatically send email notifications to all required personnel on each change of weather level.		
WEM-10	All weather data shall be recorded and archived by the ATMS and made available for all reporting purposes.		
FACILITY MANAGEMENT (FM) REQUIREMENTS			
FM-1	The ATMS shall integrate with the Commission access management system (Hirsh) to monitor and control access gates.		
FM-2	The ATMS shall notify the user when access gates are used by authorized personnel.		
FM-3	The ATMS shall allow a user to select an access gate and open/close an access gate through the HIRSH interface. When the user opens a gate, they must enter details for the action to be recorded in the ATMS system. e.g. reason, requesting person's name, company, vehicle		
FM-4	The ATMS shall integrate with a Truck Parking System to monitor the status of the system.		
FM-5	The ATMS shall allow a user to view the Truck Parking System status and statistics through a list view and by mousing over the Truck Parking System icon on the map.		

ID	Requirement Definition	Existing Capability/Conformance	Clarification Comments
PHYSICAL (PR) REQUIREMENTS			
PR-1	The ATMS solution shall be capable of being executed in a virtualized deployment environment (e.g. VMWare).		
PR-2	The ATMS solution shall be cloud-based (see the RFP document for further details regarding hosing needs and requirements. Also see Section 4.7 for hosting specific supplemental requirements).		
PR-3	The ATMS solution shall be configured for 99.95% uptime.		
PR-4	The ATMS solution shall not require the installation of additional hardware at operator workstations.		
PR-5	The ATMS solution shall not require the installation of additional software at operator workstations. The ATMS solution shall be a thin client capable of running on any modern web browser.		
PR-6	All ATMS solution components shall be cluster-able across multiple servers.		
PR-7	The ATMS solution shall support both Windows and SQL database applications.		
PR-8	The Vendor shall provide independent cloud based (hosted) production and staging environments for the ATMS solution.		
SOFTWARE PERFORMANCE (SR) REQUIREMENTS			
SR-1	The ATMS solution shall be designed to support continuous operations (24 hours per day, 365 days per year, 99.95% uptime).		
SR-2	The ATMS solution shall support the operations of all ITS devices included in the Commission's ITS Device Inventory.		
SR-3	The ATMS solution shall support the operations of all NTCIP compliant devices.		
SR-4	The ATMS solution shall support all anticipated future growth in the number of devices included in the Commission's ITS Device Inventory.		
SR-5	The ATMS solution shall support the integration with all ITS device manufacturers included in the Commission's ITS Device Inventory or the Selected Proposer shall provide a transition plan if unable to support a certain manufacturer.		
SR-6	The ATMS solution shall process and display data in real-time.		
SR-7	The ATMS solution shall process and display the status of all ITS devices in real time.		
SR-8	The ATMS solution shall automatically poll each ITS device at a configurable rate. The ATMS solution shall be able to support polling at a minimum frequency of once every 30 seconds.		
SR-9	The ATMS solution shall evaluate data quality and device status to generate alarms accordingly.		
SR-10	The ATMS solution shall be capable of continually monitoring overall system and device level performance.		
SR-11	The ATMS solution shall have the ability to discover, inventory, and configure ITS devices.		
SR-12	The ATMS solution shall be able to receive an unsolicited communication from any device containing notification of a malfunction or event involving that device.		
SR-13	The ATMS solution shall be capable of communicating with devices regardless of the communications media (e.g. fiber, wireless).		
SR-14	The ATMS solution shall not create any additional lag time or delays in the operations of ITS devices.		
SR-15	The ATMS solution shall expose ITS data through a Web Interface utilizing HTML5 standards.		
SR-16	The ATMS solution shall be a modular design with a well-documented and open database structure (SQL) with ODBC compliance.		
SR-17	The ATMS solution shall support up to 50 concurrent users.		
SR-18	The ATMS solution shall conform to all Commission IT Security Standards.		
SR-19	The ATMS solution shall support load-balanced Web farms for maximum scalability and availability using any industry standard software or a hardware-based load balancing technology. The ATMS solution needs to work with multiple web servers in a load balanced manner. The ATMS solution shall not require Sticky sessions.		

ID	Requirement Definition	Existing Capability/Conformance	Clarification Comments
SR-20	The ATMS solution shall allow for the selective turn-on / turn-off facilities (page, application, or data source level). The ATMS solution shall provide the ability to take application components offline without affecting the server or requiring the shutdown of a node in the cluster. The ATMS solution shall provide automated restart and recovery (application resiliency).		
SR-21	The ATMS solution shall provide monitoring and logging capabilities that can be configured to alert system administrators of the operational status of the application component.		
SR-22	The ATMS solution shall work seamlessly with industry standard clustering solutions for database high availability.		
SR-23	The ATMS solution shall utilize a well documented and open Application Programming Interface (API) to support enhancements or modifications by an authorized third party.		
SR-24	The ATMS solution shall log system and portlet activity including the ability to display/create detailed bandwidth usage reports.		
SR-25	The ATMS solution shall allow for all server software to run as a service or component (e.g., does not require someone to log in at the console and start up the application manually).		
SR-26	The ATMS solution shall be able to start ATMS components in any order (if a component is started or restarted, related systems will wait rather than fail).		
SR-27	The ATMS solution shall provide the ability to deploy new functionality and content into the production environment but still only accessible to test users.		
SR-28	The ATMS browser (GUI) instance shall load and be available for input within 20 seconds of opening.		
SR-29	The ATMS browser (GUI) shall have no discernable lag when entering data, navigating the software GUI, and utilizing the map or any other user interaction with the GUI.		
SR-30	The ATMS shall only require a restart or reboot resulting from major system upgrades.		
SR-31	The ATMS shall accept data input by operators with no loss of data.		
SR-32	The ATMS shall be dynamic and display changes to the system in real-time.		
SR-33	The ATMS shall make all data available to external interfaces in real-time.		
SR-34	The ATMS shall accept all data made available by external interface in real-time.		
LOGICAL DATA (LR) REQUIREMENTS			
LR-1	The ATMS solution shall have a SQL database in which collected data and system activity is automatically tracked and recorded.		
LR-2	The ATMS solution shall recognize and record in the activity log all proprietary warnings, alarms, and status transmissions from each device.		
LR-3	The ATMS shall support an industry standard relational SQL database management system (RDMS).		
LR-4	The ATMS solution shall support importing and exporting of system data. For example, data can be exported to Excel.		
LR-5	The ATMS solution shall store data collected in a relational SQL database that can be accessed and queried to develop custom reports.		
LR-6	The ATMS shall log and timestamp all user activities.		
LR-7	The ATMS solution shall collect and store data from the sources listed in the interface section of the RFP.		
LR-8	The ATMS solution shall allow for the collection and storage of all data related to maintenance and construction events for use by operations personnel or data archives.		
LR-9	Error and log messages generated and stored by the ATMS solution solution shall display clear plain text that would help facilitate a response. For example, these messages shall be stored in a human readable format and shall not use any cryptic information, e.g. instead of “Error Code #N” state “Database Error”.		
LR-10	The ATMS solution shall allow multiple people to work on the application without adversely affecting one another. It provides the ability to control who does what to a site by restricting capabilities based on individual's roles.		
LR-11	The ATMS solution shall have the ability to store ITS device data for future analysis and reporting.		

ID	Requirement Definition	Existing Capability/Conformance	Clarification Comments
LR-12	The ATMS solution shall use Active Directory Federation Services (ADFS) for user authentication.		
LR-13	The ATMS solution shall require a single user sign-on (support LDAP) for the complete management of Event and field devices.		
LR-14	The ATMS solution shall be capable of assigning each user to a user group or access level. An ATMS user with sufficient privileges shall be capable of selecting the access levels and functionality available to each user.		
USER (UR) REQUIREMENTS			
UR-1	The ATMS solution shall allow an ATMS user with sufficient privileges to create and save default map views for all users or specific user groups.		
UR-2	The ATMS solution shall provide the ability for ATMS user to create and save individual map views.		
UR-3	The ATMS solution shall provide the ability for an ATMS user with sufficient privileges create custom user groups.		
UR-4	The ATMS solution shall provide the ability for an ATMS user with sufficient privileges add new users to the system.		
UR-5	The ATMS solution shall provide the ability for an ATMS user with sufficient privileges to assign users to a user group.		
UR-6	The ATMS solution shall provide the ability for an ATMS user with sufficient privileges to assign privileges to users.		
UR-7	The ATMS solution shall provide the ability for an ATMS user with sufficient privileges to edit user information and privileges.		
UR-8	The ATMS solution shall provide the ability for an ATMS user with sufficient privileges to disable users.		
UR-9	The ATMS solution shall provide the ability for and ATMS user with sufficient privileges to remove (decommission) users.		
UR-10	The ATMS solution shall allow an ATMS user with sufficient privileges to add new devices.		
UR-11	The ATMS solution shall allow an ATMS user with sufficient privileges to edit device information.		
UR-12	The ATMS solution shall allow an ATMS user with sufficient privileges to disable devices.		
UR-13	The ATMS solution shall allow an ATMS user with sufficient privileges to remove (decommission) devices.		
UR-14	The device icons shall be initially plotted based on the latitude/longitude coordinates that are entered during device configuration.		
UR-15	When a device that is geocoded based on the latitude /longitude coordinates needs to be adjusted, the ATMS user with sufficient privileges shall be able to reposition the icon on the map, without changing the latitude /longitude for that device.		
UR-16	When adding/editing a device, the ATMS solution shall allow an ATMS user with sufficient privileges to enter/edit all device information from a single screen.		
UR-17	The ATMS solution shall allow the ATMS user with sufficient privileges to configure the color and look of map icons (e.g. incident and device icons).		
UR-18	The ATMS solution shall allow the ATMS user with sufficient privileges to upload or create new icons.		
UR-19	All routine administrative tasks shall be accomplished using the ATMS solution user interface (e.g. no direct manipulation of the database, configuration files). System administrative tasks include, but are not limited to: device management (add, edit, disable, remove or decommission), user and user group management (add, edit, disable, remove or decommission) notification/alert/alarm settings and thresholds, configurable timers, configurable system logic thresholds and settings.		
UR-20	The ATMS solution shall allow a user to initiate control of a device by selecting it from the ATMS map.		
UR-21	The ATMS solution shall allow a user to initiate control of a device by selecting it from the device list.		

ID	Requirement Definition	Existing Capability/Conformance	Clarification Comments
UR-22	The ATMS solution shall allow a user to initiate control of a device by selecting it through an existing event.		
UR-23	The ATMS solution shall display information from the CADS.		
UR-24	Information from the CADS shall automatically populate incident /event screens with all relevant information, including the CADS identification number.		
UR-25	The ATMS solution shall display information from PennDOT's Road Condition Reporting System (RCRS).		
UR-26	The ATMS solution shall be able to filter and RCRS data based on pre-set geographical boundaries and incident types.		
UR-27	The ATMS solution shall allow the user to select/view lanes affected or closed from a graphical representation of the roadway.		
UR-28	The ATMS solution shall allow the user to view and organize events based upon user-specified criteria (e.g. type, age).		
UR-29	The ATMS solution shall support the creation of user-configurable event/incident notifications and alerts.		
UR-30	The ATMS map shall support click and drag and scroll wheel mouse controls for panning and zooming of the map respectively. The Latitude and Longitude of the mouse pointer shall be displayed within the map window.		
UR-31	The ATMS solution shall be compatible with the Commission's GIS mapping solution (ESRI).		
UR-32	The ATMS solution shall support the aggregation of individual map layers into customized map views and groups (e.g. a traffic layer including incidents, vehicle detection data, Waze data; a weather layer including RWIS, Accuweather, NWS data, AVL).		
UR-33	The ATMS solution shall display interchanges and slip ramps as a standard layer that is displayed on the base map.		
UR-34	The ATMS solution shall display Commission roadway facilities and mile markers and all other roadways (State, Local, Interstate, etc.) as standard layers that are displayed on the base map.		
UR-35	As a user zooms in / out of the map, the ATMS map shall display more granular mile marker data (e.g. 10 mile increments when zoomed out and .10 mile increments when zoomed in).		
UR-36	The ATMS solution shall display maintenance sheds and zones as a separate layer on the ATMS map.		
UR-37	When a user mouses over or selects a maintenance shed or maintenance zone, a pop-up box shall display more detailed information about the maintenance shed.		
UR-38	The ATMS solution shall display weigh barrier locations as a separate layer on the base map.		
UR-39	The ATMS solution shall display service plaza locations as a separate layer on the base map.		
UR-40	The ATMS solution shall display Pennsylvania State Police (PSP) station locations and zones as a layer on the base map. When clicking on a PSP icon, the relevant contact information shall be provided.		
UR-41	The ATMS solution shall display tunnel locations as a separate layer on the base map.		
UR-42	The ATMS solution shall display bridge locations as a separate layer on the base map.		
UR-43	When a user mouses over or selects a bridge, a pop-up box shall display bridge log information.		
UR-44	The ATMS solution shall display access gate locations as a separate layer on the base map. Access gate icons shall indicate whether the gate is open or closed.		
UR-45	The ATMS solution shall display toll plazas (including E-ZPass Only) locations as a separate layer on the base map.		
UR-46	The ATMS solution shall display and identify municipal and county boundaries as a separate layer on the base map. When clicking on an municipal/county boundary/icon, the relevant contact information shall be provided.		
UR-47	The ATMS solution shall display and identify Emergency Management Service (EMS) providers as a separate layer on the base map. When clicking on an EMS icon, the relevant contact information shall be provided.		
UR-48	The ATMS solution shall display and identify fire stations as a separate layer on the base map. When clicking on a fire station icon, the relevant contact information shall be provided.		

ID	Requirement Definition	Existing Capability/Conformance	Clarification Comments
UR-49	The ATMS solution shall display and identify hospitals as a separate layer on the base map. When clicking on a hospital icon, the relevant contact information shall be provided.		
UR-50	The ATMS solution shall display and identify PennDOT district boundaries and District Office locations as a separate layer on the ATMS map.		
UR-51	The ATMS solution shall display filtered PennDOT events, within a specified geographic area, as a separate layer on the ATMS map.		
UR-52	The ATMS solution shall display drainage facilities as a separate layer on the ATMS map.		
UR-53	The ATMS solution shall display diversion routes (Plan X) as a separate layer on the ATMS map. Active diversion routes shall be color coded.		
UR-54	The ATMS solution shall display 3rd party speed data (e.g. HERE, INRIX, TomTom) as a separate color coded layer on the ATMS map.		
UR-55	The ATMS solution shall display Waze traffic data as a separate layer on the ATMS map.		
UR-56	The ATMS solution shall display AVL data as a separate layer on the ATMS map.		
UR-57	The ATMS solution shall display Smart Work Zone data as a separate layer or theme on the ATMS map.		
UR-58	The ATMS solution shall display microwave tower locations as a separate layer on the ATMS map.		
UR-59	When a user pans over or selects a microwave tower, a pop-up box shall display the tower name and location (county and road), and the system shall be capable of displaying any other available GIS data.		
UR-60	The ATMS solution shall display weather data (National Weather Service (NWS, Accuweather, etc.) as a separate layer on the ATMS map.		
UR-61	The ATMS solution shall display WAZE weather reports as a separate layer on the ATMS map.		
UR-62	The ATMS solution shall display weather alerts data generated from RWIS sensors as a separate layer on the ATMS map.		
UR-63	The ATMS solution shall display weather radar as a separate layer on the ATMS map.		
UR-64	The ATMS solution shall display different icons for different event types (e.g. accidents, construction, and other planned events).		
UR-65	The ATMS solution shall display RWIS locations as a separate layer on the ATMS map.		
UR-66	The ATMS solution shall provide the ability to toggle between different map types, such as street view or satellite view.		
UR-67	The ATMS solution shall provide the ability for users to hide or display each map layer.		
UR-68	The ATMS solution shall provide the ability to show PennDOT devices and events as a map layer.		
UR-69	To prevent a map layer from hiding another map layer, the ATMS solution shall allow the user to display only one of the following layers at a time: - Speed Data - Diversion Routes - Lane Closures		
UR-70	The ATMS solution map shall display icons that are positioned to indicate the location of each field device.		
UR-71	The device icons shall look like the respective devices as per Commission preference, or another visual differentiation approved by the Commission.		
UR-72	When a user mouses over or selects a device on the map, the complete device details, including device name, status and location shall be displayed.		
UR-73	The ATMS solution shall provide four (4) device status types: standby (outlined in green), active (solid green), warning (solid yellow), and out of service (solid red). • Standby = device is functioning by not currently being used • Active = device is operating normally • Warning = device is usable but has limited functionality and will require maintenance. • Out of Service = device is currently disabled, not usable and has a plan/needs a plan in place for resolving the issue		

ID	Requirement Definition	Existing Capability/Conformance	Clarification Comments
UR-74	The ATMS solution shall display the active incident information, CCTV snapshots and DMS and HAR messages by hovering over a device icon or displaying all active DMS, HAR and CCTV.		
UR-75	The ATMS solution map shall be developed using ESRI mapping tools.		
UR-76	The ATMS solution map shall display GIS data as provided by the Commission.		
UR-77	The ATMS solution shall facilitate displaying information from connected systems.		
UR-78	The ATMS solution shall support dynamic scaling of all objects (menus, text, etc.) on map based on the screen resolution.		
UR-79	The ATMS solution shall display all active events with location data on the map.		
UR-80	The ATMS solution shall generate alerts of upcoming planned events.		
UR-81	The ATMS solution screens shall display the login name of the user who is currently logged into the system.		
UR-82	Using all available traffic data, the ATMS solution shall display traffic speeds on the map that are color-coded based on defined thresholds.		
UR-83	The ATMS solution shall save the following information for a default map view (per user or system administrator configurable): - Zoom Level - Active Layers - Area of focus		
UR-84	The ATMS solution shall provide an interface for the user to list inventory of all field devices.		
UR-85	The ATMS solution shall provide the ability to filter all device lists based on device type.		
UR-86	The ATMS solution shall provide the ability to filter all device lists based on device sub-type.		
UR-87	The ATMS solution shall provide the ability to filter all device lists based on district.		
UR-88	The ATMS solution shall provide the ability to filter all device lists based on device name.		
UR-89	The ATMS solution shall provide the ability to filter all device lists based on Smart Work Zone.		
UR-90	The ATMS solution shall provide the ability to filter all device lists based on direction.		
UR-91	The ATMS solution shall provide the ability to filter all device lists based on error status.		
UR-92	The ATMS solution shall provide standard word processing capabilities within the user interface e.g. spell check, wrap text, keyboard shortcuts (ctrl-c, ctrl-v, etc.), copy and paste, etc.		
UR-93	The ATMS solution browser based user interface shall support the ability to minimize and maximize windows, scaling of windows, using browser tabs, drag and drop of a window, etc.		
INFORMATION MANAGEMENT (IR) REQUIREMENTS			
IR-1	The ATMS solution shall have the ability to backup, purge and restore the database and virtual system images in an automated manner.		
IR-2	for a user defined period of time, no less than 2 years. A permanent archive shall retain data in an external network for a user-defined period of time. Permanent archive shall retain data for a		
IR-3	The ATMS solution shall provide the ability for an ATMS user with sufficient privileges to indicate which users are authorized to access specific information.		
IR-4	Access to information from the CAD system shall be limited to users who are labeled as approved.		
IR-5	No data from the Commonwealth Law Enforcement Assistance Network (CLEAN) shall be included in an xml feed provided by the ATMS solution.		
IR-6	No data from the National Crime Information Center (NCIC) shall be included in an xml feed provided by the ATMS solution.		
IR-7	The Selected Proposer shall either provide source code of their solution or arrange to have each version provided to an escrow account in accordance with RFP Task H-5.		
SYSTEM LIFECYCLE (SLR) REQUIREMENTS			
SLR-1	The ATMS solution shall include testing/development environment for the initial development of the ATMS solution and the development of future enhancements and modules. This environment would be located at the Selected Proposer's site and at their expense.		
SLR-2	The ATMS solution shall include a staging environment for the Commission acceptance testing of all enhancements and modules prior to full implementation		

ID	Requirement Definition	Existing Capability/Conformance	Clarification Comments
SLR-3	The ATMS solution shall include a production environment which will support the real-time operations of the Pennsylvania Turnpike and associated facilities.		
SLR-4	The ATMS solution shall complete a 60-day Operational Testing period prior to user acceptance. During this time, it will be run in parallel with existing software platforms at the TOC.		
SLR-5	The ATMS solution shall support the complete back-up of all databased prior to updating any software versioning.		
SLR-6	The ATMS solution shall include on-site support as described in the RFP Task H-1.		
SLR-7	The ATMS solution shall include 24/7 continental United States-based technical support, with Help Desk staff fluent in the English language both spoken and written.		
SLR-8	The ATMS solution support shall include defined response times based on service levels defined in the Service Level Agreement (Appendix C).		
SLR-9	The ATMS solution shall be not taken offline during scheduled maintenance and must be designed as a redundant system that can have upgrades or changes implemented without unscheduled downtimes.		
SLR-10	The ATMS solution shall not undergo non-critical maintenance without pre-approval from the Commission. No maintenance will be allowed during weather or other critical events as dictated by		
SLR-11	The ATMS solution shall have the capability to be hot refreshed during disaster recovery events.		
SLR-12	The ATMS solution shall allow the Commission to be able to roll back to previous states of the functionality (versions), once a version, upgrade, patch or fix is deployed to production.		
SLR-13	The ATMS solution shall provide tools that can be published to staging servers for testing prior to production.		
SLR-14	The ATMS solution shall provide tools that allow site mirroring and replication.		
SLR-15	The ATMS Contractor shall work with the Commission to establish and shall follow disaster recovery procedures to have the application restored again as soon as possible.		
SLR-16	The ATMS solution shall provide an automated process to reload/recover the ATMS application code and related databases.		
SLR-17	The ATMS solution shall be expandable to allow the addition of modules to support future Commission operations.		
SLR-18	The ATMS shall have the capability to incorporate emerging industry standard technologies through optional modules. Ex. Connected/Autonomous vehicle operations and autonomous device discovery.		
VENDOR HOSTING (VHR) REQUIREMENTS			
VHR-1	The Selected Proposer shall provide all equipment (hardware and software) needed to host the ATMS solution.		
VHR-2	The Selected Proposer shall provide secure (SSL, HTTPS, or similar) access to all levels of users (as defined by the Commission) via the internet.		
VHR-3	The ATMS solution shall use commercially reasonable resources and efforts to maintain adequate internet connection bandwidth and server capacity.		
VHR-4	The Selected Proposer shall provide maintenance of all hosting equipment to maintain performance in accordance with Appendix C – Service Level Agreement.		
VHR-5	The Selected Proposer shall provide hosting services using commercially available security technologies and techniques in accordance with industry best practices and the Commission's security standards, procedures, and requirements including those relating to the prevention/detection of fraud and any other inappropriate use or access of systems and networks.		
VHR-6	The Selected Proposer shall ensure that information security of data processed through hosted services is secure.		
VHR-7	The Selected Proposer shall maintain data security controls meeting applicable law and standards set forth in Cybersecurity Framework, NST, ISO 2700Series(specifically 27001 certification), and BS 10012 (British Standards Institution).		
VHR-8	The Selected Proposer shall notify the Commission immediately if there has been a data security breach in accordance with Appendix C – Service Level Agreement.		

ID	Requirement Definition	Existing Capability/Conformance	Clarification Comments
VHR-9	The Selected Proposer shall ensure that all hosted equipment is maintained in an operational environment that meets industry practices for climate control, fire/security hazard detection, redundancy, electrical needs, and physical security.		
VHR-10	The Selected Proposer shall monitor system error logs and perform preventative maintenance in order to minimize and predict system problems and initiate appropriate action to meet system uptime requirements.		
VHR-11	The Selected Proposer shall completely test and apply patches for any third party software product before release.		
VHR-12	Allowable outages for system maintenance activities shall be governed by the Service Level Agreements found in Appendix C – Service Level Agreement.		
VHR-13	All scheduled system maintenance shall be limited to the hours of 12:00 AM to 5:00 AM, in accordance with Appendix C – Service Level Agreement.		
VHR-14	Any scheduled system maintenance activity must be coordinated with the Commission a minimum of 7 days in advance of the activity and in accordance with Appendix C – Service Level Agreement.		
VHR-15	All activities related to emergency maintenance events shall be governed by the Service Level Agreements found in Appendix C – Service Level Agreement.		
VHR-16	In the event of an emergency maintenance event, the ATMS solution shall rollover to a backup site to ensure continuity of operations.		
VHR-17	The Selected Proposer shall conduct a third party independent security/vulnerability assessment at its own expense on an annual basis and submit the results of such assessment to the Commission.		
VHR-18	The ATMS solution shall undergo third party application and vulnerability security scans on an agreed-upon schedule.		
VHR-19	The Selected Proposer shall comply with Commission directions/resolutions to remediate the results of the security/vulnerability assessment to align with the standards of the Commission.		
VHR-20	The Selected Proposer shall limit logical and physical access to all system components and provide access only to those individuals with a business need for services provided.		
VHR-21	The Selected Proposer shall audit the data center annually through an independent third party auditor.		
VHR-22	Third party audit results shall form part of the Selected Proposer's SSAW 16 (or similar standard) report.		
VHR-23	The Selected Proposer shall make SSAW 16 (or similar standard) report available to the Commission upon reasonable written request.		
VHR-24	With prior written notice (30 days) the Commission shall be permitted to conduct a structured walk-through of the Selected Proposer's data center to review the control environment and security practices relevant to the ATMS solution data.		
VHR-25	All records discussed pursuant to any structured walkthrough of the data center shall be treated as Confidential Information of the Selected Proposer.		
VHR-26	The Selected Proposer will be solely responsible for all data storage required to meet ATMS solution requirements.		
VHR-27	The Commission may choose to store certain data and require the Selected Proposer to link to or interface with that data at the Commission's sole discretion.		
VHR-28	The Selected Proposer shall employ industry best practice disaster recovery and resiliency procedures to assist in preventing interruption in the use of the system.		
VHR-29	The Selected Proposer shall develop and employ problem resolution and support procedures to provide a means to classify problems as to criticality and impact and with appropriate resolution procedures and escalation process for each classification of problem.		
VHR-30	The Selected Proposer shall utilize a secured backup solution to prevent loss of data.		
VHR-31	The Selected Proposer shall back up all system data daily.		
VHR-32	The Selected Proposer shall store backup media offsite in an all-hazards protective storage facility.		
VHR-33	All back-up data and media shall be capable of encryption.		

APPENDIX I

DEVICE DRIVER MATRIX

APPENDIX I
Device Driver Matrix

Instructions: The *Device Driver Matrix* form contains a list of PTC's existing devices. Please complete the form by using "Yes" or "No" to indicate whether a new device driver will need to be developed. If a Device Driver does not need to be developed, identify a client using the current version of that Device Driver and provide contact information for that client. List all additional (already developed) Device Drivers that are <u>included</u> as part of the proposed software solution, and available to the Commission at no additional cost, on the "Additional Device Driver" tables.

PA. Turnpike Commission Devices Vendor's Existing Device Driver Matrix					
Device Manufacture	**Model**	**Driver Needs to Be Developed**	**Client Utilizing the Driver (If No)**	**Client Contact Information**	**Comments**
DMS					
Daktronics	VF-2020-54x180-34RGB				
Daktronics	VF-2020-96x288-20RGB				
Daktronics	VF-2120-27x110-66A				
Daktronics	VF-2420-27x60-46A				
SES America	M6000				
FDS	Fiber Optic 3 line 18 character rear access				
DMS Controller					
Daktronics	VFC-3000 Firmware: 1.8.3896.1; 1.8.3936.2 1.8.3936.28; 1.8.3896.7 1.9.4588.11; 1.9.4588.15 1.9.4588.16; 1.9.4588.19 1.9.4588.22; 1.9.4588.26 1.9.4588.28; 1.9.4588.32				
SES America	SCU-6 Firmware: 20100713-v2.36 (current) 20110222-v2.48 (future)				
FDS	RK60				
FDS	UC960				
CCTV Camera					
Bosch	18X Enviro Dome				
Bosch	25X Enviro Dome				

Device Manufacture	Model	Driver Needs to Be Developed	Client Utilizing the Driver (If No)	Client Contact Information	Comments
Bosch	Auto Dome VG4-A-9543				
Bosch	Auto Dome VG5-600 series				
Bosch	VG5-623-ECS				
Bosch	VG5-613-ECS				
COHU	3925-3800 series				
COHU	3925-38-PEND				
COHU	iDome 3924-5200				
CCTV Encoders					
Bosch	VIP X1600 XF Firmware: 43500400				
Bosch	VIP X1 XF IVA Firmware: 24500454				
Bosch	VideoJet x10 Firmware: 56500410				
Bosch	VIP X1 Firmware: 04500252				
HAR Transmitters					
HIS	DCC3 Version: 0.5.21; 0.5.22 0.5.24; 0.5.25 0.5.26				
HAR Beacons					
HIS	RC200A				
HIS	RC200				
RWIS					
Vaisala (SSI)	RWS 110 SSI Road Weather Station LX LX version: 1.34; 1.35; 1.37; 1.38				

Instructions:

Populate the table below with additional Device Drivers that are included as part of the Proposed Solution.

Additional Drivers Included as part of the Proposed Solution					
Device Manufacture	**Model**	**Device Type (CCTV, DMS, HAR, etc.)**	**Client Utilizing the Driver**	**Client Contact Information**	**Comments**

Additional Drivers Included as part of the Proposed Solution					
Device Manufacture	**Model**	**Device Type (CCTV, DMS, HAR, etc.)**	**Client Utilizing the Driver**	**Client Contact Information**	**Comments**

Additional Drivers Included as part of the Proposed Solution					
Device Manufacture	**Model**	**Device Type (CCTV, DMS, HAR, etc.)**	**Client Utilizing the Driver**	**Client Contact Information**	**Comments**

Additional Drivers Included as part of the Proposed Solution					
Device Manufacture	**Model**	**Device Type (CCTV, DMS, HAR, etc.)**	**Client Utilizing the Driver**	**Client Contact Information**	**Comments**

APPENDIX J

PROPOSED ATMS SOLUTION TECHNICAL SUMMARY

APPENDIX J

PROPOSED ATMS SOLUTION TECHNICAL SUMMARY

Instructions:

The ATMS Solution Technical Summary Matrix form contains a list of technical summary questions for the proposed solution(s). Please complete the form by providing a brief answer to each item as it relates to the proposed ATMS solution.

ATMS Technical Summary		
Technical Summary Question	**Summary of Proposed**	**Comments**
1. What is your proposed Vendor Software (core ATMS package)?		
2. If a COTS product is proposed - what is your software customization approach? Do you propose to customize inside or outside of the COTS package?		
3. What is the **estimated** system size based on categories below:		
a.) Number of estimated servers?*		
b.) Number of estimated database tables?		
c.) Number of programs?		
d.) Number of estimated application services and interfaces?		
4. User Interface & Program Language		
5. Operating System		
6. Database Type (e.g. MS SQL)		
7. Middleware		
8. Other software (items not listed under questions 5, 6, 7)		
9. Host Hardware Platform		
10. Support Tools		

* Please fill out the ATMS Proposed Server Matrix on the next page. Information on the first line is provided as an example.

ATMS Proposed Server Matrix – Hosted Solution						
Processor Speed	**Number of Processors**	**Memory**	**Estimated Storage Needed**	**Operating System**	**Purpose (DB, App, etc.)**	**Server Quantity**
2.9 GHz	4	16GB	500GB	Windows 2012 R2	Database	2

APPENDIX K

PROJECT DELIVERABLE SCHEDULE FORM

Appendix K
Project Deliverable Schedule Form

Proposers must provide all completion dates below in accordance with their proposed solution. Upon Commission acceptance and approval, the completion dates in this schedule will become the official Project Deliverable Schedule Due dates, by which the Commission will expect full completion and acceptance of each identified Task and any related subtasks.

Proposers will provide completion dates based on the assumption that an executed Contract and Notice to Proceed are in place by **July 1, 2017**. Upon mutual consent, the Commission and Selected Proposer may change any of the delivery dates below in accordance with the Contract.

Deliverable Schedule

Deliverables	Completion Date	Comments
A-1: ATMS Project Management Plan		
B-1: Existing Conditions Report		
B-2: Business Requirements		
B-3: Detailed Business Solution Design		
C-1: User Interface Design		
C-2: Detailed Solution Design Document		
C-3: Network Topology Report		
D-1: Procurement Plan		
D-2: Implementation Plan		
D-3: Test Plan		
D-4: Training Plan		
E-1: Deployment – Phase 1, Part 1		
E-2: Deployment – Phase 1, Part 2		
F-1: High Level Solution Design – Phase 2		
F-2: Detailed Solution Design – Phase 2		
F-3: Training and Test Plans – Phase 2		
F-4: Deployment – Phase 2, Part 1		
F-5: Deployment – Phase 2, Part 2		
H-2: User and Support Documentation – Deployment - Phase1		
H-2: User and Support Documentation – Deployment - Phase 2		
I-1: Turnover Plan		

The following Deliverables shall not be assigned a Completion Date for the reasons described below:

- **D-5: ATMS COTS Software License(s):** The completion of this deliverable shall be defined by a Licensing Agreement.
- **G: System Enhancements:** Any deliverable resulting from this task shall be negotiated at the time of assignment.
- **H-1: On-Site Support:** This deliverable shall begin upon Completion of E-2: Deployment – Phase 1, Part 2 (i.e. Acceptance of Deployment - Phase 1) and shall be completed as defined in the RFP.

- **H-3: Routine Maintenance and Support:** This deliverable shall begin upon Completion of E-2: Deployment – Phase 1, Part 2 (i.e. Acceptance of Deployment – Phase 1) and shall continue until the end of the contract term (See RFP for additional details).

- **H-4: Hosting Services**: This deliverable shall begin upon Completion of E-2: Deployment – Phase 1, Part 2 (i.e. Acceptance of Deployment – Phase 1) and shall continue through the end of the contract term (See RFP for additional details).

- **H-5: Escrow Agreement:**
  This deliverable shall be completed in accordance with the RFP.

- **I-2: Service Turnover**
  This deliverable shall be completed in accordance with the RFP.

APPENDIX L

CONCEPT OF OPERATIONS

TABLE OF CONTENTS

1.0 PURPOSE OF THE DOCUMENT 3
2.0 CURRENT OPERATIONAL DESCRIPTION 3
3.0 HIGH-LEVEL SOLUTION NEEDS 6
4.0 OPERATIONAL USE CASES 7
5.0 SUMMARY OF OPERATIONAL USE CASES BY PHASE 86

1.0 PURPOSE OF THE DOCUMENT

The purpose of this document is to describe the Concept of Operations (ConOps) for the Pennsylvania Turnpike Commission's (Commission) Advanced Traffic Management System (ATMS) Solution. The ConOps describes how the system will be used from the operator's, maintainer's, and manager's perspectives to manage traffic throughout the Turnpike system.

This document is further expanded upon in the ATMS Software Solution Requirements document, which describe solution aspects in detail. It is anticipated that these documents will be greatly expanded into sample user interfaces, test plans, and other design documents by the Selected Proposer.

The following are included in this document:

1. Current Operational Description
2. High-Level Solution Needs
3. Operational Use-Cases
4. Summary of Operational Use-Cases by Deployment Phase

2.0 CURRENT OPERATIONAL DESCRIPTION

The primary responsibility of the TOC is to manage traffic related incidents along the Pennsylvania Turnpike, as well as monitor and support other agencies along adjacent roadways (PennDOT, NJDOT, etc.). A major component of this responsibility is information dissemination to the traveling public, media, first responders, PEMA, and adjacent transportation agencies.

The TOC serves as the central dispatch center where reports of incidents or problems along the Turnpike are received, and where dispatch of Pennsylvania State Police (PSP) Troop T personnel and PTC maintenance personnel occurs in response to these events. In addition, the TOC dispatches private service providers contracted by the PTC to respond to incidents along the Turnpike. The TOC also notifies local 911 centers when there is a need for fire and/or emergency medical service (EMS) response due to these events thus coordinating every aspect of the event response. The TOC serves as the nerve center of the PTC's ITS, incident management, and external stakeholder notification systems.

Facility
The TOC is located at the East end of the Turnpike Industrial Park (TIP) Building in Highspire, PA. The TOC facility covers approximately 13,000 square-feet and consists of three (3) distinct spaces – TOC Control Room, TOC Staff Areas, and Operational Support Areas, each with multiple designated areas.

The Control Room oversees all incident management and emergency response activities, including but not limited to: call taking, dispatch of incident responders, incident and traffic management, and ITS subsystem control and monitoring.

TOC staff areas within the TOC facility are used primarily for non-operational activities and include:

- War Room/Training Room
- Director's Office
- Common Office Areas

Staffing

The TOC is staffed 24 hours a day, seven (7) days a week with a combination of management and operations staff. The following positions have operational responsibilities related directly to the TOC:

- Director of Traffic Engineering and Operations
- Manager of Operations Center
- TOC Duty Officers
- TOC Radio Operators 1 and 2
- Manager of Traffic Operations
- Senior Traffic Operations Project Manager
- Traffic Operations Project Manager
- Traffic Incident Management Coordinator
- Network Control Manager
- Safety Advisor
- Pennsylvania State Police Troop T
- Maintenance Utility Worker
- Authorized Service Personnel

Infrastructure/Equipment

ITS devices are the devices used to assist in incident and traffic management. Some of these devices are controlled by a single system and some with multiple systems. The TOC operates the following devices (and quantities):

- Dynamic Message Signs (DMS) (87)
- Closed Circuit Television (CCTV) Cameras (65)
- Roadway Weather Information System (RWIS) (22)
- Highway Advisory Radio (HAR) (37)

PTC currently utilizes multiple communication mediums for general business data, ITS data, and radio communications. These communicate on systems are managed by the PTC Information Technology (IT) department and include fiber, microwave backbone, cellular, and other wireless technologies.

ITS, Operational and Management Systems

The TOC uses multiple systems to manage traffic and respond to incidents. Not all of these systems will require integration into the ATMS solution, but are provided for Proposer information:

- ITS Systems
  - Truck Rollover Warning System (stand-alone)
  - Fog Warning System (automated by MIST)
  - Smart Work Zones (contractor provided)

- Operational System
  - iPeMS Map
  - Web Tech Fleet Center - AVL
  - Commlog Recorder
  - EMNet
  - Emergency Notification System (ENS)
  - Computer Aided Dispatch System (CADS)
- ITS Management Systems
  - Management Information System for Transportation (MIST)

- Video Management – Vidsys
- Video Wall – BARCO
- DMS Control – Vanguard (Daktronics)
- HAR Control – Platinum

- ITS/Event Data
  - WAZE
  - 3rd Party Traffic probe data (e.g. HERE, INRIX, TomTom)
  - Accuweather

TOC Operations

The primary responsibilities of the TOC are to manage traffic, incidents, and special events (work zones, closures, etc.) along the Turnpike, and provide roadway information to the public, media, adjacent public agencies, and law enforcement agencies. The following highlights the primary focus areas:

- Incident Management – As referenced in the *Emergency Transportation Operations Plan (ETOP) June 2015*, the Turnpike Commission has preliminarily adopted the national TIM timeline.
- Roadway Weather Conditions – An important function of the TOC is to disseminate information to Turnpike motorists about hazardous roadway and driving conditions attributed to weather. The TOC aides in the preparation and response to weather events by forwarding locations and forecasts to the PTC maintenance staff in the field.
- Data Collection –The majority of data collected by the TOC is limited to operator voice recordings of phone and radio transmissions through the commlog recorder, and all CADS incident information is logged and archived. Currently, the PTC has contracted HERE (Nokia) in coordination with the Iteris iPeMS map to collect third party probe data. This information is currently being archived. RWIS and weather data from third parties, such as Accuweather, is also collected and archived.
- Traveler Information – ENS plays an important role in providing traveler information. Data inputted into ENS is fed into the PTC website Traveler Conditions Map, TRIP Talk, PennDOT 511, Service Plaza travel boards, and the Preferred Traveler System. Duty Officers input information through the web-based interface. ENS also receives camera images, CCTV status, and DMS status (including presently displayed messages), and RWIS data from MIST. Currently, InfoLogistics Inc. manages the majority of traveler information services and systems provided by the PTC.

Pre-Trip Traveler Information is available through the following outlets:

- PTC Website – Travel Conditions Map
- Preferred Traveler
- Local Radio and Television Stations

En-Route Traveler Information is available through the following outlets:

- DMS
- HAR
- TBIS (Travel Board Information System)
- TRIP (Turnpike Roadway Information Program) and TRIP Talk Mobile App
- Waze
- PA511

Maintenance of TOC Systems
Currently the Pennsylvania Turnpike, through their IT department, employs dedicated 24/7 staff (Network Control) stationed within the TOC. The Network Control group has one (1) Manager and five (5) Network Control Operators. The Network Control Operational Area consists of two (2) operator consoles and two (2) cubicles. The area houses monitoring systems for the TOC. IT also has contracted with TransCore under a service contract for internal and field systems. Network Control notifies TransCore of ITS device failures and related communication failures. The IT department tracks networking maintenance tickets through ServiceNow and Orion software platforms.

3.0 HIGH-LEVEL SOLUTION NEEDS

The operational need identified is to provide a traffic management and emergency response system on a system-wide basis. The new system will provide the ability to control all existing and planned ITS devices. A key element of the new system is the ability to aggregate all the disparate field data into a central database. The ATMS software operational needs were identified as follows:

- Integrate existing and planned "stand alone" ITS systems into one system to monitor and control the ITS devices from a central location
- Predicate device and event operations on an intuitive Graphical User Interface (GUI) that utilizes a map to display existing and planned ITS devices (All operator functions handled through GUI)
- Capability for real-time traffic, incident/event, and construction information to be displayed by current and planned traveler information systems
- Capability to activate, control, and schedule ITS devices based on operational needs
- Capability for real-time communication/notification of all stakeholders
- Automated and on-demand reporting tools
- Minimal downtime for purposes of scheduled maintenance and fail-over and redundant capability that ensures 24-hour by 7-day-per-week functionality
- Hardware based on existing infrastructure, requirements, and environment
- Developed and operated using Microsoft tools and includes standard computing security features
- State-of-the-art database with provisions for simple component upgrades, which is also expandable and scalable
- Real-time and archived ITS maintenance management and information tools, including asset management
- Support multiple products and demonstrate compliance with NTCIP
- Extensive DMS, CCTV, traffic detection, travel time, event management, scheduled action, RWIS, HAR, and CAD/AVL features. Refer to Operational Use Cases for prioritization (phasing) of individual features.

These needs were organized into eight (8) categories for the purpose of developing specific use cases:

- System Administration
- Incident and Traffic Management
- Device Control and Monitoring
- Construction and Maintenance Management
- Asset Management
- Reporting
- Weather Event Management
- Facility Management

The Use Cases described in the sections below were developed to provide the Proposer with a general understanding of the desired operational concept. While these Use Cases provide context for the Functional Requirements provided in Appendix M - Solution Requirements, the Proposer may propose alternative processes that meet the intent of the Use Cases and Functional Requirements that may benefit or simplify the solution. However, the acceptance of these alternatives will be determined at the sole discretion of the Commission.

4.0 OPERATIONAL USE CASES

The following 55 Operational Use Cases were developed to provide specific user-perspectives corresponding to operational needs and to provide the Proposer with a general understanding of the desired operational concept. While these Use Cases provide context for the Functional Requirements provided in Appendix M - Solution Requirements, the Proposer may propose alternative processes that meet the intent of the Use Cases and Functional Requirements that may benefit or simplify the solution. The Commission has identified three (3) instances for alternatives (denoted below), where the potential for simplification had been anticipated. The acceptance of any proposed alternative will be determined at the sole discretion of the Commission.

- UC1a - Creating User Groups
- UC1b - Add New Users
- UC1c - Edit User
- UC1d - Disable User
- UC1e - Remove User
- UC1f - User Messaging
- UC2a - Add New Device
- UC2b - Edit Device
- UC2c - Disable Device
- UC2d - Remove Device
- UC2e - DMS Message Management
- UC3a - Create/Edit Recommended Response Plan Settings
- UC3b - Manage Contact List
- UC3c - Map Management
- UC3d - Systems Settings Management
- UC4a - Traffic Flow Incident Detection
- UC4b - Video Incident Detection
- UC4c - Waze Incident Detection
- UC4d - RCRS Incident Detection
- UC5a - Event Creation
- UC5b - Recommended Response Plan
- UC5c - Custom Response Plan
- UC5d - Activate Diversion Route
- UC5e - Notifications
- UC5f - Linking Events
- UC5g - Event Management and Closure
- UC5h - Backlog Calculator
- UC5i - Planned Event Creation and Activation
- UC5j - Interface Failure Resolution
- UC6a - Traveler Information

- UC6b - Center-to-Center/PennDOT Sharing
- UC7 - Vehicle Tracking (AVL)
- UC8a - CCTV Control and Sharing
- UC9a - DMS Message Creation
- UC9b - DMS Activation
- UC10 - Travel Time Message Activation
- UC11a - HAR Message Creation
- UC11b - HAR Activation
- UC11c - HAR Message Creation – Not Integrated (Alternative to UC10a)
- UC11d - HAR Activation – Not Integrated (Alternative to UC10b)
- UC12 - Fog Detection System
- UC13a - Smart Work Zone
- UC13b - Smart Work Zone Alerting (Alternative to UC13)
- UC14 - Connected Vehicles
- UC15a - Schedule Construction and Maintenance Lane Closure Events
- UC15b - Track/Manage Construction and Maintenance Lane Closure Events
- UC16 - Lane Closure Conflict Monitor
- UC17 - Device Failure Alert and Service Ticketing
- UC18 - Device Failure Tracking
- UC19 - Asset Database
- UC20a - Performance Measure Reports
- UC20b - System Data Reports
- UC21 - Weather Alerts and Event Creation
- UC22 - Gate Control and Access Monitor
- UC23 - Truck Parking System Monitor

The following list provides Event type terminology and descriptions that are mentioned throughout the Use Cases. These descriptions are intended to provide additional context to the use cases.

Event Terminology and Descriptions

CADS Event: An unplanned event that is generated in the ATMS via the CADS/ATMS interface. These Events are incident related Events. The CADS Event is used to manage an incident. Unplanned Plan X's are also considered to be CADS events as a CADS incident is generated for an Unplanned Plan X.

ATMS Event: An unplanned event that is generated from within the ATMS. These Events are typically non-incident related Events. These Events can be used for general non-incident related purposes. i.e. Amber, Silver, Blue, and BOLO (Be On the Look Out) Alerts. In the case of a CADS interface failure, ATMS Events can be used to manage incident related events until the CADS interface returns.

Planned Event: A planned or scheduled event that is generated from within the ATMS that is schedulable, such as a Special Event or repeated device activations. The Event itself has a user scheduled duration and all device activations/deactivations within the Event can be scheduled with a single duration or on a Time-Of-Day (TOD) schedule. A Planned Event can be used for scheduled activations of PSA messages and Travel Time messages. Planned Events can be saved for reuse or used as a template.

Construction and Maintenance (C&M) Lane Closure Event: A planned event that is generated from the lane closure scheduling application/website. A user can also create a C&M Event if the Event was not scheduled properly by maintenance or construction personnel. After the C&M Event has been entered into the ATMS, the user can pre-plan the Event by populating the Event with devices and messages. When the Lane Closure is activated on a call from the lane closure owner, the devices will activate automatically if programmed to do so. C&M Events are monitored by a Lane Closure conflict monitor that will prevent the scheduling of lane closures in conflict or within restricted periods of time. Planned Plan X's are considered a C&M Event because they are almost always construction related.

Weather Event: An unplanned event that is generated by a user or triggered by a weather forecast or predictive weather data. A Weather Event can be created and managed similar to a CADS Event, however it is configured to export event data to external systems and make automatic notifications to maintenance personnel.

Linked Events: CADS and ATMS Events can be linked to be managed as a single Event. This occurs when two or more Events are related and are within the same vicinity. Event data fields are maintained separately in tabbed screens (or similar) but ITS devices are managed independently for all linked events in a common section of the Event window. Linking events can also be used to combine duplicate Events. Duplicate Events will occur if the CADS interface fails and an Event was created in ATMS to act in place of a CADS Event that was not generated due to the failure.

Recommended Response Plan: A logically recommended response plan made up of ITS devices, prepopulated messages, and notification list that are automatically recommended by the ATMS based on Event attributes such as milepost, direction of travel, lanes closed, etc. The Recommended Response Plan can be generated for any Event type by clicking the "Generate Response Plan" button that will be shown in all Event type screens. At a minimum, an event location will be required to generate a Recommended Response Plan. The recommended response is intended to be used to facilitate a quick, generic response to events utilizing information that has already been populated in an Event.

Use Case ID:	**UC1a**
Use Case Category:	System Administration – User Setup
Deployment:	Phase 1
Use Case Name:	**Creating User Groups**
Description:	The ATMS administrator has the ability to create user groups and assign access and action privileges to each user group.
Preconditions:	• An ATMS administrator is logged into the ATMS
Normal Course:	**1a.0: The ATMS administrator creates a new user group in the ATMS.** a. The ATMS administrator navigates to the system administration section of the ATMS. b. The ATMS administrator selects the "User Groups" section. c. The "User Group" screen appears. This screen lists the current user groups and the privileges assigned to each group. The ATMS administrator clicks on the "Add New" button. d. The ATMS administrator enters a new user group name. e. For each of the major sections of the ATMS, the ATMS administrator assigns create, read, edit or delete privileges to the new user group. f. The ATMS administrator clicks on the "Save" button. g. The ATMS must confirm the change. h. The new user group appears in the list.
Notes:	

Use Case ID:	**UC1b**
Use Case Category:	System Administration – User Setup
Deployment	Phase 1
Use Case Name:	**Add New Users**
Description:	The ATMS administrator has the ability to add new users to the ATMS.
Preconditions:	• An ATMS administrator is logged into the ATMS
Normal Course:	**1b.0: The ATMS administrator adds a new user to the ATMS.** a. The ATMS administrator navigates to the system administration section of the ATMS. b. The ATMS administrator selects the "User" section. a. The "User" screen appears. This screen displays a list of current users and any other relevant user details. c. The ATMS administrator clicks on the "Add New" button. d. The ATMS administrator enters the requested data. e. The ATMS administrator assigns the new user to a user group. f. The ATMS administrator clicks on the "Save" button. g. The ATMS must confirm the change. h. The New user appears in the list of users.
Notes:	The ATMS must be integrated with active directory for user login.

Use Case ID:	**UC1c**
Use Case Category:	System Administration – User Setup
Deployment	Phase 1
Use Case Name:	**Edit User**
Description:	The ATMS administrator has the ability to edit information (e.g. user name changes, user privileges, etc.) in the ATMS.
Preconditions:	• An ATMS administrator is logged into the ATMS.
Normal Course:	**1c.0: The ATMS administrator edits user information.** a. The ATMS administrator navigates to the system administration section of the ATMS. b. The ATMS administrator selects the "User" section. c. The "User" screen appears. This screen displays a list of current users and their user group assignment(s). d. The ATMS administrator selects a user. e. The ATMS administrator selects the "Edit" button. f. The ATMS administrator edits the information about the selected user such as name, contact information, and user group. g. The ATMS administrator clicks on the "Save" button. h. The ATMS must confirm the change. **1c.1: The ATMS administrator edits the user information for multiple users (branch at step f).** a. The ATMS administrator selects another user to update. b. Return to step e. **1c.2: The ATMS administrator edits the user privileges of multiple users simultaneously (branch at step c). Note: All selected users are being assigned to the same user group.** a. The ATMS administrator selects multiple users. b. Return to step e.
Notes:	

Use Case ID:	**UC1d**
Use Case Category:	System Administration – User Setup
Deployment:	Phase 1
Use Case Name:	**Disable User**
Description:	The ATMS administrator has the ability to disable users from accessing the ATMS.
Preconditions:	• An ATMS administrator is logged into the ATMS. • ATMS users have been added to the system.
Normal Course:	**1d.0: The ATMS administrator disables a user's access to the ATMS.** a. The ATMS administrator navigates to the system administration section of the ATMS. b. The ATMS administrator selects the "User" section. c. The "User" screen appears. This screen should display a list of current users and any other relevant user details. d. The ATMS administrator checks the "Disable" box next to the Operator's name. e. The ATMS administrator clicks on the "Save" button. f. The ATMS must confirm that the user has been disabled.
Notes:	

Use Case ID:	**UC1e**
Use Case Category:	System Administration – User Setup
Deployment	Phase 1
Use Case Name:	**Remove (Decommission) User**
Description:	The ATMS administrator has the ability to remove users from the ATMS.
Preconditions:	• An ATMS administrator is logged into the ATMS. • ATMS users have been added to the system.
Normal Course:	**1e.0: The ATMS administrator removes (decommissions) a user from the ATMS.** a. The ATMS administrator navigates to the system administration section of the ATMS. b. The ATMS administrator selects the "User" section. c. The "User" screen appears. This screen should display a list of current users and any other relevant user details. d. The ATMS administrator checks the "Remove" ("Decommission")box next to the Operator's name. e. The ATMS administrator clicks on the "Save" button. f. The ATMS must confirm that the user has been removed (decommissioned).
Notes:	The users can be decommissioned if complete removal of the user will impact reporting or other system functions. Decommissioning will have the same effect as removing the user from the ATMS.

Use Case ID:	**UC1f**
Use Case Category:	System Administration – User Setup
Deployment:	Phase 1
Use Case Name:	**User Messaging**
Description:	The ATMS administrator has the ability to send email messages to all users, specific users, or user groups.
Preconditions:	• An ATMS administrator is logged into the ATMS • ATMS users have been added to the system.
Normal Course:	**1f.0: The ATMS administrator sends a message to ATMS users.** a. The ATMS administrator navigates to the system administration section of the ATMS. b. The ATMS administrator selects to send a message to users. b. The ATMS displays a list of current users and any other relevant user details (active, disabled, etc.). c. The ATMS administrator selects individual users, multiple users individually, multiple users by selecting a user group, or all users. d. The ATMS administrator composes an email message. e. The ATMS administrator clicks to send the message. f. The ATMS sends the email message to the email addresses of all of the selected users. g. The ATMS logs and saves the sent message and confirms that the message has been sent.
Notes:	The ATMS must be integrated with the PTC email server.

Use Case ID:	**UC2a**
Use Case Category:	System Administration – Device Setup
Deployment	Phase 1
Use Case Name:	**Add New Device**
Description:	A user adds new equipment to the ATMS.
Preconditions:	• The ATMS user with sufficient privileges is logged into the ATMS. • The new ATMS device is discoverable by the ATMS.
Normal Course:	**2a.0: A user adds a new field device to the ATMS.** a. The user opens the device section of the ATMS. b. The user clicks the "Add New" button. c. The user selects a device category (CCTV, DMS, HAR, etc.). d. The user enters a device ID name. e. The user enters the device attributes such as: manufacture, model, serial numbers, firmware version, etc. Required information fields are denoted and must be populated to add a device. f. The user enters the latitude and longitude of the device location. g. The user enters communications parameters. h. The user enters information on peripheral IT equipment details: router ID, network device IP address, etc. i. The user must choose that the device will be added to the map. Otherwise, a user can add the device to the map later. • If yes, a preview of the device will be displayed on the map. The user can edit the device icon location on the map by click/drag/drop. This action does not change the actual device latitude/longitude coordinates. • If no, the device will not be displayed on the map at this time, but will be shown in a device list view for future editing. j. The user must choose that the device data will be utilized by the system (if applicable). • If yes, the ATMS will utilize the device data in related algorithms. This setting can be changed at a later time. • If no, the ATMS will not utilize the device data in related algorithms. This setting can be changed at a later time. k. The user clicks on the "Save" button. l. If required information is missing, the ATMS highlights the missing information and directs the user to add the required information. m. The ATMS confirms that the new device has been saved.

	2a.1: A user adds a device by copying an existing device a. The user opens the device section of the ATMS. b. The user clicks the "Copy Device" button. c. The user selects the device to copy. d. The ATMS creates a new device and copies all fields except for the fields that must be unique to the new device i.e. Device ID, Lat/Long, communication parameters etc. e. The user populates the required fields and edits other as necessary. f. Branch to 2a.0i. **2a.2: A user adds a phantom device (external agency device)** a. The user opens the device section of the ATMS. b. The user clicks the "Add New" button. c. The user selects a device category (CCTV, DMS, HAR, etc.). d. The user selects that the device is a phantom device. e. The user enters a device ID name. f. The user enters the device attributes such as: manufacture, model, serial numbers, firmware version, etc. Required information fields are denoted and must be populated to add a device. g. The user enters the latitude and longitude of the device location. h. The user must choose that the device will be added to the map. Otherwise, a user can add the device to the map later. • If yes, a preview of the device will be displayed on the map. The user can edit the device icon location on the map by click/drag/drop. This action does not change the actual device latitude/longitude coordinates. • If no, the device will not be displayed on the map at this time, but will be shown in a device list view for future editing. i. The user clicks on the "Save" button. j. If required information is missing, the ATMS highlights the missing information and directs the user to add the required information. k. The ATMS confirms that the new device has been saved.
Notes:	Devices should be set up in a single step. There should be no need for the user to create a "comm. channel," or any other preliminary steps. See UC3c - Map Management for managing device icons and map properties. HAR Devices shall have an attribute field for noting the DMS devices that are within the transmission range for the subject HAR transmitter.

Use Case ID:	**UC2b**

Use Case Category:	System Administration – Device Setup
Deployment	Phase 1
Use Case Name:	**Edit Device**
Description:	A user changes identification and characteristic information regarding any device. This includes, but is not limited to, device location, serial number, brand, make, type of device, map visibility, and toggle device data utilization.
Preconditions:	• The ATMS user with sufficient privileges is logged into the ATMS. • The ATMS device has been setup in the ATMS.
Normal Course:	**2b.0: The user changes identification and characteristic information regarding a device.** a. The user opens the device section of the ATMS. b. The user selects a device. c. The user views the current settings. d. The user clicks on the “Edit” button. e. The user changes the device information. f. The user clicks on the “Save” button. g. The ATMS confirms that the changes have been saved.
Notes:	See UC3c - Map Management for managing device icons and map properties.

Use Case ID:	**UC2c**
Use Case Category:	System Administration – Device Setup
Deployment	Phase 1
Use Case Name:	**Disable Device**
Description:	A user disables a device in the ATMS. The disabled device would remain viewable or editable within the ATMS, however it cannot be activated or added to an Event. A disabled device will not be recommended in Recommended Response Plans.
Preconditions:	• The ATMS user with sufficient privileges is logged into the ATMS. • The ATMS device has been setup in the ATMS.
Normal Course:	**2c.0: The user disables a device in the ATMS.** a. The user opens the device section of the ATMS. b. The user selects a device. c. The user clicks on the “Disable” button. d. The user clicks on the “Save” button. e. The ATMS confirms that the device has been disabled and saved.
Notes:	

Use Case ID:	**UC2d**
Use Case Category:	System Administration – Device Setup
Deployment:	Phase 1
Use Case Name:	**Remove (Decommission) Device**
Description:	A user removes devices from the ATMS.
Preconditions:	• The ATMS user with sufficient privileges is logged into the ATMS. • The ATMS device has been setup in the ATMS.
Normal Course:	**2d.0: The user removes (decommissions) a device from the ATMS.** a. The user opens the device section of the ATMS. b. The user selects a device. c. The user clicks on the "Remove" ("Decommission") button. d. The user clicks on the "Save" button. e. The ATMS prompts the user to confirm the removal (decommissioning) of the device. f. If yes, the ATMS confirms that the device has been removed and saved.
Notes:	A device can be decommissioned if complete removal of the device will impact reporting or other system functions. Decommissioning will have the same effect as removing the device from the ATMS.

Use Case ID:	**UC2e**
Use Case Category:	System Administration – Device Setup
Deployment:	Phase 1
Use Case Name:	**DMS Message Management**
Description:	An ATMS user can manage and organize the DMS message library including available graphics. Message templates can be created, edited, and removed.
Preconditions:	• The user with sufficient privileges is logged into the ATMS. • DMS messages have been populated in the ATMS.
Normal Course:	**2e.0: The user manages the DMS Library.** a. The user navigates to the system administration section of the ATMS. b. The user navigates to the Manage DMS Message Library section. c. From this screen the user can perform the following actions: • Organize existing DMS messages into folders and subfolders. • Create new messages in a selected folder or subfolder. • Edit/Delete existing messages. • Edit message priority levels. • Copy existing messages and place them in a new folder or subfolder. • Create/Remove folders and subfolders. d. Any changes are saved and confirmed by the ATMS.
Notes:	

Use Case ID:	**UC3a**
Use Case Category:	System Administration – System Management
Deployment:	Phase 1
Use Case Name:	**Create/Edit Recommended Response Plan Settings**
Description:	An ATMS user creates or edits the business rules for recommended response plans. The business rules allow the system to determine recommended devices to activate (DMS, HAR, etc.) and recommended message based on the Event information. The business rules first identify recommended devices by comparing the Event milepost location to a configurable milepost range look up table. Each milepost range has a respective configurable radius, combined with the travel direction of the Event, which is used to determine the devices to recommend. Off system devices (PennDOT or PTC pre-entry) will be recommended if the off system route interchange meets the Turnpike system within the configurable radius. The business rules then identify recommended messages to display on the recommended devices by comparing the populated Event information with a configurable look up table. If the Event information matches a set of the parameters (incident type, lanes closed, etc.) in the look up table, the associated generic message is selected as the recommended message. The ATMS then populates the recommended response plan with the devices and messages determined through the configurable business rules look up tables. The Diversion Route (Plan X) response plans are also defined in the recommended response plan settings. Each predetermined Diversion Route (Plan X) will have selected DMS, HAR, etc. with selected messages, and preselected notifications.
Preconditions:	• An ATMS user with sufficient privileges is logged into the ATMS.
Normal Course:	**3a.0: The user edits the settings for recommended response plans.** a. The user opens the recommended response plan settings section of the system. b. Within this section, there are two separate sections of the response plan settings: "Recommended Response Message Settings" and "Recommended Response Device Settings". c. Editing Recommended Response Message Settings: • Within the section are the settings to define the rules for the recommended message. i. The rules will be dependent on specific data fields. (i.e. incident type, direction of travel, lane(s) closed, current backlog, etc.).

	ii. A rule will have a DMS message selection for each sign size category or the system will be able to automatically scale the messages to any sign size. iii. The message will have the capability to populate fields with specific Event data within a message. i.e. "Right Lane Closed at Milepost [MILEPOST]" • The user can add/remove/edit rules from the table. d. Editing Recommended Response Device Settings: • Within this section are the settings to define the rules for recommending devices. i. The rules will define a radius for device selection based on milepost ranges defined by the user. (note: the mile post ranges will not overlap.) ii. The current Event backlog can be taken into consideration to add distance to the selection radius. iii. The user can add/remove/edit ranges. e. Any changes to the settings will be saved and confirmed by the ATMS. **3a.1: The user edits the settings for Diversion Routes (Plan X's)** a. The user opens the recommended response plan settings section of the system. b. The user selects to edit the Diversion Route settings. c. The user selects the Diversion Route to edit. d. The user makes changes to the devices, messages, and notifications that will be recommended for the selected Diversion Route. e. The user clicks to save the changes. f. The ATMS confirms that the changes have been made and saved. **3a.2: The user edits the setting for the Notification List.** a. See UC3b – Manage Contact Lists for populating the Notification List.
Notes:	The Recommended Response Plan engine shall take into consideration the DMS devices that are in transmission range of HAR devices when posting messages such as "Tune to 1640 AM." This type of message should not be posted on signs that are outside of the transmission range.

Use Case ID:	**UC3b**
Use Case Category:	System Administration – System Management
Deployment:	Phase 1
Use Case Name:	**Manage Contacts List**
Description:	The ATMS user creates/edits a contact list. The contact list is intended to hold and maintain all individuals/organizations that would be contacted for each location, incident type, and severity. This would include, at a minimum, name, email addresses and phone numbers but should contain other relevant individual/organization information as available (job title, secondary contact #, organization, etc.).
Preconditions:	• The ATMS user with sufficient privileges is logged into the ATMS Software. • Contact List has been prepopulated. • The contact list holds information for each contact, defining locations or event types that require their notification.
Normal Course:	**3b.0: The user edits the contact list.** a. The user opens the system administrative section. b. The user selects contact list. c. The user adds or edits contacts/contact information to the contact list. d. The user adds or edits scenario parameters for the contact to be included in the Recommended Response Plan Notification List. e. The user clicks on the “Save” button. f. The ATMS confirms that the changes have be saved.
Notes:	There may be a benefit to integrating with the Commission’s email services. See UC5e – Notifications for further details on the use of the contact list.

Use Case ID:	**UC3c**
Use Case Category:	System Administration – System Management
Deployment:	Phase 1
Use Case Name:	**Map Management**
Description:	A user with sufficient privileges can manage map settings such as device icon placement, default map layers, icon images/colors, etc.
Preconditions:	• A user with sufficient privileges is logged into the system. • Devices have been populated in the system and are being shown on the map. • All map layers have been created and are populated.
Normal Course:	**3c.0: A device icon location is edited.** a. The user navigates to the system administration section of the software. b. The user navigates to the Map Management or Settings section of the software. c. The user clicks to enable the "Edit Map Icon" mode. d. The user is presented with the ATMS map, and can select any of the device icons to edit its location. e. When the user first clicks on the icon, the system presents the user with the Device ID name, actual device coordinates, etc. f. The user can click and drag the icon to a new position. This does not change the actual device location, only the icon location. g. The user clicks save. h. The ATMS confirms that the changes have been saved. **3c.1: Map settings are edited.** a. The user navigates to the System Administration section of the software. b. The user navigates to the Map Management or Settings section of the software. c. The user can change settings for all configurable map settings including device icon image selection, color coding for different device or map entity states (disabled, active, failure, etc.), map layer options (default layers, enable/disable layers, etc.) d. The user makes changes to these settings. e. The user clicks save. f. The ATMS confirms that the changes have been saved.
Notes:	

Use Case ID:	**UC3d**
Use Case Category:	System Administration – System Management
Deployment:	Phase 1
Use Case Name:	**System Settings Management**
Description:	A user with sufficient privileges can manage all configurable system settings such as Lane Closure Conflict Monitor settings, audible/visual alarm threshold settings and sounds, user Alert settings, Traffic Flow Incident Detection settings, Video Incident Detection settings, Travel Time engine settings, etc.
Preconditions:	• A user with sufficient privileges is logged into the system. • All system settings have been populated with default values.
Normal Course:	**3d.0: The user edits system settings.** a. The user navigates to the system administration section of the software. b. The user navigates to the System Setting section of the software. c. The user can edit all configurable system settings and thresholds from this section of the software. d. The systems settings should be organized and presented in a logical manner for ease of user navigation. i.e. all Alert settings are presented together on the same screen, all Travel Time engine settings are presented together on the same screen, etc. e. The user makes changes as required. f. The user clicks the “Save” button. g. The ATMS confirms that the changes have been saved.
Notes:	Users shall have the ability to turn audio alerts off.

Use Case ID:	**UC4a**
Use Case Category:	Incident and Traffic Management – Incident Detection
Deployment:	Phase 1
Use Case Name:	**Traffic Flow Incident Detection**
Description:	The ATMS shall process data in real-time and identify atypical roadway congestion to detect potential incidents; the ATMS detects and alerts the user of a potential incident.
Preconditions:	• The ATMS user is logged into the ATMS. • The ATMS is receiving traffic flow data. • The Real Time Traffic Flow Data is being compared to historical Traffic Flow data. • The segments of roadway (3rd Party Traffic probe data segments) being monitored by the ATMS for a traffic flow incident/event can be toggled on and off individually, and are currently toggled "on" for traffic flow incident detection. • Incident detection thresholds are configurable for each individual roadway segment. • The traffic flow data is deemed by the system to be "Real Time"
Normal Course:	**4a.0: The ATMS alerts the user of a potential incident detected by traffic flow data.** a. The ATMS detects a potential incident through current and historical data comparison. b. The ATMS alerts the user of a potential incident. c. If the Alert is not acknowledged within a configurable period of time, an audible alarm will sound. d. On acknowledgement, the ATMS prompts the user to view the camera nearest to the detected incident (maximum distance threshold shall be configurable). e. The video source with the potential incident is highlighted on the video wall with a flashing red border. f. If an Event is confirmed, the user notifies an RO to open in incident in CADS.
Notes:	Traffic Flow data will be displayed on a map layer. If the user detects an incident based on traffic flow from viewing the map, the user would start an incident as defined in UC5a – Event Creation. VMS integration will be required for highlighting CCTV feeds on traffic flow detection trigger.

Use Case ID:	**UC4b**
Use Case Category:	Incident and Traffic Management – Incident Detection
Deployment:	Phase 3
Use Case Name:	**Video Incident Detection**
Description:	An incident is detected by the VMS video analytics functionality and is reported to the ATMS user.
Preconditions:	• An ATMS user is logged into the ATMS. • An interface has been implemented between the ATMS and VMS systems. • The VMS is integrated with the video wall management system. • The VMS has video analytics functionality. • The System Administrator has selected cameras to be monitored for video detection.
Normal Course:	**4b.0: A potential incident is detected by video detection.** a. The VMS software detects a potential incident through video analytics detection. b. Through the VMS/ATMS interface, the ATMS is notified by the passing of the proper information from the VMS. c. The ATMS verifies that the camera that has detected the potential incident has been enabled for video detection by the System Administrator. d. The ATMS alerts the user of the potential incident. e. If the alert is not acknowledged within a configurable period of time, an audible alarm will sound. f. On acknowledgement, the ATMS prompts the user to view the camera nearest to the detected incident (maximum distance threshold shall be configurable). g. The video source with the potential incident is highlighted on the video wall with a flashing red border. h. If an Event is confirmed, the user requests that an incident record is opened in CADS.
Notes:	

Use Case ID:	**UC4c**
Use Case Category:	Incident and Traffic Management – Incident Detection
Deployment:	Phase 1
Use Case Name:	**Waze Incident Detection**
Description:	An incident is detected by the Waze data and is reported to the ATMS user.
Preconditions:	• An ATMS user is logged into the ATMS. • The ATMS is accepting Waze incident data. • The Waze data is analyzed by the ATMS and the settings are configured to identify credible incidents.
Normal Course:	**4c.0: A potential incident is detected by the analysis of Waze data.** a. The ATMS identifies a credible incident report by analyzing and monitoring Waze data. b. The ATMS alerts the user of the potential incident. c. Credible incident reports are shown on a layer of the ATMS map. d. If the alert is not acknowledged within a configurable period of time, an audible alarm will sound. e. On acknowledgement, the ATMS prompts the user to view the camera nearest to the detected incident (maximum distance threshold shall be configurable). f. The video source with the potential incident is highlighted on the video wall with a flashing red border. g. If an Event is confirmed and action is required, the user requests that an incident record is opened in CADS.
Notes:	

Use Case ID:	**UC4d**
Use Case Category:	Incident and Traffic Management – Incident Detection
Deployment:	Phase 1
Use Case Name:	**RCRS Incident Detection**
Description:	A PennDOT incident is identified to be in the proximity of the Turnpike system and is reported to the ATMS user.
Preconditions:	• An ATMS user is logged into the ATMS. • The ATMS is receiving RCRS incident data. • The ATMS is configured to filter incidents that are in the proximity of impacting the Turnpike system and in a direction that would impact turnpike travelers exiting the facility.
Normal Course:	**4d.0: An incident reported by RCRS is identified in proximity of the Turnpike.** a. The ATMS identifies an incident reported by RCRS that is in proximity to the Turnpike. b. The ATMS alerts the user of the potential incident. c. If the alert is not acknowledged within a configurable period of time, an audible alarm will sound. d. On acknowledgement, the ATMS prompts the user to view the camera nearest to the detected incident (maximum distance threshold shall be configurable). e. The video source with the potential incident is highlighted on the video wall with a flashing red border. f. If an Event is confirmed and response action is required, the user requests that an incident record is opened in CADS.
Notes:	

Use Case ID:	**UC5a**
Use Case Category:	Incident and Traffic Management – Event Management
Deployment:	Phase 1
Use Case Name:	**Event Creation**
Description:	An Event is created in ATMS.
Preconditions:	• The ATMS user is logged into the ATMS. • An interface between the ATMS System and the CAD system exists. • An interface between the ATMS and ENS exists. • An incident has been created in CADS or an incident/event has been detected by the user.
Normal Course:	**5a.0: An event is created automatically by an incident created in CADS.** a. An incident occurs and a CAD operator creates an incident record in CAD. b. The ATMS automatically creates a new ATMS event and populates the ATMS event with all relevant incident information passed by CADS. c. The user is alerted that a new CADS Event has been created. d. If the alert is not acknowledged within a configurable period of time, an audible alarm will sound. e. The user acknowledges the Event and opens the newly created Event. The ATMS time stamps this action. f. The recommended response plan is automatically populated by the ATMS. (See UC5b – Recommended Response Plan) g. A checklist for notifications is automatically populated based on the Event data and contact list logic. (See UC5e - Notifications, UC3b – Manage Contact List) h. Fields imported from the CADS system cannot be edited by the ATMS user; however the fields can be updated through the CADS system interface. (See UC5j – Interface Failure Resolution for more details) i. A custom response plan can be created (See UC5c – Custom Response Plan) j. The user continues managing the Event until closure. (See UC5g – Event Management and Closure) **5a.1: An event is created in ATMS.** a. The user navigates to the incident/event management section of the system. b. The user clicks a button to open a new event. The ATMS time stamps this action. c. The new event is opened and the user begins to populate event information into the data fields. d. The user clicks a button to generate a recommended response plan based on the

	inputted data. (See UC5b – Recommended Response Plan) e. The checklist for notification is automatically populated based on the Event data and contact list logic. (See UC5e - Notifications, UC3b – Manage Contact List) f. A custom response plan can be created (See UC5c – Custom Response Plan) g. The user continues managing the Event until closure. (See UC5g – Event Management and Closure) **5a.2: A quick event is created in ATMS.** a. The user navigates to an individual DMS or HAR device through the map or a list of devices. b. The user creates a message either free-format, or via the DMS/HAR message Library. c. The user will be prompted to associate the message with an event and be able to select "Quick Event" d. The "Quick Event" window will allow the user to enter the reason for creating the event. e. The user will click a button to post the message and the event will be assigned an Event Number f. No Recommended Response Plan will be generated.
Notes:	Performance Metrics Tracking – time stamps from CADS interface, time stamps from ATMS device activations/deactivations, notifications, etc.

Use Case ID:	**UC5b**
Use Case Category:	Incident and Traffic Management – Event Management
Deployment:	Phase 1
Use Case Name:	**Recommended Response Plan**
Description:	A Recommended Response Plan is presented to the user for an Event.
Preconditions:	• The user is logged into the ATMS. • The Recommend Response Plan settings have been populated. • The Contact List has been populated. • ITS Devices are functioning properly. • An incident has been created in ATMS (automatically through the CADS interface, or manually by user)
Normal Course:	**5b.0: The ATMS generates a Recommended Response Plan** a. The ATMS analyzes populated Event information. i.e. Event type, milepost, direction of travel, lanes closed, current backlog b. The ATMS uses some or all of this information to identify the following for a Recommended Response Plan: • Devices to include in the plan • A message to display/play on each of the devices • Contacts to add to the notification list c. The System Administrator can edit the business rules/look up tables used to make the determinations above. (See UC3a – Create/Edit Recommended Response Settings) d. When Event information is updated by an external source, the ATMS will identify the change to the user. e. The ATMS will communicate to the user if a major change has been made to incident information that justifies consideration of a new Recommended Response Plan. f. The user can view the new Recommended Response Plan for consideration. **5b.1: A Recommended Response Plan is generated for an Event dependent on external input (i.e. CADS Event, Weather Event, C&M Event).** a. The user opens the Event dependent on external input (CADS, Weather, C&M). b. The Recommended Response Plan has been automatically generated for this Event by the ATMS based on the incident information passed by the external source. c. The checklist for notification is automatically populated based on the Event data and contact list logic. (See UC5e – Notifications, UC3b – Manage Contact List) d. The user can activate the response plan as presented, or make modifications to the

	response plan. (See UC5c – Custom Response Plan) e. The user can activate individual devices or all devices in the Response Plan. f. The ATMS confirms the activation of each of the devices and a time stamp is recorded by the ATMS for each device activation. g. The Recommended Response Plan can be updated as needed. See 5b.0. h. The user continues managing the Event until closure. (See UC5g – Event Management and Closure) **5b.2: A Recommend Response Plan is generated for an Event dependent on user input.** a. The user opens the Event dependent on user input (ATMS, Planned). b. If Event information has not already been populated, the user inputs Event information. c. Once Event information is entered, the user clicks a button to generate a Recommended Response Plan based on the Event information entered. d. The Recommended Response Plan is generated and displayed. e. The checklist for notification is automatically populated based on the Event data and contact list logic. (See UC5e – Notifications, UC3b – Manage Contact List) f. The user can activate the response plan as presented, or make modifications to the response plan. (See UC5c – Custom Response Plan) g. The user can activate individual devices or all devices in the Response Plan. h. The ATMS confirms the activation of each of the devices and a time stamp is recorded by the ATMS for each device activation. i. The Recommended Response Plan can be updated as needed – see 5b.0. j. The user continues managing the Event until closure. (See UC5g – Event Management and Closure)
Notes:	

Use Case ID:	**UC5c**
Use Case Category:	Incident and Traffic Management – Event Management
Deployment:	Phase 1
Use Case Name:	**Custom Response Plan**
Description:	An incident is detected and the ATMS user activates a Custom Response Plan.
Preconditions:	• The ATMS user is logged into the ATMS. • The ATMS software creates a Recommended Response Plan. • ITS devices are functioning correctly. • The Contact List has been populated. • An interface between the ATMS and CAD exists. • An incident has been created in ATMS (automatically through the CADS interface, or manually by user)

Normal Course:	**5c.0: The user Customizes a Recommended Response Plan in an Event.**
	
	a. The user opens an active Event.
	  • If a CADS generated Event: The Recommended Response Plan has been automatically generated for this Event by the ATMS based on the incident information passed by the CADS interface.
	  • If an ATMS generated Event: The user enters Event data as necessary. The user clicks the Recommend Response Plan button to generate a Recommended Response Plan.
	b. The checklist for notification is automatically populated based on the Event data and contact list logic. (See UC5e – Notifications, UC3b – Manage Contact List)
	c. The user creates a Custom Response Plan by adding or removing devices the Recommended Response Plan presented by the ATMS.
	d. The user activates the Custom Response Plan all at once, or each device individually.
	e. The ATMS confirms the activation of each of the devices and a time stamp is recorded by the ATMS for each device activation.
	f. The user continues managing the Event until closure. (See UC5g – Event Management and Closure)
	
	5c.1: The user activates a Custom Response Plan to an event created by the ATMS (Custom Response plan from scratch).
	
	a. The user opens the Event created in ATMS.
	b. The user creates a Custom Response Plan by selecting devices to activate.
	c. The user activates the Custom Response Plan.

	d. The ATMS confirms the activation of each of the devices and a time stamp is recorded by the ATMS for each device activation. e. The user continues managing the Event until closure. (See UC5g – Event Management and Closure)
Notes:	

Use Case ID:	**UC5d**
Use Case Category:	Incident and Traffic Management – Event Management
Deployment:	Phase 1
Use Case Name:	**Activate Diversion Route**
Description:	The user activates a pre-populated diversion route that is saved in the diversion route library and can be activated as needed.
Preconditions:	• The user is logged into the ATMS. • An Event has been generated through the CADS interface or ATMS for a Diversion Route (Plan X). • Diversion Routes (Plan X) and settings have been pre-populated into the ATMS. • The Contact List has been populated and notifications have been assigned for the Diversion Routes (Plan X's). • Recommended devices and messages have been assigned for the Diversion Routes (Plan X's).
Normal Course:	**5d.0: The user activates a Diversion Route for an Event (CADS or ATMS generated).** a. The user opens an existing active Event that has been created for a Diversion Route. b. The user clicks the button to activate a Diversion Route (Plan X). c. The ATMS shows the recommended diversion route(s) based on the location of the Event. d. The user can continue with the recommended Diversion Route, or select a different Diversion Route from the list of pre-established Diversion Routes. e. The Diversion Route selected has a pre-defined Response Plan made up of ITS devices and messages. The user can customize this Response Plan. f. The user activates the Diversion Route. g. The ATMS confirms that the diversion route has been activated. h. The ATMS confirms the activation of each of the devices and a time stamp is recorded for each device activation. i. The checklist for notification is automatically populated for the activated Diversion Route. (See UC5e – Notifications, UC3c – Manage Contact List, UC3a Create/Edit Recommended Response Plan Settings) j. The user continues managing the Event until closure. (See UC5g – Event Management and Closure)
Notes:	

Use Case ID:	**UC5e**
Use Case Category:	Incident and Traffic Management – Event Management
Deployment:	Phase 1
Use Case Name:	**Notifications**
Description:	The ATMS user makes notifications to people and organizations based on the location and type of Event.
Preconditions:	• The user is logged into the ATMS. • An Event has been generated through the CADS interface or ATMS. • The Contact List has been populated.
Normal Course:	**5e.0: The user makes Event notifications.** a. The user opens an existing active Event. b. The checklist for notification is automatically populated for the Event based on Event information. c. The user can send an email/text to persons identified on the populated checklist. When the user choses to make email/text contact, an email/text is generated with specific Event data. The user can choose to send the email/text as is, or customize the content. d. When the email or text is sent, the check box (or similar) next to that individual's name is automatically checked in the checklist and a time stamp is recorded for that email notification of that person. e. Additionally, the user can make a phone or radio call to the persons identified on the populated checklist. f. After the user has reached the person via phone or radio, the user clicks the check box (or similar) to denote that the notification has been made. The ATMS records a time stamp for the phone call notification of that person. g. The user can add persons to the checklist manually, or through access to the contact list. **5e.1 The user contacts a person from the contact list.** a. The user can utilize the contact list as a rolodex or address book by opening the contact list and searching for persons of interest. b. The user can send email/text notifications directly to persons from the contact list.
Notes:	

Use Case ID:	**UC5f**
Deployment:	Phase 3
Use Case Category:	Incident and Traffic Management – Event Management
Use Case Name:	**Linking Events**
Description:	An Event can be linked with another Event. This operation is intended to consolidate the management of multiple and duplicate Events to one Event. This situation would occur when related events occur in close proximity to one another. See UC5j for more information on duplicate Events. The device activation/deactivation, Event notification, etc. records for each linked Event will be recorded separately for each Event; however record will be kept by the ATMS to track which Events were linked.
Preconditions:	• The user is logged into the ATMS. • One or more Events have been generated through the ATMS. • One or more Events have been generated by the CADS interface. • The two generated events are for the same incident or related incidents.
Normal Course:	**5f.0: An ATMS or CADS Event is linked with another ATMS or CADS Event.** a. The user opens an existing Event (CADS or ATMS Event). b. Within the open Event, an option exists to "Link Event", and is selected by the ATMS user. c. The user is presented with other active Events that are located nearby the subject event (via milepost comparison). d. The user selects the Event from the presented list to link with the subject Event. An option exists to choose an Event if the target Event is not in the presented list. e. The two events are then linked. f. The user can choose multiple Events to link (repeat from 5f.0b). g. Both Events will be combined into a single Event window with separate tabs (or similar presentation) for the individual Event data fields. A portion of this window will be reserved for the management of ITS devices for the linked Events (two or more). h. The ATMS will timestamp and record the activation of devices for each of the linked Events in the record for each Event. i. The user manages the linked Events until closure. (See UC5g – Event Management and Closure) j. The user can close each Event individually as the Events are cleared. When each individual Event is closed, the ATMS records the deactivation of the devices in that Event's record however the devices will remain activated for the Event(s) that remain active in the linked Event. k. The Events included in the linked Event can also be closed simultaneously. In this

	case, the ATMS records the device deactivations for each of the linked Events and deactivates the devices in the field. **5f.1: Linking duplicate Events due to interface failure** a. See UC5j – Interface Failure Resolution.
Notes:	CADS interface Event information cannot be edited by the ATMS user because of the one way integration from CADS to ATMS. The information can be Edited by the CADS user within CADS and will in turn be updated in the ATMS. See UC5a - Event Creation notes for more details.

Use Case ID:	**UC5g**
Use Case Category:	Incident and Traffic Management – Event Management
Deployment:	Phase 1
Use Case Name:	**Event Management and Closure**
Description:	Management of an on-going Event and closure of the Event. This includes details on updating Event information and how an Event is closed.
Preconditions:	• The user is logged into the ATMS. • An Event has been generated through the ATMS or CADS interface. • The ATMS has an interface with the ENS system for Traveler Information.
Normal Course:	**5g.0: Management and Closure of an Event generated by the CADS interface.** a. The user opens an active Event (CADS interface generated). b. The fields that hold information imported from the CADS interface are disabled from editing by the ATMS user. c. Input field(s) are present in the Event window for exporting information to the ENS system. The ATMS prepopulates a concatenated text message to export to ENS using the inputted Event Data. The user can edit these messages and clicks a button to push the information to the ENS interface. A timestamped list of each ENS entry is displayed within the Event window for tracking purposes. d. The user can activate/deactivate ITS devices and edit the device messages as required through the life of the Event. A timestamped list of currently activated devices with the ability to see the current message is displayed in the Event window. e. The ATMS records all user actions within the Event with the user's ID and a timestamp – Device activations/deactivations and data entries are examples of these actions. f. When the CADS incident is closed in the CADS system, the ATMS will alert the user that the CADS system has closed the incident. g. The ATMS does not require that the CADS incident be closed before closing the Event. In the case that the CADS interface fails in the middle of an active Event. (See UC5j – Interface Failure Resolution for more details) h. When the Event is closed in ATMS, all of the ITS devices that have been activated in the Event will be deactivated. i. If a Device is reverting to a message of a lower priority in a separate Event, the user will be notified that the Device will remain active and under which active Event. **5g.1: Management and Closure of an Event generated by the ATMS.**

	a. The user opens an active Event (ATMS generated). b. The user can edit Event data fields as required. c. Input field(s) are present in the Event window for exporting information to the ENS system. The ATMS prepopulates a concatenated text message to export to ENS using the inputted Event Data. The user can edit these messages and clicks a button to push the information to the ENS interface. A timestamped list of each ENS entry is displayed within the Event window for tracking purposes. d. The user can activate/deactivate ITS devices and edit the device messages as required through the life of the Event. e. The ATMS records all user actions within the Event with the user's ID and a timestamp – Device activations/deactivations and data entries are examples of these actions. f. The user can close the Event. g. When the Event is closed in ATMS, all of the ITS devices that have been activated in the Event will be deactivated. h. If a Device is reverting to a message of a lower priority in a separate Event, the user will be notified that the Device will remain active and under which active Event. **5g.2: Nearby Event Conflict Alerts** a. The ATMS alerts the User of a potential nearby Event conflict. b. The ATMS will display nearby active Events that may impact the management of the subject Event. This includes CADS Events, ATMS Events, Weather Events, and C&M Events.
Notes:	

Use Case ID:	**UC5h**
Use Case Category:	Incident and Traffic Management – Event Management
Deployment:	Phase 2
Use Case Name:	**Backlog Calculator**
Description:	A Backlog Calculator display will be shown within an Event window.
Preconditions:	• The user is logged into the ATMS. • An Event has been generated through the ATMS or CADS interface. • The Backlog Calculator Algorithm has been integrated into the system.
Normal Course:	**5h.0: The backlog calculator data is displayed.** a. The user opens an active Event. b. The Backlog Calculator data is displayed in the Event window. c. The presented data shows the original calculated amount of time for queuing traffic to reach a 3 mile and 5 mile backlog and/or nearest interchange. The ATMS will also present a countdown timer from the original calculated time to show estimated time until reaching each threshold. The calculation will incorporate Event data imported from the CADS interface, User entered event data (Milepost, # of lanes blocked, etc.), historical data, and live data. d. If the lane blocking condition is changed (e.g. 1 lane blocked to 2 lanes blocked), the Backlog Calculator will reset and take into account any calculated residual backlog from the previous condition. e. Backlog calculation data will be recorded by the ATMS for metric reporting and accuracy analysis. f. This information is intended to provide the user with guidance to assist in the decision making for activating a diversion route.
Notes:	An algorithm is currently being used and can be made available. Consider other backlog calculator algorithms that may exist in your existing COTS product. The collected backlog calculation data will be stored by the ATMS for future reporting and comparative data analysis with 3rd Party Traffic Probe data (actual) and WAZE (third party, user reported data).

Use Case ID:	**UC5i**
Use Case Category:	Incident and Traffic Management – Event Management
Deployment:	Phase 1
Use Case Name:	**Planned Event Creation and Activation**
Description:	The ATMS user can create Planned Events for scheduling the activation of ITS devices. This includes Public Service Announcements (PSA's) and Travel Time messages on DMS, and planning of Special Events.
Preconditions:	• An ATMS user is logged into the system. • ITS devices are setup in the system.
Normal Course:	**5i.0: The user Creates a Planned Event.** a. The user navigates to the Planned Event section of the system. b. The user clicks to open a new Planned Event. c. The user enters the Planned Event Duration. This duration will define the time and date for the Planned Event to be activated and deactivated. d. The user enters event details to the Planned Event. e. The user can click to generate a recommended response based on the Event details. f. The user can add ITS devices to the Planned Event and select messages (from the message library or custom) to be played on each device. g. The user can schedule the activation and/or deactivation of each device individually, in groups, or all at together. h. The device schedules can be set for specific hours on specific days of the week (Time of Day type plan). i. The user can select and schedule notifications from the contact list as needed. j. The user schedules the Planned Event. k. The ATMS confirms that the Planned Event has been scheduled. **5i.1: A Planned Event is Activated.** a. The user is alerted by the system 15 minutes (configurable) prior to activation. b. If the alert is not acknowledged within a configurable period of time, an audible alarm will sound. c. The Planned Event is automatically turned to active when the Event's start time and date is reached. d. The ATMS will activate and deactivate the devices as scheduled. e. The ATMS sends automatic notifications to the selected entities as scheduled. f. When the Event's end time and date is reached, the user will be alerted that the Planned Event will be closed.

	g. The Planned Event will not be closed until approved by the user. **5i.2: The user edits a Planned Event.** a. The user can make edits to the Planned Event during any state of the Event (Active or Inactive). b. The user can make changes to the devices, schedules, and the overall event duration. **5i.3: The user saves a Planned Event.** a. The user opens an active Planned Event. b. The user clicks to save the Event for use at a later date. c. Schedule, Devices, Event location data, etc. is all saved by the system. d. The user names the Planned Event. e. The ATMS confirms that the Event has been saved. **5i.4: The user opens a previously saved Planned Event.** a. The user creates a new Planned Event. b. Prior to entering any Event details into the data field, the user clicks to open a saved Planned Event. c. A list of all saved Planned Events is displayed. d. The user selects the Planned Event to open, and clicks open. e. The saved Planned Event details are populated from file. f. The user edits schedule, device, and event details as required.
Notes:	Planned Events should be organized and accessible separately from regular Events. The devices activated under a planned event should have their messages set at a priority that would be overridden by an Event with higher priority.

Use Case ID:	**UC5j**
Use Case Category:	Incident and Traffic Management – Event Management
Deployment:	Phase 1
Use Case Name:	**Interface Failure Resolution**
Description:	The ATMS system will recognize when an inputting or exporting interface fails and will resolve the resolution to allow continuous, un-interrupted operations. This includes the CADS interface, ENS interface, and any other external data feeds.
Preconditions:	• The user is logged into the ATMS. • Interfaces have been established with all external sources.
Normal Course:	**5j.0: The CADS interface fails and live Event data has stopped – CADS interface generated Events are active** a. The ATMS recognizes the CADS interface failure. b. The ATMS alarms the user and system administrator (or others assigned to receive such messages) of the failed interface. (see also UC17 – Device Failure Alert and Service Ticketing and UC18 – Device Failure Tracking) c. The ATMS unlocks data fields to allow ATMS user input/update. d. The user manages the Event as normal. e. The user closes the Event as normal. **5j.1: The CADS interface fails and live Event data has stopped – a new incident related Event (normally created through CADS interface) must be created.** a. The ATMS recognizes the CADS interface failure. b. The ATMS alarms the user and system administrator (or others assigned to receive such messages) of the failed interface. (see also UC17 – Device Failure Alert and Service Ticketing and UC18 – Device Failure Tracking) c. The user creates a new Event in ATMS and populates all known Event information. d. If available, the user populates the CADS incident ID number data field. If necessary the ATMS shall have the ability to add/edit the Event at a later date to add a CADS incident ID number. e. The user manages the Event as normal. f. The user closes the Event as normal. **5j.2: The CADS interfaces returns to normal operation from a failed state** a. The ATMS recognizes the CADS interface has returned to normal operation. b. The ATMS notifies the user and system administrator (or others assigned to receive such messages) of the returned operation of the interface. (see also UC17 – Device Failure Alert and Service Ticketing and UC18 – Device Failure Tracking) c. The ATMS identifies active Events with a CADS incident ID number, updates these

	Events with the information from the CADS interface, and locks the data fields from ATMS user input/update. d. The user manages the Event as normal. e. The user closes the Event as normal. **5j.3: Other Interface Failures** a. The ATMS recognizes all interface failures (as applicable). b. The ATMS will buffer data as required to facilitate reasonable periods of failure and recovery. c. Users and system administrators (or others assigned to receive such messages) will be notified of the failed interface. (See also UC17- Device Failure Alert and Service Ticketing and UC18 – Device Failure Tracking)
Notes:	

Use Case ID:	**UC6a**
Use Case Category:	Incident and Traffic Management – Data Sharing
Deployment:	Phase 1
Use Case Name:	**Traveler Information**
Description:	The ATMS exports Traveler Information data to external systems and also populates an API data set for fetching data. Current external systems such as ENS. Future external systems may be WAZE, Twitter, 511, Service Plaza Travel Boards, Preferred Traveler, Trip Line, Trip Talk.
Preconditions:	• A user is logged into the ATMS. • All required data is being time stamped and appropriately packaged for exporting information to external systems. • An interface between CADS and ATMS exists.
Normal Course:	**6a.0: A user exports data to an external system.** a. The user enters or approves a prepopulated data field for export to an external system, such as an ENS Event update message. b. The user clicks the button to send the data. c. The sent message is recorded and timestamped by the ATMS. d. The message is pushed by the ATMS to the appropriate system interface. **6a.1: The ATMS exports data to an external system automatically – on user Action.** a. The user performs a task, such as activates a DMS. b. The ATMS timestamps and records the action details, and any other relevant information (i.e. DMS message content). c. The ATMS automatically pushes this information to an external system. **6a.2: The ATMS exports data to an external system automatically – on a data trigger.** a. The ATMS recognizes a specific piece(s) of data it is monitoring for an active Event or in the system, i.e. New Event added, or Right Lane Closed. b. The ATMS automatically timestamps the time of notification and collects all other relevant data. c. The ATMS automatically packages the information into the appropriate format or message. d. The ATMS automatically pushes this information to an external system or API.
Notes:	This Use Case is intended to capture requirements for interfacing with the external systems currently populated by ENS.

Use Case ID:	**UC6b**
Use Case Category:	Incident and Traffic Management – Data Sharing
Deployment:	Phase 2
Use Case Name:	**Center-to-Center/PennDOT Sharing**
Description:	The ATMS will support center to center incident and data sharing with other operations centers, specifically PennDOT statewide TMC.
Preconditions:	• A dedicated communications link is established between the ATMS and external systems.
Normal Course:	**6b.0: ATMS shares data with PennDOT TMC** a. The ATMS sends/receives incident data, ITS device activation data, traffic flow data, travel time data, etc. from the PennDOT ATMS (Q-Free) interface using NTCIP Center-to-Center standards. b. The ATMS utilizes this data to display map layers, identify potential incidents that may impact the Turnpike, utilize travel time links on PTC devices, etc.
Notes:	If Center to Center NTCIP standards are not sufficient, more detailed requirements can be defined.

Use Case ID:	**UC7**
Use Case Category:	Device Control and Monitoring - AVL
Deployment:	Phase 3
Use Case Name:	**Vehicle Tracking (AVL)**
Description:	The ATMS will track real-time data from PTC vehicles (i.e. Safety Vehicles, Service Vehicles, and Maintenance Vehicles). This information includes, at a minimum, vehicle identifier, GPS coordinates, and the time of day that the data was collected. The collected data can be used to coordinate the assistance/verification of a potential incident.
Preconditions:	• The ATMS user is logged into the ATMS. • The PTC vehicles have active AVL sensors. • The AVL system is integrated with the ATMS.
Normal Course:	**7.0: During an event, the ATMS user can track and coordinate PTC vehicles.** a. The user opens the AVL subsystem. b. The user selects PTC Vehicles. c. A list of the PTC vehicles, vehicle status and vehicle location is displayed. d. The user can use this information, if permitted, to coordinate the dispatch to the location. e. The user can periodically check the real-time location of a vehicle. **7.1: Using the ATMS Map, the user can view the location of PTC vehicles.** a. The user opens the ATMS map. b. The user turns on the AVL layer. c. Vehicles will be displayed on the map in their last reported location. • Each vehicle will be color-coded based on vehicle status and/or last successful location transmission. • Each vehicle type will be displayed with vehicle specific icon. d. The user can mouse over the vehicle to get more information, such as vehicle name/ID and contact information. e. Return to step d. **7.2: AVL Device Activation** a. See UC21 - Weather Alerts and Event Creation
Notes:	The PTC AVL project is currently in pilot stage.

Use Case ID:	**UC8**
Use Case Category:	Device Control and Monitoring – CCTV
Deployment:	Phase 1
Use Case Name:	**CCTV Control and Sharing**
Description:	From the ATMS, the ATMS user can access and view available CCTV cameras. The user can also control the (Pan-Tilt-Zoom) PTZ functionality from the workstation.
Preconditions:	• The ATMS user is logged into the ATMS. • The ATMS has been interfaced with the Video Management System. • CCTV has been included as a layer on the ATMS map.
Normal Course:	**8.0: Viewing and Controlling CCTV from ATMS Map.** a. The ATMS user views the ATMS Map. b. The user mouses over the CCTV icon. The CCTV video feed thumbnail is displayed. c. The user right-clicks on the CCTV icon and clicks to view the camera image. d. A CCTV pop-up window with the live camera view is displayed. e. Using the PTZ controls on the CCTV pop-up window, the user can pan, tilt, and zoom the camera to view the roadway. f. The user can also click the preset buttons to quickly view the preset views set up for the camera in the VMS. **8.1: Viewing and Controlling CCTV from the CCTV list.** a. The ATMS user views the list of CCTV sources. b. The ATMS user selects the CCTV source that they would like to view from the list. c. A CCTV pop-up window with the live camera view is displayed. d. Using the PTZ controls on the CCTV pop-up window, the user can pan, tilt, and zoom the camera to view the roadway. e. The user can also click the preset buttons to quickly view the preset views set up for the camera in the VMS.
Notes:	

Use Case ID:	**UC9a**
Use Case Category:	Device Control and Monitoring – DMS
Deployment:	Phase 1
Use Case Name:	**DMS Message Creation**
Description:	A DMS Message is created and stored in the message library.
Preconditions:	• The user is logged into the ATMS. • For Travel Time Messages – the ATMS must have integrated the travel time data, and be loaded with all travel time segments in relation to that data.
Normal Course:	**9a.0: A DMS Message is created and stored in the Message Library.** a. The user navigates to the DMS Message Library. b. The user clicks to create a new message. c. The user selects the sign type – a list of DMS per sign type should be viewable. d. The user enters the message text, adds stored images, and enters sequence settings and is previewed by the ATMS in a WYSIWYG display. e. If the message does not fit the sign, ATMS will not allow more characters to be typed with the DMS block. f. The user sets the priority of the message. g. The ATMS reviews the message to ensure that it does not contain a word that is in the forbidden word list. h. The user clicks on the “Save” button. i. The user selects a folder within the message library to save the message. j. The user enters a message name and clicks save. k. The ATMS confirms that the message is saved. **9a.1: An existing DMS message is edited (branch at step b).** a. The user selects a message from the DMS Library. b. The user clicks on the “Edit” button. c. The user revises the DMS Message. d. Return to step e. **9a.2: An existing DMS message is copied and edited (branch at step b).** a. The user selects a message category from the DMS Library. b. The user clicks on the “Copy/Edit” button. c. The ATMS opens the message for editing. d. The user edits the message settings, text, sequence, etc. as required. e. Return to step e.

9a.3: A DMS Message is created in an Event

a. The user opens an existing Event.
b. The user selects a DMS to be activated.
c. When the user is prompted to select the message to activate on the selected DMS, the user selects the "New Message" option.
d. The user enters the message text, adds stored images, and enters sequence settings and is previewed by the ATMS in a WYSIWYG display.
e. If the message does not fit the sign, ATMS will not allow more characters to be typed with the DMS block.
f. The user sets the priority of the message.
g. The ATMS reviews the message to ensure that it does not contain a word that is in the forbidden word list.
h. The user is given the opportunity to save the message in the library.
    - If yes, the user selects the folder and message name, and saves.
    - If no, the user does not save.
i. The user activates the DMS with the message. (See UC9b – DMS Activation)

9a.3: A DMS Message is created as a "Quick Event"/

a. The user navigates to an individual DMS device through the map or a list of devices.
b. The user creates a message either free-format, or via the DMS message Library.
c. The user will be prompted to associate the message with an event and be able to select "Quick Event"
d. The "Quick Event" window will allow the user to enter the reason for creating the event.
e. The user will click a button to post the message.

9a.4: A DMS Travel Time Message is created and stored in the DMS library.

a. The user navigates to the DMS Message Library.
b. The user clicks to create a new Travel Time message.
c. The user selects the DMS sign for which to set up the Travel Time message. This message will only be available for use on this sign.
d. The user enters the number of travel time destinations to be displayed on this sign (3 max).
e. The user selects the travel time segments to create the travel time link for each of the determined travel times.
f. The user enters the message text and adds stored images and is previewed by the ATMS in a WYSIWYG display.
g. If the message does not fit the sign, ATMS will not allow more characters to be typed with the DMS block.

	h. The user selects the priority level of the message (in most cases, this will be a consistent level for all Travel Time messages). i. The ATMS reviews the message to ensure that it does not contain a word that is in the forbidden word list. j. The user clicks on the “Save” button. k. The user enters a message name and clicks save. l. The message is saved in the DMS Message Library travel time folder under the assigned DMS. m. The ATMS confirms that the message is saved.
Notes:	

Use Case ID:	**UC9b**
Use Case Category:	Device Control and Monitoring – DMS
Deployment:	Phase1
Use Case Name:	**DMS Activation**
Description:	A DMS message is activated on a DMS.
Preconditions:	• The user is logged into the ATMS. • The DMS are communicating with the ATMS. • The DMS are fully functional. • The DMS is included as a layer in the ATMS map.
Normal Course:	**9b.0: A DMS Message is activated from an existing Event.** a. The user opens an existing Event. b. The user selects a DMS to activate from the listed recommended devices or clicks from a list of DMS. c. The user selects the Message to activate on the DMS from the message library (travel time messages included see UC10 – Travel Time Message Activation) or creates a quick message (See UC9a – DMS Message Creation). The library only shows messages that can be displayed on the subject DMS. d. The user clicks on the "Activate" button. e. If a communication failure occurs, the ATMS will attempt to send the message for the number of times that have been configured by an Administrative user. f. The ATMS confirms that the message is activated on the DMS - The ATMS will notify the operator of the transmission status (i.e. successfully activated or activation failure). g. The ATMS records a time stamp for the Device activation. **9b.1: A DMS Message is activated from the Map.** h. The user mouses over a DMS on the map. The current message being played is displayed on mouse over. i. The user right-clicks on the DMS icon and selects "Activate". j. The ATMS prompts the user to choose if the DMS activation is part of a new Event, an existing Event or a quick Event. • If the user selects for a new Event, a new event is created. The ATMS opens a new Event window. Branch to 9b.0c. • If the user selects for an existing Event, the user must select the existing Event for which to add the DMS. The ATMS opens the selected Event and automatically adds the DMS to the Event. Branch to 9b.0c.

	• If the user selects quick event, the ATMS posts the selected message to the DMS, and saves a quick event. No recommended response plan will be created. Branch to 9b.0c. **9b.2: A DMS Message is activated from the DMS List.** k. The user navigates to the DMS List. l. The user selects the DMS and clicks "Activate". m. The ATMS prompts the user to choose if the DMS activation is part of a new Event or existing Event, or a quick Event. • If the user selects for a new Event, a new event is created. The ATMS opens a new Event window. Branch to step 9b.0c. • If the user selects for an existing Event, the user must select the existing Event for which to add the DMS. The ATMS opens the selected Event and automatically adds the DMS to the Event. Branch to 9b.0c. • If the user selects quick event, the ATMS posts the selected message to the DMS, and saves a quick event. No recommended response plan will be created. Branch to 9b.0c. **9b.3: A DMS Message is activated from a Planned Event.** n. See UC5i - Planned Event Creation and Activation.
Notes:	

Use Case ID:	**UC10**
Use Case Category:	Device Control and Monitoring - Travel Time
Deployment:	Phase1
Use Case Name:	**Travel Time Message Activation**
Description:	user creates, activates and/or schedules a Pre-Set/Custom Travel Time Message on a DMS
Preconditions:	• The DMS are functional and communicating with the ATMS. • Travel Time information is being processed by the ATMS. • Travel Time links are configured in the ATMS. • Travel Time messages have been created for each of the subject DMS sign locations.
Normal Course:	**10.0: The user activates a travel time message in an Event (CADS, ATMS, Construction/Maintenance Events).** a. The user opens an active Event. b. The user adds a DMS to the Event for which to display the travel time(s). c. The user clicks to select the message and selects Travel Time message. d. The user selects the already created Travel Time message from the list of Travel Time messages created for this sign. e. The user clicks to activate the sign with the Travel Time message. f. The Travel Time message will be displayed as long as the supporting traffic data is deemed as "real time". If the traffic data is not deemed as "real time," the DMS will be blanked until "real time" data is available again. g. If the travel time grows above a configurable threshold (e.g. 4 times, 3 times) above the normal free flow travel time (compared to historical TT's), the DMS will be blanked or an automatic message will be posted, until travel time reduces to less than the configurable threshold of the normal free flow travel time. h. The Travel Time message will continue to play until the sign is deactivated by the user or the Event is closed. **10.1: The user activates a travel time message in a Planned Event.** a. The user opens an active Planned Event or creates a new Planned Event. b. The user defines the Start/End date and time of the Planned Event. c. The user adds a DMS to the Event for which to display the travel time(s). d. The user clicks to select the message and selects Travel Time message. e. The user selects the already created Travel Time message from the list of Travel Time messages created for this sign.

	f. The user creates a Time Of Day (TOD) schedule for the Travel Time message to be played, which includes days of the week and time of day periods. g. When the Planned Event is activated, the selected DMS(s) will play the Travel Time messages for the duration of time specified in the TOD schedule for the duration of the overall Planned Event. i. The Travel Time message will be displayed as long as the supporting traffic data is deemed as "real time". If the traffic data is not deemed as "real time," the DMS will be blanked until "real time" data is available again. h. If the Travel Time grows above 4 times (configurable) the normal free flow travel time (compared to historical TT's), the DMS will be blanked until travel time reduces to 3 times (configurable) the normal free flow travel time.
Notes:	The threshold for blanking the sign or posting a default congestion message will be configurable. The example used in this Use Case is one possible operational concept. Travel Time Message Creation is covered in UC9a.4.

Use Case ID:	**UC11a**
Use Case Category:	Device Control and Monitoring – HAR
Deployment:	Phase1
Use Case Name:	**HAR Message Creation**
Description:	An HAR Message is created and stored in the message library.
Preconditions:	• The user is logged into the ATMS.
Normal Course:	**11a.0: An HAR Message is created and stored in the Message Library.** a. The user opens the HAR Message Library. b. The user clicks to create a new HAR Message. c. The user types in the HAR message text for text to voice conversion. d. The ATMS checks the message against rules/constraints (i.e. forbidden words, etc.). e. The user assigns a priority level to the message. f. The user clicks on the "Listen to Message" button. g. The user clicks to select the Beacons "On" or "Off". h. If the beacons are selected to "On", the associated HAR beacons are activated via the DTMF tone messages incorporated into the message. The ATMS map will show the beacons as "On." When the HAR message is deactivated, the beacons will be deactivated and shown as "Off" on the ATMS map. i. The user clicks on the "Save" button. j. The user enters a message title. k. The ATMS confirms that the message has been saved. **11a.1: Edit existing HAR message (branch at step b).** a. The user selects a message from the HAR Message Library. b. The user clicks on the "Edit" button. c. The user revises the HAR Message. d. Return to step e. **11a.2: An HAR Message is created in an active Event.** a. See UC11b – HAR Activation (or UC11d)
Notes:	

Use Case ID:	**UC11b**
Use Case Category:	Device Control and Monitoring – HAR
Deployment:	Phase1
Use Case Name:	**HAR Activation**
Description:	An HAR message is activated on a HAR.
Preconditions:	• The user is logged into the ATMS. • The HAR are communicating with the ATMS. ▪ The HAR are fully functional. ▪ The HAR are included as a layer on the ATMS map.
Normal Course:	**11b.0: An HAR Message is activated from an existing Event.** a. The user opens an existing active Event. b. The user selects a HAR device to add to the Event. c. The ATMS displays the HAR status including transmitter status and wattage. d. The user selects a message from the Message Library (For a custom message see 11b.3). e. The user clicks on the "Listen to Message" button. f. The user clicks on the "Activate" button. g. The ATMS confirms that the message was sent to the HAR. h. The ATMS will notify the operator of the transmission status (i.e. successfully activated or activation failure). **11b.1: An HAR is activated from the Map.** a. The user mouses over a HAR on the map. b. The user right-clicks on the HAR icon and selects "Activate". c. The ATMS prompts the user to choose if the HAR activation is part of a new Event, an existing Event or a quick Event. • If the user selects for a new Event, a new event is created. The ATMS opens a new Event window. Branch to 11b.0c. • If the user selects for an existing Event, the user must select the existing Event for which to add the HAR. The ATMS opens the selected Event and automatically adds the HAR to the Event. Branch to 11b.0c. • If the user selects quick event, the ATMS posts the selected message to the HAR, and saves a quick event. No recommended response plan will be created. Branch to 11b.0c.

	11b.2 An HAR is activated from the HAR List. d. The user navigates to the HAR List. e. The user selects the HAR and clicks "Activate". f. The ATMS prompts the user to choose if the HAR activation is part of a new Event or existing event. • If the user selects for a new Event, a new event is created. The ATMS opens a new Event window. Branch to step 11b.0c. • If the user selects for an existing Event, the user must select the existing Event for which to add the HAR. The ATMS opens the selected Event and automatically adds the HAR to the Event. Branch to 11b.0c. • If the user selects quick event, the ATMS posts the selected message to the HAR, and saves a quick event. No recommended response plan will be created. Branch to 11b.0c. **11b.3: A custom HAR message is created and activated in an existing Event.** a. The user opens an existing active Event. b. The user selects a HAR device to add to the Event. c. The ATMS displays the HAR status including transmitter status and wattage. d. The user clicks to create a custom message. e. The ATMS opens the message creation window. f. The user types in the HAR message text. g. The ATMS checks the message against rules/constraints (i.e. forbidden words, etc.). h. The user assigns a priority level to the message. i. The user clicks on the "Listen to Message" button. j. The user clicks to select the Beacons "On" or "Off." See UC11a.0g and h. k. The user can choose to save the message, and clicks on the "Save" button. If the user chooses not to save, jump to step m. l. The user enters a message title. m. The ATMS confirms that the message has been saved. n. The ATMS returns to the active Event with the new HAR message populated on the HAR. o. The user clicks on the "Activate" button. p. The ATMS confirms that the message was sent to the HAR. q. The ATMS will notify the operator of the transmission status (i.e. successfully activated or activation failure).
Notes:	The ATMS shall provide the ability to synchronize messages, adjust message speeds, and create and post auto-generated messages (e.g. weather messages).

Use Case ID:	**UC11c**
Use Case Category:	Device Control and Monitoring - HAR
Deployment:	Phase1
Use Case Name:	**HAR Message Creation – Not Integrated (Alternative to UC11a)**
Description:	An HAR Message is created in Platinum and stored in the Platinum message library.
Preconditions:	• The user is logged into the ATMS. • All HAR devices have been added to the system and will be displayed on the Map and be available for adding to incidents. • A link to the Platinum software GUI has been integrated into the ATMS.
Normal Course:	**11c.0: An HAR Message is created and stored in the Message Library.** a. The user opens the Platinum software program. b. In the Platinum software: • The user clicks to create a new message. • The user builds a new message with text to voice. • The user clicks to save the message. • The user selects the location of the message to be saved in the message library and names the message. • The message is saved. **11c.1: Edit existing HAR message (branch at step b).** a. The user opens the Platinum software program. b. In the Platinum software: • The user clicks to open an existing message. • The user edits the message as needed with text to voice. • The user clicks to “save as…” the message. • The user selects the location of the message to be saved in the message library and names the message. • The message is saved. **11c.2: An HAR Message is created in an active Event.** a. The user opens an active Event in ATMS. b. The user selects a HAR to add to the Event. c. The user clicks a button next to the HAR to launch the Platinum software. d. The user is now in the Platinum Software. e. Branch to 11c.0b.

	f. Once the message has been saved, the user can activate the message in Platinum. g. On activation of the message, the user returns to the ATMS Event. h. The user checks a box next to the HAR device in the device list to timestamp and confirm that the message has been activated. i. The user can manage the HAR in the Platinum software. j. When the Event is closed, the ATMS alerts the user to return to the Platinum software to deactivate the message.
Notes:	This Use Case is only applicable if the HAR's are not integrated into the ATMS.

Use Case ID:	**UC11d**
Use Case Category:	Device Control and Monitoring - HAR
Deployment:	Phase1
Use Case Name:	**HAR Activation – Not Integrated (Alternative to UC11b)**
Description:	An HAR message is activated on a HAR through the Platinum Software. The HAR activation is tracked in the ATMS Event so the details can be shown on the map.
Preconditions:	• The user is logged into the ATMS. • All HAR devices have been added to the system and will be displayed on the Map and be available for adding to incidents. • A link to the Platinum software GUI has been integrated into the ATMS.
Normal Course:	**11d.0: An HAR Message is activated from an existing Event.** a. The user opens an active Event in ATMS. b. The user selects a HAR to add to the Event. c. The user clicks a button next to the HAR to launch the Platinum software. d. The user is now in the Platinum Software. • The user selects the HAR that was added to the Event and selects or creates a message to Activate. e. On activation of the message, the user returns to the ATMS Event. f. The user checks a box next to the HAR device in the device list to timestamp and confirms that the message has been activated. g. The user can manage the HAR in the Platinum software. h. When the Event is closed, the ATMS alerts the user to return to the Platinum software to deactivate the message. **11d.1: An HAR is activated from the Map.** a. The user mouses over a HAR on the map. b. The user right-clicks on the HAR icon and selects “Activate”. c. The ATMS prompts the user to choose if the HAR activation is part of a new event or existing event. • If the user selects for a new event, a new event is created. The ATMS opens a new Event window. Branch to 11d.0c. • If the user selects for an existing Event, the user must select the existing Event for which to add the HAR. The ATMS opens the selected Event and automatically adds the HAR to the Event. Branch to 11d.0c. **11d.2: An HAR is activated from the HAR List.** a. The user navigates to the HAR List. b. The user selects the HAR and clicks “Activate”. c. The ATMS prompts the user to choose if the HAR activation is part of a new Event or existing event.

	• If the user selects for a new Event, a new event is created. The ATMS opens a new Event window. Branch to step 11d.0c. • If the user selects for an existing Event, the user must select the existing Event for which to add the HAR. The ATMS opens the selected Event and automatically adds the HAR to the Event. Branch to 11d.0c. **11d.3: A custom HAR message is created and activated in an existing Event.** a. The user opens an active Event in ATMS. b. The user selects a HAR to add to the Event. c. The user clicks a button next to the HAR to launch the Platinum software. d. The user is now in the Platinum Software. e. Branch to 11c.0b then return. • Once the message has been saved, the user can activate the message in Platinum. f. On activation of the message, the user returns to the ATMS Event. g. The user checks a box next to the HAR device in the device list to timestamp and confirm that the message has been activated. h. The user can manage the HAR in the Platinum software. i. When the Event is closed, the ATMS alerts the user to return to the Platinum software to deactivate the message.
Notes:	This Use Case is only applicable if the HAR's are not integrated into the ATMS. The ATMS shall provide the ability to synchronize messages, adjust message speeds, and create and post auto-generated messages (e.g. weather messages).

Use Case ID:	**UC12**
Use Case Category:	Device Control and Monitoring – Automated Systems
Deployment:	Phase1
Use Case Name:	**Fog Detection System**
Description:	The ATMS processes the fog detection system data (RWIS data) and automatically activates DMS assigned to the system.
Preconditions:	• The ATMS has been integrated with the RWIS station fog detection devices. • The functionality is built into the ATMS to make logical decisions to automatically activate DMS.
Normal Course:	**12.0: The Fog Detection System is Activated.** a. The ATMS monitors fog data that is reporting back from RWIS devices. b. When user defined thresholds are reached at a user defined number of adjacent RWIS stations, DMS local to the respective RWIS stations are activated to warn of low visibility (user defined message). c. The user is notified of the DMS activations. **12.1: The Fog Detection System is Deactivated.** a. The fog detection system had been activated. b. The ATMS monitors fog data that is reporting back from RWIS devices. c. When user defined thresholds are no longer met, and a user defined amount of time has passed, the DMS signs are deactivated. d. The user is notified of the DMS deactivations.
Notes:	The current system polls the 9 Fog RWIS stations once every 45 seconds. There are 3 predetermined visibility thresholds. Threshold 1 (visibility 5,250ft > 1,000 ft) speed limit restriction 50mph; Threshold 2 (visibility 1,000ft > 650ft) speed limit restriction 40mph; Threshold 3 (visibility < 650ft) speed limit restriction 30mph. System activates on first successful poll past threshold setting. System will deactivate or switch to higher threshold after 3 successful polls past threshold setting. Specific scenarios are in place to enable "smoothing" between sites. For example: Site 1 activates threshold 1, site 2 reports visibility above threshold 1 (i.e.: not activated), site 3 activates threshold 1. Messages would be posted on sites 1, 2, & 3 even though site 2 is not activated.

Use Case ID:	**UC13a**
Use Case Category:	Device Control and Monitoring – Automated Systems
Deployment:	Phase 2
Use Case Name:	**Smart Work Zone**
Description:	The ATMS can create and manage Smart Work Zones comprised of portable and permanent DMS, portable traffic detection units, and portable and permanent HAR Transmitters. A Smart Work Zone plays user defined messages on DMS and HAR based on traffic flow conditions collected by the portable detection units.
Preconditions:	• The ATMS is compatible with and has added the portable/permanent message signs, portable detection devices, and portable/permanent HAR Transmitters. • The ATMS has the ability to display/play messages on DMS and HAR based on traffic flow conditions in work zones.
Normal Course:	**13a.0: Smart Work Zone creation.** a. The user navigates to the Smart Work Zone area of the system. b. The user selects to create a new smart work zone. c. The user selects the devices to be included in the smart work zone. d. The user defines the traffic flow thresholds (volume/occupancy/speed) and messages to play on each device for each threshold. e. The user provides information on detection device locations as required. f. The user saves the Smart Work Zone. g. The ATMS confirms that the Smart Work Zone has been setup and saved. **13a.1: Smart Work Zone activation/deactivation.** a. The user navigates to the Smart Work Zone area of the system. b. The user selects the Smart Work Zone to activate/deactivate. c. The user clicks Activate (Deactivate). d. The ATMS confirms that the Activation (Deactivation) has been completed. **13.2: Smart Work Zone System management.** a. The user navigates to the Smart Work Zone area of the system. b. The user selects the Smart Work Zone to manage and clicks edit. c. The user can add/remove devices as needed, and adjust any settings. d. The user clicks save. e. The ATMS confirms that the changes have been saved.
Notes:	

Use Case ID:	**UC13b**
Use Case Category:	Device Control and Monitoring – Automated Systems
Deployment:	Phase 2
Use Case Name:	**Smart Work Zone Alerting (Alternative to UC13a)**
Description:	The ATMS receives notification from a third party Smart Work Zone (SWZ) system when work zone traffic has reached a speed threshold.
Preconditions:	• The ATMS user is logged into the system. • The ATMS is integrated with a third party SWZ system to provide an alarm/alert when any of the active work zones being managed by the system reach a specified speed threshold. • Smart Work Zones are active.
Normal Course:	**13b.0: Smart Work Zone Alert.** a. The traffic in an active Smart Work Zone slows to a specified threshold (example: 25 MPH). b. The user receives an Alert in the ATMS that the work zone has reached the threshold. c. The user acknowledges the Alert. If the Alert is not acknowledged in a configurable period of time, an audible alarm is sounded. d. The user is prompted to open a new Event. e. If yes, the new Event is opened and nearby permanent ITS devices are recommended for use. **13b.1: Smart Work Zone Alert is cleared.** a. The traffic in an active Smart Work Zone speeds up above the threshold and maintains faster speeds for a specific amount of time. b. The user receives an Alert in the ATMS that the work zone has cleared the threshold. c. The user acknowledges the Alert. If the Alert is not acknowledged in a configurable period of time, an audible alarm is sounded. d. The user is prompted to close the active Event from UC13.0.
Notes:	

Use Case ID:	**UC14**
Use Case Category:	Device Control and Monitoring
Deployment:	Phase 3
Use Case Name:	**Connected Vehicles**
Description:	The ATMS can receive and transmit data from/to Connected Vehicles. Likely applications include work zone, traffic incident, safety, and weather information dissemination.
Preconditions:	• Vehicle Infrastructure Integration has been implemented. • Vehicle to Vehicle (PTC)
Normal Course:	**14.0: ATMS receives Connected Vehicle Data.** a. The ATMS receives Connected Vehicle Data detailing congestion at a location. b. The user notifies a Radio Operator of the potential incident. c. The RO creates an incident in the CADS system, which generates an Event in the ATMS. d. The user manages the Event (See UC5a – Event Creation, UC5g – Event Management and Closure). **14.1: The ATMS Transmits incident data to Connected Vehicles.** a. A CADS Event (Incident related event) has been created. b. The user manages the Event. c. The ATMS automatically transmits Event related information to vehicles in the proximity of the Event for display within the vehicle. d. The ATMS automatically transmits Event related information to PTC vehicles and passes V2V information to nearby vehicles to display within the vehicle.
Notes:	

Use Case ID:	**UC15a**
Use Case Category:	Construction and Maintenance Management
Deployment:	Phase 2
Use Case Name:	**Schedule Construction and Maintenance (C&M) Lane Closure Event**
Description:	Construction and Maintenance Events (lane closure activities) are created through the Construction/Maintenance Application and automatically entered into ECMS
Preconditions:	• All necessary C&M Management personnel have ATMS C&M Application logins • The user is logged into the ATMS C&M Application. • The standard operating procedures have been established to enter construction and maintenance events. • The ATMS C&M Application has been fully integrated into the ATMS software.
Normal Course:	**15a.0: A C&M Event (lane closure activity) is scheduled.** a. The C&M Event is scheduled in advance using an external application or website. b. An Authorized C&M user logs onto the ATMS C&M Application. c. C&M user enters the pertinent event details including number of lanes to be closed, direction of travel, milepost extents and duration of closure. d. The C&M event is sent to the ATMS Software for Scheduling. **15a.1: A C&M Event is Scheduled by the ATMS Software.** a. The ATMS receives the C&M event information b. The C&M user receives an automated email indicating that the C&M event has been received by the ATMS and has been scheduled. The notification includes pertinent information including the number of lanes to be closed, direction of travel, milepost extents and duration of closure. c. If the ATMS identifies a conflict between scheduled C&M events it is logged and a "Red Flag" email is sent to Operations Management (See UC16-Lane Conflict Monitor). d. If the conflict is not resolved, an alert will remain open in ATMS until the conflict has been resolved.
Notes:	It will be the responsibility of TOC operators to notify C&M users if there is a conflict created by the C&M event they created. It is not anticipated that "Plan X" events will be created through the ATMS C&M Applic Application.

Use Case ID:	**UC15b**
Use Case Category:	Construction and Maintenance Management
Deployment:	Phase 2
Use Case Name:	**Track/Manage Construction and Maintenance (C&M) Lane Closure Event**
Description:	Construction and Maintenance Events (lane closure activities) are tracked and scheduled within the ATMS.
Preconditions:	• The user is logged into the ATMS. • The standard operating procedures have been established to notify the TOC of construction lane closures. • The ATMS has been updated with current lane charts and holiday hours for lane closure restrictions.
Normal Course:	**15b.0: A C&M Event is activated.** a. On the scheduled day of the C&M Event, the user is notified 4 hours (configurable) prior to the scheduled start, that a C&M Event is scheduled for that day. b. The user receives a call from the C&M entity in the morning that they are beginning to set up the closure. c. The user navigates to the Construction and Maintenance Management section of the software, selects the subject C&M Event. d. The user reviews the devices and messages that were added in the initial setup of the Event. e. The user can edit the devices and messages manually or by generated recommended response plan as needed. f. The user activates the C&M Event and all selected devices. g. The ATMS exports C&M Event details for an active lane closure. h. The ATMS adds the lane closure/construction zone to the ATMS map. i. When the C&M Event's end time and date is reached, the user will be alerted that the C&M Event will be closed. j. The user receives an Alert that the C&M Event is scheduled to close. k. The user acknowledges the Alert. If the Alert is not acknowledged in a configurable period of time, an audible alarm is sounded. l. The user contacts the C&M entity of the status of the closure. m. The user receives a call for the clearance of the lane closure and closes the C&M Event. n. The ATMS exports C&M Event details for the cleared lane closure. o. The ATMS removes the lane closure/construction zone to the ATMS map.

	15b.1: A user edits a C&M Event. a. The user navigates to the Construction and Maintenance Management section of the software. b. The user selects one of the scheduled C&M Events (active or inactive) and clicks Edit. c. The user edits any of the Construction Event attributes or selected devices. d. The user saves the changes. e. The ATMS confirms and saves the changes. **15b.2: A user cancels a C&M Event.** a. The user navigates to the Construction and Maintenance Management section of the software. b. The user selects one of the scheduled C&M Events and clicks Cancel. c. The ATMS asks if the user is sure that they want to cancel the Event. d. The user selects yes. e. The ATMS confirms the changes. **15b.3: A Planned Plan X has been scheduled.** a. The ATMS recognizes that the scheduled Event is a full closure, Plan X Event and not in conflict. b. The ATMS shall automatically alert the user to create a Planned Event to display Pre-Planned Plan X messages on nearby devices. c. See Planned Event Creation UC5i. d. The ATMS will auto-populate the Planned Event Duration based on the Plan X schedule. The Default period of time before the Plan X schedule will be configurable by the SA.
Notes:	Need to define the data that will be entered by the C&M entity in the application or website. **Planned Tunnel Lane Closures will be treated as a C&M Event in the ATMS.** The closure will need to be schedule and conflict tested. The Tunnel personnel will be required to call the TOC prior to activation. Tunnel devices such as fixed cameras, lane control blank out signs, and small DMS will be managed through the Tunnel SCADA system. The cameras will be viewable in the ATMS via the integration with the VMS.

Use Case ID:	**UC16**
Use Case Category:	Construction and Maintenance Management
Deployment:	Phase 2
Use Case Name:	**Lane Closure Conflict Monitor**
Description:	The Lane Closure Conflict Monitor identifies conflicts between Construction and Maintenance Lane Closure Event and notifies the user and Operations Management.
Preconditions:	• The user is logged into the ATMS. • The standard operating procedures have been established to notify the TOC of construction lane closures. • Construction and Maintenance Events have been entered into the system. • The ATMS has been updated with current lane charts and holiday hours for lane closure restrictions.
Normal Course:	**16.0: The Lane Closure Conflict Monitor identifies a conflict.** a. When a new Construction or Maintenance Event is added, the conflict monitor compares the new Event with all other previously scheduled pending or active events. b. If a conflict is present, such as milepost extents closer than 2 miles (configurable) apart, on the same day; or the scheduled Event falls on a Holiday Period or restricted work hours period; the ATMS automatically creates an Alert. c. The Alert immediately notifies the user of the conflicting Events and sends a “Red Flag” email to Operations Management. d. The Alert cannot be cleared (except by override by a user of sufficient privileges) until the conflict is resolved by changing the schedule or milepost extents of the conflicting Events. If the conflict is not resolved 24 hours prior to the scheduled closure, an audible alarm will sound. e. The user coordinates with Management to take action to reschedule one of the conflicting Events. f. The user makes the changes in the Event Schedule. g. The ATMS clears the Alert.
Notes:	Coordinate with PTC on default required distance between scheduled lane closures.

Use Case ID:	**UC17**
Use Case Category:	Asset Management
Deployment:	Phase 2
Use Case Name:	**Device Failure Alert and Service Ticketing**
Description:	The ATMS alerts the user of a device failure, starts ticket in Service Now, and takes the devices offline/online. .
Preconditions:	• The user is logged into the ATMS. • All field devices are setup in the ATMS. • The ATMS can collect device status information for all set up devices. • Device failure thresholds are defined. i.e. # of consecutive communication attempt failures, # of status request failures, etc. • An interface is in place between Service Now and ATMS. • An interface is in place with Orion and ATMS.
Normal Course:	**17.0: The ATMS detects a communication failure.** a. A device communication failure is detected by the ATMS. b. The ATMS handshakes with Orion to confirm. c. If communication failure is confirmed: • An Alert is created and the user is notified. • The ATMS pushes the device failure information to the Service Now interface. • The failed device is taken offline and/or marked as out of service on the ATMS Map and Device lists (See UC18 – Device Failure Tracking). • The device is tracked as out of service and disabled in the ATMS. • Once the issue has been resolved, the user receives an Alert that the device is back online. • The ATMS automatically brings the device back online. d. If communication failure is not confirmed: • An email is automatically generated and sent to the system administrators for troubleshooting. • The system periodically checks for resumed communication. • The Device is temporarily taken offline and can be brought back online by a system administrator or a successful communication check by the periodic check. **17.1: Other Device Failures.** e. The ATMS detects a device failure (non-communication related). f. An alarm is created and the user is notified. g. The ATMS pushes the device failure information to the Service Now interface. h. The failed device is taken offline and/or marked as out of service on the ATMS

	Map and Device lists. (See UC18 – Device Failure Tracking) • The device is tracked as out of service and disabled in the ATMS. i. Once the issue has been resolved, the user receives an Alert that the device is back online. j. The ATMS automatically brings the device back online. **17.2: Device Failure Monitoring** k. The ATMS provides an output of open service tickets to display on the video wall.
Notes:	Timestamps for all failures and service tickets will be recorded. Information on exactly what steps should be timestamped must be determined.

Use Case ID:	**UC18**
Use Case Category:	Asset Management
Deployment:	Phase 1
Use Case Name:	**Device Failure Tracking**
Description:	The ATMS alerts the user of an equipment failure.
Preconditions:	• The user is logged into the ATMS. • ITS device data is being reported to the ATMS. • An ITS device failure is detected.
Normal Course:	**18.0: The ATMS map displays failed devices.** a. The user opens the ATMS Software Map. b. The user turns on the device layers. c. Devices that are out of service are identified by a color (red/grayed out). **18.1: The ATMS alerts the user of a device failure.** a. The user is actively using the ATMS. b. An on screen notification banner (or similar) displays text saying, "Equipment Failure - XXXX." The notification can be accompanied by a configurable audible alarm. c. The user can mouse over the notification to see more information about the device failure. d. The user navigates to the alert section of the software to view all alerts. e. The user can view a list of "out of service" devices by sorting/filtering device lists on device status.
Notes:	

Use Case ID:	**UC19**
Use Case Category:	Asset Management
Deployment:	Phase 1
Use Case Name:	**Asset Database**
Description:	The ATMS is a repository for all device/location specific data. This includes all device and location attributes, peripheral IT devices, service reports, failure history, repair history, current firmware versions, etc.
Preconditions:	• The user is logged into the ATMS. • ITS equipment information is entered into the ATMS.
Normal Course:	**19.0: Asset Database Entry.** a. When an ITS device is added to the system, a record is created in the asset database. b. The asset database collects and stores failures and service ticket tracking information automatically for each device. c. Through the integration with Service Now, details on the repair of the device are saved for each device.
Notes:	The Device Activation form is the current list of all device details that will need to be populated when a device is setup. These fields will need to coordinated with the PTC.

Use Case ID:	**UC20a**
Use Case Category:	Reporting
Deployment:	Phase 1
Use Case Name:	**Performance Measure Reports**
Description:	A user with sufficient privileges can generate Performance Measure reports from the ATMS based on historical data. Reports can be created and sorted by year, month, day, shift, district, contract, PSP, staff, etc. Some examples of Performance Measure Reports include: • Device Activation Time • Device Uptime/Availability • Device Utilization • Traffic Flow Statistics • Activation/Notification Statistics by user • Month over Month comparative analyses • Incident Notification Time • Device Reliability • Event Clearance Times • Year over Year comparative analyses • Custom Combined Reports
Preconditions:	• The user is logged into the ATMS. • All of the required data has been collected including, but not limited to: Traffic data, Incident Event data, Construction Event data, Maintenance Event data, user data, device activation data, Planned Event data, and device failure data.
Normal Course:	**20a.0: The user generates a performance measure report.** a. The user opens the performance report section of the ATMS. b. The user selects the time period for the performance report. c. The user selects the report criteria or canned report. d. The user clicks on the "Generate Report" button. e. The user views and/or prints the report. **20a.1: The user saves a performance report (after step d.).** a. The user clicks on the "Save Report" button. b. The user enters a file name and selects a file type (.pdf, .tiff, .xlsx, etc.). c. The ATMS confirms that the report has been saved.
Notes:	All user actions will be timestamped and recorded. All device activations/deactivations will be timestamped and recorded. All Event creations, cancellations, activations, deactivations will be timestamped and recorded. All user pushed data to external systems will be timestamped and recorded. Timestamps for all failures and service tickets will be recorded. All changes in device statuses will be timestamped and recorded. Additional Reports: incident clearance times, roadway clearance times, Plan X duration, incident verification time, first responder response time, queue

Use Case ID:	**UC20b**
Use Case Category:	Reporting
Deployment:	Phase 1
Use Case Name:	**System Data Reports**
Description:	A user with sufficient privileges can generate System Data Reports from the ATMS based on historical data and real-time data. System Data Reports are reports that extract data for a period of time directly from the ATMS database without any additional algorithms or calculations. Some examples of System Data Reports include: • Shift Hand-Off Reports • Device Activation Logs • Event Activation Logs • Custom Reports • Real-Time Traffic Data Reports • User Activity Reports • Event Closure Logs
Preconditions:	• The user is logged into the ATMS. • All of the required data has been collected including but not limited to: Traffic data, Incident Event data, Construction Event data, Maintenance Event data, user data, device activation data, Planned Event data, and device failure data.
Normal Course:	**20b.0: The user generates a system data report.** a. The user opens the performance report section of the ATMS. b. The user selects the time period for the performance report. c. The user selects the report criteria or canned report. d. The user clicks on the "Generate Report" button. e. The user views and/or prints the report. **20b.1: The user saves a system data report (after step d.).** a. The user clicks on the "Save Report" button. b. The user enters a file name and selects a file type (.pdf, .tif, .xlsx, etc.). c. The ATMS confirms that the report has been saved.
Notes:	All user actions will be timestamped and recorded. All device activations/deactivations will be timestamped and recorded. All Event creations, cancellations, activations, deactivations will be timestamped and recorded. All user pushed data to external systems will be timestamped and recorded. Timestamps for all failures and service tickets will be recorded. All changes in device statuses will be timestamped and recorded.

Use Case ID:	**UC21**
Use Case Category:	Weather and Planned Event Management
Deployment:	Phase 2
Use Case Name:	**Weather Alerts and Event Creation**
Description:	The ATMS Alerts the user of predicted or forecasted Weather Events.
Preconditions:	• The ATMS user is logged into the system. • The ATMS is accepting and analyzing RWIS data (or other weather systems). • The ATMS is receiving third party weather forecast data by county (Accuweather). • The ATMS is interfaced with National Weather Service to receive weather advisories by county.
Normal Course:	**21.0: Forecasted Weather Alert and Weather Event creation.** a. The ATMS is receiving periodic weather forecast data (i.e. NWS, Accuweather). b. The user can click to view a display of the most recent forecast data for each county/weather region. c. The ATMS monitors the forecast data for specific forecast information to trigger the start of a Weather Event. (i.e. NWS advisories, warnings, watches, etc.) d. When the ATMS identifies a forecast data trigger, the ATMS prompts the user to start a Weather Event for the weather region in which the forecast data is related to. e. The ATMS will adhere to the following rules for Weather Event creation and user alerting: • A Weather Event can be opened for each weather region. (4 regions = 4 events) • For each weather region, the ATMS will only alert the user once for consecutive forecast triggers of the same severity. • For each weather region, the ATMS will only alert the user once when the first county in a region receives a forecast trigger of increased severity from the current severity level of the region. • For each weather region, the ATMS will only alert the user once when the last county in a region receives a forecast trigger of reduced severity from the current severity level of the region. f. The ATMS provides a field to identify the PTC Weather Level of the region. This field provides a drop down of the PTC defined Weather Level identifiers. g. The ATMS will provide the user with data fields to populate specific to the needs of managing the weather event. h. When the user updates the Weather Level field in Weather Event (regional Event), the ATMS prompts the user for confirmation. i. On confirmation of the update to the Weather Level, the ATMS will send an email automatically to a specified list of recipients, (including all PTC staff). j. The user manages and closes the Event (see UC5g - Event Management and Closure)

	21.1: Live Weather Alerts and Alarms a. The ATMS monitors RWIS system data. b. When the RWIS is reporting data that is trending towards a hazardous travel condition, the ATMS user is immediately notified and an automatic email is sent to the maintenance district in which the reporting RWIS is located. c. The email will contain specific information on the hazardous conditions and the location. **21.2: Snowplow AVL automatic device activation** a. The user opens an active Weather Event. b. The user clicks a check box (or similar) to allow automatic device activation from AVL. c. A specified message notifying travelers of snowplow operations ahead will be automatically posted by the ATMS to DMS while AVL tracked snowplows are a specified distance away from a DMS location. d. The ATMS will automatically deactivate the message when the snowplow travels beyond the specified distance. e. The ATMS will automatically revert to the message of lower priority on the subject DMS.
Notes:	The ATMS shall recommend the Weather Level for each region based on the Weather Level definitions as defined by the system administrator.

Use Case ID:	**UC22**
Use Case Category:	Facility Management
Deployment:	Phase 2
Use Case Name:	**Gate Control and Access Monitor**
Description:	A user monitors and controls access to Turnpike access gates from the ATMS.
Preconditions:	• The ATMS user is logged into the system. • The ATMS is integrated with an Access Management System.
Normal Course:	**22.0: Gate Use Notification.** a. An authorized gate user opens a gate to enter or exit the Turnpike system. b. The ATMS provides an Alert to the user of the gate location, time of opening, and personnel ID. **22.1: Granting Gate Access.** a. The user selects a gate from a list or map layer within the ATMS. b. The user inputs the reason, person's name, company, and vehicle for which the gate was opened. c. The user clicks a button to temporarily unlock or open the gate.
Notes:	

Use Case ID:	**UC23**
Use Case Category:	Facility Management
Deployment:	Phase 3
Use Case Name:	**Truck Parking System Monitor**
Description:	A user can view the status of the truck parking system at each of the service plazas for which it is installed.
Preconditions:	• A user is logged into the ATMS. • The truck parking system is interfaced with the ATMS.
Normal Course:	**23.0: Truck Parking System is Monitored.** a. The user navigates to the Truck Parking System monitor b. The ATMS displays the status of each service plaza. c. The user clicks a service plaza from the list. d. The ATMS displays the current data for the rest area: current vehicle count, available spaces, daily vehicle count, etc. e. The user closes the Truck Parking System monitor. **23.1: The ATMS displays the Truck Parking System statuses on the Map.** a. The user navigates to the ATMS map b. The user turns on the layer holding the Truck Parking System locations. c. The ATMS displays an icon for each service plaza that is equipped with the system. d. The icon is color coded based on the status of the system at that rest area. For example: Green = spaces available, Red = full, Flashing Red = no status available.
Notes:	

5.0 SUMMARY OF OPERATIONAL USE CASES BY PHASE

PHASE 1

- UC1a - Creating User Groups
- UC1b - Add New Users
- UC1c - Edit User
- UC1d - Disable User
- UC1e - Remove User
- UC1f - User Messaging
- UC2a - Add New Device
- UC2b - Edit Device
- UC2c - Disable Device
- UC2d - Remove Device
- UC2e - DMS Message Management
- UC3a - Create/Edit Recommended Response Plan Settings
- UC3b - Manage Contact List
- UC3c - Map Management
- UC3d - Systems Settings Management
- UC4a - Traffic Flow Incident Detection
- UC4c - Waze Incident Detection
- UC4d - RCRS Incident Detection
- UC5a - Event Creation
- UC5b - Recommended Response Plan
- UC5c - Custom Response Plan
- UC5d - Activate Diversion Route
- UC5e - Notifications
- UC5g - Event Management and Closure
- UC5i - Planned Event Creation and Activation
- UC5j - Interface Failure Resolution
- UC6a - Traveler Information
- UC8 - CCTV Control and Sharing
- UC9a - DMS Message Creation
- UC9b - DMS Activation
- UC10 - Travel Time Message Activation
- UC11a - HAR Message Creation
- UC11b - HAR Activation
- UC11c - HAR Message Creation – Not Integrated (Alternative to UC10a)
- UC11d - HAR Activation – Not Integrated (Alternative to UC10b)
- UC12 - Fog Detection System
- UC18 - Device Failure Tracking
- UC19 - Asset Database
- UC20a - Performance Measure Reports
- UC20b - System Data Reports

PHASE 2

- UC5h - Backlog Calculator
- UC6b - Center-to-Center/PennDOT Sharing
- UC13a - Smart Work Zone
- UC13b - Smart Work Zone Alerting (Alternative to UC13)
- UC15a – Schedule Construction and Maintenance Lane Closure Events
- UC15b – Track/Manage Construction and Maintenance Lane Closure Events
- UC16 - Lane Closure Conflict Monitor
- UC17 - Device Failure Alert and Service Ticketing
- UC21 - Weather Alerts and Event Creation
- UC22 - Gate Control and Access Monitor

PHASE 3

- UC4b – Video Incident Detection
- UC5f - Linking Events
- UC7 - Vehicle Tracking (AVL)
- UC14 - Connected Vehicles
- UC21 - Weather Alerts and Event Creation (AVL portion)
- UC23 - Truck Parking System Monitor

APPENDIX M

SOLUTION REQUIREMENTS

TABLE OF CONTENTS

1.0 PURPOSE OF THE DOCUMENT 2
2.0 HIGH-LEVEL SOFTWARE NEEDS 2
3.0 FUNCTIONAL REQUIREMENTS 2
3.1 SYSTEMS ADMINISTRATION (SA) REQUIREMENTS 3
3.2 INCIDENT AND TRAFFIC MANAGEMENT (ITM) REQUIREMENTS 6
3.3 DEVICE CONTROL AND MONITORING (DCM) REQUIREMENTS 11
3.4 CONSTRUCTION AND MAINTENANCE MANAGEMENT (CMM) REQUIREMENTS 18
3.5 ASSET MANAGEMENT (AM) REQUIREMENTS 19
3.6 REPORTING (RR) REQUIREMENTS 20
3.7 WEATHER EVENT MANAGEMENT (WEM) REQUIREMENTS 21
3.8 FACILITY MANAGEMENT (FM) REQUIREMENTS 22
4.0 SUPPLEMENTAL REQUIREMENTS 22
4.1 PHYSICAL (PR) REQUIREMENTS 22
4.2 SOFTWARE PERFORMANCE (SR) REQUIREMENTS 23
4.3 LOGICAL DATA (LR) REQUIREMENTS 24
4.4 USER (UR) REQUIREMENTS 25
4.5 INFORMATION MANAGEMENT (IR) REQUIREMENTS 28
4.6 SYSTEM LIFECYCLE (SLR) REQUIREMENTS 29
4.7 VENDOR HOSTING (VH) REQUIREMENTS 29

1.0 PURPOSE OF THE DOCUMENT

The purpose of this document is to define the Solution Requirements for the Pennsylvania Turnpike Commission (Commission) Advanced Traffic Management System (ATMS) Solution. The Concept of Operations describes how the system will be used from the operator's, maintainer's, and manager's perspectives to manage traffic throughout the Turnpike system.

The Commission Project Management Team has identified specific requirements and tasks that an ATMS solution must be able to perform to support the Commission's Concept of Operations and Use Cases (Can be found in Appendix J). The purpose of this document is to describe the functionality necessary to perform the required tasks as a guide for future verification and testing. The document includes both functional and supplemental requirements. The functional requirements detail the particular behaviors that the ATMS solution shall perform; whereas the supplemental requirements include performance, interface, data and life cycle requirements that are crucial to developing an ATMS solution that is compatible with Commission standards. Therefore, at a minimum, all of the requirements listed within this document need to be incorporated into a successful ATMS package.

2.0 HIGH-LEVEL SOFTWARE NEEDS

The operational need identified is to provide a traffic management and emergency response system on a statewide basis. The new system will provide the ability to control all existing and planned ITS devices. A key element of the new system is the ability to aggregate all the disparate field data into a central database. These ATMS solution operational needs were identified as follows:

- Integrate existing and planned "stand alone" ITS systems into one system to monitor and control the ITS devices from a central location
- Predicate device and event operations on an intuitive Graphical User Interface (GUI) that utilizes a map to display existing and planned ITS devices (All operator functions handled through GUI)
- Capability for real-time traffic, incident/event, and construction information to be displayed by current and planned traveler information systems
- Capability to schedule ITS devices based on operational needs
- Capability for real-time communication/notification of all stakeholders
- Automated and on-demand reporting tools
- No downtime for purposes of scheduled maintenance and fail-over and redundant capability that ensures 24-hour by 7-day-per-week functionality
- Hardware based on existing infrastructure, requirements, and environment
- Developed and operated using Microsoft tools and includes standard computing security features
- State-of-the-art database with provisions for simple component upgrades, which is also expandable and scalable
- Real-time and archived ITS maintenance management and information tools, including asset management
- Support multiple proposer products and demonstrate compliance with NTCIP
- Extensive DMS, CCTV, traffic detection, travel time, event management, scheduled action, RWIS, HAR, and CAD/AVL features

These needs were organized into 8 categories for the purpose of developing specific functional requirements:

- System Administration
- Incident and Traffic Management
- Device Control and Monitoring
- Construction and Maintenance Management
- Asset Management
- Reporting
- Weather Event Management
- Facility Management

3.0 FUNCTIONAL REQUIREMENTS

The tables on the following pages document in detail the functional requirements of the software system. The requirements have been based on the Operational Use Cases detailed in Appendix J: Concept of Operations. Each functional requirement is related to its corresponding use case(s). These requirements, combined with the Supplemental Requirements defined in Section 4.0 are considered the minimum criteria that an ATMS solution must meet in order to sufficiently satisfy the needs of the Commission.

3.1 SYSTEMS ADMINISTRATION (SA) REQUIREMENTS

Functional Requirements for System Administration of the ATMS solution describe the functionality required for the Commission to effectively manage system users, devices, and control of system functions. The Commission requires that the ATMS provide the ability to configure and modify system settings to allow for changes in standard operating procedures, to provide the ability to configure automated functions to meet the real-time needs of the TOC, and to allow the Commission to fine tune the system to maximize efficiency. The business requirements related to system administration are documented under Use Cases UC1a through UC3d.

ID	Functional Requirement Definition	Related Use-Case(s)
	User Management	
SA-1	The ATMS solution shall provide the ability to assign specific users with Administrative privileges.	UC1a, UC1b
SA-2	The ATMS solution shall provide the ability for an Administrator to create custom user groups, assign users, and assign access privileges to each group and customize these privileges to users within the groups.	UC1a
SA-3	The ATMS solution shall provide the ability for an ATMS user with sufficient privileges to add new users and to edit user information and privileges.	UC1b, UC1c
SA-4	The ATMS solution shall provide the ability for an ATMS user with sufficient privileges to edit user attributes. The software shall allow the editing of multiple users simultaneously, as applicable.	UC1c
SA-5	The ATMS solution shall provide the ability for an ATMS user with sufficient privileges to disable or remove (decommission) users.	UC1d, UC1e
SA-6	The ATMS solution shall provide the ability for an ATMS Administrator to send email messages to individual users, user groups, or all users.	UC1f
	Device Management	
SA-7	The ATMS solution shall allow an ATMS user with sufficient privileges to add ITS devices. The system shall provide the ability to populate all device information in a single screen or collection of tabbed screens intended to logically organize attribute fields for ease of entry.	UC2a
SA-8	The ATMS solution shall provide the functionality for an ATMS user with sufficient privileges to copy the base attributes of an existing device to create a new device.	UC2a
SA-9	The ATMS solution shall allow an ATMS user with sufficient privileges to add “phantom” devices to the system. A “phantom” device is defined as a device with a location near Commission facilities that is owned and operated by an adjacent agency.	UC2a
SA-10	The ATMS solution shall allow “phantom” devices to be recommended for and associated with an Event to be “activated” through contacting the owner of that device. Contact information shall be made available to the user to activate/deactivate a phantom device.	UC2a, UC5g
SA-11	The ATMS solution shall allow an ATMS user with sufficient privileges to edit ITS device attributes and information.	UC2b
SA-12	The ATMS solution shall allow an ATMS user with sufficient privileges to disable ITS devices.	UC2c
SA-13	The ATMS solution shall allow an ATMS user with sufficient privileges to remove (decommission) ITS devices.	UC2d

ID	Functional Requirement Definition	Related Use-Case(s)
SA-14	The ATMS solution shall allow an ATMS user with sufficient privileges to create and store custom messages and message templates in a DMS message library.	UC2e
SA-15	The ATMS solution shall allow an ATMS user with sufficient privileges to organize the DMS message library into folders and subfolders.	UC2e
SA-16	The ATMS solution shall allow an ATMS user with sufficient privileges to edit/delete existing DMS messages and templates from the DMS message library.	UC2e
SA-17	The ATMS solution shall allow an ATMS user with sufficient privileges to assign and edit priority levels to DMS messages. A default priority level will be assigned if not assigned by a user at the time of creation.	UC2e
SA-18	The ATMS solution shall allow an ATMS user with sufficient privileges to create and store custom messages and message templates in a HAR message library.	UC2e
SA-19	The ATMS solution shall allow an ATMS user with sufficient privileges to organize HAR message library into folders and subfolders.	UC2e
SA-20	The ATMS solution shall allow an ATMS user with sufficient privileges to edit/delete existing HAR messages.	UC2e
SA-21	The ATMS solution shall allow an ATMS user with sufficient privileges to assign and edit priority levels to HAR messages. A default priority level will be assigned if not assigned by a user at the time of creation.	UC2e
Recommended Response Plan Management		
SA-22	The ATMS solution shall provide a user with sufficient privileges with the ability to add to and edit business rules (e.g. look up tables, settings) used to provide the device selection logic for Recommended Response Plans.	UC3a
SA-23	The ATMS solution shall provide a user with sufficient privileges with the ability to add to and edit business rules (e.g. look up tables, settings) used to provide the message selection logic for Recommended Response Plans.	UC3a
SA-24	The ATMS solution shall provide a user with sufficient privileges with the ability to edit the assigned default device and message selections for all of the prepopulated diversion routes (Plan X's).	UC3a, UC3b
SA-25	The ATMS solution shall provide a user with sufficient privileges with the ability to add and edit contacts in the system contact list. The user shall also have the ability to edit rules for assigning a contact to an Event Notification List. The ATMS shall have the ability to integrate with Microsoft Exchange to manage contacts lists and distribution lists.	UC3a, UC3b
Map Management		
SA-26	The ATMS solution shall allow the ATMS users with sufficient privileges to edit map settings. At a minimum, configurable map settings shall include: • Ability to modify device icon placement • Ability to customize/change device icon images • Ability to configure device status colors and display characteristics • Ability to enable/disable mouse over display per device type	UC3c

ID	Functional Requirement Definition	Related Use-Case(s)
SA-27	The ATMS solution shall allow the ATMS users with sufficient privileges to configure map layers. At a minimum configurable map settings shall include: • Ability to enable/disable map layers • Ability to customize default map layers • Ability to customize base (always on) layers • Ability to create and modify layer groups • Ability to update/modify base layers (e.g. update GIS mapping data) • Ability for layer customization to be retained by each user account	UC3c
	System Settings	
SA-28	The ATMS solution shall provide an area within the GUI for the ATMS Administrator to access all system settings. The setting shall be logically organized for ease of user navigation.	UC3d
SA-29	The ATMS solution shall allow the ATMS user with sufficient privileges to manage and configure all visual and audible system alarm and alert settings and thresholds. At a minimum, configurable alarm and alert settings shall include: • Ability to enable/disable all alerts and alarms. • Ability to modify all alert and alarm triggers or thresholds. • Ability to enable/disable visual alert and alarm notifications. • Ability to enable/disable audible alert and alarm notifications. • Ability to customize/change audible sounds.	UC3d
SA-30	The ATMS solution shall allow the ATMS user with sufficient privileges to manage and configure all Lane Conflict Monitor (UC16) and nearby event conflict (UC5g) settings. At a minimum, configurable Lane Conflict Monitor settings will include: • Ability to configure restricted holiday hours and lane charts. • Ability to configure conflict thresholds. (e.g. distance between Events) • Ability to clear false alerts or alarms. • Ability to configure email/text message recipients list for conflict notifications.	UC3d
SA-31	The ATMS solution shall allow the ATMS user with sufficient privileges to manage and configure all incident detection settings and thresholds. At a minimum, configurable incident detection settings shall include: • Ability to enable/disable roadway segments from monitoring for incidents. • Ability to configure speed data detection thresholds for individual roadway segments or ranges based on various baselines, such as posted speed limit, historical speed data, etc. • Ability to enable/disable incident detection from individual sources (speed data, WAZE, RCRS, etc.), either globally or configured to specific roadway segments. • Ability to manage alerts and alarms. • Ability to define the off-system roadways (PennDOT facilities), distance from the Turnpike, and direction of travel for filtering applicable incident alerts from any of the applicable incident data sources.	UC3d
SA-32	The ATMS solution shall allow the ATMS user with sufficient privileges to manage and configure all travel time engine settings and thresholds. At a minimum, configurable travel time engine settings shall include: • Ability to configure travel time refresh rate settings. • Ability to configure thresholds to trigger warning messages. • Ability to configure the traffic data level of confidence needed for travel time posting. • Ability to configure the thresholds for automatic disabling/enabling of travel time messages if traffic data level of confidence falls below/rises above the required level.	UC3d

ID	Functional Requirement Definition	Related Use-Case(s)
SA-33	The ATMS solution shall allow the ATMS user with sufficient privileges to manage and configure all Weather Event setting and thresholds. At a minimum, configurable Weather Event setting shall include: • Ability to configure RWIS data alert threshold levels • Ability to configure RWIS data alert automatic notification list • Ability to configure Weather Event forecast alert settings • Ability to configure Commission Weather Level settings and thresholds • Ability to enable/disable/configure AVL device activation settings	UC3d, UC21
SA-34	The ATMS solution shall allow the ATMS user with sufficient privileges to manage and define all default values that prepopulate fields that require an input. E.g. the default scheduled event reminder time.	UC3d

3.2 INCIDENT AND TRAFFIC MANAGEMENT (ITM) REQUIREMENTS

Functional Requirements for Incident and Traffic Management functions of the ATMS solution describe the functionality required for the Commission to effectively manage ITS systems for traffic events and responding to incidents. The Commission currently manages on scene response for roadway events and incidents with a Computer Aided Dispatch System (CADS). The ATMS is required to integrate with the CAD system to accept live incident response data, and integrate with other internal and external data sources to provide ATMS users with all of the important incident information required to effectively and efficiently manage ITS and disseminate information to the public and external agencies. The business requirements related to Incident and Traffic Management are documented under Use Cases UC4a through UC6b.

ID	Functional Requirement Definition	Related Use-Case(s)
	Incident Detection Requirements	
ITM-1	The ATMS solution shall have the ability to process real time traffic probe data against historical traffic data to detect roadway congestion and alert the user of a potential incident.	UC4a
ITM-2	The ATMS solution shall have the ability to receive an alert from a video analytics detection system and alert the ATMS user of a potential incident.	UC4b
ITM-3	The ATMS solution shall have the ability to receive WAZE data and alert the ATMS user of a potential incident. These Alerts shall be configurable based on type, rating level, confidence level, and/or reliability level.	UC4c
ITM-4	The ATMS solution shall have the ability to receive PennDOT RCRS data and alert the ATMS user of an incident.	UC4d, UC6b
ITM-5	The ATMS solution shall have the ability to sound a visual and/or audible alarm if the user has not acknowledged the alert in a configurable period of time.	UC4a, UC4c, UC4d (UC4b)
ITM-6	When a potential incident is detected through any of the incident detection methods (traffic speed data, video analytics, WAZE, RCRS), the ATMS solution shall have the ability to highlight the nearby CCTV video feed on the video wall with a flashing red border or similar.	UC4a, UC4c, UC4d, (UC4b)
	Incident Management Requirements	
ITM-7	The ATMS solution shall interface with the existing Commission Computer Aided Dispatch (CAD) System (Intergraph) to receive a live incident feed (xml).	UC5a, UC5g
ITM-8	The ATMS solution shall automatically generate an Event using incident data from the CADS interface and populate and update Event data fields with data passed through the interface. Passed data to be displayed will be coordinated with the Commission.	UC5a, UC5g

ID	Functional Requirement Definition	Related Use-Case(s)
ITM-9	The ATMS solution shall have the ability to filter specific incident types to trigger the creation of an Event. These incident types are discernable through specific data fields in the CADS data feed (xml). The system administrator shall have the ability to configure the incident type filter.	UC5a, UC5g
ITM-10	The ATMS solution shall refresh all Event data from updated CADS data (xml) and create all new Events from CADS data (xml) within 1 second of the update being made to the xml.	UC5a, UC5g
ITM-11	The ATMS solution shall not allow an ATMS user to edit data fields that are being updated by the CADS interface.	UC5a, UC5g
ITM-12	The ATMS solution shall recognize the failure of the CADS interface through recognition of a timeout period (configurable) and/or monitoring CADS error log files. If the interface fails during an open Event that had been generated by the interface, the ATMS shall recognize the failure and allow the ATMS user to edit those fields.	UC5j
ITM-13	In the case of a CADS interface failure of any length of time, when the interface is restored, the ATMS shall reconcile all new (filtered) CADS events with any active (non-CADS interface generated) ATMS Events. The user must confirm the pairing of the CADS Event and ATMS Events. For new CADS generated Events that are not paired, a new ATMS Event shall be created.	UC5j
ITM-14	The ATMS solution shall allow authorized users to manually disable the CADS interface at any time. If the interface is disabled during an open Event that had been generated by the interface, the ATMS shall allow the ATMS user to edit those fields.	UC5g
ITM-15	If the CADS interface has failed, or been manually disabled, the ATMS solution shall allow authorized users to create and manage ATMS Events.	UC5a, UC5g
ITM-16	The ATMS solution shall automatically generate a unique ID number for all Events. The format of this number shall be coordinated with the Commission.	UC5a
ITM-17	The ATMS solution shall display the CADS incident ID number within the interface generated Event.	UC5a, UC5g
ITM-18	The ATMS solution shall allow a user with sufficient privileges to create an Event.	UC5a
ITM-19	The ATMS solution shall keep record of all data field updates, by whom, and when the update was made within the Event.	UC5g, UC20a
ITM-20	The ATMS solution shall have the ability to immediately alert the ATMS user (visually and/or audibly – configurable) that an Event has been created by the CADS interface and alert the user (visually and/or audibly - configurable) if the event is not acknowledged in a configurable period of time.	UC5a
ITM-21	The ATMS solution shall provide the ability to view a searchable DMS list and message library, HAR list and message library, and contact list from within an Event window to select devices and contacts for the Event.	UC5c, UC5g
ITM-22	The ATMS solution shall provide the ability to create and save a DMS message or HAR message directly from an Event and to use in an Event.	UC5c, UC5g

ID	Functional Requirement Definition	Related Use-Case(s)
ITM-23	The ATMS solution shall provide the ability for the user to view an Event map view. This view shall display all devices currently active (or queued) under the Event as well as devices not associated with the Event to allow the user to identify any devices that were missed. The view shall denote devices that are active under the Event but are currently queued behind higher priority messages. This map view shall be a resizable window or similar to provide a user with a visual aid to show current device activations for an any single event, separate from the system map.	UC5c, UC5g
ITM-24	The ATMS solution shall allow a user to remove devices from an Event. If the device is activated under that Event, the ATMS shall prompt the user to confirm the action and shall deactivate the associated device and message.	UC5c, UC5g
ITM-25	The ATMS solution shall allow a user to activate the devices and messages in an Event all at once, some, or individually.	UC5c, UC5g
ITM-26	The ATMS solution shall allow a user to deactivate the devices in an Event all at once, some, or individually.	UC5c, UC5g
ITM-27	The ATMS solution shall allow a user to change the message currently playing on a device within an Event.	UC5c, UC5g
ITM-28	The ATMS solution shall present the notification list within the Event. Each contact added to the list shall have a check box (or similar) located next to the contact for the user to “check off” when a notification has been made.	UC5b, UC5c, UC5g
ITM-29	The ATMS solution shall allow a user to send notifications via email or text to the contacts populated onto the notification list. When the email or text notification is sent by the user, the ATMS shall automatically check the box (or similar) next to the contact in the notification list, and shall record when and what message was sent to the contact and display the information within the notification list.	UC5b, UC5c, UC5g
ITM-30	The ATMS solution shall allow a user to check a check box (or similar) next to a contact for notifications made manually (by phone/radio/other). The user shall have the ability to enter text with details of the notification within the notification list. The ATMS will record when this action was completed and will display the timestamp in the notification list.	UC5e, UC5g
ITM-31	The ATMS solution shall provide the ability for a user to send an Event update message the existing Commission Emergency Notification System (ENS). The ATMS will prepopulate the message by concatenating Event details into a sentence. The user can send the message to the ENS system as is or modify. The ATMS shall keep record of each of these sent messages, the user who sent the message, and the time at which it was sent.	UC5e, UC5g
ITM-32	The ATMS solution shall display within an Event, each of the messages sent to the ENS system with a timestamp to assist the user in managing the updates to ENS.	UC5e, UC5g
ITM-33	The ATMS solution shall provide the ability to close an Event. When an Event is closed, all messages currently being played (or in a device queue) will be deactivated (removed from the queue).	UC5g
ITM-34	The ATMS solution shall automatically update all external interfaces with device message and status information. (e.g. ENS will need to have live device status (active or inactive) and message playing to update external traveler information systems (TripTalk, Commission webmap, 511, etc.).	UC5g

ID	Functional Requirement Definition	Related Use-Case(s)
ITM-35	The ATMS solution shall provide a history of all DMS messages and HAR messages that have been posted by each individual sign, including when they were posted, when they were deactivated, by whom, and the associated Event number under which it was activated.	UC20a, UC20b
	Recommended Response Plan Requirements	
ITM-36	The ATMS solution shall have the ability to generate a recommended response plan based on populated Event information. A recommended response plan shall consist of recommended DMS and HAR devices (including phantom devices) , recommended device messages, and a notifications list of contacts from the contact list selected automatically by the ATMS based on configurable business rules and current populated Event information.	UC5b
ITM-37	The ATMS solution shall allow a user to click to generate or update a recommended response plan for an Event. If devices had already been added to an Event, via a previously generated response plan or added by the user, the newly generated response plan shall not remove those devices and associated messages from the list of devices.	UC5b
ITM-38	The ATMS solution shall automatically execute the generation of a recommended response plan in an Event that has been generated by the CADS interface.	UC5b
ITM-39	The ATMS solution shall have the ability to store pre-defined diversion routes and configurable template response plans (Plan X) to populate an Event. • Diversion route (Plan X) information will be provided. • The template response plan shall be configurable (e.g. devices and messages, and notification list) for each diversion route (Plan X). • The ATMS shall store supporting reference documentation (.pdf, .tiff, .jpeg, .doc, etc.) for each diversion route (Plan X). • A graphical representation highlighting the roadway shall be created for each diversion route (Plan X) to be displayed on the ATMS map.	UC5d
ITM-40	The ATMS solution shall allow the user the ability to activate a diversion route (Plan X) within an Event. When a diversion route (Plan X) is activated, the route will be shown on the map as active.	UC5d
	Linking Event Requirements	
ITM-41	The ATMS solution shall alert the users when an Event is in proximity or in conflict (configurable) with a currently active Event. This includes construction and maintenance Events and planned events (configurable on subtype).	UC5g
ITM-42	The ATMS solution shall allow the user to link one or more Events to manage concurrently, while maintaining separate database records of each Event.	UC5f
ITM-43	The ATMS solution shall allow the user to manage the linked Events' information separately (e.g. make notifications, update Event details, notes) and combine management of the linked Events' devices.	UC5f
ITM-44	The ATMS solution shall log activations/deactivations for the devices managed within a linked event separately in each of the database records for each individual Event and also track the linked status of the Events.	UC5f
ITM-45	The ATMS solution shall allow the user to close or unlink individual Event(s) in a linked Event. The software shall maintain an accurate and consistent Event and Device history in the records.	UC5f, UC5g, UC20a, UC20b

ID	Functional Requirement Definition	Related Use-Case(s)
	DMS/HAR Message Priority Requirements	
ITM-46	The ATMS solution shall track and manage the priority of all messages that have been sent to be displayed on devices.	UC5a, UC5b, UC5c, UC5d, UC5g, UC5i
ITM-47	When a message is sent to a device for activation (or deactivation) from an Event, the ATMS shall keep record that the device and message was activated (or deactivated) at that time regardless of whether the message was displayed or placed in the queue behind higher priority message (Device activation logs). Additionally, the ATMS shall keep record of the messages that were displayed on each device, times/duration, priority level, and from which Event (Device display logs).	UC5a, UC5b, UC5c, UC5d, UC5g, UC5i
ITM-48	The ATMS solution shall automatically play a message of higher priority on a device. The lower priority message shall be moved into the queue for that device.	UC5a, UC5b, UC5c, UC5d, UC5g, UC5i
ITM-49	If two message of the same priority are assigned to the same device, and both messages are single page messages; with user approval - the ATMS shall automatically combine the two single page messages into two page message.	UC5a, UC5b, UC5c, UC5d, UC5g, UC5i
ITM-50	If two messages of the same priority are assigned to the same device, and one (or both) of the messages has two pages, the ATMS shall prompt the user to resolve the conflict. Until the conflict is resolved, the message that was first assigned shall continue to be displayed.	UC5a, UC5b, UC5c, UC5d, UC5g, UC5i
ITM-51	On the deactivation of a message on a device from an Event, the ATMS solution shall update the device to play the next highest priority message in the queue or remove that message from the queue.	UC5a, UC5b, UC5c, UC5d, UC5g, UC5i
ITM-52	When a device message is deactivated through an Event or Event closure, the ATMS solution shall notify the user that the device is being activated with the next message from the queue. The notification shall detail the new message and the Event ID from which it was assigned. The user shall be able to click on the event ID to open the event.	UC5a, UC5b, UC5c, UC5d, UC5g, UC5i
ITM-53	The ATMS shall not recommend devices that have a disabled or off-line status. However, the ATMS shall prompt the user if a device would become enabled and is in the recommended response area (meets the business rules for recommendation) of an active Event. The ATMS shall also recommend a message based on current Event information.	UC5b
ITM-54	The ATMS shall provide the ability to view the message queue for all applicable devices.	UC5G, UC9b, UC11b
	Backlog Calculator Requirements	
ITM-55	The ATMS solution shall have the ability to calculate and display backlog per Event based on inputted Event data, historical and/or live traffic data.	UC5h
ITM-56	The ATMS solution shall display calculated backlog information (For each applicable Event) in the form of countdown time until a 3 mile backlog, 5 mile backlog, and/or when the backlog is anticipated to reach an interchange. This information shall be displayed in each active Event window.	UC5h
ITM-57	The ATMS solution shall maintain a history of calculated backlog data for each Event. The stored history shall be consistent with the Commission's data retention policy.	UC20a, UC20b
	Planned/Scheduled Events Requirements	
ITM-58	The ATMS solution shall allow the ATMS User the ability to create and edit a Planned Event for scheduling device activations/deactivations, contact notifications.	UC5i

ID	Functional Requirement Definition	Related Use-Case(s)
ITM-59	The ATMS solution shall allow the user the ability to input start and end time and date of the Planned Events. The Planned Event can be open ended.	UC5i
ITM-60	The ATMS solution shall allow the user the ability to save a planned event in the system for future/repeated use or as a template.	UC5i
ITM-61	The ATMS solution shall allow the user to schedule device activations/deactivations for a set duration (time/date to time/date) or on a Time of Day (TOD) schedule.	UC5i
ITM-62	The ATMS solution shall allow the user to schedule a custom notification time (reminder) to be presented to the user before the scheduled activation of the Planned Event. A minimum/maximum configurable notification time shall be configurable by a System Administrator.	UC5i
ITM-63	The ATMS solution shall provide the ability to edit, cancel, or close a Planned Event regardless of the status of the Planned Event.	UC5i
Traveler Information Requirements		
ITM-64	The ATMS solution shall have the ability to allow the ATMS User the ability to send traveler information to multiple external systems.	UC6a
ITM-65	The ATMS shall interface with the ENS system to share device and Event data.	UC6a
ITM-66	The ATMS shall have the ability to export device activation/deactivation and message data to ENS in real-time.	UC6a
ITM-67	The ATMS shall have the ability to export Event update messages to ENS in real-time.	UC6a
ITM-68	The ATMS shall expose data (input and output) through Web services and a well-defined API for use by other Commission systems, external partners and systems.	UC6a
ITM-69	The ATMS shall share information to and from PennDOT's ATMS system.	UC6b

3.3 DEVICE CONTROL AND MONITORING (DCM) REQUIREMENTS

Functional Requirements for the control and monitoring of ITS devices describe the tasks that the ATMS solution must support in order to provide the Commission with the functionality needed to perform routine ITS device tasks as well as utilize ITS devices to respond to incidents and events along and adjacent to the Turnpike System. The ITS devices currently anticipated to be integrated into the new ATMS include Closed Circuit Television Cameras (CCTV), Dynamic Message Signs (DMS), Highway Advisory Radios (HARs), Vehicle Detection Data, Automated Fog Detection, Smart Work Zones, Automated Vehicle Tracking (AVL), and Connected Vehicles. The business requirements related to the operations of these devices and systems are documented under Use Cases UC7 through UC14.

ID	Functional Requirement Definition	Related Use-Case(s)
General ITS Device Control and Monitoring Requirements		
DCM-1	The ATMS solution shall allow Commission operators to filter ITS device/vehicle data based on device/vehicle type, identifier, or location.	UC7, UC8, UC9b, UC11b, UC12, UC14
DCM-2	The ATMS solution shall provide users the capability to generate a list of equipment and their status (e.g. successful or not successful) and equipment health for a selected date or date range. This can be user activated or scheduled, and must be confirmed by the user.	UC7, UC8, UC9b, UC11b, UC12, UC14, UC19
DCM-3	The ATMS solution shall allow for monitoring and remote diagnostics of field equipment.	UC7, UC8, UC9b, UC11b, UC12, UC14, UC18, UC20a

ID	Functional Requirement Definition	Related Use-Case(s)
DCM-4	The ATMS solution shall display any device/vehicle error when selecting the device/vehicle from the list or map.	UC7, UC8, UC9b, UC11b, UC12, UC14
DCM-5	Device/vehicle icons shall be colored or otherwise highlighted in such a way as to identify devices that are in error.	UC3a, UC7, UC8, UC9b, UC11b, UC12, UC14
DCM-6	The ATMS solution shall allow for authorized users to share or hand-off control of ITS devices within the TOC i.e. a device shall not be locked into control by a single user at any time.	UC8, UC9a, UC11a, UC12, UC13a, UC14
Automated Vehicle Location (AVL) Specific Device Control and Monitoring Requirements		
DCM-7	The ATMS solution shall display vehicle location data in real time.	UC7
DCM-8	The ATMS solution shall allow operators to view all AVL-equipped Commission vehicles at any time via a list and icon on the map. Map icons shall be configurable based on vehicle type.	UC7
DCM-9	Map icons shall indicate vehicle location in real time.	UC7
DCM-10	The ATMS solution shall provide vehicle type, vehicle identifier, GPS location, time of data collection, vehicle status, and any other data transmitted through the AVL system to operators. This information shall be available by hovering over the vehicle icon on the map or selecting the vehicle from a list.	UC7
DCM-11	The ATMS solution shall allow authorized users to configure system timeouts for static vehicles. Administrators shall have the ability to remove static vehicles from maps or lists of active vehicles.	UC7
DCM-12	The ATMS solution shall record and archive historical vehicle location data.	UC7, UC20a, UC20b
DCM-13	The ATMS solution shall be capable of providing an AVL data feed to external software programs.	UC3d, UC7, UC20b
Closed Circuit Television (CCTV) Specific Device Control and Monitoring Requirements		
DCM-14	The ATMS solution shall provide operators the ability to access CCTV video feeds through both a list or by clicking on an icon on the map.	UC8
DCM-15	The ATMS solution shall provide operators the ability to manually control CCTV cameras by panning, tilting, and zooming the camera, accessing preset positions, and adjusting the camera's focus and iris settings. These functions shall be performed with no discernable lag in the response of the camera.	UC8
DCM-16	PTZ control of CCTV cameras shall be accomplished through either the use of a keyboard, or virtual joystick within the ATMS solution.	UC8
DCM-17	The ATMS solution shall allow authorized users the ability to select preset camera views.	UC8
DCM-18	The ATMS solution shall allow the configuration of up to six preset views for each CCTV camera.	UC8
DCM-19	The ATMS solution shall allow authorized users to create and modify video tours and camera sequences.	UC8
DCM-20	The ATMS solution shall allow the customization of video tours and sequences by number of cameras/views and transition rates between cameras and views.	UC8

ID	Functional Requirement Definition	Related Use-Case(s)
DCM-21	The ATMS solution shall allow authorized users to tile images from multiple camera feeds in a separate window to create a virtual video wall. Creation of the virtual video wall tiled display have a drag-and-drop capability.	UC8
DCM-22	The ATMS solution shall provide the user the ability to configure virtual video walls to display from one to up to 9 simultaneous tiled camera streams.	UC8
DCM-23	The ATMS solution shall allow users to save virtual video wall layouts as favorites which can be accessible locally to the user as well as globally.	UC8
DCM-24	The ATMS solution shall allow authorized users to share video feeds and virtual video walls with other authorized users.	UC8
DCM-25	The ATMS solution shall allow authorized users to take and save snapshots from video feeds or camera layouts.	UC8
DCM-26	The ATMS solution shall allow authorized users to push CCTV snapshots to the PA 511 website as well as ENS.	UC8
Dynamic Message Sign (DMS) Specific Device Control and Monitoring Requirements		
DCM-27	The ATMS solution shall display the current DMS message when selecting a DMS from a list or by hovering over a DMS icon on the map.	UC2e
DCM-28	Within the system map and device lists, the ATMS shall identify DMS that are within transmission range of an HAR transmitter.	UC2a, UC3a
DCM-29	The ATMS solution shall provide all DMS diagnostic data (e.g. errors, temperature, settings) when selected.	UC20a, UC20b
DCM-30	The ATMS solution shall provide authorized users the capability to create and display messages on DMS.	UC9a, UC9b
DCM-31	The ATMS solution shall associate each DMS activations with an Event. Multiple DMS activations can be associated with a single Event.	UC5a, UC5b, UC5c, UC5i, UC6a
DCM-32	The ATMS solution shall allow the user to select DMS to activate from the map, from a list, or from within an Event.	UC5g, UC9a
DCM-33	The ATMS solution shall not allow authorized users to create messages that fall outside of the allowable parameters of the individual device (e.g. number of characters, number of lines, font/image constraints). A WYSIWYG style input shall be used by the user to create the message. The WYSIWYG screen shall not allow the user to enter message outside of the constraints defined above.	UC9a
DCM-34	The ATMS solution shall allow authorized users to select from a pre-populated library of messages for each sign type. The authorized user shall have the ability to modify or copy (for editing new) pre-populated messages based on library rules.	UC2e, UC9a
DCM-35	Authorized users shall have the ability to modify or copy (for editing new) pre-populated messages based on library rules.	UC2e, UC9a
DCM-36	Custom Messages (Free-formatted messages entered by the user) shall not be automatically saved in the message library.	UC 2e, UC9a
DCM-37	The ATMS solution shall allow authorized users to select from a pre-populated library of graphics for each sign.	UC2e, UC9a

ID	Functional Requirement Definition	Related Use-Case(s)
DCM-38	The ATMS solution shall have a conflict monitor to verify selected fonts, text, and graphics are appropriate for a given sign type and sign location. For example, users shall not be able to select a message with 6" characters for a roadway where MUTCD requirements dictate a character height of 12" or 18" characters.	UC2e, UC9a
DCM-39	If multiple messages are sent to a sign for posting, the ATMS shall queue the message based on the assigned message priority.	UC2e, UC9a
DCM-40	If multiple messages of the same priority are assigned to a sign for posting, the user will be provided with an alert and prompted to select the desired message.	UC2e, UC9a
DCM-41	"Blank" shall be a user-selectable command that overrides all messages in the queue.	UC9a
DCM-42	The ATMS solution shall maintain a list of forbidden words and prevent a message with a forbidden word from being posted to a DMS. This list shall be configurable by a systems administrator.	UC2e, UC9a, UC9b
DCM-43	The ATMS solution shall require the operator to identify a priority for each message based on a selectable list. If no priority is manually assigned, the message will be automatically given a priority level defined by a systems administrator.	UC2e, UC9a
DCM-44	The ATMS solution shall allow authorized users to manually activate and de-activate messages on DMS through the map, list, or Event.	UC9b
DCM-45	The ATMS solution shall allow authorized users to manually adjust the brightness of each DMS.	UC9b
DCM-46	The ATMS solution shall provide the ability to post a message to multiple DMS simultaneously.	UC9b
DCM-47	The ATMS solution shall provide the ability to remove messages from multiple DMS simultaneously.	UC9b
DCM-48	The ATMS solution shall provide confirmation once a message has been sent to a DMS, sent a command to remove from a DMS, or if a queued DMS message has posted.	UC9b
DCM-49	The ATMS solution shall alert the operator if a message failed to post due to a communications or other error, or if a message of higher-priority is already posted to the sign.	UC9b
DCM-50	The ATMS solution shall provide the ability to automatically update DMS messages when inputted data changes (e.g. travel time, temperature).	UC9b
DCM-51	The ATMS solution shall not allow a message to be posted to a DMS that has pixel errors exceeding a pre-defined threshold, however the user may override and post the message. These manual overrides shall be logged by the ATMS.	UC9b
DCM-52	The ATMS solution shall provide a history of all DMS messages that have been posted by each individual sign, including when they were posted, when they were deactivated, by whom, and the associated Event number under which it was activated. The stored history shall be consistent with the Commission's data retention policy.	UC20a, UC20b
Travel Time Specific Device Control and Monitoring Requirements		
DCM-53	The ATMS solution shall utilize and prioritize all Commission traffic data sources for the purpose of generating travel times.	UC4a, UC10

ID	Functional Requirement Definition	Related Use-Case(s)
DCM-54	The ATMS solution shall only utilize real-time data for the generation of travel times. If real-time data is not available, travel times will not be generated for the specific Origin-Destination link.	UC10
DCM-55	The ATMS solution shall consolidate vehicle detection/speed data into travel time segments and aggregate travel time segments into user defined Origin/Destination routes for display through the ATMS solution and posting to DMS.	UC10
DCM-56	Travel time links and routes shall be configurable and customizable through the ATMS solution. Routes shall be auto-aggregated based on user-defined origins and destinations.	UC10
DCM-57	The ATMS solution shall display all travel time routes through a list display.	UC10
DCM-58	The ATMS solution shall facilitate the automated display of travel times on DMS.	UC9b, UC10
DCM-59	Automated travel time messages shall have a predetermined DMS message priority.	UC9b, UC10
DCM-60	The ATMS solution shall allow the deactivation of travel time messages through the posting of a higher-priority message, or a manual blanking of the sign.	UC9b, UC12
DCM-61	The ATMS solution shall automatically update the travel times displayed on DMS as they change. The update interval shall be configurable.	UC9b, UC10
DCM-62	Travel times which would correlate to a travel speed exceeding the posted speed limit shall not be posted. Example: If calculated travel times exceed a correlated travel speed of 60 miles per hour, a travel time corresponding to a travel speed of 60 miles per hour shall be displayed on the DMS (e.g. no less than 20 minutes for a 20 mile link). However this shall also be configurable as a system administrative setting.	UC2e, UC3d, UC10
DCM-63	The ATMS solution shall alert operators if a travel time along a link or route exceeds a user-defined threshold. The intent of this alert is to notify operators of potential incidents or non-recurrent congestion.	UC4a, UC10
DCM-64	If travel time exceeds a user-defined threshold, the ATMS solution shall have the ability to post an auto-generated message to the DMS approaching/within the affected area. Messages, thresholds, and affected areas shall be administrator configurable and selectable. For example, if a user sets up a 15 minute travel time threshold for a five mile O-D link, and that threshold is exceeded, the DMS will automatically post a message similar to the following “Incident I-476 NB / Expect Delays”.	UC2e, UC3d, UC10
DCM-65	The ATMS solution shall not post travel times to DMS if any segment as part of a defined route has no real-time data or if real-time data falls below a specified confidence level.	UC 9b, UC10
DCM-66	The ATMS solution shall not post/repost travel times to DMS until user specified threshold of consecutive real-time data reports are met to ensure that real-time data will be maintained.	UC2e, UC3d, UC10
DCM-67	The ATMS solution shall associate all travel time message DMS activations with an Event. Multiple travel time DMS activations can be associated with a single Event.	UC5i, UC6a, UC9a
DCM-68	The ATMS solution shall provide a history of all travel time DMS messages that have been posted by each individual sign, including when they were posted, when they were deactivated, by whom, and the associated Event number under which it was activated. The stored history shall be consistent with the Commission’s data retention policy.	UC20a, UC20b
DCM-69	The ATMS solution shall record and archive historical travel time data.	UC10, UC20a, UC20b

ID	Functional Requirement Definition	Related Use-Case(s)
Highway Advisory Radio (HAR) Specific Device Control and Monitoring Requirements		
DCM-70	The ATMS solution shall directly interface with the HAR field devices or through software to software integration with the existing Platinum SIM.	UC3d, UC19
DCM-71	The current HAR message shall be displayed when selecting a device from a list or by hovering over an icon on the map.	UC2e
DCM-72	The ATMS solution shall provide the ability for authorized users to create, manage, and post messages to HAR transmitters and activate HAR beacon signs.	UC 11a, UC11b
DCM-73	The ATMS solution shall associate all HAR activations with an Event. Multiple HAR activations can be associated with a single Event. These associations shall only include Event-specific activations and not default HAR safety messages.	UC5c, UC5g, UC11b
DCM-74	The ATMS solution shall allow authorized users to select from a pre-populated library of messages for each HAR. Authorized users shall have the ability to modify or copy (for editing new) entire pre-populated messages based on library rules.	UC2e, UC11a
DCM-75	Authorized users shall have the ability to modify or copy (for editing new) entire pre-populated messages based on library rules.	UC2e, UC11a
DCM-76	Custom Messages (Free-formatted messages entered by the user) shall not be automatically saved in the message library.	UC2e, UC11a
DCM-77	The ATMS solution shall support the importing of existing Commission HAR dictionaries and message libraries.	UC2e
DCM-78	The ATMS solution shall support text-to-voice HAR message creation as well as audio recording. The current text-to-voice software used by Platinum shall be used in ATMS, unless otherwise approved by the Commission.	UC11a
DCM-79	The ATMS solution shall provide the ability to post a message to multiple HAR stations simultaneously through the map, list, or Event.	UC11b
DCM-80	The ATMS solution shall provide the ability to remove messages from multiple HAR simultaneously.	UC11b
DCM-81	The ATMS solution shall provide the ability for users to listen to the advisory messages both before and after the message is posted to the HAR device. After posting, the message that is heard shall be direct from the HAR device.	UC11b
DCM-82	HAR beacon activation/deactivation shall be automatically tied to HAR message activation/deactivation.	UC11b
DCM-83	The ATMS solution shall provide confirmation once a message has been sent to a HAR, sent a command to remove from a HAR, or if a HAR message has automatically changed.	UC5g, UC11b
DCM-84	The ATMS solution shall alert the operator if a message failed to post due to a communications or other error.	UC11b
DCM-85	The ATMS solution shall support the use of auto-generated messages to be posted to one or many HARs, including weather messages.	UC11b
DCM-86	The ATMS solution shall support the synchronization of multiple HAR devices broadcasting the same messages.	UC11b
DCM-87	The ATMS solution shall have the capability to assign message speeds to HAR devices.	UC11b

ID	Functional Requirement Definition	Related Use-Case(s)
DCM-88	The ATMS solution shall maintain a history of all HAR messages that have been broadcasted by each individual device, including when they were broadcasted, when they were deactivated, by whom, and the associated Event under which it was activated. The stored history shall be consistent with the Commission's data retention policy.	UC20a, UC20b
DCM-89	The ATMS solution shall be capable of providing an HAR data feed to external software programs.	UC3d, UC20b
Fog Detection System Specific Device Control and Monitoring Requirements		
DCM-90	The ATMS solution shall generate user alarms when RWIS stations have detected the low visibility and DMS will be automatically activated (See Fog Detection System operation details).	UC3d, UC12
DCM-91	The ATMS solution shall facilitate the automated display of fog detection messages on DMS following the notification from a linked RWIS device. DMS messages will be configured to display based on reported visibility from the attached RWIS devices (See Fog Detection System operation details).	UC9b, UC12
DCM-92	The ATMS solution shall support the automatic updating of DMS based on configurable visibility reading and polling thresholds from attached RWIS devices.	UC9b, UC12
DCM-93	Automated fog warning messages shall have a predetermined DMS message priority.	UC9b, UC12
DCM-94	The ATMS solution shall allow the deactivation of fog warning messages through the posting of a higher-priority message, or a manual blanking of the sign.	UC9b, UC12
DCM-95	The ATMS solution shall automatically generate an Event for the fog detection system DMS activation(s). All DMS message activations during the fog event shall be associated with the same Event until the fog event has ended.	UC9b, UC12
DCM-96	The ATMS solution shall maintain a history of all fog detection activations and the associated Event (automatically generated by the ATMS) under which it was activated. The stored history shall be consistent with the Commission's data retention policy.	UC20a, UC20b
Smart Work Zone System Specific Device Control and Monitoring Requirements		
DCM-97	The ATMS solution shall support the integration of temporary Smart Work Zone devices.	UC13a, UC13b
DCM-98	The ATMS solution shall allow for full integration of all supported Smart Work Zone CCTV into the ATMS CCTV module.	UC8, UC13a, UC13b
DCM-99	The ATMS solution shall allow for full integration of all supported Smart Work Zone DMS into the ATMS DMS module.	UC9a, UC9b, UC13a, UC13b
DCM-100	The ATMS solution shall allow for full integration of all supported Smart Work Zone vehicle detection into the ATMS travel time and Incident Detection Modules.	UC4a, UC9b, UC10, UC13a, UC13b
DCM-101	The ATMS solution shall receive alerts from the Smart Work Zone indicating when traffic speeds have reached a configurable threshold.	UC4a, UC13a, UC13b
DCM-102	The ATMS solution shall archive all Smart Work zone activities and interactions.	UC20a, UC20b, UC13a, UC13b
Connected Vehicle Specific Device Control and Monitoring Requirements		
DCM-103	The ATMS solution shall be sufficiently modular and scalable such as to provide for the future integration and management of connected vehicle data.	UC14
DCM-104	The ATMS solution shall be sufficiently modular and flexible such as to allow for conformance to forthcoming connected vehicle data and software standards.	UC14

3.4 CONSTRUCTION AND MAINTENANCE MANAGEMENT (CMM) REQUIREMENTS

Functional Requirements for Construction and Maintenance Management functions of the ATMS solution describe the functionality required for the Commission to manage lane closure activities and to monitor potential scheduling and traffic control conflicts for these lane closures. The ATMS shall also utilize the lane closure location data to identify and notify user of the proximity of roadway incidents to active lane closures or work zones. The business requirements related to Construction and Maintenance Management are documented under Use Cases UC15 and UC16.

ID	Functional Requirement Definition	Related Use-Case(s)
Construction and Maintenance Management Requirements		
CMM-1	The ATMS solution shall maintain a real time schedule of all construction and maintenance lane closure activities. The scheduled closures shall be viewable by the user and shall be sortable/filterable on all attribute fields.	UC15a, UC15b
CMM-2	The ATMS solution shall populate a real time schedule with construction and maintenance lane closure activities by interfacing with a ATMS C&M (Construction & Maintenance) Application.	UC15a
CMM-3	The ATMS C&M Application shall be accessible via username and password.	UC15a
CMM-4	The ATMS C&M Application shall support multiple mobile platforms. (Android/iOS)	UC15a
CMM-5	The ATMS shall monitor and identify conflicts between scheduled lane closure activities. If a conflict is present, a “red flag” alert will be sent to personnel as defined by the System Administrator.	UC15a, UC16
CMM-6	The ATMS C&M Application shall support 50 concurrent users.	UC15a
CMM-7	The ATMS shall allow users to create a draft Event for each scheduled lane closure activity so that a response plan (custom or recommended) can be pre-populated and ready to utilize upon the activation of the lane closure.	UC15a
CMM-8	The ATMS shall move the draft Event to active, or create an Event, for each lane closure activity type (configurable) when the lane closure is activated by the user. Note: The activation of a lane closure is currently preempted by a notification phone call from the contactor or maintenance personnel on the start of closure.	UC15b
CMM-9	The ATMS shall allow users to delete or edit draft Events at any time prior to activation.	UC15b
CMM-10	The ATMS shall provide the ability to classify a lane closure activity and/or associated draft Event as a planned Plan X (diversion route). The draft Event can be pre-populated with default or custom Plan X response plans. The classification will also allow the user to create or/set a reminder to create an Event to manage pre-Plan X notifications and device activations.	UC15b
CMM-11	The ATMS shall keep record of the relationship of the pre-Plan X Event and planned Plan X Event for metrics and reporting purposes.	UC15b, UC20a, UC20b
CMM-12	The ATMS shall provide notification/reminders to ATMS users for upcoming scheduled lane closures. The notifications/reminders will be configurable on time of day or time in advance of the schedule activity and closure type (e.g. shoulder - off shoulder work, shoulder closed, left/right/center lanes closed, all lanes closed)	UC15b

3.5 ASSET MANAGEMENT (AM) REQUIREMENTS

Functional Requirements for Asset Management functions of the ATMS solution describe the functionality required for the Commission to manage all ITS assets and all respective attributes, including asset history (failures, communications issues, and maintenance history, etc.). The business requirements related to Asset Management are documented under Use Cases UC17 through UC19.

ID	Functional Requirement Definition	Related Use-Case(s)
	Asset Management Requirements	
AM-1	The ATMS shall maintain an ITS asset database that can be edited and expanded as new assets (devices) are added to the system.	UC19
AM-2	The ATMS shall allow a user to add devices to the ATMS system with detailed information about the device that shall be stored in the ITS asset database. The ATMS shall require the user to enter a set of required attribute fields in order to add a device.	UC19
AM-3	The ATMS shall allow a user to edit the attributes of any asset.	UC19
AM-4	The ATMS shall monitor the status of all ITS assets and keep record of these statuses for purpose of issuing service tickets, generating performance metrics and reports, and maintaining a history of maintenance activities.	UC18
AM-5	The ATMS shall alert the user to device errors and failures visually and/or audibly (configurable).	UC18
AM-6	The ATMS shall integrate with Service Now to create and track service tickets for devices, interfaces and system failures and errors.	UC17, UC18
AM-7	The ATMS shall automatically disable devices from use that have been found to be in failure, and automatically enable devices when working condition has been restored.	UC18
AM-8	The ATMS shall interface with Orion to verify communication failures. e.g. If the ATMS identifies a communication failure, the ATMS shall ping Orion to verify the failure. If Orion does not have the same determination, the system administrator shall be notified to troubleshoot the discrepancy.	UC17, UC18
AM-9	The ATMS shall provide the ability to view a list of all current device errors and failures.	UC18
AM-10	The ATMS shall provide the ability to document and report device outage trends across both individual devices as well as device types.	UC18, UC20a
AM-11	The ATMS shall allow users to record preventative maintenance activities for all ITS devices	UC19, UC20a
AM-12	The ATMS shall display the status of a device on ATMS Map.	UC18

3.6 REPORTING (RR) REQUIREMENTS

Functional Requirements for Reporting functions of the ATMS solution describe the functionality required for the Commission to create documents or files through logical organization of system collected data to detail the operational performance of measureable details of the Operations Center and personnel. The ATMS shall be required to track and store all user tasks, Event specific data, system operational tasks, and imported data, etc. in a database that can be queried to create clean, professional reports. The business requirements related to Reporting are documented under Use Cases UC20a and UC20b.

ID	Functional Requirement Definition	Related Use-Case(s)
	Reporting Requirements	
RR-1	The ATMS shall provide an area within the GUI to select and generate reports.	UC20a, UC20b

RR-2	The ATMS shall allow a user to create custom system data reports utilizing data collected by the ATMS system. The user shall be able to select a custom period of time and data to be outputted. System data reports shall include but not be limited to:
	• Shift Hand Off Report
	  o Open Events
	  o Active Lane Closures
	  o Scheduled Lane Closures (next shift)
	  o Active Devices
	• Device Activation Logs
	• Event Logs
	• Real-Time Traffic Data Reports
	• User Activity Reports
		UC20b

RR-3	The ATMS shall allow a user to run custom performance measure reports utilizing data collected by the ATMS system. The user shall be able to select a custom period of time and data sets to be outputted. Reports can be created and sorted by year, month, day, shift, district, contract, PSP, staff, etc. Performance measure reports shall include but not be limited to:
	• Event Response Reports
	  o Device Activation Time
	  o Incident Notification Time
	  o Event Clearance Time
	• Device Uptime/Availability
	• Device Utilization
	• Device Reliability
	• Traffic Flow Statistics
	• Activation/Notification Statistics by User
	• Month over Month, Year over Year Comparative Analysis
	• Custom Combined Reports
		UC20a

RR-4	The Selected Proposer shall work with the Commission to create a total of 25 canned report types.	UC20a, UC20b
RR-5	The ATMS shall provide the ability to output and save reports in various file types (e.g. .pdf, .xlsx, .xml)	UC20a, UC20b
RR-6	The ATMS shall provide the ability to create and save reports using industry standard tools (e.g. Crystal Reports)	UC20a, UC20b
RR-7	The ATMS shall allow a user to schedule reports to be created and delivered via email to user specified recipients.	UC20a, UC20b

3.7 WEATHER EVENT MANAGEMENT (WEM) REQUIREMENTS

Functional Requirements for Weather Event Management functions of the ATMS solution describe the functionality required for the Commission to manage weather conditions and events. The Commission currently manages four weather regions. The ATMS shall mirror the Standard Operating Procedures for weather event management and shall automate as many operations as practical. The business requirements related to Weather Event Management are documented under Use Case UC21.

ID	Functional Requirement Definition	Related Use-Case(s)
	Weather Event Management Requirements	
WEM-1	The ATMS shall accept data from external weather forecast data sources: Accuweather and National Weather Service or an equivalent weather forecast provider.)	UC21
WEM-2	The ATMS shall monitor imported data from the external sources for each of the Commission's 4 geographical weather regions.	UC21
WEM-3	The ATMS shall alert the user of inclement weather forecasts (by county) for each weather region based on predefined thresholds and prompt the user to create an Event for the respective region. The ATMS shall consider counties that are in one or more weather regions as a county in each regions in which it is geographically included. e.g. if County A is part of Region 1 and 2, County A data will be monitored for both Region 1 and 2.	UC21
WEM-4	The ATMS shall manage weather data alerts on a region by region basis. e.g. The ATMS shall alert the user of the first weather advisory level for a county in a region, but not for subsequent advisories of the same severity for counties in the same region. The same logic shall apply for elevation or de-elevation of advisory levels. e.g. The ATMS shall alert the user for the first elevation in advisory level, or shall alert the user of the last de-elevation of advisory level. Regardless of the user alerting, the ATMS shall track and display the advisory levels for each county in each weather region.	UC21
WEM-5	The ATMS shall automatically populate the region weather Event with all DMS and HAR in the weather region with recommended messages based on the imported data and populate the notification list with contacts from the contact list for each region.	UC21
WEM-6	The ATMS shall allow users activate/deactivate devices, edit messages, and manage and make Event notifications to contacts throughout the life of the Event.	UC21
WEM-7	The ATMS shall monitor real-time weather data (RWIS data) for potentially dangerous scenarios (e.g. precipitation at high rates, icing conditions). On detection of such scenarios, the ATMS shall alert the user and automatically send an email/text alert to the respective maintenance personnel based on the location of the RWIS station. e.g. The ATMS identifies an RWIS station with data reports approaching a freezing condition with current precipitation, the ATMS shall alert the user and send the alert email/text to the responsible maintenance personnel with relevant information.	UC21
WEM-8	The ATMS shall have the ability to automatically change DMS messages based on the locations and/or status (plowing/salting/etc.) of AVL equipped vehicles. e.g. An AVL equipped snow plow travels near a DMS sign. The ATMS recognizes the proximity of the plow to a DMS and posts a message to alert drivers to snow plow activities. The ATMS will then deactivate that message once the plow has left a predefined proximity.	UC21
WEM-9	The ATMS shall display the current Commission weather level based on current weather conditions and input from the user for each region. The ATMS shall have the capability to automatically send email notifications to all required personnel on each change of weather level.	UC21
WEM-10	All weather data shall be recorded and archived by the ATMS and made available for all reporting purposes.	UC20a, UC20b, UC21

3.8 FACILITY MANAGEMENT (FM) REQUIREMENTS

Functional Requirements for Facility Management functions of the ATMS solution describe the functionality required for the Commission to manage facility based systems. The business requirements related to Facility Management are documented under Use Case UC22 and UC23.

ID	Functional Requirement Definition	Related Use-Case(s)
	Facility Management Requirements	
FM-1	The ATMS shall integrate with the Commission access management system (Hirsh) to monitor and control access gates.	UC22
FM-2	The ATMS shall notify the user when access gates are used by authorized personnel.	UC22
FM-3	The ATMS shall allow a user to select an access gate and open/close an access gate through the HIRSH interface. When the user opens a gate, they must enter details for the action to be recorded in the ATMS system. e.g. reason, requesting person's name, company, vehicle	UC22
FM-4	The ATMS shall integrate with a Truck Parking System to monitor the status of the system.	UC23
FM-5	The ATMS shall allow a user to view the Truck Parking System status and statistics through a list view and by mousing over the Truck Parking System icon on the map.	UC23

4.0 SUPPLEMENTAL REQUIREMENTS

Supplemental requirements are items that are necessary for the implementation of a fully functioning ATMS, however, may not necessarily be tied to a specific use case (or business requirement).

The Supplemental Requirements enclosed in the tables on the following pages were developed in coordination with Commission traffic engineering and operations staff. As part of developing the supplemental requirements, in order to keep them logically organized, they have been aggregated into the following six categories:

- Physical Requirements (PR)
- System Requirements (SR)
- Logical Data Requirements (LR)
- User Requirements (UR)
- Information Management Requirements (IR)
- System Life Cycle Requirements (SLR)
- Vendor Hosting Requirements (VHR)

The tables on the following pages include a tabular listing and definition of all of the identified Supplemental Requirements grouped as indicated above. These requirements, combined with the Functional Requirements defined in Section 3.0 are considered the minimum criteria that an ATMS solution must meet in order to sufficiently satisfy the needs of the Commission.

4.1 PHYSICAL (PR) REQUIREMENTS

Physical Requirements for the ATMS hardware identify the environmental characteristics including where the system will be installed, the durability characteristics of the system, the adaptability of growth and expansion of the system and environmental requirements. The following Physical Requirements (PRs) have been identified by the stakeholder group:

ID	Physical Requirement Definition
PR-1	The ATMS solution shall be capable of being executed in a virtualized deployment environment (e.g. VMWare).
PR-2	The ATMS solution shall be cloud-based (see the RFP document for further details regarding hosing needs and requirements. Also see Section 4.7 for hosting specific supplemental requirements).
PR-3	The ATMS solution shall be configured for 99.95% uptime.
PR-4	The ATMS solution shall not require the installation of additional hardware at operator workstations.
PR-5	The ATMS solution shall not require the installation of additional software at operator workstations. The ATMS solution shall be a thin client capable of running on any modern web browser.

PR-6	All ATMS solution components shall be cluster-able across multiple servers.
PR-7	The ATMS solution shall support both Windows and SQL database applications.
PR-8	The Vendor shall provide independent cloud based (hosted) production and staging environments for the ATMS solution.

4.2 SOFTWARE PERFORMANCE (SR) REQUIREMENTS

Software Performance (SR) Requirements for the ATMS solution define the necessary performance and quality of the overall system deployment. They define the characteristics of the system and the performance conditions under which the system is required to operate. The following Systems Requirements (SRs) have been identified by the stakeholder group:

ID	Software Performance Requirement Definition
SR-1	The ATMS solution shall be designed to support continuous operations (24 hours per day, 365 days per year, 99.95% uptime).
SR-2	The ATMS solution shall support the operations of all ITS devices included in the Commission's ITS Device Inventory.
SR-3	The ATMS solution shall support the operations of all NTCIP compliant devices.
SR-4	The ATMS solution shall support all anticipated future growth in the number of devices included in the Commission's ITS Device Inventory.
SR-5	The ATMS solution shall support the integration with all ITS device manufacturers included in the Commission's ITS Device Inventory or the Selected Proposer shall provide a transition plan if unable to support a certain manufacturer.
SR-6	The ATMS solution shall process and display data in real-time.
SR-7	The ATMS solution shall process and display the status of all ITS devices in real time.
SR-8	The ATMS solution shall automatically poll each ITS device at a configurable rate. The ATMS solution shall be able to support polling at a minimum frequency of once every 30 seconds.
SR-9	The ATMS solution shall evaluate data quality and device status to generate alarms accordingly.
SR-10	The ATMS solution shall be capable of continually monitoring overall system and device level performance.
SR-11	The ATMS solution shall have the ability to discover, inventory, and configure ITS devices.
SR-12	The ATMS solution shall be able to receive an unsolicited communication from any device containing notification of a malfunction or event involving that device.
SR-13	The ATMS solution shall be capable of communicating with devices regardless of the communications media (e.g. fiber, wireless).
SR-14	The ATMS solution shall not create any additional lag time or delays in the operations of ITS devices.
SR-15	The ATMS solution shall expose ITS data through a Web Interface utilizing HTML5 standards.
SR-16	The ATMS solution shall be a modular design with a well-documented and open database structure (SQL) with ODBC compliance.
SR-17	The ATMS solution shall support up to 50 concurrent users.
SR-18	The ATMS solution shall conform to all Commission IT Security Standards.
SR-19	The ATMS solution shall support load-balanced Web farms for maximum scalability and availability using any industry standard software or a hardware-based load balancing technology. The ATMS solution needs to work with multiple web servers in a load balanced manner. The ATMS solution shall not require Sticky sessions.
SR-20	The ATMS solution shall allow for the selective turn-on / turn-off facilities (page, application, or data source level). The ATMS solution shall provide the ability to take application components offline without affecting the server or requiring the shutdown of a node in the cluster. The ATMS solution shall provide automated restart and recovery (application resiliency).
SR-21	The ATMS solution shall provide monitoring and logging capabilities that can be configured to alert system administrators of the operational status of the application component.
SR-22	The ATMS solution shall work seamlessly with industry standard clustering solutions for database high availability.
SR-23	The ATMS solution shall utilize a well documented and open Application Programming Interface (API) to support enhancements or modifications by an authorized third party.
SR-24	The ATMS solution shall log system and portlet activity including the ability to display/create detailed bandwidth usage reports.
SR-25	The ATMS solution shall allow for all server software to run as a service or component (e.g., does not require someone to log in at the console and start up the application manually).
SR-26	The ATMS solution shall be able to start ATMS components in any order (if a component is started or restarted, related systems will wait rather than fail).

SR-27	The ATMS solution shall provide the ability to deploy new functionality and content into the production environment but still only accessible to test users.
SR-28	The ATMS browser (GUI) instance shall load and be available for input within 20 seconds of opening.
SR-29	The ATMS browser (GUI) shall have no discernable lag when entering data, navigating the software GUI, and utilizing the map or any other user interaction with the GUI.
SR-30	The ATMS shall only require a restart or reboot resulting from major system upgrades.
SR-31	The ATMS shall accept data input by operators with no loss of data.
SR-32	The ATMS shall be dynamic and display changes to the system in real-time.
SR-33	The ATMS shall make all data available to external interfaces in real-time.
SR-34	The ATMS shall accept all data made available by external interface in real-time.

4.3 LOGICAL DATA (LR) REQUIREMENTS

The Logical Data Requirements (LRs) will define how the system data is stored and used.

ID	Logical Data Requirement Definition
LR-1	The ATMS solution shall have a SQL database in which collected data and system activity is automatically tracked and recorded.
LR-2	The ATMS solution shall recognize and record in the activity log all proprietary warnings, alarms, and status transmissions from each device.
LR-3	The ATMS shall support an industry standard relational SQL database management system (RDMS).
LR-4	The ATMS solution shall support importing and exporting of system data. For example, data can be exported to Excel.
LR-5	The ATMS solution shall store data collected in a relational SQL database that can be accessed and queried to develop custom reports.
LR-6	The ATMS shall log and timestamp all user activities.
LR-7	The ATMS solution shall collect and store data from the sources listed in the interface section of the RFP.
LR-8	The ATMS solution shall allow for the collection and storage of all data related to maintenance and construction events for use by operations personnel or data archives.
LR-9	Error and log messages generated and stored by the ATMS solution solution shall display clear plain text that would help facilitate a response. For example, these messages shall be stored in a human readable format and shall not use any cryptic information, e.g. instead of “Error Code #N” state “Database Error”.
LR-10	The ATMS solution shall allow multiple people to work on the application without adversely affecting one another. It provides the ability to control who does what to a site by restricting capabilities based on individual's roles.
LR-11	The ATMS solution shall have the ability to store ITS device data for future analysis and reporting.
LR-12	The ATMS solution shall use Active Directory Federation Services (ADFS) for user authentication.
LR-13	The ATMS solution shall require a single user sign-on (support LDAP) for the complete management of Event and field devices.
LR-14	The ATMS solution shall be capable of assigning each user to a user group or access level. An ATMS user with sufficient privileges shall be capable of selecting the access levels and functionality available to each user.

4.4 USER (UR) REQUIREMENTS

The User Requirements define how the users will interact with the ATMS. They also define the information that will be available through the ATMS.

ID	User Requirement Definition
	Administration
UR-1	The ATMS solution shall allow an ATMS user with sufficient privileges to create and save default map views for all users or specific user groups.
UR-2	The ATMS solution shall provide the ability for ATMS user to create and save individual map views.
UR-3	The ATMS solution shall provide the ability for an ATMS user with sufficient privileges create custom user groups.
UR-4	The ATMS solution shall provide the ability for an ATMS user with sufficient privileges add new users to the system.
UR-5	The ATMS solution shall provide the ability for an ATMS user with sufficient privileges to assign users to a user group.
UR-6	The ATMS solution shall provide the ability for an ATMS user with sufficient privileges to assign privileges to users.
UR-7	The ATMS solution shall provide the ability for an ATMS user with sufficient privileges to edit user information and privileges.
UR-8	The ATMS solution shall provide the ability for an ATMS user with sufficient privileges to disable users.
UR-9	The ATMS solution shall provide the ability for and ATMS user with sufficient privileges to remove (decommission) users.
UR-10	The ATMS solution shall allow an ATMS user with sufficient privileges to add new devices.
UR-11	The ATMS solution shall allow an ATMS user with sufficient privileges to edit device information.
UR-12	The ATMS solution shall allow an ATMS user with sufficient privileges to disable devices.
UR-13	The ATMS solution shall allow an ATMS user with sufficient privileges to remove (decommission) devices.
UR-14	The device icons shall be initially plotted based on the latitude/longitude coordinates that are entered during device configuration.
UR-15	When a device that is geocoded based on the latitude /longitude coordinates needs to be adjusted, the ATMS user with sufficient privileges shall be able to reposition the icon on the map, without changing the latitude /longitude for that device.
UR-16	When adding/editing a device, the ATMS solution shall allow an ATMS user with sufficient privileges to enter/edit all device information from a single screen.
UR-17	The ATMS solution shall allow the ATMS user with sufficient privileges to configure the color and look of map icons (e.g. incident and device icons).
UR-18	The ATMS solution shall allow the ATMS user with sufficient privileges to upload or create new icons.
UR-19	All routine administrative tasks shall be accomplished using the ATMS solution user interface (e.g. no direct manipulation of the database, configuration files). System administrative tasks include, but are not limited to: device management (add, edit, disable, remove or decommission), user and user group management (add, edit, disable, remove or decommission) notification/alert/alarm settings and thresholds, configurable timers, configurable system logic thresholds and settings.
	Devices
UR-20	The ATMS solution shall allow a user to initiate control of a device by selecting it from the ATMS map.
UR-21	The ATMS solution shall allow a user to initiate control of a device by selecting it from the device list.
UR-22	The ATMS solution shall allow a user to initiate control of a device by selecting it through an existing event.
	Incident / Events
UR-23	The ATMS solution shall display information from the CADS.
UR-24	Information from the CADS shall automatically populate incident /event screens with all relevant information, including the CADS identification number.

UR-25	The ATMS solution shall display information from PennDOT's Road Condition Reporting System (RCRS).
UR-26	The ATMS solution shall be able to filter and RCRS data based on pre-set geographical boundaries and incident types.
UR-27	The ATMS solution shall allow the user to select/view lanes affected or closed from a graphical representation of the roadway.
UR-28	The ATMS solution shall allow the user to view and organize events based upon user-specified criteria (e.g. type, age).
UR-29	The ATMS solution shall support the creation of user-configurable event/incident notifications and alerts.
Map	
UR-30	The ATMS map shall support click and drag and scroll wheel mouse controls for panning and zooming of the map respectively. The Latitude and Longitude of the mouse pointer shall be displayed within the map window.
UR-31	The ATMS solution shall be compatible with the Commission's GIS mapping solution (ESRI).
UR-32	The ATMS solution shall support the aggregation of individual map layers into customized map views and groups (e.g. a traffic layer including incidents, vehicle detection data, Waze data; a weather layer including RWIS, Accuweather, NWS data, AVL).
UR-33	The ATMS solution shall display interchanges and slip ramps as a standard layer that is displayed on the base map.
UR-34	The ATMS solution shall display Commission roadway facilities and mile markers and all other roadways (State, Local, Interstate, etc.) as standard layers that are displayed on the base map.
UR-35	As a user zooms in / out of the map, the ATMS map shall display more granular mile marker data (e.g. 10 mile increments when zoomed out and .10 mile increments when zoomed in).
UR-36	The ATMS solution shall display maintenance sheds and zones as a separate layer on the ATMS map.
UR-37	When a user mouses over or selects a maintenance shed or maintenance zone, a pop-up box shall display more detailed information about the maintenance shed.
UR-38	The ATMS solution shall display weigh barrier locations as a separate layer on the base map.
UR-39	The ATMS solution shall display service plaza locations as a separate layer on the base map.
UR-40	The ATMS solution shall display Pennsylvania State Police (PSP) station locations and zones as a layer on the base map. When clicking on a PSP icon, the relevant contact information shall be provided.
UR-41	The ATMS solution shall display tunnel locations as a separate layer on the base map.
UR-42	The ATMS solution shall display bridge locations as a separate layer on the base map.
UR-43	When a user mouses over or selects a bridge, a pop-up box shall display bridge log information.
UR-44	The ATMS solution shall display access gate locations as a separate layer on the base map. Access gate icons shall indicate whether the gate is open or closed.
UR-45	The ATMS solution shall display toll plazas (including E-ZPass Only) locations as a separate layer on the base map.
UR-46	The ATMS solution shall display and identify municipal and county boundaries as a separate layer on the base map. When clicking on an municipal/county boundary/icon, the relevant contact information shall be provided.
UR-47	The ATMS solution shall display and identify Emergency Management Service (EMS) providers as a separate layer on the base map. When clicking on an EMS icon, the relevant contact information shall be provided.
UR-48	The ATMS solution shall display and identify fire stations as a separate layer on the base map. When clicking on a fire station icon, the relevant contact information shall be provided.
UR-49	The ATMS solution shall display and identify hospitals as a separate layer on the base map. When clicking on a hospital icon, the relevant contact information shall be provided.
UR-50	The ATMS solution shall display and identify PennDOT district boundaries and District Office locations as a separate layer on the ATMS map.
UR-51	The ATMS solution shall display filtered PennDOT events, within a specified geographic area, as a separate layer on the ATMS map.
UR-52	The ATMS solution shall display drainage facilities as a separate layer on the ATMS map.
UR-53	The ATMS solution shall display diversion routes (Plan X) as a separate layer on the ATMS map. Active diversion routes shall be color coded.
UR-54	The ATMS solution shall display 3rd party speed data (e.g. HERE, INRIX, TomTom) as a separate color coded layer on the ATMS map.
UR-55	The ATMS solution shall display Waze traffic data as a separate layer on the ATMS map.

UR-56	The ATMS solution shall display AVL data as a separate layer on the ATMS map.
UR-57	The ATMS solution shall display Smart Work Zone data as a separate layer or theme on the ATMS map.
UR-58	The ATMS solution shall display microwave tower locations as a separate layer on the ATMS map.
UR-59	When a user pans over or selects a microwave tower, a pop-up box shall display the tower name and location (county and road), and the system shall be capable of displaying any other available GIS data.
UR-60	The ATMS solution shall display weather data (National Weather Service (NWS, Accuweather, etc.) as a separate layer on the ATMS map.
UR-61	The ATMS solution shall display WAZE weather reports as a separate layer on the ATMS map.
UR-62	The ATMS solution shall display weather alerts data generated from RWIS sensors as a separate layer on the ATMS map.
UR-63	The ATMS solution shall display weather radar as a separate layer on the ATMS map.
UR-64	The ATMS solution shall display different icons for different event types (e.g. accidents, construction, and other planned events).
UR-65	The ATMS solution shall display RWIS locations as a separate layer on the ATMS map.
UR-66	The ATMS solution shall provide the ability to toggle between different map types, such as street view or satellite view.
UR-67	The ATMS solution shall provide the ability for users to hide or display each map layer.
UR-68	The ATMS solution shall provide the ability to show PennDOT devices and events as a map layer.
UR-69	To prevent a map layer from hiding another map layer, the ATMS solution shall allow the user to display only one of the following layers at a time: - Speed Data - Diversion Routes - Lane Closures
UR-70	The ATMS solution map shall display icons that are positioned to indicate the location of each field device.
UR-71	The device icons shall look like the respective devices as per Commission preference, or another visual differentiation approved by the Commission.
UR-72	When a user mouses over or selects a device on the map, the complete device details, including device name, status and location shall be displayed.
UR-73	The ATMS solution shall provide four (4) device status types: standby (outlined in green), active (solid green), warning (solid yellow), and out of service (solid red). • Standby = device is functioning by not currently being used • Active = device is operating normally • Warning = device is usable but has limited functionality and will require maintenance. • Out of Service = device is currently disabled, not usable and has a plan/needs a plan in place for resolving the issue
UR-74	The ATMS solution shall display the active incident information, CCTV snapshots and DMS and HAR messages by hovering over a device icon or displaying all active DMS, HAR and CCTV.
UR-75	The ATMS solution map shall be developed using ESRI mapping tools.
UR-76	The ATMS solution map shall display GIS data as provided by the Commission.
UR-77	The ATMS solution shall facilitate displaying information from connected systems.
UR-78	The ATMS solution shall support dynamic scaling of all objects (menus, text, etc.) on map based on the screen resolution.
UR-79	The ATMS solution shall display all active events with location data on the map.
UR-80	The ATMS solution shall generate alerts of upcoming planned events.
UR-81	The ATMS solution screens shall display the login name of the user who is currently logged into the system.

UR-82	Using all available traffic data, the ATMS solution shall display traffic speeds on the map that are color-coded based on defined thresholds.
UR-83	The ATMS solution shall save the following information for a default map view (per user or system administrator configurable): - Zoom Level - Active Layers - Area of focus
ITS Devices	
UR-84	The ATMS solution shall provide an interface for the user to list inventory of all field devices.
UR-85	The ATMS solution shall provide the ability to filter all device lists based on device type.
UR-86	The ATMS solution shall provide the ability to filter all device lists based on device sub-type.
UR-87	The ATMS solution shall provide the ability to filter all device lists based on district.
UR-88	The ATMS solution shall provide the ability to filter all device lists based on device name.
UR-89	The ATMS solution shall provide the ability to filter all device lists based on Smart Work Zone.
UR-90	The ATMS solution shall provide the ability to filter all device lists based on direction.
UR-91	The ATMS solution shall provide the ability to filter all device lists based on error status.
User Interface	
UR-92	The ATMS solution shall provide standard word processing capabilities within the user interface e.g. spell check, wrap text, keyboard shortcuts (ctrl-c, ctrl-v, etc.), copy and paste, etc.
UR-93	The ATMS solution browser based user interface shall support the ability to minimize and maximize windows, scaling of windows, using browser tabs, drag and drop of a window, etc.

4.5 INFORMATION MANAGEMENT (IR) REQUIREMENTS

The Information Management Requirements (IRs) describe how data will be stored and archived.

ID	Information Management Requirement Definition
IR-1	The ATMS solution shall have the ability to backup, purge and restore the database and virtual system images in an automated manner.
IR-2	The ATMS solution shall have multiple stages of archiving. A local archive shall retain information for a user defined period of time, no less than 2 years. A permanent archive shall retain data in an external network for a user-defined period of time. Permanent archive shall retain data for a minimum of 7 years but be user-defined based on data storage capacity.
IR-3	The ATMS solution shall provide the ability for an ATMS user with sufficient privileges to indicate which users are authorized to access specific information.
IR-4	Access to information from the CAD system shall be limited to users who are labeled as approved.
IR-5	No data from the Commonwealth Law Enforcement Assistance Network (CLEAN) shall be included in an xml feed provided by the ATMS solution.
IR-6	No data from the National Crime Information Center (NCIC) shall be included in an xml feed provided by the ATMS solution.
IR-7	The Selected Proposer shall either provide source code of their solution or arrange to have each version provided to an escrow account in accordance with RFP Task H-5.

4.6 SYSTEM LIFECYCLE (SLR) REQUIREMENTS

System Lifecycle Requirements (SLRs) for the ATMS solution define the capacity to change or enhance the software in order to ensure its functionality throughout the lifecycle. The following System Lifecycle Requirements have been identified by the stakeholder group:

ID	System Lifecycle Requirement Definition
SLR-1	The ATMS solution shall include testing/development environment for the initial development of the ATMS solution and the development of future enhancements and modules. This environment would be located at the Selected Proposer's site and at their expense.
SLR-2	The ATMS solution shall include a staging environment for the Commission acceptance testing of all enhancements and modules prior to full implementation
SLR-3	The ATMS solution shall include a production environment which will support the real-time operations of the Pennsylvania Turnpike and associated facilities.
SLR-4	The ATMS solution shall complete a 60-day Operational Testing period prior to user acceptance. During this time, it will be run in parallel with existing software platforms at the TOC.
SLR-5	The ATMS solution shall support the complete back-up of all databased prior to updating any software versioning.
SLR-6	The ATMS solution shall include on-site support as described in the RFP Task H-1.
SLR-7	The ATMS solution shall include 24/7 continental United States-based technical support, with Help Desk staff fluent in the English language both spoken and written.
SLR-8	The ATMS solution support shall include defined response times based on service levels defined in the Service Level Agreement (**Appendix C**).
SLR-9	The ATMS solution shall be not taken offline during scheduled maintenance and must be designed as a redundant system that can have upgrades or changes implemented without unscheduled downtimes.
SLR-10	The ATMS solution shall not undergo non-critical maintenance without pre-approval from the Commission. No maintenance will be allowed during weather or other critical events as dictated by the Commission.
SLR-11	The ATMS solution shall have the capability to be hot refreshed during disaster recovery events.
SLR-12	The ATMS solution shall allow the Commission to be able to roll back to previous states of the functionality (versions), once a version, upgrade, patch or fix is deployed to production.
SLR-13	The ATMS solution shall provide tools that can be published to staging servers for testing prior to production.
SLR-14	The ATMS solution shall provide tools that allow site mirroring and replication.
SLR-15	The ATMS Contractor shall work with the Commission to establish and shall follow disaster recovery procedures to have the application restored again as soon as possible.
SLR-16	The ATMS solution shall provide an automated process to reload/recover the ATMS application code and related databases.
SLR-17	The ATMS solution shall be expandable to allow the addition of modules to support future Commission operations.
SLR-18	The ATMS shall have the capability to incorporate emerging industry standard technologies through optional modules. Ex. Connected/Autonomous vehicle operations and autonomous device discovery.

4.7 VENDOR HOSTING (VH) REQUIREMENTS

Vendor Hosting Requirements (VHRs) for the ATMS solution define the specific requirements related to the off-site hosting of the ATMS solution applications and databased. The following Vendor Hosting Requirements have been identified by the stakeholder group:

ID	Vendor Hosting Requirement Definition
VHR-1	The Selected Proposer shall provide all equipment (hardware and software) needed to host the ATMS solution.
VHR-2	The Selected Proposer shall provide secure (SSL, HTTPS, or similar) access to all levels of users (as defined by the Commission) via the internet.
VHR-3	The ATMS solution shall use commercially reasonable resources and efforts to maintain adequate internet connection bandwidth and server capacity.
VHR-4	The Selected Proposer shall provide maintenance of all hosting equipment to maintain performance in accordance with **Appendix C – Service Level Agreement.**
VHR-5	The Selected Proposer shall provide hosting services using commercially available security technologies and techniques in accordance with industry best practices and the Commission's security standards, procedures, and requirements including those relating to the prevention/detection of fraud and any other inappropriate use or access of systems and networks.
VHR-6	The Selected Proposer shall ensure that information security of data processed through hosted services is secure.

VHR-7	The Selected Proposer shall maintain data security controls meeting applicable law and standards set forth in Cybersecurity Framework, NST, ISO 2700Series(specifically 27001 certification), and BS 10012 (British Standards Institution).
VHR-8	The Selected Proposer shall notify the Commission immediately if there has been a data security breach in accordance with **Appendix C – Service Level Agreement**.
VHR-9	The Selected Proposer shall ensure that all hosted equipment is maintained in an operational environment that meets industry practices for climate control, fire/security hazard detection, redundancy, electrical needs, and physical security.
VHR-10	The Selected Proposer shall monitor system error logs and perform preventative maintenance in order to minimize and predict system problems and initiate appropriate action to meet system uptime requirements.
VHR-11	The Selected Proposer shall completely test and apply patches for any third party software product before release.
VHR-12	Allowable outages for system maintenance activities shall be governed by the Service Level Agreements found in **Appendix C – Service Level Agreement**.
VHR-13	All scheduled system maintenance shall be limited to the hours of 12:00 AM to 5:00 AM, in accordance with **Appendix C – Service Level Agreement**.
VHR-14	Any scheduled system maintenance activity must be coordinated with the Commission a minimum of 7 days in advance of the activity and in accordance with **Appendix C – Service Level Agreement**.
VHR-15	All activities related to emergency maintenance events shall be governed by the Service Level Agreements found in **Appendix C – Service Level Agreement**.
VHR-16	In the event of an emergency maintenance event, the ATMS solution shall rollover to a backup site to ensure continuity of operations.
VHR-17	The Selected Proposer shall conduct a third party independent security/vulnerability assessment at its own expense on an annual basis and submit the results of such assessment to the Commission.
VHR-18	The ATMS solution shall undergo third party application and vulnerability security scans on an agreed-upon schedule.
VHR-19	The Selected Proposer shall comply with Commission directions/resolutions to remediate the results of the security/vulnerability assessment to align with the standards of the Commission.
VHR-20	The Selected Proposer shall limit logical and physical access to all system components and provide access only to those individuals with a business need for services provided.
VHR-21	The Selected Proposer shall audit the data center annually through an independent third party auditor.
VHR-22	Third party audit results shall form part of the Selected Proposer's SSAW 16 (or similar standard) report.
VHR-23	The Selected Proposer shall make SSAW 16 (or similar standard) report available to the Commission upon reasonable written request.
VHR-24	With prior written notice (30 days) the Commission shall be permitted to conduct a structured walk-through of the Selected Proposer's data center to review the control environment and security practices relevant to the ATMS solution data.
VHR-25	All records discussed pursuant to any structured walkthrough of the data center shall be treated as Confidential Information of the Selected Proposer.
VHR-26	The Selected Proposer will be solely responsible for all data storage required to meet ATMS solution requirements.
VHR-27	The Commission may choose to store certain data and require the Selected Proposer to link to or interface with that data at the Commission's sole discretion.
VHR-28	The Selected Proposer shall employ industry best practice disaster recovery and resiliency procedures to assist in preventing interruption in the use of the system.
VHR-29	The Selected Proposer shall develop and employ problem resolution and support procedures to provide a means to classify problems as to criticality and impact and with appropriate resolution procedures and escalation process for each classification of problem.
VHR-30	The Selected Proposer shall utilize a secured backup solution to prevent loss of data.
VHR-31	The Selected Proposer shall back up all system data daily.
VHR-32	The Selected Proposer shall store backup media offsite in an all-hazards protective storage facility.
VHR-33	All back-up data and media shall be capable of encryption.

| Category | Category | System Administration | | | | | | | | | | | | | | | Incident and Traffic Management | | | | | | | | | | | | | Device Control and Monitoring | | | | | | | | | | | | | | C&M Management | | | Asset Management | | | Reporting | | Weather Mgmt. | Facility Mgmt. | |
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| Category | Category | System Administration | | | | | | | | | | | | | | | Incident and Traffic Management | | | | | | | | | | | | | | Device Control and Monitoring | | | | | | | | | | | | | | C&M Management | | | Asset Management | | | Reporting | | Weather Mgmt. | Facility Mgmt. | |
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Category	Category	System Administration															Incident and Traffic Management													Device Control and Monitoring															C&M Management			Asset Management			Reporting		Weather Mgmt.	Facility Mgmt.	
	Use Case	UC1a	UC1b	UC1c	UC1d	UC1e	UC1f	UC2a	UC2b	UC2c	UC2d	UC2e	UC3a	UC3b	UC3c	UC3d	UC4a	UC4b	UC4c	UC4d	UC5a	UC5b	UC5c	UC5d	UC5e	UC5f	UC5g	UC5h	UC5i	UC5j	UC6a	UC6b	UC7	UC8	UC9a	UC9b	UC10	UC11a	UC11b	UC11c*	UC11d*	UC12	UC13a	UC13b	UC14	UC15a	UC15b	UC16	UC17	UC18	UC19	UC20a	UC20b	UC21**	UC22	UC23
Category	Requirement																																																						
Device Control and Monitoring	DCM-37											X																							X																			
	DCM-38											X																							X																			
	DCM-39											X																							X																			
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| Category | Category | System Administration | | | | | | | | | | | | | | | Incident and Traffic Management | | | | | | | | | | | | | | Device Control and Monitoring | | | | | | | | | | | | | | C&M Management | | | Asset Management | | | Reporting | | Weather Mgmt. | Facility Mgmt. | |
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APPENDIX O

INTERFACE LIST AND DESCRIPTIONS

Appendix O

Interface List and Descriptions

This Appendix provides the Proposer with information about some anticipated system interfaces that must be provided or developed by the Proposer to successfully deliver a complete ATMS system as defined by the Solution Requirements (Appendix M) and Concept of Operations (Appendix L). The interfaces described in the table below shall not be considered a complete list or complete description. This document is provided and intended for information only.

Data From	Data To	Description/Purpose
Intergraph (CADS)	ATMS	Incident data being collected by the CADS system will be used by the ATMS to create, populate, and update ATMS Events, and used to provide recommended event responses.
RWIS (ScanWeb)	ATMS	Roadway weather data will be imported and monitored by the ATMS to alert users and PTC personnel to dangerous weather conditions. RWIS data will be used by the ATMS to control the fog warning system.
ATMS	ENS	ATMS will push event data and device data to the ENS system for traveler information type uses.
ENS	ATMS	ATMS will accept data from the ENS system as required.
Construction/Maintenance Closure Application	ATMS	ATMS will accept data from the Proposer developed web/mobile Construction/Maintenance Closure Application.
3rd Party Traffic Data (e.g. HERE, INRIX, TomTom)	ATMS	ATMS will receive real-time traffic speed data. This data will have multiple uses within the system.
ATMS	Platinum (SIM)	ATMS may activate/deactivate HAR transmitters through the existing Platinum software. This will be needed if the vendor chooses this interface over integrating directly with HAR transmitters and bacons.
Platinum (SIM)	ATMS	Platinum may send acknowledgements and other device status data to the ATMS. This will be needed if the vendor chooses this interface over integrating directly with HAR transmitters and beacons.
ATMS	ServiceNow	ATMS will report system/device failures to ServiceNow for ticketing.
ServiceNow	ATMS	ServiceNow will report closed service tickets to ATMS.
Orion	ATMS	ATMS will confirm communication failures with Orion to verify or rule out communication failures.
WAZE	ATMS	Incident data is received by the ATMS to alert users of potential incidents on PTC roadways.
ATMS	WAZE	ATMS pushes incident data to WAZE.
PTC Email Service (Microsoft Exchange)	ATMS	Sharing of PTC email distribution lists and email addresses.

ATMS	PTC Email Service (Microsoft Exchange)	ATMS shall send emails through the PTC email service.
HIRSH	ATMS	ATMS will receive access gate activity and other system data.
ATMS	HIRSH	ATMS will control access gates or other HIRSH controlled facilities.

APPENDIX P

ITS EQUIPMENT INVENTORY

Appendix P

ITS Equipment Inventory

1. The table below provides a breakdown of the existing and planned future deployments of ITS devices that must be integrated into the system. The pages that follow provide the complete inventory of all existing PTC devices.

ITS Device	Existing Total	Planned Deployments (0-5 years)	Future Deployments (>5 years)	Future Total (Estimated)
CCTV	65	11	35	111
DMS	87	118	50	250
HAR Transmitters	37	0	0	37
HAR Beacon	82	0	0	87
RWIS	22	1	8	31

2. The table below provides a summary of the existing software systems used to operate the existing ITS devices.

Summary of Device Software	
Device Type	**Software**
CCTV	
	Genetec 5.4 SR3 (5.4.686.18)
DMS	
	Vanguard
	MIST
HAR	
	DR2000 Platinum
PVMS *(under contract with construction project)*	
	JamLogic
	ASTI

CCTV Device List

DEVICE TYPE	DEVICE STATUS	DEVICE ID	MILE-POST	ROUTE	DIR	LATITUDE	LONGITUDE	SITE DESCRIPTION	COMMUNICATION TYPE	SUPPORT TYPE	MANUFACTURER	MODEL
CCTV	Active	CCTV-I-476-A020.00-SB	A020.00	I-476	SB	40.108486	-75.286428	Mid-County I/C / Toll Plaza	Fiber Optic	Pole-Mounted (Metal)	Bosch	CNV
CCTV	Under Construction	CCTV-I-476-A030.10-NB	A030.10	I-476	NB	40.248371	-75.345577	Lansdale I/C	Wireless 4.9 GHz	Pole-Mounted (Metal)	CNV	CNV
CCTV	Active	CCTV-I-476-A044.00-NB	A044.00	I-476	NB	40.437979	-75.425686	Quakertown I/C	Fiber Optic	Pole-Mounted (50-ft, Metal)	Bosch	AutoDome VG4-A-9543
CCTV	Active	CCTV-I-476-A057.30-SB	A057.30	I-476	SB			Lehigh Valley I/C	Fiber Optic	Pole-Mounted (50-ft, Metal)	Bosch	AutoDome VG4-A-9543
CCTV	Active	CCTV-US-22-A057.30-EB	A057.30	US-22	EB			US 22 at Lehigh Valley I/C	Fiber Optic	Pole-Mounted (50-ft, Metal)	Bosch	AutoDome VG4-A-9543
CCTV	Active	CCTV-I-476-A069.60-NB	A069.60	I-476	NB	40.75918	-75.638241	Lehigh Tunnel MP A069.6N	Wireless 4.9 GHz	Pole-Mounted (Metal)	Bosch	CNV
CCTV	Active	CCTV-I-476-A070.50-SB	A070.50	I-476	SB	40.769907	-75.647605	Lehigh Tunnel MP A070.5S	Wireless 4.9 GHz	Pole-Mounted (Metal)	Bosch	CNV
CCTV	Active	CCTV-I-476-A071.80-SB	A071.80	I-476	SB	40.787209	-75.658114	Lehigh Tunnel MP A071.8S	Wireless 4.9 GHz	Pole-Mounted (Metal)	Bosch	CNV
CCTV	Active	CCTV-I-476-A072.10-SB	A072.10	I-476	SB	40.789353	-75.663287	Lehigh Tunnel MP A072.1S	Wireless 4.9 GHz	Pole-Mounted (Metal)	Bosch	CNV
CCTV	Active	CCTV-I-476-A074.70-SB	A074.70	I-476	SB			Mahoning Valley I/C	Fiber Optic	Pole-Mounted (70-ft, Metal)	Bosch	AutoDome VG4-A-9543
CCTV	Active	CCTV-I-476-A094.70-SB	A094.70	I-476	SB			Pocono I/C	Fiber Optic	Pole-Mounted (70-ft, Metal)	Bosch	AutoDome VG4-A-9543
CCTV	Active	CCTV-I-476-A105.30-NB	A105.30	I-476	NB			Wilkes-Barre I/C	Fiber Optic	Pole-Mounted (50-ft, Metal)	Bosch	AutoDome VG4-A-9543
CCTV	Active	CCTV-I-476-A112.40-SB	A112.40	I-476	SB			Wyoming Valley Toll Plaza	Fiber Optic	Pole-Mounted (50-ft, Metal)	Bosch	AutoDome VG4-A-9543
CCTV	Active	CCTV-I-476-A114.60-SB	A114.60	I-476	SB			Wyoming Valley I/C	Fiber Optic	Pole-Mounted (50-ft, Metal)	Bosch	AutoDome VG4-A-9543
CCTV	Active	CCTV-I-476-A121.30-SB	A121.30	I-476	SB			Keyser Avenue I/C Toll Plaza	Fiber Optic	Pole-Mounted (50-ft, Metal)	Bosch	AutoDome VG4-A-9543
CCTV	Active	CCTV-I-476-A121.80-SB	A121.80	I-476	SB			Keyser Avenue I/C	Wireless 2.4 GHz	Pole-Mounted (50-ft, Metal)	Bosch	AutoDome VG4-A-9543
CCTV	Active	CCTV-I-476-A130.70-SB	A130.70	I-476	SB			Clarks Summit I/C	Wireless 4.9 GHz	Pole-Mounted (50-ft, Metal)	Bosch	AutoDome VG4-A-9543
CCTV	Active	CCTV-I-76-T001.20-EB	T001.20	I-76	EB	40.904575	-80.498491	Gateway MLTP	Fiber Optic	Pole-Mounted (Metal)	Bosch	CNV
CCTV	Active	CCTV-I-76-T001.60-WB	T001.60	I-76	WB	40.903435	-80.490475	Gateway MLTP	Fiber Optic	Pole-Mounted (Metal)	Bosch	CNV
CCTV	Active	CCTV-I-76-T028.50-WB	T028.50	I-76	WB	40.678962	-80.103362	Cranberry I/C	Cellular 4G	Pole-Mounted (Metal)	Bosch	VG5-623-ECS

DEVICE TYPE	DEVICE STATUS	DEVICE ID	MILE-POST	ROUTE	DIR	LATITUDE	LONGITUDE	SITE DESCRIPTION	COMMUNICATION TYPE	SUPPORT TYPE	MANUFACTURER	MODEL
CCTV	Active	CCTV-I-76-T030.80-WB	T030.80	I-76	WB	40.656048	-80.076041	Warrendale I/C	Fiber Optic	Pole-Mounted (Metal)	Cohu	3925-3800
CCTV	Active	CCTV-I-76-T031.30-WB	T031.30	I-76	WB	40.654743	-80.067547	Warrendale I/C	Fiber Optic	Pole-Mounted (Metal)	Cohu	3925-3800
CCTV	Active	CCTV-I-76-T047.60-WB	T047.60	I-76	WB	40.543866	-79.82348	Allegheny Valley I/C Mainline (ARB 2)	Fiber Optic	Pole-Mounted (Metal)	Bosch	Envirodome
CCTV	Active	CCTV-I-76-T047.70-EB	T047.70	I-76	EB	40.540688	-79.824748	Allegheny Valley I/C Toll Plaza (ARB 1)	Fiber Optic	Pole-Mounted (Metal)	Bosch	CNV
CCTV	Active	CCTV-I-76-T056.60-EB	T056.60	I-76	EB	40.436102	-79.749428	Pittsburgh I/C	Fiber Optic	Pole-Mounted (50-ft, Metal)	Cohu	3925-38-PEND
CCTV	Active	CCTV-I-76-T057.00-EB	T057.00	I-76	EB	40.432099	-79.74616	Pittsburgh I/C	Fiber Optic	Sign Structure	Cohu	3925-38-PEND
CCTV	Active	CCTV-I-76-T067.30-EB	T067.30	I-76	EB	40.311417	-79.678706	Irwin I/C	Fiber Optic	Pole-Mounted (Metal)	Bosch	VG5-623-ECS
CCTV	Active	CCTV-I-76-T075.20-WB	T075.20	I-76	WB	40.224236	-79.606051	New Stanton I/C	Fiber Optic	Pole-Mounted (50-ft, Metal)	Cohu	3925-38-PEND
CCTV	Active	CCTV-I-76-T090.70-EB	T090.70	I-76	EB	40.108693	-79.380961	Donegal I/C	Fiber Optic	Pole-Mounted (Metal)	Bosch	VG5-623-ECS
CCTV	Active	CCTV-I-76-T109.90-EB	T109.90	I-76	EB	40.020368	-79.08178	Somerset I/C	Fiber Optic	Pole-Mounted (Metal)	Bosch	VG5-623-ECS
CCTV	Active	CCTV-I-76-T121.50-EB	T121.50	I-76	EB	39.969458	-78.878489	Allegheny Tunnel MP 121.5E	Wireless 4.9 GHz	Pole-Mounted (Metal)	CNV	CNV
CCTV	Active	CCTV-I-76-T121.90-EB	T121.90	I-76	EB	39.967876	-78.872018	Allegheny Tunnel MP 121.9E	Wireless 4.9 GHz	Pole-Mounted (Metal)	CNV	CNV
CCTV	Active	CCTV-I-76-T123.40-WB	T123.40	I-76	WB	39.957214	-78.847311	Allegheny Tunnel MP 123.4W	Wireless 4.9 GHz	Pole-Mounted (Metal)	CNV	CNV
CCTV	Active	CCTV-I-76-T145.90-WB	T145.90	I-76	WB	40.050326	-78.512558	Bedford I/C	Fiber Optic	Pole-Mounted (Metal)	Bosch	VG5-623-ECS
CCTV	Active	CCTV-I-76-T161.50-EB	T161.50	I-76	EB	39.985985	-78.257735	Breezewood I/C	Fiber Optic	Pole-Mounted (50-ft, Metal)	Cohu	3925-38-PEND
CCTV	Active	CCTV-I-76-T161.50-WB	T161.50	I-76	WB	39.987543	-78.256689	Breezewood I/C	Fiber Optic	Pole-Mounted (50-ft, Metal)	Cohu	3925-38-PEND
CCTV	Active	CCTV-I-76-T179.40-WB	T179.40	I-76	WB	40.050489	-77.96132	Fort Littleton I/C	Fiber Optic	Pole-Mounted (Metal)	Bosch	VG5-623-ECS
CCTV	Active	CCTV-I-76-T184.70-EB	T184.70	I-76	EB	40.078621	-77.875932	Tuscarora Tunnel MP 184.7	Wireless 4.9 GHz	Pole-Mounted (Metal)	Bosch	CNV
CCTV	Active	CCTV-I-76-T186.00-EB	T186.00	I-76	EB	40.091576	-77.858374	Tuscarora Tunnel MP 186.0	Fiber Optic	Pole-Mounted (Metal)	Bosch	CNV
CCTV	Active	CCTV-I-76-T187.40-WB	T187.40	I-76	WB	40.086796	-77.831454	Tuscarora Tunnel MP 187.4	Wireless 4.9 GHz	Pole-Mounted (Metal)	Bosch	CNV

DEVICE TYPE	DEVICE STATUS	DEVICE ID	MILE-POST	ROUTE	DIR	LATITUDE	LONGITUDE	SITE DESCRIPTION	COMMUNICATION TYPE	SUPPORT TYPE	MANUFACTURER	MODEL
CCTV	Active	CCTV-I-76-T188.00-WB	T188.00	I-76	WB	40.091615	-77.82442	Tuscarora Tunnel MP 188.0	Wireless 4.9 GHz	Pole-Mounted (Metal)	Bosch	CNV
CCTV	Active	CCTV-I-76-T188.60-EB	T188.60	I-76	EB	40.096393	-77.815751	Willow Hill I/C	Fiber Optic	Pole-Mounted (Metal)	Bosch	VG5-623-ECS
CCTV	Active	CCTV-I-76-T196.50-EB	T196.50	I-76	EB	40.159071	-77.694198	Kittatinny Tunnel MP 196.5E	Wireless 4.9 GHz	Pole-Mounted (Metal)	Bosch	CNV
CCTV	Active	CCTV-I-76-T197.10-EB	T197.10	I-76	EB	40.159071	-77.68367	Kittatinny Tunnel MP 197.1E	Wireless 4.9 GHz	Pole-Mounted (Metal)	CNV	CNV
CCTV	Active	CCTV-I-76-T200.40-EB	T200.40	I-76	EB	40.151202	-77.628347	Blue Mountain Tunnel MP 200.4E	Fiber Optic	Pole-Mounted (Metal)	Bosch	CNV
CCTV	Active	CCTV-I-76-T201.30-EB	T201.30	I-76	EB	40.158056	-77.614393	Blue Mountain I/C	Fiber Optic	Pole-Mounted (Metal)	Bosch	CNV
CCTV	Active	CCTV-I-76-T226.60-WB	T226.60	I-76	WB	40.22859	-77.15285	Carlisle I/C; Infield area near WB off-ramp	Fiber Optic	Pole-Mounted (50-ft, Metal)	Bosch	VG5-613-ESC
CCTV	Active	CCTV-I-76-T236.00-WB	T236.00	I-76	WB	40.19585	-76.97575	Gettysburg I/C; Infield area near WB off-ramp	Fiber Optic	Pole-Mounted (50-ft, Metal)	Bosch	VG5-613-ESC
CCTV	Active	CCTV-I-76-T245.60-EB	T245.60	I-76	EB	40.19899	-76.810301	Susquehanna River Bridge 1	Fiber Optic	Pole-Mounted (Metal)	Bosch	Envirodome
CCTV	Active	CCTV-I-76-T246.80-WB	T246.80	I-76	WB	40.213049	-76.796991	Susquehanna River Bridge 2	Fiber Optic	Pole-Mounted (Metal)	Bosch	CNV
CCTV	Active	CCTV-I-76-T247.40-WB	T247.40	I-76	WB	40.215847	-76.788959	Harrisburg East I/C / Central Admin Building Roof	Ethernet (Copper)	Structure Mount (CAB)	Bosch	CNV
CCTV	Active	CCTV-I-76-T266.50-WB	T266.50	I-76	WB	40.23013	-76.43648	Lebanon-Lancaster I/C; Infield are at NE quadrant	Fiber Optic	Pole-Mounted (70-ft, Metal)	Bosch	VG5-613-ESC
CCTV	Active	CCTV-I-76-T286.10-WB	T286.10						Fiber Optic	Pole-Mounted (50-ft, Metal)	Bosch	AutoDome VG5 600 Series
CCTV	Active	CCTV-I-76-T286.50-WB	T286.50	I-76	WB			Reading I/C	Fiber Optic	Pole-Mounted (50-ft, Metal)	Bosch	AutoDome VG4-A-9543
CCTV	Active	CCTV-I-76-T298.40-WB	T298.40	I-76	WB			Morgantown I/C	Fiber Optic	Pole-Mounted (50-ft, Metal)	Bosch	AutoDome VG4-A-9543
CCTV	Active	CCTV-I-76-T311.20-EB	T311.20	I-76	EB			Downingtown I/C	Fiber Optic	Pole-Mounted (50-ft, Metal)	Bosch	AutoDome VG4-A-9543
CCTV	Active	CCTV-I-76-T319.30-EB	T319.30	I-76	EB	40.074892	-75.531582	Great Valley (PA 29) Slip Ramp	Fiber Optic	Pole-Mounted (Metal)	Bosch	AutoDome VG5 600 Series
CCTV	Active	CCTV-I-276-T326.60-WB	T326.60	I-276	WB	40.092343	-75.407698	Valley Forge I/C Mainline	Fiber Optic	Pole-Mounted (Metal)	Bosch	CNV
CCTV	Active	CCTV-I-76-T326.60-EB	T326.60	I-76	EB	40.087099	-75.402492	Valley Forge I/C Toll Plaza	Fiber Optic	Pole-Mounted (Metal)	Bosch	CNV
CCTV	Active	CCTV-I-276-T333.70-WB	T333.70	I-276	WB	40.112817	-75.281054	Plymouth Meeting Maintenance / Radio Tower	Ethernet (Copper)	Radio Tower	Bosch	CNV

DEVICE TYPE	DEVICE STATUS	DEVICE ID	MILE-POST	ROUTE	DIR	LATITUDE	LONGITUDE	SITE DESCRIPTION	COMMUNICATION TYPE	SUPPORT TYPE	MANUFACTURER	MODEL
CCTV	Active	CCTV-I-276-T338.50-WB	T338.50	I-276	WB	40.133139	-75.192725	Fort Washington I/C	Fiber Optic	Pole-Mounted (70-ft, Metal)	Cohu	3925-38-PEND
CCTV	Active	CCTV-I-276-T339.90-WB	T339.90	I-276	WB			Virginia Drive I/C	Fiber Optic	Pole-Mounted (50-ft, Metal)	Bosch	AutoDome VG4-A-9543
CCTV	Active	CCTV-I-276-T343.00-WB	T343.00	I-276	WB	40.162009	-75.119121	Willow Grove I/C	Fiber Optic	Pole-Mounted (70-ft, Metal)	Cohu	3925-38-PEND
CCTV	Active	CCTV-I-276-T350.40-EB	T350.40	I-276	EB	40.135343	-74.989339	Bensalem I/C (0.95 Miles W of I/C)	Wireless 4.9 GHz	Pole-Mounted (50-ft, Metal)	Cohu	iDome 3924-5200
CCTV	Active	CCTV-I-276-T351.50-WB	T351.50	I-276	WB	40.132321	-74.971495	Bensalem I/C	Fiber Optic	Pole-Mounted (50-ft, Metal)	Cohu	3925-38-PEND
CCTV	Active	CCTV-I-276-T357.80-EB	T357.80	I-276	EB	40.1227	-74.85136	Delaware Valley I/C	Fiber Optic	Pole-Mounted (50-ft, Metal)	Cohu	iDome 3924-5200

DMS Device List

DEVICE TYPE	DEVICE STATUS	DEVICE ID	MILE-POST	ROUTE	DIR	LATITUDE	LONGITUDE	SITE DESCRIPTION	COMMUNICATION TYPE	SUPPORT TYPE	MANUFACTURER	MODEL
DMS	Out of Service	DMS-I-476-A023.00-SB	A023.00	I-476	SB	40.16194	-75.4686	OLD Mid County ***REMOVED***	--	Center-Mount	Fiber Optic Display Systems (FDS)	CNV
DMS	Active	DMS-I-476-A023.50-SB	A023.50	I-476	SB	40.16011	-75.2988	Northeast MP A023.5 SB Mid-County I/C	Cellular 4G	Center-Mount	Daktronics	VF-2120-27x90-66-A
DMS	Active	DMS-I-476-A033.30-SB	A033.30	I-476	SB	40.29172	-75.3664	Northeast MP A033.3 SB Lansdale I/C	Cellular 4G	Center-Mount	S.E.S. America	M6000 Series
DMS	Active	DMS-I-476-A051.40-SB	A051.40	I-476	SB	40.52022	-75.5108	Northeast MP A051.4 SB Quakertown I/C	Wireless 4.9 GHz	Center-Mount	S.E.S. America	M6000 Series
DMS	Active	DMS-I-476-A054.60-NB	A054.60	I-476	NB	40.55825	-75.5444	Northeast MP A054.6 NB Lehigh Valley I/C	Wireless 4.9 GHz	Center-Mount	S.E.S. America	M6000 Series
DMS	Active	DMS-I-476-A067.50-NB	A067.50	I-476	NB	40.73144	-75.6283	Northeast MP A067.5 NB Lehigh Tunnel	Cellular 4G	Center-Mount	S.E.S. America	M6000 Series
DMS	Active	DMS-I-476-A069.70-NB	A069.70	I-476	NB	40.76103	-75.6396	Northeast MP A069.7 NB Lehigh Tunnel	Cellular 4G	Center-Mount	S.E.S. America	M6000 Series
DMS	Active	DMS-I-476-A072.00-SB	A072.00	I-476	SB	40.789	-75.6623	Northeast MP A072.0 SB Lehigh Tunnel	Fiber Optic	Center-Mount	S.E.S. America	M6000 Series
DMS	Active	DMS-I-476-A077.20-SB	A077.20	I-476	SB	40.85244	-75.6546	Northeast MP A077.2 SB Mahoning Valley I/C	Cellular 4G	Center-Mount	S.E.S. America	M6000 Series
DMS	Active	DMS-I-76-T000.00-EB	T000.00	I-76	EB	40.91638	-80.5284	Mainline MP 000.0 EB Gateway MLTP (Ohio 240.6E)	Cellular 4G	Overhead	Fiber Optic Display Systems (FDS)	Sylvia
DMS	Active	DMS-I-76-T000.90-EB	T000.90	I-76	EB	40.90583	-80.5037	Mainline MP 000.9 EB Gateway MLTP	Cellular 4G	Overhead	Fiber Optic Display Systems (FDS)	Sylvia
DMS	Active	DMS-I-76-T006.80-EB	T006.80	I-76	EB	40.79327	-80.275	Station 363+62; Offset – 71’ RT	Cellular 4G	Center-Mount	Daktronics	VF-2020-96x288-20-RGB
DMS	Active	DMS-I-76-T015.80-WB	T015.80	I-76	WB	40.79327	-80.275	Station 413+50; Offset – 54’ LT	Cellular 4G	Center-Mount	Daktronics	VF-2020-96x288-20-RGB
DMS	Active	DMS-I-76-T025.90-EB	T025.90	I-76	EB	40.71103	-80.1292	Station 85+75; Offset – 53’ RT	Cellular 4G	Center-Mount	Daktronics	VF-2020-96x288-20-RGB
DMS	Active	DMS-I-76-T028.90-EB	T028.90	I-76	EB	40.67227	-80.1008	Mainline MP 028.9 EB Warrendale MLTP	Cellular 4G	Overhead	Fiber Optic Display Systems (FDS)	Sylvia
DMS	Active	DMS-I-76-T030.50-EB	T030.50	I-76	EB	40.65686	-80.0819	Mainline MP 030.5 EB Warrendale MLTP	Cellular 4G	Overhead	Fiber Optic Display Systems (FDS)	Sylvia
DMS	Active	DMS-I-76-T031.70-WB	T031.70	I-76	WB	40.65263	-80.059	Mainline MP 031.7 WB Warrendale MLTP	Cellular 4G	Cantilever	Daktronics	VF-2120-27x110-66-A
DMS	Active	DMS-I-76-T033.00-WB	T033.00	I-76	WB	40.64841	-80.0362	Mainline MP 033.0 WB Warrendale MLTP	Cellular 4G	Cantilever	Fiber Optic Display Systems (FDS)	Sylvia
DMS	Active	DMS-I-76-T036.20-EB	T036.20	I-76	EB	40.63073	-79.9861	Station 391+56; Offset – 55’ RT	Cellular 4G	Center-Mount	Daktronics	VF-2020-96x288-20-RGB
DMS	Out of Service	DMS-I-76-T045.80-EB	T045.80	I-76	EB	40.55805	-79.8489	Mainline MP 045.8 EB Allegheny Valley I/C	Cellular 4G	Center-Mount	Fiber Optic Display Systems (FDS)	CNV

DEVICE TYPE	DEVICE STATUS	DEVICE ID	MILE-POST	ROUTE	DIR	LATITUDE	LONGITUDE	SITE DESCRIPTION	COMMUNICATION TYPE	SUPPORT TYPE	MANUFACTURER	MODEL
DMS	Active	DMS-I-76-T049.50-WB	T049.50	I-76	WB	40.52103	-79.8097	Station 1106+47; Offset – 54’ LT	Cellular 4G	Center-Mount	Daktronics	VF-2020-96x288-20-RGB
DMS	Active	DMS-I-76-T054.90-EB	T054.90	I-76	EB	40.45827	-79.7583	Station 1388+90; Offset – 54’ RT	Cellular 4G	Center-Mount	Daktronics	VF-2020-96x288-20-RGB
DMS	Active	DMS-I-76-T059.70-WB	T059.70	I-76	WB	40.40425	-79.7092	Mainline MP 059.7 WB Pittsburgh I/C	Cellular 4G	Center-Mount	Daktronics	VF-2020-96x288-20-RGB
DMS	Active	DMS-I-76-T072.40-EB	T072.40	I-76	EB	40.25227	-79.6426	Station 569+24; Offset – 67’ RT	Fiber Optic	Center-Mount	Daktronics	VF-2020-96x288-20-RGB
DMS	Active	DMS-I-76-T081.70-WB	T081.70	I-76	WB	40.17475	-79.5069	Mainline MP 081.7 WB New Stanton I/C	Cellular 4G	Center-Mount	Daktronics	VF-2020-96x288-20-RGB
DMS	Active	DMS-I-76-T088.60-EB	T088.60	I-76	EB	40.12933	-79.4084	Station 148+19; Offset – 66’ RT	Fiber Optic	Center-Mount	Daktronics	VF-2020-96x288-20-RGB
DMS	Active	DMS-I-76-T092.70-WB	T092.70	I-76	WB	40.11592	-79.3455	Station 157+38; Offset – 71’ LT	Cellular 4G	Center-Mount	Daktronics	VF-2020-96x288-20-RGB
DMS	Active	DMS-I-76-T104.90-EB	T104.90	I-76	EB	40.06633	-79.1486	Mainline MP 104.9 EB Somerset I/C	Cellular 4G	Center-Mount	Fiber Optic Display Systems (FDS)	Sylvia
DMS	Active	DMS-I-76-T113.80-WB	T113.80	I-76	WB	39.99353	-79.0194	Station 609+91; Offset – 63’ LT	Cellular 4G	Center-Mount	Daktronics	VF-2020-96x288-20-RGB
DMS	Active	DMS-I-76-T120.10-EB	T120.10	I-76	EB	39.97314	-78.9048	Mainline MP 120.1 EB Allegheny Tunnel	Fiber Optic	Center-Mount	S.E.S. America	M6000 Series
DMS	Active	DMS-I-76-T121.60-EB	T121.60	I-76	EB	39.96933	-78.8775	Mainline MP 121.6 EB Allegheny Tunnel	Fiber Optic	Center-Mount	S.E.S. America	M6000 Series
DMS	Active	DMS-I-76-T123.60-WB	T123.60	I-76	WB	39.95838	-78.8441	Mainline MP 123.6 WB Allegheny Tunnel	Wireless 4.9 GHz	Center-Mount	S.E.S. America	M6000 Series
DMS	Active	DMS-I-76-T142.90-EB	T142.90	I-76	EB	40.04408	-78.5603	Station 697+11; Offset – 52’ RT	Cellular 4G	Center-Mount	Daktronics	VF-2020-96x288-20-RGB
DMS	Active	DMS-I-76-T143.00-EB	T143.00	I-76	EB	40.04401	-78.5604	Mainline MP 143.0 EB Bedford I/C	Cellular 4G	Center-Mount	Fiber Optic Display Systems (FDS)	Sylvia
DMS	Active	DMS-I-76-T149.40-WB	T149.40	I-76	WB	40.01168	-78.4632	Station 1046+09; Offset – 57’ LT	Cellular 4G	Center-Mount	Daktronics	VF-2020-96x288-20-RGB
DMS	Active	DMS-I-76-T154.30-EB	T154.30	I-76	EB	40.00536	-78.3834	Mainline MP 154.2 EB Everett I/C	Cellular 4G	Center-Mount	Daktronics	VF-2020-96x288-20-RGB
DMS	Active	DMS-I-70-T161.50-WB	T161.50	I-70	WB	39.96963	-78.2461	Mainline MP 161.5 I-70 NB Pre-Entry	Cellular 4G	Center-Mount	Daktronics	VF-2120-27x90-66-A
DMS	Active	DMS-I-76-T162.10-EB	T162.10	I-76	EB	39.98576	-78.2451	Mainline MP 162.1 Sideling Hill	Fiber Optic	Center-Mount	Daktronics	VF-2420-27x60-46-A
DMS	Active	DMS-I-76-T163.00-EB	T163.00	I-76	EB	39.99044	-78.2288	Mainline MP 163.0 Sideling Hill	Fiber Optic	Center-Mount	Daktronics	VF-2420-27x60-46-A
DMS	Active	DMS-I-76-T163.00-WB	T163.00	I-76	WB	39.9905	-78.229	Mainline MP 163.0 Sideling Hill	Fiber Optic	Center-Mount	Daktronics	VF-2420-27x60-46-A

DEVICE TYPE	DEVICE STATUS	DEVICE ID	MILE-POST	ROUTE	DIR	LATITUDE	LONGITUDE	SITE DESCRIPTION	COMMUNICATION TYPE	SUPPORT TYPE	MANUFACTURER	MODEL
DMS	Active	DMS-I-76-T165.10-EB	T165.10	I-76	EB	40.01459	-78.2027	Mainline MP 165.1 Sideling Hill	Fiber Optic	Center-Mount	Daktronics	VF-2420-27x60-46-A
DMS	Active	DMS-I-76-T165.10-WB	T165.10	I-76	WB	40.01459	-78.2027	Mainline MP 165.1 Sideling Hill	Fiber Optic	Center-Mount	Daktronics	VF-2420-27x60-46-A
DMS	Active	DMS-I-76-T167.00-EB	T167.00	I-76	EB	40.0292	-78.1701	Mainline MP 167.0 Sideling Hill	Fiber Optic	Center-Mount	Daktronics	VF-2420-27x60-46-A
DMS	Active	DMS-I-76-T167.00-WB	T167.00	I-76	WB	40.0292	-78.1701	Mainline MP 167.0 Sideling Hill	Fiber Optic	Center-Mount	Daktronics	VF-2420-27x60-46-A
DMS	Active	DMS-I-76-T169.50-EB	T169.50	I-76	EB	40.03966	-78.1274	Mainline MP 169.5 Sideling Hill	Fiber Optic	Center-Mount	Daktronics	VF-2420-27x60-46-A
DMS	Active	DMS-I-76-T169.50-WB	T169.50	I-76	WB	40.03966	-78.1274	Mainline MP 169.5 Sideling Hill	Fiber Optic	Center-Mount	Daktronics	VF-2420-27x60-46-A
DMS	Active	DMS-I-76-T171.60-WB	T171.60	I-76	WB	40.05985	-78.0939	Mainline MP 171.6 Sideling Hill	Fiber Optic	Center-Mount	Daktronics	VF-2420-27x60-46-A
DMS	Active	DMS-I-76-T175.90-WB	T175.90	I-76	WB	40.04485	-78.0196	Mainline MP 175.9 WB Sideling Hill	Cellular 4G	Center-Mount	Daktronics	VF-2020-96x288-20-RGB
DMS	Active	DMS-I-76-T177.60-EB	T177.60	I-76	EB	40.03928	-77.9883	Mainline MP 177.0 EB Sideling Hill	Cellular 4G	Center-Mount	S.E.S. America	M6000 Series
DMS	Active	DMS-I-76-T184.90-EB	T184.90	I-76	EB	40.08131	-77.8732	Mainline MP 184.9 EB Tuscarora Tunnel	Wireless 4.9 GHz	Center-Mount	S.E.S. America	M6000 Series
DMS	Active	DMS-I-76-T185.90-EB	T185.90	I-76	EB	40.09147	-77.861	Mainline MP 185.9 EB Tuscarora Tunnel	Wireless 4.9 GHz	Center-Mount	S.E.S. America	M6000 Series
DMS	Active	DMS-I-76-T187.90-WB	T187.90	I-76	WB	40.09122	-77.8249	Mainline MP 187.9 WB Tuscarora Tunnel	Fiber Optic	Center-Mount	S.E.S. America	M6000 Series
DMS	Active	DMS-I-76-T189.40-WB	T189.40	I-76	WB	40.10444	-77.8031	Mainline MP 189.4 WB Tuscarora Tunnel	Wireless 4.9 GHz	Center-Mount	S.E.S. America	M6000 Series
DMS	Active	DMS-I-76-T194.30-EB	T194.30	I-76	EB	40.14242	-77.7264	Mainline MP 194.4 EB Blue/Kittatinny Tunnel	Wireless 4.9 GHz	Center-Mount	S.E.S. America	M6000 Series
DMS	Active	DMS-I-76-T197.10-EB	T197.10	I-76	EB	40.15881	-77.6831	Mainline MP 197.1 EB Blue/Kittatinny Tunnel	Wireless 4.9 GHz	Center-Mount	S.E.S. America	M6000 Series
DMS	Active	DMS-I-76-T200.30-WB	T200.30	I-76	WB	40.1512	-77.6283	Mainline MP 200.3 WB Blue Mountain I/C	Fiber Optic	Center-Mount	S.E.S. America	M6000 Series
DMS	Active	DMS-US-11-T226.50-NB	T226.50	US-11	NB	40.22768	-77.151	Mainline MP 226.6 US-11 NB Pre-Entry (0011/0510/0362)	Cellular 4G	Post-Mounted (Type A)	Daktronics	VF-2420-27x60-46-A
DMS	Active	DMS-US-11-T226.50-SB	T226.50	US-11	SB	40.23485	-77.1346	Mainline MP 226.6 US-11 SB Pre-Entry (0011/0531/0985)	Cellular 4G	Post-Mounted (Type A)	Daktronics	VF-2420-27x60-46-A
DMS	Active	DMS-I-76-T227.65-WB	T227.65	I-76	WB	40.22805	-77.1304	Mainline MP 227.65 WB Carlisle I/C	Cellular 4G	Center-Mount	Daktronics	VF-2020-54x180-34-RGB
DMS	Active	DMS-I-76-T233.60-EB	T233.60	I-76	EB	40.19738	-77.0263	Mainline MP 233.6 EB Carlisle I/C	Cellular 4G	Center-Mount	Daktronics	VF-2020-54x180-34-RGB

DEVICE TYPE	DEVICE STATUS	DEVICE ID	MILE-POST	ROUTE	DIR	LATITUDE	LONGITUDE	SITE DESCRIPTION	COMMUNICATION TYPE	SUPPORT TYPE	MANUFACTURER	MODEL
DMS	Active	DMS-US-15-T236.20-SB	T236.20	US-15	SB	40.20277	-76.9682	Mainline MP 236.3 US-15 SB Pre-Entry (0015/0111/1836)	Cellular 4G	Post-Mounted (Type A)	Daktronics	VF-2420-27x60-46-A
DMS	Active	DMS-I-76-T238.20-EB	T238.20	I-76	EB	40.19836	-76.9399	Mainline MP 238.2 EB Gettysburg Pike I/C	Cellular 4G	Center-Mount	Daktronics	VF-2020-54x180-34-RGB
DMS	Active	DMS-I-76-T239.30-WB	T239.30	I-76	WB	40.1967	-76.9211	Mainline MP 239.3 WB Gettysburg Pike I/C	Cellular 4G	Center-Mount	Daktronics	VF-2020-54x180-34-RGB
DMS	Active	DMS-I-83-T241.90-SB	T241.90	I-83	SB	40.22908	-76.8897	Mainline MP 241.9 I-83 SB Pre-Entry (0083/0450/0170)	Cellular 4G	Center-Mount	Daktronics	VF-2420-27x60-46-A
DMS	Active	DMS-I-76-T243.70-EB	T243.70	I-76	EB	40.20212	-76.8446	Mainline MP 243.7 EB Harrisburg East I/C	Fiber Optic	Overhead	Daktronics	VF-2020-54x180-34-RGB
DMS	Under Construction	DMS-I-76-T243.70-WB	T243.70	I-76	WB	40.20212	-76.8446	Mainline MP 243.7 WB Harrisburg West I/C	Fiber Optic	Overhead	Daktronics	VF-2020-54x180-34-RGB
DMS	Active	DMS-I-283-T247.40-SB	T247.40	I-283	SB	40.23759	-76.8009	Mainline MP 247.3 I-283 SB Pre-Entry (0283/0011/2333)	Cellular 4G	Post-Mounted (Type A)	Daktronics	VF-2420-27x60-46-A
DMS	Active	DMS-PA 283-T247.40-WB	T247.40	PA 283	WB	40.22414	-76.7737	Mainline MP 248.5 PA 283 WB Pre-Entry (0300/0031/0960)	Cellular 4G	Center-Mount	Daktronics	VF-2020-54x180-34-RGB
DMS	Active	DMS-I-76-T250.20-WB	T250.20	I-76	WB	40.2102	-76.7339	Mainline MP 250.2 WB Harrisburg East I/C	Cellular 4G	Center-Mount	Daktronics	VF-2020-54x180-34-RGB
DMS	Active	DMS-I-76-T265.60-EB	T265.60	I-76	EB	40.22843	-76.4519	Mainline MP 265.6 EB Lebanon-Lancaster I/C	Fiber Optic	Center-Mount	Daktronics	VF-2020-54x180-34-RGB
DMS	Active	DMS-PA 72-T266.50-NB	T266.50	PA 72	NB	40.22944	-76.4324	Mainline MP 266.5 PA 72 NB Pre-Entry (0072/0420/3000)	Cellular 4G	Post-Mounted (Type A)	Daktronics	VF-2420-27x60-46-A
DMS	Active	DMS-PA 72-T266.50-SB	T266.50	PA 72	SB	40.23641	-76.4361	Mainline MP 266.5 PA 72 SB Pre-Entry (0072/0440/840)	Cellular 4G	Post-Mounted (Type A)	Daktronics	VF-2420-27x60-46-A
DMS	Active	DMS-I-76-T269.75-WB	T269.75	I-76	WB	40.22762	-76.3786	Mainline MP 269.7 WB Lebanon-Lancaster	Cellular 4G	Center-Mount	Daktronics	VF-2020-54x180-34-RGB
DMS	Active	DMS-I-76-T282.70-EB	T282.70	I-76	EB	40.24016	-76.1369	SHOULDER JUST WEST OF 6TH ST. OVERPASS	Cellular 4G	Center-Mount	Daktronics	VF-2020-96x288-20-RGB
DMS	Active	DMS-I-76-T290.55-WB	T290.55	I-76	WB	40.19566	-76.0063	SHOULDER ? MILE EAST OF MAPLE GROVE RD	Cellular 4G	Center-Mount	Daktronics	VF-2020-96x288-20-RGB
DMS	Active	DMS-I-76-T297.87-EB	T297.87	I-76	EB	40.16072	-75.8198	SHOULDER @ MORGANTOWN RD OVERPASS	Cellular 4G	Center-Mount	Daktronics	VF-2020-96x288-20-RGB
DMS	Active	DMS-I-76-T301.95-WB	T301.95	I-76	WB	40.14599	-75.8198	SHOULDER JUST WEST OF YODER RD OVERPASS	Cellular 4G	Center-Mount	Daktronics	VF-2020-96x288-20-RGB
DMS	Active	DMS-I-76-T308.65-EB	T308.65	I-76	EB	40.08645	-75.7238	SHOULDER ? MILE EAST OF STYER RD	Cellular 4G	Center-Mount	Daktronics	VF-2020-96x288-20-RGB
DMS	Active	DMS-I-76-T308.70-EB	T308.70	I-76	EB	40.08647	-75.724	Mainline MP 308.7 EB Downingtown I/C	Cellular 4G	Center-Mount	Fiber Optic Display Systems (FDS)	VF-2020-96x288-20-RGB
DMS	Active	DMS-I-76-T315.95-WB	T315.95	I-76	WB	40.06497	-75.5964	SHOULDER JUST WEST OF DEVAULT MAINTENANCE	Cellular 4G	Center-Mount	Daktronics	VF-2020-96x288-20-RGB

DEVICE TYPE	DEVICE STATUS	DEVICE ID	MILE-POST	ROUTE	DIR	LATITUDE	LONGITUDE	SITE DESCRIPTION	COMMUNICATION TYPE	SUPPORT TYPE	MANUFACTURER	MODEL
DMS	Active	DMS-I-76-T316.22-EB	T316.22	I-76	EB	40.06482	-75.5908	SHOULDER ? MILE EAST OF BODINE RD OVERPASS	Cellular 4G	Center-Mount	Daktronics	VF-2020-96x288-20-RGB
DMS	Active	DMS-I-76-T323.00-EB	T323.00	I-76	EB	40.07848	-75.4684	Mainline MP 323.0 EB Valley Forge I/C	Cellular 4G	Center-Mount	Fiber Optic Display Systems (FDS)	Sylvia
DMS	Active	DMS-I-276-T329.90-EB	T329.90	I-276	EB	40.09331	-75.3456	Mainline MP 329.9 EB ERO	Wireless 4.9 GHz	Center-Mount	S.E.S. America	M6000 Series
DMS	Active	DMS-I-276-T332.10-WB	T332.10	I-276	WB	40.10671	-75.3092	MAINTENANCE RD AT BELVOIR RD	Cellular 4G	Center-Mount	Daktronics	VF-2020-96x288-20-RGB
DMS	Active	DMS-I-276-T334.75-EB	T334.75	I-276	EB	40.11626	-75.2613	MONOPIPE STRUCTURE JUST EAST OF BUTLER PIKE	Cellular 4G	Overhead	Daktronics	VF-2020-96x288-20-RGB
DMS	Active	DMS-I-276-T334.75-WB	T334.75	I-276	WB	40.11679	-75.261	MONOPIPE STRUCTURE JUST EAST OF BUTLER PIKE	Cellular 4G	Overhead	Daktronics	VF-2020-96x288-20-RGB
DMS	Out of Service	DMS-I-276-T337.00-WB	T337.00	I-276	WB	40.12718	-75.2206	Mainline MP 337 WB Fort Washington I/C	Cellular 4G	Cantilever	Fiber Optic Display Systems (FDS)	CNV
DMS	Active	DMS-I-276-T339.90-EB	T339.90	I-276	EB	40.1392	-75.1685	SHOULDER BEHIND GUIDERAIL WITH PULLOFF	Fiber Optic	Center-Mount	Daktronics	VF-2020-96x288-20-RGB
DMS	Active	DMS-I-276-T341.30-WB	T341.30	I-276	WB	40.15197	-75.1443	Mainline MP 341.3 WB Virginia Drive I/C	Cellular 4G	Center-Mount	S.E.S. America	M6000 Series
DMS	Active	DMS-I-276-T346.83-WB	T346.83	I-276	WB	40.16232	-75.0469	SHOULDER @ 2ND ST. PIKE OVERPASS	Cellular 4G	Center-Mount	Daktronics	VF-2020-96x288-20-RGB
DMS	Active	DMS-I-276-T350.50-EB	T350.50	I-276	EB	40.13492	-74.9878	Mainline MP 350.5 EB Bensalem I/C	Wireless 4.9 GHz	Center-Mount	Daktronics	VF-2020-54x180-34-RGB
DMS	Active	DMS-I-276-T359.10-WB	T359.10	I-276	WB	40.11074	-74.8077	Mainline MP 359.1 WB (1.29 MI East of DMB - NJ)	Cellular 4G	Center-Mount	Daktronics	VF-2020-54x180-34-RGB

HAR Device List

DEVICE TYPE	DEVICE STATUS	DEVICE ID	MILE-POST	ROUTE	DIR	LATITUDE	LONGITUDE	SITE DESCRIPTION	COMMUNICATION TYPE	SUPPORT TYPE	MANUFACTURER	MODEL
HAR BEACON	Under Construction	HAR BEACON-I-476-A027.50-NB	A027.50	I-476	NB	40.21389	-75.3257	Lansdale I/C	Dual Tone Multi-Frequency (DTMF)	Post-Mounted (Type A)	M. H. Corbin (formerly HIS Inc.)	CNV
HAR BEACON	Active	HAR BEACON-PA 63-A030.10-EB	A030.10	PA 63	EB	40.24686	-75.3438	Lansdale I/C / Prior to entry ramp to Turnpike	Dual Tone Multi-Frequency (DTMF)	Post-Mounted (Type A)	M. H. Corbin (formerly HIS Inc.)	RC 200A
HAR BEACON	Active	HAR BEACON-PA 63-A030.10-WB	A030.10	PA 63	WB	40.24603	-75.3417	Lansdale I/C / At Turnpike entrance	Dual Tone Multi-Frequency (DTMF)	Post-Mounted (Type A)	M. H. Corbin (formerly HIS Inc.)	RC 200A
HAR BEACON	Active	HAR BEACON-I-476-A033.10-SB	A033.10	I-476	SB	40.29012	-75.3656	Lansdale I/C	Dual Tone Multi-Frequency (DTMF)	Post-Mounted (Type A)	M. H. Corbin (formerly HIS Inc.)	RC 200A
HAR BEACON	Out of Service	HAR BEACON-I-476-A054.20-NB	A054.20	I-476	NB	40.55365	-75.5402	Lehigh Valley I/C	Dual Tone Multi-Frequency (DTMF)	Post-Mounted (Type A)	M. H. Corbin (formerly HIS Inc.)	CNV
HAR BEACON	Active	HAR BEACON-PA 309-A057.30-NB	A057.30	PA 309	NB	40.57803	-75.5509	Lehigh Valley I/C / 1.4 mi prior to Turnpike	Dual Tone Multi-Frequency (DTMF)	Post-Mounted (Type A)	M. H. Corbin (formerly HIS Inc.)	RC200
HAR BEACON	Active	HAR BEACON-US 22-A057.30-EB	A057.30	US 22	EB	40.58736	-75.5934	Lehigh Valley I/C / 800 ft prior to Turnpike	Dual Tone Multi-Frequency (DTMF)	Post-Mounted (Type A)	M. H. Corbin (formerly HIS Inc.)	CNV
HAR BEACON	Active	HAR BEACON-US 22-A057.30-WB	A057.30	US 22	WB	40.59824	-75.5645	Lehigh Valley I/C / 1.0 mi prior to Turnpike	Dual Tone Multi-Frequency (DTMF)	Post-Mounted (Type A)	M. H. Corbin (formerly HIS Inc.)	RC200
HAR BEACON	Active	HAR BEACON-I-476-A058.80-SB	A058.80	I-476	SB	40.61375	-75.5772	Lehigh Valley I/C	Dual Tone Multi-Frequency (DTMF)	Post-Mounted (Type A)	M. H. Corbin (formerly HIS Inc.)	RC 200
HAR BEACON	Active	HAR BEACON-I-476-A072.60-NB	A072.60	I-476	NB	40.79404	-75.6715	Mahoning Valley I/C	Dual Tone Multi-Frequency (DTMF)	Post-Mounted (Type A)	M. H. Corbin (formerly HIS Inc.)	RC 200
HAR BEACON	Active	HAR BEACON-I-476-A077.40-SB	A077.40	I-476	SB	40.85384	-75.6536	Mahoning Valley I/C	Dual Tone Multi-Frequency (DTMF)	Post-Mounted (Type A)	M. H. Corbin (formerly HIS Inc.)	RC 200
HAR BEACON	Active	HAR BEACON-I-476-A092.20-NB	A092.20	I-476	NB	41.04801	-75.6721	Pocono I/C	Dual Tone Multi-Frequency (DTMF)	Post-Mounted (Type A)	M. H. Corbin (formerly HIS Inc.)	RC 200A
HAR BEACON	Active	HAR BEACON-I-80-A094.60-EB	A094.60	I-80	EB	41.05719	-75.7318	Pocono I/C / 2.0 mi W of Pocono Interchange	Dual Tone Multi-Frequency (DTMF)	Post-Mounted (Type A)	M. H. Corbin (formerly HIS Inc.)	RC 200A
HAR BEACON	Active	HAR BEACON-I-80-A094.60-WB	A094.60	I-80	WB	41.07815	-75.6688	Pocono I/C / 2.0 mi E of Pocono Interchange	Dual Tone Multi-Frequency (DTMF)	Post-Mounted (Type A)	M. H. Corbin (formerly HIS Inc.)	RC 200A
HAR BEACON	Active	HAR BEACON-PA 940-A094.60-EB	A094.60	PA 940	EB	41.06925	-75.7112	Pocono I/C / 0.05 mi W of Pocono Interchange	Dual Tone Multi-Frequency (DTMF)	Post-Mounted (Type A)	M. H. Corbin (formerly HIS Inc.)	RC 200A
HAR BEACON	Active	HAR BEACON-PA 940-A094.60-WB	A094.60	PA 940	WB	41.07188	-75.7	Pocono I/C / 0.25 mi E of Pocono Interchange	Dual Tone Multi-Frequency (DTMF)	Post-Mounted (Type A)	M. H. Corbin (formerly HIS Inc.)	RC 200A
HAR BEACON	Active	HAR BEACON-I-476-A097.00-SB	A097.00	I-476	SB	41.09131	-75.7405	Pocono I/C	Dual Tone Multi-Frequency (DTMF)	Post-Mounted (Type A)	M. H. Corbin (formerly HIS Inc.)	RC 200A
HAR BEACON	Active	HAR BEACON-I-76-T026.10-EB	T026.10	I-76	EB	40.70869	-80.1263	Cranberry I/C and Warrendale MLTP	Dual Tone Multi-Frequency (DTMF)	Post-Mounted (Type A)	M. H. Corbin (formerly HIS Inc.)	RC 200A
HAR BEACON	Out of Service	HAR BEACON-I-79-T028.50-NB	T028.50	I-79	NB	40.6435	-80.0966	Cranberry I/C / Warrendale MLTP / 1.0 mi S of I/C	Dual Tone Multi-Frequency (DTMF)	Post-Mounted (Type A)	M. H. Corbin (formerly HIS Inc.)	RC 200A

DEVICE TYPE	DEVICE STATUS	DEVICE ID	MILE-POST	ROUTE	DIR	LATITUDE	LONGITUDE	SITE DESCRIPTION	COMMUNICATION TYPE	SUPPORT TYPE	MANUFACTURER	MODEL
HAR BEACON	Active	HAR BEACON-I-79-T028.50-SB	T028.50	I-79	SB	40.71972	-80.1021	Cranberry I/C / Warrendale MLTP / 2.5 mi N of I/C	Dual Tone Multi-Frequency (DTMF)	Post-Mounted (Type A)	M. H. Corbin (formerly HIS Inc.)	RC 200A
HAR BEACON	Active	HAR BEACON-US 19-T028.50-NB	T028.50	US 19	NB	40.65844	-80.0908	Cranberry I/C / Warrendale MLTP / 1.5 mi S of I/C	Dual Tone Multi-Frequency (DTMF)	Post-Mounted (Type A)	M. H. Corbin (formerly HIS Inc.)	RC 200A
HAR BEACON	Out of Service	HAR BEACON-US 19-T028.50-SB	T028.50	US 19	SB	40.68075	-80.1	Cranberry I/C / Warrendale MLTP / On-ramp of I/C	Dual Tone Multi-Frequency (DTMF)	Post-Mounted (Type A)	M. H. Corbin (formerly HIS Inc.)	CNV
HAR BEACON	Active	HAR BEACON-I-76-T031.80-WB	T031.80	I-76	WB	40.65266	-80.0575	Cranberry I/C and Warrendale MLTP	Dual Tone Multi-Frequency (DTMF)	Post-Mounted (Type A)	M. H. Corbin (formerly HIS Inc.)	RC 200A
HAR BEACON	Under Constructio n	HAR BEACON-I-76-T045.00-EB	T045.00	I-76	EB	40.56745	-79.8553	Allegheny Valley I/C	Dual Tone Multi-Frequency (DTMF)	Post-Mounted (Type A)	M. H. Corbin (formerly HIS Inc.)	CNV
HAR BEACON	Active	HAR BEACON-I-76-T049.80-WB	T049.80	I-76	WB	40.5205	-79.8046	Allegheny Valley I/C	Dual Tone Multi-Frequency (DTMF)	Post-Mounted (Type A)	M. H. Corbin (formerly HIS Inc.)	RC 200A
HAR BEACON	Active	HAR BEACON-I-76-T054.40-EB	T054.40	I-76	EB	40.46463	-79.762	Pittsburgh I/C	Dual Tone Multi-Frequency (DTMF)	Post-Mounted (Type A)	M. H. Corbin (formerly HIS Inc.)	RC 200A
HAR BEACON	Active	HAR BEACON-I-376-T056.40-EB	T056.40	I-376	EB	40.44233	-79.7871	Pittsburgh I/C / 1.8 mi prior to Pittsburgh I/C	Dual Tone Multi-Frequency (DTMF)	Post-Mounted (Type A)	M. H. Corbin (formerly HIS Inc.)	RC 200A
HAR BEACON	Active	HAR BEACON-PA 48-T056.40-SB	T056.40	PA 48	SB	40.44137	-79.7606	Pittsburgh I/C	Dual Tone Multi-Frequency (DTMF)	Post-Mounted (Type A)	M. H. Corbin (formerly HIS Inc.)	RC 200A
HAR BEACON	Active	HAR BEACON-US 22-T056.40-EB	T056.40	US 22	EB	40.43863	-79.7582	Pittsburgh I/C / Just prior to Pittsburgh I/C	Dual Tone Multi-Frequency (DTMF)	Post-Mounted (Type A)	M. H. Corbin (formerly HIS Inc.)	RC 200A
HAR BEACON	Active	HAR BEACON-US 22-T056.40-WB	T056.40	US 22	WB	40.42934	-79.7276	Pittsburgh I/C / 1.8 mi E of Pittsburgh I/C	Dual Tone Multi-Frequency (DTMF)	Post-Mounted (Type A)	M. H. Corbin (formerly HIS Inc.)	RC 200A
HAR BEACON	Active	HAR BEACON-I-76-T059.10-WB	T059.10	I-76	WB	40.40788	-79.7202	Pittsburgh I/C	Dual Tone Multi-Frequency (DTMF)	Post-Mounted (Type A)	M. H. Corbin (formerly HIS Inc.)	RC 200A
HAR BEACON	Active	HAR BEACON-I-76-T073.00-EB	T073.00	I-76	EB	40.23562	-79.6221	New Stanton I/C	Dual Tone Multi-Frequency (DTMF)	Post-Mounted (Type A)	M. H. Corbin (formerly HIS Inc.)	RC 200A
HAR BEACON	Out of Service	HAR BEACON-I-70-T075.40-EB	T075.40	I-70	EB	40.21402	-79.642	New Stanton I/C / 0.25 mi W of Penn Valley Road	Dual Tone Multi-Frequency (DTMF)	Post-Mounted (Type A)	M. H. Corbin (formerly HIS Inc.)	CNV
HAR BEACON	Active	HAR BEACON-TPK 66-T075.40-SB	T075.40	TPK 66	SB	40.24547	-79.6088	New Stanton I/C / West of US 119	Dual Tone Multi-Frequency (DTMF)	Post-Mounted (Type A)	M. H. Corbin (formerly HIS Inc.)	RC 200A
HAR BEACON	Active	HAR BEACON-US 119-T075.40-NB	T075.40	US 119	NB	40.19219	-79.5705	New Stanton I/C / 2.2 mi S of New Stanton I/C	Dual Tone Multi-Frequency (DTMF)	Post-Mounted (Type A)	M. H. Corbin (formerly HIS Inc.)	RC 200A
HAR BEACON	Active	HAR BEACON-US 119-T075.40-SB	T075.40	US 119	SB	40.22908	-79.5887	New Stanton I/C / 0.5 mi N of New Stanton I/C	Dual Tone Multi-Frequency (DTMF)	Post-Mounted (Type A)	M. H. Corbin (formerly HIS Inc.)	RC 200A
HAR BEACON	Active	HAR BEACON-I-76-T078.50-WB	T078.50	I-76	WB	40.19997	-79.5556	New Stanton I/C	Dual Tone Multi-Frequency (DTMF)	Post-Mounted (Type A)	M. H. Corbin (formerly HIS Inc.)	RC 200A
HAR BEACON	Active	HAR BEACON-I-76-T107.50-EB	T107.50	I-76	EB	40.04134	-79.1144	Somerset I/C	Dual Tone Multi-Frequency (DTMF)	Post-Mounted (Type A)	M. H. Corbin (formerly HIS Inc.)	RC200
HAR BEACON	Active	HAR BEACON-I-76-T112.90-WB	T112.90	I-76	WB	39.997	-79.0359	Somerset I/C	Dual Tone Multi-Frequency (DTMF)	Post-Mounted (Type A)	M. H. Corbin (formerly HIS Inc.)	RC200

DEVICE TYPE	DEVICE STATUS	DEVICE ID	MILE-POST	ROUTE	DIR	LATITUDE	LONGITUDE	SITE DESCRIPTION	COMMUNICATION TYPE	SUPPORT TYPE	MANUFACTURER	MODEL
HAR BEACON	Active	HAR BEACON-I-76-T143.70-EB	T143.70	I-76	EB	40.04877	-78.5481	Bedford I/C	Dual Tone Multi-Frequency (DTMF)	Post-Mounted (Type A)	M. H. Corbin (formerly HIS Inc.)	RC 200A
HAR BEACON	Active	HAR BEACON-I-99-T145.50-NB	T145.50	I-99	NB	40.04275	-78.5143	Bedford I/C / 1.4 mi S of Bedford I/C	Dual Tone Multi-Frequency (DTMF)	Post-Mounted (Type A)	M. H. Corbin (formerly HIS Inc.)	RC 200A
HAR BEACON	Active	HAR BEACON-I-99-T145.50-SB	T145.50	I-99	SB	40.08302	-78.529	Bedford I/C / 2.0 mi N of Bedford I/C	Dual Tone Multi-Frequency (DTMF)	Post-Mounted (Type A)	M. H. Corbin (formerly HIS Inc.)	RC200
HAR BEACON	Active	HAR BEACON-I-76-T146.00-EB	T146.00	I-76	EB	40.0525	-78.5116	Bedford I/C	Dual Tone Multi-Frequency (DTMF)	Post-Mounted (Type A)	M. H. Corbin (formerly HIS Inc.)	RC 200A
HAR BEACON	Active	HAR BEACON-I-76-T147.60-WB	T147.60	I-76	WB	40.02866	-78.4878	Bedford I/C	Dual Tone Multi-Frequency (DTMF)	Post-Mounted (Type A)	M. H. Corbin (formerly HIS Inc.)	RC 200A
HAR BEACON	Active	HAR BEACON-I-76-T159.20-EB	T159.20	I-76	EB	39.98566	-78.296	Breezewood I/C	Dual Tone Multi-Frequency (DTMF)	Post-Mounted (Type A)	M. H. Corbin (formerly HIS Inc.)	RC 200A
HAR BEACON	Active	HAR BEACON-I-70-T161.50-WB	T161.50	I-70	WB	39.98206	-78.2439	Breezewood I/C / 1.5 mi S of Breezewood I/C	Dual Tone Multi-Frequency (DTMF)	Post-Mounted (Type A)	M. H. Corbin (formerly HIS Inc.)	RC 200A
HAR BEACON	Active	HAR BEACON-US 30-T161.50-EB	T161.50	US 30	EB	39.99834	-78.2518	Breezewood I/C / 1.5 mi prior to Breezewood I/C	Dual Tone Multi-Frequency (DTMF)	Post-Mounted (Type A)	M. H. Corbin (formerly HIS Inc.)	RC 200A
HAR BEACON	Active	HAR BEACON-US 30-T161.50-WB	T161.50	US 30	WB	39.99964	-78.232	Breezewood I/C / 0.25 mi prior to Breezewood I/C	Dual Tone Multi-Frequency (DTMF)	Post-Mounted (Type A)	M. H. Corbin (formerly HIS Inc.)	RC 200A
HAR BEACON	Active	HAR BEACON-I-76-T165.30-WB	T165.30	I-76	WB	40.01564	-78.1995	Breezewood I/C	Dual Tone Multi-Frequency (DTMF)	Post-Mounted (Type A)	M. H. Corbin (formerly HIS Inc.)	RC 200A
HAR BEACON	Out of Service	HAR BEACON-I-76-T223.80-EB	T223.80	I-76	EB	40.21678	-77.2014	Carlisle I/C	Dual Tone Multi-Frequency (DTMF)	Post-Mounted (Type A)	M. H. Corbin (formerly HIS Inc.)	CNV
HAR BEACON	Active	HAR BEACON-I-81-T226.50-NB	T226.50	I-81	NB	40.21729	-77.1526	Carlisle I/C / At SR 2002 Overpass	Dual Tone Multi-Frequency (DTMF)	Post-Mounted (Type A)	M. H. Corbin (formerly HIS Inc.)	RC 200A
HAR BEACON	Active	HAR BEACON-I-81-T226.50-SB	T226.50	I-81	SB	40.24339	-77.0952	Carlisle I/C / Near Bernheisel Road Overpass	Dual Tone Multi-Frequency (DTMF)	Post-Mounted (Type A)	M. H. Corbin (formerly HIS Inc.)	RC 200A
HAR BEACON	Active	HAR BEACON-I-76-T228.70-WB	T228.70	I-76	WB	40.22366	-77.1115	Carlisle I/C	Dual Tone Multi-Frequency (DTMF)	Post-Mounted (Type A)	M. H. Corbin (formerly HIS Inc.)	RC200
HAR BEACON	Active	HAR BEACON-I-76-T238.80-EB	T238.80	I-76	EB	40.19546	-76.9288	Harrisburg East/West I/Cs	Dual Tone Multi-Frequency (DTMF)	Post-Mounted (Type A)	M. H. Corbin (formerly HIS Inc.)	RC 200A
HAR BEACON	Active	HAR BEACON-I-83-T241.90-NB	T241.90	I-83	NB	40.19455	-76.8558	Harrisburg East/West I/Cs / 2.0 mi S of Hbg West I/C	Dual Tone Multi-Frequency (DTMF)	Post-Mounted (Type A)	M. H. Corbin (formerly HIS Inc.)	CNV
HAR BEACON	Under Construction	HAR BEACON-I-76-T244.50-EB	T244.50	I-76	EB	40.1975	-76.8308	Harrisburg East/West I/Cs	Dual Tone Multi-Frequency (DTMF)	Post-Mounted (Type A)	M. H. Corbin (formerly HIS Inc.)	CNV
HAR BEACON	Under Construction	HAR BEACON-I-76-T244.70-WB	T244.70	I-76	WB	40.1974	-76.8277	Harrisburg East/West I/Cs	Dual Tone Multi-Frequency (DTMF)	Post-Mounted (Type A)	M. H. Corbin (formerly HIS Inc.)	CNV
HAR BEACON	Active	HAR BEACON-PA 441-T247.40-NB	T247.40	PA 441	NB	40.22389	-76.7572	Harrisburg East/West I/Cs / Ramp to PA 283 W	Dual Tone Multi-Frequency (DTMF)	Post-Mounted (Type A)	M. H. Corbin (formerly HIS Inc.)	RC 200A
HAR BEACON	Active	HAR BEACON-I-76-T249.80-WB	T249.80	I-76	WB	40.21042	-76.742	Harrisburg East/West I/Cs	Dual Tone Multi-Frequency (DTMF)	Post-Mounted (Type A)	M. H. Corbin (formerly HIS Inc.)	RC200

DEVICE TYPE	DEVICE STATUS	DEVICE ID	MILE-POST	ROUTE	DIR	LATITUDE	LONGITUDE	SITE DESCRIPTION	COMMUNICATION TYPE	SUPPORT TYPE	MANUFACTURER	MODEL
HAR BEACON	Active	HAR BEACON-I-76-T296.00-EB	T296.00	I-76	EB	40.17474	-75.9205	Morgantown I/C	Dual Tone Multi-Frequency (DTMF)	Post-Mounted (Type A)	M. H. Corbin (formerly HIS Inc.)	RC 200A
HAR BEACON	Active	HAR BEACON-I-176-T298.30-SB	T298.30	I-176	SB	40.16861	-75.901	Morgantown I/C / 1.0 mi N of Morgantown I/C	Dual Tone Multi-Frequency (DTMF)	Post-Mounted (Type A)	M. H. Corbin (formerly HIS Inc.)	RC 200A
HAR BEACON	Active	HAR BEACON-PA 10-T298.30-NB	T298.30	PA 10	NB	40.1587	-75.8907	Morgantown I/C / 0.05 mi S of Morgantown I/C	Dual Tone Multi-Frequency (DTMF)	Post-Mounted (Type A)	M. H. Corbin (formerly HIS Inc.)	RC 200A
HAR BEACON	Active	HAR BEACON-PA 10-T298.30-SB	T298.30	PA 10	SB	40.16426	-75.8802	Morgantown I/C / 0.25 mi N of Morgantown I/C	Dual Tone Multi-Frequency (DTMF)	Post-Mounted (Type A)	M. H. Corbin (formerly HIS Inc.)	RC 200A
HAR BEACON	Active	HAR BEACON-I-76-T300.80-WB	T300.80	I-76	WB	40.15033	-75.8412	Morgantown I/C	Dual Tone Multi-Frequency (DTMF)	Post-Mounted (Type A)	M. H. Corbin (formerly HIS Inc.)	RC200
HAR BEACON	Active	HAR BEACON-I-76-T310.30-EB	T310.30	I-76	EB	40.07548	-75.6976	Downingtown I/C	Dual Tone Multi-Frequency (DTMF)	Post-Mounted (Type A)	M. H. Corbin (formerly HIS Inc.)	RC 200A
HAR BEACON	Active	HAR BEACON-PA 100-T311.90-NB	T311.90	PA 100	NB	40.0576	-75.6615	Downingtown I/C / 0.6 mi S of Downingtown I/C	Dual Tone Multi-Frequency (DTMF)	Post-Mounted (Type A)	M. H. Corbin (formerly HIS Inc.)	RC 200A
HAR BEACON	Active	HAR BEACON-PA 100-T311.90-SB	T311.90	PA 100	SB	40.07172	-75.6815	Downingtown I/C / North of Downingtown I/C	Dual Tone Multi-Frequency (DTMF)	Post-Mounted (Type A)	M. H. Corbin (formerly HIS Inc.)	RC 200A
HAR BEACON	Out of Service	HAR BEACON-I-76-T314.90-WB	T314.90	I-76	WB	40.06567	-75.6163	Downingtown I/C	Dual Tone Multi-Frequency (DTMF)	Post-Mounted (Type A)	M. H. Corbin (formerly HIS Inc.)	CNV
HAR BEACON	Active	HAR BEACON-I-76-T321.90-EB	T321.90	I-76	EB	40.0759	-75.4899	Mid-County/Valley Forge I/Cs	Dual Tone Multi-Frequency (DTMF)	Post-Mounted (Type A)	M. H. Corbin (formerly HIS Inc.)	RC 200A
HAR BEACON	Active	HAR BEACON-I-76-T326.60-WB-1	T326.60	I-76	WB-1	40.0772	-75.3689	Mid-County/Valley Forge I/Cs	Dual Tone Multi-Frequency (DTMF)	Post-Mounted (Type A)	M. H. Corbin (formerly HIS Inc.)	RC 200A
HAR BEACON	Active	HAR BEACON-I-76-T326.60-WB-2	T326.60	I-76	WB-2	40.04775	-75.2601	Mid-County/Valley Forge I/Cs	Dual Tone Multi-Frequency (DTMF)	Post-Mounted (Type A)	M. H. Corbin (formerly HIS Inc.)	CNV
HAR BEACON	Active	HAR BEACON-US 202-T326.60-EB	T326.60	US 202	EB	40.05855	-75.4836	Mid-County/Valley Forge I/Cs / W of Valley Forge I/C	Dual Tone Multi-Frequency (DTMF)	Post-Mounted (Type A)	M. H. Corbin (formerly HIS Inc.)	RC 200A
HAR BEACON	Active	HAR BEACON-US 422-T326.60-EB	T326.60	US 422	EB	40.10139	-75.419	Mid-County/Valley Forge I/Cs / W of Valley Forge I/C	Dual Tone Multi-Frequency (DTMF)	Post-Mounted (Type A)	M. H. Corbin (formerly HIS Inc.)	RC 200A
HAR BEACON	Active	HAR BEACON-I-276-T327.50-EB	T327.50	I-276	EB	40.09221	-75.387	Mid-County/Valley Forge I/Cs	Dual Tone Multi-Frequency (DTMF)	Post-Mounted (Type A)	M. H. Corbin (formerly HIS Inc.)	RC 200A
HAR BEACON	Active	HAR BEACON-I-276-T328.30-WB	T328.30	I-276	WB	40.08953	-75.3724	Mid-County/Valley Forge I/Cs	Dual Tone Multi-Frequency (DTMF)	Post-Mounted (Type A)	M. H. Corbin (formerly HIS Inc.)	RC 200A
HAR BEACON	Out of Service	HAR BEACON-I-476-T333.90-NB	T333.90	I-476	NB	40.08056	-75.314	Mid-County/Valley Forge I/Cs / S of Mid-County I/C	Dual Tone Multi-Frequency (DTMF)	Post-Mounted (Type A)	M. H. Corbin (formerly HIS Inc.)	CNV
HAR BEACON	Out of Service	HAR BEACON-I-476-T333.90-SB	T333.90	I-476	SB	0	0	Mid-County/Valley Forge I/Cs	Dual Tone Multi-Frequency (DTMF)	Post-Mounted (Type A)	M. H. Corbin (formerly HIS Inc.)	CNV
HAR BEACON	Active	HAR BEACON-I-276-T336.20-WB	T336.20	I-276	WB	40.12333	-75.2354	Mid-County/Valley Forge I/Cs	Dual Tone Multi-Frequency (DTMF)	Post-Mounted (Type A)	M. H. Corbin (formerly HIS Inc.)	RC 200A
HAR BEACON	Out of Service	HAR BEACON-I-276-T339.90-EB	T339.90	I-276	EB	40.13919	-75.1685	Willow Grove I/C	Dual Tone Multi-Frequency (DTMF)	Post-Mounted (Type A)	M. H. Corbin (formerly HIS Inc.)	CNV

DEVICE TYPE	DEVICE STATUS	DEVICE ID	MILE-POST	ROUTE	DIR	LATITUDE	LONGITUDE	SITE DESCRIPTION	COMMUNICATION TYPE	SUPPORT TYPE	MANUFACTURER	MODEL
HAR BEACON	Active	HAR BEACON-US 611-T342.80-NB	T342.80	US 611	NB	40.16097	-75.1233	Willow Grove I/C / S of Willow Grove I/C	Dual Tone Multi-Frequency (DTMF)	Post-Mounted (Type A)	M. H. Corbin (formerly HIS Inc.)	RC 200A
HAR BEACON	Active	HAR BEACON-US 611-T342.80-SB	T342.80	US 611	SB	40.16449	-75.1248	Willow Grove I/C / N of Willow Grove I/C (Entry ramp)	Dual Tone Multi-Frequency (DTMF)	Post-Mounted (Type A)	M. H. Corbin (formerly HIS Inc.)	RC 200A
HAR BEACON	Active	HAR BEACON-I-276-T346.50-WB	T346.50	I-276	WB	40.16356	-75.0526	Willow Grove I/C	Dual Tone Multi-Frequency (DTMF)	Post-Mounted (Type A)	M. H. Corbin (formerly HIS Inc.)	RC 200A
HAR BEACON	Active	HAR BEACON-I-276-T348.80-EB	T348.80	I-276	EB	40.14774	-75.0152	Bensalem I/C	Dual Tone Multi-Frequency (DTMF)	Post-Mounted (Type A)	M. H. Corbin (formerly HIS Inc.)	RC 200A
HAR BEACON	Active	HAR BEACON-US 1-T351.50-NB	T351.50	US 1	NB	40.13235	-74.9664	Bensalem I/C / Adjacent to GW Motor Lodge	Dual Tone Multi-Frequency (DTMF)	Post-Mounted (Type A)	M. H. Corbin (formerly HIS Inc.)	RC 200A
HAR BEACON	Out of Service	HAR BEACON-US 1-T351.50-SB	T351.50	US 1	SB	40.13799	-74.9616	Bensalem I/C / At the end of Rockhill Drive	Dual Tone Multi-Frequency (DTMF)	Post-Mounted (Type A)	M. H. Corbin (formerly HIS Inc.)	CNV
HAR BEACON	Active	HAR BEACON-I-276-T353.00-WB	T353.00	I-276	WB	40.12875	-74.9163	Bensalem I/C	Dual Tone Multi-Frequency (DTMF)	Post-Mounted (Type A)	M. H. Corbin (formerly HIS Inc.)	RC 200A
HAR TRANSMITTER	Active	HAR TRANSMITTER-I-476-A020.20-SB	A020.20	I-476	SB	40.1085	-75.2864	Mid-County I/C	Ethernet (Copper)	Pole-Mounted (Metal)	M. H. Corbin (formerly HIS Inc.)	CNV
HAR TRANSMITTER	Active	HAR TRANSMITTER-I-476-A030.30-NB	A030.30	I-476	NB	40.24977	-75.3447	Lansdale I/C	Ethernet (Copper)	Pole-Mounted (Wood)	M. H. Corbin (formerly HIS Inc.)	CNV
HAR TRANSMITTER	Active	HAR TRANSMITTER-I-476-A043.90-NB	A043.90	I-476	NB	40.43613	-75.4223	Quakertown I/C	Ethernet (Copper)	Pole-Mounted (Wood)	M. H. Corbin (formerly HIS Inc.)	CNV
HAR TRANSMITTER	Active	HAR TRANSMITTER-I-476-A057.20-SB	A057.20	I-476	SB	40.59405	-75.5695	Lehigh Valley I/C	Ethernet (Copper)	Pole-Mounted (Wood)	M. H. Corbin (formerly HIS Inc.)	CNV
HAR TRANSMITTER	Active	HAR TRANSMITTER-I-476-A075.70-SB	A075.70	I-476	SB	40.83667	-75.6719	Mahoning Valley I/C	Ethernet (Copper)	Pole-Mounted (Wood)	M. H. Corbin (formerly HIS Inc.)	CNV
HAR TRANSMITTER	Active	HAR TRANSMITTER-I-476-A094.70-SB	A094.70	I-476	SB	41.07206	-75.7047	Pocono I/C	Ethernet (Copper)	Structure Mounted (Plaza)	M. H. Corbin (formerly HIS Inc.)	CNV
HAR TRANSMITTER	Active	HAR TRANSMITTER-I-476-A105.30-NB	A105.30	I-476	NB	41.19982	-75.7919	Wilkes-Barre I/C	Ethernet (Copper)	Pole-Mounted (Wood)	M. H. Corbin (formerly HIS Inc.)	CNV
HAR TRANSMITTER	Active	HAR TRANSMITTER-I-476-A112.40-SB	A112.40	I-476	SB	41.28106	-75.7684	Wyoming Valley I/C	Ethernet (Copper)	Structure Mounted (Plaza)	M. H. Corbin (formerly HIS Inc.)	CNV
HAR TRANSMITTER	Active	HAR TRANSMITTER-I-476-A122.00-SB	A122.00	I-476	SB	41.38358	-75.7281	Keyser Avenue MLTP	Ethernet (Copper)	Structure Mounted (Plaza)	M. H. Corbin (formerly HIS Inc.)	CNV
HAR TRANSMITTER	Active	HAR TRANSMITTER-I-476-A129.50-SB	A129.50	I-476	SB	41.48247	-75.6939	Clarks Summit Bridge	Ethernet (Copper)	Pole-Mounted (Wood)	M. H. Corbin (formerly HIS Inc.)	CNV
HAR TRANSMITTER	Active	HAR TRANSMITTER-I-76-T001.40-EB	T001.40	I-76	EB	40.90288	-80.4944	Gateway MLTP	Ethernet (Copper)	Pole-Mounted (Wood)	M. H. Corbin (formerly HIS Inc.)	CNV
HAR TRANSMITTER	Active	HAR TRANSMITTER-I-76-T009.50-WB	T009.50	I-76	WB	40.83639	-80.3733	New Castle I/C	Ethernet (Copper)	Pole-Mounted (Wood)	M. H. Corbin (formerly HIS Inc.)	CNV
HAR TRANSMITTER	Active	HAR TRANSMITTER-I-76-T028.90-EB	T028.90	I-76	EB	40.67265	-80.1011	Cranberry I/C and Warrendale MLTP	Ethernet (Copper)	Pole-Mounted (Wood)	M. H. Corbin (formerly HIS Inc.)	CNV

DEVICE TYPE	DEVICE STATUS	DEVICE ID	MILE-POST	ROUTE	DIR	LATITUDE	LONGITUDE	SITE DESCRIPTION	COMMUNICATION TYPE	SUPPORT TYPE	MANUFACTURER	MODEL
HAR TRANSMITTER	Active	HAR TRANSMITTER-I-76-T039.40-WB	T039.40	I-76	WB	40.61062	-79.9466	Butler Valley I/C	Ethernet (Copper)	Structure Mounted (Plaza)	M. H. Corbin (formerly HIS Inc.)	CNV
HAR TRANSMITTER	Active	HAR TRANSMITTER-I-76-T047.70-EB	T047.70	I-76	EB	40.5413	-79.8249	Allegheny Valley I/C	Ethernet (Copper)	Structure Mounted (Plaza)	M. H. Corbin (formerly HIS Inc.)	CNV
HAR TRANSMITTER	Active	HAR TRANSMITTER-I-76-T056.60-WB	T056.60	I-76	WB	40.43638	-79.7533	Pittsburgh I/C	Ethernet (Copper)	Pole-Mounted (Wood)	M. H. Corbin (formerly HIS Inc.)	CNV
HAR TRANSMITTER	Active	HAR TRANSMITTER-I-76-T067.40-EB	T067.40	I-76	EB	40.3133	-79.6791	Irwin I/C	Ethernet (Copper)	Pole-Mounted (Wood)	M. H. Corbin (formerly HIS Inc.)	CNV
HAR TRANSMITTER	Active	HAR TRANSMITTER-I-76-T075.20-WB	T075.20	I-76	WB	40.22245	-79.6036	New Stanton I/C	Ethernet (Copper)	Pole-Mounted (Wood)	M. H. Corbin (formerly HIS Inc.)	CNV
HAR TRANSMITTER	Active	HAR TRANSMITTER-I-76-T090.70-EB	T090.70	I-76	EB	40.10875	-79.3811	Donegal I/C	Ethernet (Copper)	Pole-Mounted (Wood)	M. H. Corbin (formerly HIS Inc.)	CNV
HAR TRANSMITTER	Active	HAR TRANSMITTER-I-76-T109.90-EB	T109.90	I-76	EB	40.01955	-79.0815	Somerset I/C	Ethernet (Copper)	Pole-Mounted (Wood)	M. H. Corbin (formerly HIS Inc.)	CNV
HAR TRANSMITTER	Active	HAR TRANSMITTER-I-76-T145.50-WB	T145.50	I-76	WB	40.05191	-78.5116	Bedford I/C	Ethernet (Copper)	Pole-Mounted (Wood)	M. H. Corbin (formerly HIS Inc.)	Highway Information Systems DRTXM4
HAR TRANSMITTER	Active	HAR TRANSMITTER-I-76-T161.40-WB	T161.40	I-76	WB	39.98992	-78.2527	Breezewood I/C	Ethernet (Copper)	Structure Mounted (Plaza)	M. H. Corbin (formerly HIS Inc.)	DRTXM4
HAR TRANSMITTER	Active	HAR TRANSMITTER-I-76-T179.50-WB	T179.50	I-76	WB	40.05067	-77.9615	Fort Littleton I/C	Ethernet (Copper)	Pole-Mounted (Wood)	M. H. Corbin (formerly HIS Inc.)	CNV
HAR TRANSMITTER	Active	HAR TRANSMITTER-I-76-T188.60-EB	T188.60	I-76	EB	40.09449	-77.814	Willow Hill I/C	Ethernet (Copper)	Pole-Mounted (Wood)	M. H. Corbin (formerly HIS Inc.)	CNV
HAR TRANSMITTER	Active	HAR TRANSMITTER-I-76-T201.50-EB	T201.50	I-76	EB	40.15394	-77.6135	Blue Mountain I/C	Ethernet (Copper)	Pole-Mounted (Wood)	M. H. Corbin (formerly HIS Inc.)	CNV
HAR TRANSMITTER	Active	HAR TRANSMITTER-I-76-T226.60-WB	T226.60	I-76	WB	40.22937	-77.1514	Carlisle I/C	Ethernet (Copper)	Pole-Mounted (Wood)	M. H. Corbin (formerly HIS Inc.)	CNV
HAR TRANSMITTER	Active	HAR TRANSMITTER-I-76-T236.00-WB	T236.00	I-76	WB	40.19677	-76.9758	Gettysburg I/C	Ethernet (Copper)	Pole-Mounted (Metal)	M. H. Corbin (formerly HIS Inc.)	CNV
HAR TRANSMITTER	Active	HAR TRANSMITTER-I-76-T242.00-EB	T242.00	I-76	EB	40.21118	-76.8762	Harrisburg West I/C	Ethernet (Copper)	Structure Mounted (Plaza)	M. H. Corbin (formerly HIS Inc.)	CNV
HAR TRANSMITTER	Active	HAR TRANSMITTER-I-76-T247.30-WB	T247.30	I-76	WB	40.21576	-76.7872	Harrisburg East I/C	Ethernet (Copper)	Pole-Mounted (Wood)	M. H. Corbin (formerly HIS Inc.)	CNV
HAR TRANSMITTER	Active	HAR TRANSMITTER-I-76-T266.50-WB	T266.50	I-76	WB	40.23229	-76.4369	Lebanon-Lancaster I/C	Ethernet (Copper)	Pole-Mounted (Wood)	M. H. Corbin (formerly HIS Inc.)	CNV
HAR TRANSMITTER	Active	HAR TRANSMITTER-I-76-T286.60-EB	T286.60	I-76	EB	40.21436	-76.0834	Reading I/C	Ethernet (Copper)	Structure Mounted (Plaza)	M. H. Corbin (formerly HIS Inc.)	Highway Information Systems DRTXM3
HAR TRANSMITTER	Active	HAR TRANSMITTER-I-76-T298.40-WB	T298.40	I-76	WB	40.16222	-75.8831	Morgantown I/C	Ethernet (Copper)	Structure Mounted (Plaza)	M. H. Corbin (formerly HIS Inc.)	CNV
HAR TRANSMITTER	Active	HAR TRANSMITTER-I-76-T312.00-EB	T312.00	I-76	EB	40.06611	-75.6696	Downingtown I/C	Ethernet (Copper)	Structure Mounted (Plaza)	M. H. Corbin (formerly HIS Inc.)	CNV

DEVICE TYPE	DEVICE STATUS	DEVICE ID	MILE-POST	ROUTE	DIR	LATITUDE	LONGITUDE	SITE DESCRIPTION	COMMUNICATION TYPE	SUPPORT TYPE	MANUFACTURER	MODEL
HAR TRANSMITTER	Active	HAR TRANSMITTER-I-76-T324.60-EB	T324.60	I-76	EB	40.08247	-75.4404	Valley Forge I/C	Cellular 4G	Pole-Mounted (Wood)	M. H. Corbin (formerly HIS Inc.)	Highway Information Systems DRTXM4-3
HAR TRANSMITTER	Active	HAR TRANSMITTER-I-276-T343.00-WB	T343.00	I-276	WB	40.16333	-75.1217	Willow Grove I/C	Ethernet (Copper)	Structure Mounted (Plaza)	M. H. Corbin (formerly HIS Inc.)	CNV
HAR TRANSMITTER	Active	HAR TRANSMITTER-I-276-T351.50-WB	T351.50	I-276	WB	40.13253	-74.9681	Bensalem I/C	Ethernet (Copper)	Structure Mounted (Plaza)	M. H. Corbin (formerly HIS Inc.)	CNV
HAR TRANSMITTER	Active	HAR TRANSMITTER-I-276-T357.70-EB	T357.70	I-276	EB	40.12291	-74.8523	Delaware Valley I/C	Ethernet (Copper)	Pole-Mounted (Wood)	M. H. Corbin (formerly HIS Inc.)	CNV

RWIS Device List

DEVICE TYPE	DEVICE STATUS	DEVICE ID	MILE-POST	ROUTE	DIR	LATITUDE	LONGITUDE	SITE DESCRIPTION	COMMUNICATION TYPE	SUPPORT TYPE	MANUFACTURER	MODEL
RWIS	Active	RWIS-I-476-A057.40-SB	A057.40	I-476	SB	40.595888	-75.568853	Lehigh Valley I/C	Fiber Optic	RWIS Tower (Metal)	Vaisala (formerly SSI)	CNV
RWIS	Active	RWIS-I-476-A094.80-SB	A094.80	I-476	SB	41.073708	-75.707623	Pocono I/C	Fiber Optic	RWIS Tower (Metal)	Vaisala (formerly SSI)	CNV
RWIS	Active	RWIS-I-476-A129.50-SB	A129.50	I-476	SB	41.482359	-75.694004	Clarks Summit Bridge	Wireless 4.9 GHz	RWIS Tower (Metal)	Vaisala (formerly SSI)	CNV
RWIS	Active	RWIS-I-76-T010.20-EB	T010.20	I-76	EB	40.833746	-80.36697	New Castle I/C	Wireless 4.9 GHz	RWIS Tower (Metal)	Vaisala (formerly SSI)	CNV
RWIS	Active	RWIS-I-76-T048.30-WB	T048.30	I-76	WB	40.533841	-79.821495	Allegheny River Bridge	Wireless 4.9 GHz	RWIS Tower (Metal)	Vaisala (formerly SSI)	CNV
RWIS	Active	RWIS-I-76-T099.00-WB	T099.00	I-76	WB	40.105895	-79.230334	RWIS MP 099 Laurel By-pass	Wireless	RWIS Tower (Metal)	Vaisala (formerly SSI)	CNV
RWIS	Active	RWIS-I-76-T120.00-WB	T120.00	I-76	WB	39.972132	-78.894648	RWIS MP 120 Allegheny Tunnel	Cellular 4G	RWIS Tower (Metal)	Vaisala (formerly SSI)	CNV
RWIS	Active	RWIS-I-76-T163.00-WB	T163.00	I-76	WB	39.990567	-78.229085	Fog RWIS 1 MP 163.0 Sideling Hill	Fiber Optic	RWIS Tower (Metal)	Vaisala (formerly SSI)	CNV
RWIS	Active	RWIS-I-76-T164.10-EB	T164.10	I-76	EB	40.002188	-78.215342	Fog RWIS 2 MP 164.1 Sideling Hill	Fiber Optic	RWIS Tower (Metal)	Vaisala (formerly SSI)	CNV
RWIS	Active	RWIS-I-76-T165.00-EB	T165.00	I-76	EB	40.013482	-78.204445	Fog RWIS 3 MP 165.0 Sideling Hill	Fiber Optic	RWIS Tower (Metal)	Vaisala (formerly SSI)	CNV
RWIS	Active	RWIS-I-76-T166.00-EB	T166.00	I-76	EB	40.020868	-78.187068	Fog RWIS 4 MP 166.0 Sideling Hill	Fiber Optic	RWIS Tower (Metal)	Vaisala (formerly SSI)	CNV
RWIS	Active	RWIS-I-76-T167.10-WB	T167.10	I-76	WB	40.030133	-78.166722	Fog RWIS 5 MP 167.1 Sideling Hill	Fiber Optic	RWIS Tower (Metal)	Vaisala (formerly SSI)	CNV
RWIS	Active	RWIS-I-76-T168.40-WB	T168.40	I-76	WB	40.033898	-78.143775	Fog RWIS 6 MP 168.4 Sideling Hill	Fiber Optic	RWIS Tower (Metal)	Vaisala (formerly SSI)	CNV
RWIS	Active	RWIS-I-76-T169.50-EB	T169.50	I-76	EB	40.04067	-78.126456	Fog RWIS 7 MP 169.5 Sideling Hill	Fiber Optic	RWIS Tower (Metal)	Vaisala (formerly SSI)	CNV
RWIS	Active	RWIS-I-76-T170.60-WB	T170.60	I-76	WB	40.051329	-78.109334	Fog RWIS 8 MP 170.6 Sideling Hill	Fiber Optic	RWIS Tower (Metal)	Vaisala (formerly SSI)	CNV
RWIS	Active	RWIS-I-76-T171.60-WB	T171.60	I-76	WB	40.059937	-78.093674	Fog RWIS 9 MP 171.6 Sideling Hill	Fiber Optic	RWIS Tower (Metal)	Vaisala (formerly SSI)	CNV
RWIS	Active	RWIS-I-76-T197.20-WB	T197.20	I-76	WB	40.158204	-77.680791	Kittatinny Tunnel West Portal	Wireless 4.9 GHz	RWIS Tower (Metal)	Vaisala (formerly SSI)	CNV
RWIS	Active	RWIS-I-76-T201.40-EB	T201.40	I-76	EB	40.158107	-77.614719	Blue Mountain I/C	Fiber Optic	RWIS Tower (Metal)	Vaisala (formerly SSI)	RWS110 SSI Road Weather Station LX
RWIS	Active	RWIS-I-76-T245.70-EB	T245.70	I-76	EB	40.199125	-76.810096	Susquehanna River Bridge	Fiber Optic	RWIS Tower (Metal)	Vaisala (formerly SSI)	CNV
RWIS	Active	RWIS-I-76-T260.40-EB	T260.40	I-76	EB	40.21034	-76.543642	Mt. Gretna area west of Lebanon/Lancaster I/C	Cellular 4G	RWIS Tower (Metal)	Vaisala (formerly SSI)	RWS110 SSI Road Weather Station LX
RWIS	Active	RWIS-I-76-T293.00-EB	T293.00	I-76	EB	40.172037	-75.974755	State Game Lands Number 52 west of Reading I/C	Cellular 4G	RWIS Tower (Metal)	Vaisala (formerly SSI)	RWS110 SSI Road Weather Station LX
RWIS	Active	RWIS-I-76-T317.50-EB	T317.50	I-76	EB	40.069819	-75.567961	Valley Forge Microwave Base	Wireless 4.9 GHz	RWIS Tower (Metal)	Vaisala (formerly SSI)	CNV

Current ITS Device Inventory - Complete Attribute Summary

Due to the size of the existing ITS Inventory spreadsheet, the fields listed in the tables above were selected to provide relevant information. The complete lists of attribute fields being tracked by the PTC are listed below.

Attribute	Description
DEVICE TYPE	Device Type – i.e. CCTV, DMS, Detector, RWIS, etc.
DEVICE STATUS	Status – Active, under construction, under test
DEVICE ID	Device ID #
MILEPOST	Milepost #
ROUTE	Route designation
DIR	Side of direction of travel
newLatitude	Latitude
newLongitude	Longitude
SITE DESCRIPTION	Description of the Location
PTC DISTRICT	PTC district location
MAINTENANCE AREA	PTC maintenance of location
COUNTY	County of location
MUNICIPALITY	Municipality of location
PENNDOT DISTRICT	PennDOT district
COMMUNICATION TYPE	Communication Type to device
Number of SPARE FIBER TERMINATIONS	Spare fibers located at the site
SUPPORT TYPE	Type of structural support
POWER PROVIDER	Utility Company name
METER #	Utility Meter #
POWER CONTACT	Contact number for Utility person
POWER ACCOUNT #	Utility Account #
UPS PRESENT	Yes/No for Uninterruptible Power Supply
Number of UPS Batteries	Number of batteries in UPS
MANUFACTURER	Device Manufacturer
MODEL	Device Model
DISPLAY LINES	DMS display Lines (Vertical pixels)
DISPLAY WIDTH	DMS display Width (Horizontal pixels)
IP ADDRESS	IP Address
INSTALL YEAR	Year of Installation
UNDER WARRANTY	Is the device currently under warranty
WARRANTY START DATE	Start Date of Warranty
WARRANTY DURATION	Duration of Warranty
WARRANTY END DATE	End Date of Warranty
VENDOR NAME	Name of Vendor
VENDOR PHONE	Phone number of Vendor
DEVICE AGE	Age of the Device
NOTES	Notes
CABINETKEY	Cabinet Key Type
OTHERKEY	Alternative Key Type
cctvEncoderModel	Encoder Model (CCTV only)
DMS ACCESS	Access style to DMS (Front, Rear, Walk-In)
dmsDisplayLinesEstimate	Estimated number of Display Lines (DMS)
dmsDisplayPanels	Display Panels (DMS)
dmsController	Controller Model
File 1 Container site.front	Site Photo
File 2 Container site.back	Site Photo
File 3 Container site.power	Site Photo
File 4 Container site.powermeter	Site Photo
File 5 Container site.cab1	Site Photo
File 6 Container site.cab2	Site Photo
File 7 Container site.cab3	Site Photo
File 8 Container site.cab4	Site Photo
File 9 Container site.cab5	Site Photo
File 10 Container site.cab6	Site Photo

Attribute	Description
File 11 Container site.power2	Site Photo
NETWORK SWITCH IP ADDRESS	Managed switch IP Address
NETWORK SWITCH MODEL	Managed switch Model
NETWORK SWITCH SERIAL	Managed switch serial number
NETWORK SWITCH IP ADDRESS 2	Managed switch IP Address 2
Network Switch Model 2	Managed switch Model 2
NETWORK SWITCH SERIAL 2	Managed switch serial number 2
NETWORK POWER CONTROLLER (NPC) MODEL	NPC Model number
NPC IP ADDRESS	NPC IP address
NPC SERIAL	NPC serial number
NPC OUTLET1	Device name plugged into outlet 1
NPC OUTLET2	Device name plugged into outlet 2
NPC OUTLET3	Device name plugged into outlet 3
NPC OUTLET4	Device name plugged into outlet 4
NPC OUTLET5	Device name plugged into outlet 5
NPC OUTLET6	Device name plugged into outlet 6
NPC OUTLET7	Device name plugged into outlet 7
NPC OUTLET8	Device name plugged into outlet 8
Parent Site	Parent Site Name/ID
Child Site	Chile Site Name/ID
Antenna1	Antenna 1 type
Antenna1 DIR	Antenna 1 direction
Antenna2	Antenna 2 type
Antenna2 DIR	Antenna 2 direction
ROUTER MGT IP	Route Management IP address
IP PORT	IP port number

APPENDIX R

PTC DMS Message Library

PENNA
TURN
PIKE
DMS
MESSAGING
LIBRARY
November 2016

DMS MESSAGE CATEGORY MAPPING		
PA Turnpike "Standard VMS Messages"	**AECOM Proposed Scenario Groupings**	**Recommended DMS Messages PennDOT DMS Operating Standards Appendix B (Page)**
Amber Alert	4_Amber Alert	Amber Alert / MEPA (22)
	2_Rdwy Restriction	Lane Restriction (20) Speed/Vehicle Restrictions (21)
Weather	6_Weather	Winter Weather (24) Other Weather (25)
Plan X	1_Road Closure	No Entry Access (19)
Safety Messages	11_Scheduled Safety Messages	Safety Press Office Approved DMS Messages (29, 30)
Plaza Services, E-Zpass Express Closures	8_Toll and Service Plaza	Travel Plaza (28)
Toll Related	8_Toll and Service Plaza	
Miscellaneous	9_Special Events 12_Sign Testing	Special Events (26)
Accident and Congestion (Current) Road Work	5_Congestion & Road Work	Congestion (23)
	3_Emergency Management	
(Planned) Road Work	10_Future/Planned Events	Future Road Work (26) Impending Severe Weather (27)
FWS DMS Massages	13_Fog Warning DMS	
	7_Travel Times	Travel Times (25)

DMS Classes								
Class	**Display Size**	**Pitch**	**Max Chars**	**Lines**	**Char Ht**	**Color**	**Matrix**	**Location**
Class 1	54 x 180	34 mm	15	3	18”	RGB	Full	Mainline / Pre-entry
	96 x 288	20 mm	15	3	18"	RGB	Full	Mainline / Pre-entry
Class 2	27 x 90	66 mm	15	3	18”	Amber	Full	Mainline / Pre-entry
	27 x 110	66 mm	15	3	18"	Amber	Full	Mainline
Class 3	3 Line 7 x 90	66 mm	15	3	18”	Amber	Line	Mainline
	16 x 90 - MIST ONLY		15	3	18"	Amber	Line	Mainline
Class 4	64 x 160	20 mm	12	3	12”	RGB	Full	Pre-Entry
Class 5	64 x 144	20 mm	11	3	12"	RGB	Full	Pre-Entry
Class 6	27 x 60	46 mm	10	3	12”	Amber	Full	Fog/Pre-Entry
Class 7			8	3	12"	Amber	Full	PCMS
Class 8			12	3	12"	RGB	Full	PCMS

(Note: a maximum of 15 chars/line will be used even on 18 chars/line signs)

1. ROADWAY CLOSURE

LEGEND:
Messages for **Pre-Entry** Signs Only
Messages Generated by ATMS
VARIABLE TEXT - Change as Required for Situation

Message ID / Sign Classes / Max Characters	Message Title	Page 1		Page 2		
1-1 ALL SIGNS 8	1.1_Quick_Incident Ahead Stay Alert.	INCIDENT AHEAD	8 0 5	STAY ALERT	4 0 5	
1-2 1, 2, 3 13	1.2_Quick_Incident ahead All lanes blocked	INCIDENT AHEAD MILE *XXX*	8 5 8	ALL LANES BLOCKED EXPECT DELAYS	9 7 13	
1-3 ALL SIGNS 7	Pre_Turnpike closed HAR PA Turnpike Logo	*I-76 EB* CLOSED	7 0 6	TUNE TO 1640 AM	4 2 7	(I-76 EB) CLOSED / TUNE TO 1640 AM
1-4 1, 2, 3, 4, 5, 6 9	Pre_Turnpike closed At exit Use alternate route. PA Turnpike Logo	*I-76 EB* CLOSED AT EXIT *XXX*	7 9 9	USE ALTERNATE ROUTE	3 9 5	(I-76 EB) CLOSED AT EXIT (XXX) / USE ALTERNATE ROUTE
1-5 1, 2, 3, 4, 5, 6 10	Pre_Turnpike closed Due to weather PA Turnpike Logo	*I-76 EB* CLOSED DUE TO WEATHER	7 10 10	TUNE TO 1640 AM	4 2 7	(I-76 EB) CLOSED DUE TO WEATHER / TUNE TO 1640 AM
1-6 1, 2, 3, 4, 5 11	Turnpike closed At exit All traffic must exit. PA Turnpike Logo	*I-76 EB* CLOSED AT EXIT *XXX*	7 9 9	ALL TRAFFIC MUST EXIT AT EXIT *XXX*	11 9 11	(I-76 EB) CLOSED AT EXIT (XXX) / ALL TRAFFIC MUST EXIT AT EXIT (XXX)
1-7 1, 2, 3, 4, 5, 6 9	Turnpike closed At exit HAR. PA Turnpike Logo	*I-76 EB* CLOSED AT EXIT *XXX*	7 9 9	TUNE TO 1640 AM	4 2 7	(I-76 EB) CLOSED AT EXIT (XXX) / TUNE TO 1640 AM
1-8 1, 2, 3 14	Turnpike closed Between exits All traffic must exit. PA Turnpike Logo	*I-76 EB* CLOSED EXIT *XXX* TO EXIT *XXX*	14 11 9	ALL TRAFFIC MUST EXIT AT EXIT *XXX*	11 9 11	(EB) CLOSED EXIT (XXX) TO EXIT (XXX) / ALL TRAFFIC MUST EXIT AT EXIT (XXX)
1-9 1, 2, 3 14	Turnpike closed Between exits HAR. PA Turnpike Logo	*I-76 EB* CLOSED EXIT *XXX* TO EXIT *XXX*	14 11 9	TUNE TO 1640 AM	4 2 7	(EB) CLOSED EXIT (XXX) TO EXIT (XXX) / TUNE TO 1640 AM
PennDOT Messages						
1-10 1, 2, 3, 4, 5, 6 9	HWY_2digit PennDOTClosed AtExit. Interstate Logo	*I-XX EB* CLOSED AT EXIT *XXX*	7 9 8	USE ALTERNATE ROUTE	3 9 5	(I-XX EB) CLOSED AT EXIT (XXX) / USE ALTERNATE ROUTE
1-11 ALL SIGNS 7	HWY_2digit PennDOTClosedHAR Interstate Logo	*I-XX EB* CLOSED	7 0 6	TUNE TO 1640 AM	4 2 7	(I-XX EB) CLOSED / TUNE TO 1640 AM
1-12 1, 2, 3, 4, 5, 6 9	HWY_3digit PennDOTClosed AtExit. Interstate Logo	*I-XXX EB* CLOSED AT EXIT *XXX*	8 9 8	USE ALTERNATE ROUTE	3 9 5	(I-XXX EB) CLOSED AT EXIT (XXX) / USE ALTERNATE ROUTE
1-13 ALL SIGNS 8	HWY_3digit PennDOTClosedHAR Interstate Shield	*I-XXX EB* CLOSED	8 0 6	TUNE TO 1640 AM	4 2 7	(I-XXX EB) CLOSED / TUNE TO 1640 AM

1. ROADWAY CLOSURE

LEGEND:
Messages for **Pre-Entry** Signs Only
Messages Generated by ATMS
VARIABLE TEXT - Change as Required for Situation

	Message ID / Sign Classes / Max Characters	Message Title	Page 1		Page 2		
	1-14 1, 2, 3, 4, 5, 6 9	State_2digit PennDOTClosed AtExit. Keystone Logo	*PA-XX EB* CLOSED AT EXIT *XXX*	8 9 8	USE ALTERNATE ROUTE	3 9 5	
	1-15 ALL SIGNS 8	State_2digit PennDOTClosedHAR Keystone Logo	*PA-XX EB* CLOSED	8 0 6	TUNE TO 1640 AM	4 2 7	
	1-16 1, 2, 3, 4, 5, 6 9	State_3digit PennDOTClosed AtExit. Keystone Logo	*PA-XXX EB* CLOSED AT EXIT *XXX*	9 9 8	USE ALTERNATE ROUTE	3 9 5	
	1-17 1, 2, 3, 4, 5, 6 9	State_3digit PennDOTClosedHAR Keystone Logo	*PA-XXX EB* CLOSED	9 0 6	TUNE TO 1640 AM	4 2 7	
	1-18 1, 2, 3, 4, 5, 6 9	US_1digit PennDOTClosed AtExit. US Logo	*US-X EB* CLOSED AT EXIT *XXX*	7 9 8	USE ALTERNATE ROUTE	3 9 5	
	1-19 ALL SIGNS 7	US_1digit PennDOTClosedHAR US Logo	*US-X EB* CLOSED	7 0 6	TUNE TO 1640 AM	4 2 7	
	1-20 1, 2, 3, 4, 5, 6 9	US_2digit PennDOTClosed AtExit. US Logo	*US-XX EB* CLOSED AT EXIT *XXX*	8 9 8	USE ALTERNATE ROUTE	3 9 5	
	1-21 ALL SIGNS 8	US_2digit PennDOTClosedHAR US Logo	*US-XX EB* CLOSED	8 0 6	TUNE TO 1640 AM	4 2 7	
	1-22 1, 2, 3, 4, 5, 6 9	US_3digit PennDOTClosed AtExit. US Logo	*US-XXX EB* CLOSED AT EXIT *XXX*	9 9 8	USE ALTERNATE ROUTE	3 9 5	
	1-23 1, 2, 3, 4, 5, 6 9	US_3digit PennDOTClosedHAR US Logo	*US-XXX EB* CLOSED	9 0 6	TUNE TO 1640 AM	4 2 7	

2. ROADWAY RESTRICTIONS

LEGEND:
Messages for **Pre-Entry** Signs Only
Messages Generated by ATMS
VARIABLE TEXT - Change as Required for Situation

Message ID / Sign Classes / Max Characters	Message Title	Page 1		Page 2	
2-1 ALL SIGNS *6*	2.1_Quick_Lane closed ahead Stay alert	LANE CLOSED AHEAD	4 6 5	STAY ALERT	4 0 5
2-2 1, 2, 3 *14*	Comm Vehicle Restriction HAR	COMMERCIAL VEH RESTRICTION IN EFFECT	14 11 10	TUNE TO 1640 AM	4 2 7
2-3 1, 2, 3, 4, 5 *11*	Incident xx miles ahead. Stay Alert. ATMS. PA Turnpike Logo.	*I-76 EB* INCIDENT XX MI AHEAD	7 8 11	STAY ALERT EXPECT DELAYS	10 6 7
2-4 1, 2, 3, 4, 5 *11*	Left lane closed ahead Keep right ATMS. LT Lane Closed Logo	LEFT LANE CLOSED *XX* MI AHEAD	9 6 11	KEEP RIGHT	4 0 5
2-5 1, 2, 3, 4, 5 *11*	Left Lane closed ahead Stay alert ATMS. LT Lane Closed Logo	LEFT LANE CLOSED *XX* MI AHEAD	9 6 11	STAY ALERT EXPECT DELAYS	10 6 6
2-6 1, 2, 3, 4, 5 *11*	Left lane closed at location Keep right LT Lane Closed Logo	LEFT LANE CLOSED AT MILE *XXX*	9 6 11	KEEP RIGHT	4 0 5
2-7 1, 2, 3, 4, 5 *11*	Left lane closed at location Stay alert LT Lane Closed Logo	LEFT LANE CLOSED AT MILE *XXX*	9 6 11	STAY ALERT EXPECT DELAYS	10 6 6
2-8 1, 2, 3 *13*	No Shoulder	NO SHOULDER FOR NEXT *XX* MILES	11 3 13	STAY ALERT	4 0 5
2-9 1, 2, 3, 4, 5 *11*	Pre_Incident At location Stay Alert. PA Turnpike Logo.	*I-76 EB* INCIDENT AT MILE *XXX*	7 11 8	STAY ALERT EXPECT DELAYS	10 6 7
2-10 1, 2, 3, 4, 5 *11*	Right lane closed ahead Keep left ATMS. RT Lane Closed Logo	RIGHT LANE CLOSED *XX* MI AHEAD	10 6 11	KEEP LEFT	4 0 4
2-11 1, 2, 3, 4, 5 *11*	Right Lane closed ahead Stay alert ATMS. RT Lane Closed Logo	RIGHT LANE CLOSED *XX* MI AHEAD	10 6 11	STAY ALERT EXPECT DELAYS	10 6 6
2-12 1, 2, 3, 4, 5 *11*	Right lane closed at location Keep left RT Lane Closed Logo	RIGHT LANE CLOSED AT MILE *XXX*	10 6 11	KEEP LEFT	4 0 4
2-13 1, 2, 3, 4, 5 *11*	Right Lane closed at location Stay alert RT Lane Closed Logo	RIGHT LANE CLOSED AT MILE *XXX*	10 6 11	STAY ALERT EXPECT DELAYS	10 6 6
2-14 1, 2, 3, 4, 5 *11*	Speed Reduction Stay Alert_25. 25 MPH logo	REDUCED SPEED LIMIT *25* MPH	7 11 6	STAY ALERT	4 0 5
2-15 1, 2, 3, 4, 5 *11*	Speed Reduction Stay Alert_45. 45 MPH logo	REDUCED SPEED LIMIT *45* MPH	7 11 6	STAY ALERT	4 0 5

2. ROADWAY RESTRICTIONS

LEGEND:
Messages for **Pre-Entry** Signs Only
Messages Generated by ATMS
VARIABLE TEXT - Change as Required for Situation

Message ID / Sign Classes / Max Characters	Message Title	Page 1		Page 2	
		PennDOT Messages			
2-16	HWY_2digit_PennDOT	*I-XX EB*	7	STAY ALERT	10
1, 2, 4, 5, 6	IncidentAhead	INCIDENT	8	EXPECT	6
10	Interstate Logo	AHEAD	5	DELAYS	6
		PennDOT Messages			
2-17	HWY_2digit_PennDOT	*I-XX EB*	7	STAY ALERT	10
1, 2, 3, 4, 5	IncidentAtLocation	INCIDENT AT	11	EXPECT	6
11	Interstate Logo	MILE *XXX*	8	DELAYS	6
2-18	HWY_3digit_PennDOT	*I-XXX EB*	8	STAY ALERT	10
1, 2, 4, 5, 6	IncidentAhead	INCIDENT	8	EXPECT	6
10	Interstate Logo	AHEAD	5	DELAYS	6
2-19	HWY_3digit_PennDOT	*I-XXX EB*	8	STAY ALERT	10
1, 2, 3, 4, 5	IncidentAtLocation	INCIDENT AT	11	EXPECT	6
11	Interstate Logo	MILE *XXX*	8	DELAYS	6
2-20	State_2digit_PennDOT	*PA-XX EB*	8	STAY ALERT	10
1, 2, 4, 5, 6	IncidentAhead	INCIDENT	8	EXPECT	6
10	Keystone Logo	AHEAD	5	DELAYS	6
2-21	State_2digit_PennDOT	*PA-XX EB*	8	STAY ALERT	10
1, 2, 3, 4, 5	IncidentAtLocation	INCIDENT AT	11	EXPECT	6
11	Keystone Logo	MILE *XXX*	8	DELAYS	6
2-22	State_3digit_PennDOT	*PA-XXX EB*	9	STAY ALERT	10
1, 2, 4, 5, 6	IncidentAhead	INCIDENT	8	EXPECT	6
10	Keystone Logo	AHEAD	5	DELAYS	6
2-23	State_3digit_PennDOT	*PA-XXX EB*	9	STAY ALERT	10
1, 2, 3, 4, 5	IncidentAtLocation	INCIDENT AT	11	EXPECT	6
11	Keystone Logo	MILE *XXX*	8	DELAYS	6
2-24	US_1digit_PennDOT	*US-X EB*	7	STAY ALERT	10
1, 2, 4, 5, 6	IncidentAhead	INCIDENT	8	EXPECT	6
10	US Logo	AHEAD	5	DELAYS	6
2-25	US_1digit_PennDOT	*US-X EB*	7	STAY ALERT	10
1, 2, 3, 4, 5	IncidentAtLocation	INCIDENT AT	11	EXPECT	6
11	US Logo	MILE *XXX*	8	DELAYS	6
2-26	US_2digit_PennDOT	*US-XX EB*	8	STAY ALERT	10
1, 2, 4, 5, 6	IncidentAhead	INCIDENT	8	EXPECT	6
10	US Logo	AHEAD	5	DELAYS	6
2-27	US_2digit_PennDOT	*US-XX EB*	8	STAY ALERT	10
1, 2, 3, 4, 5	IncidentAtLocation	INCIDENT AT	11	EXPECT	6
11	US Logo	MILE *XXX*	8	DELAYS	6
2-28	US_3digit_PennDOT	*US-XXX EB*	9	STAY ALERT	10
1, 2, 4, 5, 6	IncidentAhead	INCIDENT	8	EXPECT	6
10	US Logo	AHEAD	5	DELAYS	6
2-29	US_3digit_PennDOT	*US-XXX EB*	9	STAY ALERT	10
1, 2, 3, 4, 5	IncidentAtLocation	INCIDENT AT	11	EXPECT	6
11	US Logo	MILE *XXX*	8	DELAYS	6

3. EMERGENCY MANAGEMENT		LEGEND:			
		Messages for **Pre-Entry** Signs Only			
Message ID		Messages Generated by ATMS			
Sign Classes		***VARIABLE TEXT*** - Change as Required for Situation			
Max Characters	**Message Title**	**Page 1**		**Page 2**	
3-1	Warning	**WARNING**	**7**		**0**
1, 2, 3	Wrong Way Driver	**WRONG WAY DRIVER**	**16**		**0**
16		**REPORTED**	**8**		**0**
3-2	Warning	**WARNING**	**7**	**REPORTED**	**8**
6	Wrong Way Driver	**WRONG WAY**	**9**		**0**
9		**DRIVER**	**6**	**AHEAD**	**5**

4. AMBER ALERT

LEGEND:
Messages for **Pre-Entry** Signs Only
Messages Generated by ATMS
VARIABLE TEXT - Change as Required for Situation

	Message ID / Sign Classes / Max Characters	Message Title	Page 1		Page 2		
	4-1	Amber Alert	AMBER ALERT	11	*Veh Color*	9	
	1, 2, 3, 4, 5	No HAR	SIGHTING	8	*Make/Model*	10	
	11	(logo)	CALL 911	8	*Tag*	3	
	4-2	MEP	MISSING PERSON	14	*Veh Color*	9	
	1, 2, 3	No HAR	SIGHTING	8	*Make/Model*	10	
	14	(logo)	CALL 911	8	*Tag*	3	
	4-3	Amber Alert	AMBER	5	TUNE	4	
	6	HAR		0	TO	2	
	7		ALERT	5	1640 AM	7	

5. CONGESTION (due to accident, road work, non-recurring)

LEGEND:
Messages for **Pre-Entry** Signs Only
Messages Generated by ATMS
VARIABLE TEXT - Change as Required for Situation

Message ID / *Sign Classes* / *Max Characters*	Message Title	Page 1		Page 2	
5-1 / 1, 2, 3 / *13*	5.1_Quick_Congestion Ahead	CONGESTION AHEAD	10 0 5	STAY ALERT EXPECT DELAYS	10 0 13
5-2 / 1, 2, 4, 5, 6 / *10*	5.2_Quick_Pre_Heavy Congestion PA Turnpike logo	*I-76 EB* HEAVY CONGESTION	7 5 10	STAY ALERT EXPECT DELAYS	10 7 6
5-3 / 1, 2, 3 / *13*	5.3_Quick_Stopped or slow Traffic	STOPPED OR SLOW TRAFFIC AHEAD	10 12 5	STAY ALERT EXPECT DELAYS	10 0 13
5-4 / ALL SIGNS / *7*	New Pattern Message	NEW TRAFFIC PATTERN	3 7 7	STAY ALERT	4 0 5
5-5 / 1 / *17*	Pre_Slow Traffic Paces at MP Stay Alert (Logo)	*I-XX EB* TRAFFIC PACES MP XXX	7 13 6	STAY ALERT WATCH FOR STOPPED OR SLOW TRAFFIC	10 17 15
5-6 / 6 / *10*	Pre_Slow Traffic Paces Stay Alert	*I-XX EB* TRAFFIC PACES	7 7 5	MP XXX-XXX STAY ALERT	10 0 10
5-7 / 6 / *10*	Pre_Slow Traffic Paces Stay Alert Expect Delays	*I-XX EB* TRAFFIC PACES	7 7 5	STAY ALERT EXPECT DELAYS	10 6 6
5-8 / 1, 2, 3, 4, 5 / *11*	Road Work Ahead (logo) at MP Left Lane Closed	ROAD WORK AHEAD AT MILE *XXX*	9 5 11	LEFT LANE CLOSED STAY ALERT	9 6 10
5-9 / 1, 2, 3, 4, 5 / *11*	Road Work Ahead (logo) at MP Right Lane Closed	ROAD WORK AHEAD AT MILE *XXX*	9 5 11	RIGHT LANE CLOSED STAY ALERT	10 6 10
5-10 / 1, 2, 3, 4, 5 / *11*	Road Work Ahead (logo) at MP Stay Alert	ROAD WORK AHEAD AT MILE *XXX*	9 5 11	STAY ALERT	4 0 5
5-11 / 1, 2, 3, 4, 5 / *11*	Road Work (logo) XX miles Lt Lane Closed. ATMS	ROAD WORK *XX* MI AHEAD	9 0 11	LEFT LANE CLOSED STAY ALERT	9 6 10
5-12 / 1, 2, 3, 4, 5 / *11*	Road Work (logo) XX miles Rt Lane Closed. ATMS	ROAD WORK *XX* MI AHEAD	9 0 11	RIGHT LANE CLOSED STAY ALERT	10 6 10
5-13 / 1, 2, 3, 4, 5, 6 / *9*	Road Work (logo) XX miles Stay Alert ATMS	ROAD WORK *XX* MI AHEAD	9 5 5	STAY ALERT	4 0 5
5-14 / 1 / *17*	Slow Traffic Paces at MP Stay Alert	SLOW MOVING TRAFFIC PACES MP XXX	11 13 6	STAY ALERT WATCH FOR STOPPED OR SLOW TRAFFIC	10 17 15
5-15 / 1, 2, 3, 4, 5, 6 / *9*	Trucks use Left Lane	TRUCKS USE LEFT LANE	6 3 9	THROUGH WORK ZONE	7 4 4
5-16 / 1, 2, 3, 4, 5, 6 / *10*	Trucks use Right Lane	TRUCKS USE RIGHT LANE	6 3 10	THROUGH WORK ZONE	7 4 4

5. CONGESTION (due to accident, road work, non-recurring)

LEGEND:
Messages for **Pre-Entry** Signs Only
Messages Generated by ATMS
VARIABLE TEXT - Change as Required for Situation

Message ID / *Sign Classes* / *Max Characters*	Message Title	Page 1		Page 2	
5-17	Tunnel	**TUNNEL WORK**	**11**	**STAY ALERT**	**10**
1, 3	Message 1		**0**	**FOR**	**3**
15		**AHEAD**	**5**	**STOPPED TRAFFIC**	**15**
5-18	Tunnel	**SINGLE LANE**	**11**	**STAY**	**4**
1, 3	Message 2	**TRAFFIC THROUGH**	**15**		**0**
15		**TUNNEL**	**6**	**ALERT**	**5**
5-19	Tunnel	**STOPPED TRAFFIC**	**15**		**0**
1, 3	Message 3	**AT TUNNEL**	**9**		**0**
15		**STAY ALERT**	**10**		**0**
5-20	Tunnel	**TWO-WAY**	**7**	**STAY**	**4**
1, 3	Message 4	**TRAFFIC**	**7**		**0**
14		**THROUGH TUNNEL**	**14**	**ALERT**	**5**
5-21	Tunnel	**STOPPED TRAFFIC**	**15**	**STAY ALERT**	**10**
1, 3	Message 5		**0**		**0**
15		**AHEAD**	**5**	**EXPECT DELAYS**	**13**
5-22	Tunnel	**TRAFFIC STOPPED**	**15**	**STAY ALERT**	**10**
1, 3	Message 6	**AT**	**2**		**0**
15		**TUNNEL**	**6**	**EXPECT DELAYS**	**13**
5-23	Tunnel	**SINGLE LANE**	**12**	**SLOW DOWN**	**9**
1, 3	Message 7	**TRAFFIC IN**	**10**		**0**
12		**TUNNEL AHEAD**	**12**	**STAY ALERT**	**10**
5-24	Tunnel	**SINGLE LANE**	**11**	**STAY**	**4**
1, 3	Message 8	**THROUGH**	**7**	**IN**	**2**
11		**TUNNEL**	**6**	**LANE**	**4**

Long Term Construction

	5-25	LT Lane Shift	**CONSTRUCTION**	**12**	**LANE SHIFTS**	**11**	
	1, 2, 3, 4	Long Term Construction Msg	**ZONE**	**4**	**STAY**	**4**	
	12	55 MPH/Left Lane shift logo	**REDUCE SPEED**	**12**	**ALERT**	**5**	
	5-26	No Restrictions	**CONSTRUCTION**	**12**		**0**	
	1, 2, 3, 4	Long Term Construction Msg	**ZONE**	**4**		**0**	
	12	55 MPH Logo	**REDUCE SPEED**	**12**		**0**	
	5-27	No Shoulder	**CONSTRUCTION**	**12**	**NO SHOULDER**	**11**	
	1, 2, 3	Long Term Construction Msg	**ZONE**	**4**	**FOR**	**3**	
	13	55 MPH Logo	**REDUCE SPEED**	**12**	**NEXT XX MILES**	**13**	
	5-28	RT Lane Shift	**CONSTRUCTION**	**12**	**LANE SHIFTS**	**11**	
	1, 2, 3, 4	Long Term Construction Msg	**ZONE**	**4**	**STAY**	**4**	
	12	55 MPH/Right Lane shift logo	**REDUCE SPEED**	**12**	**ALERT**	**5**	
	5-29	Uneven Lanes	**CONSTRUCTION**	**12**	**UNEVEN LANES**	**12**	
	1, 2, 3, 4	Long Term Construction Msg	**ZONE**	**4**	**STAY**	**4**	
	12	55 MPH Logo	**REDUCE SPEED**	**12**	**ALERT**	**5**	
	5-30	Uneven Lanes_LT Lane Shift	**CONSTRUCTION**	**12**	**UNEVEN LANES**	**12**	
	1, 2, 3, 4	Long Term Construction Msg	**ZONE**	**4**	**LANE SHIFTS**	**11**	
	12	55 MPH/Left Lane shift logo	**REDUCE SPEED**	**12**	**STAY ALERT**	**10**	
	5-31	Uneven Lanes_RT Lane Shift	**CONSTRUCTION**	**12**	**UNEVEN LANES**	**12**	
	1, 2, 3, 4	Long Term Construction Msg	**ZONE**	**4**	**LANE SHIFTS**	**11**	
	12	55 MPH/Right Lane shift logo	**REDUCE SPEED**	**12**	**STAY ALERT**	**10**	

5. CONGESTION (due to accident, road work, non-recurring)

LEGEND:
Messages for **Pre-Entry** Signs Only
Messages Generated by ATMS
VARIABLE TEXT - Change as Required for Situation

Sign	Message ID / Sign Classes / Max Characters	Message Title	Page 1		Page 2		Sign
			PennDOT Messages				
(I-XX EB) HEAVY CONGESTION	**5-32**	HWY_2digit_PennDOT	*I-XX EB*	7	STAY ALERT	10	STAY ALERT EXPECT DELAYS
	1, 2, 3, 4, 5, 6	HeavyCongestion	HEAVY	5	EXPECT	6	
	10	Interstate Logo	CONGESTION	10	DELAYS	6	
(I-XXX EB) HEAVY CONGESTION	**5-33**	HWY_3digit_PennDOT	*I-XXX EB*	8	STAY ALERT	10	STAY ALERT EXPECT DELAYS
	1, 2, 3, 4, 5, 6	HeavyCongestion	HEAVY	5	EXPECT	6	
	10	Interstate Logo	CONGESTION	10	DELAYS	6	
(PA-XX EB) HEAVY CONGESTION	**5-34**	State_2digit_PennDOT	*PA-XX EB*	8	STAY ALERT	10	STAY ALERT EXPECT DELAYS
	1, 2, 3, 4, 5, 6	HeavyCongestion	HEAVY	5	EXPECT	6	
	10	Keystone Logo	CONGESTION	10	DELAYS	6	
(PA-XXX EB) HEAVY CONGESTION	**5-35**	State_3digit_PennDOT	*PA-XXX EB*	9	STAY ALERT	10	STAY ALERT EXPECT DELAYS
	1, 2, 3, 4, 5, 6	HeavyCongestion	HEAVY	5	EXPECT	6	
	10	Keystone Logo	CONGESTION	10	DELAYS	6	
(US-X EB) HEAVY CONGESTION	**5-36**	US_1digit_PennDOT	*US-X EB*	7	STAY ALERT	10	STAY ALERT EXPECT DELAYS
	1, 2, 3, 4, 5, 6	HeavyCongestion	HEAVY	5	EXPECT	6	
	10	US Logo	CONGESTION	10	DELAYS	6	
(US-XX EB) HEAVY CONGESTION	**5-37**	US_2digit_PennDOT	*US-XX EB*	8	STAY ALERT	10	STAY ALERT EXPECT DELAYS
	1, 2, 3, 4, 5, 6	HeavyCongestion	HEAVY	5	EXPECT	6	
	10	US Logo	CONGESTION	10	DELAYS	6	
(US-XXX EB) HEAVY CONGESTION	**5-38**	US_3digit_PennDOT	*US-XXX EB*	9	STAY ALERT	10	STAY ALERT EXPECT DELAYS
	1, 2, 3, 4, 5, 6	HeavyCongestion	HEAVY	5	EXPECT	6	
	10	US Logo	CONGESTION	10	DELAYS	6	
			Trucks Left Lane				
TRUCK/BUS ALERT LEFT LANE ONLY MP 227-220	**5-39**	Truck/Bus Alert (logo)	TRUCK/BUS ALERT	15		0	
	1	Left Lane Only	LEFT LANE ONLY	14		0	
	15	bet MP	MP XXX-XXX	10		0	
TRUCK/BUS ALERT LEFT LANE ONLY	**5-40**	Truck/Bus Alert (logo)	TRUCK/BUS ALERT	15		0	
	1	Left Lane Only	LEFT LANE	9		0	
	15		ONLY	4		0	

6. CURRENT WEATHER

LEGEND:
Messages for **Pre-Entry** Signs Only
Messages Generated by ATMS
VARIABLE TEXT - Change as Required for Situation

Message ID / Sign Classes / Max Characters	Message Title	Page 1		Page 2	
6-1	6.1_Quick_Weather	WEATHER	7	KEEP ALERT	10
1, 2, 3, 4	Plan Level I, II		0	FOR CHANGING	12
12		ALERT	5	CONDITIONS	10
6-2	Cross	HIGH	4	STAY	4
ALL SIGNS	Winds	CROSS	5		0
5		WINDS	5	ALERT	5
6-3	Flooding	ROADWAY	7	STAY	4
ALL SIGNS	Generic location	FLOODING	8		0
8		POSSIBLE	8	ALERT	5
6-4		DENSE FOG	9	SLOW DOWN	9
1, 2, 3, 4, 5, 6	Fog		0		0
10		AHEAD	5	STAY ALERT	10
6-5	Rain and ponding water	HEAVY	5	SLOW DOWN	9
1, 2, 3, 4, 5, 6	ATMS	RAIN	4		0
10	Slippery logo	AHEAD	5	STAY ALERT	10
6-6	Severe Heat Warning	EXCESSIVE	9	DIAL *11	8
1, 2, 3, 4, 5, 6		HEAT	4	FOR	3
10		ALERT	5	ASSISTANCE	10
6-7	Severe Thunderstorm	SEVERE	6	KEEP ALERT	10
1, 2, 3, 4	Alert	WEATHER	7	FOR CHANGING	12
12		ALERT	5	CONDITIONS	10
6-8	Speed limit	WEATHER ALERT	13	TUNE	4
1, 2, 3	Restriction 25	SPEED LIMIT	11	TO	2
13	HAR. 25 MPH Logo	*25* MPH	6	1640 AM	7
6-9	Speed limit	WEATHER ALERT	13	TRUCK AND	9
1, 2, 3	Restriction 25	SPEED LIMIT	11	TRAILER	7
13	TruckTrailerRestr. 25 MPH Logo	*25* MPH	6	RESTRICTIONS	12
6-10	Speed limit	WEATHER ALERT	13	TUNE	4
1, 2, 3	Restriction 45	SPEED LIMIT	11	TO	2
13	HAR. 45 MPH Logo	*45* MPH	6	1640 AM	7
6-11	Speed limit	WEATHER ALERT	13	TRUCK AND	9
1, 2, 3	Restriction 45	SPEED LIMIT	11	TRAILER	7
13	TruckTrailerRestr. 45 MPH Logo	*45* MPH	6	RESTRICTIONS	12
6-12	Speed limit	WEATHER ALERT	13	TUNE	4
1, 2, 3	Restriction	REDUCE	6	TO	2
13	HAR	SPEED	5	1640 AM	7
6-13	Speed limit	WEATHER ALERT	13	TRUCK AND	9
1, 2, 3	Restriction	REDUCE	6	TRAILER	7
13	TruckTrailerRestr	SPEED	5	RESTRICTIONS	12
6-14	Speed	WINTER	6	REDUCED	7
1, 2, 3, 4, 5	Reduction 25	WEATHER	7	SPEED LIMIT	11
11	25 MPH Logo	ALERT	5	*25* MPH	6
6-15	Speed	WINTER	6	REDUCED	7
1, 2, 3, 4, 5	Reduction 45	WEATHER	7	SPEED LIMIT	11
11	45 MPH Logo	ALERT	5	*45* MPH	6

6. CURRENT WEATHER

LEGEND:
Messages for **Pre-Entry** Signs Only
Messages Generated by ATMS
VARIABLE TEXT - Change as Required for Situation

Message ID / Sign Classes / Max Characters	Message Title	Page 1		Page 2	
6-16	Weather	WEATHER ALERT	13	*Type*	4
1, 2, 3	Plan III	*Condtion*	8	*of*	2
13			0	*Restriction*	11
6-17	Weather	WEATHER ALERT	13	ROADWAY	7
1, 2, 3	Plan	TUNE TO	7	CLOSED	6
13	Level IV	1640 AM	7	*Location*	8
6-18	Weather	WEATHER	7	*Selected*	8
1, 2, 3, 4, 5, 6	Plan		0	*Safety*	6
9	Level IV-2	EMERGENCY	9	*Message*	7
6-19	White Out Conditions	WEATHER ALERT	13	STAY ALERT	10
1, 2, 3	Reduce speed	WHITE OUT	9		0
13		CONDITIONS	10	REDUCE SPEED	12
6-20	Winter Weather	WINTER	6	TUNE	4
ALL SIGNS	Alert	WEATHER	7	TO	2
7		ALERT	5	1640 AM	7

7. TRAVEL TIME		LEGEND:			
		Messages for **Pre-Entry** Signs Only			
Message ID		Messages Generated by ATMS			
Sign Classes		*VARIABLE TEXT* - Change as Required for Situation			
Max Characters	**Message Title**	**Page 1**		**Page 2**	
7-1	Travel Time 1	**TRAVEL TIME TO**	**14**		**0**
1, 2, 3	ATMS	**EXIT** *XXX*	**8**		**0**
14		*XX* **MI** *XX* **MIN**	**14**		**0**
7-2	Travel Time 2	**TRAVEL TIME TO**	**14**	**TRAVEL TIME TO**	**14**
1, 2, 3	ATMS	**EXIT** *XXX*	**8**	**EXIT** *YYY*	**8**
14		*XX* **MI** *XX* **MIN**	**14**	*YY* **MI** *YY* **MIN**	**14**

8. TOLL AND SERVICE PLAZA

LEGEND:
Messages for **Pre-Entry** Signs Only
Messages Generated by ATMS
VARIABLE TEXT - Change as Required for Situation

Message ID *Sign Classes* *Max Characters*	Message Title	Page 1		Page 2		
8-1 ALL SIGNS *8*	8.1_Quick_Plaza Limited Services	LIMITED SERVICE MILE *XXX*	7 7 8	TUNE TO 1640 AM	4 2 7	
8-2 1, 2, 3, 4, 5, 6 *9*	Cashless Toll In Effect HAR	CASHLESS TOLL IN EFFECT	8 4 9	TUNE TO 1640 AM	4 2 7	
8-3 1, 2, 3 *14*	Cashless Toll In Effect Keep Moving	CASHLESS TOLL IN EFFECT	8 4 9	KEEP MOVING AT *Interchange* INTERCHANGE	11 14 11	
8-4 1, 2, 3 *13*	Cashless Toll Starting HAR	CASHLESS TOLL STARTING *Month / Day*	13 8 11	TUNE TO 1640 AM	4 2 7	
8-5 1, 2, 3 *13*	EZ Pass Express Lane Closed All Traffic Keep Right. EZPass Logo.	EZ PASS EXPRESS LANES CLOSED	7 13 6	ALL TRAFFIC KEEP RIGHT	11 4 5	
8-6 1, 2, 3 *13*	EZ Pass Express Lanes Closed At Interchange. EZPass Logo.	EZ PASS EXPRESS LANES CLOSED	7 13 6	AT *Interchange* EXIT *XXX*	2 11 8	
8-7 1, 2, 3 *13*	EZ Pass Express Lane Closed HAR. EZPass Logo.	EZ PASS EXPRESS LANES CLOSED	7 13 6	TUNE TO 1640 AM	4 2 7	
8-8 1, 2, 3 *13*	Heavy traffic Approaching Toll ahead	HEAVY TRAFFIC EXITING AT MILE *XXX*	13 7 11	STAY ALERT EXPECT DELAYS	10 0 13	
8-9 1, 2, 3 *15*	New cash Toll Rates	TOLL INCREASE IN EFFECT	4 8 9	*Time* *Date* TUNE TO 1640 AM	4 4 15	
8-10 ALL SIGNS *8*	New cash Toll Rates Now In effect	NEW CASH TOLL RATES	8 4 5	NOW IN EFFECT	3 2 6	
8-11 1, 2, 3, 4, 5, 6 *10*	No Plaza Services	NO *Type* *Plaza* MILE *XXX*	7 5 8	NEXT PLAZA MILE *XXX*	10 0 8	
8-12 1, 2, 3, 4, 5, 6 *10*	Plaza Closed	*Plaza* CLOSED	5 0 6	NEXT PLAZA LOCATED AT MILE *XXX*	10 10 8	

9. SPECIAL EVENTS		LEGEND: Messages for **Pre-Entry** Signs Only; Messages Generated by ATMS; *VARIABLE TEXT* - Change as Required for Situation			
Message ID ***Sign Classes*** ***Max Characters***	**Message Title**	**Page 1**		**Page 2**	
9-1 **ALL SIGNS** *7*	Generic name Traffic HAR	*GENERIC* *NAME* **TRAFFIC**	**7** **4** **7**	**TUNE** **TO** **1640 AM**	**4** **2** **7**
9-2 **ALL SIGNS** *7*	Special event Expect delays	*SPECIAL* *EVENT* *NAME*	**7** **5** **4**	**EXPECT** **DELAYS**	**6** **0** **6**
9-3 **ALL SIGNS** *8*	Special event Use exit	*SPECIAL* *EVENT* *NAME*	**7** **5** **4**	**USE** **EXIT** *XXX*	**3** **0** **8**

10. FUTURE EVENTS		LEGEND: Messages for **Pre-Entry** Signs Only; Messages Generated by ATMS; *VARIABLE TEXT* - Change as Required for Situation			
Message ID ***Sign Classes*** ***Max Characters***	**Message Title**	**Page 1**		**Page 2**	
10-1 **1, 2, 3, 4** *12*	Planned Road Closure	**ROAD CLOSED** *DofW / Date* *Time* **TO** *Time*	**11** **11** **12**	*I-76 EB* **EXIT** *XXX* **TO** **EXIT** *XXX*	**7** **11** **8**
10-2 **1, 2, 3** *14*	Planned Severe Weatther Expected	**SEVERE WEATHER** **EXPECTED** *Day of Week*	**14** **8** **11**		

11. SCHEDULED SAFETY MESSAGES

LEGEND:
Messages for **Pre-Entry** Signs Only
Messages Generated by ATMS
VARIABLE TEXT - Change as Required for Situation

Message ID *Sign Classes* *Max Characters*	Message Title	Page 1		Page 2	
11-1	Emergency Vehicle	MOVE OVER	9	IT'S	4
1, 2, 3	Law	FOR	3	THE	3
14	Message	EMERG VEHICLES	14	LAW	3
11-2	Texting	DON'T TEXT	10	IT'S	4
1, 2, 3, 4, 5, 6	Law		0	THE	3
10		AND DRIVE	9	LAW	3
11-3	Impaired Driving	DON'T DRIVE	11	DRIVE SOBER	11
1, 2, 3, 4, 5	Message 1		0	OR GET	6
11	Large	IMPAIRED	8	PULLED OVER	11
11-4	Impaired Driving	DRIVE SOBER	11		0
1, 2, 3, 4, 5	Message 2	OR GET	6		0
11	Small	PULLED OVER	11		0
11-5	Impaired Driving	BUZZED	6	DRUNK	5
ALL SIGNS	Message 3	DRIVING	7		0
7		IS	2	DRIVING	7
11-6	Impaired Driving	DRIVE SOBER	11	LAST YEAR	9
1, 2, 3	Message 4	OR GET	6	*XX* DUI	6
13		PULLED OVER	11	CRASHES IN PA	13
11-7	Occupant	BUCKLE UP	9	CLICK IT	8
1, 2, 3, 4, 5, 6	Protection	SEAT BELTS	10	OR	2
10	Message 1. Seat belt logo.	SAVE LIVES	10	TICKET	6
11-8	Occupant	CLICK IT	8	DRIVE	5
ALL SIGNS	Protection	OR	2		0
8	Message 2. Seat belt logo.	TICKET	6	SAFELY	6
11-9	Aggressive	SLOW DOWN	9	AVOID	5
1, 2, 3, 4, 5	Driving		0	AGGRESSIVE	10
11	Message 1	SAVE A LIFE	11	DRIVING	7
11-10	Aggressive	SLOW	4	SAVE	4
ALL SIGNS	Driving		0	A	1
4	Message 2	DOWN	4	LIFE	4
11-11	Motorcycle	SHARE THE ROAD	14		0
1, 2, 3	Safety	WATCH FOR	9		0
14	Message 1	MOTORCYCLES	11		0
11-12	Motorcycle	SHARE	5	MOTORCYCLE	10
1, 2, 3, 4, 5, 6	Safety	THE	3	SAFETY	6
10	Message 2	ROAD	4	MONTH	5
11-13	Motorcycle	WATCH 4	7	DRIVE	5
ALL SIGNS	Safety	MOTOR	5		0
7	Message 3	CYCLES	6	SAFELY	6
11-14	Distracted	DISTRACTED	10	KEEP ALERT	10
1, 2, 3	Driving	DRIVING	7	ON THE ROAD &	13
14	Message 1	CAUSES CRASHES	14	AT TOLL PLAZAS	14
11-15	Stay Right, Pass Le	STAY RIGHT	10	IT'S	4
1, 2, 3, 4, 5, 6	Law		0	THE	3
10	Message	PASS LEFT	9	LAW	3

11. SCHEDULED SAFETY MESSAGES

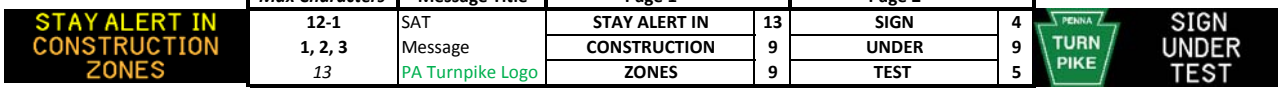
LEGEND:
Messages for **Pre-Entry** Signs Only
Messages Generated by ATMS
VARIABLE TEXT - Change as Required for Situation

Message ID / *Sign Classes* / *Max Characters*	Message Title	Page 1		Page 2	
11-16	Headlights	**WIPERS ON**	**9**	**IT'S**	**4**
1, 2, 3	and wipers on		**0**	**THE**	**3**
13	Message 1	**HEADLIGHTS ON**	**13**	**LAW**	**3**
11-17	Buzzed Driving	**BUZZED DRIVING**	**14**	**DON'T**	**5**
1, 2, 3	Drunk Driving logo	**IS**	**2**	**DRIVE**	**5**
14		**DRUNK DRIVING**	**13**	**IMPAIRED**	**8**
11-18	Impaired Driving	**DON'T**	**5**		**0**
ALL SIGNS	Drunk Driving logo	**DRIVE**	**5**		**0**
8		**IMPAIRED**	**8**		**0**
11-19	Deer Awareness	**OCT - NOV**	**9**	**BE ALERT**	**8**
1, 2, 3, 4, 5	Deer logo	**DEER ACTIVE**	**11**	**FOR DEER**	**8**
11		**DUSK- DAWN**	**10**	**ON ROADWAY**	**10**
11-20	Distracted Driving	**DISTRACTED**	**10**	**KEEP ALERT**	**10**
1, 2, 3	color	**DRIVING**	**7**	**ON THE ROAD &**	**13**
14		**CAUSES CRASHES**	**14**	**AT TOLL PLAZAS**	**14**
11-21	Motorcycle Safety	**SHARE THE ROAD**	**14**		**0**
1, 2, 3	color	**WATCH FOR**	**9**		**0**
14		**MOTORCYCLES**	**11**		**0**
11-22	Move Over	**STATE LAW**	**9**	**EMERGENCY VEHICLES**	**18**
TOO BIG	color	**MOVE OVER AND**	**13**	**MAINTENANCE AND**	**15**
18		**SLOW DOWN FOR**	**13**	**TOW TRUCKS**	**10**
11-23	Operation Orange	**SLOW DOWN**	**9**		**0**
1, 2, 3, 4, 5, 6	Squeeze	**IN**	**2**		**0**
10	Orange Squeeze lo	**WORK ZONES**	**10**		**0**
11-24	Trip Talk	**PLAN AHEAD**	**10**		**0**
1, 2, 3, 4, 5	Trip Talk logo	**W/ TRIPTALK**	**11**		**0**
11		**APP**	**3**		**0**
11-25	Veterans Day	**THANK YOU**	**9**	**SEATBELTS**	**9**
TOO BIG	color	**VETERANS**	**8**	**SAVE**	**4**
16		**FOR YOUR SERVICE**	**16**	**LIVES**	**5**

12. SIGN TESTING

LEGEND:
Messages for **Pre-Entry** Signs Only
Messages Generated by ATMS
VARIABLE TEXT - Change as Required for Situation

Message ID *Sign Classes* *Max Characters*	Message Title	Page 1		Page 2	
12-1	SAT	STAY ALERT IN	13	SIGN	4
1, 2, 3	Message	CONSTRUCTION	9	UNDER	9
13	PA Turnpike Logo	ZONES	9	TEST	5



13. FOG WARNING SYSTEM

LEGEND:
Messages for **Pre-Entry** Signs Only
Messages Generated by ATMS
VARIABLE TEXT - Change as Required for Situation

Message ID *Sign Classes* *Max Characters*	Message Title	Page 1		Page 2		Page 3	
13-1	13.1_Quick_Reduced	REDUCED	7		0		0
1, 6	Vision Ahead	VISION	6		0		0
7		AHEAD	5		0		0
13-2	Reduced vision	REDUCED	7	*XX* MILES	8		0
1, 6	XX miles ahead	VISION	6	AHEAD	5		0
8			0		0		0
13-3	Reduced vision ahead	REDUCED	7	PREAPARE	8		0
1, 6	Prepare to Stop	VISION	6	TO	2		0
8		AHEAD	5	STOP	4		0
13-4	Reduced vision ahead	REDUCED	7	SPEED	5	TRUCKS	6
1, 6	SP30	VISION	6	LIMIT	5	KEEP	6
8	30 mph logo.	AHEAD	5	30 MPH	6	RIGHT	8
13-5	Reduced vision ahead	REDUCED	7	SPEED	5	TRUCKS	6
1, 6	SP40	VISION	6	LIMIT	5	KEEP	6
8	40 mph logo.	AHEAD	5	40 MPH	6	RIGHT	8
13-6	Reduced vision ahead	REDUCED	7	SPEED	5	TRUCKS	6
1, 6	SP50	VISION	6	LIMIT	5	KEEP	6
8	50 mph logo.	AHEAD	5	50 MPH	6	RIGHT	8
13-7	SP 30	SPEED	5	SLOW	4		0
1, 6	Slow Down	LIMIT	5		0		0
6	30 mph logo.	30 MPH	6	DOWN	4		0
13-8	SP 40	SPEED	5	SLOW	4		0
1, 6	Slow Down	LIMIT	5		0		0
6	40 mph logo.	40 MPH	6	DOWN	4		0
13-9	SP 50	SPEED	5	SLOW	4		0
1, 6	Slow Down	LIMIT	5		0		0
6	50 mph logo.	50 MPH	6	DOWN	4		0

APPENDIX S

RCRS SAMPLE DATA FEED

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<FromLocLatLog>39.9822987961906,-75.100183893451</FromLocLatLog>
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<FromLocDirection></FromLocDirection>
<ToLoc>Exit: ARAMINGO AVE</ToLoc>
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<County>67</County>
<LaneStatus>closed</LaneStatus>
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<OtherDesc>Detour=N</OtherDesc>
<IsInterstate>Y</IsInterstate>
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<ActualDateTimeOpened></ActualDateTimeOpened>
<DateTimeReported>20150423_14:01</DateTimeReported>
<DateTimeVerified>20150423_14:01</DateTimeVerified>
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Section 3: 0022 (US - 022) () From Intersection of LAUDERMILCH RD in EAST HANOVER [2TWP] To
Section 4: 0022 (US - 022) () From To
Section 5: 0934 (PA - 934) () From To
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Section 2: 0841  (PA - 841) (CHATHAM RD / EVERGREEN ST) From Intersection of CHATHAM ST / + WILLIAM F GAEBEL
INC in WEST GROVE  [BORO] To ON RAMP FROM US 1 N
Section 3: 3026  (BALTIMORE PK / OLD BALTIMORE PK / NEW BALTIMORE PK / LINCOLN ST / EVERGREEN AV /
THIRD ST / LINCOLN AV) From Intersection of 0841  (PA - 841) - EVERGREEN ST / CHATHAM RD in WEST GROVE
[BORO] To
Section 4: 0041  (PA - 041) (GAP NEWPORT PK) From Intersection of LONDON WY in LONDON GROVE  [2TWP] To Exit:  US
1 NORTH
Section 5: Ramp 8013  (US - 1 / PA - 41)</DetourDescription>
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APPENDIX T

PROJECT DELIVERABLE REVIEW AND APPROVAL PROCESS

APPENDIX T

PROJECT DELIVERABLE REVIEW AND APPROVAL PROCESS

The term "deliverable" refers to any and all tasks as indicated on **Appendix G**, Cost Submittal. Deliverables may include shop drawings, reports, samples, test reports, and other information that may be required for quality control and as required by the Contract Documents.

All deliverables must be submitted and accepted on or before the scheduled deliverable date. All deliverables must be error free with regard to spelling, grammar, source data and calculations. Approval of deliverables shall not relieve the Selected Proposer of responsibility for any errors or omissions in such drawings, nor from responsibility for complying with the requirements of this Contract.

For all written deliverables, the Selected Proposer shall provide a high level outline of the proposed contents of the deliverable to make sure the deliverable meets the Commission expectations. The outline shall be submitted to the Commission Project Manager electronically via e-mail. The Commission reserves 5 working days to review each submitted outline. Upon review, the result shall be provided in email indicating on of the following:

a. "No Exceptions Taken"
   With this indication, the Selected Proposer can proceed with work.

b. "Amend and Resubmit"
   With this indication, the procedure shall be:
   i. Make the changes noted on the marked return.
   ii. Send revised outline to the Commission Project Manager for review.
   iii. Repeat revisions and submissions until marked "No Exception Taken."

   the Commission will indicate whether the Selected Proposer can proceed with work not indicated for revision in the outline.

c. "Rejected."
   With this indication, the procedure shall be:
   i. Review the outline in conjunction with the Contract Documents and transmit new outline.
   ii. Repeat resubmissions until marked "No Exceptions Taken."

   Do NOT proceed with any fabrication of the work indicated in the outline.

Some deliverables will require formal presentations to the Commission staff. The Selected Proposer shall plan to conduct the presentations in a timely manner and allow the Commission the time to adequately review the deliverables before final approval, following such presentations. Please refer to timeframes identified in the deliverable review process below.

The Selected Proposer shall provide electronic versions of all documentation. Where appropriate, a table of contents, an index, and keywords shall be available for information searching. The Commission does not require printed documentation except in a case where the Selected Proposer requests and the Commission agrees to accept a printed rather than an electronic document.

All deliverables shall contain a cover sheet with the following information:

- The Company's name;
- Contract number and description;
- Name and address of Selected Proposer;
- Name of preparer of the document;
- Page number, sheet number of detail and revision numbers;
- Description of deliverable; and
- Signature by Selected Proposer certifying the deliverable was reviewed.

All deliverables shall be numbered sequentially with the Selected Proposer maintaining responsibility for a deliverable log.

The deliverable submission and review process will consist of the following steps:

- The Selected Proposer will submit all written deliverables through email whenever possible. For deliverables that are not written documents, an email indicating the deliverable is complete will be required. The email shall contain all information as outlined in the cover sheet above. The Commission may request hardcopy of the deliverable upon receipt of the electronic version. The Selected Proposer is responsible to ensure the Commission has received the deliverable notifications.

- The Commission reserves 15 working days to review each submitted deliverable. Upon review, the result shall be provided in email indicating one of the following:

  a. "No Exceptions Taken"
  With this indication, the Selected Proposer can proceed with work.

  b. "Amend and Resubmit"
  With this indication, the procedure shall be:
  i. Make the changes noted on the marked return.
  ii. Send revised deliverable to the Commission for review in accordance with initial submission procedures
  iii. Repeat revisions and submission until marked "No Exception Taken."

  The Commission will indicate whether the Selected Proposer can proceed with work not indicated for revision in the deliverable.

  c. "Rejected"
  With this indication, the procedure shall be:
  i. Review the deliverable in conjunction with the Contract Documents and transmit new deliverables.
  ii. Repeat resubmissions until marked "No Exceptions Taken."

  Do NOT proceed with any fabrication of the work indicated in the deliverable.

  The review of deliverables by the Commission is for general conformance with the design concept and Contract Documents. Markings or comments shall not be construed as relieving the Selected Proposer from

compliance with the Contract Documents, nor departures there from. The Selected Proposer remains responsible for complying with the requirements of the Contract, for details and accuracy, and completing the work in a timely manner.

Next Generation ATMS
RFP# 16-10400-7393

Appendix U - Payment Schedule

The information provided below details the payment amounts and payment milestones related to each of the task deliverables. The "Task Total" is defined by the sum of the costs for the task deliverables shown. The "% Payment of Task Total" represents the percentage of the total cost ("Task Total") for which the Selected Proposer will be paid on reaching each of the Payment Milestones.

Task	Deliverable	Task Total	Payment Milestone	% Payment of Task Total
A-1	Management Plan	A-1	On Document Acceptance	100%
B-1	Existing Conditions Report	B-1 + B-2 + B-3	On Document Acceptance	25%
B-2	Business Requirements		On Document Acceptance	25%
B-3	Detailed Business Solution Design		On Document Acceptance	50%
C-1	User Interface Design	C-1 + C-2	On Document Acceptance	25%
C-2	Detailed Solution Design Document		On Document Acceptance	75%
C-3	Network Topology Report	C-3	On Document Acceptance	100%
D-1	Procurement Plan	D-1	On Document Acceptance	100%
D-2	Implementation Plan	D-2	On Document Acceptance	100%
D-3	Test Plan	D-3	On Document Acceptance	100%
D-4	Training Plan	D-4	On Document Acceptance	100%
D-5	ATMS COTS Software License	D-5	Per License Agreement	Per License Agreement
E-1	Deployment - Phase 1, Part 1	E-1 + E-2	On Completed Software Installation into Staging Environment	25%
E-2	Deployment - Phase 1, Part 2		On ATMS Software Acceptance (Phase 1)	75%
F-1	High Level Solution Design - Phase 2	F-1	On Document Acceptance	100%
F-2	Detailed Solution Design - Phase 2	F-2	On Document Acceptance	100%
F-3	Training and Test Plans - Phase 2	F-3	On Document Acceptance	100%
F-4	Deployment - Phase 2, Part 1	F-4 + F-5	On Completed Software Installation into Staging Environment	25%
F-5	Deployment - Phase 2, Part 2		On ATMS Software Acceptance (Phase 2)	75%
H-2	User and Support Documentation	H-2	On Document Acceptance (Phase 1)	60%
			On Document Acceptance (Phase 2)	40%
I-1	Turnover Plan	I-1	On Document Acceptance	100%
I-2	Service Turnover	I-2	On Completion of Plan	100%

Task	Deliverable	Task Total	Payment Milestone	Payment Notes
H-1	On-Site Support	H-1	Paid Monthly through end of RFP defined periods.	480 hours (60 days)
H-3	Routine Maintenance and Support	H-3	Paid Monthly starting the day after Deployment Phase 1 Acceptance and Ending at Contract expiration or Commission termination of Routine Maintenance Services.	It is anticipated that Deployment Phase 1 will not be completed and accepted until Year 2. Monthly payments will be paid only for months of Routine Maintenance and Support service provided. A partial month will be pro-rated based on the current year, monthly cost provided in the Cost Submittal. If additional months are required in Year 2, funds will be added through a change order to the contract using the monthly rate provided in the Cost Submittal for Year 2. Routine Maintenance and Support will not be paid during the 60-day test periods (Phase 1 or Phase 2).
H-4	Hosting Services	H-4	Paid Monthly starting the day after Commission Acceptance of Deployment - Phase 1 and ending at Contract expiration or Commission termination.	It is anticipated that Deployment Phase 1 will not be completed and accepted until Year 2. Monthly payments will be paid only for months of Hosting services provided after acceptance. A partial month will be pro-rated based on the yearly monthly cost provided in the Cost Submittal. If additional months are required in Year 2, funds will be added through a change order to the contract using the monthly rate provided in the Cost Submittal for Year 2.
H-5	Escrow	H-4	Paid per Escrow agreement through the duration of the contract.	

APPENDIX V

LIST OF ABBREVIATIONS

Appendix V
List of Abbreviations

AAR	After Action Review
ADFS	Active Directory Federation Services
AMBER	America's Missing: Broadcasting Emergency Response
API	Application Programming Interface
ATIS	Advanced Traveler Information System
ATMS	Advanced Traffic Management System
AVL	Automatic Vechicle Location
BS	British Standards
C&M	Construction and Maintenance
CADS	Computer Aided Dispatch System
CCTV	Closed Circuit Television
CD	Compact Disk
CLEAN	Commonwealth Law Enforcement Assistance Network
ConOps	Concept of Operations
COTS	Commercial Off-The-Shelf
CPM	Critical Path Method
DB	Diverse Business
DFS	Distributed File Share
DMS	Dynamic Message Sign
DO	Duty Officer
DTMF	Dual Tone Multi Frequency
EB	Eastbound
EMS	Emergency Management Service
ENS	Emergency Notification System
FBI	Federal Bureau of Investigation
FTP	File Transfer Protocol
GIS	Geographical Information System
GPS	Global Positioning System
GUI	Graphical User Interface
HAR	Highway Advisory Radio
HTML	Hypertext Markup Language
HTTP	Hypertext Transfer Protocol
ID	Identification
IP	Internet Protocol
ISO	International Organization for Standardization
IT	Information Technology
ITS	Intelligent Transportation System
Lat	Latitude
LDAP	Lightweight Directory Access Protocol
LOE	Level of Effort
Long	Longitude

MIST	Management Information System for Transportation
MP	Milepost
MPL	Minimum participation level
MUTCD	Manual on Uniform Traffic Control Devices
NB	Northbound
NCIC	National Crime Information Center
NDA	Non-Disclosure Agreement
NFS	Network File System
NJDOT	New Jersey Department of Transportation
NST	Network Security Toolkit
NTCIP	National Transportation Communications for Intelligent Transportation Systems Protocol
NTP	Notice to Proceed
NWS	National Weather Service
ODBC	Open Database Connectivity
PA	Pennsylvania
PennDOT	Pennsylvania Department of Transportation
PM	Project Manager
PSP	Pennsylvania State Police
PSPC	Professional Services Procurement Committee
PTC	Pennsylvania Turnpike Commission
PTZ	Pan-Tilt-Zoom
PVMS	Portable Variable Message Sign
RCRS	Roadway Closure and Reporting System
RDMS	Relational Database Management System
RFP	Request for Proposal
RO	Radio Operator
RSS	Rich Site Summary
RTKL	Right-to-Know Law
RWIS	Roadway Weather Information System
SA	System Administrator
SB	Southbound
SCADA	Supervisory Control and Data Acquisition
SDLC	System Development Life Cycle
SIR	Self-Insured Retention
SLA	Service Level Agreement
SQL	Structured Query Language
SSL	Secure Sockets Layer
TBIS	Travel Board Information System
TET	Technical Evaluation Team
TIP	Turnpike Industrial Park
TMC	Traffic Management Center
TOC	Traffic Operations Center
TOD	Time of Day

TRIP	Turnpike Roadway Information Program
UAT	User Acceptance Testing
USB	Universal Serial Bus
V2I	Vehicle to Infrastructure
V2V	Vehicle to Vehicle
VMDK	Virtual Machine Disk
VMS	Video Management System
WB	Westbound
SIWYG	What You See Is What You Get
XML	Extensible Markup Language

APPENDIX W

PROPOSAL QUESTION FORM

Proposer Questions

Pennsylvania Turnpike Commission (PTC) **RFP #: 16-10400-7393**

#	Page	Section	Section Description	Proposer Question	Commission Response
1.					
2.					
3.					
4.					

Addendum No. 1

RFP # 16-10400-7393

Next Generation Advanced Traffic Management System

Prospective Respondents: You are hereby notified of the following information in regard to the referenced RFP:

REVISIONS

1. **Section I-26** – Performance/Payment Bond has been deleted as a requirement for this RFP.
2. **Appendix H and Appendix M** – Requirement SR-27 has been deleted.
3. **Appendix I** – Add the following DMS Devices/Models:
   - **a.** Daktronics – VF-2420-64x160-20-RGB
   - **b.** Daktronics – VF-2420-64x144-20-RGB
   - **c.** Daktronics – VF-2420-36x90-34-RGB
4. **Appendix P – Page 15 to 17**, the Model Column for all HAR TRANSMITTERS are revised to read: "Highway Information Systems DCC-1 Interface."
5. **Appendix L – Concept of Operations, Section 2, Page 5:** Replace "Vidsys" with "Genetec." Genetec is the Commissions current video management system.

QUESTIONS & ANSWERS

Following are the answers to questions submitted in response to the above referenced RFP as of January 11, 2017. All of the questions have been listed verbatim, as received by the Pennsylvania Turnpike Commission.

#	Page	Section	Section Description	Proposer Question	Commission Response
1.				Whether companies from Outside USA can apply for this? (like, from India or Canada)	Yes, they can.
2.				Whether we need to come over there for meetings?	Yes, in person meetings would be a part of this contract.

#	Page	Section	Section Description	Proposer Question	Commission Response
3.				Can we perform the tasks (related to RFP) outside USA? (like, from India or Canada)	There are many tasks that require on the ground assistance, planning in Pennsylvania, and support from within the continental United States.
4.				Can we submit the proposals via email?	Proposals cannot be submitted via email. See RFP Section I-13 for delivery instructions.
5.				On behalf of several Black business IT firms who have an interest in this project, please consider scheduling a mandatory pre-proposal meeting for the above referenced project. There is no way that the firms I work with can market their interest to a potential prime about a joint venture or a sub consultant opportunity as a result of this RFP. Under the current RFP schedule, the PA. Turnpike Commission (PTC) does not allow for a fair and equal opportunity for Black firms to compete since there is not a way for networking to take place without a mandatory pre-proposal meeting. The meeting would allow for the purpose of getting questions/answers and networking to take place.	A mandatory pre-proposal meeting was not scheduled because all the information about this procurement has already been communicated through the RFP and subsequent written addendum; there are no additional details to communicate. Since mandatory pre-proposal meetings can end up limiting the number of vendors submitting a bid or proposal and thus result in limiting the opportunities for Diverse Businesses, outreach and networking opportunities are typically scheduled separate from PTC procurements.
6.	9 of 55	I-26	Performance/Payment Bond	Would the Turnpike accept an alternative form of surety, in lieu of the bonding required in the RFP?	See Revision #1 above.
7.	9 of 55	I-26	Performance/Payment Bond	Would the Turnpike allow bonds to be provided on a recurring annual basis to reduce the burden imposed by providing and maintaining the bonds for the entire 5-year contract?	See Revision #1 above.
8.	9 of 55	I-26	Performance/Payment Bond	A payment bond is typically to guaranty payment of sub-contractors. Is the intent that the required payment bond should be in the amount of 100% of any sub-contracts that may exist? Establishing a payment bond in an amount 100% of the total contract seems inconsistent with the purpose of a	See Revision #1 above.

#	Page	Section	Section Description	Proposer Question	Commission Response
				payment bond. Could the Turnpike please explain the intent of the required payment bond?	
9.	N/A	N/A	N/A	Although Appendix K states the proposer shall provide a schedule for Phases 1, 2 and 3, what is the expected delivery dates for the implementation of Phases 1, 2 and 3?	The proposer shall provide the delivery dates.
10.	21	Appendix H	Solution Capabilities Matrix (SLR) Requirements	What is intended by Requirement "SLR-11 The ATMS solution shall have the capability to be hot refreshed during disaster recovery events"?	When ATMS is restored after a disaster (i.e. server failure, power outage, etc.), the ATMS application shall update to the latest data or program code without requiring the user to restart the ATMS application or "reboot" the system.
11.	1	Appendix I	Device Driver Matrix	Do the Fiber Optic Display Systems (FDS) Controllers RK60 and UC960 support any version of NTCIP? If so which?	NTCIP version 1
12.	9	Appendix H	Device Control and Monitoring (DCM) Requirements	"DCM-26 The ATMS solution shall allow authorized users to push CCTV snapshots to the PA 511 website as well as ENS." How should this be made available to the ATMS users?	This will be determined during Stage 1: ATMS Solution Design.
13.	5	Appendix H	Systems Administration (SA) Requirements	"SA-34 The ATMS solution shall allow the ATMS user with sufficient privileges to manage and define all default values that prepopulate fields that require an input. E.g. the default scheduled event reminder time." Does this requirement apply to all ATMS components, including the ATMS C&M application?	This will be determined during Stage 1 and Stage 3, Solution design for phase 1 and phase 2, respectively.
14.	19	Appendix H	User (UR) Requirements UR-37 UR-38 UR-39 UR-41 UR-42 UR-45 UR-52	Are maintenance sheds and zones, weigh barriers, service plazas and other such elements (not directly operated by the ATMS) created in the Asset Management component of the new solution or obtained from an existing system?	The Asset Management component will track ITS devices only. As indicated in the User Requirements, these elements are to be included as layers within the ATMS map and include attributes related to contact information, etc as indicated in Appendix H. Locations for these elements will be provided to the selected proposer.

#	Page	Section	Section Description	Proposer Question	Commission Response
15.	71	Appendix B Special Terms and Conditions	1. Federally Funded Contracts	Will Federal funding be used to support the work governed by this Contract?	Federal funding may be a potential source of funding throughout the contract.
16.	6 of 30	Append. M	ITM-7	To support the development required interface to Commission's Computer Aided Dispatch (CAD) System can the Commission provide an Interface Control Document or API for this system. This will allow proposers to properly evaluate the work required as part of the proposal process.	The Interface Control Document for the CAD System is confidential and proprietary and cannot be furnished at this time. The PTC will coordinate with the successful bidder and CAD System Provider to facilitate a Non-Disclosure Agreement, at which time this information can be provided. For the purposes of evaluating work required, assume that the ATMS system will need to monitor a system folder containing CAD XML files. The ATMS will need to filter incidents based on type (and subtype) and ingest data based on the associated incident type / subtype. This data will include attributes such as incident number, location, time of event, etc.
17.	8 of 30	Append. M	ITM-31	To support the integration with Commission's Emergency Notification System can the Commission provide an Interface Control Document or API for this system. This will allow proposers to properly evaluate the work required as part of the proposal process.	This will be determined during Stage 1: ATMS Solution Design.
18.	26 of 30	Append. M	UR-25	To support the development required interface to PennDOT's Road Condition Reporting System (RCRS) can the Commission provide an Interface Control Document or API for this system. This will allow proposers to properly evaluate the work required as part of the proposal process.	Appendix S provides an RCRS sample data feed.

#	Page	Section	Section Description	Proposer Question	Commission Response
19.	22 of 30	Append. M	FM-1	To support the required integration with the Commission's access management system (Hirsch) can the Commission provide an Interface Control Document or API for this system. This will allow proposers to properly evaluate the work required as part of the proposal process.	The Commission will not provide this API/SDK at this time. The interface design will take place during Stage 3.
20.	22 of 30	Append. M	FM-4	To support the required integration with the Truck Parking System can the Commission provide an Interface Control Document or API for this system. This will allow proposers to properly evaluate the work required as part of the proposal process.	The truck parking system is not yet deployed. This is a phase 3 item which may be deployed at some point in the future.
21.	27 of 30	Append. M	UR-66	UR-66 requires the ability to toggle between different map types such as street view or satellite view. The requirements also specify use of the Commission ESRI map data. Does the Commission's map data support the use of both the street view and satellite view?	Yes
22.	5 of 55	I-14	Economy of Preparation	In this section it states that the response is to be in 12 font size or larger. May tables, graphics, and headers/footers utilize a smaller font size?	Yes, as long as the tables, graphics, header, and footer details are legible, otherwise all remaining text fonts must be size 12 or larger.
23.				General Questions: Will the wining vendor/consortium be allowed the time for a PoC before final deployment? If yes, what will be the time for that?	Refer to Section IV, Work Statement.
24.				Can the participating vendor/consortium provide alternative solution or additional product/solution as an addendum for consideration? The idea is to make the total offer most cost effective in operational point of view.	Yes, this will be included in the body of the proposal as described in Section II-5, Work Plan.
25.				What will be evaluation process in terms of technical and commercial merits?	This is defined in RFP Part III, Criteria for Selection.

#	Page	Section	Section Description	Proposer Question	Commission Response
26.				If the participating vendor/consortium gets the higher grade in technical offer, will they be invited for bid defense? And will they be given opportunity to match the lower equivalent bid?	See RFP Section I-16, Best and Final Offers.
27.				Can we get 4 weeks of extension on the due date?	No extension will be given.
28.				Will there be any site survey opportunity along with or separate to pre-bid meeting?	No.
29.	5	I-14	Economy Of Preparation	This section states 100 page max for technical proposal and 10 max for appendices. First, are tab pages and the cover pages included? Second, is 110 pages between the two sections, split as we prefer acceptable? With the same exclusions as identified elsewhere.	Refer to RFP section I-14, Economy of Preparation.
30.	11	II-5	Work Plan	Just to be sure, this section asks for hours allocated for each task. Is this to be included in the Technical Proposal even though the price is separate?	Per the Work Plan, indicate the number of person hours allocated to each task. This applies to the technical proposal. Appendix G defines person hour requirements for the cost submittal.
31.	12	II-7	Personnel	Does the requirement for approval to change key personnel extend into the support and maintenance period, or only through the full deployment of phase 1 and 2?	This includes the support and maintenance period.
32.	15	III-4	Evaluation Criteria	The introduction states that the criteria is in order of importance from highest to lowest. Is this true down to the bullet level, or just 1,2,3,4? For example, is the "Soundness of proposal……" to be considered more than the "Ability to meet the requirements…."?	This is only true for the primary criteria, 1 through 4.
33.	17	IV-1	Objectives/General	Are the referenced "Commissions IT standard and guidelines" available? Where can we get them?	The Commission's IT standards and guidelines are included within the body of the RFP, as use cases, solution requirements, and other appendices as required.

#	Page	Section	Section Description	Proposer Question	Commission Response
34.	18	IV-1	Objectives/General/third bullet	Is integration with more than one third party weather service required, or just one?	Reference Appendix L – Concept of Operations and Appendix M – Solution Requirements.
35.	20	IV-2 2.ii & iii	ATMS Solution Design, Configuration and Deployment	Is the Proposer allowed to suggest minor changes to which requirements that are in phase 1 vs phase 2 if it makes sense, or are these absolutes?	Reference Section II-5, Work Plan.
36.	21	4.	Maintenance and Support	This section is indented under "3: Solution Enhancements". Are we safe to assume this is not the intent, and it is its own section under IV-2?	Section 4 is not indented under solution enhancements. Rather, it is indented under "The project structure can be broken down into the following:" Therefore, Section 4 is its own section.
37.	21	IV-2	Appendix O – Interface List Description bullet	States that the commission will provide the services of Information Logistics Inc. under a separate agreement to provide the interface on the ENS side. Are we to assume that the proposer will be responsible for any costs for interfaces on the other side for all the other interfaces listed in Appendix O. For example, are we responsible for any costs on the ServiceNow side for them to feed us closed tickets, or for interface costs on the Intergraph side?	The Selected Proposer is responsible for any costs relating to sharing data from ATMS and interfaces listed in Appendix O.
38.	23	d.	Project Staffing	States that all project staffing changes must be approved by the Commission Project Manager. Are we safe to assume that this only applies to key staff as indicated earlier in the RFP. For example we have software developers that we pull from a development pole as needed. I would not consider these key personnel, but our project software lead would be.	Key Personnel is defined in section II-7, Personnel.
39.	24	f.	Commission Policies, Procedures and Standards	Are these all available on line?	All Commission Policy Letters are available online at https://www.paturnpike.com/yourTurnpike/policy_letters.aspx Standards and Procedures – See question #33.

#	Page	Section	Section Description	Proposer Question	Commission Response
40.	24	i.	Workstation Information	Is compatibility with "Edge" really important to the commission?	Yes and all other current browsers listed within the RFP.
41.	30	B-1.2.	Center to Field Protocol Inventory Report	Is it really the intent of the Commission for the selected proposer to reverse engineer potentially proprietary protocols?	The vendor is required to communicate with all devices listed in the RFP to the extent necessary to provide the required functionality. The methodology the bidder uses to accomplish that goal is not specifically stated. This statement's purpose is to make it clear the responsibility lies with the bidder, and a non-responsive 3rd party will not be grounds for extra time or funding. The selected vendor will not be reverse engineering commission software, but rather potentially that of a non-responsive third-party.
42.	34	C-3	Network Topology Report	Is the intent of this report to include all ITS field infrastructure or just as needed to support the integration of the ATMS into the Commissions network? Or is the selected proposer becoming responsible for the entire ITS communications infrastructure? We certainly can take that on if it is the intent. Just need to budget appropriately.	The Selected Proposer will be responsible for connecting to the PTC network, however will not be responsible for the entire ITS communications infrastructure.
43.	40	E-1.2	Configuration, Customization, and Testing in the Development Environment - fourth bullet	States that we are to work with the Commission to establish the database sizing and space estimates. This is very open ended. Do you have any guidelines or limits we can use to help cost the requirement for storage? ITS data can build up fast.	The Commissions data retention policy is 7 years.
44.	50	H-3	Routine Maintenance and Support – fifth bullet	Lists "Special Reports and Data Extracts". The term "Special Reports" is very open ended and hard to estimate. Any suggestions as to how we budget this into our routine maintenance? We could set aside a specific budget each year for "Special Report" development. Note that Special	Reports are described in more detail on page 51, Appendix L – Concept of Operations and Appendix M – Solution Requirements.

#	Page	Section	Section Description	Proposer Question	Commission Response
				Reports can become very complicated.	
45.	50	H-3	Routine Maintenance and Support. Fourth Paragraph	This paragraph states that it is ultimately the Proposers responsibility to ensure that the ATMS Software solution remains operational. Is the intent of this to put the responsibility of the ITS communications network onto the proposer?	The demarcation of maintenance responsibility is described in the first paragraph of section H-3.
46.	52	H-5	Escrow Agreement and Appendix B	The last paragraph on the page states that all software developed by the proposer as a result of this contract is considered Developed Work Material. When this is combined with Appendix B it implies that any modifications that we make to our COTS ATMS to support the Commission cannot be used by the Proposer on any other projects. Is this truly your intent? We have a very large base of ATMS users and like to keep base modules in line to the max extent possible to minimize ongoing costs for all users.	This topic can be discussed during contract negotiations to develop an approach and contract language that encourages the improvement of ATMS products and services to give the PTC the benefit of the improvements and the vendor financial remuneration for its ingenuity.
47.	Appendix c – Page 2	2 of 6	Credits	Is the time used to perform routine maintenance items such as updates to the operating system or other off the self COTS included in the time that the system is considered not available. Also what about system changes or enhancements requested by the Commission. For example, we make a change to the system at the request of the Commission and it requires a system reboot outside of peak hours to deploy. Is this included in the down time. With only 22 minutes a month available this is important to know. Also, what about down time that is outside the control of the Proposer? For example the Commissions internet access goes down.	Approved scheduled maintenance will not be considered down time.

#	Page	Section	Section Description	Proposer Question	Commission Response
48.	Appendix H	All	Relates to many requirements	Many of the requirements have multiple bullets that really represent multiple requirements. If the proposed ATMS meets all but say one of the requirements out of the box, how should it be labeled as far as "Existing Capability"? We would suggest an "Existing Capability" response for each bullet. Then you are sure all responses are compared on the same bases. Otherwise a response that meets one of several bullets will look the same as one that meets all but one.	Appendix H requires vendors to indicate whether a requirement is fully met. If all bullets noted under the referenced requirement cannot be met fully through the "out of the box" product, a response other than "OB" must be provided. The proposer can clarify which requirement elements are met out of the box and which will require modification in the clarification comments section of the form.
49.	Appendix L	Use Case	All	Please confirm that the Use Case "Normal Course" is not expected to be an exact step by step requirement, but a general concept that would guide the intent of the related requirements. In several cases we fully meet requirements in a fashion that clearly meets the intent, but with slightly different steps. We would expect that these differences are the kind of details you would like to see in the Clarification comments in the Solution Capabilities Matrix. Is this correct?	Yes.
50.	1 of 4	Appendix D	Item b)	Will an SIR of up to $350,000 be acceptable?	Approval would depend upon a review of the Contractor's financials by the Commission.
51.	2 of 4	Appendix D	Item g)	Our Professional Liability insurance is intended to provide coverage for our errors and omissions and if a claim/loss is not as a result of our wrongful act, then we preserve the ability for our insurer to seek recovery for any costs incurred. Based on this, can we take an exception to this item?	Item g) Waiver of Rights of Subrogation is not applicable to Professional Liability.
52.	4 of 4	Appendix D	Item 6. Cyber & Privacy Liability	Will Professional Liability insurance including coverage for liability arising out of a breach of duty to protect client's confidential and proprietary business information be acceptable in lieu of Cyber & Privacy Liability insurance?	Cyber Liability is typically separate coverage, especially with respect to network security.

#	Page	Section	Section Description	Proposer Question	Commission Response
53.	23 of 55	Part IV	e. Background Checks	We complete a background check on all new employees via an outside vendor and do not utilize the FBI Identity History Summary Check. Is this acceptable?	FBI Identity History Summary Checks are necessary because the successful vendor will have access to the Traffic Operations Center which includes law enforcement databases containing FBI and other criminal justice information. Other background checks though outside vendors are insufficient and thus unacceptable.
54.	All pages	Appendix H	Worksheet Supplemental Requirements	For the supplemental requirements in Appendix H, should those be answered YES if we intend to implement (only YES and NO are options).	Yes. Add clarification in the comments column as needed.
55.	2 of 6	Appendix I	Vasaila RWIS devices	For the Vasaila RWIS devices, is the Vasaila XML feed an option to use for integration?	It could be, but it is not preferred. See question 85 below.
56.	2 of 6	Appendix I	Vasaila RWIS devices	For the Vasaila RWIS devices, do they support the NTCIP protocol?	No.
57.	9 of 12	Appendix H	Reqs DCM-97 thru DCM-102	Are smart work zone devices using the same protocols as permanent devices?	Smart work zone devices are NTCIP compliant.
58.	9 of 55	I-26	Performance/Payment Bond	I-26 calls for a 100% Performance and Payment Bond to be issued on contract award. Does this bond cover only the initial design/build period of the contract or will it need to cover the Routine Maintenance and Support period as well?	See revision 1 above.
59.	1, 2	Appendix O	Interface List and Descriptions	In accordance with the referenced section and as described in other areas of the RFP, the Next Generation ATMS will be required to interface with several existing PTC systems. Though the purpose of the interfaces and functional interaction with the ATMS is defined in the requirements and use cases, with the exception of RCRS, no technical interface descriptions are provided for the listed systems. Please provide interface design documentation or API documentation for the listed systems. Additionally, please provide interface design documentation or API documentation for Web Tech Fleet Center AVL system and the Truck	The AVL system has been decommissioned and the truck parking system is a future deployment. See questions 16 – 19 above.

#	Page	Section	Section Description	Proposer Question	Commission Response
				Parking System.	
60.	40 of 55	E-2	Deployment Phase 1, Part 2	Will field verification of physical device status/performance be required during system deployment, i.e. personnel in the field to witness and validate sign messages match system commands? Should field verification of device status/performance during system deployment and testing be required, will these services be provided by the Contractor or by PTC?	The PTC will provide field verification as needed during acceptance testing.
61.	21 of 23	Appendix H	Solution Capabilities Matrix	Requirement IR-2 states, "The ATMS solution shall have multiple stages of archiving. A local archive shall retain information for a user defined period of time, no less than 2 years. A permanent archive shall retain data in an external network for a user-defined period of time. Permanent archive shall retain data for a minimum of 7 years but be user-defined based on data storage capacity." Requirement PR-2 states, "The ATMS solution shall be cloud-based (see the RFP document for further details regarding hosing needs and requirements. Also see Section 4.7 for hosting specific supplemental requirements)." Can the archive be stored in the cloud or does it have to be stored on physical servers located on PTC property. If the latter is required, does PTC provide the data circuits necessary to support archive data transport between the cloud hosted system and the local archive?	This will be determined during Stage 1: ATMS Solution Design.
62.	24 of 55	IV-3 (f)	Commission Policies, Procedures, and Standards	The referenced section requires compliance with the "prevailing organization's" software and application development standards. Please identify the "prevailing organization" and provide guidance to the applicable software and application development standards.	The prevailing organization means the Pennsylvania Turnpike Commission. Commission Policy Letters - See question 39 above. Standards and Procedures - See question 33 above.

#	Page	Section	Section Description	Proposer Question	Commission Response
63.	17 of 55	Main RFP Document - 100868.pdf	IV-1. Objectives Part A General (bullet 3)	The RFP requires that the ATMS solution "will be compliant with all of Commission's IT standards and guidelines." Please provide a copy of the IT standards and guidelines applicable to the contract.	See question 33 above.
64.	39 of 55	E-1.2	Configuration, Customization, and Testing in the Development Environment	The referenced section requires all ATMS solution, enhancements and upgrades to be tested in the Selected Proposer's development environment. We anticipate this testing will be required to include ATMS to field device drivers. Will the Commission temporarily provide representative field equipment and/or controllers for the Selected Proposer's use during this portion of each Deployment Phase?	This will be addressed on a case by case basis, as equipment is available.
65.	22 0f 23	Appendix H – VHR-2,VHR-3, D1	Solution Capabilities Matrix, Procurement Plan	VHR-2 specifies secure access over the internet. Does this indicate the ATMS should be accessible over the public internet from outside of the PTC's private network and without VPN connection into the PTC Network? Are redundant, dedicated data circuits required between the Contractors hosted solution and the PTC network? Is the Contractor or the Commission responsible for the procurement and maintenance of dedicated communications circuits between the hosted solution and the PTC network? If these circuits are to be provided by the Contractor, please provide Commission property addresses where these circuits will connect to the PTC network.	No Redundant data circuits are required to maintain the uptime as stated in the RFP. The Commission will be responsible for procurement and maintenance.
66.	30 of 55 2 of 11	Main RFP Document - 100868.pdf	B-1 Existing Conditions Reports B-1.2. Center to Field Protocol Inventory Report Appendix B Special Terms and Conditions 2. OWNERSHIP RIGHTS c) Commission Property—Non-Exclusive, License	The RFP documents indicate the selected proposer is responsible for executing NDAs where applicable and/or reverse engineering if a protocol is not in the public domain. However, under Appendix B special terms and conditions, reverse engineering is explicitly restricted for any of the Commission software. Since communications protocols are implemented through software which is in use by the Commission, it appears a conflict in the RFP	See question 41 above.

#	Page	Section	Section Description	Proposer Question	Commission Response
			Grant and Restrictions	requirements may exist. Please clarify the proposer's obligations concerning reverse engineering intellectual property (i.e. software and protocols) owned by third parties that are unwilling to enter into an NDA with the proposer. Paragraph B-1.2. Center to Field Protocol Inventory Report indicates: If protocol is not in the public domain, the Selected Proposer shall be responsible for coordinating and executing, in a timely manner, any Non-Disclosure agreements (NDA) required by the equipment manufacturers to obtain available protocol documentation. If protocol information is not available, the Selected Proposer shall be responsible to reverse engineer the protocol. Paragraph 2c) of Appendix B Special terms and Conditions indicates: 4. … neither CONTRACTOR nor any of its subcontractors may decompile or reverse engineer, or attempt to decompile or reverse engineer, any of the Commission Software.	
67.	5 of 87 18 of 55	2.0	CURRENT OPERATIONAL DESCRIPTION, IV-1. Objectives,	In section 2.0 – Current operational description, the video management system is listed as Vidsys. In IV-1. Objectives, the video management system is listed as Genetec. Please clarify.	See Revision 5 above. The current video management system is Genetec, therefore replace Vidsys with Genetec in this section.
68.	23 of 23	VHR-27	Solution Capabilities Matrix	The referenced requirement states, "The Commission may choose to store certain data and require the Selected Proposer to link to or interface with that data at the Commission's sole discretion." Please provide further clarification regarding the type and amount of data and the specified interface.	The Commission requires that all data will be accessible to a data analytics tool TBD at a later date.
69.		Appendix Q	Network Diagram	Does the Level-3 MPLS Network Provide access to all required devices?	No. The Level-3 MPLS network is used for backup routing only.

#	Page	Section	Section Description	Proposer Question	Commission Response
70.	4 of 55	I.10	Questions & Answers	Will the Commission accept and respond to questions beyond the stated deadline?	No.
71.	10	RFP, Part II	Information Required from Proposers	1. Should each of the three submittals be contained in a separate volume or binder. 2. Do you want each to be encased in a separate sealed envelope?	1. Yes 2. See Part II – Information Required from Proposers. Each proposal shall consist of three separately sealed submittals.
72.	9	Appendix H	Solution Capabilities Matrix Device Control and Monitoring (DCM) Requirements DCM-14	What is format of Genetec consumed video	Roadway cameras stream H.264 multicast at 192K bandwidth.
73.	3	Appendix H	Solution Capabilities Matrix Systems Administration (SA) Requirements SA-10	Are phantom devices needed if a Center-To-Center interface is provided that includes device status and/or control?	Phantom devices will not be required for devices that the PTC can activate and operate directly through the ATMS software.
74.	5	Appendix H	Solution Capabilities Matrix Systems Administration (SA) Requirements SA-33	Please clarify the meaning of device AVL activation settings.	The current Automated Vehicle Location (AVL) system has been decommissioned. However, the ATMS must allow for this functionality for future AVL deployments.
75.	*5*	Appendix H	Solution Capabilities Matrix incident and Traffic Management (ITM) Requirements ITM-3	The interface list includes pushing data to WAZE, but no requirements related to this function are included in the RFP. Please clarify.	See Appendix L, Concept of Operations (UC4c, UC5h, UC6a); Appendix M, solution requirements: (SA-31, ITM-3, ITM-6, UR-32, UR-55, UR-61); and Appendix O, Interface List and Descriptions.
76.	5	Appendix H	Solution Capabilities Matrix incident and Traffic Management (ITM) Requirements ITM-6	Is the video wall currently controlled by the Genetec video management software?	The Barco video wall is controlled by Barco's Sidebar software. The Barco wall can also be controlled by the Genetec VMS system via an installed plugin.

#	Page	Section	Section Description	Proposer Question	Commission Response
77.	5	Appendix H	Solution Capabilities Matrix Incident and Traffic Management (ITM) Requirements ITM-8	Are CADS events always considered confirmed or is any operator confirmation also required?	CAD incidents are always considered confirmed. In the event an incident is unfounded, it's closed out with the appropriate code such as GOA (gone on arrival)
78.	6	Appendix H	Solution Capabilities Matrix incident and Traffic Management (ITM) Requirements ITM-31	What type of data would ENS provide to the ATMS?	Data such as Construction and Maintenance events. Final design of this interface will be completed in stage 1.
79.	7	Appendix H	Solution Capabilities Matrix incident and Traffic Management (ITM) Requirements ITM-39	Are diversion routes stored in the ESRI solution?	Diversion routes (Plan X) are stored in both Word and html formats outside of GIS.
80.	8	Appendix H	Solution Capabilities Matrix incident and Traffic Management (ITM) Requirements ITM-63	Please explain the use case where edit capability would be required on an active Planned Event?	See Appendix L – Concept of Operations, Use Case UC5i.
81.	9	Appendix H	Solution Capabilities Matrix Device Control and Monitoring (DCM) Requirements DCM-13	Can external programs access AVL data directly from the AVL solution?	See question 74 above.
82.	9	Appendix H	Solution Capabilities Matrix Device Control and Monitoring (DCM) Requirements DCM-31	Please explain the operational benefit requiring that PSAs be associated with an Event? Is there a use case for allowing them to run outside of and Event?	The PTC may run certain PSAs during certain days/weeks/months of the year. Associating with an event is a use case for the PTC to ensure consistency and efficiency.

#	Page	Section	Section Description	Proposer Question	Commission Response
83.	11	Appendix H	Solution Capabilities Matrix Device Control and Monitoring (DCM) Requirements DCM-71	Can HAR processing be handled as it is in PennDOT? PennDOT went through several design revisions to greatly enhance the HAR usability. Would PTC consider using the PennDOT module as currently deployed and then re-evaluate the functionality in a future upgrade?	See Appendix L, Concept of Operations and Appendix M, solution requirements for PTC HAR use cases and requirements.
84.	11	Appendix H	Solution Capabilities Matrix Device Control and Monitoring (DCM) Requirements DCM-81	How can you hear the HAR message direct from the transmitter if you are not in range of the transmitter?	The intent is to mimic the current system which has text to voice capabilities. This allows the operators to hear what should be broadcast from the transmitter in the field.
85.	12	Appendix H	Solution Capabilities Matrix Device Control and Monitoring (DCM) Requirements DCM-90	Is the ScanWeb interface independent of the SSI RWIS listed in the Device Driver matrix or are those the same devices? Will the ATMS take over data collection of RWIS from MIST or is the plan for ATMS to integrate with MIST to get that data?"	ScanWeb is the SSI RWIS data portal. It is intended to decommission MIST after ATMS system acceptance. Therefore there will be no interface to MIST. The ATMS may poll the RWIS devices directly, thereby eliminating the need for an interface to ScanWeb and allow us to retire that system as well.
86.	12	Appendix H	Solution Capabilities Matrix Construction and Maintenance Management (CCM) Requirements CCM-2	Is a C&M app necessary if the functionality can be accessed via a browser on portable devices?	See Appendix L, Concept of Operations Appendix M, solution requirements. This will also be revisited and finalized during Stage 3.
87.	13	Appendix H	Solution Capabilities Matrix Asset Management (AM) Requirements AM-11	Why are maintenance activities not stored in ServiceNow?	Integration hasn't taken place yet.

#	Page	Section	Section Description	Proposer Question	Commission Response
88.	16	Appendix H	Solution Capabilities Matrix Software Performance (SR) Requirements SR-2	Are all devices listed in the ITS Device Inventory covered in the Device Driver Matrix?	The device inventory has been updated to remove references to old HAR transmitter equipment and the Device Driver Matrix has been updated to include DMS models that are not currently installed, but are available for deployment under an existing contract. Device information listed in the inventory as "CNV" could not be verified by the Commission during field inventory of devices. See Revision #3 and #4 above.
89.	17	Appendix H	Solution Capabilities Matrix Software Performance (SR) Requirements SR-20	Please clarify the intent of selective on/off functionality.	The intent of the referenced requirement centers around making the software modular such that if there is an issue with a certain module or component, it can be disabled without impacting the functionality of the overall software.
90.	17	Appendix H	Solution Capabilities Matrix Software Performance (SR) Requirements SR-27	New functionality will be deployed and tested in the staging environment prior to deployment on the production environment. Please explain the use case where limiting new functionality to a "Test User" would be required given that the functionality has been proved out in the staging environment.	See Revision #2 above. Requirement SR-27 has been removed from the RFP.
91.	18	Appendix H	Solution Capabilities Matrix User (UR) Requirements UR-15	Please explain the use case where map icons would be located at map locations different than their actual lat/lon coordinates?	A device may need to be slightly adjusted on the map to improve the devices map location visually, such as showing a DMS on the correct side of the roadway.

#	Page	Section	Section Description	Proposer Question	Commission Response
92.	19	Appendix H	Solution Capabilities Matrix User (UR) Requirements UR-31	Does the ESRI solution provide data and associated layers mentioned via standard web accessible methods? Is there an expectation that the solution will utilize an ESRI plugin to provide full ESRI functionality or is a more standards based approach acceptable?	ESRI map and feature services can be provided. ESRI plugin will be considered along with other standards based approaches. ESRI compatibility is desired.
93.	19	Appendix H	Solution Capabilities Matrix User (UR) Requirements UR-43	What information is contained in the Bridge log?	Bridge data attributes, such as span length, width, etc. This will be finalized during Stage 1.
94.	23	Appendix H	Solution Capabilities Matrix Vendor Hosting (VHR) Requirements VHR-22	Is PTC expecting a (Service Organization Control) SOC 1 or SOC 2 on the SSAE Audit?	Yes
95.	9	RFP	I-26. Performance/ Payment Bond	1. The RFP states that the amount of the payment bond shall be equal to the contract price. However, standard industry practice is that the value of the payment bond is equal to the costs of all subcontracted work to ensure payment to these entities. Therefore, would PTC agree to a modification of the payment bond amount (coverage) to equal the total cost of subcontracted work? 2. Much of the current legislation regarding performance bonding still relates mainly to construction projects, and therefore requires performance bonding to equal the total contract value. However, in the software industry, full contract value for performance bonding is not typical. We have faced this issue on other large ATMS projects, where the bonding industry will	See Revision #1 above.

#	Page	Section	Section Description	Proposer Question	Commission Response
				not support performance bonding at the full contract value since the exposure of the full project is not yet realized. In the past, we have mitigated this issue by securing “phased” bonding where is secured for each project phase. Therefore, would PTC agree to a phased approach to performance bonding where a $1 million and renewed at each delivery phase?	

All other terms, conditions and requirements of the original RFP dated December 12, 2016 remain unchanged unless modified by this Addendum.