REQUEST FOR PROPOSALS FOR

INSTALLATION OF INTELLIGENT TRANSPORTATION SYSTEMS

ISSUING OFFICE

Pennsylvania Turnpike Commission
Intelligent Transportation System / Traffic Department

RFP NUMBER

09-40110-1925

DATE OF ISSUANCE

April 29, 2009

REQUEST FOR PROPOSALS FOR

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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 satisfy a need for the furnishing and installation of completely functional Variable Message Sign Systems (VMS), Closed Circuit Television Systems (CCTV), Arrow Boards, and fiber optic cable as well as all required power and communications at the approaches to four (4) Turnpike tunnel areas and other Mainline and Northeast Extension locations.

Work items include, but are not limited to:

- Design, procure, install, integrate, test, train and maintain 21 new VMS, associated structures and equipment along the Turnpike.
- Design, procure, install, integrate, test, train and maintain CCTV cameras, associated structures and equipment along the Turnpike.
- Design, procure, install, integrate, test, train and maintain a 48-strand single mode fiber optic cable, riser-rated, end to end including all conduit and patch panels at each of the tunnels within this project. The fiber will be connected to the Commissions Wide Area Network (WAN) at each of the tunnel facilities.
- Design, procure, install, integrate, test, train and maintain an IP or web-based Video Management System at each tunnels control room and the Traffic Operations Center (TOC) in Highspire to view the new CCTV camera images.
- Design, procure, install, integrate, test, train and maintain equipment to digitize (compress, encode and provide an IP Address) CCTV camera video feeds and transmit to the existing central CCTV monitor equipment at Highspire via the PTC Wide Area Network (WAN).
- Design, procure, install, integrate, test, train and maintain four (4) LED Arrow boards along the Turnpike (Lehigh Tunnel approaches).
- Removal of two (2) Arrow board/VMS combination signs and a cantilever warning sign with structure along the Turnpike (Lehigh Tunnel approaches).
- Relocation of two (2) Type A signs and support structures. (Lehigh Tunnel area).
- Relocation of a RTMS pole from MP 120.1 WB to 166.0 EB.
- Removal and disposal of a VMS, structure , cabinet and foundation at I-70 MP 149.1 WB
- Design, procure, install, and integrate a complete electrical power supply to the aforementioned equipment.
- Design, procure, install, integrate of complete communications system (fiber optic, wireless or a hybrid of both) to the aforementioned equipment. **Dial-up or leased line communications will not be considered as an acceptable means of communications to devices in this project.** The PROPOSER must contact Daniel Buckley of Tyco Electronics (Telephone - 978-442-4452 – email buckleyd@tycoelectronics.com) to coordinate wireless services for this project.

This contract is located between milepost 120.1 and milepost 123.6, milepost 175.6 and milepost 189.4, milepost 194.4 and milepost 197.1, milepost 247.2, milepost 328.1, milepost 341.3, milepost A20.0 and milepost A77.2 in Somerset, Fulton, Huntingdon, Franklin, Dauphin, Montgomery, Bucks, Lehigh and Carbon Counties, Pennsylvania.

I-2. Issuing Office. This RFP is issued for the Commission by the ITS/Traffic Department:

Lou Cortelazzi
ITS Manager
Pennsylvania Turnpike Commission
PO Box 67676
Harrisburg, PA 17106-7676

Phone – 717-939-9551 ext 3450; Fax – 717-986-9762
Email – lcortela@paturnpike.com

The Issuing Office is the sole point of contact in the Commission for this RFP.

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 Turnpike Commission is expanding their Variable Message Sign (VMS), Closed Circuit Television (CCTV) camera, Arrow Board and fiber optic cable coverage around the approaches to the Allegheny, Blue- Kittatinny Mountain, Tuscarora and Lehigh Tunnels, as well as other locations on the Mainline and Northeast Extension roadways. The intent of this contract is to acquire the services of a PROPOSER to provide the Turnpike Commission with this expanded ITS system to manage traffic, increase mobility and improve safety. Additional detail is provided in Part IV of this RFP.

I-5. Type of Contract. It is proposed that if a contract is entered into as a result of this RFP, it will be a deliverables-based unit price contract and will contain the provisions shown in the attached standard contract. 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, and capable of performing the work.

I-6. 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-7. Subcontracting. Any use of subcontractors and suppliers by a PROPOSER must be identified in the proposal. During the contract period use of any subcontractors by the selected PROPOSER that were not previously identified in the proposal must be approved in advance in writing by the Commission.

A firm that responds to this solicitation as a PROPOSER may not be included as a designated subcontractor to another firm that responds to the same solicitation. **Multiple responses under any of the foregoing situations may 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 subcontractor to more than one prime PROPOSER responding to the project advertisement.

I-8. 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-9. Mandatory Pre-proposal Conference. A **mandatory** pre-proposal conference will be held on **May 13, 2009 at 10:00 AM** in the Large Board Room at the Turnpike Central Administration Building located at 700 South Eisenhower Blvd., Middletown, PA 17057. The purpose of this conference is to clarify any points in the RFP, which may not have been clearly understood. Written questions should be submitted to the Issuing Office prior to the meeting at the address indicated above to be received no later than **May 8, 2009.** In view of the limited facilities available for the conference, it is requested representation be limited to three (3) individuals per PROPOSER Team. The pre-proposal conference is for information only. Answers furnished during the conference will not be official until verified, in writing, by the Issuing Office.

FAILURE OF THE PRIME CONTRACTOR TO BE REPRESENTED AND SIGNED IN AT THIS MANDATORY PRE-PROPOSAL CONFERENCE WILL BE CAUSE FOR AUTOMATIC REJECTION OF PROPOSAL.

Questions may be forwarded to the Issuing Office **after** the Pre-Proposal Conference and should be received no later than **May 20, 2009**. All questions and written answers will be issued as an addendum, within 2 weeks after the question due date, and become part of this RFP.

I-10. 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 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-11. Response. To be considered, proposals must be delivered to the Pennsylvania Turnpike Commission's Contracts Administration Department, Attention: Fran Furjanic, Contracts Supervisor, on or before **June 17, 2009 by 12:00 noon, local time**. 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 delivery does not guarantee delivery to this address 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-12. Proposals. To be considered, PROPOSERS should submit a complete response to this RFP, using the format provided in PART II. Each PROPOSER should submit **seven (7)** color copies and one (1) CD-ROM containing a PDF version of the entire proposal to the Contracts Administration Department. No other distribution of proposals will be made by the PROPOSER. Each proposal page should be numbered for ease of reference. Proposals must be signed by an official authorized to bind the PROPOSER to its provisions and include the PROPOSER'S Federal Identification Number. For this

RFP, the proposal must remain valid for at least **90** 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, telefax or email notice received at the Commission's address for proposal delivery prior to the exact hour and date specified for proposal receipt. However, if the PROPOSER chooses to attempt to provide such written notice by telefax transmission, the Commission shall not be responsible or liable for errors in telefax transmission. A proposal may also be withdrawn in person by a PROPOSER or its authorized representative, provided its identity is made known and it 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 RFP.

I-13. 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. **Proposals should be limited to 30 pages total, including appendices,** with no smaller than 12pt., 8½ x 11 inch page size (larger pages are allowed for figures or tables, but they must be folded into the overall proposal and used sparingly).

I-14. Discussions for Clarification. PROPOSERS who submit proposals may be required to make an oral or written clarification of their proposals to the Issuing Office to ensure thorough mutual understanding and PROPOSER responsiveness to the solicitation requirements. The Issuing Office will initiate requests for clarification.

I-15. 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-16. 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-17. 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. If a contract is executed, however, the successful proposal submitted in response to this RFP shall be subject to disclosure. 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.

I-18. Disadvantaged Business Enterprise (DBE) Involvement. The Pennsylvania Turnpike Commission is committed to providing opportunities for Disadvantaged Business Enterprises to

compete for work. To support this commitment, there is a goal of ten percent (10%) of the total contract dollar amount set for this RFP. As part of their proposal, the Prime PROPOSER must identify how this goal will be accomplished.

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, other than the position of its proposal in relation to all other proposals.

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 Issuing Office will provide the necessary workspace to accommodate up to two individuals for the duration of the initial deployment (for database entry, training, report generation, etc.) and for a period of two months after cutover to the new system.

I-22. Cost Submittal. The cost submittal shall be placed in a separately sealed envelope within the sealed proposal and kept separate from the technical submittal. **Failure to meet this requirement may result in disqualification of the proposal.**

I-23. Term of Contract. The term of the contract will commence on the Effective Date (as defined below) and will end **within 28 months from NTP, which includes the 12-month maintenance period.** The Commission shall fix the Effective Date after the contract has been fully executed by the PROPOSER 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 cover letter to 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.

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. Each proposal shall consist of two (2) separately sealed submittals. The submittals are as follows: (i) Technical Submittal, in response to **Sections II-1 through II-7** hereof; (ii) Cost Submittal, in response to Section **II-8** hereof.

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. Statement of the Problem. The PROPOSER shall provide text to verify complete understanding of the services required by this RFP.

II-2. Management Summary. Include a narrative description of the team's technical approach and a list of the items to be delivered or services to be provided.

II-3. Work Plan. Describe in narrative form your technical plan for accomplishing the work. Use the task descriptions in Part IV of this RFP as your reference point. Include in the text what type of communications system (fiber optic, wireless or hybrid of the two) the PROPOSER intends to use at each location. Modifications of the task descriptions are permitted; however, reasons for changes should be fully explained. Include a detailed project schedule or similar type display, time related, showing each event anticipated by the PROPOSER. If more than one approach is apparent, comment on why you chose this approach.

II-4. Past Performance - The PROPOSER must either be PennDOT Prequalified for ITS construction and integration, or provide substantial backup to demonstrate their (personnel and previous work experience) ability to complete this project. The PROPOSER must also submit information on contracts/subcontracts performed over the past five (5) years for organizations (commercial, state, local, Federal, etc.) involving similar or related services. The PROPOSER shall submit no more than 10 contract/subcontract descriptions for the entire proposed team (PROPOSER plus major subcontractors/engineers). The PROPOSER must submit this information on the most recently completed contracts/subcontracts or on-going contract/subcontracts that are at least three months into the period of performance. The following information must be provided.

- Customer name, address, and telephone number.
- Technical office point(s) of contact (name, telephone number and email address).
- Contracting/Business office point(s) of contact (name and telephone number).
- Contract name and number, if applicable.

- Date of contract award and period of performance.
- Type of contract.
- Total contract dollar value at time of award.
- Start/End dates of Contract. Identify if the contract was completed early, late or on-time.
- Brief description of product or services.
- Brief description of the contract's relevance to the Task Areas of this project.
- Matrix of Past Performance and Experience. PROPOSER shall create a matrix relating past work performed by the proposed team (prime PROPOSER plus major subcontractors) to the Task Areas of this project.

II-5. Personnel. Include the number, and names where practical, of executive and professional personnel, analysts, auditors, researchers, programmers, consultants, etc., who will be engaged in the work. The proposal shall demonstrate the PROPOSERS ability to perform Task 2, described in Part IV. For this project, the PROPOSER must include the following individuals:

- Project Manager – This person will serve as the PROPOSERS overall Point of Contact for the project. Document the experience of this individual to demonstrate a minimum of three (3) projects and five (5) years successfully managing ITS projects of similar size and content.
- Construction Project Manager - This person will serve as the PROPOSERS overall construction Project Manager for the project. Document the experience of this individual to demonstrate a minimum of three (3) ITS projects successfully constructing ITS projects of similar size.
- Lead Construction Foreman - This person will serve as the PROPOSERS overall construction foreman for the project. Document the experience of this individual to demonstrate a minimum of three (3) ITS projects successfully constructing ITS projects of similar size.
- ITS Project Manager - This person will serve as the PROPOSERS overall ITS Project Manager for the project. This person must be a licensed Professional Engineer, in good standing, in the Commonwealth of Pennsylvania. Document the experience of this individual to demonstrate a minimum of three (3) projects and five (5) years successfully designing ITS projects of similar size and content.
- Lead ITS Engineer - This person will serve as the PROPOSERS overall ITS Designer for the project. This person must be a licensed Professional Engineer, in good standing, in the Commonwealth of Pennsylvania. Document the experience of this individual to demonstrate a minimum of three (3) projects and five (5) years successfully designing ITS projects of similar size and content.
- ITS Integrator - This person will serve as the PROPOSERS ITS Integrator for the project. Document the experience of this individual to demonstrate a minimum of three (3) projects and five (5) years successfully designing ITS projects of similar size and content.

Show where these personnel will be physically located during the time they are engaged in the work. Include through a resume or similar document, educational background and experience in which each team member will be providing their expertise i.e. project management, database engineering, software engineering, etc. Indicate the responsibilities each will have in this project and how long each has been with your company.

Identify the major subcontractors you intend to use and the services they will perform. Where subcontractors are named, include information regarding their role, personnel to be provided, and

through resumes or similar documents, their educational background and experience. Indicate the responsibilities each will have in this project and how long each has been with the named subcontractor.

II-6. Training. The PROPOSER will provide one training session on all ITS subsystems during the contract period. The training will consist of separate training for both operators and field technicians and will occur before System Acceptance Testing (SAT). This training will be digitally recorded and provided to the Commission within 2 weeks of this training.

II-7. M/W/DBE Participation. The Turnpike Commission is committed to the inclusion of disadvantaged, minority, and woman firms in contracting opportunities. The minimum participation level for DBE/MBE/WBEs in this contract will be **10% total**. Participation may be in design, procurement and construction phases, or combination of, for this project. Responding PROPOSERS shall clearly identify DBE/MBE/WBE firms, expected to participate in this contract, in their Proposal. If the selected PROPOSER does not meet the minimum requirement for DBE/MBE/WBE participation, they will be required to demonstrate good faith efforts to achieve the required level. Proposed DBE/MBE/WBE firms must be certified by the Pennsylvania Department of Transportation or the PA UCP (www.paucp.com) at the time of the submission of the proposal. **If further information is desired concerning DBE/MBE/WBE participation**, direct inquiries to the Pennsylvania Turnpike Commission's Contract Administration Department by calling (717) 939-9551 Ext. 4241.

II-8. Cost Submittal. The information requested in this section shall constitute your cost submittal. **The Cost Submittal shall be placed in a separate sealed envelope within the sealed proposal, 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**.** The PROPOSERS should direct in writing to the Issuing Office pursuant to Part I-9 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 following materials **must** be provided in the sealed Cost Submittal. Failure to provide any of these completed items will constitute an incomplete Cost Submittal and an automatic rejection of the PROPOSER'S proposal.

1. Completed PROPOSER'S Bid Sheet. (The Bid Sheet is located in Appendix A.)

2. Completed Schedule of Values form **for each bid item**, except items 0608-0001, 9900-0443 and 9900-0444. A sample Schedule of Values form is located on the next page of this RFP.

3. Official Tyco Electronics proposal for their wireless services offered to the PROPOSER for this contract. (The PROPOSER shall be aware that the Commission will make direct payments to Tyco Electronics on this project, based on the payment schedule defined in Appendix A. The PROPOSER **WILL NOT** include the Tyco Electronics cost in their Bid Sheets.)

INSTALLATION OF INTELLIGENT TRANSPORTATION SYSTEMS
VMS, CCTV, ARROW BOARD and FIBER OPTIC CABLE
SCHEDULE OF VALUES (SAMPLE SHEET)
RFP NO. 09-40110-1925
Sheet ____ of ____

Bid Item No.: _____
Bid Item Description: _____

Engineering: $ _____
(Includes complete site, ITS and structure design.)

Foundation: $ _____
(Includes complete installation - Excavation, Concrete, Rebar, Anchor Bolts)

Structure: $ _____
(Includes complete installation - Fabrication, Delivery, Installation)

Control Cabinet: $ _____
(Includes complete installation - Fabrication, Delivery, Installation)

ITS Equipment: $ _____
(CCTV, VMS, Arrow Board)

Maintenance and Protection of Traffic (MPT): $ _____

Power: $ _____
(Includes all necessary material, equipment, labor and coordination to provide a complete power supply to the site.)

Total Communications*: $ _____

Fiber Optic Communications (Subcategory) $ _____

(Includes all necessary material, equipment, labor and coordination to provide a fiber optic communications system to the site. This section also will include any fiber optic communications material, equipment and labor for the fiber optic portion of a hybrid fiber optic/wireless solution.)

Wireless Communications Infrastructure (Subcategory) $ _____
(Includes all necessary infrastructure (power, conduit, foundations, structures, connections, wiring) material, equipment, labor and coordination to provide the base infrastructure for a wireless communications system at this site. These materials must be coordinated between the PROPOSER and Tyco Electronics prior to submitting a bid.)

Tyco Electronics Wireless Communications Equipment, Integration and Labor (Subcategory)* $ _____
(This cost only includes the wireless equipment, labor and integration provided by Tyco Electronics. These materials must be coordinated between the PROPOSER and Tyco Electronics prior to submitting a bid.)
-This amount will be paid to Tyco Electronics by the Commission, and <u>WILL NOT</u> be included in the PROPOSER'S bid price for this site.

Integration: $ _____

Testing: $ _____

Other: (All other items related to the construction of this site. i.e. guide rail, clearing and grubbing) $ _____

ITEM TOTAL $ _____
(MUST MATCH TOTAL ON BID SHEET)

II-9. Performance Bond. The PROPOSER must post security in a form satisfactory to the Commission (a commercially recognized form of credit) in an amount equal to 100% of the contract price. This must be completed within 10 working days of receipt of the Notice-to-Proceed. The cost of the bond shall be the responsibility of the contractor. The bond must be issued by a corporate surety authorized to do business in the Commonwealth and made payable to the Pennsylvania Turnpike Commission. The bond must be renewed for each year of the contract.

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 this 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 this Contract.

PART III

CRITERIA FOR SELECTION

III-1. Mandatory Responsiveness Requirements. To be eligible for selection, a proposal should be (a) timely received from a PROPOSER; (b) properly signed by the PROPOSER; and (c) formatted such that all cost data is kept separate from and not included in the Technical Submittal.

III-2. Proposals will be reviewed and evaluated by a committee of qualified personnel selected by the Commission. This committee will recommend for selection the proposal that most closely meets the requirements of the RFP and satisfies Commission needs. 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-3. The following criteria will be used in evaluating each proposal:

a. **Understanding the Problem.** This refers to the PROPOSER'S understanding of the Commission needs that generated the RFP, of the Commission's objectives in asking for the services or undertaking the study, and of the nature and scope of the work involved.

b. **PROPOSER Qualifications.** This refers to the ability of the PROPOSER to meet the terms of the RFP, especially the time constraint and the quality, relevancy, and recency of studies and projects completed by the PROPOSER. This also includes the PROPOSER'S financial ability to undertake a project of this size.

c. **Personnel Qualifications.** This refers to the competence of professional personnel who would be assigned to the job by the PROPOSER. Qualifications of professional personnel will be measured by experience and education, with particular reference to experience on studies/services similar to that described in the RFP. Particular emphasis is placed on the qualifications of the project manager.

d. **Soundness of Approach.** Emphasis here is on the techniques for sequence and relationships of major steps, and methods for managing the service/project. Of equal importance is whether the technical approach is completely responsive to all written specifications and requirements contained in the RFP and if it appears to meet Commission objectives.

e. **Cost.** Emphasis here is on the PROPOSER to demonstrate to the Commission that the above criteria and the functional requirements of the RFP can be completed within a cost efficient manner. While this area may be weighted, it will not be the 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 PROPOSAL offering the best price. The Commission will select the PROPOSER with the proposal that best meets its needs, at the sole discretion of the Commission.

PART IV

WORK STATEMENT

IV-1. Objectives.

The objective of this contract is to acquire the services of the PROPOSER to complete the Pennsylvania Turnpike's ITS expansion to better effectively and efficiently manage congestion, improve safety and disseminate information to the motoring public. The Proposer will be required to design, supply, install, integrate, and test all equipment for full functionality and contract intention. In addition, the Proposer will train Commission personnel on field devices and TOC hardware/software. This work will include all required maintenance and protection of traffic in accordance with Commission standards for Maintenance and Protection of Traffic. Commission standards for installation of ITS devices are also available. The ITS standards may be used as the details and notes for the delivery and installation of the systems for the project. The standards may also be used as a guide in the design and preparation of the ITS plans for the project. These drawings are not intended to replace standard practice, the latest NTCIP protocols, and / or engineering judgment and may be reasonably modified, with Commission approval. The Commission standards may be found at www.paturnpike.com/contractor/engineering.aspx

IV-2. Nature and Scope of the Project. The Pennsylvania Turnpike is a key transportation route within the Commonwealth of Pennsylvania and a vital link in the roadway network of the eastern United States. The Turnpike is 512 miles in length with 55 fare collection facilities, twenty-two (22) service plazas and two (2) traveler information centers, twenty (20) maintenance facilities, eight (8) State Police Barracks and five (5) tunnels. The proposed ITS subsystem expansion will enable the Commission to better collect and disseminate roadway travel conditions and potential alternative routes to motorists to aide in the reduction of congestion. The system should have the capacity to include future expansion.

IV-3. Tasks.

Task A - Project Management

1. Provide a project schedule to Commission for review and approval of the tasks associated with all Phases of this project The schedule, created in the latest version of Primavera, shall detail, at a minimum the tasks provided below, as well as all tasks/subtasks the contractor requires to complete each phase of the RFP in a clear and efficient manner. In addition, the schedule should identify the milestones listed in Section IV-4.

2. Attend and conduct biweekly (once every 2 weeks) project status meetings. The PROPOSER is responsible to create and submit minutes to attendees, for all project meetings, within three (3) business days. Meeting minutes shall be consecutively numbered throughout the entire project and submitted in PDF format.

3. Project management is incidental to the project and will not be paid separately.

4. Coorindate with the Commmissions (or their representative) Quality Assurnace / Quality Control (QA/QC) services.

Task B - Design, construct, integrate, test and train Commission personnel on the ITS subsystems being installed under this Expansion project.

1. Design, procure, furnish and install a completely functional center mount VMS location as identified in **Table 1** and on the plans sheets provided. Each location will include the PROPOSER to install one (1) LED VMS board, appropriate foundation, center mount structure, control cabinet, necessary guide rail, power and communications to each location as well as all integration and testing, as specified within these contract documents. The PROPOSER is required to provide all required hardware and software improvements at the Commissions facility to allow TOC operational staff complete control of this subsystem. The PROPOSER shall coordinate with the Commission on the final location of each VMS prior to the design submission. The PROPOSER shall have the option to install one of the communications methods shown in **Table 1** and the plan sheets. It is the responsibility of the PROPOSER to clearly identify the communication method (fiber optic, wireless or a hybrid of both communications solution) being utilized at every VMS site within their proposal. The PROPOSER can only utilize Tyco Electronics, the Commissions wireless provider, for their wireless solution on this project. No other wireless solution will be accepted by the Commission. Failure to be clear on the communications method may result in a lower score.

2. Design, procure, furnish and install a completely functional relocated VMS's, as identified in **Table 1** and on the plans sheets provided. Each location will include the PROPOSER to install two (2) existing (located at the Homewood Maintenance Facility) VMS board, appropriate foundation, center mount structure, control cabinet, necessary guide rail, power and communications to each location as well as all integration and testing, as specified within these contract documents. The PROPOSER is required to provide all required hardware and software improvements at the Commissions facility to allow TOC operational staff complete control of this subsystem. The PROPOSER shall coordinate with the Commission on the final location of each VMS prior to the design submission. The PROPOSER shall have the option to install one of the communications methods shown in **Table 1** and the plan sheets. It is the responsibility of the PROPOSER to clearly identify the communication method (fiber optic, wireless or a hybrid of both communications solution) being utilized at every VMS site within their proposal. The PROPOSER can only utilize Tyco Electronics, the Commissions wireless provider, for their wireless solution on this project. No other wireless solution will be accepted by the Commission. Failure to be clear on the communications method may result in a lower score.

3. Design, procure, furnish and install a completely functional CCTV location as identified in **Table 1** and on the plans sheets provided. Each location will include the PROPOSER to install one (1) CCTV camera, appropriate foundation, 50-foot pole, lowering device system, control cabinet, necessary guide rail, power and communications to each location, as well as all integration and testing as specified within these contract documents. The CCTV camera control and telemetry will also be integrated into the Commissions current video network. The Contractor is required to provide all required hardware and software improvements at the Commissions facility to allow TOC operational staff complete control of this subsystem. The Contractor shall coordinate with the Commission on the final location of each CCTV camera prior to the design submission. The PROPOSER shall have the option to install one of the communications methods shown in **Table 1** and the plan sheets. It is the responsibility of the PROPOSER

to clearly identify the communication method (fiber optic, wireless or a hybrid of both communications solution) being utilized at every CCTV site within their proposal. The PROPOSER can only utilize Tyco Electronics, the Commissions wireless provider, for their wireless solution on this project. No other wireless solution will be accepted by the Commission. Failure to be clear on the communications method may result in a lower score.

4. Design, procure, furnish and install a completely functional Arrow Board location as identified in **Table 1** and on the plans sheets provided. Each location will include the PROPOSER to install one (1) LED Arrow Board, appropriate foundation, support mounting structure, control cabinet, power and communications to each location, as well as all integration and testing, as specified within these contract documents. The PROPOSER is required to provide all required hardware and software improvements at the Commissions facility to allow TOC operational staff complete control of this subsystem. The PROPOSER shall coordinate with the Commission on the final location of each Arrow Board prior to the design submission. The PROPOSER shall have the option to install one of the communications methods shown in **Table 1** and the plan sheets. It is the responsibility of the PROPOSER to clearly identify the communication method being utilized at every Arrow Board site within their proposal. Failure to be clear on the communications method may result in a lower score.

5. Design, procure, furnish and install a completely functional fiber optic communication infrastructure identified in **Table 1** and on the plans sheets provided in the tunnels denoted. Each location will include the PROPOSER to install a LSZH 48-strand, riser rated, single mode fiber optic cable for the entire run of the tunnels identified. The PROPOSER is required to provide all required conduit, mounting hardware, junction boxes, connection to the Commissions Wide Area Network (WAN) at the tunnels network room, all patch panels, jumper cables, connectors, fiber tipping, as well as all integration to allow both tunnel and TOC operational staff complete access to this fiber. The PROPOSER shall coordinate with the Commission on the final location of the conduit, fiber and jumper cables prior to the final design submission. It is the responsibility of the PROPOSER to clearly identify all material and equipment being utilized in each tunnel within their proposal.

Construction of the above must begin within 60 days from Notice-to-Proceed. The actual required completion dates for project milestones will be finalized during the kick-off meeting for this work.

IV-4. Anticipated Project Milestones

Key project milestones are indicated below.

- Notice-to-Proceed
- System Block Diagrams
- List of Equipment
- Engineering Design Review and Field Walk
- Engineering Design Complete
- Engineering Design Approval
- Begin procurement
- Factory Acceptance Testing (FAT)/Traceability Matrix
- Field Construction
- Training

- System Acceptance Testing (SAT)
- Operational Period / Operation Acceptance Testing (OAT)
- Submission of Final As-Built Drawings
- Final System Acceptance By Commission
- Beginning of 1-Year Maintenance Period for installed equipment

IV-5. Report and Project Controls

a. Upon being given a Notice-to-Proceed, the successful PROPOSER shall meet biweekly (every two weeks) with the Commissions Project Manager and their representatives to assess the status of the tasks included in IV-3 above, as directed by the Commission. The PROPOSER will have in attendance all Team personnel required to answer appropriate questions at each meeting. This will be known as the Project Status Meeting. The Project Manager will schedule all meetings and will select location. It is anticipated that most meetings will take place at Turnpike Central Administration Building located at 700 South Eisenhower Blvd., Middletown, PA 17057.

b. Project Status Report – At each Project Status Meeting, the PROPOSER will provide a report that details the work completed during the two weeks prior to the meeting as well as detail the work to be completed within the following two weeks. This report will include all work performed by the PROPOSERS engineers, subcontractors, and construction staff.

c. Problem Identification Report. An "as required" report, identifying problem areas. The report should describe the problem and its impact on the overall project and on each affected task. It should list possible courses of action with advantages and disadvantages of each, and include PROPOSER recommendations with supporting rationale.

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Table 1 - Equipment List

Facility	MP	Direction	Equipment	Power Source (Local / Tunnel)	Potential Local Power Source Pole No.	Communications Options	Tower Location	Comments
Lehigh	A70.5	Median	Arrow Board	Local or Tunnel		Wireless or Fiber Optic to WAN via Tunnel	Tower at A51.0 (South Mountain) or A71.0 (Hullmerton)	
Lehigh	A70.6	Median	Arrow Board	Local or Tunnel		Wireless or Fiber Optic to WAN via Tunnel	Tower at A51.0 (South Mountain) or A71.0 (Hullmerton)	
Lehigh	A71.7	Median	Arrow Board	Local or Tunnel		Wireless or Fiber Optic to WAN via Tunnel	Tower at A51.0 (South Mountain) or A71.0 (Hullmerton)	
Lehigh	A71.8	Median	Arrow Board	Local or Tunnel		Wireless or Fiber Optic to WAN via Tunnel	Tower at A51.0 (South Mountain) or A71.0 (Hullmerton)	
Alleghenny	121.5	EB	CCTV	Local	168393 / 93015	Wireless or Fiber Optic to WAN via Tunnel	Tower at 122.8 (Alleghenny) or 128.5 (Bald Knob)	
Alleghenny	121.9	EB	CCTV	Local	227105	Wireless or Fiber Optic to WAN via Tunnel	Tower at 122.8 (Alleghenny) or 128.5 (Bald Knob)	
Alleghenny	123.4	WB	CCTV	Tunnel		Wireless or Fiber Optic to WAN via Tunnel	Tower at 122.8 (Alleghenny) or 128.5 (Bald Knob)	
Tuscarora	184.7	EB	CCTV	Local	8S-166	Wireless or Fiber Optic to WAN via Tunnel	Tower 169.8 (Seiling Hill) or 186.6 (Tuscarora)	
Tuscarora	186.0	EB	CCTV	Local		Wireless or Fiber Optic to WAN via Tunnel	Tower 169.8 (Seiling Hill) or 186.6 (Tuscarora)	
Tuscarora	187.4	WB	CCTV	Tunnel		Wireless or Fiber Optic to WAN via Tunnel	Tower 169.8 (Seiling Hill) or 186.6 (Tuscarora)	
Tuscarora	188.0	WB	CCTV	Local or Tunnel	9-16213	Wireless or Fiber Optic to WAN via Tunnel	Tower 169.8 (Seiling Hill) or 186.6 (Tuscarora)	
Kittatinny and Blue	196.5	EB	CCTV	Local	9-16098	Wireless or Fiber Optic to WAN via Tunnel	Tower 198.8 (BM) or 199.0 (Clarkes Knob)	
Kittatinny and Blue	197.1	EB	CCTV	Tunnel		Wireless or Fiber Optic to WAN via Tunnel	Tower 198.8 (BM) or 199.0 (Clarkes Knob)	
Mid-County	A20.0	NB	CCTV	Interchange		Wireless or Fiber Optic to WAN via Interchange Building		
Lansdale	A31.0	NB	CCTV	Interchange		Wireless or Fiber Optic to WAN via Interchange Building		
Lehigh	A69.6	NB	CCTV	Local or Tunnel		Wireless or Fiber Optic to WAN via Tunnel	Tower at A51.0 (South Mountain) or A71.0 (Hullmerton)	
Lehigh	A70.5	SB	CCTV	Local or Tunnel		Wireless or Fiber Optic to WAN via Tunnel	Tower at A51.0 (South Mountain) or A71.0 (Hullmerton)	
Lehigh	A71.8	SB	CCTV	Local or Tunnel		Wireless or Fiber Optic to WAN via Tunnel	Tower at A51.0 (South Mountain) or A71.0 (Hullmerton)	
Lehigh	A72.1	SB	CCTV	Local	5776 / N23388	Wireless or Fiber Optic to WAN via Tunnel	Tower at A51.0 (South Mountain) or A71.0 (Hullmerton)	
Lehigh	A67.5	NB	Sign	N/A	N/A	N/A		Relocation Type A "Falling Rock" Sign towards as Shown
Lehigh	A76.8	SB	Sign	N/A	N/A	N/A		Relocation Type A Sign from MP A77.2

Pennsylvania Turnpike Commission
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Table 1 - Equipment List

Facility	MP	Direction	Equipment	Power Source (Local / Tunnel)	Potential Local Power Source Pole No.	Communications Options	Tower Location	Comments
Alleghenny	120.1	EB	VMS	Local	WQUC4 SPP4	Wireless to WAN via Radio Tower or Tunnel		
Alleghenny	121.6	EB	VMS	Local	168393 / 93015	Wireless to WAN via Radio Tower or Tunnel. OR Fiber Optic to WAN via Tunnel.	Tower at 122.8 (Alleghenny) or 128.5 (Bald Knob)	
Alleghenny	123.6	WB	VMS	Local or Tunnel		Wireless to WAN via Radio Tower or Tunnel. OR Fiber Optic to WAN via Tunnel.	Tower at 122.8 (Alleghenny) or 128.5 (Bald Knob)	
Tuscarora	175.6	EB	VMS	Local	116N 113	Wireless to WAN via Radio Tower	Tower 169.8 (Seiling Hill) or 186.6 (Tuscarora)	
Tuscarora	184.9	EB	VMS	Local		Wireless to WAN via Radio Tower	Tower 169.8 (Seiling Hill) or 186.6 (Tuscarora)	
Tuscarora	185.9	EB	VMS	Local or Tunnel		Wireless to WAN via Radio Tower or Tunnel. OR Fiber Optic to WAN via Tunnel.	Tower 169.8 (Seiling Hill) or 186.6 (Tuscarora)	
Tuscarora	187.9	WB	VMS	Local or Tunnel	9-16213	Wireless to WAN via Radio Tower or Tunnel	Tower 169.8 (Seiling Hill) or 186.6 (Tuscarora)	
Tuscarora	189.4	WB	VMS	Local	9-16192	Wireless to WAN via Radio Tower or Tunnel	Tower 169.8 (Seiling Hill) or 186.6 (Tuscarora)	
Kittatinny and Blue	194.4	EB	VMS	Local	9-16125	Wireless to WAN via Radio Tower or Tunnel	Tower 198.8 (BM) or 199.0 (Clarkes Knob)	
Kittatinny and Blue	197.1	EB	VMS	Tunnel		Wireless to WAN via Radio Tower or Tunnel. OR Fiber Optic to WAN via Tunnel.	Tower 198.8 (BM) or 199.0 (Clarkes Knob)	
	328.1	EB	VMS	Local	0597A (SR0202)	Fiber Optic Cable back to Valley Forge Interchange.	N/A	
	341.3	WB	VMS	Local	463 (Welsh Road)	Wireless to WAN via Radio Tower.	Tower at 343.0 (Willow Grove Interchange)	
	A33.3	SB	VMS	Local	6650 / S35710	Wireless to WAN at Lansdale Interchange (A31.0)		
	A51.4	SB	VMS	Local	62230 / S44020	Wireless to WAN via Radio Tower.	Tower at A51.0 (South Mountain)	
Lehigh	A54.6	NB	VMS	Local		Wireless to WAN via Radio Tower	Tower at A51.0 (South Mountain) or A71.0 (Hullmerton)	
Lehigh	A67.5	NB	VMS	Local	58789	Wireless to WAN via Radio Tower	Tower at A51.0 (South Mountain) or A71.0 (Hullmerton)	
Lehigh	A69.7	NB	VMS	Local or Tunnel		Wireless to WAN via Radio Tower or Tunnel. OR Fiber Optic to WAN via Tunnel.	Tower at A51.0 (South Mountain) or A71.0 (Hullmerton)	
Lehigh	A72.0	SB	VMS	Local	5776 / N23388	Wireless to WAN via Radio Tower or Tunnel. OR Fiber Optic to WAN via Tunnel.	Tower at A51.0 (South Mountain) or A71.0 (Hullmerton)	
Lehigh	A77.2	SB	VMS	Local	ATTCH57945 / N25670	Wireless to WAN via Radio Tower or Tunnel	Tower at A51.0 (South Mountain) or A71.0 (Hullmerton)	
Breezewood	I-70		VMS	N/A	N/A	N/A	N/A	Removal and Disposal of VMS, VMS Structure, Control Cabinet and Foundations

The information in Table 1 is to provide the PROPOSER with the location of all new/relocated devices to be installed. The table also provides the PROPOSER with point of service (POS) power facilities, whether they are on a local utility pole (Local), or are available through the Commissions facilities (Tunnel or Interchange). For those locations where local power has been identified, a pole number has been provided to the PROPOSER. It is the duty of the PROPOSER to identify all points of service for this project and may choose to utilities the information provided in the RFP, or may utilize a point of service more advantageous to their proposal.

PROPOSER BID SHEET

INSTALLATION OF INTELLIGENT TRANSPORTATION SYSTEMS
VMS, CCTV, ARROW BOARD and FIBER OPTIC CABLE
PROPOSER BID SHEET
RFP NO. 09-40110-1925

ITEM NO.	Quantity	Unit	ITEM DESCRIPTION	UNIT PRICE	TOTAL ITEM COST
0608-0001	1	LS	MOBILIZATION		
9900-0400	1	LS	VMS (CENTER MOUNT) 120.1 EB		
9900-0401	1	LS	CCTV 121.5 EB		
9900-0402	1	LS	VMS (CENTER MOUNT)121.6 EB		
9900-0403	1	LS	CCTV 121.9 EB		
9900-0404	1	LS	CCTV 123.4 WB		
9900-0405	1	LS	VMS (CENTER MOUNT) 123.6 EB		
9900-0406	1	LS	48-STRAND TUNNEL FIBER OPTIC CABLE (ALLEGHENNY TUNNEL)		
9900-0407	1	LS	VMS (CENTER MOUNT) 175.6 EB		
9900-0408	1	LS	CCTV 184.7 EB		
9900-0409	1	LS	VMS (CENTER MOUNT) 184.9 EB		
9900-0410	1	LS	VMS (CENTER MOUNT) 185.9 EB		
9900-0411	1	LS	CCTV 186.0 EB		
9900-0412	1	LS	CCTV 187.4 WB		
9900-0413	1	LS	VMS (CENTER MOUNT) 187.9 WB		
9900-0414	1	LS	CCTV 188.0 WB		

INSTALLATION OF INTELLIGENT TRANSPORTATION SYSTEMS
VMS, CCTV, ARROW BOARD and FIBER OPTIC CABLE
PROPOSER BID SHEET
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9900-0418	1	LS	CCTV 196.5 EB		
9900-0419	1	LS	CCTV 197.1 EB		
9900-0420	1	LS	VMS (CENTER MOUNT) 197.1 EB		
9900-0421	1	LS	48-STRAND TUNNEL FIBER OPTIC CABLE (KITTATINNY AND BLUE MOUNTAIN TUNNEL)		
9900-0422	1	LS	VMS (WB FULL SPAN) 328.1 WB		
9900-0423	1	LS	VMS (CENTER MOUNT) 341.3 WB		
9900-0424	1	LS	CCTV A20.0 NB		
9900-0425	2	LS	CCTV A31.0 NB		
9900-0426	1	LS	VMS (CENTER MOUNT) A33.3 SB		
9900-0427	1	LS	VMS (CENTER MOUNT) A51.4 SB		
9900-0428	1	LS	VMS (CENTER MOUNT) A54.6 NB		
9900-0429	1	LS	VMS (CENTER MOUNT) A67.5 NB and TYPE A SIGN RELOCATION		
9900-0430	1	LS	CCTV A69.6 NB		
9900-0431	1	LS	VMS (CENTER MOUNT) A69.7 NB		
9900-0432	1	LS	ARROW BOARD A70.5 MEDIAN		
9900-0433	1	LS	CCTV A70.5 SB		
9900-0434	1	LS	ARROW BOARD A70.6 MEDIAN		
9900-0435	1	LS	ARROW BOARD A71.7 MEDIAN		

INSTALLATION OF INTELLIGENT TRANSPORTATION SYSTEMS
VMS, CCTV, ARROW BOARD and FIBER OPTIC CABLE
PROPOSER BID SHEET
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9900-0440	1	LS	CCTV A72.1 SB		
9900-0441	1	LS	VMS (CENTER MOUNT) A77.2 SB and TYPE A SIGN RELOCATION		
9900-0442	1	LS	RELOCATION OF RTMS POLE 120.1 WB TO 166.0 EB		
9900-0443	1	LS	NOT USED		
9900-0444	1	LS	IP VIDEO MANAGEMENT SYSTEM		
9900-0445	1	LS	SYSTEM SUPPORT EQUIPMENT		
9900-0446	1	LS	1-YEAR MAINTAINANCE		

TOTAL PROJECT BID

The PROPOSER **WILL NOT** include the Tyco Electronics Wireless Communications Equipment, Integration and Labor in their Total Project Bid, as this amount will be paid by the Commission. The PROPOSER **WILL** have to provide the Tyco Electronics costs in their Schedule of Values submission.

APPENDIX A

SPECIAL PROVISIONS

APPENDIX A
SPECIAL PROVISIONS

GENERAL

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 satisfy a need for the furnishing and installation of completely functional Variable Message Sign Systems (VMS) and Closed Circuit Television Systems (CCTV) at the approaches to four (4) Turnpike tunnel areas and other Mainline and Northeast Extension locations..

Work items include, but are not limited to:

- Design, procure, install, integrate, test, train and maintain 21 new VMS, associated structures and equipment along the Turnpike.
- Design, procure, install, integrate, test, train and maintain 15 CCTV cameras, associated structures and equipment along the Turnpike.
- Design, procure, install, integrate, test, train and maintain a 48-strand single mode fiber optic cable, riser-rated, end to end including all conduit and patch panels at each of the tunnels within this project. The fiber will be connected to the Commissions Wide Area Network (WAN) at each of the tunnel facilities.
- Design, procure, install, integrate, test, train and maintain an IP or web-based Video Management System at each tunnels control room and the Traffic Operations Center (TOC) in Highspire to view the new CCTV camera images.
- Design, procure, install, integrate, test, train and maintain equipment to digitize (compress, encode and provide an IP Address) CCTV camera video feeds and transmit to the existing central CCTV monitor equipment at Highspire via the PTC Wide Area Network (WAN).
- Design, procure, install, integrate, test, train and maintain four (4) LED Arrow boards along the Turnpike (Lehigh Tunnel approaches).
- Removal of two (2) Arrow board/VMS combination signs and a cantilever warning sign with structure along the Turnpike (Lehigh Tunnel approaches).
- Relocation of two (2) Type A signs and support structures. (Lehigh Tunnel area).
- Relocation of a RTMS pole from MP 120.1 WB to 166.0 EB.
- Removal and disposal of a VMS, structure , cabinet and foundation at I-70 MP 149.1 WB
- Design, procure, installation, integration of complete electrical power supply to the aforementioned equipment.
- Design, procure, install, integrate, test, train and maintain a complete communications system (fiber optic, wireless or a hybrid of the two) to the aforementioned equipment. **Dial-up or leased line communications will not be considered as an acceptable means of communications to devices in this project.** The PROPOSER can only utilize Tyco Electronics, the Commissions wireless provider, for their wireless solution on this project. No other wireless solution will be accepted by the Commission. The PROPOSER must contact Daniel Buckley of Tyco Electronics (Telephone - 978-442-4452 – email buckleyd@tycoelectronics.com) to coordinate wireless services for this

project. **The PROPOSER must complete all coordination with Tyco Electronics 3 business days prior to the proposal due date.**

- The project design and implementation shall follow the systems engineering process per 23 CFR Part 940.11. As such, the contractor should reflect in their design, the following, at a minimum:
  - Analysis of alternative system configuration and technology options to meet the RFP's requirements
  - Use of applicable standards and test procedures

The designation "Engineer" in the RFP documents shall refer to the appropriate the Commission point of contact, which will be provided upon Notice-To-Proceed to the contractor.

RESTRICTION OF OPERATIONS DURING HOLIDAY PERIODS

Arrange schedule to provide maximum use of the roadway during holiday periods. Have all travel lanes, each direction, and all interchange ramps available to traffic during the holiday periods. Applicable holiday periods include:

2009 Holiday Schedule

INDEPENDENCE DAY	From 3:00 P.M., local time, Wednesday, July 1 to 6:00 A.M., local time, Tuesday, July 7, 2009.
LABOR DAY	From 3:00 P.M., local time, Thursday, September 3 to 6:00 A.M., local time, Wednesday, September 9, 2009.
COLUMBUS DAY	From 3:00 P.M., local time, Friday, October 9 to 6:00 A.M., local time, Tuesday, October 13, 2009.
VETERANS DAY	From 3:00 P.M., local time, Monday, November 9 to 6:00 A.M., local time, Thursday, November 12, 2009.
THANKSGIVING DAY	From 3:00 P.M., local time, Tuesday, November 24 to 6:00 A.M., local time, Monday, November 30, 2009.
CHRISTMAS AND NEW YEARS	From 3:00 P.M., local time, Tuesday, December 22, 2009, to 6:00 A.M., local time, Monday, January 4, 2010.

2009 Special Events

POCONO 500 RACE	From 3:00 P.M., local time, Thursday, June 4 to 6:00 A.M., local time, Monday, June 8, 2009.
PENNSYLVANIA 500 RACE	From 3:00 P.M., local time, Thursday, July 30 to 6:00 A.M., local time, Monday, August 3, 2009.
MAPLE GROVE RACEWAY NATIONALS	From 3:00 P.M., local time, Thursday, August 20 to 6:00 A.M., local time, Monday, August 24, 2009.
CORVETTES AT CARLISLE AUTO SHOW	From 3:00 P.M., local time, Thursday, August 27 to 6:00 A.M., local time, Monday, August 31, 2009.
FALL CARLISLE AUTO SHOW	From 3:00 P.M., local time, Thursday, October 1 to 6:00 A.M., local time, Monday, October 5, 2009.
HERSHEY REGION FALL MEET	From 3:00 P.M., local time, Thursday, October 8 to 6:00 A.M., local time, Sunday, October 11, 2009.

2010 Holiday Schedule

EASTER	From 3:00 P.M., local time, Thursday, April 1 to 6:00 A.M., local time, Tuesday, APRIL 6, 2010.
MEMORIAL DAY	From 3:00 P.M., local time, Thursday, May 27 to 6:00 A.M., local time, Wednesday, June 2, 2010.
INDEPENDENCE DAY	From 3:00 P.M., local time, Wednesday, June 30 to 6:00 A.M., local time, Tuesday, July 6, 2010.

LABOR DAY	From 3:00 P.M., local time, Thursday, September 2 to 6:00 A.M., local time, Wednesday, September 8, 2010.
COLUMBUS DAY.....	From 3:00 P.M., local time, Friday, October 8 to 6:00 A.M., local time, Tuesday, October 12, 2010.
VETERANS DAY	From 3:00 P.M., local time, Tuesday, November 9 to 6:00 A.M., local time, Monday, November 15, 2010.
THANKSGIVING DAY	From 3:00 P.M., local time, Tuesday, November 23 to 6:00 A.M., local time, Monday, November 29, 2010.
CHRISTMAS AND NEW YEARS.....	From 3:00 P.M., local time, Thursday, December 23, 2010, to 6:00 A.M., local time, Monday, January 3, 2011.

2010 Special Events

POCONO 500 RACE……	From 3:00 P.M., local time, Thursday, Prior to Pocono 500 Race to 6:00 A.M., local time, Monday, After Pocono 500 Race, 2010.
PENNSYLVANIA 500 RACE.	From 3:00 P.M., local time, Thursday, Prior to Pennsylvania 500 Race to 6:00 A.M., local time, Monday, After Pennsylvania 500 Race, 2010.
U.S. WOMEN'S OPEN	From 6:00 A.M., local time, Monday, July 5, to 6:00 A.M., local time, Tuesday, July 13, 2010.

PROTECTION AND COORDINATION OF UTILITIES

Ascertain and locate any utility lines in the vicinity of the entire project and take all precautions to fully protect the (utility) facility and service. Prior to performing any work in the vicinity of any underground or overhead line or service, advise the facility owner at least 72 hours in advance of

initiating work and provide all measures for protection in accordance with the National Electric Safety Code, the Occupational Safety and Health Administration's Regulations and as deemed necessary by the facility owner with the Engineer's concurrence. Coordinate protection and relocation of utilities with the facility owner.

Attention is directed to the Provisions of Act 287 of 1974 and subsequent amendments, which specify the responsibilities in regard to public health and safety during excavation and demolition operations in areas of underground utilities. Contact the One Call System at 1-800-242-1776 for all facilities prior to performing underground work.

Immediately report to the facility owner, including the Department of Transportation, any break, leak or other damage to the lines or protective coatings made or discovered during the work and immediately alert the occupants of the premises and the employees of any emergency created or discovered.

Perform all work required for the location, replacement, adjustment or reconstruction of underground utilities in accordance with the Commission's Publication 408, Section 105.06.

No work by facility owners with identified utility facilities within the project limits or the Commission's right-of-way is anticipated. The correctness of the information is not guaranteed and the Commission will not pay costs incurred by the PROPOSER or facility owners for work performed for their convenience, unless prior written consent is obtained from the Commission.

This work is incidental to the project.

COORDINATION OF WORK

Contractors working on either the same or adjacent projects are to cooperate with each other as part of their own scope of work and as directed. Without in any way limiting the foregoing requirement, cooperate and coordinate to the extent necessary to satisfactorily conclude all work essential for the operation of the Turnpike. Include all considerations, financial and otherwise, resulting from this requirement herein to interface, coordinate, and cooperate with other PROPOSER'S working the same or other areas, as well as with the Commission and its authorized representative.

Arrange the work and place and dispose of the materials being used so as not to interfere with the operations of the other PROPOSER'S within the limits of, or adjacent to the project.

If any part of the work depends on proper execution or results upon the work of any other PROPOSER, within 2 working days of the start of the work, inspect the work of the other PROPOSER'S and report in writing to the Commission any apparent discrepancies, interferences, defects, or delays in such work that render it unsuitable for such proper execution and results. Failure to so inspect and report will constitute an acceptance of the other PROPOSER'S work as fit and proper to receive this work, except as to defects which may develop in the other PROPOSER'S work after the execution of the work hereunder.

If any PROPOSER does not complete the various portions of the work in general harmony, and another PROPOSER is caused damage or injury by the failure to so act in harmony, the PROPOSER damaged or injured is to settle with the PROPOSER causing the damage or injury by agreement or arbitrate such claim or disputes. The Commission, however, is not liable to any PROPOSER for any increased costs or damages resulting from the defective work, interference, final construction decisions, failure to coordinate and cooperate, or delays of other PROPOSER'S.

PROJECT SCHEDULE AND LIQUIDATED DAMAGES

The Contractor shall supply, within their proposal, a Project Schedule depicting at a minimum the following project milestones:

- Notice-to-Proceed (NTP)
- Submission of System Level Block Diagram
- Submission of Complete List of Equipment and Materials
- Submission of Engineering Design Package
- Final Approval of Engineering Design Package
- Factory Acceptance Testing (FAT)/Traceability Matrix
- Begin Procurement of Materials
- Pre-Construction Meeting
- Installation of communications and electric services
- Installation of each VMS
- Installation of each CCTV
- Installation of each Arrow Board
- Installation of Tunnel Fiber at each tunnel
- Installation of all head-end equipment.
- Submission of Final Testing and Training Documents
- Completion of construction and all System Acceptance Testing (SAT)
- Receive the Commissions approval to begin 30-Day Operational Acceptance Testing (OAT)
- Completion of 30-Day Operational Acceptance Testing (OAT)
- Submission of Final Documentation
- Submission of Final Maintenance Plan and Schedule
- Start 1-Year Maintenance Period
- Completion of Maintenance Period
- Submission of any remaining documents
- Overall project completion

The Contractor shall utilize all available time, including multiple shifts, to complete the contract within the required time limit.

Complete all work and have all equipment pass final system acceptance tests within time frame presented in the schedule milestones. The maintenance and warranty period will follow the final approval of the operational acceptance test milestone.

The anticipated time frame to complete the project is approximately sixteen (16) months. The Commission reserves the right to negotiate these durations with the Contractor prior to contract award. The Contractor may be subject to liquidated damages as per the Commission Publication 408, Section 108.07, in the amount of one thousand two hundred dollars ($1,200.00) for each calendar day that any work under the contract remains after the required completion dates for Phase 1 and Phase 2. Each phase shall be considered separate events for the purposes of calculating liquidated damages. This provision shall continue in full force and effect for a maximum of 180 days following termination of the contract.

Even though Tyco Electronics will be paid by the Commission for their wireless service on this project, as agreed to between the PROPOSER and Tyco Electronics, the PROPOSER is still responsible that all work at each site is completed within the 16 month project time frame to create a fully operational VMS, CCTV, Arrow Board and fiber optic communications systems. The Commission cannot be held responsible by the PROPOSER for any delays in the design, furnishing, installation and integration of wireless services provided by Tyco Electronics.

Liquidated damages shall be assessed only after the Commission notifies the PROPOSER in writing of the failure to meet the milestones, as detailed in the approved Final Project Schedule.

MAINTENANCE AND PROTECTION OF TRAFFIC DURING CONSTRUCTION

This work includes designing, furnishing, installing, maintaining, resetting, relocating, storing, and removal of all traffic control devices necessary for maintenance and protection of traffic during construction. The PROPOSER shall design all the Maintenance and Protection of Traffic Plans (MPT) and have them approved by the Commission and perform the work for the project using staging sequences approved by the Commission. A chart detailing site installation areas and associated MPT for each subsystem must be provided by the PROPOSER, and approved by the Commission, as well as a pre-construction meeting must be held a minimum of 30 days prior to the commencement of equipment field construction for each subsystem. For construction that requires lane closures and detours, the PROPOSER shall provide detour plans and brief narrative describing any supplemental equipment required. All detour plans must be approved by the Commission. When submitting the MPT for approval, during the Design Submission, the PROPOSER shall identify all Pennsylvania State Police (PSP) resources required, including expense.

Perform maintenance and protection of traffic in accordance with the Commission's PTS-900 through PTS-980 standards.

Design, furnish, install and maintain all required lights, guides, sandbags and appurtenances as deemed necessary by the Engineer for the proper maintenance and protection of traffic and to warn of any obstruction or hazard to traffic. Use Type A and Type B flasher units and Type C steady burn units on this project. Furnish, install and maintain all shadow vehicles. Shadow vehicles must meet the requirements of the Commission's and PennDOT's Publication 203, Section 203.106.

Notify local municipal officials, police, fire and EMS agencies in the counties of Beaver, Allegheny, Cumberland, Dauphin, Chester, Lehigh, Luzerne, Wyoming and the Commission's Commission Community Relations Coordinator two (2) weeks prior to starting work. Provide two (2) contact persons 24 hours a day that are able to respond within one (1) hour of notification for incidents and emergencies. Provide the name and telephone numbers to the Commission's Traffic Operations Center for distribution to the State Police, emergency personnel and the Commission's District Maintenance Managers.

During any highway incidents/emergencies requiring an Incident Commander, participate in the Unified Command System under direction of the designated on-scene Incident Commander (State Police or other State Agency). Provide any available equipment necessary to facilitate the opening of lanes to traffic as directed by the Inspector in Charge.

For night operations, provide non-glare balloon type work lighting, clothe all workers in reflective garments that outline the torso, arms and legs. All workers will wear strong yellow-green vests and hard hats.

The PROPOSER shall refer to Restriction of Operations During Holiday Periods section for periods of construction restrictions.

EROSION AND SEDIMENTATION CONTROL DURING CONSTRUCTION

Description - Provide, install and maintain erosion control measures as indicated in Sections 845 and 865, and as directed by the Engineer. Perform all construction in a manner that controls pollution and soil erosion and adhere to the following:

A. Apply water to access roads, haul roads, and other work areas to keep dust within tolerable limits. Ensure that water used for sprinkling is completely additive free and approved by the Engineer. Use no material other than water, as specified herein, for dust control.

B. Locate equipment repair, maintenance and staging areas so that chemicals, fuels, lubricants, etc., will not discharge into streams, drainage features, watercourses, or wetlands.

Construction - During the construction operations, take the following erosion and sediment control measures as specified herein and/or shown in the standard drawings.

A. Reduce to the greatest extent practicable the area and duration of exposure of readily erodible soils.

B. Retard the rate of runoff and trap sediment by utilizing inlet protection, silt fence barriers, rock filter outlets and dewatering basins.

C. Direct all pump discharges resulting from dewatering operations to a suitable sediment trap.

D. Protect the soils by seeding, temporary vegetation and/or mulching.

E. Complete and protect segments of work as rapidly as is consistent with construction schedules.

F. Isolate any active flow present at the time of ditch regrading by sand bagging, pumping or other suitable means.

G. Stabilize all ditches within twenty (20) days.

If work is suspended for any appreciable length of time, implement temporary measures to control erosion. Temporary measures may include, but are not limited to diverting surface water from disturbed areas, sloping the top of fills in the upstream direction, diversions, mulching, and seeding. Soils or topsoil maintained in small stockpiles or in trucks for a short duration may be protected against erosion by covering with polyethylene or other plastic or rubber sheeting.

Upon permanent stabilization of all areas disturbed by construction, remove sediment from all control devices and remove all silt fence barriers from the site. Unless otherwise approved by the Engineer, dispose of all erosion and sediment control devices off site.

GENERAL PROJECT REQUIREMENTS

Description - This section describes the general requirements that the Contractor has to meet in furnishing and installation of a completely functional Variable Message Sign System (VMS), Closed Circuit Television System (CCTV) system and Arrow Boards. Items not specifically covered in these Special Provisions will be governed by the applicable sections of the Commissions Standard Drawings as well as the 2007 Commonwealth of Pennsylvania, Department of Transportation Specifications, Publication 408, Change No. 4, (or latest version) and all application publications. Standard drawings include:

PENNSYLVANIA TURNPIKE COMMISSION STANDARD DRAWINGS

PTS-130	TYPE 2S GUIDERAIL INSTALLATION (SHEETS 1 TO 5 OF 5)	OCT 2007
PTS-135	TEMPORARY GUIDERAIL CONNECTION (SHEETS 1, 2 OF 2)	JUL 2006
PTS-900	MAINTENANCE AND PROTECTION OF TRAFFIC (SHEETS 1 TO 5, 8 OF 10)	OCT. 2007
PTS-910	MAINTENANCE AND PROTECTION OF TRAFFIC (SHEETS 1 TO 4, 7 OF 7)	OCT. 2007
PTS-960	MAINTENANCE AND PROTECTION OF TRAFFIC SIGN FABRICATION (SHEETS 1 TO 4 OF 4)	OCT. 2007
PTS-980	MISCELLANEOUS DETAILS (SHEET 2 OF 2)	OCT. 2007
PTS-310	DYNAMIC MESSAGE SIGN STRUCTURE DETAILS (SHEETS 1 TO 4 OF 4)	FEB. 2009

PTS-320 CLOSED CIRCUIT TELEVISION CAMERA (CCTV) STRUCTURES FEB. 2009
(SHEETS 1 TO 4 OF 4)
PTS-330 HIGHWAY ADVISORY RADIO SIGNS AND STRUCTURES FEB. 2009
(SHEET 1 TO 4 OF 4)
PTS-340 ROAD WEATHER INFORMATION SYSTEM (RWIS) DETAILS FEB. 2009
(SHEET 1 OF 1)
PTS-345 TRAFFIC FLOW DETECTION SYSTEM FEB. 2009
(SHEET 1 OF 1)
PTS-350 ITS CONDUIT AND JUNCTION BOXES FEB. 2009
(SHEETS 1, 2 OF 2)
PTS-355 STRUCTURE MOUNTED ITS CONDUIT FEB. 2009
(SHEETS 1 TO 8 OF 8)
PTS-360 CONTROLLER CABINET FOUNDATIONS FEB. 2009
(SHEET 1 OF 1)
PTS-370 UTILITY SERVICE DETAILS FEB. 2009
(SHEETS 1 TO 4 OF 4)
PTS-380 ITS DEVICE GROUNDING DETAILS FEB. 2009
(SHEET 1 OF 1)

PENNSYLVANIA DEPARTMENT OF TRANSPORTATION STANDARD DRAWINGS

BC-735M WALL CONSTRUCTION & EXPANSION JOINT DETAILS January 21, 2003
BC-736M REINFORCEMENT BAR FABRICATION DETAILS January 21, 2003
BC-741M OVERHEAD SIGN STRUCTURES, CANTILEVER AND January 21, 2003
CENTER-MOUNT STRUCTURES, STRUT LENGHTHS UP TO 40’
RC-10M CLASSIFICATION OF EARTHWORK April 15, 2004
RC-11M CLASSIFICATION OF EARTHWORK FOR STRUCTURES April 15, 2004
RC-12M BACKFILL AT STRUCTURES March 30, 2006
RC-52M TYPE 2 STRONG POST GUIDE RAILS March 30, 2006
RC-54M BARRIER PLACEMENT AT OBSTRUCTIONS March 30, 2006
RC-60M RIGHT-OF-WAY FENCE April 15, 2004
RC-61M RIGHT-OF-WAY GATE AND REMOVABLE April 15, 2004
FENCE SECTIONS
RC-64M CURBS AND GUTTERS April 15, 2004
RC-70M EROSION AND SEDIMENT POLLUTION CONTROL April 15, 2004
RC-80M HIGHWAY LIGHTING FOUNDATIONS April 15, 2004
RC-82M HIGHWAY LIGHTING JUNCTION BOXES April 15, 2004
CAST-IN-PLACE OR PRECAST
RC-83M HIGHWAY LIGHTING April 15, 2004
TC-7804 ELECTRICAL DISTRIBUTION June 30, 1989
TC-8702A POST MOUNTED SIGNS, TYPE A May 25, 2007

A. Scope of Work

Perform the following major tasks, at a minimum, in order to provide completely functional and operational VMS, CCTV and Arrow Boards:

1. Design, furnish and install a closed circuit television (CCTV) camera system including required foundation, 50-foot pole, camera, lowering device and control cabinet and all head-end equipment to convey the CCTV video images and telemetry through the Commissions Wide Area Network (WAN) and switching equipment to operate the system at the Commission's Highspire TOC facility as well as operate the CCTV's at the specific tunnel facilities. The system shall be capable of operating both the existing and proposed CCTV cameras on the Commissions existing video displaying network and shall have the capabilities to be expandable to accommodate additional CCTV cameras.

2. Design, furnish and install a variable message sign (VMS) system including the appropriate foundation(s), center mount structure and control cabinet to operate both the proposed VMS through the Commission existing MIST system at the Commission's Highspire TOC facility. Integration into the MIST system will be performed by the Commission, or their representatives.

3. Design, furnish and install a variable message sign (VMS) system, utilizing two (2) stored VMS located at the Homeswood Maintenance Facility, including the appropriate foundation(s), center mount structure and control cabinet to operate both the proposed VMS through the Commission existing MIST system at the Commission's Highspire TOC facility.

4. Design, furnish and install LED Arrow Board system including the appropriate foundation, structure and control cabinet to operate both the proposed Arrow Board through the Commission existing MIST system at the Commission's Highspire TOC facility, as well as at the specific tunnel location. Integration into the MIST system will be performed by the Commission, or their representatives.

5. Design, procure, furnish and install a completely functional fiber optic communication infrastructure in the tunnels identified in this contract. Each location will include the installation of a LSZH 48-strand, riser rated, single mode fiber optic cable for the entire run of the tunnels shown on the plans. Provide all required conduit, mounting hardware, junction boxes, connection to the Commissions Wide Area Network (WAN) at the tunnels network room, all patch panels, jumper cables, connectors, fiber tipping, as well as all integration to allow both tunnel and TOC operational staff complete access to this fiber. Coordinate with the Commission on the final location of the

conduit, fiber and jumper cables prior to the final design submission. It is the responsibility of the PROPOSER to clearly identify all material and equipment being utilized in each tunnel within their proposal.

6. Furnish and install all required field power and communications necessary to make the field and TOC systems fully operational. The Contractor is required to coordinate with the utility companies for all power services. Utility accounts will be created utilizing the Commission's contact information. Upon initial installation of these services, all monthly invoices will be sent directly to the Commission's for payment. The PROPOSER is responsible for all set-up and initially services fees to obtain the services.

7. Coordinate with the Commission to access their Wide Area Network (WAN) through either fiber optic cable or wireless communications (to facilities with WAN connections, such as toll plazas tunnels or maintenance facilities). All wireless communications will be coordinated through the Commission and will utilize the Tyco Electronics hardware to connect to existing WAN radio towers or before mentioned facilities. **Leased line communications will not be accepted for this contract.** Installation of complete communications system (fiber optic, wireless or a hybrid of the two) to the aforementioned equipment. **Dial-up or leased line communications will not be considered as an acceptable means of communications to devices in this project.** The PROPOSER can only utilize Tyco Electronics, the Commissions wireless provider, for their wireless solution on this project. No other wireless solution will be accepted by the Commission. The PROPOSER must contact Daniel Buckley of Tyco Electronics (Telephone - 978-442-4452 – email buckleyd@tycoelectronics.com) to coordinate wireless services for this project. **The PROPOSER must complete all coordination with Tyco Electronics 3 business days prior to the proposal due date.**

8. The project design and implementation shall follow the systems engineering process

9. Furnish and install conduit, fittings, terminations, termination panels, junction boxes, cable, cable strain relief hardware and other ancillary accessories.

10. Furnish and install surge and lightning protection for cables entering and leaving all cabinets (CCTV, VMS, Arrow Boards, communications, and power).

11. Provide training and operations support equipment as per Appendix D.

12. Conduct all required tests, and submit test procedures and results to the Engineer.

13. Provide all incidental equipment and perform all necessary tasks to provide completely integrated (as System Acceptance Tested) and operational VMS, CCTV and Arrow Board systems.

14. Provide as built plan and all necessary documentation.

B. Equipment Requirements

1. General

a. Procure all equipment in a manner to minimize the number of manufacturers.

b. Procure all material and equipment, which meet the latest applicable standards of National Electrical Manufacturers Association (NEMA), Electronics Industries Association (EIA), National Electric Code (NEC) Underwriters Laboratory (UL), Publication 408, and these Special Provisions.

c. Procure the equipment from a manufacturer or manufacturers who have been successfully engaged in the manufacture of such equipment for a period of at least five years.

d. Submit certification(s) from the various manufacturer(s) of equipment supplied under this contract that they will carry in factory stock, for at least 10 years, all necessary parts and stock items to keep the equipment operational.

2. Parts and Material

In the selection of parts and materials, fulfillment of the requirements of these Special Provisions is of prime consideration. Design equipment to utilize the latest available techniques and utilize the minimum number of different parts, subassemblies, circuits, cards and/or modules, to maximize standardization and commonality.

3. Electrical Components

Use electrical components that are generally industry standard items available from several manufacturers. Comply with the latest industry standard practices, specifications and tests, or approved alternatives for all the components, being furnished under this contract to assure reliable operation of all the equipment.

4. Mechanical Components

a. Hardware

Provide stainless steel external screws, nuts and lock washers. Do not use self-tapping screws. For internal screws, nuts and lock washers, use corrosion resistant material or material suitably plated to resist corrosion. Use material in accordance with the highest industry practices.

b. Material

Provide parts made of corrosion resistant material, such as plastic, stainless steel, aluminum, or brass; or parts treated to resist corrosion, such as cadmium plating or galvanizing.

c. Component Mounting and Identification

Identify operating circuit components mounted on circuit boards by either identifying characters, which are legible and permanently printed on the circuit boards, and by the use of complete assembly drawings showing all components with values or by JEDEC numbers. Reference the identifying characters to their respective components in the schematic diagram and in the parts list.

C. Control Software

The PROPOSER will utilize the proposed video management software, as identified in this contract to view the Commission existing and proposed CCTV cameras. The video management system will allow the tunnel personnel to view all video images, at one time, of the CCTV cameras associated with this contract. Through the video management system, the TOC at the Highspire, PA facility will be used on an "on-demand" basis. The video management system will be able to view and control one (1) CCTV camera image from each tunnel location. The TOC will also be able to view up to one (1) CCTV camera image from each interchange (Mid-County and Lansdale) on an "on-demand" basis. The video management system will allow the TOC to view the Commissions existing CCTV cameras with all the current functionalities, as performed at the time of this contract.

All proposed VMS control will be completed through the Commissions MIST system. The PROPOSER will coordinate with the Commission to aid in the integration of these VMS into the MIST system.

All proposed Arrow Boards will be both manually and automatically controlled from the local tunnels facility. The PROPOSER will coordinate with the Commission on the location of the Arrow Board controls.

D. Design and Construction

Design and construct equipment such that performance will not be impaired after it has been subjected to shock and vibration caused by installation, transportation, maintenance handling, and normal use.

Install surge and lightning protection for all electrical and communication cables that are leaving or entering a cabinet. Provide resettable surge and lightning protection devices that can be subjected to multiple surges.

During construction work at the Commission 8-0 Network and communication rooms, protect all equipment using dust-proof covers. Do not remove the dust-proof protection until after the work is completed and the work area cleaned.

1. Electrical

    a. Design Life

        Design all components in their normal circuit applications to operate continuously for at least 10 years.

    b. Power Requirements

        Provide equipment that meets the performance requirements at the specified power input level plus or minus 5%.

    c. Primary Input Power Interruption

        Provide equipment such that in the event of a power failure, proper operation will commence immediately after restoration of power without creating false information or malfunction.

    d. High Frequency Interference and Line Voltage Transients

        Protect the equipment power supply circuitry against high frequency electrical interference and line voltage transients.

    e. Wire Size

        Procure all wiring of such size to meet the requirements of the National Electric Code.

    f. Wire Identification

        Identify all wiring connected to terminal strips by the use of insulated preprinted sleeving slipped over the wire before final attachment.

g. Wire Dressing

Procure wires cut to proper length before assembly. Do not double back wires to take up slack. Lace wires neatly into cables with nylon lacing or plastic straps. Secure cables with suitable clamps. Provide identification tags for all cables.

h. Cable Termination

Terminate all cables, as required, using appropriate termination panels, with built-in surge protection and test access ports.

i. Protection

Provide equipment containing readily accessible, manually replaceable circuit protection devices such as fuses, for equipment and power source protection.

j. Fail Safe

Provide and install equipment such that failure of individual equipment does not cause failure of the subsystem or system.

k. Static, Lightning and Surge Protection

Fully protect each piece of equipment from damage due to static electricity accumulation or discharge during unpacking, normal handling, and installation. Provide static electricity protection by case construction and by the use of protective devices on wires connected to the equipment. Use material and type of finish, which will not permit the accumulation of static electric charge. Provide a static-inhibiting device that can fit on a person's wrist, in all the cabinets. Protect all electrical and communication cables entering or leaving the equipment cabinets and which might be subject to damage, with bleeder resistors, current limiting resistors, zener diodes, MOVs, or other suitable means of limiting momentary current surges. Provide in-line, re-settable surge protection to avoid damage from lightning induced surges or other power line transients for all cables entering and leaving all cabinets. Provide transient suppression devices meeting the requirements of NEMA TS-2 specifications. Surge protection is incidental to the cost of equipment. Include surge protection details in the shop drawings for approval by the Engineer.

Coordinate with the equipment and surge protection device manufacturers to determine in-line voltage requirements.

2. Mechanical

a. Modular Design

Design equipment in a modular fashion such that major portions may be readily replaced in the field.

b. Keying

Mechanically key modules of unlike functions to prevent insertion into the wrong socket or connector.

c. Identification

Clearly identify all modules and assemblies with name, model number, serial number and any other pertinent information required to facilitate equipment maintenance.

E. Maintenance Provisions

Procure equipment designed for ease of maintenance. Make all component parts readily accessible for inspection and maintenance. Provide test points utilizing test jacks or equivalent to enable testing and troubleshooting with the equipment operating.

F. Environmental Design Requirements

Provide equipment meeting all of its specified requirements during and after exposure to any combination of the specified environmental and power line conditions.

Temperature Range: -30 degrees C to +74 degrees C, unless otherwise specified for each piece of equipment or subsystem.

Relative Humidity: Not to exceed 95%, non-condensing.

G. Personnel Safety

Procure equipment with provisions for personnel safety designed in. Design to prevent reversed assembly or installation of connectors, fasteners, etc., where possible malfunction or personnel hazards might occur. Properly ground in accordance with the requirements of the National Electric Code all external conductive material on the equipment. Provide electrical equipment having provisions to limit ground fault current and leakage current to levels below that prescribed by Underwriters Laboratories, Inc.

H. Quality Assurance Provisions

In cases where design tests are specified herein, documentation may be provided indicating that such tests have previously been satisfactorily completed and additional tests will not be required. Subject equipment to all tests as specified in Appendix D to determine conformance with all the applicable requirements. The Engineer reserves the right to have his/her representative witness all tests. The results of each test will be compared with the requirements specified herein. Failure to conform to requirements for any test will be subject to rejection by the Engineer.

Rejected equipment may be offered again for retest provided all non-compliances have been corrected and retested by the Contractor. Final inspection and acceptance of equipment will be made after delivery and successful completion of final system acceptance tests.

I.Preparation for Delivery

Package equipment to prevent shipping damage. All equipment must be in an undamaged and operational condition after delivery and unpacking in order to be accepted. Make all repairs or replacements to the satisfaction of the Engineer at no additional cost.

J. Field Cabinet Locks and Keys

Provide all cabinets with locks using an interchangeable core, as directed by the Commission. Number (No.) 2 key locks will not be acceptable. Following the successful completion of system acceptance test, provide the Commission with five sets of new keys for all field cabinets, with all cabinets keyed alike.

K. Trenches

At the end of each working day, backfill all the trenches to a point that is within 10 feet from the end of each trench. Cover the 10-foot length of the open trench with a ½-inch thick steel plate.

Mark on the center of each steel plate used for decking over trenches the following information:

Contractor's Name
Contact Person
Emergency Telephone Number

Each letter will be four inches high, in a space four inches wide, and each stroke forming each character will be 3/4 inch wide. Provide clear and legible lettering.

Use the appropriate method to label the trench plate so that the lettering will not be eradicated due to traffic or people movement over the trench plate. When placing trench plates over excavations, secure the plates to the surface to prevent lateral movement

avoiding an unsafe condition. Between the period of November 1st and April 1st, notify the Engineer of any steel plates used to cover excavation made in snow emergency routes.

L. Exposed Conduit

Use conduit made of Galvanized Rigid Steel (GRS) for all structure mounted conduit or exposed conduit, unless otherwise noted in the contract drawings.

DOCUMENTATION

Request for Proposal Requirements

Equipment submittals should be provided by the PROPOSER within the RFP to demonstrate that the equipment initially proposed for the project has the capability to meet the functional objectives and specifications required by these Special Provisions. The level of effort required for the submittal material could vary depending on the complexity of the equipment and the degree to which the proposed equipment is off-the-shelf or custom in nature. **No cost data is to be included within the initial equipment submission.**

Provide an overall project schedule detailing, at a minimum, the project milestones that will be followed by the PROPOSER to demonstrate compliance with the construction schedule. This schedule should detail meetings, design, equipment catalog cut sheet submissions, procurement, installation, testing, training, final documentation submission and maintenance tasks. This schedule must be approved by the Commission's.

Design Submission Requirements

Submit within 45 calendar days following Notice-to-Proceed, system level block diagrams on 22 in. (H) x 34 in. (W) sheets which demonstrate the feasibility of the system as well as the interconnection of all equipment. Include in the block diagrams, the electrical and mechanical details and the interconnection details showing equipment part numbers, cable type, connectors, etc. Use separate sheets for field, central and complete system configurations. Include block diagrams for every major functional area.

Furnish an updated (from proposal) and complete list of equipment and material within 60 calendar days after Notice to Proceed. Include the name, manufacturer, part number and material specifications as applicable.

Submit for final approval the Engineering Design, as detailed on page A18, for approval. The PROPOSER must receive approval of the Engineering Design within 4-months from the Notice-To-Proceed, and is responsible to provide all documents to the Commission allowing the Commission a maximum of 10 calendar days to provide review comments.

Submit detailed testing procedures and traceability matrix as to which specific National Transportation Communications for ITS Protocol (NTCIP) standards, if applicable.

Design documentation consists of all drawings and text required to define the configuration of the system including both hardware and software documentation. The PROPOSER will be provided electronic base plan drawings (in MicroStation format) of all drawings provided within this RFP at the time of Notice-to-Proceed. The PROPOSER is required to provide the following sheets in the design set:

Title Sheet
Index Sheet
System Block Diagram
Summary of Equipment Sheets
Fiber Optic Cable Details
Highspire TOC Equipment Block Diagram
Tunnel Network Room Layouts
Cabinet Block Diagrams
Miscellaneous Details
Cable and Conduit Attachment Details
Roadway and Shoulder Closure Details
Typical Electrical Details
Typical Utility Pole Details
Structural and Foundations General Notes
VMS Details Sheets
Camera Pole and Lowering System Details Sheets
Arrow Board Details Sheets
ITS General Notes
ITS Legend
ITS Plan Sheets (VMS, CCTV Arrow Boards, Fiber Optic and Communications Plans) For Each Location.

CADD Requirements

All drawings including ITS construction plans, details, right-of-way plans and plots, profiles, typical sections, cross sections, shop drawings, details, schematics, etc. to be provided under this contract shall be accomplished and developed using computer-aided design and drafting (CADD) software and procedures conforming to the following criteria.

All CADD data shall be supplied in the DWG/DGN electronic digital format. No translations will be accepted. The PROPOSER shall ensure that all digital files and data (e.g., model files, reference files and resource files) are compatible with the Commissions primary CADD system and adhere to the standards and requirements specified herein. The term “compatible” means that data can be accessed directly by the target CADD system without translation, preprocessing, or post processing of the electronic digital data files. It is the responsibility of the consultant to ensure this level of compatibility.

CADD drawings shall be prepared in accordance with the Pennsylvania Turnpike Commission CADD Standards Manual. All other CADD Standards not covered by the Commissions CADD Standards Manual must be in accordance with PennDOT Highway Plans Presentation Manual, Publication 14M, July 2001 Edition. Standard drawing size shall be ANSI D (34" x 22") and the PTC CADD Standard file naming conventions for model and sheet files shall be used.

The PROPOSER shall submit a written request for approval of any deviations from the Commission's established CADD standard. No deviations from the Commission's established CADD standard will be permitted unless prior written approval of such deviation has been received from the Commission.

A copy of all CADD data and files developed under this contract shall be delivered to the Commission as part of the Final submission.

Submissions

Provide five (5) sets of all descriptive material, (manuals, cut-sheets, drawings, brochures, etc.), for each type of equipment and apparatus proposed for this project to demonstrate that the intended equipment or integration of intended equipment will meet the functional objectives and specifications of the system. Documentation for each subsystem shall be grouped together into one submission to provide a single complete subsystem package. The PROPOSER shall not submit incomplete or portions of a subsystem documentation, unless approved by the Commission's. If the PROPOSER does not receive prior approval to transmit an incomplete submission, the submission will be immediately rejected. Include in these documents sufficient technical data for complete evaluation of the proposed system by the Engineer. Provide original manuals or brochures or copies equal to originals.

Describe methods of expansion and maximum capacities.

Provide all user manuals and maintenance manuals for third party equipment.

The PROPOSER will provide five (5) hard copies and an electronic version (PDF format) of all documents transmitted for review. The Commission will be allowed a maximum of 10 calendar days to provide review comments to the PROPOSER for any documents submitted for review. Provide the following project documentation:

A. Equipment Manuals

Provide 5 (five) hard copies and one (1) electronic file (PDF format) of operating, maintenance and installation manuals for each type of equipment item to be furnished. Include in the manuals sufficient information to operate and maintain the equipment including schematic wiring and interconnection diagrams; complete instructions for proper installation including equipment outlines, mounting, weight, power and cooling

requirements; a complete parts list and a list of recommended spares.

Include text, which completely describes all functional capabilities of the equipment. Explain all adjustments, how they are performed and their effect on equipment operation. Include flow charts, which describe troubleshooting procedures in a logical manner. Define expected signal levels and waveforms at key test points. Describe required test equipment and incorporate descriptions of its use in manual sections dealing with maintenance and repair of equipment items.

Submit test procedures and checklists required for the various stages of equipment tests as described in Appendix D.

Include information necessary for the proper installation, start-up, initialization, operation and fine-tuning of the equipment item.

Include environmental and operational specifications such as operating temperature range, power requirements, equipment weight, special handling considerations and equipment power dissipation rates and cooling requirements.

Submit all manuals to the Engineer for approval at least 30 calendar days prior to the anticipated start of the System Acceptance Testing for that equipment item.

B. Shop Drawings

Submit 5 (five) hard copies and one (1) electronic file (PDF format) of shop drawings on 22 in. (H) x 34 in. (W) sheets.

Include, at a minimum the following in shop drawings:

1. Wiring Diagrams
2. Installation Drawings
3. Detail Drawings
4. Catalog information

C. Control Cabinet and Service Panel Drawings

Provide drawings, which show all terminals, terminations and connections within each equipment cabinet. At each terminal illustrate the terminal designation for the other end of the wire or cable. Cross-reference connections that go to equipment harnesses or connectors to the nomenclature used in that equipment's manual.

Tailor drawings to each individual cabinet.

Submit all drawings to be attached in cabinets to the Engineer for approval at least 30 calendar days prior to the system acceptance testing. Supply marked up copies of all

cabinet drawings to the Engineer at the time of cabinet installation. Enclose drawings in a clear, plastic, waterproof enclosure.

Provide to the Engineer five (5) hard copy sets and one (1) electronic (PDF format) of final reproducible Mylar originals and four copies for each set of control cabinet and service panel drawings within at least 14 days following the approval of the 30-day operational test.

D. Installation Summary

Compile and furnish as-built installation summaries within at least 14 days of start of the 30-day operational test for each field installation. This summary will include the following information:

1. Equipment inventory including quantities of all equipment supplied under this contract, model number, manufacturer, and distributors for all equipment.

2. Cable lists specifying cable, wire pair and connector and pin assignments for all signal, power and ground leads.

3. Composite drawing of the system.

The Engineer has the right to stop the 30-day operational test if the installation summaries are not submitted within at least 14 days of the start of the test.

E. System Operations and Maintenance Manuals

Develop and deliver comprehensive systems operation and maintenance manuals for all the systems furnished under this contract. The objective of each manual is to present a systems oriented view of the operation and maintenance requirements of the system. Include a detailed functional description of the system. Include a description and streamlined step-by-step procedure for all routine operating events. Include equipment preventative maintenance procedures and equipment fine-tuning and adjustment procedures.

Submit all manuals to the Engineer for approval at least 14 calendar days prior to the anticipated start of the 30-day operational test.

Final Documentation Submission Requirements

The PROPOSER will provide five (5) hard copies and an electronic version (PDF format) of all documents transmitted as final documents and will include:

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A. As-Built Drawings and Details

Submit all As-Built drawings for the VMS, CCTV, Arrow Board and fiber optic cable installation locations. As-Builts and details shall be on 22' x 34" paper, as well as in PDF format. Include all As-Built plans, wiring diagrams, installation plans, cabinet diagrams, video wall schematic, service panel drawings and detail drawings.

B. Final versions of all system operations and maintenance manuals (System Maintenance Manual, System Operator and Administrator Manuals)

C. All equipment and system/subsystem Warranties

D. All manufacturer equipment manuals

E. All final NTCIP compliance documentation, if applicable.

Payment

The payment schedule for the aforementioned items will be as follows:

Project Management is incidental to other bid items and will not be paid separately.

Mobilization

Section 608.1 Description. Revise this section by adding the following:

Include in negotiations with DBE subcontractors the opportunity to identify an item for their mobilization. Include any amounts agreed to in the contract lump sum bid price for mobilization, also list agreed to amounts for each DBE subcontractor on Attachment A (part of documentation required by special provisions Disadvantaged Business Utilization Requirements).

Section 608.4 Measurement and Payment. Revise completely to read:

Lump Sum

Will be paid as specified in Section 110.05, and in accordance with the following schedule:

(a) Submit the detailed construction schedule specified in Section 108.03 indicating thereon the starting date of work subcontracted to DBE's. One month prior to the scheduled start of the subcontracted DBE work, but not earlier than the Notice to Proceed, 25 % of the amount shown on Attachment A for mobilization will be paid. The remaining 75% of the amount shown on Attachment A for mobilization will be paid in 3 equal payments, each payment made when subcontracted DBE work is 25%, 50% and 75% completed. Pay the affected DBE's within 7 days of receipt of payment from the Commission.

(b) Whenever work is performed equal to 10% of the total contract price, excluding the bid price for this item, the amount bid for mobilization less any payments made under Section 608.4(a), or 3% of the total contract price, excluding the bid price for this item,

whichever is less, will be paid.

(c) Whenever work is performed equal to 25% of the total contract price, excluding the bid price for this item, any remaining amount bid for mobilization less any payment made under Section 608.4(a), or an additional 2% of the total contract price, excluding the bid price for this item, whichever is less, will be paid.

(d) If the total contract lump sum price for mobilization has been paid prior to any payments made as specified in Section 608.4(a), pay 25% of the amount shown on Attachment A for mobilization to the affected DBE's not later than 10 days prior to the scheduled start of the subcontracted DBE work. Pay the remaining 75% as specified in Section 608.4(a).

(e) Upon completion of the project, any remaining amount bid for mobilization will be paid.

- Eight percent (8%) of the bid price for all bid items, except for items 0608-0001, 9900-0442, 9900-0445 and 9900-0446, will be paid upon the Engineering Design submission, approval of the Design submission set by the Commission, and field review and approval of the information on the plan sets. Design plan set submission shall include the following, at a minimum:

    1. Complete Foundation Design
    2. Complete Structures Design – VMS, CCTV and Arrow Board Support Structures.
    3. Site Plan (ID Point of Service, Conduit, Junction Boxes, Equipment Location, Guide rail)
    4. Structures Plan - Foundations (VMS and CCTV Plans and Elevations)
    5. Guide rail design
    6. MPT Plans
    7. Sediment Control Plans
    8. Block Wiring Diagrams
    9. Draft FAT, SAT and OAT Plans, including testing and traceability matrix.
    10. Catalog Cut Sheets for all VMS, CCTV, Arrow Board and fiber optic cable components. The PROPOSER may submit cut sheets for these items separate from the Design submission. If the cut sheets are approved by the Commission, the PROPOSER may begin to procure such items.
    11. All plans shall be submitted in both hard copy and in electronic format (PDF and MicroStation).

- Up to fifty percent (50%) of the bid price or equipment invoice price, whichever is lower, for all bid items, except for items 0608-0001, 9900-0442, 9900-0445 and 9900-0446, will be paid upon the delivery of all equipment for each item to the project storage site (one central

location) and proper certification of the successful completion of the factory acceptance tests, not exceeding the invoice price of the product.

- Twenty percent (20%) of the bid price for all bid items, except for items 0608-0001, 9900-0442, 9900-0445 and 9900-0446, will be paid upon the successful installation and completion of the System Acceptance Test (SAT) as specified. The SAT testing procedures, must be approved by the Commission prior to the commencing of SAT testing.

- Ten percent (10%) of the bid price for all bid items, except for items 0608-0001, 9900-0442, 9900-0445 and 9900-0446, will be paid upon the successful completion of the Operational Acceptance Test (OAT) as specified. SAT testing on all project equipment must be completed prior to the commencement of OAT testing. The OAT testing procedures must be approved by the Commission prior to the commencing of OAT testing.

- Twelve percent (12%) of the bid price for all bid items, except for items 0608-0001, 9900-0442, 9900-0445 and 9900-0446, will be paid upon the Final Approval of all system documentation, which include:

    1. Complete As-Built Plans including all Details
    2. Final System Operations and Maintenance Manuals (System Maintenance, System Administrator and Operator guides.)
    3. Submission of all System/Subsystem Warranties
    4. Submission of all Equipment Manuals
    5. Submission of all Shop Drawings (Wiring Diagrams, Installation Drawings and Detail Drawings)
    6. Submission of all Control Cabinet, Video Wall and Service Panel Drawings
    7. Complete NTCIP Compliance testing results and certifications
    8. Software installation diskettes or CD-ROM's

- Item 9900-0442, Relocation of RTMS Pole 120.1 WB to 166.0 EB, will be paid to the PROPOSER in the following method; 17% of this lump sum item will be paid upon removal of the RTMS pole and foundation at MP 1201. WB; 8% of this lump sum item will be paid to the PROPOSER upon the approval of the new pole and foundation design at 166.0 EB; 50% of this lump sum item will be paid to the PROPOSER upon the complete installation of foundation construction and pole installation; 25% of this lump sum item will be paid to the PROPOSER upon re-grading, seeding and final site clean up, to the satisfaction of the Commission of the new pole and foundation at MP 166.0 EB.

- Fifty percent (50%) of item 9900-0445, System Support Equipment, will be paid upon the delivery of all equipment to the project storage site (one central location) and proper certification of the successful completion of the factory acceptance tests, not exceeding the invoice price of the product. Upon approval of the 30-Day Operational Test, the remaining amount of the item will be paid to the PROPOSER.

- Item 9900-0446, 1-Year Maintenance, will be paid to the PROPOSER, on monthly bases of $1/12^{th}$ the item value, after final approval of the operational testing period, and submission of

the final documentation for any item has been received and written approved has been given by the Commission. All maintenance activities must be logged in the system described in Appendix E, and an electronic and hard copy must be provided to the Commission on the 15th of following month, along with the PROPOSER'S monthly invoice. The Commission will not release any payment under this item without first receiving the completed electronic log and invoice.

- The Tyco Electronics cost that includes the wireless equipment (hardware and software), labor, Tyco Electronics supplied materials and integration provided by Tyco Electronics **WILL NOT** be required to be a part of the PROPOSERS bid. This amount, for each site, will be paid to Tyco Electronics by the Commission.

WARRANTIES AND GUARANTEES

Description - Guarantee the equipment services, software and hardware provided under this Contract until final system acceptance (i.e., satisfactory completion of 30-Day operational test). Submit all equipment and material guarantees or warranties supplied by equipment manufacturer or supplier to the Commission in writing.

Software License, Warranty, Support, and Upgrades

A. The Commission's Rights

The PROPOSER and its subcontractors shall grant the Commission intellectual property rights to unlimited copies of any software/firmware, if any, acquired or created for use at any site or facility operated by the Commission. the Commission shall have the right to duplicate any Documentation associated with the software/firmware for use of its employees or agents. If the CCTV, VMS or Arrow Board systems makes use of software packages purchased from a Third Party, the PROPOSER will provide the Commission enough licensed copies of that standard software package to properly implement the systems for this project. A total of 10 licenses are required for this contract for all software. The PROPOSER will coordinate with the Commission on the final number of software licenses required.

B. Warranty

Fully guarantee all Software/Firmware, and items, or materials created by, or manufactured by the PROPOSER, and provided under this Contract, to be FREE FROM DEFECTS (insofar as known) at the time of acceptance. For third-party suppliers, furnish the Commission those warranties offered as normal trade practice by those suppliers.

For one (1) year after approval of the operational testing and final acceptance, the PROPOSER will provide promptly, within one (1) month after made available by the

manufacturer, any amendments or alterations to the software/firmware that may be required to correct errors present at the time of acceptance, which affect performance, in accordance with these Specifications. Any alterations will be preformed with a system configuration management process, which will first be approved by the Commission.

C. Upgrades

For one (1) year after acceptance, the PROPOSER will notify the Commission of upgrades, enhancements, or special features developed for these systems. The PROPOSER will provide upgrades and enhancements to the software that will improve the operating performance of the systems, but do not change the basic functions of the systems. These upgrades and enhancements shall be provided to the Commission at no charge. After this term it will be the sole responsibility of the Commission for requesting available upgrades, enhancements, or special features developed for these systems.

D. Level of Service

The LOS of the Warranty is equivalent to FHWA/McTrans LOS 1, "Full Technical and Maintenance Support". Provide the following:

Immediate (same-day) notification via email and telephone of any serious "defect/bug" discovered in a supported, maintained program.

Free replacements of programs, program modules, firmware, and documentation, which are updated to correct "defects/bugs". This is the implementation of the Warranty.

Full telephone, email and FAX, question and answer user support during normal business hours.

Send two (2) copies of each replacement /enhancement /upgrade /version /documentation via overnight express carrier delivery. The PROPOSER has the right to market or sell the software/firmware developed for the Commission to other vendors, agencies, or highway departments. In return, during the period of Warranty, the PROPOSER shall provide the Commission free of cost, those new versions of the software/firmware that may be developed as enhancements or modifications to meet the requirements of other highway departments

PROPOSER RESPONSIBILITY

General - It is the sole responsibility of the PROPOSER to provide the Commission with the design, procurement, installation and integration of a fully functional VMS, CCTV, Arrow Board, power and communications systems, to the approval of the Commission. The PROPOSERS final bid price for this contract, will not be altered unless additional work is mutually agreed upon between both the Commission and the PROPOSER.

A. The PROPOSER shall maintain all equipment procured under this Contract in proper working and fully operational condition throughout the period of construction, system acceptance testing, the successful completion of the 30-Day operational test and maintenance periods, as determined by the Commission. Proper working and operational conditions means that all field equipment, all hardware, and software meets the contract specifications, the intent of the project, and the manufacturer's specifications functions. All field and TMC equipment must be installed and all equipment must have successfully completed System Acceptance Testing (SAT) before the 30-day Operational Acceptance Test (OAT) period can commence. The Department will provide the PROPOSER with written or oral approval to begin OAT testing. The Commission is not responsible for any delays or penalties incurred by the PROPOSER due to incomplete testing, or failure to provide a satisfactory system, prior to the start of the OAT testing.

For equipment malfunctions, respond to and repair within the applicable time frame as specified in Appendix E.

If the equipment is damaged or rendered inoperable due to external reasons including, but not limited to, vehicular accidents on the roadway, rainstorm, snowstorm, or other natural disasters, restore to proper operating conditions within the applicable time frame as specified in Appendix E. If such damage occurs after the start of the 30-Day operational test and before the guaranty period, the PROPOSER will be reimbursed for the repair in accordance with the Commission's Publication 408, Section 110.03.

B. Closed Circuit Television System (CCTV)

Design, furnish and install CCTV elements specified under this Contract. Coordinate with the CCTV vendor to provide a fully functional and operational CCTV system. Coordinate with the CCTV vendor to provide power and communication links as specified. Furnish/modify/upgrade the necessary Commissions central control software to allow the full operational use of both the existing and proposed CCTV cameras at the TOC as well as at each specified tunnel.

C. Variable Message Sign System (VMS)

Design, furnish and install VMS foundations and structures. Install the VMS components. Coordinate with the local electric and telephone companies and provide electric and telephone services as specified. Coordinate with the VMS vendors to provide a fully functional and operational VMS system. Furnish/modify/upgrade the necessary Commission's central control software to allow the full operational use of both the existing and proposed VMS. The above VMS requirements include the work to be performed on the existing relocated VMS.

D. LED Arrow Boards

Design, field verify, furnish and install a fully functional and operational Arrow Board system at the tunnels denoted in this RFP. Perform all necessary work to successfully

integrate a completely operational Arrow Board system. Provide all necessary equipment to tie into the existing communication system and communicate to/from the TOC as well as at each specific tunnel denoted in the RFP.

E. 48 Strand Single Mode Fiber

Design, furnish and install the 48 strand single mode fiber (SMF) in the tunnels denoted in this RFP. Provide all conduit, mounting hardware, connections, terminations and testing to provide a functional communication link.

F. Communications Equipment

Design, furnish and install a fully functional communications system based on either fiber optic, wireless or a hybrid of these two (2) technologies. All wireless communications will be coordinated through the Commission and will utilize the Tyco Electronics hardware to connect to existing WAN radio towers or before mentioned facilities. **Leased line communications will not be accepted for this contract.** Installation of complete communications system (fiber optic, wireless or a hybrid of the two) to the aforementioned equipment. **Dial-up or leased line communications will not be considered as an acceptable means of communications to devices in this project.** The PROPOSER can only utilize Tyco Electronics, the Commissions wireless provider, for their wireless solution on this project. No other wireless solution will be accepted by the Commission. The PROPOSER must contact Daniel Buckley of Tyco Electronics (Telephone - 978-442-4452 – email buckleyd@tycoelectronics.com) to coordinate wireless services for this project. **The PROPOSER must complete all coordination with Tyco Electronics 3 business days prior to the proposal due date.**

SYSTEM SUPPORT EQUIPMENT

General - This work is the furnishing of system support equipment for the CCTV, VMS, Arrow Board systems. Provide equipment identical to those used elsewhere in the project and as specified under this Contract. The system support equipment may be utilized as replacement parts in the field during the maintenance period. All replaced equipment must be fixed and returned to the Contractor within 30-days of replacement. All spare equipment quantities must be provided to the Commission at the conclusion of the 1-year maintenance period.

Material - Furnish the following equipment and associated quantities for the CCTV, in accordance with Appendix B:

A. Complete Dome CCTV Camera Assembly (4)

Furnish the following equipment for the VMS in accordance with Appendix B:

A. LED Character Module (6)

B. VMS board power supply module (6)
C. MPEG-4 Encoder (6)

Furnish the following equipment and associated quantities for the Arrow Boards in accordance with Appendix B:

A. Modular LED Boards (12)

Furnish the following equipment and associated quantities for the fiber optic or wireless communications systems in accordance with Appendix B:

A. Fiber Optic Video/Data Transciver (4)
B. Fiber Optic Modems (4)
C. Ethernet Switch (4)
D. Terminal Server (4)
E. Wireless Transceiver (5)
F. Bosch Decoder Shelf
    a. VIP-X1600-XFB Decoder Card Chasse (2)
    b. VIP-X1600-XFMO Decoder Cards (4)
    c. VIP-X1600-PS Power Supply

As directed by the Engineer, deliver all equipment to the Commission's, Project Manager in Highspire, PA.

APPENDIX B

FUNCTIONAL REQUIREMENTS

APPENDIX B
CLOSED CIRCUIT TELEVISION (CCTV) CAMERA – FUNCTIONAL REQUIREMENTS

A. GENERAL

The PROPOSER shall design, build and install a complete and functioning Closed Circuit Television (CCTV) System, including, but not limited to, pan-tilt-zoom (PTZ) CCTV camera, CCTV camera lowering devices, 50-foot CCTV camera poles, foundations, cabinets, guide rail, all power and required equipment to utilize either the Tyco Electronics wireless, fiber optic cable or a hybrid of both communications system to transfer video and control back to the TOC via the Commissions WAN, required video recording equipment due to this expansion, and all head-end equipment for switching and controlling video due to this expansion. The system shall be capable of utilizing the Commissions existing video sharing with other outside agencies. The system designed and installed by the PROPOSER shall be able to fully operate all the existing CCTV cameras currently owned by the Commission, in addition to the proposed CCTV cameras. The PROPOSER is required to trim all trees and vegetation to provide an unobstructed view of the Commissions roadways, ramps and interchanges.

It is the sole responsibility of the PROPOSER to design, procure, install and integrate a fully functional CCTV system at the locations denoted in this contract, to the approval of the Commission. No additional payments will be made to the PROPOSER for the CCTV system, unless it is additional work items mutually agreed upon by both the PROPOSER and the Commission.

B. APPLICABLE STANDARDS, CODES AND PUBLICATIONS

1. All work shall conform to the latest edition of the codes, standards and specifications listed below and all local codes.

    a. American National Standards Institute - ANSI
    b. Institute of Electrical and Electronics Engineers - IEEE
    c. International Standards Organization - ISO
    d. Military Specifications -MIL
    e. National Electrical Code -NEC, Latest Edition
    f. Pennsylvania Uniform Construction Code
    g. Pennsylvania Electrical Code
    h. Pennsylvania Building Code
    i. Underwriters Laboratories, Inc. -U.L.
    j. National Transportation Communications ITS Protocol - NTCIP

C. MANUFACTURER EXPERIENCE

1. The PROPOSER shall provide equipment for this item from a manufacturer established in the production and installation of a CCTV camera system that employ the technologies specified herein.

2. Specific experience criteria to be satisfied by a manufacturer with respect to quality assurance of the system are furnished under this section and must be satisfied.

3. CCTV camera system equipment shall be manufactured by the following, or approved equal:

   a. Cohu Electronics - San Diego CA
   b. Bosch Security Systems - (Formerly Philips-CSI), Lancaster, PA

4. CCTV camera manufacturers of equal experience may be approved for work of this contract after submittal of past experience as specified within this specification.

CLOSED CIRCUIT TELEVISION SYSTEM

Material - Furnish all hardware specified herein, tools, equipment, cables, materials, supplies, and manufactured articles, and perform all operations and integration, as indicated and as specified herein.

Provide all cabling, connectors, terminators, mounting hardware, shelves, cable strain relief hardware and other ancillary accessories required for the interconnection of the equipment, specified herein to perform the functions required by this special provision.

A. Manufacturer/Vendor Qualifications: All CCTV equipment provided by these, or other, manufacturers / vendors must satisfy the requirements indicated in these specifications. In addition, all manufacturers/ vendors of CCTV equipment must show that they have provided the type of equipment proposed for use on this project for at least five years. The manufacturer / vendor must also provide at least two references from individuals at public agencies (include contact person and phone number) who will be able to document that similar CCTV equipment provided by the manufacturer / vendor has been in successful operation for at least three years.

B. Camera Assembly. The Camera Assembly is an integrated unit in a dome housing that includes the camera, lens, receiver/driver unit, positioner, and related equipment in a pressurized dome housing. Provide Camera Assemblies that meet the requirements listed below.

   1. System

      a. Pan/Tilt Drive
         1. Pan: 360 degree range

2. Tilt: -90 to +5 degree range
3. Pan Speed (preset): 250 degree/second, accurate to +/- 0.5 degree
4. Pan Speed (manual): variable from 0.1 to 80 degree/second
5. Tilt Speed (preset): 80 degree/second
6. Tilt Speed (manual): variable from 0.1 to 40 degree/second

b. Power Input
   1. Camera: 24 VAC nominal (21.6 to 26.4 VAC), 15 watts
   2. Heater: 24 VAC nominal (21.6 to 26.4 VAC), 44 watts

c. Weight
   1. 14 lbs maximum

d. Presets
   1. 64 preset positions, minimum

e. Title generation – minimum 16 character titles for each of the following:
   1. Camera ID
   2. Preset ID
   3. Sector ID
   4. Privacy Zone
   5. Low Pressure Alarm

f. Housing pressurization
   1. Ingress Protection: IP67, NEMA 4X

g. Environmental
   1. –40 degrees C to 50 degrees C (-40 deg. F to 122 deg. F) operating temperature
   2. 0% to 100% relative humidity

h. EMI
   1. FCC rules, Part 15, Subpart J, Class A

i. Safety
   1. UL listed

2. Camera
   a. Imager: ¼ inch color interline transfer CCD
   b. Horizontal Resolution: 470TVL (NTSC) minimum
   c. Lens:
      1. 18X optical zoom minimum (approximate focal length 4mm – 72mm)
      2. 10X digital zoom minimum
   d. Focus and Iris: automatic with manual override
   e. Synchronization:
      1. Line-Lock with phase adjust or internal crystal
   f. Video output:
      1. Analog - NTSC in conformance with EIA-170 standards
   g. Gain Control:
      1. Off/Automatic
   h. Sensitivity (useable video, scene illumination):
      1. Daylight mode: Color, 3.0 lux with integration (slow shutter) off.
      2. Daylight mode: Color 0.2 lux with integration (slow shutter) on.
      3. Night mode: Monochrome, 0.7 lux with integration (slow shutter) off.

4. Night mode: Monochrome, 0.02lux with integration (slow shutter) on.

i. Integration rate:
   1. Automatic or user-selectable shutter speed ranging from 1/60 of a second to 1/4 second, minimum.

j. Day/Night Operation
   1. Day (color), Night (monochrome)
   2. Switchover is user selectable: automatic or manual

k. Signal to Noise Ratio: 50dB minimum

3. Camera Control Communications Protocols
   a. Support RS-232, RS-422, or RS-485 serial communications interface.
   b. Support NTCIP 1205 camera control protocol
   c. The camera control protocol will be user defined at the camera assembly either thru dipswitch settings on the camera or upload/download of firmware. At a minimum, support NTCIP and RS-232/RS-485 protocols without the need for translator plug-ins or an external code converter.
   d. The supported NTCIP standards include Object Definitions for Closed Circuit Television Camera Control, NTCIP 1205:2001, or the current version of this standard. Support all "Mandatory" Conformance Groups. Support the Motion Control Conformance Group. Provide tables indicating the specific objects supported in each conformance group. Identify any manufacturer specific objects that are not in the current version of the standard and register with NEMA. Provide all documentation for Commission approval.

C. Cables and Surge Protectors. Provide and install all necessary cables, as required, recommended by the camera and cable manufacturers and approved by the Representative.

Install camera communications, camera power, and coaxial cables between the Camera Assembly and the Camera Control Cabinet as indicated in the Contract Plans. Use outside plant (OSP) weather resistant material for these cables.

In lieu of separate cables, the PROPOSER for approval of the Representative may propose a suitable, camera manufacturer approved, hybrid camera power/control/coaxial cable.

Provide surge and lightning arrestors incidental to the cable installation, for all cables that are entering and leaving the cabinet, including the camera power, PTZ control, and coaxial cables. Protectors may be DIN rail or panel mount. Include surge and lightning arrestor details in the shop drawings for review and approval by the Representative.

For the coaxial cables, provide surge protectors that meet the following requirements:

- Attenuation: 0.1 dB maximum at 10 MHZ

- Response time: 1ns maximum
- Voltage clamp: less than 6v when the protector is being subjected to its rated surge current.
- Peak Surge Current: 5kA (when subjected to a 8x20□s waveform)
- Connector: Type BNC
- Impedance: 75 ohms
- UL497 listed

For the PTZ control cables, provide surge protectors that meet the following requirements:

- Response time: 1ns maximum
- Peak Surge Current: 10kA (when subjected to a 8x20□s waveform)
- UL497 listed
- Connector: Terminal Strip

For the 24VAC camera power cables, provide surge protectors that meet the following requirements:

- Voltage clamp: less than 58V when the protector is being subjected to its rated surge current.
- Peak Surge Current: 3kA (when subjected to a 8x20□s waveform)
- Connector: Terminal Strip

Provide a video interface panel inside the cabinet to terminate the cables that run between the camera control cabinet and the camera assembly. Provide connectors with a screw type locking mechanism for the secure connection of the cables.

Include for each Camera Control Cabinet an RFI filter and an AC power transient surge suppressor that meet NEMA TS-2 transient protection requirements.

Provide a camera assembly power supply in the Camera Control Cabinet that is connected to the transient protected side of the AC power distribution system in the cabinet.

D. Camera Control Cabinet and Cabinet Foundation. New CCTV camera control cabinets shall be designed for foundation mounting as indicated. The anchor bolts, nuts, washers and adapter plates required for mounting of the cabinets as well as sealant required to waterproof the junction between the cabinet and foundation shall be included.

Provide new reinforced concrete control cabinet foundation as indicated.

Provide all CCTV camera control cabinets meeting or exceeding the requirements of a NEMA 3R rating. Provide cabinet and doors fabricated from 0.125 inch minimum thickness of 5052-H32 sheet aluminum and adequately reinforced. Provide continuous seams, solid welds made by the Heliarc welding method. Provide neatly formed welds, free from cracks, blowholes, and other

irregularities.

Provide cabinet roof, which is pitched away from the door, to prevent water from collecting on the top of the cabinet. Provide a drip shield, which is incorporated into the construction of the roof to protect the door from run-off water.

Provide a cabinet, which has minimal dimensions of height, depth, and width of 48-inch, 24-inch, and 24-inch respectively such that selected components and cables can be installed. Should a custom design cabinet be recommended, provide justification and seek approval from the Representative.

Meet minimum clearances (as specified by the manufacturer and approved by the Representative) of all components, and do not exceed all minimum bending radius for cables as specified by the manufacturer and approved by the Representative, including a 15-inch high space between the bottom of the equipment mounted at the lowest level on the rack and the bottom of the cabinet.

Provide vented cabinet. Provide cabinet, which has provisions for mounting a forced air fan system that can be thermostatically controlled with air exhausted through the cabinet ventilation system.

Install cabinet with front door oriented such that an individual accessing the cabinet will be facing and perpendicular to the mainline of the highway at which the cabinet is located. Furnish door handles, which provide for positive latching of the door at three points as viewed when facing the door - top, bottom, and left side.

Provide door hinged along the right side. Provide hinges and pins made of stainless steel conforming to ASTM A276. Provide one continuous hinge mechanism along the entire right side. Provide doors equipped with an adjustable doorstop to hold the door open at the angles of 90 degrees, 135 degrees, and 180 degrees with the front of the cabinet.

Provide gaskets, which are permanently bonded to the metal on all door openings. Cover the mating surface of the gaskets with a silicone lubricant to prevent sticking to the mating surface.

Equip the inside door with a document pocket capable of holding 11-inch x 14-inch documents.

Provide all necessary camera control and video transmission cables in accordance with applicable sections and as recommended by the manufacturer.

Provide a cabinet equipped with EIA standard 19-inch racks with fixed front frame. A pullout shelf capable of holding a minimum 20 lb. Mount the shelf on the 19-inch racks as a support for a laptop computer.

Electric Distribution Panel - Power all cabinet accessories from a power distribution panel to be furnished and installed as an integral part of the cabinet. Provide a main service disconnect inside the cabinet. Allow removal of power from all cabinet accessories and equipment by tripping the main service disconnects circuit breaker. Provide a main circuit breaker, trip current as shown in the Plans, 100 Amp Frame, 240 Volt Rated, single Pole, 10 KAIC (Symmetrical) in a NEMA 1 enclosure.

Feed the power distribution panel from the main circuit breaker. Provide a power distribution panel, which has the following ratings:

- 120/240 Volt
- Single Phase
- Three Wire
- 10 KAIC (Symmetrical)
- 40 Amp Main Lugs
- 4 Single Pole Circuit Breaker Capacity
- NEMA 1 Enclosure
- Isolated Neutral Bus
- Ground Bus

Provide power distribution panel containing the following circuit breakers. Provide single phase, 120-Volt Rated, 10 KAIC (Symmetrical) circuit breakers of the quantity and current capacity as shown in the Plans.

Neutral bus - Provide a neutral bus of solid metallic strip rigidly mounted on the power panel and isolated from cabinet ground. Provide all neutral conductors terminated on the neutral bus.

Ground bus - Bond the camera control cabinet, the main disconnect, the power distribution panel, the service ground wire and the branch circuit ground wires to the ground bus. Furnish and install a 3/4 inch by 10-foot copper clad steel ground rod in the 18 inches below final grade at the camera control cabinet location, bond the ground bus to the ground rod with AWG #4 Ground Wire.

Cabinet Light - Furnish and install in the camera control cabinet, one 20-watt, commercially available, commercial grade, fluorescent lamp and lamp assembly. Provide a U.L.-listed assembly. Provide a lamp, which is automatically turned on when the cabinet door is opened, and automatically turned off when the door is shut. Provide a lamp assembly positioned so as to provide light to all of the equipment within the cabinet. Provide a lamp assembly, which is shielded so as not to shine directly in the eyes of servicing personnel.

Convenience Outlet - Furnish and install one duplex, NEMA 5-15R, GFCI receptacle with box and cover plate in an accessible location when all equipment is installed within the camera control cabinet. Furnish U.L.-listed receptacle meeting Federal Spec. # WC596.

Heater - Furnish and install a heavy duty, radiant electric heater in the cabinet meeting the following requirements:

- 120 VAC operation, UL-listed
- Power consumption not to exceed 2.5 amps
- Minimum Output: 250 watts
- Thermostatically-controlled

Fan – Furnish and install heavy duty cooling fan in the cabinet meeting the following requirements:

Equip the cabinet with a 100 CFM, 0.18 amp at 120 VAC, cooling fan. Furnish a thermostatically controlled fan equipped with a fan guard.

Fiber Optic Distribution Panel (if required) – Furnish a fiber optic distribution panel for the full cable termination and optical continuation of fiber optic cables as required. The unit will act as an interface between the fiber optic cable and the fiber optic patch cables located within the cabinet. The panel is configured in connector fields consisting of rack mounted bulkhead connectors. The field shall contain a sufficient quantity of connectors to accommodate the maximum number of the fibers entering the equipment cabinet. Each connector field comes preconnectorized with 12 single mode ST adapters with 9 ft pigtails. The panel will have the capability to store the slack cable.

E. NTCIP. To ensure compatibility and interchangeability with equipment furnished in previous and future contracts, the CCTV Camera Assembly shall be compliant with the latest version of the NTCIP 1201 and 1205 Standards where applicable, as defined by AASHTO, ITE, and NEMA.

Construction -

General - Construct the CCTV System in accordance with the Plans and with all requirements of the manufacturer, all applicable codes, regulations and Standards.

Furnish all necessary materials such as cables, connectors, splicing kits, and other appurtenances as required by the manufacturer and the Commission for a complete installation of the system.

Install CCTV camera system elements as indicated and as suggested by manufacturer to provide fully functional CCTV system.

Obtain the services of a site Representative/technical advisor from the manufacturer to assist in the construction, set up, turn-on and testing of the completed installation.

Before starting Construction, verify existing underground and overhead lines.

A. Camera Assembly

Mount the dome camera housing as recommended by dome manufacturer and the camera lowering device manufacturer. Use weather and corrosion resistant hardware to withstand a wind-load of 100 mph and with a 30 percent gust factor.

Install and setup all elements of camera assembly prior to field installation.

Provide any necessary hardware and/or software to enable operator to change camera set-up parameters.

Set up the preset views and electronic limit stops for each camera as directed by the Representative. If required by the Representative, submit a list of the proposed preset views and their proposed titles for review and approval.

B. Camera Control Cabinet and Cabinet Foundation

Install a camera control cabinet and controller cabinet foundation as indicated in the plans. Install concrete cabinet foundation in accordance with Sections 1001 and 1002. Excavation shall be in accordance with Section 204. Install galvanized rigid conduits through the controller cabinet foundation, size and type as indicated on the plans. Secure the cabinet to foundation such that the complete cabinet assembly withstands a wind load of 100 mph with a 30% gust factor.

Use an insulated grounding bushing on the end of the conduits inside the cabinet to prevent chaffing of the cables. Bond all conduits to the grounding system with a #4 AWG ground conductor.

CAMERA LOWERING SYSTEM WITH POLE

Description - This work is the furnishing, and installation, of a complete and functioning Camera Lowering System and mounting pole.

Provide a camera lowering system, at the designated field locations as indicated in the Contract Plans and specified herein.

Provide a camera lowering system designed to support and lower the dome, cabling, connectors and other supporting field components (as described in this Special Provision); without damage or causing degradation of camera operations.

Provide a concrete pedestal and all hardware required to support and anchor a pole.

The camera lowering system device and the pole are interdependent, and thus, must be designed as a single unit or system. Provide a lowering system consisting of a suspension contact unit, support divided channel arm, and a pole adapter for attachment to pole top tenon, pole top junction box, and camera connection box.

Provide support arm and receiver brackets designed to self-align the contact unit with the pole centerline during installation and insure the contact unit cannot twist under high wind conditions.

Provide the entire device capable of withstanding wind forces of 100 mph with a 30 percent gust factor using a 1.65 safety factor. Provide a camera-lowering device from a manufacturer with a minimum of 3 years of experience in the successful manufacturing of such systems.

Provide a factory representative to assist the PROPOSER with the assembly and testing of the first lowering system onto the pole assembly. Furnish the applicable documentation to the Representative certifying that the PROPOSER has been instructed on the installation, operation and safety features of the lowering device. Provide applicable maintenance personnel "on site" for operational instructions.

Material –

A. Suspension Contact Unit – Provide the suspension contact unit that has at least a load capacity of 200 lbs. with a 4 to 1 safety factor and locking mechanism between the fixed and moveable components of the lowering device. Provide a moveable assembly with a minimum of 2 latches.

   Provide a latching mechanism, which securely holds the device and its mounted equipment. Provide latching mechanism, which operates by alternately raising and lowering the assembly using the winch and lowering cable such that when latched, all weight is removed from the lowering cable.

   Provide the fixed unit with a heavy-duty cast tracking guide and means to allow latching in the same position each time. Provide a weatherproof contact unit housing with a replaceable neoprene gasket provided to seal the interior from dust and moisture.

   Design the prefabricated components of the lift unit support system such that it precludes the lifting cable from contacting the power or video cabling. Provide a conduit mount adapter for housing the lowering cable. The adapter shall have a threaded interface to allow the connection of a PROPOSER provided conduit and is to be located below the cable stop block at the back of the lowering device. Supply internal conduit in the pole as required. The stainless steel lowering cable is the only cable permitted to move within the pole or lowering device during lowering or raising. During lowering and raising operations, all other cables are to remain stable and secure.

   Design the female and male socket contact halves to be made of the thermosetting synthetic rubber, Hypalon. Permanently mold the female brass socket contacts and the male high conductivity brass pin into the Hypalon body.

All male current carrying contacts shall be 1/8 inches in diameter. Provide two (2) male contacts that are longer then the rest so they may make first and break last contact to provided optimum grounding performance. There shall be fourteen (14) male contacts and the camera mounted thereto, shall be capable of performing all of its necessary function on fourteen (14) contacts or less.

All female current carrying contacts shall be 1/8 inches in diameter and be recessed 0.125 inches from the face of the connector. Center cored holes, measuring 0.25 inches in diameter and 0.125 inches deep, molded into the connector body on each contact on the face of the connector to create rain-tight seals when mated with the male connector.

Mold the wire leads from both the male and female contacts permanently and integrally into the Hypalon body. Construct the current carrying and signal wires molded to the connector body of #18/1 AWG Hypalon jacketed wire.

The contacts shall be self-wiping with a shoulder at the base of each male contact so that it will recess into the female block. The electrical contact connector must meet Mil Spec Q-9858 and Mil Spec I-45208.

B. Lowering Tool - Provide four powered portable tools for safely raising and lowering the camera assembly. The tools shall consist of a lightweight metal frame and winch assembly with cable as described herein, a quick release cable connector, an adjustable safety clutch and a variable speed industrial duty electric drill motor. The tools shall be compatible with accessing the support cable through the hand hole of the pole.

The lowering tool shall attach to the pole with one single bolt and will support itself and the load assuring lowering operations when loaded. The lowering tool shall have a reduction gear to reduce the manual effort required to operate the lifting handle to raise and lower a capacity load. Provide an adaptor to operate the lowering device by a portable drill using a clutch mechanism. A positive breaking mechanism shall be equipped to secure the cable reel during raising and lowering operation and prevent freewheeling.

Provide all pulleys for the camera lowering device and portable lowering tool with sealed, self-lubricated bearings, oil tight bronze bearings, or sintered bronze bushings.

Provide lowering cable with a minimum 1/8-inch diameter stainless steel aircraft cable with a minimum breaking strength of 1740 pounds with 7 strands of 19 wires each.

Protect from exposure to the weather all electrical and video connections between the fixed and movable lowering device components by providing a waterproof seal to prevent degradation of the electrical contacts.

Design the electrical connections between the fixed and movable lowering device components to conduct high frequency data bits and one (1) volt peak to peak video signals as well as the power and control requirements for operation of dome environmental controls.

Provide interface and locking components made of stainless steel and or aluminum. All external components of the lowering device shall be made of corrosion resistant materials, power coated, galvanized or otherwise protected from the environment by industry-accepted coatings to withstand exposure to a corrosive environment.

Provide a ZA-12 (12% aluminum and 88% zinc) cast camera junction box with a minimum weight of 50 lbs to insure stability of the camera during the raising and lowering operation. The camera junction box shall be equipped with a condensation / moisture exit system and have two (2) fully gasketed doors to prevent water intrusion.

Provide weights and/or counterweights as necessary to assure that the alignment of pins and connectors are proper for the camera support to be raised into position without binding.

Provide the lowering unit with sufficient weight to disengage the camera and its control components in order that it can be lowered properly.

With each system, provide a set of cables of sufficient length to run from the camera control cabinet to the lowered Dome assembly. The connectors on each cable shall securely mate with the video interface panel and the camera assembly, allowing all functions of the camera assembly to be exercised while it is in the lowered position.
Provide a mounting flange sufficient for mounting their respective camera assembly to the bottom of the camera connection box.

The camera lowering device shall be the $[MG]^2$ Model CLDMG2-HYP-050-ST(dom) and CLDMG2-HYP-075-ST(dom).

C. Pole and Foundation – Provide steel pole and concrete pedestal constructed with the following materials:

- Pole Shaft - Carbon Steel – Section 1105 (ASTM A595, Grade A with a min yield strength of 55 ksi or ASTM A572 with a min yield strength of 65 ksi)
- Cold Formed Welded and Seamless Carbon Structural Steel Tubing – Section 1105 (ASTM A500, Grade C (Fy = 46 KSI))
- Anchor Bolts – Section 1105 (ASTM F1554, Grade 55)
- Nuts – Section 1105 (ASTM A563)
- Base Plate – (ASTM A36 or ASTM A572, Grade 42)

- Washers – Section 1105 (ASTM F436)
- Galvanizing – Section 1105.02s (ASTM A153)
- Cement Concrete – Section 704 (Class A)
- Nonshrink Mortar – Section 1001.2 (d)
- Reinforcing Bars, Epoxy Coated – Section 1002

Construction - Provide installation and layout plans for approval by the Representative before construction.

Fabricate new tapered steel pole for the CCTV camera as indicated in the contract drawings. Provide standard hand hole and service entrances as shown in the contract drawings. Provide grounding rod, wire, etc. in accordance with RC-84M.

Galvanize all fabricated structural steel including interior and exterior surfaces of tapered poles, anchor bolts, bolt hardware, anchor plates, base and ring plates and all appurtenances.

For CCTV pole foundations, construct in accordance with Section 910.3, and as indicated.

Furnish and install a 1/8" thick neoprene gasket between the cap plate and the camera attachment plate.

Install and connect the hardware to the CCTV. Perform an on-site test to ensure that the field performance of the system meets all functional requirements. Submit test procedures for approval in accordance with Appendix D.

The system components shall be covered by a standard one year warranty period, during which any manufacturing defects or system failures will be replaced or repaired without any additional cost to the Commission. The warranty will begin after the final system acceptance date.

Labor and on-site visits, including materials and installation equipment, required to repair or replace defective equipment shall be provided as part of the warranty. The PROPOSER shall provide the Commission with the contact person name and phone number, during and after the warranty period. Traffic control and lane closure for any warranty work are not included as part of the warranty. Lane closure and traffic control shall either be provided by Commission or provided by the manufacturer at an additional cost to be paid for by Commission.

Repairs of Equipment when defect(s) result(s) from one or more of the following causes shall not be covered:

- Exposure to hurricane and other severe acts of God;
- Operation, maintenance or modification which is not in accordance with the Manufacturer's procedures;

- Theft.

Upon completion of construction, the manufacturer shall furnish documentation to describe the design, installation, operation and maintenance of the CCTV and Camera Lowering System delivered.

Design documentation shall consist of all drawings and text required to define the configuration of the delivered system and shall include both hardware and software documentation. It shall also describe methods of expansion and maximum capacities.

Installation documentation shall consist of all drawings and text required to define the following:

- Electrical power, data and control and other interface procedures in accordance with the specification.
- Floor, rack and shelf mounting, drilling and bolting methods necessary to secure the equipment in place.
- Safety precautions and guards.
- Grounding and lightning protection.

Testing methods and other procedures needed to properly install the equipment, terminal strips and wiring connections shall be detailed.

TUNNEL CCTV VIEWING STATION

Description – This work is to make ready control rooms with equipment to be able to view CCTV images at each tunnel and the connection of cables and conduit to connect the control room with adjacent electrical room. Payment for this item is incidental to the project.

Material – Furnish the following quantity of materials within each tunnel control room:

- One high resolution NTSC color video monitor at tunnels for each new camera
- Appurtenances as required
- Conduits connecting electrical rooms and adjacent control rooms

Each tunnel viewing station includes the following monitor quantities:

- Allegheny (3)
- Tuscarora (4)
- Kittatinny (2)
- Lehigh (4)

A. High Resolution NTSC Color Video Monitor - Provide high-resolution National Television Standards Committee (NTSC) color video monitors that meet the following minimum requirements:

Screen Size	Minimum 14" diagonal
Horizontal Resolution	450 TV lines at center
Input	Composite video, sync negative, 1v p-p, color NTSC standard
Front Panel Controls	Power on/off, brightness, color, contrast
Rear Panel Connectors	2 BNC video inputs and looping outputs, 1 S-Video input, 3 audio inputs with looping outputs
Construction	Steel cabinet with black finish

Furnish and install all the necessary mounting hardware to properly mount and secure all the monitors as required on shelves, in racks, or in existing consoles.

Electrical:

Input Voltage: 110 VAC 60HZ nominal
Power: 45W nominal.

Environmental:

Operating Temperature: 32°F to 106°F
Relative Humidity: 0%–90%, non-condensing.

Certifications and Approvals:

Electromagnetic Compatibility (EMC): Complies with FCC, Class A
Safety: UL Listed.

B. Accessories and Appurtenances - Furnish all necessary accessories and appurtenances (e.g., data cables, coaxial cables, connectors, video rack mount kits, mounting equipment, power supplies, electrical identification equipment, cable management equipment, etc.) required for a complete and fully operational system video system.

C. Conduit - Furnish all necessary conduits to install the required interconnection cabling into the control room from the installed communications equipment cabinet in Special Provision F28.00 titled “LAN Communications Equipment”.

Construction –

Coordination and Work Plan - Schedule and conduct a site survey. Identify locations of existing equipment, available input and output ports, existing space for new equipment, and available electrical power outlets.

Coordinate with the Representative to determine the assignment of video input ports, video output ports, data output ports, addressing, labeling, limit stops, and other required parameters for the system.

Develop and submit for approval a work plan. The work plan must ensure the continuity of existing tunnel control room operations. Include a schematic diagram identifying connections of new equipment to the existing system. If required, develop and submit a schematic diagram identifying additional branch circuits or extensions of existing circuits to power the new equipment. Also develop and submit a dimensioned plan indication proposed locations of new equipment. Clearly identify any "make-ready" work that is required.

Make Ready - Perform "make-ready" to the tunnel control room and adjacent electrical room in order to allow the new equipment to be installed. This may include installation of a new 20A branch circuit, or extension of an existing branch circuit to power the new equipment. This may also include the installation of mounting devices (e.g., shelves, monitor mounts, etc.) to install new equipment.

For the purpose of estimating cost, assume that one new branch circuit, of total length of 200', with a new 1 pole, 120VAC, 20A circuit breaker, 3 boxes, and 3 duplex receptacles will need to be furnished and installed by the Contractor to provide electrical power to the new equipment in a tunnel control room. The existing power distribution panel will be located in an adjacent room. Install the cable in EMT, consistent with these specifications and all requirements of NFPA 70. Also assume that all new equipment will require mounting devices, including devices to mount to walls, ceilings, on new shelves or mounts in existing rack space, or similar. Assume that the location of existing equipment in existing racks or consoles may require minor relocation to provide space for the new equipment.

After receiving approval from the Representative, provide 30 day advanced notice to the facility prior to starting this work.

Connect Equipment - Install all signal and communication cable assemblies required to connect the equipment. Route and manage cables to provide a neat appearance without causing strain at the connectors. Wherever possible, install data and coaxial cables in existing pathways or through the existing consoles. Where this is not possible, provide new cable management devices to route the cable.

Set up the configuration parameters for the system. Develop databases, switching sequences and tours, video annotations, labels, develop all documentation, and all other parameters as required for a fully integrated and operational system. Adjust the configuration and fine-tune the settings as required to troubleshoot problems that arise and to optimize the performance of the system and as directed by the Representative.

Satisfaction of the above requirements does not relieve the Contractor of responsibility for incorrect installation, defective equipment items, or collateral damage as a result of Contractor work/equipment.

IP VIDEO MANAGEMENT SYSTEM

Description – This work consists of furnishing, installing, integrating, and testing a fully operational IP Video Management System at tunnel control rooms and the Traffic Operations Center in Highspire. The IP video system at the TOC shall have the ability to stream "on-demand" video from any camera installed in this Contract over PTC's existing Wide Area Network. It shall also allow for dual PTZ control between the TOC and the four tunnel control rooms. The system shall also allow for automated snapshots from each tunnel location to be transmitted to the Highspire facility. The frequency of snapshots will be agreed to upon between the PROPOSER and the Commission. Payment for this item is incidental to the project.

Video systems exist at Kittatinny/Blue and Lehigh tunnels. The new IP Video Management System at these tunnels shall operate independently of current hardware at these tunnels and no integration is needed.

Material – The IP video management system shall consist of an advanced software suite designed to provide high quality delivery and processing of IP based video using MPEG-4 compression using standard Ethernet based networks. The IP video system shall be a distributed based architecture with seamless integration of all video and camera control functions. An intuitive graphical user interface shall manage all IP based system configuration, video matrix switching and camera control functions. The IP video management system shall also be capable of integrating into larger system environments through available API or SDK component libraries.

The following is a list of approved manufacturers and products of IP Video Management Systems:

- Bosch Security Systems
  Vidos 3504/X Series Video Management System
  850 Greenfield Road
  Lancaster, PA 17601-5874
  Telephone: (800) 326-3270

- Cohu, Inc
  i-linx II 9900 Series IP Video Management System
  3912 Calle Fortunada
  San Diego, CA 92123
  Telephone: (858) 277-6700

Other manufacturers of video management systems that meet the specifications may be used subject to approval by the Representative. Provide a list of customer references, addresses, and telephone numbers when requesting approval.

Furnish an IP Video Management system with six (6) licenses for non-proprietary PC workstations – one each at four (4) tunnel control rooms and two (2) at the Traffic

Operations Center in Highspire. The system shall have the ability to manage at least thirteen (13) cameras under this Contract and be scalable for the addition of more cameras on a unit-by-unit basis.

Major functions of the IP video management system include:

- IP video stream routing, allow selecting any video source to any video destination and display management.
- Software decoding and display management.
- Manual and automatic camera site PTZ control with camera site programming/setup
- User GUI web interface.
- Multi-user system architecture with password protection, including user definable system privileges, system device partitioning and camera control contention priority scheme.
- Dedicated client GUI programmable for full system monitoring, control and management, using hierarchal site maps or tree-view lists for device selections
- Allow USB based CCTV control panel/joystick capability.
- Provide a comprehensive system device configuration utility application.
- Allow for a centralized or distributed system database.
- Support IP network connectivity, including LAN, WAN, VPN, Internet and Wireless (WiFi and Cellular) technologies.
- Supports IP Multicast (UDP) and Unicast (TCP or UDP) video streaming as well as Multi-unicast.
- Set each camera encoder's bit rate, frame rate and resolution independently from other camera encoders in the system.

Keypad - Furnish Keypads with integral variable speed pan/tilt/zoom (PTZ) joystick that are compatible with the IP Video Management System and the Camera Assemblies. Keypads will enable all CCTV camera PTZ control and video switch functionality described. Keypads shall have a USB connection. Furnish one keypad per license.

Construction – Procure licenses and install software at each existing workstation at tunnel control rooms and Highspire.

Configure the system such that the new cameras' PTZ may either be controlled from a workstation and keypads at its respective tunnel and at workstations at the TOC in Highspire. Control between tunnels is not required (e.g., camera control at Lehigh Tunnel will only control Lehigh CCTV cameras).

Training, Documentation, System Testing Procedures, and Warranty and Guaranty requirements are covered in Special Provisions of this contract.

Testing – For the Factory Demonstration Test for this Video Management System, include the CCTV camera, keypad, monitor, all accessories and appurtenances.

Demonstrate control of the camera from two different locations, at each tunnel control and at Highspire. Demonstrate camera addressing, selecting, control and all other functionality.

Measurement and Payment - As specified in the Special Provision as item 9900-0442.

APPENDIX B
VARIABLE MESSAGE SIGN (VMS) - FUNCTIONAL REQUIREMENTS

GENERAL

The PROPOSER shall design, furnish and install a typical highway usage Light Emitting Diode (LED) Variable Message Signs (VMS) as described herein. The VMS shall utilized the existing Commission central software that that is capable of controlling all of the Commissions existing and proposed VMS from this contract, The VMS shall be used to provide variable displays to advise the travelers of changing roadway conditions. This document describes the functional sign requirements for several locations within the Commission. The VMS, depending on the location, shall electronically vary the visual textual word, number, symbolic or graphic display as traffic conditions warrant. It is the intent of the Commission to utilize amber LED technology for all VMS signs.

Design, furnish, completely install, integrate, and test all proposed center mounted and full span (overhead) VMS as described herein, and shown in Appendix A, including all foundations, structures, signs, cabinets, guide rail, all power and required equipment to utilize either Tyco Electronics wireless, fiber optic cable or hybrid of both communications system to transfer VMS data back to the TOC via the Commissions WAN. These signs shall be amber LED VMS, and shall be controlled by a client/server controlling software that is capable of controlling all of the Commissions existing and proposed VMS from this contract. The PROPOSER is required to trim all trees and vegetation to provide an unobstructed view of the VMS for up to 1000-feet .Integrate all VMS of this Part into the remote control and monitoring of all signs from the Commissions TOC within the Highspire facility.

It is the sole responsibility of the PROPOSER to design, procure, install and integrate a fully functional VMS system at the locations denoted in this contract, to the approval of the Commission. No additional payments will be made to the PROPOSER for the VMS system, unless it is additional work items mutually agreed upon by both the PROPOSER and the Commission.

Material – Provide a fully debugged VMS system complete with all individual units, components, software modules, cabling, connectors, etc. that are completely compatible with each other and is capable of being controlled by the current MIST transportation management workstations operated by the Commission.

General Requirements - The Variable Message Sign shall be designed in accordance with NEMA Standards Publication TS-4, Hardware Standards for Dynamic Message Signs with NTCIP Requirements and manufactured from an ISO-9001: 2000 facility. It shall consist of amber Light Emitting Diode (LED) pixel based matrix modules arranged to form a line matrix display. The matrix shall be capable of displaying, at a minimum, three (3) rows of fifteen (15) characters each, with a nominal character size of 18-inches using a 7x5 pixel matrix for each character. The maximum dimensions and weight are called out in the Contract Drawings.

Light Emitting Diodes (LED's)

- The LED's that make up the display modules shall be high luminous intensity T-1 3/4" type Aluminum Indium Gallium Phosphate AlInGaP II lamps as manufactured by Agilent, Series HLMP-AL16 or HLMP-BL16 or equivalent approved by the Representative. The LED's shall have an ultraviolet light inhibitor in the epoxy dome package and be of a production type already tested for use in high vibration commercial traffic environments and climate of the northeastern United States.

- The light emitted by the LED display shall be amber, with a dominant wavelength centered at 592 nanometers, plus or minus 2 nanometers.

- All LEDs shall have a nominal viewing cone of 30 degrees with a half-power angle of 15 degrees measured from the longitudinal axis of the LED.

- The LED's used in the display shall be obtained from batches sorted for luminous output, where the highest luminosity LED in the batch shall not be more than fifty percent more luminous than the lowest luminosity LED in the batch when operated at the manufacturer's recommended drive current. To ensure uniformity of display and operational life, all LED's used to make up a display module shall be obtained from the same manufacturing batch.

- The LED mean time before failure (MTBF) shall be a minimum of 100,000 hours of elapsed time calendar hours use in an ambient temperature of 131 degrees Fahrenheit, based on an average daily on-time usage factor of 50%, when driven at the specific forward current recommended by the LED manufacturer for normal daylight LED VMS display operation. As part of the LED manufacturer's technical specification sheet submittal, the specific forward current shall be noted.

- The statistical average long term light output degradation of the LED's used in the display, operated at the LED manufacturer's recommended drive current to achieve a minimum of 100,000 hours of operation without catastrophic failure in an ambient temperature of 131 degrees Fahrenheit, shall not exceed the following:
- A maximum of 10% reduction in light output after 10,000 hours of continuous on-time.
- A maximum of 25% reduction in light output after 50,000 hours of continuous on-time.

- Manufacturers documentation for high temperature operating life (HTOL) shall indicate if HTOL values are based upon actual or extrapolated data.

LED Display Modules

- The LED display modules shall have a minimum refresh rate of 60 times per second to prevent visible flicker.

- The LED's shall be grouped in pixels consisting of discrete LED's arranged in a continuous matrix display with individual pixel addressability. The centers of all pixels shall be arranged so as to maintain the same horizontal and vertical spacing between adjacent pixels. All pixels shall be replaceable. The LED grouping and mounting angle shall be optimized for maximum readability.

- The electronics for the LED VMS shall be fully configured to drive the total required number of LED's. The failure of any one pixel shall not affect the operation of any other pixel. The power driver circuitry shall be designed to minimize power consumption. Each LED display module shall have a diagnostic capability to detect a failure on the LED display module, down to the pixel level and report the failure to the VMS controller.

- Removal of any display module shall not affect the operation of the remaining modules.

- The LED VMS shall be protected from degradation due to sunlight. The method used shall not obstruct the view of the display or reduce the viewing angle below that provided by an unprotected LED VMS. The method and design of the LED VMS sunlight protection shall be approved by the Representative.

- Each pixel shall contain an adequate number of discrete LED's, based on a nominal pixel spacing of 2.57 inches (center to center) to meet the luminosity requirements herein.

- Each discrete LED on the display module is driven at the LED manufacturer's recommended drive current to achieve a minimum of 100,000 hours of operation without catastrophic failure.

- The full graphic display of the LED VMS shall be clearly visible and legible from in-vehicle viewing distance of 900 feet from the VMS face under clear daylight and nighttime conditions with the VMS face positioned in the roadway line of sight configuration shown on the Contract Drawings.

Dimming Circuitry

- The LED VMS shall have a photocell controlled dimming circuit which shall automatically adjust the luminance of the VMS display pixels in accordance with ambient light conditions. As part of the Contractor's shop drawing submittal, a complete schematic of the LED display power, driver and dimming circuits shall be provided for approval by the Representative.

- Continuous current drive shall be used at the maximum brightness level. The current used for maximum brightness shall not exceed the current used to achieve the rated mean time before failure (MTBF). The current used for maximum brightness shall be indicated as part of the shop drawing submittal.

- For luminance levels less than maximum brightness, either continuous current drive or current pulse width modulation shall be used to dim the LED's. If pulse width modulation is used, the dimming circuit shall be designed so that the maximum, instantaneous and average currents shall not exceed the rated peak and transient forward current ratings of the LED's.

- The LED VMS shall be equipped with a minimum of two external light sensors oriented in opposite directions and shall be scaled for up to 100,000 lux.

- The LED dimming circuit shall also incorporate temperature controlled dimming, which shall reduce the current through the LED's based on the temperature inside the VMS enclosure, so that the LED current does not exceed the rated LED current at that temperature. If the temperature of the VMS exceeds the rated operating temperature of the LED's the VMS shall blank-out, until the temperature has returned to safe operating levels.

- The LED dimming circuit shall not cause the LED display to flicker as the temperature oscillates above and below the rated operating temperature of the LED's.

Power Supply

- The LED display shall be operated at a low internal DC voltage not exceeding 24 Volts.
- The quantity of power supplies and current rating of each power supply shall be at least 25% spare capacity over that required to light every pixel of the LED VMS at full brightness.
- The LED VMS and controller shall have redundant power supplies wired so that in the event of a failure of any one power supply, the second power supply shall automatically power that portion of the sign. Power supply failure shall be automatically reported by the VMS controller when polled by the VMS Central Processor.
- The power supplies shall be short circuit protected and shall reset automatically after 5 seconds of AC power off. The power supplies shall be protected by a suitable overcurrent protection device.
- The power supply shall have an efficiency rating of 85%, minimum.
- The operating temperature range of the power supply inside the VMS enclosure shall be -20 degrees Fahrenheit to 140 degrees Fahrenheit.
- The power supply shall be UL listed.

Sign Enclosures

- The LED VMS enclosures shall be of such design and shape as to house all necessary LED display modules, LED display driver electronics, transformers,

and power supplies unless otherwise indicated on the Contract Drawings. The LED VMS enclosures shall have a weatherproof housing with overall dimensions as shown on the Contract Drawings.

- The LED VMS enclosures shall be constructed of corrosion resistant aluminum material conforming to the following:
- Sheet aluminum shall be fabricated from aluminum alloy sheet meeting the requirements of ASTM B 209, Alloy 5052, Temper H3, or equivalent, minimum 0.125 inch thick. Cast aluminum shall be fabricated from aluminum alloy meeting the requirements of ASTM B 686, Alloy A 356 (A 13560) or equivalent. Flat cast surfaces exceeding 12 inches in both directions shall have a minimum thickness of 0.25 inches. Flat cast surfaces not exceeding 12 inches in both directions shall have a minimum thickness of 0.187 inches.
- All LED VMS enclosures shall meet the requirements for TYPE 3R enclosures according to NEMA Standard Publication 250. All seams and openings shall be designed to prevent entry of water resulting from high pressure washing of the LED VMS enclosure.
- Unpainted aluminum VMS enclosures shall be fabricated from mill-finish material and shall be cleaned using appropriate methods that will remove oil, film, weld black, and mill ink marks and render the surface clean, bright, smooth, and non-sticky to touch.
- Isolate all adjacent dissimilar materials, as approved by the Representative.
- All nuts and bolts used in the VMS assembly shall be stainless steel. All connecting surfaces shall be weatherproof and watertight when secured. All internal components shall be mounted so that there are no external protrusions.
- The LED VMS shall be in accordance with the AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaries, and Traffic Signals, except as modified herein: The VMS enclosures shall be designed and constructed to present a clean, neat appearance and the equipment located inside shall be adequately protected from moisture, dust, dirt, corrosion, and excessive heat.
- All surfaces shall be suitably protected from the weather and painted. All corners and seams shall be heli-arc welded to provide a weatherproof seal around the entire case.
- The LED VMS enclosure shall not be adversely affected by salt from the roadways or marine environments or chemicals or fumes discharged from nearby automobiles, industries and other sources. The interior of the VMS face window and the LED's shall be easily accessible for cleaning and other maintenance.
- Appropriate precautions, such as heating elements or ventilation fans or openings, shall be taken to ensure that condensation does not occur between the matrix elements and the VMS window face, and that the environment inside all enclosures remains within the temperature and humidity limits required for proper operation of the sign's electronic components.

- All hinges used shall be continuous stainless steel, equipped with stainless steel hinge pins. Each hinge shall be secured with stainless steel bolts and lock nuts. The hinge pins and bolts shall be tamper proof.
- The dead load shall consist of the total weight as installed of the VMS enclosure and appurtenances. The point of application of weights of the individual items shall be their representative centers of gravity.
- Ice load shall be as per AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaries, and Traffic Signals except that ice load shall be applied to all sides and top surfaces of the VMS enclosure simultaneously.
- Wind load shall be as per AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaries and Traffic Signals except as modified herein. The enclosure and their mountings shall withstand a sustained wind speed of 90 miles per hour (mph), with a gust factor of 1.3.
- Full 100 percent impact shall be used for handling and erection stress.
- The Contractor shall furnish mounting brackets that will allow for field adjustment of the VMS housing for optimizing the viewing angle after installation.
- The signs shall be capable of being mounted without gaining access to the inside of the enclosure. Any mounting eyes shall be attached to the VMS enclosure structural framing. The LED VMS enclosure shall be adaptable for mounting as shown on the Contract Drawings.
- Removal of any of the display modules or any other electronic or electrical component, shall not alter the structural integrity of the VMS display assembly or the VMS enclosure.
- Access to the interior of the VMS enclosure shall be rear access via canopy doors. No walk-in housings shall be permitted. The access doors shall be hinged at the top and at some other intermediate point, so that when the access doors are in the open position, they shall create a temporary shelter that consists of a roof and partial rear wall. When all of the doors are open, the canopy shall protect the electronic equipment and maintenance personnel from the elements. The gap between two adjacent doors shall be no larger than 3/4 inch. Opening a canopy door shall allow maintenance personnel immediate access to circuit boards and internal sign parts, without having to remove any item in the sign, or the need to use any tools or to remove any device that could be dropped or lost, such as a locking pin or bolt. Each door shall be sealed to prevent the elements from entering, and shall have at least two locking points to keep unauthorized persons from accessing the interior of the VMS Sign. In addition, each door shall be provided with rigid, telescopic, retention device, to keep the door in the open position.

  Alternate rear-access doors are acceptable. When in the open position, the doors shall not obstruct any portion of the opening. The doors system shall pull the

door tight and compress a gasket located around the perimeter. The gasket shall prevent water from the interior of the cabinet.

- All serviceable components shall be modular, interchangeable and removable from within the VMS enclosure. The sign design shall allow unobstructed and convenient access to all serviceable components within the VMS enclosure and between the VMS display and the VMS display cover.

- Drain holes shall be provided and designed to remove any condensation that may form inside the VMS enclosure and allow any water that may have collected in the housing to escape. All holes shall be screened to prevent small objects, insects and creatures from entering into the enclosure.

Ventilation

- Electric exhaust fans shall be provided and sized to provide 25 percent excess ventilation capacity, with one fan inoperative, over that required to maintain the VMS enclosure interior temperature within the range over which the LED VMS components can operate without failure or degradation, during full daylight heat gain conditions. All fans shall have ball or roller bearings. Fan operation and failure shall be reported to the VMS Central Processor via the communications protocol.

- Louvered air inlets with removable, non-proprietary 500 micron, 2-stage filters and air deflector, sized to provide a maximum air intake velocity of 600 feet per minute with all fans operating. The direction of airflow and the filter characteristics (i.e. filter model number, type, dimensions and particle size) shall be permanently engraved on each air vent. Exhaust air vents, if without filters, shall be screened to prevent small objects and creatures from entering into the enclosure.

- Heating, cooling and dehumidifying equipment sized to maintain the internal VMS enclosure temperature within the operating ranges of the electric, electronic and mechanical equipment components. The environmental equipment shall have controls which shall shutdown the LED VMS just prior to the temperature that the interior of the enclosure reaches the rated maximum operating temperature of the LED's, and shall restore operation when the temperature has returned to safe operating levels. The shutdown shall be automatically reported by the VMS controller when polled by the VMS Central Processor.

VMS Controller

- The VMS controller shall be a microprocessor-based unit with sufficient on-board memory and input and output interfaces to provide all the functions required by this Section.

- The VMS controller shall accommodate both local and remote control from multiple host devices as described herein. Local control shall be supported from a locally connected Sign Programmer and local control panel unless otherwise indicated on the Contract Drawings. Remote control shall be supported from a remotely located VMS Central Processor (control computer system) unless

otherwise indicated on the Contract Drawings.

- The VMS controller shall receive and interpret commands sent by the host device to either configure the VMS or cause a requested message to be displayed on the VMS. Based on the command, the VMS Controller shall provide return data to the host device to provide information about the status of the sign.
- The VMS controller shall be capable of simultaneously receiving commands from and transmitting status data to multiple host devices, i.e. the sign programmer, local control panel and the VMS Central Processor.
- The method of control of the LED VMS shall be dependent upon the setting of the Control Mode Selector switch in each local control panel. This switch shall allow for two modes of operation:
- "Remote" mode: This is the normal mode of operation of the LED VMS, where all control is from a remote VMS Central Processor, via NTCIP data exchanged directly between the remote VMS Central Processor and the VMS controller.
- "Local" mode: When the Control Mode Selector switch is in this position, control from the remote VMS Central Processor shall be disabled and the LED VMS shall be controlled in accordance with commands entered via the message selector switch on the Local Control Panel or a NTCIP data exchanged directly with a locally connected Sign Programmer. When in "local" mode, the remote VMS Central Processor shall still be able to monitor the status of the LED VMS.
- When switching from one mode to another, the LED VMS shall continue to display its current message, until it receives a command to display another message, from either the remote VMS Central Processor or the local controls, as applicable.
- A change of position of the mode selector switch shall be reported to the VMS Central Processor, via the communications protocol.
- Each VMS controller shall have error detection and reporting features, which shall be utilized to guard against incomplete or incorrect information transmission and message generation and display on the VMS face, as well as capability to detect a failure down to a replaceable component and report the failure and failed component. All errors and hardware failures shall be logged and reported to the VMS Central Processor, or Sign Programmer (if connected), via the communications protocol. The VMS controller shall have the capability to automatically recover from failure conditions when the failure conditions are corrected or the failures are no longer present, and report the restored operation of the LED VMS to the VMS Central Processor or sign programmer if connected.
- The VMS controller shall have diagnostic capabilities features to:
    - perform redundant checking of all data received and transmitted, incorporate cyclic redundancy check (CRC) error detection logic, as specified by the NTCIP standards (see below).

- validate the content of all received transmissions.
- check and report logic or data errors.
- monitor status for communication line malfunction or break.
- respond to system polling from the VMS Central Processor.
- check and report errors in display driver operation. check and report the failure and location of bad pixels.
- check and report the failure of bad fans
- check and report whether the controller cabinet or VMS enclosure door is open or closed.
- check the operation and report the failure and location of bad power supplies.
- check the duration of power failures.
- check and report the number of occurrences the watchdog timer resets the controller.

- Whenever any of the following error or failure conditions is detected, the controller shall blank the VMS and shall include the error or failure in the return message. Information of the specific failures shall be sent to the VMS Central Processor.
  - The number of pixels that are not working for the particular sign type exceed a specified maximum value. The Contractor shall determine this number for each sign type and have these numbers approved by the Representative.
  - The ratio of the number of pixels that actually achieve a commanded state divided by the number of pixels actually commanded to that state exceeds a legibility threshold value. The test shall include only those pixels that are contained in the actual character positions of the message text.
  - Communication loss greater than a configurable time value measured in minutes. The default value shall be 10 minutes. If a system poll is not received within a configurable threshold period, the controller shall blank all signs connected to it. The configuration of system polling shall also have an option for disabling this feature.
  - Upon detection of a power failure to the VMS controller or the LED VMS display(s) connected to the controller the current message displayed on the LED VMS just prior to the power failure shall be retained in memory.
  - Upon power restoration, the LED VMS shall remain blank if the duration of the power failure exceeded the configurable long term power failure duration threshold, else the previous message shall be restored to its respective LED VMS. The default value of the long term power failure duration threshold shall be 10 minutes.

- Overheating condition in VMS enclosure: The LED dimming circuit shall also incorporate temperature controlled dimming, which shall reduce the current through the LED's based on the temperature inside the VMS enclosure, so that the LED current does not exceed the rated LED current at that temperature. If the temperature of the VMS exceeds the rated operating temperature of the LED's the VMS shall blank-out, until the temperature has returned to safe operating levels.

- Each VMS controller shall have the capability of displaying messages transmitted directly from a VMS Central Processor or Sign Programmer in addition to displaying locally commanded messages displayed from a pre-programmed local message library. Each sign's local message library shall have the capacity to store a minimum of 256 display messages with related display attributes for each message, such as flashing rate and percent "on" time. The local message library shall consist of:

  - A "changeable, non-volatile" local message library stored in battery backed RAM. The changeable local message library shall be programmable through both the VMS Central Processor and the Sign Programmer. The minimum number of "changeable" local messages, message text and associated display parameters shall be as defined in Table 1 below.
  - A "permanent, non-volatile" local message library, stored on EPROM shall be provided. Battery-backed RAM memory shall not be acceptable. The number of "permanent" local messages, message text and associated display parameters are indicated in Table 1 and Table 2 below in a generic manner; however, the Representative may request that the actual number of permanent messages might be larger and that the actual message be change. If a microprocessor-based controller is used then EEPROM, flash RAM or similar technology memory devices, programmed as described herein, may be used to store the message library.

- Each VMS controller shall write messages on the LED VMS at a minimum rate of 300 characters per second.
- Each VMS controller shall have an easily accessible and clearly labeled ON/OFF switch. When in the "OFF" position all power shall be disconnected from the VMS control electronics and matrix units and the LED VMS displays shall blank out.
- The VMS controller shall have a momentary contact switch which resets the VMS controller when depressed. Operation of the momentary contact switch shall not require the user to hold the switch in the depressed position for more than 0.25 seconds.
- The VMS controller shall interface and communicate with one or more Operator Interfaces, as indicated on the Contract Drawings. Operator Interfaces and associated

functions shall be as described elsewhere herein.

- The VMS controller shall be provided with all software and hardware required to perform the following functions:
    - Password protection to restrict access to control & configuration functions.
    - Fully programmable parameters for all functions described in this section.
    - Real-time clock and calendar for timing and scheduling of automatic functions. The calendar shall automatically adjust itself for leap years, and for changeover from Standard to Daylight savings time and back.
    - Variable message flash rate and percent "on" time.
    - Flash rate shall be adjustable in one-tenth second increments.
    - Percent "on" time shall be adjustable from 0 to 9.9 seconds, in one-tenth second increments.
    - Multi-page messages with variable page display times that are adjustable in one-tenth second increments from 0 to 15.0 seconds.
    - Negative text inversion (or inverse/reverse video) - switch between illuminated text on a dark background or dark text on an illuminated background. Inverse/reverse video shall be implemented with the use of standard NTCIP foreground and background objects.
    - Displayed line justification (center, left or right) with center justification as the default setting.
    - Displayed page justification (top, center, bottom) with center justification as the default setting.
    - Displayed message duration parameter, to specify how long the current message should remain displayed regardless of the status of the communications with the VMS Central Processor.
    - Communications Loss message threshold, to specify how long the current message should remain displayed in the absence of communications with the VMS Central Processor.
    - Control of pixel luminance levels, both directly and based on ambient light levels obtained from the photocells. Luminance levels shall be stored in the VMS Controller and shall be adjustable, in a range of 0 to 255, on either:
    - A continuous logarithmic basis, to match the normal human eye luminous response characteristic, or
    - A 1/2 incremental dimming basis, where each lower dimming level is 1/2 the previous level.
    - Monitoring of each pixel of the LED VMS.

- Monitoring of power failures: When a power failure is detected, the displayed message shall be retained in memory. If power to the VMS controller is restored within a configurable period of time, the last displayed message shall be restored. If the duration of the power failure exceeds the configured period of time, the LED VMS shall remain blank, until a command to display a message is received. Upon restoration of power, the VMS controller shall report the occurrence, time and duration of the power failure, to the VMS Central Processor or Sign Programmer, if connected.
- Hardware watchdog timer: The VMS controller shall have a hardware watchdog timer that shall check for a stall condition in the controller hardware, software or firmware. While the VMS controller is powered on, the software shall poll the watchdog timer. Upon reset, the watchdog timer shall initialize its timing circuit. If the watchdog timing circuit times out without being reset by the software, the watchdog counter shall be incremented and the watchdog shall reset the controller to clear a potential stall condition from the hardware, software or firmware and send an error message to the VMS Central Processor or Sign programmer, if connected, to advise of the condition. The number of occurrences the watchdog timer resets the controller shall be transmitted to the VMS Central Processor or Sign programmer, if connected, upon request, then cleared.
- Programmable Font Sets: The VMS controller shall support a minimum of 4 programmable font sets. Each font set shall be capable of being programmed from the VMS Central Processor or the Sign Programmer if connected. Three of the font sets shall look like the E-modified font set defined by the MUTCD, replicating the appearance of the font used on some static signage on the LED VMS. A single, double and triple stroke E-modified font shall be provided. A fourth font set shall be provided and shall replicate the Helvetica Medium font used on most static signage at the facility where the VMS is to be installed. Alternate font sets shall be provided if otherwise indicated on the Contract Drawings. All font sets shall be submitted to the Representative for approval.
- Each font set shall include, but not be limited to, all upper case letters, numerals, punctuation marks and arrows that are displayed in each of the eight cardinal directions.
- The VMS controller shall keep a log of all system errors, malfunctions, automatic operations and locally controlled commands and activities. All logs shall be time and date stamped. The VMS controller shall have sufficient memory to store a minimum of 500 log entries. If 100% of the log storage memory has been reached without a successful download to the VMS Central Processor or a Sign Programmer, the oldest log entry shall be overwritten. The VMS controller shall download all log entries to a VMS Central Processor or Sign Programmer, upon user request from one of these devices and clear the log.

Communications - The VMS to be deployed for this project shall deploy two different communications methods. VMS within range of the fiber optics communications lines shall be connected using terminal servers, while VMS outside of the fiber optics communications lines shall be connected wirelessly using CDMA modems.

The VMS controller shall have a minimum of two (2) serial data and one (1) Ethernet communications ports to facilitate simultaneous communications for local and remote control, programming and diagnostics. It shall be at the option of the PTC to connect a CDMA modem or a fiber optic modem to either a serial port or the Ethernet port.

When connected to a serial port, the VMS shall automatically use the NTCIP communications stack associated with serial communications, i.e., NTCIP 2101, NTCIP 2201, and NTCIP 2301.

When connected to the Ethernet port, the VMS shall automatically use the NTCIP communications stack associated with Ethernet communications, i.e., NTCIP 2104, NTCIP 2202, and NTCIP 2301.

All ports shall be configurable.

- Communications with the serial ports shall support all typical serial baud rates ranging from 1200 to 115,200 baud.
- Communications with the Ethernet port shall be capable of communicating via TCP/IP or UDP/IP at 10 or 100 MB.

The serial ports in the VMS sign controller shall be protected with surge protection to protect the modem communication port from over-voltage and over-current conditions between each signal line and ground.

VMS Software - Furnish NTCIP compatible control/diagnostic software for the purpose of troubleshooting and testing during installation and testing. The software shall send requests to and receive responses over any TCP/IP-based network for the functions of controlling VMS messaging, monitoring system status and perform VMS diagnostics (detecting failed pixels, display drivers, power supplies, alarm conditions etc.).

For the details and definitions for the actual NTCIP communications protocols used to accomplish this, see below.

Cabinet and Concrete Foundation - Furnish a ground-mounted controller cabinet that shall be constructed to have a neat, professional appearance. The cabinet shall protect all internal components from rain, ice, dust and corrosion in a accordance with NEMA 3R standards, as described in NEMA Standards Publication 250 and be made of aluminum (0.125-inch thick). The cabinet shall include the following:

- A full-height standard EIA 19-inch rack
- The main power supply and energy distribution system (main disconnect)

- One work lamp to illuminate the work area, when the cabinet door is open (lamp shall automatically turn off when cabinet door is closed)
- At least one 15 Amp, 120 VAC GFCI protected duplex service outlet
- Lightning protection and terminations for the communication and control cables
- Termination blocks for the control cables to and from the VMS sign housing
- Permanently mounted document holder
- Electrical drawings shall printed on water/tear-resistant material
- A pullout shelf
- An open door alarm that reports to the VMS controller
- Surge protection on all incoming power lines meeting the following minimum specifications:
- Maximum Clamp Voltage: 340V
- Peak Current: 20,000 Amps
- Response Time 5 nanoseconds
- Occurrences 20 times at peak current
- Minimum Series Inductance: 200 microhenries

Catwalk and Enclosed Ladder for rear access sign - Furnish an anti-skid catwalk with handrails to offset the back of the sign from the structure, and to provide workspace for maintenance personnel and door clearance for rear access VMS. For access to the catwalk from the roadside, furnish a ladder permanently attached to the back side (rear access VMS) of the post. The ladder shall be enclosed with accessibility to be restricted by a door with a locking mechanism. Submit shop drawings to the Representative for approval.

NTCIP - All VMS and associated control equipment shall comply with the latest approved versions of the National Transportation Communication for ITS Protocol (NTCIP) Standards during installation as detailed in the following NEMA Standard Publications.

- NTCIP 1102:2004 (v01.15, October 2005) – Octet Encoding Rules (OER) Base Protocol
- NTCIP 1103 v01.26 (Approved, November 2005) – NTCIP Transportation Management Protocol (TMP) Base Protocol
- NTCIP 1201:1996 and Amendment 1 – Global Objects (GO) Definitions
- NTCIP 1203:1997 and Amendment 1 – NTCIP Object Definitions for Dynamic Message Signs, or the current version of this standard
- NTCIP 2101:2001 (v01.19, November 26, 2001) – Point–to-MultiPoint Protocol (PMPP) using RS-232 Subnetwork Profile
- NTCIP 2104:2003 (v01.11, September 2005) – Ethernet Subnetwork Profile
- NTCIP 2201:2003 (v01.15, September 2005) – Transportation Transport Profile
- NTCIP 2202:2001 (v01.05, December 2001) – Internet (TCP/IP and

UDP/IP) Transport Profile

- NTCIP 2301:2001 (v01.08, December 2001) – AP-STMF (Simple Transportation Management Framework) – Conformance Level 1
- NTCIP 8004 v01.37a (Approved) – Structure and Identification of Management Information (SMI) Base Protocol

The proposed VMS shall support both of the following communications stacks and provide a configuration mechanism to select either one of these stacks:

- For serial communications: NTCIP 2101, NTCIP 2201, and NTCIP 2301
- For Ethernet-type communications: NTCIP 2104, NTCIP 2202, and NTCIP 2301

Furnish and install all mandatory objects specified by the NTCIP specifications and all other objects, both NTCIP optional and the manufacturer specific, that are required to provide the functionality to meet the requirements of these specifications.

Each VMS Component shall support the Full, Standardized Object Range (FSOR) of all objects required by these procurement specifications, unless otherwise indicated below or approved by the Representative.

The VMS system shall not require the support of any agency-specific or manufacturer-specific objects. However, the Contractor shall propose any object definitions necessary to fulfill the above functional requirements that are not addressable by standardized NTCIP-defined object definitions. All functional requirements and the corresponding NTCIP objects have been carefully reviewed and only functions that have corresponding NTCIP objects have been selected. Manufacturer-specific objects may be implemented in the sign controller but they shall in no way required to be used in order to communicate with the sign.

The VMS shall support all mandatory objects of all mandatory Conformance Groups as defined in NTCIP 1201 and NTCIP 1203 and their amendments.
The NTCIP Component shall also implement all mandatory objects of the following optional conformance groups.

The NTCIP Component shall also implement all mandatory objects of the following optional conformance groups.

- Time Management, as defined in NTCIP 1201
- Timebase Event Schedule, as defined in NTCIP 1201. The following list indicates the modified object requirements for this conformance group.

In the event of a conflict between the Contract Drawings and Specifications and the NTCIP standards, the Representative shall be solely responsible for the identification of the acceptable solution.

Construction – Provide installation and layout plans for approval by the Representative

before construction.

Position sign for optimum view for motorists as per sign specifications.

Install a VMS control cabinet and controller cabinet foundation as indicated in the plans. Install concrete cabinet foundation in accordance with Sections 1001 and 1002. Excavation shall be in accordance with Section 204. Secure the cabinet to foundation such that the complete cabinet assembly withstands a wind load of 90 mph and a gust factor of 1.3.

Install all interconnection cables inside conduits, which run between the sign controller unit and the sign support structure and within the sign support structure itself.

- Associated Cables and Wiring. Provide all wiring and grounding conforming to the requirements of Section 1104.05. Size of conductors will be as required by load and distance.

- Install power and control necessary to operate the variable message signs. Install the cables in liquid tight conduit in concealed locations as indicated, between the nipples on the sign support and sign case. The cables will use the sign support beams and legs as raceway and will be installed in continuous, unspliced lengths between the sign case and the VMS controller. Provide sufficient slack to ensure that the connections to the controller and the power source will be possible without the need to add or splice any cables.

Variable Message Sign Bonding. Provide a VMS having an all metallic enclosure (except for the viewing window) electrically bonded to the support structure at all mounting bolt locations, consisting of an electrical bond wire or properly prepared electrical contact points.

SINGLE POST MOUNTED SIGN STRUCTURE, NEW VMS

Description – This work is the construction of single-post mounted sign structures for stored and new Variable Message Signs furnished under this Contract at locations indicated. The sign structures will follow the PTC-310 and PennDOT ITS standards. Where there is a conflict between the two standards, the Commissions standards will govern.

Material – Sections 948.2 and 1105.02, and as follows:

A. Provide materials and workmanship in accordance with the above Sections and the AASHTO/AWS/D1.5 Bridge Welding Code. Use ANSI/AWS/D1.1 for welding not covered in AASTHO/AWS/D1.5.

B. Provide structural steel conforming to ASTM A 709, Grade 36 designation except where noted otherwise.

C. Provide welded or seamless steel pipe conforming to ASTM A 53, Grade B. AS an alternate. Provide welded or seamless steal pipe conforming to ASTM A 500, Grade B.

D. Provide high-strength steel bolts conforming to ASTM A 325. Provide anchor bolts conforming to ASTM F 1554, Grade 55. Mechanically galvanize all bolts, nuts, and washers. Provide U-bolts conforming to ASTM A 449.

E. Epoxy/Urethane Paint:

1. Prepare surfaces to be painted in accordance with paint manufacturer's recommendations.
2. Apply polyamaide epoxy primer to 2-3 mils dry, 4-6 mils wet.
3. Apply acrylic aliphatic urethane top coat to 4-6 mils dry, 6-10 wet.
4. Fully cure to manufacturer's recommendations.
5. Package for shipment.

F. Fabrication - Grind all areas to be welded to bright metal. Butt weld splices are not permitted, unless shown on the plans. Complete all welding and required testing before any material is galvanized. Non-destructively test all circumferential and stiffener welds using methods and procedures in accordance with section 948. The acceptable criteria are stated in Table 6.1 of ANSI/AWS D1.1. Provide full penetration groove weld and inspect as specified above. Provide maximum weld uncut of 0.01".

Hot-dip galvanize all components (except reinforcement bars, aluminum, and non ferrous incidentals) after fabrication per ASTM A 123 or ASTM A 153, as appropriate.

Structural steel, including all connection hardware and mounting components, shall have an epoxy/urethane paint applied over the hot-dip galvanizing. Paint color shall be brown, Federal Standard 595B No. 30108 Brown. Submit a color chip to the Bridge Engineer Manager for approval prior to purchasing and application.

Construction – Section 948.3 and as follows:

Submit detailed shop drawings for review and acceptance. All material and workmanship will be inspected at the fabrication shop.

Measurement and Payment – Lump Sum, for the location indicated.

APPENDIX B
ARROW BOARD SYSTEM - FUNCTIONAL REQUIREMENTS

GENERAL

This work includes the design, furnishing and installation of a complete and properly operational 4-foot by 8-foot Arrow Board Sign Assembly (ASA) that employs (Light Emitting Diode) LED technology, including all LED signs, break away assembly structure posts, foundations, cabinets, guide rail, all power and required equipment to utilize either a wireless or fiber optic cable communications system to transfer video and control back to the tunnel. The ASA shall include a LED message panel capable of displaying a flashing or static, one-directional "arrow" for the purpose of directing traffic during tunnel lane closures. All other times, the ASA shall not be illuminated and shall be unreadable, regardless of sunlight intensity or direction. The ASA consists of installing signs at four existing crossover paths, two on the northbound approach and two on the southbound approach, of the Commission's Tunnel, as directed in the Plans. The PROPOSER is required to trim all trees and vegetation to provide an unobstructed view of the Arrow Boards from a minimum of 1000-feet.

Design, furnish, completely install, integrate, and test all proposed Arrow Boards as described herein, and shown in Appendix A. These signs shall be a blank out message board utilizing amber LEDs and shall utilize both remote control software, located at each tunnel facility, as well as manual control from the individual Arrow Boards.

It is the sole responsibility of the PROPOSER to design, procure, install and integrate a fully functional Arrow Board system at the locations denoted in this contract, to the approval of the Commission. No additional payments will be made to the PROPOSER for the Arrow Board system, unless it is additional work items mutually agreed upon by both the PROPOSER and the Commission.

APPLICABLE STANDARDS, CODES AND PUBLICATIONS

A. All work shall conform to the latest codes, standards and specifications listed below and all local codes.

1. National Electrical Code (NEC), Latest Edition
2 Occupational Safety and Health Act (OSHA)
3 Underwriters Laboratories, Inc. (UL)
4 Institute of Electrical and Electronics Engineers (IEEE)

ARROW BOARD SIGN ASSEMBLY

Material – The Arrow Board sign assembly includes a weather sealed vented aluminum housing, a blankout sign message panel/optical system, controller cabinet and

miscellaneous hardware, wire and cable. Submit for approval, complete details for the arrow design, sign control and housing including power calculations and heat load for approval of Representative.

A. Sign Housing – The ASA housing dimensions are called out in the plans. The ASA shall operate without any decrease in performance over an ambient temperature range of –30° F to 165° F with a relative humidity of up to 95%; and, it shall be capable of withstanding wind pressures of 74 psf (AASHTO 120 mph).

The housing shall be built entirely of aluminum at least 0.125-inch thick. Access to the interior of the housing for routine maintenance or inspection shall be by access doors mounted on the front of the sign. Each door shall open from the bottom to help prevent the elements from entering, and shall have two locking mechanisms. In addition, each door shall open and close, and be retained in the open position by rigid telescoping self-locking retention devices.

The housing shall be rated for NEMA 3 with the door internally gasketed to provide the necessary seal. All corners shall be welded for stability and water tightness. Silicone or other sealants will not be allowed to seal joints. One screened vent shall be installed on either side of the ASA for ventilation.

The front of the ASA shall be completely finished using a high contrast black color. To eliminate any distractions to the illuminated messages, shiny, reflective or non-black areas shall not be visible from the front of the ASA (including door locks). Front faces of any sort (plastic, Lexan, etc.) will not be allowed.

The sign housing shall come equipped with slotted aluminum extrusions mounted horizontally across the back of the sign. Each extrusion shall accept manufacturer supplied 1/2" stainless steel mounting hardware with bolts that slide within the extrusion for complete adjustability in the horizontal direction. This configuration shall allow the sign to be mounted to vertical members on the structure or hardware supplied by others.

B. Blank Message Panel/Optical Characteristics – The message panel shall display a flashing arrows formed by LEDs. The source of the light shall be two quartz halogen lamps with parabolic reflectors for each individual message. These LEDs shall be rated for at least 100,000 hours average life by the manufacturer, and shall be mounted on vibration absorbing, rubber dampened platforms. The replacement of the modules shall be possible without the use of any tools.

To reduce the number of parts, each pair of lamps shall use only one transformer to step-down the voltage from the nominal 120 VAC line voltage, to the 10 volts required at the lamps.

C. LED’s - The typical luminous output of the LED’s shall be either 3.0 candelas for 15 degree viewing angle, 1.6 candelas for 23 degree viewing angle or 1.0 candela

for 30 degree viewing angle. Luminous outputs shall be per individual discrete LED when driven at a current of 20 milliamperes, measured on the mechanical axis of the lamp package.

The minimum viewing angle (2 ½ degrees) of the LED's to be utilized for each sign shall be either 15 degrees, 23 degrees or 30 degrees, as selected by the Engineer based upon the actual roadway conditions and field of view requirements at each Sign location. The Detailed Contract drawings shall include a table indicating the cone of view requirements and corresponding LED (2 ½ degree) angle for each sign.

The LED mean time before failure (MTBF) shall be a minimum of 100,000 hours of permanent use at an operating temperature of 140 degrees Fahrenheit, then driven at the specific forward current used for normal daylight LED VMS display operation. As part of the LED manufacturer's technical specification sheet submittal, the specific forward current shall be noted.

D. Electrical Characteristics and Components - The ASA shall operate from a nominal 120 VAC power source which is supplied to the ASA via the field wires. The field wiring shall terminate on screw type compression terminal blocks that are easily accessible within the ASA. One hot shall be connected to for the message to energize. All neutrals shall be connected to a single neutral bus bar and all grounds shall be brought to a single grounding point electrically bonded to the housing.

E. Control – The ASA shall operate in either an on or off state. Control of the ASA shall be accomplished via switches, both remotely at the tunnel north and south portal buildings and locally at each Arrow Board, as indicated. No separate ASA controller or software shall be needed to energize the ASA. Submit block diagrams for proposed method of control to the Representative for approval.

E. Control Cabinet – Furnish a pole-mounted NEMA 4X, Type 316 SS, ASA control cabinet sized to adequately contain all equipment and wiring termination required to power and control the ASA. Provide hinged gasketed door with clamps, hasp, and lock. Furnish necessary surge and lightning protection of all incoming cables.

Construction – Submit for approval, complete details for the Arrow Board control for approval of the Representative.

Submit shop drawings to the Representative for approval indicating the recommended materials and method for fastening the Arrow Board and control cabinet to the signposts. Submit cabinet equipment layout diagram, drawn to scale and dimensioned, identifying all equipment, locations, and sizes.

Before starting construction, verify existing underground and overhead lines.

Construct the Arrow Board sign assembly in accordance with the requirements of the

Plans, the manufacturer, applicable codes, regulations and applicable standards.

Mount ASA on new or existing double-post mounted sign structure. Position the front sign face and direction of arrow as indicated in the Plans and optimally for viewing by motorists as per sign specifications.

Install power and control to the sign.

Mount cabinet to post of sign structure using approved method. Cabinet should house power and signal (control) cables and switch and all protective devices such as lightning arresters and surge protectors.

DOUBLE POST MOUNTED SIGN STRUCTURE – ARROW BOARD

Description - This work is the construction of a double-post mounted sign structure, Type A, for Arrow Board mounting at MP A70.5, A70.6, A71.7 and MP A71.8 (for Lehigh Tunnel) as specified herein.

Material – Applicable parts of Section 930.2 and as follows:

Double-post mounted sign structure, Type A.

Submit shop drawings to the Representative for approval prior to ordering material. Indicate the recommended materials and the recommended method(s) for fastening the Arrow Panel and the Electrical Cabinet to the signposts as indicated.

Construction – Applicable parts of Section 930.3 and as indicated.

APPENDIX B
COMMUNICATIONS SYSTEM - FUNCTIONAL REQUIREMENTS

GENERAL

The PROPOSER shall design, furnish and install a communications system to convey all data from CCTV, VMS, and Arrow Boards back to either the TOC at the Highspire, PA facility or to the specified tunnel, as noted in this contract. The communications system will utilize either a 4.9 GHz wireless or fiber optic cable communications system to transfer video and control data. The communications system is incidental to the payments items, and the PROPOSER will not be paid additional amounts for this system.

It is the sole responsibility of the PROPOSER to design, procure, install and integrate a fully functional communication system at the locations denoted in this contract, to the approval of the Commission. No additional payments will be made to the PROPOSER for the communication system, unless it is additional work items mutually agreed upon by both the PROPOSER and the Commission.

APPLICABLE STANDARDS, CODES AND PUBLICATIONS

B. All work shall conform to the latest codes, standards and specifications listed below and all local codes.

1. National Electrical Code (NEC), Latest Edition
5 Occupational Safety and Health Act (OSHA)
6 Underwriters Laboratories, Inc. (UL)
7 Institute of Electrical and Electronics Engineers (IEEE)

WAN COMMUNICATIONS EQUIPMENT

Description – This work is to connect each tunnel's Local Area Network to the PTC's Wide Area Network through an existing Layer 3 Ethernet Switch, and transmitted to the TOC in Highspire over the Turnpike's microwave WAN. An existing complementary Layer 3 Ethernet switch will be located at the TOC. This connection will establish data communications between each tunnels' newly installed ITS equipment and the TOC. Also included in this provision is the installation of encoders that will send compressed digital video streams at DVD quality to the TOC and decoders at the TOC will convert video back to analog form.

Material –

MPEG-4 Encoder/Decoder –

Furnish encoder and decoder as required for every camera installed under this contract. In order to assure compatibility and provide full functionality all encoders

and decoders furnished under this item shall come from the same manufacturer as the IP Video Management System furnished, as follows:

Bosch
- VIP X1 Encoder Single Channel Encoder
- VIP XD Decoder

Cohu
- i-linx II Model 9905-4050 Video Codec, Single Channel Encoder
- i-linx II Model 9905-2050 Video Codec, Single Channel Decoder

Encoders/decoders shall be either 19" wide 1RU high with associated power supplies or be in the form of cards that plug into and are powered from rack chassis provided by the same manufacturer. Rack chassis and power supplies are included as part of this item. Mounting kits are acceptable.

Video Encoding
- Accepts NTSC or PAL video format, user selectable
- Single channel capability
- Input video; BNC, connection, 75 ohm 1 V p-p
- MPEG-4 (ISO/IEC 14496-2 Advanced Simple Profile)
- Adjustable resolution selections of 4CIF, 2CIF, CIF and QCIF
- Adjustable frame rates of 1-30
- Adjustable bit rate from 10kbs up to 6Mbs
- GOP Structure: I, IP
- Dual Streaming – Two independent IP MPEG-4 video streams per channel, user configurable
- PTZ Latency < 200 ms

Network Interface
- 10/100Base-T 802.3U interface, auto-sensing, RJ-45
- IGMP V2.0 for full-multicast support
- Full control of units via network (Telnet) or HyperTerminal
- Protocol stacks: UDP, TCP, IP, ICMP, SNTP, FTP, ARP, Telnet
- 1xRS-232/422/485 COM port. Configurable properties include baud rate, data bits, stop bits, parity and handshake.

Video Decoding
- The decoder shall decode a native video stream resolution to analog output for presentation on a standard CCTV monitor.

<u>Construction</u> –

Closely coordinate with PTC IT group for specific connection requirements to the PTC WAN and provide 30 day advanced notice prior to actual connection and 60 day advanced notice prior to connection to coordinate service. Advance notice will be

made to both Kevin Geiger (717-939-9551 x5461) and Stephanie Bentley (x5410).

Securely mount Encoders for CCTV cameras in the equipment cabinet located in each tunnel's electrical room on the control room's side.

Connect the loop-thru inputs of the video monitors to the Encoder's analog video inputs. Connect the console port on the new video switch to Encoder's serial data port. Connect the network port of the Encoder to the Ethernet switch.

Install Decoders in the Highspire TOC to convert the compressed images into a format that will be displayed in the Control Room. Coordinate with the PTC IT group in order to connect the Decoders to the existing PTC WAN switch and the analog outputs of the Decoders to the input ports on the existing Bosch/Allegiant 8801/60 video matrix switch.

Furnish and install all necessary coaxial, CAT-6 and serial data cables connecting equipment in this specification, including all cables required to connect to the existing equipment.

FIBER OPTIC CABLE, SINGLE MODE

Description - This work consists of furnishing and installing fiber optic cables of the types indicated. This cable will be the transmission medium for video and data signals between field equipment and either the tunnel control rooms or interchange buildings.

Material –

A. General. Certify the manufacturer meets the following requirements. Submit proof of this experience to the Representative. Certify the cable manufacturer meets the following requirements:
   - ISO 9001 and ISO 14001 certified manufacturer
   - TL 9000 registered quality management system

B. Outside Plant Cable (OSP). Provide fiber optic cable meeting the following general requirements:
   - Number of fibers shall be as indicated.
   - Meet the requirements of RUS 7CFR1755.900, ANSI/ICEA S-87-640-1999, and Telcordia GR-20-Core
   - All dielectric loose tube buffer design.
   - Incorporates a water swellable tape.

   Provide fiber optic cable meeting the following optical requirements:
   - Single mode
   - Meet the requirements of ITU-T G.652.D low water peak standard
   - Maximum attenuations shall be as follows

- at 1310 nm: 0.4 dB/km
- at 1550nm: 0.3 dB/km
- Attenuation shall be uniform with no discontinuities greater than 0.1 dB. The attenuation at 1383∀ 3 nm shall not exceed 0.4 dB/km.
- IEEE 802.3z performance: The fiber shall support laser-based Gigabit Ethernet operation in the 100Base-LX(1300 nm) operating window at 5000 m.
- The Mode-field diameter shall be as follows:
- at 1310 nm: 9.30 +/- 50 nm
- at 1550 nm: 10.50 +/- 1.00 nm
- Cutoff wavelength: less than or equal to 1260 nm
- Polarization mode dispersion: less than or equal to 0.5 ps/√km
- Chromatic Dispersion: less than or equal to 3.3 ps/(nm.km) for 1285 nm through 1330 nm and less than or equal to 18 ps/(nm.km) at 1550 nm.
- Macrobend attenuation: The attenuation due to 100 turns of fiber around a 75∀2mm diameter mandrel shall not exceed 0.05 dB at 1310 nm and 0.10 db at 1550 nm.

Provide fiber optic cable meeting the following mechanical requirements:

- All fibers within a cable shall be from the same manufacturer and shall contain no factory splices.
- The fibers shall be from Corning.
- Typical core diameter: 8.3 μm
- Cladding diameter: 125.0 +/- 1.0 μm
- Core-to-cladding offset: less than or equal to 0.8 μm.
- Cladding non-circularity: less than or equal to 1.0 %
- Each fiber shall have a dual layered, UV acrylate coating applied to it by the manufacturer. The coating shall be mechanically strippable without damaging the fiber. The coating diameter shall be 245 +/- 10 μm.
- Each fiber shall have a color coating applied to it by the manufacturer. The coating shall not affect the optical characteristics of each fiber. The color coding shall be in accordance with EIA/TIA-598-A. The colored fiber nominal diameter shall be 250 μm.
- The central strength member shall consist of a dielectric, glass-reinforced plastic rod.
- All fibers shall be enclosed in a non-conductive loose buffer tubes. For fiber cables containing less than thirty-six (36) fibers, a maximum of six (6) fibers shall be placed in each buffer tube. For cables of thirty-six (36) or more fibers, a maximum of twelve (12) fibers shall be placed in each buffer tube. The fiber shall not adhere to the inside of the buffer tube. Each buffer tube containing fibers shall be color coded in accordance with EIA/TIA 598-A. In buffer tubes containing multiple fibers, the colors shall be stable during temperature cycling and not be subject to fading or smearing onto each either or into the gel filling material. Colors shall not cause fibers to stick together. Buffer tubes shall be of dual layer construction.

- The buffer tubes shall be filled with a non-hygroscopic gel to prevent water and moisture penetration. The gel shall contain anti-oxidant additives, and the gel shall be readily removable with conventional solvents. The gel shall be non-toxic and dermatologically safe to exposed skin. It shall be chemically and mechanically compatible with all cable components, nonnutritive to fungus and electrically non-conductive.
- Filler rods shall be used to fill all unused buffer tubes, or shall be used instead of unused buffer tubes. The filler rod shall be solid polyethylene material and shall be natural in color. The filler rods shall maintain the concentricity of the cable cross section where required.
- Buffer tubes shall be stranded around the central strength member using the reverse oscillation, or "S-Z", stranding process. Water swellable yarns shall be applied longitudinally along the central strength member during stranding.
- Two polyester yarn binders shall be applied contrahelically with sufficient tension to secure each buffer tube layer to the dielectric central member without crushing the buffer tubes. The binders shall be non-hygroscopic, non-wicking, and dielectric with low shrinkage.
- A water swellable tape shall be applied longitudinally around the outside of the stranded tubes/fillers. The water swellable tape shall be non-nutritive to fungus, electrically non-conductive, free from dirt and foreign matter and homogenous.
- A ripcord shall be placed under the sheath for easy sheath removal. The ripcord color shall be orange.
- Tensile strength shall be provided by the central member and dielectric yarns which shall be helically stranded evenly around the cable core.
- The cable shall be sheathed with medium density polyethylene (MDPE) with a minimum nominal jacket thickness of 1.4 mm. The jacketing material shall be applied directly over the tensile strength members and water swellable tape. The polyethylene shall contain carbon black for ultraviolet protection and shall not promote the growth of fungus. The MDPE jacket material shall be defined by ASTM D1248, Type II, Class C and Grades J4, E7 and E8. The jacket shall be free of holes, splits and blisters, of uniform thickness and contain no metal elements.
- The jacket shall be marked in white with the following information:
- Manufacturer's name and part number followed by "OPTICAL CABLE – xx F" (where xx is the number of fibers in the cable)
- Sequential foot markings with the actual length within –0/+1% of the length marking
- Month and year of manufacturer
- A telephone handset symbol as required by Section 350G of the NESC.
- If a reprint of the marking is necessary, the re-print shall be in yellow.
- The cable shall be rated for a maximum tensile loading of 600 lbs. during installation and 200 lbs. long term installed.
- The cable shall be capable of withstanding a minimum bending radius of 10 times its outer diameter during operation and 15 times its outer diameter

during installation without changing the characteristics of the optical fiber.

- The temperature rating of the cable shall be as follows:
  - Shipping, storage and operating: -40 degree F to +158 degree F
  - Installation: -22 degree F to +158 degree F
- The cable manufacturer shall certify that each reel of cable that is furnished meets or exceeds the following test requirements as defined EIA/TIA-455A Fiber Optic Test Procedures (FOTP):
  - Fluid Penetration: When tested in accordance with FOTP-82, a one meter length of unaged fiber optic cable shall withstand a one meter static head or equivalent continuous pressure of water for one hour without leakage through the open cable end.
  - Filling Compound Flow: When tested in accordance with FOTP-81, the cable shall exhibit no flow (drip or leak) of filling or flooding compound at 158 degree F.
  - Compressive Load: When tested in accordance with FOTP-41, the cable shall withstand a minimum compressive load of 125 lbf/in applied uniformly over the length of the sample. The load shall be maintained for a period of 1 minute. The load shall then be decreased to 63 lbf/in. Alternatively it is acceptable to remove the 125 lbf/in load entirely and apply the 63 lbf/in load within five minutes at a rate of 0.1 in per minute. Attenuation measurements shall be performed before release of the 63 lbf/in load. The change in attenuation shall not exceed 0.15 dB during loading at 1550 mm.
  - Cable Flex: When tested in accordance with FOTP-104, the cable shall withstand 25 mechanical flexing cycles at a rate of 30 cycles per minute with a sheath diameter not greater than 20 times the cable diameter. The fibers shall not experience an attenuation change greater than 0.1 dB at 1550 nm. The cable jacket shall exhibit no cracking or splitting when observed under five times magnification.
  - Temperature cycling: When tested in accordance with FOTP-3, the change in attenuation at extreme operational temperatures (-40F to +158F) shall not exceed 0.2 dB/km at 1550 nm.
  - Tensile load: When tested in accordance with FOTP-33, using a maximum mandrel and sheave diameter of 560 mm, the cable shall withstand a rated tensile load of 1 lbf and residual load of 30% of the rated installation load. The axial fiber strain shall be less than or equal to 60% of the fiber proof level after completion of 60 minute conditioning and while the cable is under the rated installation load. The axial fiber strain shall be less than or equal to 20% of the fiber proof level after completion of 10 minute conditioning and while the cable is under residual load. The change in attenuation at residual load and after load removal shall not exceed 0.15 dB at 1550 nm.
  - Low or high temperature bending: When tested in accordance with FOTP-37, the cable shall withstand four full turns around a mandrel of less than or equal to 10 times its diameter after conditioning four hours at test temperatures of -22 degree F and +140 degree F. Neither the inner or outer

surface of the jacket shall exhibit visible cracks, splits, tears or other openings. Optical continuity shall be maintained throughout the test.
    - Cable twist: When tested in accordance with FOTP-85, a length of cable no longer than 2 meters shall withstand 10 cycles of mechanical twisting. The change in attenuation shall not exceed 0.15 dB at 1550 nm.

Meet the following factory testing requirements:

- All optical fibers shall be 100% attenuation tested. The attenuation of each fiber shall be provided with each reel.

Meet the following delivery requirements:

- The cable shall be delivered on reels without splices. Ten feet of each end of the cable shall be accessible for testing at the PROPOSER's facility prior to installation. Both ends of the cable shall be sealed to prevent moisture ingress.
- A durable weatherproof tag or label on each reel shall contain the following information:
    - Manufacturer's name
    - Cable Type
    - Length of cable contained on the reel in feet
    - PROPOSER's name
    - The Commission's contract number
    - Reel number
- Attached to each reel in a weatherproof envelope shall be a shipping record. The shipping record shall contain the following in addition to the above information:
    - Date of manufacture
    - Date cable tested
    - Cable characteristics (size, attenuation of each fiber)
    - Cable reel identification number

C. Riser-Rated, LSZH Cable. Provide cables that meet the following requirements:

- Double jacketed
- Minimum outer jacket thickness 0.9 mm
- UL 1666 listed for riser applications
- Low smoke/zero halogen (LS0H) rated (per IEC 1034)

Meets all of the requirements of Outside Plant Cable with the following additional requirements: Sheathed with flame-retardant, non-halogen thermoplastic. Inner jacketing materials are applied directly over the tensile strength members and water blocking tape. Outer jacketing materials are applied over the armoring. Include carbon black to provide ultraviolet light protection and minimize the growth of fungus.

- The temperature rating of the cable is:
    - Shipping, storage and operations: -40 degree F to +158 degree F

- Installation: 14 degree F to +140 degree F
- The jacket markings include the marking "OFCR" in accordance with Section 770.50 of the NEC.
- Cable Flex: When tested in accordance with FOTP-104, the cable withstands 25 mechanical flexing cycles at a rate of 30 +/- 1 cycles per minute. The fibers shall not experience an attenuation change greater than 0.4 dB at 1550 nm. The cable jacket exhibits no cracking, tearing or splitting when observed under five times magnification.
- Impact Resistance: When tested in accordance with FOTP-25, the cable withstands a minimum of 2 impact cycles at 3 locations along a one-meter section of cable. The impact energy is at least 4.4 nm (in accordance with ICEA S-87-640). The fibers do not experience an attenuation change of greater than 0.15 dB at 1550 nm.
- Temperature cycling: When tested in accordance with FOTP-3, the change in attenuation at extreme operational temperatures (-40 degree F to +158 degree F) does not exceed 0.4 dB/km at 1550 nm when measured with respect to the baseline values at room temperature before temperature cycling.
  - Low or High Temperature Bending: When tested in accordance with FOTP-37, the cable withstands four full turns around a mandrel of less than or equal to 10 times its diameter after conditioning four hours at test temperatures of 14 degree F and +140 degree F. Neither the inner or outer surface of the jacket exhibits visible cracks, splits, tears or other openings. Optical continuity is maintained throughout the test. The fibers do not experience an attenuation change greater than 0.40 dB at 1550 nm.
  - Cable twist: When tested in accordance with FOTP-85, a length of cable no longer than 2 meters withstands 10 cycles of mechanical twisting. The change in attenuation does not exceed 0.4dB at 1550 nm. No cracks, splits, tears or other openings are present on the inner or outer surface of the jacket.

Non-halogen thermoplastic cable jacket requirements:

- Smoke Generation per ASTM E 662:
  - Flaming Avg. Ds after 4 min. $\leq$ 50
  - Flaming Avg. Dm $\leq$ 250
  - Non-flaming Avg. Ds after 4 min. $\leq$ 50
  - Non-flaming Avg. Dm $\leq$ 300
- Ozone Resistance Test: Pass per ASTM D470
- Smoke Index $\leq$ 25 per NES 711, Issue 2
- Toxicity Index $\leq$ 5 per NES 713, Issue 3
- Acid Gas Equivalent $\leq$ 0.5 % per MIL-C24643, Sept. 28, 1984
- Halogen Content $\leq$ 0.2 % per MIL-C24643, Sept. 28, 1984

D. Splice Enclosures. Provide splice enclosures that meet the following requirements:

- Rigid non-filled case
- Case molded out of flame retardant polyester/polycarbonate steel

- Maximum dimensions consistent with pullbox size and minimum cable bend radius requirements
- Reenterable without the use of special tools
- Accommodates a minimum of four 48-fiber cables
- Holds splice trays specified for fusion splices
- The enclosure shall have the capability of holding trays from various manufacturers and have the capacity to accommodate the sufficient trays for a minimum of 96 splices.
- Provides for management of unopened buffer tubes and unspliced fibers.
- All hardware corrosion resistant aluminum or stainless steel.
- Fiber bend radius controlled to a minimum of 1.5 inches.
- Strain relief provided around the cable jacket and internal cable strength members.
- Cable gripping and sealing hardware shall not cause an increase in fiber attenuation in excess of 0.05 dB.
- Temperature rated -40 degree F to +158 degree F.
- The splice trays furnished with the enclosure shall meet the following requirements:
  - Compatible with the fusion splices specified herein
  - Accommodate loose buffer tubes and tight buffered cable. No cable ties are to be used. The loose buffer tubes shall be secured with a tube guide or channel snap
  - Slack fiber within the tray shall be placed in an oval shape along the inside wall of the tray
  - The tray shall accommodate both 250 □m and 900 □m fiber
  - The trays shall be stackable within the enclosure.

Quality Assurance - Prior to installation, the PROPOSER shall perform a splice immersion test at their facility on the splice enclosure proposed for installation. Three samples of each type of configuration proposed for installation in the network shall be tested. Each sample shall be immersed in water under a head of ten feet for a period of one week. The ends of the cables installed into the enclosure shall either be sealed so as to prevent water penetration or installed such that they are above the top of the water head. After seven days, each of the samples shall be removed and examined for water ingress. Any visible dampness shall be cause for rejection. Rejection shall require that the test be repeated for three samples of the configuration that failed. If the PROPOSER elects to substitute a different model, the test shall be repeated for three samples of each of the configurations.

E. Connectors. Provide Connectors that meet the following requirements: Type ST twist lock (bayonet) or Type SC, as indicated, for fiber connections to new equipment. The PROPOSER shall field verify the type to be used for fiber connections to existing equipment.

Telcordia GR-326 Issue 3 compliant and as specified under these requirements,

whichever requirement is more stringent shall apply.

- Uses ceramic ferrules.
- Fiber secured within the ferrule with epoxy, in accordance with the requirements of the connector or epoxy manufacturer.
- A strain relief mechanism shall be provided for coupling the connector to the fiber's aramid strength member.
- Operating temperature: -40 degree F to +158 degree F
- Insertion loss: <0.25 dB typical individual loss, 0.4 dB maximum when measured in accordance with FOTP-171.
- Return loss: <-55 dB when measured in accordance with FOTP-107.

F. Cable Tags. Provide cable tags of weather resistant, non-ferrous metal, nylon or other nonconducting material. Provide tags not less than 0.75 inches in diameter, and not less than 0.03125 inches thick. Permanently mark each tag with identification information, legibly stamped on metal tags or legibly lettered with permanent ink on the nylon tags. Unless otherwise approved by the Representative, cable tags must read "Turnpike Fiber Optic Cable". The Representative must approve the method of labeling.

Construction - Sections 910.3(a) and 910.3(h) paragraphs one, three, four and five as indicated, and as described below.

A. Pre-installation Requirements. The PROPOSER is entirely responsible for the fiber optic cable security and adherence to these specifications, from its manufacturer to the time the network is accepted. Prior to installation of the cable plant, provide to the Representative for approval, a Cable Plant Installation Plan and proof of appropriate training and experience for personnel who will be installing the fiber.

B. Cable Plant Installation Plan. Provide a Cable Plant Installation Submission including:

- Shop drawings and catalog cuts for all cable, connectors, splice equipment, splice enclosures, patch cable, optical fiber patch panel, and installation and test equipment.
- Shop drawings and catalog cuts detailing method of attaching fiber optic cable to walls of exhaust spaces at Allegheny, Tuscarora, Kittatinny, and Blue tunnels as shown in the Plans.
- Shop drawings and catalog cuts detailing method of securing fiber optic cable to existing cable trays of the Lehigh exhaust space as show in the Plans.
- Manufacturer's recommended cable installation techniques such that the optical and mechanical characteristics of the cable are not degraded at the time of installation.

The proposed recommendations shall include the following:

  - Cable manufacturer's approved pulling lubricants for use on the cable and method of installation. No other lubricant will be permitted.

- Installation set-up included size and type of rollers, feeder guides, tension gauge make and model number, attachment of pulling jig to jacket and direction of pull.
- Maximum pulling tensions and corresponding method of attachment of pulling grip to the cable.
- Slack of 50 feet of cable to be left in pull boxes and enclosures containing splices required for splicing and splice enclosure preparation.
- Minimum bending radii, which shall specify a radius both for the installation and for the long term installation.
- Method to pull multiple cables including a mixture of power and fiber, as recommended by the fiber cable manufacturer.
- Method to seal cable ends to prevent water ingress until the cable is terminated
- Splice material manufacturer's recommended procedures for installation of the splices.
- Expected attenuation between termination points of all fibers including losses resulting from splices and connectors.

Do not install fiber optic cable until all of the items listed above have been submitted and approved by the Representative.

C. Experience Requirements. Provide proof of the experience requirements defined below, including resumes listing each person's name, address, telephone number, proof of appropriate training and projects worked on and the names of references who can be contacted regarding the installed optical fiber systems. Document for all personnel involved in the installation, splicing and testing of the optical fiber cable:

- A minimum of five (5) years experience in the installation of optical fiber cable including fusion splicing, terminating and testing of single mode fiber.
- Installed a minimum of five (5) systems where the optical fiber cable has been installed outdoors in conduit and where the systems have been in continuous operation for at least two years.
- Personnel involved in specific tasks shall be certified to meet the following requirements:

  - Trained and certified in optical fiber splicing procedures by the manufacturer of the fiber optic splice material/equipment.
  - Trained and certified in optical fiber cable installation and handling procedures by the manufacturer of the optical fiber cable used.
  - Trained and certified by the manufacturer of the optic fiber test equipment used in performing the test.

Pre-installation Verification Test: The fiber optic cable shall be tested at the site storage area prior to installation. Each optical fiber in the cable shall be tested from one end with an OTDR compatible with wavelength and fiber type. Testing

shall check for continuity, length, anomalies, and approximate attenuation. Each measurement shall be recorded with color, location and type of fiber. In the event that a meaningful measurement cannot be made from one end, it shall be performed from the opposite end of that fiber.

D. Installation. Pull fiber optic cable into existing conduit, existing cable trays, and new conduit or ducts installed under this project. Do not degrade the optical and mechanical characteristics of the fiber during installation. Install the cable such that neither the minimum bend radius nor the maximum tension is violated, both during and after installation. Unless otherwise approved by the Representative, the equipment used and the procedures followed are as specified in the latest edition of Corning Cable Systems Recommended Procedure SRP-005-011. Do not proceed without the Representative being present, unless otherwise directed.
Do not pull cable through any intermediate junction box, pull box, or any other opening in the conduit, unless specifically approved by the Representative. Pull the necessary length of cable to be installed from junction box or cabinet to the immediate next downstream junction box or cabinet. Carefully store the remaining length of cable to be installed in the next conduit in a manner that allows that length of cable to be safely pulled into the next. Install cable entering a junction box or cabinet directly from the cable reel storage stack, and pull directly out of the immediate downstream pull box or cabinet.

Cable Installation Verification Test: After installing each cable section, but prior to splicing or termination, perform the following tests:

Using an OTDR, test each fiber in the link at 1310 nm and 1550 nm for fiber attenuation, continuity, length and anomalies. This test shall be performed from both ends. Each fiber shall meet the following criteria:

- Attenuation: Not to exceed 0.4 dB/km at 1310 nm and 0.3 dB/km at 1550nm
- Anomalies: No event shall exceed 0.3 dB.
- Using an optical source and power meter, measure the attenuation from both ends. The measured attenuation shall meet the requirements defined for the attenuation using the OTDR.

If the above criteria are not met, the PROPOSER shall replace the entire section of cable.

Splicing: Provide all required equipment and consumable supplies. Do not splice between termination points. Splice locations are shown on the Plans.

Make fusion splices, incidental to the cost of cable, wherever the cable is subject to transition to individual fibers or wherever two individual fibers are spliced. Splice all optical fibers, including spares, to provide continuous runs. Do not provide a full splice of the fiber optic cable, i.e., all fibers within the cable being spliced, more frequently than once every 5,000 feet. Store sixty feet of slack cable

at each splice location, 30 feet on either side of the splice.

For connection of the fiber optic cable to fiber optic distribution panel or splicing to other cables, cut only those fibers needed for the connection or splice. Use splice trays to hold the spliced and unspliced fibers, with each fiber neatly secured to the tray. Contain all buffer tubes entirely within the splice tray, with no tubes being exposed.

Package each spliced fiber in a protective sleeve or housing. Completely re-coat bare fibers with a protective, room-temperature vulcanizing (RTV) coating, gel or similar substance as recommended by the cable manufacturer, prior to application of the sleeve or housing, so as to protect the fiber from scoring, dirt, or microbending.

Termination: In the tunnel control rooms and equipment cabinets where optical fibers are to be connected to terminal equipment, provide matching connectors with factory-installed fiber pigtails of sufficient length, plus five feet of slack, and splice them to the corresponding optical fibers. Do not field install connectors. Provide fiber optic pigtails buffered and strengthened with aramid to reduce the possibility of accidental damage to the fiber or connection. Properly protect unused optical fibers with sealed end caps. Provide connectors meeting the requirements herein.

Replacement: If the above-specified cable, splice, and termination criteria are not met, replace the entire section of cable.

Identification: Install cable tags, incidental to the cost of cable, at each junction box, controller cabinet, and splice cabinet. Affix tags to the cable using bands at least 0.5 inches wide to avoid crushing the buffer tubes and optical fibers in the cable. Nylon or plastic cable ties are not permitted. The Representative must approve the method of attachment.

Optical Fiber Cable Plant Installation Verification Test: Perform this test after the complete optical fiber cable plant has been installed for the facility for each link and all patch chords specified in the plans to provide a continuous link have been installed.

Using an OTDR, test each fiber in the link at 1310 nm and 1550 nm for fiber attenuation, continuity, length and anomalies. Perform the test from both ends. Each fiber shall meet the following criteria:

- Attenuation: Not to exceed 0.4 dB/km at 1310 nm and 0.3 dB/km at 1550nm + 0.1 dB/splice + 0.5 dB/connector for links.
- Remake any splice with a loss exceeding 0.2 dB until its loss falls below 0.2 dB. Record each attempt for purposes of acceptance.
- Anomalies: No event shall exceed 0.3 dB.

- Using an optical source and power meter, measure the attenuation from both ends. The measured attenuation shall meet the requirements defined for the attenuation using the OTDR.

Successful completions of the above tests are the basis for acceptance. If the above criteria are not met, isolate the problem and replace the splice, section of cable or factory connectorized section of cable that causes the fiber not to meet the acceptance criteria.

Test Documentation: Prepare a form or table for documenting splices, and submit this form or table for approval by the Representative. Use this form or table to record splice loss associated with each splice. Record all splice losses in tabular form and submit to the Representative for approval. Submit chart recordings of the "signature" with the splice data with a record of all OTDR settings and the OTDR locations written on the trace. The Representative must witness all splice loss measurements. Submit the form to the Representative within five days of the splice being made. Also submit the test results in electronic format that may be displayed on a PC operating under the Microsoft Windows 2000 or XP operating system. Provide any "viewer" software application required for the Representative to review the information.

TUNNEL LAN COMMUNICATIONS EQUIPMENT

Description – This work consists of furnishing and installing local area network equipment at each tunnel, providing the infrastructure for field devices to communicate with control rooms using optical fiber cable.

All tunnels will communicate with VMS's and CCTV by employing either a fiber optic network, wireless or hybrid of both communication methods. Each field equipment device and their corresponding tunnel control rooms will use transceiver pairs and dedicated fiber strands to transmit data and video in a point-to-point protocol.

Material - Furnish LAN Communications Equipment that is EIA standard 19" rack-mountable at the portal buildings. Shelf mounted equipment shall be used at field locations and be powered by separate power supplies provided. Rack mounted equipment shall be installed at portals and be in the form of cards that plug into and are powered from a rack chassis provided by the same manufacturer. The rack chassis and power supplies shall be included under this contract item. Mounting kits are acceptable. Equipment at CCTV and VMS cabinet shall be field hardened and capable of operating properly over an ambient temperature range of -30 degree F to +165 degree F and relative humidity conditions of 95% non-condensing.

Furnish LAN Communications Equipment as indicated consisting of the following:

- VMS Cabinets:
  1. Terminal Server

- CCTV Cabinets:
  1. Fiber Optic Video/Data Transceiver

- Portal Building Electrical Room (control room side):
  1. Media Converters
  2. Fiber Optic Video/Data Transceivers
  3. Ethernet Switch
  4. Wall Mounted Communications Equipment Cabinet (with Fiber Optic Distribution Panel).

- Portal Building Electrical Room (non-control room side):
  1. Wall Mounted Communications Equipment Cabinet (with Fiber Optic Distribution Panel).

Ethernet Switch - In order to assure compatibility with Commission's existing Wide Area Network, furnish an Ethernet switch at each tunnel that is fully compatible with Cisco Part Number WS-C2960-24TC-L, 24-port 10/100BASE-TX/FX Fast Ethernet managed rackmountable Ethernet switch with 2 dual-purpose uplinks 10/100/1000BASE-T.

The data ports of the Ethernet switch can be configured to work with or without media converters as follows:

- Twenty four (24) 10/100Base TX ports, RJ-45 connectors (for use with media converters for VMS communications).
  or
- An SFF Fiber Module with four (4) 100Mb 15km single-mode FX LC connectors and twenty (20) 10/100Base TX ports, RJ-45 connectors (for use without media converters for VMS communications).
- Both configurations include two ports Gigabit (1000Base-T) auto-negotiating
- All RJ-45 Ports – 100 or 10 Mb speed, full or half duplex mode, per port, individually determined. 10/100 auto-negotiating & auto-cross.

Network Standards:
- IEEE 802.3z, 802.3ab, 802.1p: 100Base-TX, -FX, 1000BASE-SX, -LX
- Auto-negotiation and auto-crossover on TP, IEEE 802.3u
- SNMPv1, SNMPv2c, SNMPv3

Processing Type:
- Store and forward with IEEE 802.33x, full-duplex flow control

Address Table
- 4k nodes, self-learning, with address aging

Media Converter - Furnish a media converters at tunnel portal buildings for VMS communications to provide 100Mb Ethernet media conversion between fiber and twisted pair.

- Data Rate: 100Mbps, FDX and HDX mode, transparent, auto-negotiation support on the RJ-45 port, user selectable, Link
- Network Standards: Ethernet IEEE 802.3u; 100Base-TX, 100Base-FX.
- Connectors: RJ-45, 100Base-TX: shielded 8-pin female and 100Base-FX-SST

Terminal Server – Furnish a terminal server with one serial port 4 wires full-duplex asynchronous (RS-422/485) and one port 10/100Base-FX auto-negotiation/Auto MDIX with Single Mode ST Connector at VMS cabinets. The terminal server will be compliant with IEEE802.3 10Base-T and IEEE 802.3u, 100Base-FX standards and with EIA/TIA RS-232E, EIA/TIA-574

Serial Communication Parameters:
- Interface: RS-232/422/485
- Connector: DB9 for RS-232/422/485
- Parity: None, Even, Odd
- Data Bits: 5,6,7,8
- Stop Bits: 1,2
- Flow Control: None, RTS/CTS, Xon/Xoff
- Speed: 600 bps to 230.4 Kbps

Ethernet Switch Fiber Port:
- Interface: 10/100Base-FX
- Connector: ST Type (100Base-FX)
- Typical Distance: 20 km
- Nominal Wavelength: 1310 nm
- Cable Type: 10/125 SM
- Optical Budget: 19 dB

Protocols:
- TCP, IP, UDP, Telnet, DHCP, ICMP, HTTP

Operation Mode:
- Virtual COM Port Mode, TCP Mode, UDP Mode

OS Driver Support:
- Windows 2000/XP

Management
- Serial Console, Telnet Console, Web Management, Firmware Upgradeable

Fiber Optic Video/Data Transceiver – Furnish fiber optic video/data transceiver pairs at CCTV cabinets and portal buildings as indicated. These pairs of modems shall transmit and receive baseband video and PTZ (Pan Tilt Zoom) control data over a single optical fiber and shall be compliant with the following requirements:

- All equipment shall be from the same manufacturer
- Video Input: 75 Ohm nominal impedance, 1.0 Volt peak-to-peak typical. The transmitter shall be NTSC compatible.
- Data Input: Selectable Asynchronous EIA-232/422/485, full duplex transmission, at data rates up to and including 19,200 bits per second
- Operating Wavelength: 1310 nm/1550 nm, single mode
- Link Budget: sufficient to accommodate a link loss budget, excluding power penalties totaling 3 dB, of 19 dB for 1310 nm signals and 15 dB for 1550 nm signals.
- Receiver Optical Dynamic Range: Sufficient range to preclude the possibility of receiver saturation. The use of external fiber optic attenuators shall not be permitted
- Receiver Video Output: 75 Ohm nominal impedance, 1.0 Volt peak-to-peak output
- Modulation: Either frequency or digital
- Signal to Noise Ratio: Greater than 60 dB measured in accordance with EIA-250
- Linearity: Less than 1%
- Field Tilt: Less than 1%
- Differential Phase: Less than 2% at 10 to 90% average picture level (APL)
- Differential Gain: Less than 2% at 10 to 90% APL
- Frequency Response: Within +/- 1 dB, from 10 Hz to 5 MHz
- Connectors: Type ST

Wall Mounted Communications Equipment Cabinet - Furnish a wall-mounted communications equipment cabinet that includes the following:

- Chassis with front and rear doors
- EIA Mounting Rails
- Fan Assembly
- Electrical Distribution Panel

Chassis with Front and Rear Doors:

The wall mount fiber optic hub cabinet shall be a swing-out design which provides access to component rear panels. It shall be built using one-piece construction technique with 14 AWG cold rolled steel. The wall mount cabinet shall have a hinged front and rear doors. The side panels shall be louvered for air circulation.
The front door shall be hinged on the left side of the chassis. The front door shall be smoked acrylic with steel frame. The front door shall be equipped with a key lock. Furnish five sets of keys to the Representative for every wall mount cabinet furnished and installed in this contract. Front and Rear doors shall be able to be latched without

locking.

The rear support mounting section shall be made with 14 AWG steel which permits cabinet to be opened without sagging even fully loaded. The top and bottom panels shall each have two conduit knockouts. The wall mount cabinet shall be equipped with front EIA mounting rails to support 19" rack-mount equipment.

The interior and exterior of the wall mount cabinet shall have textured finish with black polyurethane baked-on paint.

The wall mount cabinet shall meet the following physical requirements:

- Overall Width: 21.25"
- Usable Height: 48" (26RU)
- Usable Depth: 26"
- Weight Capacity: 150 lbs.

Fan:

A ventilation fan assembly powered by a 115 volt single phase motor and rated at airflow of 150 cfm shall be installed at the top of the cabinet. The screened exhaust vent shall be provided at the top of the cabinet. The ventilation fan shall be controlled by means of a thermostat with a range of 70 to 160 ^{O}F with overload protection and noise suppressor.

Electrical Distribution Panel:

The wall mount cabinet shall have an electrical distribution assembly to supply 120 VAC electrical power. It shall have a main circuit breaker and a GFI duplex outlet. The duplex outlet shall supply power to the 6- plug power strip mount on the side and towards the rear of the cabinet

Fiber Optic Distribution Panel

Furnish a 19-inch rack mounted fiber optic distribution panel for the full cable termination and optical continuation of fiber optic cables as required. The unit will act as an interface between the fiber optic cable and the fiber optic patch cables located within the cabinet. The panel is configured in connector fields consisting of rack mounted bulkhead connectors. The field shall contain a sufficient quantity of connectors to accommodate the maximum number of the fibers entering the equipment cabinet. Each connector field comes preconnectorized with 12 singlemode ST adapters with 9 ft pigtails. The panel will have the capability to store the slack cable.

Furnish all signal and communication cable assemblies required to connect the LAN communications equipment including fiber optic patch cables, RG-59 coaxial cable,

serial data and Cat5 cables. Fiber optic patch cables shall be full duplex, single mode with ST connectors.

Construction – Install LAN communications equipment at all VMS field cabinets that communicate with fiber optic cable as indicated. Connect the VMS controller serial port output to terminal server.

Install LAN communications equipment at all field CCTV cabinets as indicated. Connect the camera's data cable and video output to the fiber optic video/data transceiver.

At both portal buildings at each tunnel, perform the following:

Mount the communications equipment cabinet to the wall at locations indicated and designated by the Representative. Submit method of mounting cabinet to wall to the Representative for approval.

Mount LAN communications equipment securely in rails of communication equipment cabinet. Connect LAN communications equipment with all signal and communications cables as indicated.

For the purpose of estimating cost, provide electrical power to LAN communications equipment by installing one new branch circuit, with a new 1 pole, 120VAC, 20A circuit breaker, 1 box, and 1 duplex receptacle and connecting EMT conduit to installed communications equipment cabinet. This work will be necessary at the control room side of each tunnel as indicated. The existing power distribution panel shall be located in the same room as the LAN equipment as indicated.

WIRELESS COMMUNICATIONS

The Commission encourages the use of wireless communications (or a hybrid of wireless and fiber optic communication system) on this project. All wireless communications on this project will utilize Tyco Electronics hardware and materials which can only be coordinated through the Commission. The PROPOSER will only be responsible for determining the location of the wireless communications infrastructure, coordination with the Commission and Tyco Electronic to verify wireless service, provide all required power to the wireless field locations and Highspire, PA facilities. Payment to Tyco Electronics for system design, all wireless communications materials, installation, integration and system support will be made by the Commission. The PROPOSER must identify these costs on their Schedule of Value sheets. This amount WILL NOT be included in the PROPOSERS bid price for this site. The Commission and Tyco electronics will coordinate with the PROPOSER to provide data integration of the VMS, CCTV and Arrow Board data to the Highspire facility. The PROPOSER will be responsible for taking all the CCTV, VMS and Arrow Board data and integrating it into the CCTV video management.

MISCELLANEOUS ITEMS - FUNCTIONAL REQUIREMENTS

GENERAL

The below items are to provide the PROPOSER specific functional requirements on certain aspects of the project. These items are incidental to the Pay Items of this Contract, as it is the sole responsibility of the PROPOSER to provide the Commission with design, procurement, installation and integration of a fully functional VMS, CCTV, Arrow Board, power and communications systems. .

It is the sole responsibility of the PROPOSER to design, procure, install and integrate a fully functional VMS, CCTV, Arrow Board and communication system at the locations denoted in this contract, to the approval of the Commission. No additional payments will be made to the PROPOSER for the VMS, CCTV, Arrow Board and communication system, unless it is additional work items mutually agreed upon by both the PROPOSER and the Commission.

All miscellaneous items listed and not listed below are the responsibility of the PROPOSER and are incidental to the other Payment Items in this Contract. No additional payment will be made to the PROPOSER for these items, as the PROPOSER is to provide a fully functional and operational system, as required by the RFP.

RELOCATION OF RTMS POLE FROM MP 120.1 WB TO MP 166.0 EB

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Description – This work is the removal, relocation, foundation design, installation and erection of an existing RTMS pole and foundation from MP 1201. WB to MP 166.0 EB. This work includes the design of a foundation to support the existing pole and wireless equipment.

Material – Sections 202, 203 and 704.1, as applicable.

Construction – Sections 202, 203 and 704.1, as applicable and as follws:

Remove pole and foundation from site at MP 120.1 WB. Remove the foundation to a level 2 feet below the existing grade. Grade, seed and mulch, as per sections 802, 804 and 805, as applicable. Design new foundation for the relocated pole. Install new foundation and reset pole at location 166.0 EB,

Excavation shall be in accordance with Section 203. Secure the pole to the foundation such that the pole withstands a wind load of 90 mph and a gust factor of 1.3.

Measurement and Payment – Lump Sum, for the location indicated.

COMPLETE POWER SUPPLY, PORTAL BUILDING

Description – This work is the furnishing, installation, erection and wiring of the complete power supply system at designated portal buildings, including the electrical power supply and distribution system to ITS equipment

Material - Section 910.2.

Construction – Section 910.3, as applicable, as indicated, and as follows:

In general, substitute the words, "Arrow Board System", "Variable Message Sign System" or "Closed Circuit Television System" for the words "Lighting System" throughout the paragraphs contained within the section.

Provide NEMA 3R, 200KAIC, 100A, 120/240V, single phase fusible primary service disconnects with either a one or two-pole switch as indicated. The switch shall be lockable on the ON position. This lock on feature shall be manufacturer installed and provided. Provide Class RK5 time delay current limiting fuses of voltage and current ratings as indicated. Provide black phenolic engraved plastic-laminate tags with white lettering, screw on type, for each disconnect.

Provide NEMA 3R, 120/240 V, 100 A MCB single phase power distribution panel mounted on side of cabinet as indicated. Provide all exposed GRS conduits for power conductors in accordance with these Special Provision.

Provide black self-tapping screws for installation on equipment. Label the tags with "ARROW BOARD - # xxx DISCONNECT", "VMS - # xxx DISCONNECT" or "CCTV - # xxx DISCONNECT".

COMMUNICATIONS/POWER CONDUIT

Description – This work is the furnishing and installation of high-density polyethylene (HDPE) conduits by method of Trench Modified (unpaved surfaces) or Trench and Backfill, Type II (paved surfaces) and flexible delineator posts.

Material –

(a) HDPE Conduit – SDR11 with smooth interior wall and smooth exterior wall. Manufactured in accordance with ASTM F2160 and ASTM D3035 from thermoplastic polymer conforming to the minimum standards defined in ASTM 3350 (See Table 1). The bank of (4) 1-1/4" will be used for communication cables with colors: Black, green, blue, and orange. The black conduit is to contain a tracing wire. 2" Conduit in the quantity specified will be used for power cables as called out in the plans.

Table 1 – Resin Properties

The resin Properties shall meet or exceed the values listed below for HDPE

ASTM Test	Description	Values HDPE
D-1505	Density g/CM^3	.941 - .955
D-1238	Melt Index, g/10 min. Condition E	.05 - .50
D-790	Flexural Modulus, MPa (PSI)	80,000 min.
D-1693	Environmental Stress Crack Resistance Condition B,F_{10}	96 hrs. min.
D-638	Tensile strength at yield ((PSI)	3000 min.
D-746	Brittleness Temperature	-75ºC

1. Plastic Marking Tape, Red - Section 1101.12(e)
2. Pulling Lines – (Woven polyester or Aramid fiber with an average tensile strength in excess of that which is required to pull a 96 – pair fiber optic cable.) - Muletape as manufactured by Neptco Inc. – Teltek Sales 215-477-5888, Bull-Line; as manufactured by Arnco Corp. 1-800-321-7914; or approved equal.

(b) Flexible Delineator Post – Sections 937.2 and 938.2, and as follows:

1. Flexible Delineator Post - Similar to material manufactured by Safe-Hit Corporation, 1930 W Winton Ave., Building 11, Hayward, CA 94545, (510) 783-6550 or approved equal and as detailed on the plans.

2. Decals – Non-reflective with warning message of Buried Fiber Optic Cable or Buried Electrical Cable.

Construction -

(a) HDPE Conduit - Section 910.3(g) and as follows:

Place communications and power conduits (SDR11) at locations indicated on the drawings. Place conduits such that it is a continuous run with no splicing between junction boxes.

Prevent conduits from twisting during installation and minimize variation in the horizontal and vertical alignment. Orientation of the conduits must be consistent throughout the project in and out of each junction box. Submit method to the Representative prior to installation. Install the conduits as follows: the black conduit with the tracer wire in the upper left position, green conduit in the upper right, blue conduit in the lower right and orange conduit in the lower left positions.

At obstructions, taper conduit runs to provide vertical or horizontal offset at a rate of 20:1 or flatter.

Provide conduits within the trench. Identify the conduits within the trench with red marker tape as indicated on the drawings. The black conduit is to contain a tracer wire. Extend the green conduit 2' into the junction box at both ends.

After placing the conduit between junction boxes, provide orange flexible delineator post fiber optic cable markers and red flexible delineator post electrical cable markers and as indicated on the drawings. Flexible markers are to be placed where the conduit passes from the edge of shoulder to the junction box and are to identify the conduit as underground communications cable.

Install pulling lines in each individual conduit to insure that the conduit has not been damaged during installation. If conduit is damaged, replace the conduit at no additional expense to the Commission. The pulling lines will remain in the conduits for future use by others.

Seal all conduits at both ends with manufacturer's plugs to make conduits watertight.

(b) Trench Modified – Section 910.3(c), as indicated and as follows:

Spider plow trenching is an acceptable method of construction.
Maintain a depth of 21 inches below subgrade except where lateral obstructions require a deeper excavation. Where conduit is to cross a drainage pipe or other lateral obstruction, identify the location in the field with paint or another method acceptable to the Representative prior to beginning trenching operations.

(c) Trench and Backfill, Type II – Section 954.3(a).

(d) Flexible Delineator Posts. Install decals**,** sheeting, letters, and numbers on the posts as indicated on Standard Drawings.

For soil installations use a chisel pointed, drivable, reusable metal anchor into which the post is inserted and held in place with a locking mechanism.

Install orange flexible delineator post fiber optic cable marker at horizontal bend points in fiber optic conduit, as indicated, and as directed by the Representative.

Install red flexible delineator post power cable marker at horizontal bend points in power conduit, as indicated and as directed by the Representative.

SPLICE ENCLOSURE CABINET

Description - This work is the furnishing and installation of surface mounted junction boxes and splice enclosure cabinets.

Material –

Furnish boxes that are NEMA 4X, stainless steel Type 316, 14 gauge. Materials and fabrication shall be as per Hoffman, Bulletin A4S, or approved equal. Include single front door, NEMA 4X stainless steel breather/drain, clamp-type door closures, and lockable hasp. Provide unpainted, smooth brushed finish. Provide tamperproof hinges.

Nominal dimensions of the boxes are 36" High x 36" Wide x 12" Deep and include:

- mounting supports and/or collar studs on the back, left, and right side interior walls
- full size stainless steel back panel
- catch to hold front door open at 135 +/- 25 degrees.

Construction - Install splice enclosure cabinets in accordance with manufacturer's instructions. Provide anchors, fasteners and supports in accordance with NECA "Standard of Installation". Provide materials, sizes, and types of anchors, fasteners and supports to carry the loads of equipment and conduit. Obtain permission from Representative before drilling or cutting structural members. Fabricate supports from structural steel or steel channel. Rigidly weld members or use hexagon head bolts to present neat appearance with adequate strength and rigidity. Use spring lock washers under all nuts. Do not fasten supports to pipes, ducts, equipment or conduit.

All conduit entrances to splice enclosure cabinets mounted at locations subject to water entry, from condensation or migration along the cables:

- Include conduit-sealing bushings/hubs to block water entry.
- Wherever practical, entrances shall be at the bottom or lower one third of the junction box.

REMOVE AND DISPOSE EXISTING FIXED SIGN AND STRUCTURE

Description – This work is for the removal and disposal of two small VMS/Arrowboard combinations (Northbound Lehigh Tunnel at Milepost A70.5 and Milepost A70.6) and cantilever warning sign with flashing beacon and cantilever structure (Southbound Lehigh Tunnel at Milepost A72.0).

Construction – Remove VMS/Arrowboard combinations and leave posts with break-away bases for future use.

Remove cantilever warning sign and structure to ground level.

Coordinate with the Representative to dispose the removed signs and structures properly.

CONDUIT

Description - This work is furnishing and installation of conduit at locations indicated.

Material - Sections 910.2 and 954.2, as applicable.

Construction – Applicable portions of Sections 910.3 and 954.3, and as indicated, except as follows: Revise Section 954.3 (b) to read: Where directed, and for 2", 3", and 4" Conduit, Modified, install conduit meeting the requirements of Section 1101.09 (c) by means of jacking, auguring, and boring. Do not damage existing utilities.
Install PVC fixed or flexible conduit sweeps from junction boxes to bridge parapet. Install transition adapters from sweeps to conduit on structure.

Install conduit in portal buildings using approved methods. Submit drawing for approval by the Representative prior to construction detailing cable routing plan and attachment hardware for each portal building. Use existing hangars where available. When penetrating walls, repair walls around conduits to original characteristics. When installing conduit in non-linear sections for fiber optic cable, install conduit sweeps, obeying minimum cable bending radius.

Install weather heads on exposed GRS conduit where required and as indicated.

JUNCTION BOXES, MODIFIED

Description - This work is furnishing and installation junction boxes at locations indicated.

Material – Section 910.2

Construction – Section 910.3 and as follows:

Revise Section 910.3(p) by adding:

A. Bond metal framed junction box and cover to ground. The bond shall provide a solid electrical and mechanical connection.

A. Cast the label "ELECTRICAL" into the covers for J.B.-12. Cast the label "COMMUNICATIONS" into the covers for J.B.-11.

B. Ground all J.B.-12 junction boxes in accordance with NEC Article 250.

ELECTRICAL CABLE

Description - This work is furnishing and installation of electrical cable at locations indicated.

Material – Section 910.2 and as follows:

Revise Section 1101.08, by adding:

A. Supply electrical 600 Volt rated electrical cable. Installation shall be in accordance with Section 910.3(h).

B. Provide soft drawn copper conductors per ASTM B-3. Provide Type THWN/THHN insulation. Provide 600 Volt rated, UL Listed conductors.

C. Conductors sized AWG #8 or larger shall be Class B concentrically stranded per ASTM B-8. Conductors sized AWG #10 or smaller shall be solid.

D. Use rubber molded breakaway connectors in accordance with PENNDOT RC-84M. Drawing for all electrical cables that will be installed on breakaway posts.

E. Triplex cable may be used in lieu of individual cables for aerial runs. Aluminum conductors are not acceptable.

Construction – Section 910.3.

CONCRETE SIDEWALK RESTORATION

Description – This work is the restoration of all concrete sidewalks during construction at seven (7) portal building entries where new conduits will be installed, as required. This work is incidental to the project.

Material – For rigid pavement, use material of a type equal to the existing pavement, in accordance with Sections 630.2 and 676.2, and as determined by the Representative.

Construction – Restore concrete sidewalk in accordance with Sections 630.3 and 676.3, and as directed by the Representative.

RELOCATE EXISTING FIXED SIGN

Description - This work is the removal of the existing flat sheet and W8-13 signs and the relocation of the signs to the designated relocated sites as indicated.

Material – As shown on the Standard Drawings and as follows:

(a) Signs, Posts, Supports, and Miscellaneous Material

- Treated Wood Posts – Section 1103.09
- Aluminum Bolts, Nuts, Lock-Washers; Aluminum or Nylon Washers; Lag Screws – Section 1103.11
- Shims and Bars – Section 1105.02(a)2
- Brackets – Section 1105.02(f)2

(b) Foundations

- Class A Cement Concrete – Section 704
- Sleeves – Section 1105.02(j)1

Construction – Remove the existing signposts to ground level. Either dispose of properly or deliver to PTC as per the Representative.

Submit shop drawings to the Representative for approval prior to erecting the new sign foundations, posts and erection of the existing sign to the new wood posts.

Repair or replace any damaged portions of the signs.

Provide all new hardware for fastening the existing sign to the new wood posts.

SELECTIVE TREE TRIMMING

Description – This work is the trimming of selected trees and shrubs as required to provide adequate site distance for VMS, CCTV and Arrow Board viewing. Selective tree trimming for VMS and Arrow Boards should provide a minimum of 1000-feet of viewing. Selective tree trimming for CCTV should provide a clear view of up to 2000-feet.

Construction – Sections 810.3 (c), (d), and (e).

FURNISH, INSTALL, REMOVE AND REPLACE GUIDERAIL

Description – This work is for the furnishing, installing, removing and replacing of guiderail for access and length of need at various locations during construction.

Material – Section 620.2

Construction – Section 620.3

TRANSFORMER ASSEMBLY

Description - This work is the furnishing and installation of a transformer, enclosed

circuit breaker equipment mounting structure and interconnecting conduit and cable as indicated.

Material - Furnish transformers as indicated with the following ratings:

STEP-UP TRANSFORMER
- Single phase
- Dry-type
- 240 deg. F temperature rise
- 240-volt primary
- 480-volt secondary
- 60 Hertz
- 10 KVA
- 2.5% full capacity taps (min)
- NEMA 3R enclosure, UL-listed

STEP-DOWN TRANSFORMER:
- Single phase
- Dry-type
- 240 deg.F temperature rise
- 480-volt primary
- 120/240-volt secondary
- 60 Hertz
- 10 KVA
- 2.5% full capacity taps (min)
- NEMA 3R enclosure, UL-listed

Furnish an UL-listed, enclosed, molded case circuit breaker with ratings as indicated on the plans. The enclosure shall be NEMA 3R rated and shall be lockable.

Furnish an equipment mounting structure suitable for mounting the transformer and disconnect switch. Mounting post and instruct shall be hot dipped galvanized steel. All mounting bolts, nuts, washers, and lock washers shall be stainless steel.

Class C Concrete (for footing): Section 704.

Construction – As indicated

TEMPORARY SHORING

Description – This work is the design, construction, maintenance, and removal of temporary shoring for fill or excavation areas as required to construct abutments, wingwalls, piers, culverts, retaining walls, sound barriers or sign structures.

Materials – Materials need not be new but must be in serviceable condition. Provide certification or laboratory test results verifying material properties. For used steel, the

salvage design values from the AASHTO Guide Design Specifications for Bridge Temporary Works may be used in lieu of testing. Any temporary shoring material used does not have to be from a Bulletin 15 source, but must meet the following:

- Structural Steel.....AASHTO M270, (ASTM A709)(Grade 36, Grade 50 or Grade 50W)
- Steel Sheet Piling ....ASTM A328, (ASTM A572)
- Sheet H-Piles.....AASHTO M270, (ASTM A709)(Grade 36)
- Wood Lagging .....Rough Cut Species in AASHTO Guide Spec Appendix A and AASHTO Construction Handbook for Bridge Temporary Works Appendix C.
- Cement .....AASHTO M85 and AASHTO M 240
- Pre-Stressing Steel ..ASTM A416 and ASTM A722 (Grade 270)
- Welding Wire Fabric AASHTO M55, (ASTM A185)
- Reinforcement Bars AASHTO M31 (ASTM A615), ASHTO M42 (ASTM A616, ASTM A617)(Grade 60)
- Other Material……In accordance with applicable sections of Publication 408

Construction – Areas where temporary shoring is anticipated are indicated on the drawings.

(a) Design – Design the temporary shoring in accordance with AASHTO LRFD Bridge Design Specifications, Design Manual Part 4, current FHWA guidelines, and AASHTO Guide Specifications. Design temporary shoring for the final condition and all construction conditions. Where appropriate, include in the design, surcharge loads due to vehicle traffic and other surcharges due to construction equipment. The temporary shoring calculations and drawings must be prepared, signed and sealed by a Professional Engineer licensed in Pennsylvania. Submit the temporary shoring calculations and drawings to the Representative for approval twenty-one (21) days prior to beginning temporary shoring work.

(b) Construction – Install temporary shoring in accordance with the applicable sections of Publication 408 and the approved temporary shoring drawings. Take baseline readings on all temporary shoring, and regularly monitor the shoring for vertical and horizontal movement throughout the construction duration of the project. The Contractor's Professional Engineer must certify, sign and seal, that the temporary shoring has been installed in accordance with the approved temporary shoring drawings prior to beginning work in the shored area. The Contractor is responsible for the adequacy and safety of the temporary shoring, and its compliance with the traffic control for the project.

(c) Removal - Remove the temporary shoring when no longer required, unless otherwise indicated or approved to remain in place. Where temporary shoring is allowed to remain in place, remove all temporary shoring within three (3) feet of the finished grade or roadway surfaces.

OSHA REQUIREMENTS

The Contractor shall recognize that the project entails work within areas considered Confined Spaces under OSHA regulations, including, but not limited to the air plenum space above the tunnel ceiling. It is the sole responsibility of the Contractor to comply with OSHA standards.

PAYMENT FOR MISCELLANEOUS ITEMS

All miscellaneous items listed and not listed above are the responsibility of the PROPOSER and are incidental to the other Payment Items in this Contract. No additional payment will be made to the PROPOSER for Miscellaneous Items.

APPENDIX C

PENNDOT PUBLICATION 408 SPECIFICATIONS

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PENNDOT PUBLICATION 408 SPECIFICATIONS

A. GENERAL

1. The Contractor is expected to utilize the following PennDOT standard specifications within their design, when Commission standards are not prevalent. The list is provided for informational purposes and is not intended to be a complete list of potential standard items. All specific standard PennDOT items and quantities must be provided by the Contractor at the time of their Engineering Design submission. All standard items utilized by the Contractor shall follow Publication 408/2007 standards, latest version.

2. The Contractor is expected to utilize the following anticipated Special and Modified items within their design. The list is provided for informational purposes and is not intended to be a complete list of potential special items. All special items and quantities must be provided by the Contractor at the time of their Engineering Design submission.

Specification Section	Item Description
0201	CLEARING AND GRUBBING
0204	CLASS 3 EXCAVATION
0608	MOBILIZATION
0619	PERMANENT IMPACT ATTENUATING DEVICE, TYPE II, TEST LEVEL 3
0620	TERMINAL SECTION, SINGLE
0804	SEEDING AND SOIL SUPPLEMENTS - FORMULA D MODIFIED
0804	SEEDING AND SOIL SUPPLEMENTS - FORMULA L MODIFIED
0805	MULCHING - STRAW
0810	SELECTIVE TREE TRIMMING
0845	EROSION AND SEDIMENTATION CONTROL DURING CONSTRUCTION
0901	MAINTENANCE & PROTECTION OF TRAFFIC DURING CONSTRUCTION
0901	ARROW PANELS
4910	JUNCTION BOXES, PennDOT J.B.-2, MODIFIED
4910	2/0 ELECTRICAL CABLE, COPPER, 1 CONDUCTOR, THWN/THHN INSULATED
4910	1/0 ELECTRICAL CABLE, COPPER, 1 CONDUCTOR, THWN/THHN INSULATED
4910	AWG 2 ELECTRICAL CABLE, COPPER, 1 CONDUCTOR, THWN/THHN INSULATED
4910	AWG 4 ELECTRICAL CABLE, COPPER, 1 CONDUCTOR, THWN/THHN INSULATED
0910	2" DIRECT BURIAL SCHEDULE 40 PVC CONDUIT
0910	3" DIRECT BURIAL SCHEDULE 40 PVC CONDUIT
0910	2" EXPOSED GRS CONDUIT
4954	2" CONDUIT, MODIFIED
0954	TRENCH AND BACKFILL
0954	JUNCTION BOX, JB-27

Specification Section	Item Description
0955	VEHICULAR SIGNAL HEAD, ONE-SECTION
1001	CLASS A CEMENT CONCRETE
1002	REINFORCEMENT BARS
SPECIAL	ELECTRIC UTILITY SERVICES
SPECIAL	COMPLETE POWER SUPPLY, VMS SYSTEM
SPECIAL	COMPLETE POWER SUPPLY, CCTV SYSTEM
SPECIAL	COMPLETE POWER SUPPLY, HAR TRANSMITTER
SPECIAL	35' WOODEN UTILITY POLE ASSEMBLY
SPECIAL	TESTING
SPECIAL	TRAINING
SPECIAL	3/4" EMT
SPECIAL	2" EMT
SPECIAL	GUY WIRE ASSEMBLY
SPECIAL	TRANSFORMER ASSEMBLY
9910	6" DIRECT BURIAL SCHEDULE 40 PVC CONDUIT
9937	FLEXIBLE DELINEATOR - RED
9937	FLEXIBLE DELINEATOR - ORANGE

APPENDIX D

SYSTEM AND EQUIPMENT TESTING, AND TRAINING

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SYSTEM AND EQUIPMENT TESTING, AND TRAINING

A. GENERAL TESTING PROCEDURE

1. The Engineer shall have the right to witness and/or assign a representative to witness any test required in the Contract Documents.

2. All tests shall be conducted in accordance with approved test procedures. Testing is to be conducted by a qualified representative of the manufacturer of the element to be tested. Pertinent quantitative and qualitative test results shall be recorded on data summary sheets. All test records shall be submitted to Commission immediately following the test.

3. The PROPOSER shall complete testing for each element, subsystem in as few consecutive days as possible.

4. The PROPOSER shall provide all testing equipment necessary to perform and complete the testing described in the Contract Documents.

5. All test procedures shall document what equipment function is being tested, the exact testing procedures, and outcome. All tests will be pass or fail. At the end of each testing section, an area for contractor signature, Commission signature and date will be required. Also, at the end of each testing section, an Ad-hoc area (1 page) will be required for Commission and its consultant to document any other tests performed.

B. EQUIPMENT TESTS

1. The PROPOSER shall perform all tests required by the Contract Documents to ensure that the equipment and assemblies intended to be furnished and installed, meet or exceed the requirements of the Contract Documents and are ready to be integrated into the overall existing ITS System at the Commission's Highspire facility.

2. The PROPOSER shall conduct the following tests, on each subsystem that will be furnished and installed under this Contract: Engineering Design Approval/Field View; Factory Acceptance Testing (FAT); System Acceptance Test (SAT); 30-Day Operational Test. Costs for re-testing any parts within project testing, shall be the responsibility of the PROPOSER. Costs include all transportation, lodging and meals for one (1) Commission employee and one (1) Commission representative.

    a. Engineering Design Approval: The PROPOSER will submit to the Commission their Engineering Design package for review and approval. The Commission will review the package and provide comments. Upon resolution of all the Commission comments, the PROPOSER along with the Commission representatives shall conduct the Design Field View review in the field, at each location, before any construction or factory tests are commenced.

b. Testing at Manufacturers Facility: The PROPOSER representative along with one (1) Commission employee and one (1) Commission representative shall observe Factory Acceptance Tests (FAT) at the CCTV and VMS manufacturer's facility prior to shipping the equipment. FAT testing shall also include NTCIP compliance testing. The PROPOSER shall provide testing procedures to validate NTCIP 1201, 1203, 2001 and 1205. The PROPOSER shall define, implement and utilize a 3rd party to test that all proposed equipment features and functions will be tested using known and established standard NEMA mandatory and optional objects and procedures as opposed to implementing manufacturer-specific objects and procedures. The PROPOSER shall provide all necessary equipment and software required to fully test NTCIP compliance. A traceability matrix should demonstrate functional requirements mapped to the related MIB object(s), and test procedures. The PROPOSER shall require the approval by the Commission of the FAT testing procedures a minimum of 30-days before the start of FAT testing. The PROPOSER shall utilize a traceability matrix format to the testing procedures to demonstrate compliance to the specifications.

c. System Acceptance Testing (SAT): After the equipment has been installed at the designated locations, the PROPOSER shall perform system acceptance testing. This testing shall verify that equipment has been installed properly and is fully functional in the field, as well as in the TMC. It will be the responsibility of the PROPOSER, during SAT testing, to demonstrate through testing procedures that each piece of field equipment is fully functional in the field as a stand alone unit, as well as a piece of equipment that is part of the entire system and can be operated from the TMC. The PROPOSER shall require the approval by the Commission of the SAT testing procedures a minimum of 30-days before the start of SAT testing. The PROPOSER shall utilize a traceability matrix format to the testing procedures to demonstrate compliance to the specifications.

d. Fiber Optic Cable Tests: Concurrently to the SAT, all fiber optic cable in this contract, will be tested. For this testing, all fiber optic cable shall be fully operational for Commission personnel to operate.

e. Operational Acceptance Testing (OAT): Upon installation of all field equipment within Phase I and Phase II of this contract, Operational Acceptance Testing (OAT) will begin. For this testing, the entire system shall be fully operational for the Commission personnel to operate.

3. Testing shall be conducted at key points in time, at the developmental, or production stage in order to find and eliminate problems associated with the design and operation of the equipment. The completion of each test shall not relieve the PROPOSER from any re-testing that may be necessary to eliminate subsequent test failures. Re-testing of any test is to be conducted to the level necessary to isolate the problem and establish a course of action to resolve the failure. The PROPOSER shall be responsible for all costs, expenses for one (1) Commission personnel and one (1) Commission

representative for delays resulting from re-testing, correcting previous test failures, or re-testing.

C. DESIGN APPROVAL/FIELD VIEW

1. The PROPOSER shall provide five (5) half-size (11" x 17") and one (1) CD-ROM (files in PDF format) containing all plans and documentation required for field installation, as described in Appendix A. The Commission and its representatives will perform a thorough design review. The PROPOSER shall submit the plan set a minimum of 21-days prior to the scheduled field review date. All comments provided by the Commission or its representatives must be fully incorporated into the plan set prior to the start of the field view.

2. Upon reviewing the Design plan set, the PROPOSER shall receive a copy (in MS Word Format) of all comments made during the Commission's review. The PROPOSER must submit written responses to all comments within 10 days.

3. During the field review, the PROPOSER, Commission and its representatives shall visit all VMS, CCTV, Arrow Board and fiber optic cable installation locations in the field. A review of the design and all design concerns will be addressed for each location.

4. The PROPOSER shall prepare test documentation, conduct testing, record results and repeat testing as required under the general testing requirements.

D. FACTORY ACCEPTANCE TESTING (FAT)

1. Factory acceptance tests shall verify that all equipment satisfies the full range of operational and functional requirements before the equipment is shipped to the vender's assembling plant or project site.

2. The PROPOSER shall provide all transportation, lodging, meal and any other business related expenses for one (1) Commission personnel and one (1) Commission representative to attend the FAT for the CCTV and VMS components. All travel arrangements will be made by the PROPOSER for these two (2) representatives.

3. PROPOSER shall prepare factory acceptance test documentation. The FAT shall be conducted on 3 or more element units, depending on the quantity of units of a particular item. Factory Acceptance Tests shall be conducted at the manufacturer's facility for all other units provided for this project. The PROPOSER and vender shall complete and sign FAT test forms for equipment not tested in front of the Commission and its representative and shall provide these forms to the Commission.

4. Equipment shall not be shipped from the factory or the vender's assembling plant to the project site until submitted test records and certifications have been approved by the Commission.

5. FAT tests shall be conducted, and approved by the Commission a minimum of 30 days prior to the start of field installation and commissioning.

E. SYSTEM ACCEPTANCE TEST (SAT)

1. System Acceptance Tests shall verify that all equipment has been installed properly in the field and is fully operational in a local mode (at the field site) as well as in the TMC. It will be the responsibility of the PROPOSER, during SAT testing, to demonstrate through testing procedures that each piece of field equipment is fully functional in the field as a stand alone unit, as well as a piece of equipment that is part of the entire system and can be operated from the TMC. SAT approval of all contract equipment is required before the start of Operation Acceptance Testing (OAT).

2. The PROPOSER shall provide all transportation and any other business related expenses for one (1) Commission personnel and one (1) Commission representative to attend the SAT. All travel arrangements will be made by the PROPOSER for these two (2) representatives.

3. PROPOSER shall prepare System Acceptance Test (SAT) documentation. The SAT shall be conducted on all field devices. System Acceptance Tests shall be conducted in the field as well as in the TMC.

4. SAT tests shall be conducted, and approved by the Commission prior to the start of Operational Acceptance Testing.

5. During SAT testing, if there are more than 3 failures of any CCTV, VMS, Arrow Board or fiber optic cable testing procedures, the testing will be stopped and the PROPOSER shall make any and all necessary repairs. All repairs will be documented. Once the repair are completed, and the systems are retested by the PROPOSER to verify proper functionality, the PROPOSER shall send a written letter to the Commission requesting the continuance of SAT testing, and provide verification that the system is functional. Re-testing, due to equipment failure, or due to PROPOSER delay, will not be at the expense of the Commission. The PROPOSER shall be required to pay for all expenses, including meals and transportation of any of the Commission testing personnel, and up to one (1) of their assignee's during system re-testing, until the testing is completed.

6. When testing the VMS, the PROPOSER shall utilize generic messages depicting that the sign is under test. At no time during testing shall the PROPOSER utilize words such as "Road Closed", "Emergency", or other words that can indicate an incident to the motorists.

7. After installation and agreement by the Commission to initiate testing, the System shall be tested in compliance with the System Acceptance Test Plan. The System Acceptance Test shall be conducted with all devices and components integrated as a System at the construction site with use of simulation expressly limited to perform stress and performance testing. The test scripts shall be used to validate the intended function and

performance of all field devices and infrastructure components, e.g., local processors, network components, etc. System Acceptance Testing shall demonstrate that all equipment satisfies the specification requirements herein and design changes approved by Commission.

8. All repairs, construction, or modifications as required to comply with this Section shall be performed by the PROPOSER without additional cost to the Commission.

9. Submit to Commission a System Acceptance Test Report at the conclusion of the test at locations on Commission property for the purpose of verifying and validating the accuracy and integrity of the System as installed. The Commission will review the report and respond; indicating approval or noting changes required either in the performance of the Work or in the report. Make all changes or perform additional Work as the Commission may direct prior to the start of the Operational Test.

10. Due to the need to advise patrons of traffic advisories, each Variable Message Sign (VMS) shall be placed into service upon successful completion of the test for that VMS. Prior to the installation of any VMS, however, install, configure and complete the field test for the Sign Management System to operate all of the VMS.

F. FIBER OPTIC CABLE TESTING

1. The PROPOSER shall submit a fiber optic testing plan for all fiber installed, to the Commission for review and approval prior to starting the test.

2. Prior to installing the fiber optic cable, the PROPOSER shall conduct such the below tests to ensure that the cable is in good condition and meets the specifications. The PROPOSER shall provide report to the Engineer of these tests.

3. After installing a fiber optic cable between termination points, the PROPOSER shall immediately test the cable. The PROPOSER shall present the test results to the Engineer for approval within one week of the test. The PROPOSER shall test the entire length of each fiber in each cable using an Optical Time Domain Reflectometer (OTDR), testing for all the wavelengths that the fiber is designed to carry. The Commission or his representative will witness all OTDR tests. The PROPOSER shall give the Commission durable, labeled plots of the results for each fiber, and shall also provide these plots on electronic media. The plots shall have a record of all OTDR settings and the OTDR locations written on the trace. The PROPOSER shall also submit a listing of splices and the associated losses in tabular form, along with calculations demonstrating that the OTDR results for each fiber meet the attenuation requirements of these specifications and that the optical properties of the cable have not been impaired by the installation.

4. If special software is necessary to view the results of the OTDR tests on a personal computer, two licensed copies of the software associated with these test shall be

provided to the Commission. The cost of this software will be considered incidental to the testing.

5. Also, perform an attenuation test with an optical power meter to demonstrate that the connectors at the ends of the run meet the attenuation specifications.

6. If the test results indicate that the cable, splices, or terminations do not meet the attenuation specifications, or if they indicate that the optical properties of the cable have been impaired during the installation, then the PROPOSER shall, at his expense, take such action as the Commission may approve to correct the problem. This may entail complete replacement of the fiber optic cable.

7. The PROPOSER shall, at a minimum, include the following documentation and tests in the fiber optic cable testing program:

   (a) List of test equipment;
   (b) Cable attenuation measurements in both directions at all wavelengths, including average link losses, for every fiber in every segment of every cable;
   (c) Loss for each splice and connection;
   (d) OTDR trace to each fiber with every event annotated as to what caused the event; and
   (e) Calculations demonstrating that the OTDR results for each fiber meet the attenuation requirements of these specifications.

8. The PROPOSER shall conduct Bit Error Rate Tests (BERT) tests in conjunction with circuit loop back tests to helps isolate equipment or line segments with degraded performance or certifies circuits for tune up and operational used. Typically, the technician will activate a loop back on one end of the communications link and activate the BERT test on the other and conduct the test for a certain period of time.

9. The PROPOSER supplied BERT tester functions shall include the following capabilities:

   (a) Input and output flow control, (Xon/Xoff and hardware)
   (b) Test patterns include QBF, 63, 511, 2047, alternate mark/space, all printable characters, all 256 hex values.
   (c) BERT tests can be timed or continuous.
   (d) The polling tests can be sync or async.
   (e) The BERT shall be capable of being the polling master or can be set to one of 16 remote addresses (slave). The unit shall be able to be polling only, or data blocks of various sizes can be sent at various rates. The unit shall be programmable control over the time from CTS until data is sent, the timeout, number of sync characters, or re-transmit criteria.
   (f) Timing tests include RTS/CTS delay, character counting, echo time measurement, modem clock speed measurement, flow control response time, transition time from high to low or low to high state of control leads, high or low status of control leads.

10. The BERT tester shall be able to fully test the following application:

    (a) Polling tests
    (b) Bit error rate testing
    (c) Throughput testing
    (d) Testing multiplexers
    (e) Testing modems
    (f) Testing terminal, printer and personal computers
    (g) Testing terminal servers
    (h) Bench testing or field testing
    (i) RTS/CTS delay measurement
    (j) Sync operation to 64 Kbps
    (k) Async operation to 38.4 Kbps
    (l) Externally clocked async operation to 64 Kbps
    (m) Test patterns - QBF, QBF###, 63, 511, 2047, alt mark/space, printable characters, all 256 hex characters
    (n) RS-232C male DTE connector

11. The PROPOSER shall submit a BERT testing plan for all serial data circuits installed to the Commission for review and approval prior to starting the test. Each BERT test shall be conducted for a minimum of 10 minutes utilizing at least two different test patterns. All BERT testing shall be conducted in the presence of the Commission.

G. OPERATIONAL ACCEPTANCE TEST (OAT)

1. Upon notification from the Commission of approval of the System Acceptance Test Report for the System including all of the subsystems and the PROPOSER's certification that the System is ready for operational testing, an Operational Test phase shall commence. The Operational Test shall be performed by the Commission operating staff with the advice and assistance of the PROPOSER operating the System during a thirty (30) consecutive day period.

2. During this period, the Commission's operating staff will operate the System as specified in the Operational Acceptance Test Plan using the final version of all applicable manuals, printed guides and procedures. During the test, field elements must be continuously monitored with daily reports generated to confirm proper integration with the software. Correct, as determined by the Commission, any Failure or malfunction of material significance during the test period. Said malfunctions include, but are not to be limited to, equipment failure or failure of the System or any subsystem to comply with the requirements stipulated in the Contract. A Failure that requires correction before proceeding with the testing is defined as any failure of any item of the equipment or software, or both, that prevents the Commission operating staff from performing meaningful use of the System or any subsystem.

3. If a subsystem has a Failure, as determined by the Commission or its representatives, then the Operational Test for that subsystem shall restart from day one. After the PROPOSER corrects a Failure for two (2) or more subsystems, the Operational Test for the entire System shall restart at day one, and shall continue until the results meet the conditions and terms of the performance period. During the Operational Test phase, the Commission, based upon information provided by the Commission operating staff, will determine the System's standard of performance as described herein and whether any failure shall be considered a Failure.

4. In the case where ten percent (10%) of similar equipment malfunctions during the test period, the Commission may declare a system defect and require replacement of similar equipment. When a system defect is declared, restart the 30-Day test for that specific system. The 30-day test period is to begin when all similar equipment is replaced and a system acceptance retest has been successfully completed. A total of 60 calendar days is provided for retests.

    a. Performance Period

    The Performance Period for operational testing shall begin on the date of notification to the PROPOSER by the Commission to commence operational testing and shall end when the System has met the Standard of Performance for the consecutive days required by operating in conformity with the Contract at the required Availability Level stated in the Specifications.

    b. Exchange and Expansion Equipment During System and Operational Testing

    Certify in writing to the Commission when exchange or expansion equipment, devices, or components are installed and ready for use. For the purpose of this Section, "expansion" is used to denote equipment, which is not specified in the approved final design Bill of Materials. Provide an Equipment or Component Installation Certificate, including date, for the equipment or component. If this occurs during the 30-day Operational Test, the performance period of thirty consecutive calendar days for the operational test shall recommence on the first Commission work day following acceptance of the PROPOSER's Equipment or Component Installation Certificate, at which time operational testing shall commence. It is not required that one thirty day period expire in order for another performance period to begin.

H. TEST DOCUMENTATION

1. The PROPOSER shall provide test documentation, including at a minimum, test equipment, special test software, test procedures, checklist, test forms and data summary sheets. Test documentation shall:

    a. Demonstrate that the System satisfies the intended project functionalities.

b. Reference the requirements matrix to show that all requirements will be tested to demonstrate compliance with the Basic Design Criteria.

Test procedures, test forms and checklists shall be referenced to the Contract Document requirements, listing each requirement to be tested.

2. Test documentation shall be submitted for Engineer's approval, at least 30 days prior to the scheduled start of testing. Test documentation that does not receive the Commission's approval shall be reworked until approved. Testing shall not start until test documentation has been approved. After test documentation is approved, PROPOSER shall provide at least 20 working day's notice prior to all tests to permit the Commission to schedule and observe each test.

I. TEST RESULTS AND ANALYSIS

1. The outcome of each test shall be compared with the specified functional performance and operational requirements. Failure to conform to the requirements of any test shall be considered a defect, and equipment and/or subsystems shall be subject to rejection by the Commission.

2. When an element unit is modified as a result of a defect, the PROPOSER shall prepare a report for the Commission's approval. The report shall describe the nature of the failure and the corrective action taken. If a failure pattern develops, the Commission may direct that design and construction modifications be made.

3. Equipment rejected because of defects limited to the specific unit being tested, may be offered for retest provided all non-compliant items have been corrected and re-tested by the PROPOSER and evidence thereof submitted to the Commission.

4. The PROPOSER shall analyze and categorize all defects as to whether they are limited to the specific unit being tested or are potential problems for all units.

5. For the case of defects common to multiple units, all deliverable units shall be modified without additional cost to the Commission. This modification includes design changes required to pass design approval tests.

6. If any of the test results fail to conform to the requirements of the applicable Technical Parameter, the equipment, subsystem or system failing shall be considered a defective item and shall be subject to rejection by the Commission. Rejected elements, sub-system or system may be offered for re-test, provided all the defects have been rectified by the PROPOSER and/or manufacturer and the required documentation submitted thereof to the Commission.

J. SYSTEM TESTING AND ACCEPTANCE

1. In addition to or as a supplement to all testing requirements described elsewhere in this part and the specifications, the PROPOSER shall conduct a full program of testing, the purpose of which shall be to demonstrate to the Commission's satisfaction that the System fulfills all of the specifications and requirements as set forth herein.

2. Pre-Acceptance Testing

    a. The PROPOSER shall be allowed to proceed with pre-acceptance testing without regular monitoring by the Commission. Without interrupting the PROPOSER's installation and testing schedule, the Commission and its representatives shall reserve the right to review testing progress and to witness the PROPOSER pre-acceptance tests. Test milestones for pre-acceptance testing shall be reflected in the Project Plan and Schedule, and testing progress shall be documented in the PROPOSER's regularly issued project status reports. The PROPOSER shall conduct all pre-acceptance tests to ensure compliance with the specification requirements herein and design changes approved by the Commission. Before proceeding with the assembly and integration of the subsystem equipment the PROPOSER shall test each unit of installed equipment on a stand alone basis. Subsequent to stand-alone equipment testing, the PROPOSER shall test the software and hardware components as an integrated subsystem.

    b. The PROPOSER shall certify the results of all pre acceptance tests and submit a certification to the Commission.

        1. Acceptance Testing Provisions - Prepare and deliver to the Commission a comprehensive Acceptance Test Plan that describes all the activities and tasks associated with testing during each test phase at least 30-days prior to the scheduled start of each test phase- Factory, System and Operational. The Acceptance Test Plan for each phase shall describe the activities and tasks associated with the tests to be performed during the appropriate acceptance test phase. At a minimum, the Acceptance Test Plan shall contain the following elements:

            a. A summary statement of the purpose and goal of each test phase

            b. The method of testing

            c. A description of the overall test environment

            d. A block diagram of all equipment and components used in the test Configuration

            e. Specification of the hardware and software required for the test which describes the number and type of devices to be used, describes what real-world inputs and outputs will be simulated and how the inputs and outputs will be simulated

f. A detailed matrix that identifies all design requirements and indicates where each requirement will be demonstrated as part of the test procedure. The matrix shall include, at a minimum, references to both the individual specification requirements and each approved design change.

g. A detailed test procedure which:

   1. Demonstrates that every feature and function to be provided in the furnished hardware and software conforms to the requirements of the Contract

   2. Identifies the contract requirements to be demonstrated as part of each individual test procedure through the specific references to both the specification requirements and the approved design changes

   3. Identifies the steps for each test to be performed, test purpose, conditions which will exist at the start of the test, and conditions/results expected at the conclusion of the test

   4. Identifies the success/failure status of each test along with adequate space for comments of the test witness to be recorded

   5. Describes the outputs to be provided to the Commission to document the test results (reports, database listings, statistical analyses, message displays, etc.).

h. After receipt of each Acceptance Test Plan, the Commission will review and comment on its content, and if necessary, the PROPOSER shall make appropriate changes to the Acceptance Test Plan to address the Commission's comments and resubmit the plan for Commission review and approval. the Commission requires a minimum of fifteen (15) workdays to review and comment or approves resubmitted test plans. Incorporate adequate time in the project schedule to address comments, resubmit a revised test plan, seek approval and perform each Acceptance test without changing the scheduled Acceptance test date. The PROPOSER shall be responsible for maintaining the scheduled date of all acceptance tests.

i. When all tests for a testing phase have been executed to the satisfaction of the Commission, prepare and deliver to the Commission an Acceptance Test Report along with the PROPOSER's written certification that the System has successfully passed all tests for that specific test phase. The Acceptance Test Report shall contain at a minimum the following sections:

   - Summary of the test phase

- Description of the tests performed to include, test conditions at start and end of each test, expected test results with Pass/Fail criteria, actual test results, signature block for individuals who witnessed the successful completion of the test, itemized list of unresolved items that were not completely compliant with the contract items and require correction prior to initiation of the next level of testing

- Action plan to conduct the next iteration of the test phase or a statement that the phase was completed successfully

j. the Commission and its representatives will evaluate each Acceptance Test Report and notify the PROPOSER of its evaluation. No acceptance test phase shall be initiated without the Commission's written approval of the Acceptance Test Plan specific to that phase, and no test phase shall be considered complete, nor may the PROPOSER proceed to the next step until the Commission has approved, in writing, the PROPOSER's Acceptance Test Report for the previous phase.

K. RECORD KEEPING

1. The PROPOSER shall develop and maintain during the life of the contract, a comment and response tracking log to facilitate monitoring the progress of all required submittals. The tracking log shall take the form of a spreadsheet or database and clearly delineate the process of all submittals up to and including final approval.

L. PROJECT IMPLEMENTATION REQUIREMENTS

The PROPOSER shall at its own expense prepare, maintain and update a detailed project plan and schedule as it relates to Work of this Section.

1. Project Plan and Schedule

Within thirty (30) calendar days after receipt by the PROPOSER of the acceptance of his Proposal and notice to proceed, the PROPOSER shall submit a Project Plan and Schedule to the Commission. The Project Plan and Schedule shall include Gantt charts with the critical path identified (using CPM) showing when tasks occur, when resources are required, and what task dependencies exist. The Project Plan and Schedule shall be of sufficient detail and clarity so that the Work can be reviewed and the Commission can monitor progress. The charts shall indicate a logical sequence of Work and identify all dependencies, personnel resources, material, equipment, and work areas required for completion of the Work. The degree of detail shall be sufficient to identify at a minimum:

a. Major contract phases, milestones and de1iverab1es as specified both within the PROPOSER's system development and installation methodology and those specifically identified herein.

b. Project activities with associated tasks and sub-tasks.

c. Interfaces and dependencies with preceding, concurrent, and succeeding work effort.

d. Resources needed and assignments down to the task level for staff, material, and equipment.

In addition to the above, the Project Plan and Schedule shall contain a detailed schedule for delivery of training, and any changes, updates or new information related to the PROPOSER's project organization, methodologies and standards, facilities, Quality Assurance Program or any other requirement, deliverable or feature related to the performance of the System, different from the information which the PROPOSER included in its Proposal.

2. Installation Plan of Technology Components

Prepare and deliver to the Commission a detailed Installation Plan of Technology Components that describes all the activities and tasks associated with the installation, integration, configuration and preparation of the central computer servers and subsystem components including communications equipment of the System prior to field testing. The Installation Plan shall also detail the stages of the System setup and configuration including the estimated time of completion for each stage. This plan shall be submitted for the Commission's review, and only upon the Commission's approval of the Installation Plan shall the PROPOSER commence the required Work.

The Installation Plan shall include the identification and description of all activities, tasks and stages of construction to be used in bringing the System to a fully operational state without disruption to current operation of the facility. Elements of the plan shall include, but are not limited to: installation plan drawings and product installation literature for all primary components of the System; a schedule and plan for the installation of all devices and computer hardware, and the loading of all software (with emphasis on what precautions shall be taken to minimize disruption of current operations); plans for the loading of the initial database; training; and. responsibilities for system administration during installation.

3. System Start-up and Initial System Administration - Once the Field Acceptance Testing has been successfully concluded, perform all activities necessary to ready the System for operation, including but not limited to:

- Instructions for System generation and loading of all initial data and parameters
- Data Initialization and Conversion (if any is required due to the PROPOSER's design)
- Initial database loading
- Initial Parameter Settings

- Adjustments of System parameters and thresholds to allow maximum performance and reliability shall be made as soon as practical.

The PROPOSER shall authorize and accept responsibility for application of power to equipment and initiation of operation, be responsible for running all initial diagnostics and System generation programs necessary to provide a complete working System.

4. Training

   a. Training Plan - Submit to the Commission for review and approval, a Training Plan which shall address Operator Training, Supervisor Training, System Administration Training and Maintenance Training. The Training Plan shall include at a minimum:

      1. A description of all training courses including identification of the purpose and goals of each course, duration of the course, type of presentations (lectures, labs) and identification of the facility and training equipment requirements (e.g., lecterns, overhead projectors, televisions, video cassette recorders, specific System hardware elements, etc.).

      2. A list of classroom instructors who shall conduct the training and description of their skills, experience and qualifications.

         a. Individual course curricula, course materials, manuals, study guides and workbooks.

         b. Course critique and evaluation forms for students.

         c. Post-training and or on-the-job technical reference guides.

         d. A detailed schedule for the delivery of all training courses.

      After receipt of the Training Plan, the Commission will comment on its content. Make appropriate changes to the Training Plan and resubmit for review and approval.

   b. Training Program

      1. After approval of the Training Plan and prior to the beginning of the Field Acceptance Test, conduct the specified training to the staff. The training program shall be implemented through the use of formal classroom training and/or other forms of presentation as recommended by the PROPOSER. The curriculum shall be designed so that each group of trainees shall be trained in the full repertoire of System commands which they may have to use in the course of performing their designated functions. Students shall be provided with complete sets of training materials and operating manuals during the training sessions, which they shall retain for use on the job at the completion of training.

Formal training shall also include a comprehensive student-testing program for determining that the intended training has been successfully imparted.

2. Submit to the Commission two (2) copies of each training manual for review and comment. After incorporating the Commission's comments, resubmit two (2) copies or each such manual until approved by the Commission. After approval by the Commission, submit to the Commission the number of copies of each approved manual as stipulated herein. In addition, submit three (3) CD-ROMS with an electronic version (PDF format) of the training manuals for future reproduction by the Commission.

3. Upon completion of each training program, prepare and submit to the Commission a training report which shall summarize the results of the training program, including a list of attendees and individual test results, course evaluation forms and recommendations for follow-up training or modifications to the curriculum.

c. Conduct of Training

1. Conduct the required training at the scheduled times and locations designated by the Commission consistent with the approved Training Plan. The full complement of training courses shall be conducted over the duration of this contract to accommodate shift personnel, vacations, new personnel and make-up sessions. The training shall include, but not be limited to, the following groupings of staff (with an estimated student population as stipulated herein). Re-fresher training will be required a maximum of two (2) times per year.

Staff Category	Number of Staff
Operations	8
Supervisory/Management/ System Administrators	6
Maintenance Supervisors	6

d. Training Manuals

1. Provide the Training Manuals and any other associated course materials, study guides and workbooks, as described in the approved Training Plan. These manuals shall be for instructional use during the Training Program, for study and for refresher use to provide training of all the features and functions of the System during normal and emergency operations. These manuals shall also be suitable for Commission use to train new operators, supervisors, system administrators and maintenance staff on an ongoing basis.

5. Operating Documentation

a. Submit to the Commission two (2) copies each of “System Administrators Manual”, “Site Specific Manual” and “Supervisor’s Manual” for review and approval. After incorporating the Commission’s comments, resubmit two copies of each such manual until approved by the Commission. Submit to the Commission five (5) copies of the approved “Standard Operating Procedures Manual” and five (5) copies each of the approved “System Administrator’s Manual”, “Site Specific Manual” and “Supervisor’s Manual”. In addition, submit 3 CD-ROMs with a PDF version of each manual. The CD-ROMs shall have a label with the date and “FINAL APPROVED” stamp, along with the project name, and number.

1. Standard Operating Procedures Manual

A System Standard Operating Procedures Manual shall be provided which contains graphical depictions and explanations of system operation for all operator functions specified under Operator Training. This manual shall be for instructional, study and refresher use and shall explain all the features and functions of the System for day-to-day operation (e.g., log-on, monitors, print daily reports). The manual shall also have a section for problems and/or exception conditions so the operator can resolve common operating problems (e.g., trouble shoot network problems, restart the System in the event of a component failure, clear jams). The manual shall also contain instructions on how to perform normal maintenance (e.g., changing paper for the printer). Submit to the Commission five (5) copies of approved Standard Operating Procedures manual and three (3) CD-ROM’s with PDF version of the full manual.

2. System Administrator’s Manual

A System Administrator’s Manual shall be provided which contains graphical depictions and written descriptions of all functions required for system maintenance and specified under System Administrator Training. This manual shall contain all procedures necessary for the proper monitoring and administration of the System. At a minimum, the manual shall contain separate sections that cover the following topics: backup and recovery, performance analysis, scheduled maintenance, audit and control, report production, contingency plan, configuration control, system diagnostics, database integrity, special requests and expendable supplies. A separate, removable section of the System Administration Manual shall contain information on the proper administration and control of the security features built into the System. Some of the information to be contained in this section includes: maintenance of user identifiers, password control, and security policy review. This System Administrator’s manual shall also include computer-generated listings of all system programs as an addendum under separate cover. Submit to the

Commission five (5) copies of approved System Administrator's manual and three (3) CD-ROM's with PDF version of the full manual.

3. Supervisor's Manual

   A Supervisor's Manual shall be provided with graphic descriptions of all functions and procedures required for system modifications specified under Supervisor Training. This manual shall contain all the instructions included in the Operator Procedures Manual plus instructions on printing standard and ad hoc reports. Submit to the Commission five (5) copies of approved Supervisor's manual and three (3) CD-ROM's with PDF version of the full manual.

4. System Preparation

   After System installation and until the System is formally accepted by the Commission, the PROPOSER shall undertake and perform all System preparation activities to ensure a fully functioning System that operates in conformance to the requirements of the Contract. Such activities shall include, but not be limited to, the following:

   a. Systems monitoring; System and application backup and archiving; System fault detection, diagnosis and correction, database initialization and updates, and report generation.
   b. Administration and control of System access and backup security.
   c. Capacity management and performance monitoring.
   d. Management of hardware, firmware, and software configuration changes.
   e. System documentation maintenance.
   f. Training and System user assistance.
   g. Monitor and manage physical protection devices stipulated in Technical Parameter herein.

5. Close-Out

   Upon successful completion of the 30-day Operational Test, prepare and submit to the Commission all materials necessary to close out the System design. This shall include, but not be limited to: the delivery of a fully functioning System that meets all performance and expansion requirements and that has successfully completed factory, field and operational testing; the delivery and approval of all documentation and; the training of all management, supervisory, operations, system administration and maintenance staff, as specified in the training plan; all documentation necessary for the operation of the System whether or not it has been submitted as part of a previous deliverable. This includes but is not limited to: third party software documentation and licenses, software executable code, hardware documentation, final Operating Documentation and maintenance manuals.

6. Schedule of Submittals

   In concert with the progress schedule, the PROPOSER shall complete the following schedule of design submittals and fill in the submittal dates. Submittals shall be within the time stipulated in the “Schedule of PROPOSER’s Design Submittals” herein.

SCHEDULE OF CONTRACTOR'S DESIGN SUBMITTALS

CONTRACTOR

SUBMITTAL	Submit Date:
Progress Schedule in accordance with "PROGRESS SCHEDULE" requirements	_____
Engineering Design Submission Package (Hardware and Software)	_____
Project Plan and Schedule	_____
Installation Schedule and Plan	_____
Acceptance Test Plan (FAT, SAT and OAT)	_____
Factory Acceptance Test Report	_____
System Acceptance Test Report	_____
Operational Acceptance Test	_____
Equipment Exchange/Expansion Certificate(s) during Factory Testing (if any)	_____
Equipment Exchange/Expansion Certificate(s) during Field Testing (if any)	_____
Equipment Exchange/Expansion Certificate(s) during Operational Testing (if any)	_____
Training Plan	_____
Preliminary Training Manuals for Review	_____
Approved Training Manuals	_____
Training Program Report	_____
Videotape of Instruction (Operations)	_____
Videotape of Instruction (Supervisory)	_____

Videotape of Instruction (Administrators) _____

Videotape of Instruction (Maintenance) _____

Videotape of Instruction (Operations) _____

Videotape of Equipment Operation _____

Close-out Documentation _____

Detailed Maintenance of Traffic Plans _____

Structural Calculations _____

Final Certified Set of Detailed
Contract Drawings and Detailed
Specifications _____

Catalog Cuts and Data Sheets _____

Shop Drawings for Signs and Poles _____

Operation, Maintenance
and Communication Protocol Manuals
For Approval _____

Final Operation, Maintenance
and Communication Protocol Manuals _____

Factory Inspection Test Procedures
Executed Factory Inspection
Test Results Document _____

Reproducible Master Set of
all Manual Documents _____

APPENDIX E

MAINTENANCE CONTRACT REQUIREMENTS

APPENDIX E
MAINTENANCE CONTRACT REQUIREMENTS

GENERAL

A. Provide full operations and maintenance support for all the components furnished under this contract for a period of 12 months, commencing with the Commission accepting the 30-day operational test for all systems and equipment. The Commission will be able to fully operate their entire (existing and proposed) ITS system during this 30-day period, including all previously installed ITS equipment and all equipment furnished within this contract.

B. Submit operational support plan for approval by the Commission 30 days in advance of the start of this item.

C. Provide materials and complete maintenance activities according to the following requirements.

    1. Furnish a detailed operational support plan covering preventive and remedial maintenance of all equipment furnished under this Contract. Furnish all necessary labor, materials, equipment, tools, transportation, supplies, maintenance and protection of traffic and incidentals. The plan must provide a complete list of all parts provided by this Contract, including manufacturer, model #, description, quantity, location. The plan must include qualifications for the personnel assigned by the PROPOSER for each activity included in the plan. The plan must be approved by the Commission before final acceptance of the system.

D. If any corrections or improvements are made in any of the software provided under this Contract before the end of the operation and maintenance support period, provide this upgraded software to the Commission at no charge.

E. If any adjustments are made to wiring or equipment settings during the operation and maintenance support period, reflect the adjustments in the As-built documentation.

F. Coordinate with the Commission for all field activities. Except for emergency service requested by the Commission, respond to and repair within five (5) calendar days. Work requiring maintenance and protection of traffic is restricted.

G. Preventive Maintenance

    1. Detail the activities to be included in a preventive maintenance program and the frequency of each activity. Provide preventive maintenance including all procedures that are recommended by the equipment manufacturers, and at a minimum, the following additional activities to be performed every three (3) months (a total of five (5) times) at beginning of the maintenance period, at

three months into the maintenance period, six months into the maintenance period, nine months into the maintenance period and at 11 months into the maintenance period):

2. Visually inspect all VMS, CCTV and Arrow Boards for proper function every three (3) months.

3. Replacing equipment cabinet filters as per the manufacturer's recommendations, or every 6-months, whichever comes first.

4. Visually observe the CCTV camera transmitters in operation. Use the CCTV transmitter's internal diagnostics to verify proper operation. Repair any malfunctions found, and adjust equipment settings as required.

5. Visual inspection of every control cabinet for water entry and animal infestation. Repair equipment to a like-new condition. Repair any instances of water entry.

6. Clean CCTV camera lense dome housings. Treat all camera housings to enhance rainwater sheeting and runoff in accordance with manufacturer recommendations. Complete this task four (4) times over the 12 month period (every three months) in December, March, June and October.

7. Utilize an electronic database to log <u>all</u> equipment model numbers, serial numbers, equipment part number and filter numbers for all materials installed in this project. The PROPOSER will provide a sample of this database before the completion of the OAT.

8. Submit this electronic log (hardcopy and electronic version) with the Preventative Maintenance report submissions, and at the completion of the project. The database shall contain, at a minimum, the following information:

    a. Equipment Type (CCTV, VMS, Arrow Boards)
    b. Equipment Location (Roadway and Direction)
    c. Equipment Location (Mile Post)
    d. Equipment Location Description
    e. Equipment Serial Number (Camera, VMS, VMS Controller, Arrow Board)
    f. Initial Inspection Date
    g. All Preventative Maintenance Dates
    h. All Response Maintenance Date(s)
    i. All Emergency Repair Date(s)
    j. ITS Maintenance Agreement Period
    k. Maintenance "Approved By" and date.

9. All maintenance activities must be logged in this system and an electronic and hard copy must be provided to the Commission on the 15th of following month, along with the PROPOSER'S monthly invoice. The PROPOSER will not receive payment for any work that does not include the updated electronic monthly activity log.

H. Remedial Maintenance

1. When equipment malfunctions, the Commission will telephone the PROPOSER during normal business hours and fax a maintenance form. Provide, within two (2) calendar days of notification, the PROPOSER'S repair technician at the equipment location, working to fix the problem. Restore the malfunctioning equipment to a fully operational condition within five (5) calendar days of notification. Failure to meet these deadlines will result in a $1000/day deduction from the amount due to the PROPOSER.

2. Keep a neat and accurate log of failures reported by the Commission and the corrective action taken. Utilize the electronic database to log all remedial maintenance for all materials installed in this project. Submit two (2) copies of the logs to the Commission every month. At the end of the operational support period, the logs become the property of the Commission.

3. All remedial maintenance activities must be logged in this system and an electronic and hard copy must be provided to the Commission on the 15th of following month, along with the PROPOSER'S monthly invoice. The PROPOSER will not receive payment for any work that does not include the updated electronic monthly activity log.

4. Provide full operations support for all components furnished under this contract for a period of twelve (12) months, commencing with the successful completion of the 30-day operational test period for all systems and equipment.

5. All traffic control required for the above work is incidental to the preventive or remedial maintenance.

I. Emergency Service/Maintenance

1. This work is the restoration of any malfunction or damage caused by severe and unusual forces of nature, vehicular accidents and collisions, vandalism, theft, fire, erosion, exposure to chemicals or pollutants, or any other damage not included elsewhere in these Special Provisions. The causes of such damages are generally considered to be those of an unpredictable nature.

2. The PROPOSER shall provide emergency contact names (a minimum of two) and corresponding information, telephone or cell phone, address, and fax

number of those persons providing 24-hour emergency service. This list shall be updated by the PROPOSER every year, and shall be provided to the Commission by January 15th.

3. Provide, within 24-hours of notification, the PROPOSER'S repair technician at the equipment location, working to repair the problem.

4. Emergency repairs generally will involve physical damage to part of the ITS equipment necessitating the removal and replacement of structures and/or equipment.

5. In the event normal operation, as approved by the Commission, cannot be restored immediately, supply a substitute device or structure until repairs to the existing device can be made. Repair the existing device and return it to the field as quickly as practical, or as directed by the Engineer. For equipment that the PROPOSER does not have readily available, provide to the Commission for approval, with two (2) business days of initial notification, a schedule to provide and install the equipment. Failure to meet the dates in this schedule will result in a $1000/day deduction from the amount due to the PROPOSER.

6. For damage caused by vehicular collision, notify the Engineer immediately; photograph all damaged structures and equipment. Submit these photographs to the Engineer.

7. Submit by the 15th of the month, a monthly status report showing all emergency maintenance completed during the previous month to the Engineer (Administrative Contact). Include in the report, a detailed description of the emergency maintenance performed, copies of payroll records and work reports. Also, include test results in the report for all the tests conducted during emergency maintenance.

J. Warranties And Guarantees

1. Guarantee the equipment and services provided under this Contract until final project acceptance (i.e., satisfactory completion of Operational Support Program) or for the duration of the manufacturer's standard warranty and guarantee, whichever is longer.

2. Obtain all equipment and material guarantees or warranties which are normally given by a manufacturer or supplier, or as otherwise required in the contract, and assign them to the in writing.

3. Be responsible for repairing and/or replacing all hardware, software, and equipment supplied under this contract. Bear the total cost of delivery and transportation costs related to the repair of PROPOSER supplied equipment

during the terms of the guarantee as detailed in this section. The Commission reserves the sole right to determine the suitability of the PROPOSER supplied equipment within the guarantee period.

4. In the event of failure on the part of the PROPOSER to replace or repair any malfunctioning equipment within five (5) calendar days from the date of notice, the Engineer may have work done by others and charge the cost to money due, or that may become due to the PROPOSER, or if there be no money due, the PROPOSER agrees to pay such costs.

5. If a unit has been modified as a result of a system test failure, prepare a report and deliver it to the Commission for approval. Describe in the report the nature of the failure and the corrective action taken. If a failure pattern, as defined by the Commission develops, the Commission may direct that design and construction modifications be made to all similar units without additional cost to the Commission.

6. For the case of problems common to 20% of any one subsystem (CCTV, VMS, and Arrow Boards) units, modify all deliverable units without additional cost to the Commission, including design changes required to pass factory tests.

APPENDIX F

MINIMUM LANE REQUIREMENTS

MINIMUM LANE REQUIREMENTS TO BE AVAILABLE
DURING WORKING HOURS

LOCATION: **MP 119 TO MP 124 ITS TUNNEL**
MONTH: **SEPTEMBER THRU OCTOBER**
YEAR: **2009**
LANES AVAILABLE: **EB = 2** **WB = 3**

	SUNDAY		MONDAY		TUESDAY		WEDNESDAY		THURSDAY		FRIDAY		SATURDAY	
HOUR	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB
12 MID TO 1 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1 AM TO 2 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2 AM TO 3 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
3 AM TO 4 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
4 AM TO 5 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
5 AM TO 6 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
6 AM TO 7 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
7 AM TO 8 AM	1	1	1	2	1	2	1	2	1	2	2	2	1	1
8 AM TO 9 AM	1	1	1	2	1	2	1	2	1	2	2	2	1	1
9 AM TO 10 AM	1	1	2	2	2	2	2	2	2	2	2	2	2	2
10 AM TO 11 AM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
11 AM TO 12 NOON	2	2	2	2	2	2	2	2	2	2	2	2	2	2
12 NOON TO 1 PM	2	2	2	2	2	2	2	2	2	2	2	3	2	2
1 PM TO 2 PM	2	3	2	2	2	2	2	2	2	2	2	3	2	2
2 PM TO 3 PM	2	3	2	2	2	2	2	2	2	2	2	3	2	2
3 PM TO 4 PM	2	3	2	3	2	3	2	3	2	3	2	3	2	2
4 PM TO 5 PM	2	3	2	3	2	3	2	3	2	3	2	3	2	2
5 PM TO 6 PM	2	3	2	3	2	3	2	3	2	3	2	3	1	2
6 PM TO 7 PM	2	2	2	3	2	3	2	3	2	3	2	3	1	2
7 PM TO 8 PM	2	2	2	2	2	2	2	2	2	2	2	2	1	1
8 PM TO 9 PM	2	2	2	2	2	2	2	2	2	2	2	2	1	1
9 PM TO 10 PM	2	2	2	2	2	2	2	2	2	2	2	2	1	1
10 PM TO 11 PM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
11 PM TO 12 MID	1	1	1	1	1	1	1	1	1	1	1	1	1	1

NOTE: DURING THE LABOR DAY AND COLUMBUS DAY HOLIDAY PERIODS ALL TRAVEL LANES MUST BE AVAILABLE EASTBOUND AND WESTBOUND

MINIMUM LANE REQUIREMENTS TO BE AVAILABLE
DURING WORKING HOURS

LOCATION: **MP 119 TO MP 124 ITS TUNNEL**
MONTH: **NOVEMBER THRU DECEMBER**
YEAR: **2009**
LANES AVAILABLE: **EB = 2** **WB = 3**

	SUNDAY		MONDAY		TUESDAY		WEDNESDAY		THURSDAY		FRIDAY		SATURDAY	
HOUR	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB
12 MID TO 1 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1 AM TO 2 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2 AM TO 3 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
3 AM TO 4 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
4 AM TO 5 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
5 AM TO 6 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
6 AM TO 7 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
7 AM TO 8 AM	1	1	1	2	1	2	1	2	1	2	2	2	1	1
8 AM TO 9 AM	1	1	1	2	1	2	1	2	1	2	2	2	1	1
9 AM TO 10 AM	1	1	2	2	2	2	2	2	2	2	2	2	2	2
10 AM TO 11 AM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
11 AM TO 12 NOON	2	2	2	2	2	2	2	2	2	2	2	2	2	2
12 NOON TO 1 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
1 PM TO 2 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
2 PM TO 3 PM	2	2	2	2	2	2	2	2	2	2	2	3	2	2
3 PM TO 4 PM	2	2	2	3	2	3	2	3	2	3	2	3	2	2
4 PM TO 5 PM	2	2	2	3	2	3	2	3	2	3	2	3	1	2
5 PM TO 6 PM	2	2	2	3	2	3	2	3	2	3	2	3	1	2
6 PM TO 7 PM	2	2	2	3	2	3	2	3	2	3	2	3	1	2
7 PM TO 8 PM	2	2	2	2	2	2	2	2	2	2	2	2	1	1
8 PM TO 9 PM	2	2	2	2	2	2	2	2	2	2	2	2	1	1
9 PM TO 10 PM	2	2	1	1	1	1	1	1	1	1	1	1	1	1
10 PM TO 11 PM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
11 PM TO 12 MID	1	1	1	1	1	1	1	1	1	1	1	1	1	1

NOTE: DURING THE VETERANS DAY, THANKSGIVING DAY, CHRISTMAS AND NEW YEARS HOLIDAY PERIODS ALL TRAVEL LANES MUST BE AVAILABLE EASTBOUND AND WESTBOUND

MINIMUM LANE REQUIREMENTS TO BE AVAILABLE
DURING WORKING HOURS

LOCATION: **MP 119 TO MP 124 ITS TUNNEL**
MONTH: **JANUARY THRU MARCH**
YEAR: **2010**
LANES AVAILABLE: **EB = 2** **WB = 3**

	SUNDAY		MONDAY		TUESDAY		WEDNESDAY		THURSDAY		FRIDAY		SATURDAY	
HOUR	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB
12 MID TO 1 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1 AM TO 2 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2 AM TO 3 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
3 AM TO 4 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
4 AM TO 5 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
5 AM TO 6 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
6 AM TO 7 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
7 AM TO 8 AM	1	1	1	2	1	2	1	2	1	2	2	2	1	1
8 AM TO 9 AM	1	1	1	2	1	2	1	2	1	2	2	2	1	1
9 AM TO 10 AM	1	1	2	2	2	2	2	2	2	2	2	2	1	1
10 AM TO 11 AM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
11 AM TO 12 NOON	2	2	2	2	2	2	2	2	2	2	2	2	2	2
12 NOON TO 1 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
1 PM TO 2 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
2 PM TO 3 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
3 PM TO 4 PM	2	2	2	3	2	3	2	3	2	3	2	3	2	2
4 PM TO 5 PM	2	3	2	3	2	3	2	3	2	3	2	3	1	2
5 PM TO 6 PM	2	3	2	3	2	3	2	3	2	3	2	3	1	2
6 PM TO 7 PM	2	2	2	3	2	3	2	3	2	3	2	3	1	1
7 PM TO 8 PM	2	2	2	2	2	2	2	2	2	2	2	2	1	1
8 PM TO 9 PM	2	2	2	2	2	2	2	2	2	2	2	2	1	1
9 PM TO 10 PM	2	2	1	1	1	1	1	1	1	1	1	1	1	1
10 PM TO 11 PM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
11 PM TO 12 MID	1	1	1	1	1	1	1	1	1	1	1	1	1	1

NOTE: DURING THE CHRISTMAS AND NEW YEARS HOLIDAY PERIODS ALL TRAVEL LANES MUST BE AVAILABLE EASTBOUND AND WESTBOUND

MINIMUM LANE REQUIREMENTS TO BE AVAILABLE
DURING WORKING HOURS

LOCATION: **MP 119 TO MP 124 ITS TUNNEL**
MONTH: **APRIL - MAY**
YEAR: **2010**
LANES AVAILABLE: **EB = 2** **WB = 3**

	SUNDAY		MONDAY		TUESDAY		WEDNESDAY		THURSDAY		FRIDAY		SATURDAY	
HOUR	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB
12 MID TO 1 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1 AM TO 2 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2 AM TO 3 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
3 AM TO 4 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
4 AM TO 5 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
5 AM TO 6 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
6 AM TO 7 AM	1	1	1	1	1	1	1	1	1	1	2	2	1	1
7 AM TO 8 AM	1	1	1	2	1	2	1	2	1	2	2	2	1	1
8 AM TO 9 AM	1	1	1	2	1	2	1	2	1	2	2	2	1	1
9 AM TO 10 AM	1	1	2	2	2	2	2	2	2	2	2	2	2	2
10 AM TO 11 AM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
11 AM TO 12 NOON	2	2	2	2	2	2	2	2	2	2	2	3	2	2
12 NOON TO 1 PM	2	3	2	2	2	2	2	2	2	2	2	3	2	2
1 PM TO 2 PM	2	3	2	2	2	2	2	2	2	2	2	3	2	2
2 PM TO 3 PM	2	3	2	2	2	2	2	2	2	2	2	3	2	2
3 PM TO 4 PM	2	3	2	3	2	3	2	3	2	3	2	3	2	2
4 PM TO 5 PM	2	3	2	3	2	3	2	3	2	3	2	3	2	2
5 PM TO 6 PM	2	3	2	3	2	3	2	3	2	3	2	3	1	2
6 PM TO 7 PM	2	3	2	3	2	3	2	3	2	3	2	3	1	2
7 PM TO 8 PM	2	2	2	2	2	2	2	2	2	2	2	2	1	1
8 PM TO 9 PM	2	2	2	2	2	2	2	2	2	2	2	2	1	1
9 PM TO 10 PM	2	2	2	2	2	2	2	2	2	2	2	2	1	1
10 PM TO 11 PM	2	2	2	2	2	2	2	2	2	2	2	2	1	1
11 PM TO 12 MID	1	1	1	1	1	1	1	1	1	1	1	1	1	1

NOTE: DURING THE EASTER HOLIDAY PERIOD ALL TRAVEL
LANES MUST BE AVAILABLE EASTBOUND AND WESTBOUND

MINIMUM LANE REQUIREMENTS TO BE AVAILABLE
DURING WORKING HOURS

LOCATION: **MP 119 TO MP 124 ITS TUNNEL**
MONTH: **JUNE THRU AUGUST**
YEAR: **2010**
LANES AVAILABLE: **EB = 2** **WB = 3**

	SUNDAY		MONDAY		TUESDAY		WEDNESDAY		THURSDAY		FRIDAY		SATURDAY	
HOUR	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB
12 MID TO 1 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1 AM TO 2 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2 AM TO 3 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
3 AM TO 4 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
4 AM TO 5 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
5 AM TO 6 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
6 AM TO 7 AM	1	1	1	2	1	2	1	2	1	2	2	2	1	1
7 AM TO 8 AM	1	1	2	3	2	3	2	3	2	3	2	3	2	2
8 AM TO 9 AM	1	1	2	3	2	3	2	3	2	3	2	3	2	2
9 AM TO 10 AM	2	2	2	3	2	3	2	3	2	3	2	3	2	3
10 AM TO 11 AM	2	2	2	3	2	3	2	3	2	3	2	3	2	3
11 AM TO 12 NOON	2	3	2	3	2	3	2	3	2	3	2	3	2	3
12 NOON TO 1 PM	2	3	2	3	2	3	2	3	2	3	2	3	2	3
1 PM TO 2 PM	2	3	2	3	2	3	2	3	2	3	2	3	2	3
2 PM TO 3 PM	2	3	2	3	2	3	2	3	2	3	2	3	2	3
3 PM TO 4 PM	2	3	2	3	2	3	2	3	2	3	2	3	2	3
4 PM TO 5 PM	2	3	2	3	2	3	2	3	2	3	2	3	2	3
5 PM TO 6 PM	2	3	2	3	2	3	2	3	2	3	2	3	2	3
6 PM TO 7 PM	2	3	2	3	2	3	2	3	2	3	2	3	2	3
7 PM TO 8 PM	2	3	2	3	2	3	2	3	2	3	2	3	2	2
8 PM TO 9 PM	2	3	2	3	2	3	2	3	2	3	2	3	2	2
9 PM TO 10 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
10 PM TO 11 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
11 PM TO 12 MID	2	2	2	2	2	2	2	2	2	2	2	2	1	1

NOTE: DURING THE INDEPENDENCE DAY HOLIDAY PERIOD ALL TRAVEL LANES MUST BE AVAILABLE EASTBOUND AND WESTBOUND

MINIMUM LANE REQUIREMENTS TO BE AVAILABLE
DURING WORKING HOURS

LOCATION: **MP 119 TO MP 124 ITS TUNNEL**
MONTH: **SEPTEMBER THRU OCTOBER**
YEAR: **2010**
LANES AVAILABLE: **EB = 2** **WB = 3**

	SUNDAY		MONDAY		TUESDAY		WEDNESDAY		THURSDAY		FRIDAY		SATURDAY	
HOUR	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB
12 MID TO 1 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1 AM TO 2 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2 AM TO 3 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
3 AM TO 4 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
4 AM TO 5 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
5 AM TO 6 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
6 AM TO 7 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
7 AM TO 8 AM	1	1	1	2	1	2	1	2	1	2	2	2	1	1
8 AM TO 9 AM	1	1	1	2	1	2	1	2	1	2	2	2	1	1
9 AM TO 10 AM	1	1	2	2	2	2	2	2	2	2	2	2	2	2
10 AM TO 11 AM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
11 AM TO 12 NOON	2	2	2	2	2	2	2	2	2	2	2	2	2	2
12 NOON TO 1 PM	2	2	2	2	2	2	2	2	2	2	2	3	2	2
1 PM TO 2 PM	2	3	2	2	2	2	2	2	2	2	2	3	2	2
2 PM TO 3 PM	2	3	2	2	2	2	2	2	2	2	2	3	2	2
3 PM TO 4 PM	2	3	2	3	2	3	2	3	2	3	2	3	2	2
4 PM TO 5 PM	2	3	2	3	2	3	2	3	2	3	2	3	2	2
5 PM TO 6 PM	2	3	2	3	2	3	2	3	2	3	2	3	1	2
6 PM TO 7 PM	2	2	2	3	2	3	2	3	2	3	2	3	1	2
7 PM TO 8 PM	2	2	2	2	2	2	2	2	2	2	2	2	1	1
8 PM TO 9 PM	2	2	2	2	2	2	2	2	2	2	2	2	1	1
9 PM TO 10 PM	2	2	2	2	2	2	2	2	2	2	2	2	1	1
10 PM TO 11 PM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
11 PM TO 12 MID	1	1	1	1	1	1	1	1	1	1	1	1	1	1

NOTE: DURING THE LABOR DAY AND COLUMBUS DAY HOLIDAY PERIODS ALL TRAVEL LANES MUST BE AVAILABLE EASTBOUND AND WESTBOUND

MINIMUM LANE REQUIREMENTS TO BE AVAILABLE
DURING WORKING HOURS

LOCATION: **MP 119 TO MP 124 ITS TUNNEL**
MONTH: **NOVEMBER THRU DECEMBER**
YEAR: **2010**
LANES AVAILABLE: **EB = 2** **WB = 3**

	SUNDAY		MONDAY		TUESDAY		WEDNESDAY		THURSDAY		FRIDAY		SATURDAY	
HOUR	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB
12 MID TO 1 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1 AM TO 2 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2 AM TO 3 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
3 AM TO 4 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
4 AM TO 5 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
5 AM TO 6 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
6 AM TO 7 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
7 AM TO 8 AM	1	1	1	2	1	2	1	2	1	2	2	2	1	1
8 AM TO 9 AM	1	1	1	2	1	2	1	2	1	2	2	2	1	1
9 AM TO 10 AM	1	1	2	2	2	2	2	2	2	2	2	2	2	2
10 AM TO 11 AM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
11 AM TO 12 NOON	2	2	2	2	2	2	2	2	2	2	2	2	2	2
12 NOON TO 1 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
1 PM TO 2 PM	2	2	2	2	2	2	2	2	2	2	2	3	2	2
2 PM TO 3 PM	2	2	2	2	2	2	2	2	2	2	2	3	2	2
3 PM TO 4 PM	2	2	2	3	2	3	2	3	2	3	2	3	2	2
4 PM TO 5 PM	2	2	2	3	2	3	2	3	2	3	2	3	2	2
5 PM TO 6 PM	2	2	2	3	2	3	2	3	2	3	2	3	2	2
6 PM TO 7 PM	2	2	2	3	2	3	2	3	2	3	2	3	2	2
7 PM TO 8 PM	2	2	2	2	2	2	2	2	2	2	2	2	1	1
8 PM TO 9 PM	2	2	2	2	2	2	2	2	2	2	2	2	1	1
9 PM TO 10 PM	2	2	2	2	2	2	2	2	2	2	2	2	1	1
10 PM TO 11 PM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
11 PM TO 12 MID	1	1	1	1	1	1	1	1	1	1	1	1	1	1

NOTE: DURING THE VETERANS DAY, THANKSGIVING DAY, CHRISTMAS AND NEW YEARS HOLIDAY PERIODS ALL TRAVEL LANES MUST BE AVAILABLE EASTBOUND AND WESTBOUND

MINIMUM LANE REQUIREMENTS TO BE AVAILABLE
DURING WORKING HOURS

LOCATION: **MP 175 to MP 190 ITS Tunnel**
MONTH: **SEPTEMBER**
YEAR: **2009**
LANES AVAILABLE: **EB = 2 WB = 2**

	SUNDAY		MONDAY		TUESDAY		WEDNESDAY		THURSDAY		FRIDAY		SATURDAY	
HOUR	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB
12 MID TO 1 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1 AM TO 2 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2 AM TO 3 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
3 AM TO 4 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
4 AM TO 5 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
5 AM TO 6 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
6 AM TO 7 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
7 AM TO 8 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
8 AM TO 9 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
9 AM TO 10 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
10 AM TO 11 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
11 AM TO 12 NOON	1	1	1	1	1	1	1	1	1	1	1	2	1	1
12 NOON TO 1 PM	1	1	1	1	1	1	1	1	1	1	1	2	1	1
1 PM TO 2 PM	2	1	1	1	1	1	1	1	1	1	1	2	1	1
2 PM TO 3 PM	2	2	1	1	1	1	1	1	1	1	1	2	1	1
3 PM TO 4 PM	2	2	1	2	1	2	1	2	1	2	1	2	1	1
4 PM TO 5 PM	2	2	1	2	1	2	1	2	1	2	1	2	1	1
5 PM TO 6 PM	2	2	1	2	1	2	1	2	1	2	1	2	1	1
6 PM TO 7 PM	2	2	1	2	1	2	1	2	1	2	1	2	1	1
7 PM TO 8 PM	1	1	1	1	1	1	1	1	1	1	1	2	1	1
8 PM TO 9 PM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
9 PM TO 10 PM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
10 PM TO 11 PM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
11 PM TO 12 MID	1	1	1	1	1	1	1	1	1	1	1	1	1	1

NOTE: DURING THE LABOR DAY HOLIDAY PERIOD TWO (2)
TRAVEL LANES MUST BE AVAILABLE EASTBOUND AND WESTBOUND

MINIMUM LANE REQUIREMENTS TO BE AVAILABLE
DURING WORKING HOURS

LOCATION: **MP 175 to MP 190 ITS Tunnel**
MONTH: **OCTOBER**
YEAR: **2009**
LANES AVAILABLE: **EB = 2 WB = 2**

	SUNDAY		MONDAY		TUESDAY		WEDNESDAY		THURSDAY		FRIDAY		SATURDAY	
HOUR	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB
12 MID TO 1 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1 AM TO 2 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2 AM TO 3 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
3 AM TO 4 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
4 AM TO 5 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
5 AM TO 6 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
6 AM TO 7 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
7 AM TO 8 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
8 AM TO 9 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
9 AM TO 10 AM	1	1	1	1	1	1	1	1	1	1	1	2	1	1
10 AM TO 11 AM	1	1	1	1	1	1	1	1	1	1	1	2	1	2
11 AM TO 12 NOON	1	1	1	1	1	1	1	1	1	1	1	2	1	2
12 NOON TO 1 PM	2	1	1	1	1	1	1	1	1	1	1	2	1	2
1 PM TO 2 PM	2	1	1	1	1	1	1	1	1	1	1	2	1	1
2 PM TO 3 PM	2	2	1	1	1	1	1	1	1	1	1	2	1	1
3 PM TO 4 PM	2	2	1	2	1	2	1	2	1	2	1	2	1	1
4 PM TO 5 PM	2	2	1	2	1	2	1	2	1	2	1	2	1	1
5 PM TO 6 PM	2	2	1	2	1	2	1	2	1	2	1	2	1	1
6 PM TO 7 PM	2	2	1	2	1	2	1	2	1	2	1	2	1	1
7 PM TO 8 PM	2	1	1	1	1	1	1	1	1	1	1	2	1	1
8 PM TO 9 PM	1	1	1	1	1	1	1	1	1	1	1	2	1	1
9 PM TO 10 PM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
10 PM TO 11 PM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
11 PM TO 12 MID	1	1	1	1	1	1	1	1	1	1	1	1	1	1

NOTE: DURING THE COLUMBUS DAY HOLIDAY PERIOD TWO (2)
TRAVEL LANES MUST BE AVAILABLE EASTBOUND AND WESTBOUND

MINIMUM LANE REQUIREMENTS TO BE AVAILABLE
DURING WORKING HOURS

LOCATION: **MP 175 to MP 190 ITS Tunnel**
MONTH: **November - December**
YEAR: **2009**
LANES AVAILABLE: **EB = 2 WB = 2**

	SUNDAY		MONDAY		TUESDAY		WEDNESDAY		THURSDAY		FRIDAY		SATURDAY	
EB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB
12 MID TO 1 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1 AM TO 2 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2 AM TO 3 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
3 AM TO 4 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
4 AM TO 5 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
5 AM TO 6 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
6 AM TO 7 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
7 AM TO 8 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
8 AM TO 9 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
9 AM TO 10 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
10 AM TO 11 AM	1	1	1	1	1	1	1	1	1	1	1	2	1	2
11 AM TO 12 NOON	1	1	1	1	1	1	1	1	1	1	1	2	1	2
12 NOON TO 1 PM	2	1	1	1	1	1	1	1	1	1	1	2	1	2
1 PM TO 2 PM	2	1	1	1	1	1	1	1	1	1	1	2	1	1
2 PM TO 3 PM	2	1	1	1	1	1	1	1	1	1	1	2	1	1
3 PM TO 4 PM	2	1	1	1	1	1	1	1	1	1	1	2	1	1
4 PM TO 5 PM	2	1	1	2	1	2	1	2	1	2	1	2	1	1
5 PM TO 6 PM	2	1	1	2	1	2	1	2	1	2	1	2	1	1
6 PM TO 7 PM	2	1	1	1	1	1	1	1	1	1	1	2	1	1
7 PM TO 8 PM	2	1	1	1	1	1	1	1	1	1	1	2	1	1
8 PM TO 9 PM	1	1	1	1	1	1	1	1	1	1	1	2	1	1
9 PM TO 10 PM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
10 PM TO 11 PM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
11 PM TO 12 MID	1	1	1	1	1	1	1	1	1	1	1	1	1	1

NOTE: DURING THE VETERANS DAY THANSKGIVING, CHRISTMAS AND NEW YEARS HOLIDAY PERIODS TWO TRAVEL LANES MUST BE AVAILABLE EASTBOUND AND WESTBOUND

MINIMUM LANE REQUIREMENTS TO BE AVAILABLE
DURING WORKING HOURS

LOCATION: **MP 175 to MP 190 ITS Tunnel**
MONTH: **JANUARY THRU MARCH**
YEAR: **2010**
LANES AVAILABLE: **EB = 2** **WB = 2**

	SUNDAY		MONDAY		TUESDAY		WEDNESDAY		THURSDAY		FRIDAY		SATURDAY	
HOUR	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB
12 MID TO 1 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1 AM TO 2 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2 AM TO 3 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
3 AM TO 4 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
4 AM TO 5 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
5 AM TO 6 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
6 AM TO 7 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
7 AM TO 8 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
8 AM TO 9 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
9 AM TO 10 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
10 AM TO 11 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
11 AM TO 12 NOON	1	1	1	1	1	1	1	1	1	1	1	1	1	1
12 NOON TO 1 PM	1	1	1	1	1	1	1	1	1	1	1	2	1	1
1 PM TO 2 PM	1	1	1	1	1	1	1	1	1	1	1	2	1	1
2 PM TO 3 PM	1	2	1	1	1	1	1	1	1	1	1	2	1	1
3 PM TO 4 PM	1	2	1	2	1	2	1	2	1	2	1	2	1	1
4 PM TO 5 PM	1	2	1	2	1	2	1	2	1	2	1	2	1	1
5 PM TO 6 PM	1	2	1	2	1	2	1	2	1	2	1	2	1	1
6 PM TO 7 PM	1	2	1	1	1	1	1	1	1	1	1	2	1	1
7 PM TO 8 PM	1	2	1	1	1	1	1	1	1	1	1	1	1	1
8 PM TO 9 PM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
9 PM TO 10 PM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
10 PM TO 11 PM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
11 PM TO 12 MID	1	1	1	1	1	1	1	1	1	1	1	1	1	1

NOTE: DURING THE NEW YEARS HOLIDAY PERIOD TWO (2) TRAVEL LANES
MUST BE AVAILABLE EASTBOUND AND WESTBOUND

MINIMUM LANE REQUIREMENTS TO BE AVAILABLE
DURING WORKING HOURS

LOCATION: **MP 175 to MP 190 ITS Tunnel**
MONTH: **APRIL-MAY**
YEAR: **2010**
LANES AVAILABLE: **EB = 2** **WB = 2**

	SUNDAY		MONDAY		TUESDAY		WEDNESDAY		THURSDAY		FRIDAY		SATURDAY	
HOUR	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB
12 MID TO 1 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1 AM TO 2 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2 AM TO 3 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
3 AM TO 4 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
4 AM TO 5 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
5 AM TO 6 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
6 AM TO 7 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
7 AM TO 8 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
8 AM TO 9 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
9 AM TO 10 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
10 AM TO 11 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
11 AM TO 12 NOON	1	1	1	2	1	2	1	2	1	2	1	2	1	2
12 NOON TO 1 PM	2	1	1	2	1	2	1	2	1	2	1	2	1	2
1 PM TO 2 PM	2	2	1	2	1	2	1	2	1	2	1	2	1	1
2 PM TO 3 PM	2	2	1	2	1	2	1	2	1	2	1	2	1	1
3 PM TO 4 PM	2	2	1	2	1	2	1	2	1	2	2	2	1	1
4 PM TO 5 PM	2	2	1	2	1	2	1	2	1	2	2	2	1	1
5 PM TO 6 PM	2	2	1	2	1	2	1	2	1	2	2	2	1	1
6 PM TO 7 PM	2	2	1	2	1	2	1	2	1	2	1	2	1	1
7 PM TO 8 PM	2	1	1	1	1	1	1	1	1	1	1	2	1	1
8 PM TO 9 PM	1	1	1	1	1	1	1	1	1	1	1	2	1	1
9 PM TO 10 PM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
10 PM TO 11 PM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
11 PM TO 12 MID	1	1	1	1	1	1	1	1	1	1	1	1	1	1

NOTE: DURING THE EASTER HOLIDAY PERIOD TWO (2)
TRAVEL LANES MUST BE AVAILABLE EASTBOUND AND WESTBOUND

MINIMUM LANE REQUIREMENTS TO BE AVAILABLE
DURING WORKING HOURS

LOCATION: **MP 175 to MP 190 ITS Tunnel**
MONTH: **June Thru August**
YEAR: **2010**
LANES AVAILABLE: **EB = 2** **WB = 2**

	SUNDAY		MONDAY		TUESDAY		WEDNESDAY		THURSDAY		FRIDAY		SATURDAY	
HOUR	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB
12 MID TO 1 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1 AM TO 2 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2 AM TO 3 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
3 AM TO 4 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
4 AM TO 5 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
5 AM TO 6 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
6 AM TO 7 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
7 AM TO 8 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
8 AM TO 9 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
9 AM TO 10 AM	2	1	1	1	1	1	1	1	1	1	1	1	1	1
10 AM TO 11 AM	2	1	1	2	1	2	1	2	1	2	1	2	2	2
11 AM TO 12 NOON	2	1	1	2	1	2	1	2	1	2	2	2	2	2
12 NOON TO 1 PM	2	2	1	2	1	2	1	2	1	2	2	2	2	2
1 PM TO 2 PM	2	2	1	2	1	2	1	2	1	2	2	2	1	2
2 PM TO 3 PM	2	2	1	2	1	2	1	2	1	2	2	2	1	2
3 PM TO 4 PM	2	2	2	2	2	2	2	2	2	2	2	2	1	2
4 PM TO 5 PM	2	2	2	2	2	2	2	2	2	2	2	2	1	2
5 PM TO 6 PM	2	2	2	2	2	2	2	2	2	2	2	2	1	1
6 PM TO 7 PM	2	2	1	2	1	2	1	2	1	2	1	2	1	1
7 PM TO 8 PM	2	2	1	2	1	2	1	2	1	2	1	2	1	1
8 PM TO 9 PM	2	2	1	2	1	2	1	2	1	2	1	2	1	1
9 PM TO 10 PM	2	1	1	1	1	1	1	1	1	1	1	1	1	1
10 PM TO 11 PM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
11 PM TO 12 MID	1	1	1	1	1	1	1	1	1	1	1	1	1	1

NOTE: DURING THE EASTER HOLIDAY PERIOD TWO (2)
TRAVEL LANES MUST BE AVAILABLE EASTBOUND AND WESTBOUND

MINIMUM LANE REQUIREMENTS TO BE AVAILABLE
DURING WORKING HOURS

LOCATION: **MP 175 to MP 190 ITS Tunnel**
MONTH: **SEPTEMBER**
YEAR: **2010**
LANES AVAILABLE: **EB = 2 WB = 2**

	SUNDAY		MONDAY		TUESDAY		WEDNESDAY		THURSDAY		FRIDAY		SATURDAY	
HOUR	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB
12 MID TO 1 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1 AM TO 2 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2 AM TO 3 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
3 AM TO 4 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
4 AM TO 5 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
5 AM TO 6 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
6 AM TO 7 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
7 AM TO 8 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
8 AM TO 9 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
9 AM TO 10 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
10 AM TO 11 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
11 AM TO 12 NOON	1	1	1	1	1	1	1	1	1	1	1	2	1	1
12 NOON TO 1 PM	2	1	1	1	1	1	1	1	1	1	1	2	1	1
1 PM TO 2 PM	2	2	1	1	1	1	1	1	1	1	1	2	1	1
2 PM TO 3 PM	2	2	1	2	1	2	1	2	1	2	1	2	1	1
3 PM TO 4 PM	2	2	1	2	1	2	1	2	1	2	1	2	1	1
4 PM TO 5 PM	2	2	1	2	1	2	1	2	1	2	1	2	1	1
5 PM TO 6 PM	2	2	1	2	1	2	1	2	1	2	1	2	1	1
6 PM TO 7 PM	2	2	1	2	1	2	1	2	1	2	1	2	1	1
7 PM TO 8 PM	2	2	1	1	1	1	1	1	1	1	1	2	1	1
8 PM TO 9 PM	1	1	1	1	1	1	1	1	1	1	1	2	1	1
9 PM TO 10 PM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
10 PM TO 11 PM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
11 PM TO 12 MID	1	1	1	1	1	1	1	1	1	1	1	1	1	1

NOTE: DURING THE LABOR DAY HOLIDAY PERIOD TWO (2)
TRAVEL LANES MUST BE AVAILABLE EASTBOUND AND WESTBOUND

MINIMUM LANE REQUIREMENTS TO BE AVAILABLE
DURING WORKING HOURS

LOCATION: **MP 175 to MP 190 ITS Tunnel**
MONTH: **OCTOBER**
YEAR: **2010**
LANES AVAILABLE: **EB = 2 WB = 2**

	SUNDAY		MONDAY		TUESDAY		WEDNESDAY		THURSDAY		FRIDAY		SATURDAY	
HOUR	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB
12 MID TO 1 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1 AM TO 2 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2 AM TO 3 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
3 AM TO 4 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
4 AM TO 5 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
5 AM TO 6 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
6 AM TO 7 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
7 AM TO 8 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
8 AM TO 9 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
9 AM TO 10 AM	1	1	1	1	1	1	1	1	1	1	1	2	1	1
10 AM TO 11 AM	1	1	1	1	1	1	1	1	1	1	1	2	1	2
11 AM TO 12 NOON	2	1	1	1	1	1	1	1	1	1	1	2	1	2
12 NOON TO 1 PM	2	1	1	1	1	1	1	1	1	1	1	2	1	2
1 PM TO 2 PM	2	2	1	1	1	1	1	1	1	1	1	2	1	1
2 PM TO 3 PM	2	2	1	2	1	2	1	2	1	2	1	2	1	1
3 PM TO 4 PM	2	2	1	2	1	2	1	2	1	2	2	2	1	1
4 PM TO 5 PM	2	2	1	2	1	2	1	2	1	2	2	2	1	1
5 PM TO 6 PM	2	2	1	2	1	2	1	2	1	2	2	2	1	1
6 PM TO 7 PM	2	2	1	2	1	2	1	2	1	2	1	2	1	1
7 PM TO 8 PM	2	2	1	2	1	2	1	2	1	2	1	2	1	1
8 PM TO 9 PM	1	1	1	1	1	1	1	1	1	1	1	2	1	1
9 PM TO 10 PM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
10 PM TO 11 PM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
11 PM TO 12 MID	1	1	1	1	1	1	1	1	1	1	1	1	1	1

NOTE: DURING THE COLUMBUS DAY HOLIDAY PERIOD TWO (2)
TRAVEL LANES MUST BE AVAILABLE EASTBOUND AND WESTBOUND

MINIMUM LANE REQUIREMENTS TO BE AVAILABLE
DURING WORKING HOURS

LOCATION: **MP 175 to MP 190 ITS Tunnel**
MONTH: **November - December**
YEAR: **2010**
LANES AVAILABLE: **EB = 2 WB = 2**

	SUNDAY		MONDAY		TUESDAY		WEDNESDAY		THURSDAY		FRIDAY		SATURDAY	
HOUR	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB
12 MID TO 1 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1 AM TO 2 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2 AM TO 3 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
3 AM TO 4 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
4 AM TO 5 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
5 AM TO 6 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
6 AM TO 7 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
7 AM TO 8 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
8 AM TO 9 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
9 AM TO 10 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
10 AM TO 11 AM	1	1	1	1	1	1	1	1	1	1	1	2	1	2
11 AM TO 12 NOON	2	1	1	1	1	1	1	1	1	1	1	2	1	2
12 NOON TO 1 PM	2	1	1	1	1	1	1	1	1	1	1	2	1	2
1 PM TO 2 PM	2	1	1	1	1	1	1	1	1	1	1	2	1	1
2 PM TO 3 PM	2	1	1	1	1	1	1	1	1	1	1	2	1	1
3 PM TO 4 PM	2	2	1	2	1	2	1	2	1	2	1	2	1	1
4 PM TO 5 PM	2	2	1	2	1	2	1	2	1	2	1	2	1	1
5 PM TO 6 PM	2	2	1	2	1	2	1	2	1	2	1	2	1	1
6 PM TO 7 PM	2	2	1	2	1	2	1	2	1	2	1	2	1	1
7 PM TO 8 PM	2	1	1	1	1	1	1	1	1	1	1	2	1	1
8 PM TO 9 PM	1	1	1	1	1	1	1	1	1	1	1	2	1	1
9 PM TO 10 PM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
10 PM TO 11 PM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
11 PM TO 12 MID	1	1	1	1	1	1	1	1	1	1	1	1	1	1

NOTE: DURING THE VETERANS DAY THANSKGIVING, CHRISTMAS AND NEW YEARS HOLIDAY PERIODS TWO TRAVEL LANES MUST BE AVAILABLE EASTBOUND AND WESTBOUND

MINIMUM LANE REQUIREMENTS TO BE AVAILABLE
DURING WORKING HOURS

LOCATION: **MP 194 TO MP 197 ITS Tunnel**
MONTH: **SEPTEMBER THRU OCTOBER**
YEAR: **2009**
LANES AVAILABLE: **EB = 2** **WB = 2**

	SUNDAY		MONDAY		TUESDAY		WEDNESDAY		THURSDAY		FRIDAY		SATURDAY	
HOUR	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB
12 MID TO 1 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1 AM TO 2 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2 AM TO 3 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
3 AM TO 4 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
4 AM TO 5 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
5 AM TO 6 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
6 AM TO 7 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
7 AM TO 8 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
8 AM TO 9 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
9 AM TO 10 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
10 AM TO 11 AM	1	1	1	1	1	1	1	1	1	1	1	2	1	2
11 AM TO 12 NOON	2	1	1	1	1	1	1	1	1	1	1	2	1	2
12 NOON TO 1 PM	2	1	1	2	1	2	1	2	1	2	1	2	1	1
1 PM TO 2 PM	2	1	1	2	1	2	1	2	1	2	1	2	1	1
2 PM TO 3 PM	2	2	1	2	1	2	1	2	1	2	1	2	1	1
3 PM TO 4 PM	2	2	2	2	2	2	2	2	2	2	2	2	1	1
4 PM TO 5 PM	2	2	2	2	2	2	2	2	2	2	2	2	1	1
5 PM TO 6 PM	2	2	2	2	2	2	2	2	2	2	2	2	1	1
6 PM TO 7 PM	2	2	1	2	1	2	1	2	1	2	2	2	1	1
7 PM TO 8 PM	2	1	1	2	1	2	1	2	1	2	1	2	1	1
8 PM TO 9 PM	2	1	1	2	1	2	1	2	1	2	1	2	1	1
9 PM TO 10 PM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
10 PM TO 11 PM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
11 PM TO 12 MID	1	1	1	1	1	1	1	1	1	1	1	1	1	1

NOTE: DURING THE LABOR DAY AND COLUMBUS DAY HOLIDAY PERIODS TWO (2)
TRAVEL LANES MUST BE AVAILABLE EASTBOUND AND WESTBOUND

MINIMUM LANE REQUIREMENTS TO BE AVAILABLE
DURING WORKING HOURS

LOCATION: **MP 194 TO MP 197 ITS Tunnel**

MONTH: **NOVEMBER THRU DECEMBER**
YEAR: **2009**
LANES AVAILABLE: **EB = 2** **WB = 2**

	SUNDAY		MONDAY		TUESDAY		WEDNESDAY		THURSDAY		FRIDAY		SATURDAY	
HOUR	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB
12 MID TO 1 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1 AM TO 2 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2 AM TO 3 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
3 AM TO 4 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
4 AM TO 5 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
5 AM TO 6 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
6 AM TO 7 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
7 AM TO 8 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
8 AM TO 9 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
9 AM TO 10 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
10 AM TO 11 AM	1	1	1	1	1	1	1	1	1	1	1	2	1	1
11 AM TO 12 NOON	1	1	1	1	1	1	1	1	1	1	1	2	1	1
12 NOON TO 1 PM	1	1	1	2	1	2	1	2	1	2	1	2	1	1
1 PM TO 2 PM	2	1	1	2	1	2	1	2	1	2	1	2	1	1
2 PM TO 3 PM	2	1	1	2	1	2	1	2	1	2	1	2	1	1
3 PM TO 4 PM	2	1	1	2	1	2	1	2	1	2	1	2	1	1
4 PM TO 5 PM	2	1	1	2	1	2	1	2	1	2	1	2	1	1
5 PM TO 6 PM	2	1	1	2	1	2	1	2	1	2	1	2	1	1
6 PM TO 7 PM	2	1	1	2	1	2	1	2	1	2	1	2	1	1
7 PM TO 8 PM	1	1	1	2	1	2	1	2	1	2	1	2	1	1
8 PM TO 9 PM	1	1	1	2	1	2	1	2	1	2	1	2	1	1
9 PM TO 10 PM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
10 PM TO 11 PM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
11 PM TO 12 MID	1	1	1	1	1	1	1	1	1	1	1	1	1	1

NOTE: DURING THE VETERANS DAY, THANKSGIVING, CHRISTMAS AND NEW YEARS HOLIDAY PERIODS TWO (2) TRAVEL LANES MUST BE AVAILABLE EASTBOUND AND WESTBOUND

MINIMUM LANE REQUIREMENTS TO BE AVAILABLE
DURING WORKING HOURS

LOCATION: **MP 194 TO MP 197 ITS Tunnel**
MONTH: **JANUARY THRU MARCH**
YEAR: **2010**
LANES AVAILABLE: **EB = 2** **WB = 2**

	SUNDAY		MONDAY		TUESDAY		WEDNESDAY		THURSDAY		FRIDAY		SATURDAY	
HOUR	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB
12 MID TO 1 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1 AM TO 2 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2 AM TO 3 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
3 AM TO 4 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
4 AM TO 5 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
5 AM TO 6 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
6 AM TO 7 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
7 AM TO 8 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
8 AM TO 9 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
9 AM TO 10 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
10 AM TO 11 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
11 AM TO 12 NOON	1	1	1	1	1	1	1	1	1	1	1	2	1	1
12 NOON TO 1 PM	1	1	1	1	1	1	1	1	1	1	1	2	1	1
1 PM TO 2 PM	1	1	1	1	1	1	1	1	1	1	1	2	1	1
2 PM TO 3 PM	1	1	1	1	1	1	1	1	1	1	1	2	1	1
3 PM TO 4 PM	1	1	1	1	1	1	1	1	1	1	1	2	1	1
4 PM TO 5 PM	1	1	1	2	1	2	1	2	1	2	1	2	1	1
5 PM TO 6 PM	1	1	1	2	1	2	1	2	1	2	1	2	1	1
6 PM TO 7 PM	1	1	1	2	1	2	1	2	1	2	1	2	1	1
7 PM TO 8 PM	1	1	1	1	1	1	1	1	1	1	1	2	1	1
8 PM TO 9 PM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
9 PM TO 10 PM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
10 PM TO 11 PM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
11 PM TO 12 MID	1	1	1	1	1	1	1	1	1	1	1	1	1	1

NOTE: DURING THE NEW YEARS HOLIDAY PERIOD TWO (2) TRAVEL LANES
MUST BE AVAILABLE EASTBOUND AND WESTBOUND

MINIMUM LANE REQUIREMENTS TO BE AVAILABLE
DURING WORKING HOURS

LOCATION: **MP 194 TO MP 197 ITS Tunnel**
MONTH: **APRIL-MAY**
YEAR: **2010**
LANES AVAILABLE: **EB = 2** **WB = 2**

	SUNDAY		MONDAY		TUESDAY		WEDNESDAY		THURSDAY		FRIDAY		SATURDAY	
HOUR	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB
12 MID TO 1 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1 AM TO 2 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2 AM TO 3 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
3 AM TO 4 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
4 AM TO 5 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
5 AM TO 6 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
6 AM TO 7 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
7 AM TO 8 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
8 AM TO 9 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
9 AM TO 10 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
10 AM TO 11 AM	1	1	1	1	1	1	1	1	1	1	1	2	1	1
11 AM TO 12 NOON	1	1	1	1	1	1	1	1	1	1	1	2	1	1
12 NOON TO 1 PM	1	1	1	1	1	1	1	1	1	1	1	2	1	1
1 PM TO 2 PM	2	1	1	2	1	2	1	2	1	2	1	2	1	1
2 PM TO 3 PM	2	1	1	2	1	2	1	2	1	2	1	2	1	1
3 PM TO 4 PM	2	2	1	2	1	2	1	2	1	2	1	2	1	1
4 PM TO 5 PM	2	2	1	2	1	2	1	2	1	2	2	2	1	1
5 PM TO 6 PM	2	2	1	2	1	2	1	2	1	2	2	2	1	1
6 PM TO 7 PM	2	2	1	2	1	2	1	2	1	2	1	2	1	1
7 PM TO 8 PM	1	1	1	2	1	2	1	2	1	2	1	2	1	1
8 PM TO 9 PM	1	1	1	2	1	2	1	2	1	2	1	1	1	1
9 PM TO 10 PM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
10 PM TO 11 PM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
11 PM TO 12 MID	1	1	1	1	1	1	1	1	1	1	1	1	1	1

NOTE: DURING THE EASTER HOLIDAY PERIOD TWO (2) TRAVEL LANES
MUST BE AVAILABLE EASTBOUND AND WESTBOUND

MINIMUM LANE REQUIREMENTS TO BE AVAILABLE
DURING WORKING HOURS

LOCATION: **MP 194 TO MP 197 ITS Tunnel**
MONTH: **JUNE THRU AUGUST**
YEAR: **2010**
LANES AVAILABLE: **EB = 2** **WB = 2**

	SUNDAY		MONDAY		TUESDAY		WEDNESDAY		THURSDAY		FRIDAY		SATURDAY	
HOUR	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB
12 MID TO 1 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1 AM TO 2 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2 AM TO 3 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
3 AM TO 4 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
4 AM TO 5 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
5 AM TO 6 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
6 AM TO 7 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
7 AM TO 8 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
8 AM TO 9 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
9 AM TO 10 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
10 AM TO 11 AM	1	1	1	2	1	2	1	2	1	2	2	2	2	2
11 AM TO 12 NOON	2	1	1	2	1	2	1	2	1	2	2	2	2	2
12 NOON TO 1 PM	2	1	1	2	1	2	1	2	1	2	2	2	1	2
1 PM TO 2 PM	2	2	1	2	1	2	1	2	1	2	2	2	1	2
2 PM TO 3 PM	2	2	1	2	1	2	1	2	1	2	2	2	1	2
3 PM TO 4 PM	2	2	2	2	2	2	2	2	2	2	2	2	1	2
4 PM TO 5 PM	2	2	2	2	2	2	2	2	2	2	2	2	1	2
5 PM TO 6 PM	2	2	2	2	2	2	2	2	2	2	2	2	1	1
6 PM TO 7 PM	2	2	1	2	1	2	1	2	1	2	2	2	1	1
7 PM TO 8 PM	2	2	1	2	1	2	1	2	1	2	1	2	1	1
8 PM TO 9 PM	2	1	1	2	1	2	1	2	1	2	1	2	1	1
9 PM TO 10 PM	1	1	1	2	1	2	1	2	1	2	1	1	1	1
10 PM TO 11 PM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
11 PM TO 12 MID	1	1	1	1	1	1	1	1	1	1	1	1	1	1

NOTE: DURING THE INDEPENDENCE DAY HOLIDAY PERIOD TWO (2)
TRAVEL LANES MUST BE AVAILABLE EASTBOUND AND WESTBOUND

MINIMUM LANE REQUIREMENTS TO BE AVAILABLE
DURING WORKING HOURS

LOCATION: **MP 194 TO MP 197 ITS Tunnel**
MONTH: **SEPTEMBER THRU OCTOBER**
YEAR: **2010**
LANES AVAILABLE: **EB = 2** **WB = 2**

	SUNDAY		MONDAY		TUESDAY		WEDNESDAY		THURSDAY		FRIDAY		SATURDAY	
HOUR	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB
12 MID TO 1 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1 AM TO 2 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2 AM TO 3 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
3 AM TO 4 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
4 AM TO 5 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
5 AM TO 6 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
6 AM TO 7 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
7 AM TO 8 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
8 AM TO 9 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
9 AM TO 10 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
10 AM TO 11 AM	1	1	1	1	1	1	1	1	1	1	1	2	1	2
11 AM TO 12 NOON	2	1	1	1	1	1	1	1	1	1	1	2	1	2
12 NOON TO 1 PM	2	1	1	2	1	2	1	2	1	2	1	2	1	1
1 PM TO 2 PM	2	1	1	2	1	2	1	2	1	2	1	2	1	1
2 PM TO 3 PM	2	2	1	2	1	2	1	2	1	2	1	2	1	1
3 PM TO 4 PM	2	2	2	2	2	2	2	2	2	2	2	2	1	1
4 PM TO 5 PM	2	2	2	2	2	2	2	2	2	2	2	2	1	1
5 PM TO 6 PM	2	2	2	2	2	2	2	2	2	2	2	2	1	1
6 PM TO 7 PM	2	2	2	2	2	2	2	2	2	2	2	2	1	1
7 PM TO 8 PM	2	1	1	2	1	2	1	2	1	2	1	2	1	1
8 PM TO 9 PM	2	1	1	2	1	2	1	2	1	2	1	2	1	1
9 PM TO 10 PM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
10 PM TO 11 PM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
11 PM TO 12 MID	1	1	1	1	1	1	1	1	1	1	1	1	1	1

NOTE: DURING THE LABOR DAY AND COLUMBUS DAY HOLIDAY PERIODS TWO (2)
TRAVEL LANES MUST BE AVAILABLE EASTBOUND AND WESTBOUND

MINIMUM LANE REQUIREMENTS TO BE AVAILABLE
DURING WORKING HOURS

LOCATION: **MP 194 TO MP 197 ITS Tunnel**

MONTH: **NOVEMBER THRU DECEMBER**
YEAR: **2010**
LANES AVAILABLE: **EB = 2** **WB = 2**

	SUNDAY		MONDAY		TUESDAY		WEDNESDAY		THURSDAY		FRIDAY		SATURDAY	
HOUR	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB
12 MID TO 1 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1 AM TO 2 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2 AM TO 3 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
3 AM TO 4 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
4 AM TO 5 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
5 AM TO 6 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
6 AM TO 7 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
7 AM TO 8 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
8 AM TO 9 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
9 AM TO 10 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
10 AM TO 11 AM	1	1	1	1	1	1	1	1	1	1	1	2	1	1
11 AM TO 12 NOON	1	1	1	1	1	1	1	1	1	1	1	2	1	1
12 NOON TO 1 PM	1	1	1	2	1	2	1	2	1	2	1	2	1	1
1 PM TO 2 PM	2	1	1	2	1	2	1	2	1	2	1	2	1	1
2 PM TO 3 PM	2	1	1	2	1	2	1	2	1	2	1	2	1	1
3 PM TO 4 PM	2	1	1	2	1	2	1	2	1	2	1	2	1	1
4 PM TO 5 PM	2	1	1	2	1	2	1	2	1	2	1	2	1	1
5 PM TO 6 PM	2	1	1	2	1	2	1	2	1	2	1	2	1	1
6 PM TO 7 PM	2	1	1	2	1	2	1	2	1	2	1	2	1	1
7 PM TO 8 PM	1	1	1	2	1	2	1	2	1	2	1	2	1	1
8 PM TO 9 PM	1	1	1	2	1	2	1	2	1	2	1	2	1	1
9 PM TO 10 PM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
10 PM TO 11 PM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
11 PM TO 12 MID	1	1	1	1	1	1	1	1	1	1	1	1	1	1

NOTE: DURING THE VETERANS DAY, THANKSGIVING, CHRISTMAS AND NEW YEARS HOLIDAY PERIODS TWO (2) TRAVEL LANES MUST BE AVAILABLE EASTBOUND AND WESTBOUND

MINIMUM LANE REQUIREMENTS TO BE AVAILABLE
DURING WORKING HOURS

LOCATION: **MP A-67 TO MP A-78 ITS TUNNEL**
MONTH: **SEPTEMBER THRU OCTOBER**
YEAR: **2009**
LANES AVAILABLE: **NB = 2** **SB = 2**

	SUNDAY		MONDAY		TUESDAY		WEDNESDAY		THURSDAY		FRIDAY		SATURDAY	
HOUR	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB
12 MID TO 1 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1 AM TO 2 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2 AM TO 3 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
3 AM TO 4 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
4 AM TO 5 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
5 AM TO 6 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
6 AM TO 7 AM	1	1	1	2	1	2	1	2	1	2	1	2	1	1
7 AM TO 8 AM	1	1	1	2	1	2	1	2	1	2	1	2	1	1
8 AM TO 9 AM	1	1	1	2	1	2	1	2	1	2	1	2	2	1
9 AM TO 10 AM	1	1	1	1	1	1	1	1	1	1	2	2	2	1
10 AM TO 11 AM	2	2	2	1	2	1	2	1	2	1	2	2	2	1
11 AM TO 12 NOON	2	2	2	1	2	1	2	1	2	1	2	2	2	2
12 NOON TO 1 PM	2	2	2	1	2	1	2	1	2	1	2	2	2	2
1 PM TO 2 PM	2	2	2	1	2	1	2	1	2	1	2	2	2	1
2 PM TO 3 PM	2	2	2	1	2	1	2	1	2	1	2	2	2	1
3 PM TO 4 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	1
4 PM TO 5 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	1
5 PM TO 6 PM	1	2	2	2	2	2	2	2	2	2	2	2	1	1
6 PM TO 7 PM	1	2	2	2	2	2	2	2	2	2	2	2	1	1
7 PM TO 8 PM	1	2	1	1	1	1	1	1	1	1	2	2	1	1
8 PM TO 9 PM	1	2	1	1	1	1	1	1	1	1	2	1	1	1
9 PM TO 10 PM	1	2	1	1	1	1	1	1	1	1	2	1	1	1
10 PM TO 11 PM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
11 PM TO 12 MID	1	1	1	1	1	1	1	1	1	1	1	1	1	1

NOTE: DURING THE LABOR DAY AND COLUMBUS DAY HOLIDAY PERIODS TWO (2)
TRAVEL LANES MUST BE AVAILABLE NORTHBOUND AND SOUTHBOUND

MINIMUM LANE REQUIREMENTS TO BE AVAILABLE
DURING WORKING HOURS

LOCATION: **MP A-67 TO MP A-78 ITS TUNNEL**
MONTH: **NOVEMBER THRU DECEMBER**
YEAR: **2009**
LANES AVAILABLE: **NB = 2** **SB = 2**

	SUNDAY		MONDAY		TUESDAY		WEDNESDAY		THURSDAY		FRIDAY		SATURDAY	
HOUR	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB
12 MID TO 1 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1 AM TO 2 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2 AM TO 3 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
3 AM TO 4 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
4 AM TO 5 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
5 AM TO 6 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
6 AM TO 7 AM	1	1	1	2	1	2	1	2	1	2	1	1	1	1
7 AM TO 8 AM	1	1	1	2	1	2	1	2	1	2	1	2	1	1
8 AM TO 9 AM	1	1	1	2	1	2	1	2	1	2	1	2	2	1
9 AM TO 10 AM	1	1	1	2	1	2	1	2	1	2	1	2	2	1
10 AM TO 11 AM	1	2	2	2	2	2	2	2	2	2	2	2	2	2
11 AM TO 12 NOON	2	2	2	2	2	2	2	2	2	2	2	2	2	2
12 NOON TO 1 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
1 PM TO 2 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	1
2 PM TO 3 PM	1	2	2	2	2	2	2	2	2	2	2	2	2	1
3 PM TO 4 PM	1	2	2	2	2	2	2	2	2	2	2	2	2	1
4 PM TO 5 PM	1	2	2	2	2	2	2	2	2	2	2	2	1	1
5 PM TO 6 PM	1	2	2	2	2	2	2	2	2	2	2	2	1	1
6 PM TO 7 PM	1	2	2	2	2	2	2	2	2	2	2	2	1	1
7 PM TO 8 PM	1	2	1	1	1	1	1	1	1	1	2	1	1	1
8 PM TO 9 PM	1	2	1	1	1	1	1	1	1	1	2	1	1	1
9 PM TO 10 PM	1	2	1	1	1	1	1	1	1	1	2	1	1	1
10 PM TO 11 PM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
11 PM TO 12 MID	1	1	1	1	1	1	1	1	1	1	1	1	1	1

NOTE: DURING THE VETERANS DAY, THANKSGIVING DAY, CHRISTMAS AND NEW YEARS HOLIDAY PERIODS TWO (2) TRAVEL LANES MUST BE AVAILABLE NORTHBOUND AND SOUTHBOUND

MINIMUM LANE REQUIREMENTS TO BE AVAILABLE
DURING WORKING HOURS

LOCATION: **MP A-67 TO MP A-78 ITS TUNNEL**
MONTH: **JANUARY THRU MARCH**
YEAR: **2010**
LANES AVAILABLE: **NB = 2** **SB = 2**

	SUNDAY		MONDAY		TUESDAY		WEDNESDAY		THURSDAY		FRIDAY		SATURDAY	
HOUR	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB
12 MID TO 1 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1 AM TO 2 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2 AM TO 3 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
3 AM TO 4 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
4 AM TO 5 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
5 AM TO 6 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
6 AM TO 7 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
7 AM TO 8 AM	1	1	1	2	1	2	1	2	1	2	1	2	1	1
8 AM TO 9 AM	1	1	1	2	1	2	1	2	1	2	1	2	1	1
9 AM TO 10 AM	1	1	1	1	1	1	1	1	1	1	2	2	2	1
10 AM TO 11 AM	2	2	2	1	2	1	2	1	2	1	2	2	2	1
11 AM TO 12 NOON	2	2	2	1	2	1	2	1	2	1	2	2	2	1
12 NOON TO 1 PM	2	2	2	1	2	1	2	1	2	1	2	2	2	1
1 PM TO 2 PM	2	2	2	1	2	1	2	1	2	1	2	2	2	1
2 PM TO 3 PM	2	2	2	1	2	1	2	1	2	1	2	2	2	1
3 PM TO 4 PM	2	2	2	1	2	1	2	1	2	1	2	2	1	1
4 PM TO 5 PM	2	2	2	2	2	2	2	2	2	2	2	2	1	1
5 PM TO 6 PM	1	2	2	2	2	2	2	2	2	2	2	2	1	1
6 PM TO 7 PM	1	2	1	1	1	1	1	1	1	1	2	2	1	1
7 PM TO 8 PM	1	2	1	1	1	1	1	1	1	1	2	2	1	1
8 PM TO 9 PM	1	2	1	1	1	1	1	1	1	1	2	1	1	1
9 PM TO 10 PM	1	1	1	1	1	1	1	1	1	1	2	1	1	1
10 PM TO 11 PM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
11 PM TO 12 MID	1	1	1	1	1	1	1	1	1	1	1	1	1	1

NOTE: DURING THE NEW YEARS AND EASTER DAY HOLIDAY PERIODS TWO (2)
TRAVEL LANES MUST BE AVAILABLE NORTHBOUND AND SOUTHBOUND

MINIMUM LANE REQUIREMENTS TO BE AVAILABLE
DURING WORKING HOURS

LOCATION: **MP A-67 TO MP A-78 ITS TUNNEL**
MONTH: **APRIL-MAY**
YEAR: **2010**
LANES AVAILABLE: **NB = 2** **SB = 2**

	SUNDAY		MONDAY		TUESDAY		WEDNESDAY		THURSDAY		FRIDAY		SATURDAY	
HOUR	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB
12 MID TO 1 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1 AM TO 2 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2 AM TO 3 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
3 AM TO 4 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
4 AM TO 5 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
5 AM TO 6 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
6 AM TO 7 AM	1	1	1	2	1	2	1	2	1	2	1	2	1	1
7 AM TO 8 AM	1	1	1	2	1	2	1	2	1	2	1	2	1	1
8 AM TO 9 AM	1	1	2	2	2	2	2	2	2	2	2	2	2	1
9 AM TO 10 AM	2	1	2	2	2	2	2	2	2	2	2	2	2	2
10 AM TO 11 AM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
11 AM TO 12 NOON	2	2	2	2	2	2	2	2	2	2	2	2	2	2
12 NOON TO 1 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
1 PM TO 2 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
2 PM TO 3 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
3 PM TO 4 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
4 PM TO 5 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
5 PM TO 6 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
6 PM TO 7 PM	2	2	2	2	2	2	2	2	2	2	2	2	1	1
7 PM TO 8 PM	1	2	1	1	1	1	1	1	1	1	2	2	1	1
8 PM TO 9 PM	1	2	1	1	1	1	1	1	1	1	2	1	1	1
9 PM TO 10 PM	1	2	1	1	1	1	1	1	1	1	2	1	1	1
10 PM TO 11 PM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
11 PM TO 12 MID	1	1	1	1	1	1	1	1	1	1	1	1	1	1

NOTE: DURING THE EASTER HOLIDAY PERIOD TWO (2)
TRAVEL LANES MUST BE AVAILABLE NORTHBOUND AND SOUTHBOUND

MINIMUM LANE REQUIREMENTS TO BE AVAILABLE
DURING WORKING HOURS

LOCATION: **MP A-67 TO MP A-78 ITS TUNNEL**
MONTH: **JUNE THRU AUGUST**
YEAR: **2010**
LANES AVAILABLE: **NB = 2** **SB = 2**

	SUNDAY		MONDAY		TUESDAY		WEDNESDAY		THURSDAY		FRIDAY		SATURDAY	
HOUR	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB
12 MID TO 1 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1 AM TO 2 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2 AM TO 3 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
3 AM TO 4 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
4 AM TO 5 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
5 AM TO 6 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
6 AM TO 7 AM	1	1	1	2	1	2	1	2	1	2	2	2	1	1
7 AM TO 8 AM	1	1	2	2	2	2	2	2	2	2	2	2	2	2
8 AM TO 9 AM	2	1	2	2	2	2	2	2	2	2	2	2	2	2
9 AM TO 10 AM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
10 AM TO 11 AM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
11 AM TO 12 NOON	2	2	2	2	2	2	2	2	2	2	2	2	2	2
12 NOON TO 1 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
1 PM TO 2 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
2 PM TO 3 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
3 PM TO 4 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
4 PM TO 5 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
5 PM TO 6 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
6 PM TO 7 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
7 PM TO 8 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
8 PM TO 9 PM	2	2	2	1	2	1	2	1	2	1	2	2	1	1
9 PM TO 10 PM	1	2	1	1	1	1	1	1	1	1	2	2	1	1
10 PM TO 11 PM	1	2	1	1	1	1	1	1	1	1	1	1	1	1
11 PM TO 12 MID	1	1	1	1	1	1	1	1	1	1	1	1	1	1

NOTE: DURING THE INDEPENDENCE DAY AND LABOR DAY HOLIDAY PERIODS TWO (2) TRAVEL LANES MUST BE AVAILABLE NORTHBOUND AND SOUTHBOUND

NOTE: DURING THE TWO (2) POCONO 500 RACE PERIODS TWO (2) TRAVEL LANES MUST BE AVAILABLE NORTHBOUND AND SOUTHBOUND

MINIMUM LANE REQUIREMENTS TO BE AVAILABLE
DURING WORKING HOURS

LOCATION: **MP A-67 TO MP A-78 ITS TUNNEL**
MONTH: **SEPTEMBER THRU OCTOBER**
YEAR: **2010**
LANES AVAILABLE: **NB = 2** **SB = 2**

	SUNDAY		MONDAY		TUESDAY		WEDNESDAY		THURSDAY		FRIDAY		SATURDAY	
HOUR	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB
12 MID TO 1 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1 AM TO 2 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2 AM TO 3 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
3 AM TO 4 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
4 AM TO 5 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
5 AM TO 6 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
6 AM TO 7 AM	1	1	1	2	1	2	1	2	1	2	1	2	1	1
7 AM TO 8 AM	1	1	1	2	1	2	1	2	1	2	1	2	1	1
8 AM TO 9 AM	1	1	1	2	1	2	1	2	1	2	1	2	2	1
9 AM TO 10 AM	2	1	2	2	2	2	2	2	2	2	2	2	2	1
10 AM TO 11 AM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
11 AM TO 12 NOON	2	2	2	2	2	2	2	2	2	2	2	2	2	2
12 NOON TO 1 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
1 PM TO 2 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
2 PM TO 3 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
3 PM TO 4 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	1
4 PM TO 5 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	1
5 PM TO 6 PM	2	2	2	2	2	2	2	2	2	2	2	2	1	1
6 PM TO 7 PM	2	2	2	2	2	2	2	2	2	2	2	2	1	1
7 PM TO 8 PM	1	2	1	1	1	1	1	1	1	1	2	2	1	1
8 PM TO 9 PM	1	2	1	1	1	1	1	1	1	1	2	1	1	1
9 PM TO 10 PM	1	2	1	1	1	1	1	1	1	1	2	1	1	1
10 PM TO 11 PM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
11 PM TO 12 MID	1	1	1	1	1	1	1	1	1	1	1	1	1	1

NOTE: DURING THE LABOR DAY AND COLUMBUS DAY HOLIDAY PERIODS TWO (2)
TRAVEL LANES MUST BE AVAILABLE NORTHBOUND AND SOUTHBOUND

MINIMUM LANE REQUIREMENTS TO BE AVAILABLE
DURING WORKING HOURS

LOCATION: **MP A-67 TO MP A-78 ITS TUNNEL**
MONTH: **NOVEMBER THRU DECEMBER**
YEAR: **2010**
LANES AVAILABLE: **NB = 2** **SB = 2**

	SUNDAY		MONDAY		TUESDAY		WEDNESDAY		THURSDAY		FRIDAY		SATURDAY	
HOUR	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB
12 MID TO 1 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1 AM TO 2 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2 AM TO 3 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
3 AM TO 4 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
4 AM TO 5 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
5 AM TO 6 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
6 AM TO 7 AM	1	1	1	2	1	2	1	2	1	2	1	1	1	1
7 AM TO 8 AM	1	1	1	2	1	2	1	2	1	2	1	2	1	1
8 AM TO 9 AM	1	1	1	2	1	2	1	2	1	2	1	2	2	1
9 AM TO 10 AM	1	1	1	2	1	2	1	2	1	2	1	2	2	1
10 AM TO 11 AM	1	2	2	2	2	2	2	2	2	2	2	2	2	2
11 AM TO 12 NOON	2	2	2	2	2	2	2	2	2	2	2	2	2	2
12 NOON TO 1 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
1 PM TO 2 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
2 PM TO 3 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
3 PM TO 4 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
4 PM TO 5 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
5 PM TO 6 PM	1	2	2	2	2	2	2	2	2	2	2	2	2	2
6 PM TO 7 PM	1	2	2	2	2	2	2	2	2	2	2	2	1	2
7 PM TO 8 PM	1	2	1	1	1	1	1	1	1	1	2	2	1	1
8 PM TO 9 PM	1	2	1	1	1	1	1	1	1	1	2	1	1	1
9 PM TO 10 PM	1	2	1	1	1	1	1	1	1	1	2	1	1	1
10 PM TO 11 PM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
11 PM TO 12 MID	1	1	1	1	1	1	1	1	1	1	1	1	1	1

NOTE: DURING THE VETERANS DAY, THANKSGIVING DAY, CHRISTMAS AND NEW YEARS HOLIDAY PERIODS TWO (2) TRAVEL LANES MUST BE AVAILABLE NORTHBOUND AND SOUTHBOUND

MINIMUM LANE REQUIREMENTS TO BE AVAILABLE
DURING WORKING HOURS

LOCATION: **MP 328.1**
MONTH: **SEPTEMBER THROUGH OCTOBER**
YEAR: **2009**
LANES AVAILABLE: **EB = 3** **WB = 3**

	SUNDAY		MONDAY		TUESDAY		WEDNESDAY		THURSDAY		FRIDAY		SATURDAY	
HOUR	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB
12 MID TO 1 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1 AM TO 2 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2 AM TO 3 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
3 AM TO 4 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
4 AM TO 5 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
5 AM TO 6 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
6 AM TO 7 AM	1	1	2	3	2	3	2	3	2	3	2	3	1	1
7 AM TO 8 AM	1	1	3	3	3	3	3	3	3	3	3	3	1	2
8 AM TO 9 AM	1	1	3	3	3	3	3	3	3	3	3	3	2	2
9 AM TO 10 AM	1	1	2	3	2	3	2	3	2	3	2	3	2	2
10 AM TO 11 AM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
11 AM TO 12 NOON	2	2	2	2	2	2	2	2	2	2	2	2	2	2
12 NOON TO 1 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
1 PM TO 2 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
2 PM TO 3 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
3 PM TO 4 PM	2	2	3	2	3	2	3	2	3	2	3	2	2	2
4 PM TO 5 PM	2	2	3	3	3	3	3	3	3	3	3	3	2	2
5 PM TO 6 PM	2	2	3	3	3	3	3	3	3	3	3	3	2	2
6 PM TO 7 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
7 PM TO 8 PM	2	2	2	1	2	1	2	1	2	1	2	2	2	1
8 PM TO 9 PM	2	1	1	1	1	1	1	1	1	1	2	1	2	1
9 PM TO 10 PM	1	1	1	1	1	1	1	1	1	1	1	1	2	1
10 PM TO 11 PM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
11 PM TO 12 MID	1	1	1	1	1	1	1	1	1	1	1	1	1	1

NOTE: DURING THE LABOR DAY AND COLUMBUS DAY HOLIDAY PERIODS ALL TRAVEL LANES MUST BE AVAILABLE EASTBOUND AND WESTBOUND

MINIMUM LANE REQUIREMENTS TO BE AVAILABLE
DURING WORKING HOURS

LOCATION: **MP 328.1**
MONTH: **NOVEMBER THROUGH DECEMBER**
YEAR: **2009**
LANES AVAILABLE: **EB = 3** **WB = 3**

	SUNDAY		MONDAY		TUESDAY		WEDNESDAY		THURSDAY		FRIDAY		SATURDAY	
HOUR	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB
12 MID TO 1 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1 AM TO 2 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2 AM TO 3 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
3 AM TO 4 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
4 AM TO 5 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
5 AM TO 6 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
6 AM TO 7 AM	1	1	2	3	2	3	2	3	2	3	2	3	1	1
7 AM TO 8 AM	1	1	3	3	3	3	3	3	3	3	3	3	1	2
8 AM TO 9 AM	1	1	3	3	3	3	3	3	3	3	3	3	1	2
9 AM TO 10 AM	1	1	2	3	2	3	2	3	2	3	2	3	2	2
10 AM TO 11 AM	1	2	2	2	2	2	2	2	2	2	2	2	2	2
11 AM TO 12 NOON	2	2	2	2	2	2	2	2	2	2	2	2	2	2
12 NOON TO 1 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
1 PM TO 2 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
2 PM TO 3 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
3 PM TO 4 PM	2	2	3	2	3	2	3	2	3	2	3	2	2	2
4 PM TO 5 PM	2	2	3	3	3	3	3	3	3	3	3	3	2	2
5 PM TO 6 PM	2	2	3	3	3	3	3	3	3	3	3	3	2	2
6 PM TO 7 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
7 PM TO 8 PM	2	1	2	1	2	1	2	1	2	1	2	2	2	1
8 PM TO 9 PM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
9 PM TO 10 PM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
10 PM TO 11 PM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
11 PM TO 12 MID	1	1	1	1	1	1	1	1	1	1	1	1	1	1

NOTE: DURING THE VETERANS DAY, THANKSGIVING DAY, AND CHRISTMAS/NEW YEARS HOLIDAY PERIODS TWO (2) TRAVEL LANES MUST BE AVAILABLE NORTHBOUND AND SOUTHBOUND

MINIMUM LANE REQUIREMENTS TO BE AVAILABLE
DURING WORKING HOURS

LOCATION: **MP 328.1**
MONTH: **JANUARY THROUGH MARCH**
YEAR: **2010**
LANES AVAILABLE: **EB = 3** **WB = 3**

	SUNDAY		MONDAY		TUESDAY		WEDNESDAY		THURSDAY		FRIDAY		SATURDAY	
HOUR	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB
12 MID TO 1 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1 AM TO 2 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2 AM TO 3 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
3 AM TO 4 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
4 AM TO 5 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
5 AM TO 6 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
6 AM TO 7 AM	1	1	2	3	2	3	2	3	2	3	2	3	1	1
7 AM TO 8 AM	1	1	3	3	3	3	3	3	3	3	3	3	1	1
8 AM TO 9 AM	1	1	3	3	3	3	3	3	3	3	3	3	1	2
9 AM TO 10 AM	1	1	2	3	2	3	2	3	2	3	2	3	2	2
10 AM TO 11 AM	1	2	2	2	2	2	2	2	2	2	2	2	2	2
11 AM TO 12 NOON	2	2	2	2	2	2	2	2	2	2	2	2	2	2
12 NOON TO 1 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
1 PM TO 2 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
2 PM TO 3 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
3 PM TO 4 PM	2	2	3	2	3	2	3	2	3	2	3	3	2	2
4 PM TO 5 PM	2	2	3	3	3	3	3	3	3	3	3	3	2	2
5 PM TO 6 PM	2	2	3	3	3	3	3	3	3	3	3	3	2	2
6 PM TO 7 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
7 PM TO 8 PM	2	2	2	1	2	1	2	1	2	1	2	2	2	1
8 PM TO 9 PM	1	1	1	1	1	1	1	1	1	1	2	1	1	1
9 PM TO 10 PM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
10 PM TO 11 PM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
11 PM TO 12 MID	1	1	1	1	1	1	1	1	1	1	1	1	1	1

NOTE: DURING THE CHRISTMAS/NEW YEARS HOLIDAY PERIOD TWO (2) TRAVEL LANES MUST BE AVAILABLE NORTHBOUND AND SOUTHBOUND

MINIMUM LANE REQUIREMENTS TO BE AVAILABLE
DURING WORKING HOURS

LOCATION: **MP 328.1**
MONTH: **APRIL THROUGH MAY**
YEAR: **2010**
LANES AVAILABLE: **EB = 3** **WB = 3**

	SUNDAY		MONDAY		TUESDAY		WEDNESDAY		THURSDAY		FRIDAY		SATURDAY	
HOUR	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB
12 MID TO 1 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1 AM TO 2 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2 AM TO 3 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
3 AM TO 4 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
4 AM TO 5 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
5 AM TO 6 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
6 AM TO 7 AM	1	1	2	3	2	3	2	3	2	3	2	3	1	1
7 AM TO 8 AM	1	1	3	3	3	3	3	3	3	3	3	3	1	2
8 AM TO 9 AM	1	1	3	3	3	3	3	3	3	3	3	3	2	2
9 AM TO 10 AM	2	1	2	3	2	3	2	3	2	3	2	3	2	2
10 AM TO 11 AM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
11 AM TO 12 NOON	2	2	2	2	2	2	2	2	2	2	2	2	2	2
12 NOON TO 1 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
1 PM TO 2 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
2 PM TO 3 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
3 PM TO 4 PM	2	2	3	2	3	2	3	2	3	2	3	3	2	2
4 PM TO 5 PM	2	2	3	3	3	3	3	3	3	3	3	3	2	2
5 PM TO 6 PM	2	2	3	3	3	3	3	3	3	3	3	3	2	2
6 PM TO 7 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
7 PM TO 8 PM	2	2	2	1	2	1	2	1	2	1	2	2	2	1
8 PM TO 9 PM	2	2	1	1	1	1	1	1	1	1	2	1	2	1
9 PM TO 10 PM	1	1	1	1	1	1	1	1	1	1	1	1	2	1
10 PM TO 11 PM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
11 PM TO 12 MID	1	1	1	1	1	1	1	1	1	1	1	1	1	1

NOTE: DURING THE EASTER AND MEMORIAL DAY HOLIDAY PERIODS ALL TRAVEL LANES MUST BE AVAILABLE EASTBOUND AND WESTBOUND

MINIMUM LANE REQUIREMENTS TO BE AVAILABLE
DURING WORKING HOURS

LOCATION: **MP 328.1**
MONTH: **JUNE THROUGH AUGUST**
YEAR: **2010**
LANES AVAILABLE: **EB = 3** **WB = 3**

	SUNDAY		MONDAY		TUESDAY		WEDNESDAY		THURSDAY		FRIDAY		SATURDAY	
HOUR	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB
12 MID TO 1 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1 AM TO 2 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2 AM TO 3 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
3 AM TO 4 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
4 AM TO 5 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
5 AM TO 6 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
6 AM TO 7 AM	1	1	2	3	2	3	2	3	2	3	2	3	1	1
7 AM TO 8 AM	1	1	3	3	3	3	3	3	3	3	3	3	1	2
8 AM TO 9 AM	1	1	3	3	3	3	3	3	3	3	3	3	2	2
9 AM TO 10 AM	1	1	2	3	2	3	2	3	2	3	2	3	2	2
10 AM TO 11 AM	2	2	2	2	2	2	2	2	2	2	2	3	2	2
11 AM TO 12 NOON	2	2	2	2	2	2	2	2	2	2	2	3	2	2
12 NOON TO 1 PM	2	2	2	2	2	2	2	2	2	2	2	3	2	2
1 PM TO 2 PM	2	2	2	2	2	2	2	2	2	2	2	3	2	2
2 PM TO 3 PM	2	2	2	2	2	2	2	2	2	2	3	3	2	2
3 PM TO 4 PM	2	2	3	3	3	3	3	3	3	3	3	3	2	2
4 PM TO 5 PM	2	2	3	3	3	3	3	3	3	3	3	3	2	2
5 PM TO 6 PM	2	2	3	3	3	3	3	3	3	3	3	3	2	2
6 PM TO 7 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
7 PM TO 8 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
8 PM TO 9 PM	2	2	1	1	1	1	1	1	1	1	2	1	2	2
9 PM TO 10 PM	1	1	1	1	1	1	1	1	1	1	1	1	2	1
10 PM TO 11 PM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
11 PM TO 12 MID	1	1	1	1	1	1	1	1	1	1	1	1	1	1

NOTE: DURING THE MEMORIAL DAY AND INDEPENDENCE DAY HOLIDAY PERIODS
ALL TRAVEL LANES MUST BE AVAILABLE EASTBOUND AND WESTBOUND

MINIMUM LANE REQUIREMENTS TO BE AVAILABLE
DURING WORKING HOURS

LOCATION: **MP 328.1**
MONTH: **SEPTEMBER THROUGH OCTOBER**
YEAR: **2010**
LANES AVAILABLE: **EB = 3** **WB = 3**

	SUNDAY		MONDAY		TUESDAY		WEDNESDAY		THURSDAY		FRIDAY		SATURDAY	
HOUR	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB
12 MID TO 1 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1 AM TO 2 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2 AM TO 3 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
3 AM TO 4 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
4 AM TO 5 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
5 AM TO 6 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
6 AM TO 7 AM	1	1	2	3	2	3	2	3	2	3	2	3	1	1
7 AM TO 8 AM	1	1	3	3	3	3	3	3	3	3	3	3	1	2
8 AM TO 9 AM	1	1	3	3	3	3	3	3	3	3	3	3	2	2
9 AM TO 10 AM	2	1	2	3	2	3	2	3	2	3	2	3	2	2
10 AM TO 11 AM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
11 AM TO 12 NOON	2	2	2	2	2	2	2	2	2	2	2	2	2	2
12 NOON TO 1 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
1 PM TO 2 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
2 PM TO 3 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
3 PM TO 4 PM	2	2	3	2	3	2	3	2	3	2	3	3	2	2
4 PM TO 5 PM	2	2	3	3	3	3	3	3	3	3	3	3	2	2
5 PM TO 6 PM	2	2	3	3	3	3	3	3	3	3	3	3	2	2
6 PM TO 7 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
7 PM TO 8 PM	2	2	2	1	2	1	2	1	2	1	2	2	2	2
8 PM TO 9 PM	2	2	1	1	1	1	1	1	1	1	2	1	2	1
9 PM TO 10 PM	1	1	1	1	1	1	1	1	1	1	1	1	2	1
10 PM TO 11 PM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
11 PM TO 12 MID	1	1	1	1	1	1	1	1	1	1	1	1	1	1

NOTE: DURING THE LABOR DAY AND COLUMBUS DAY HOLIDAY PERIODS ALL TRAVEL LANES MUST BE AVAILABLE EASTBOUND AND WESTBOUND

MINIMUM LANE REQUIREMENTS TO BE AVAILABLE
DURING WORKING HOURS

LOCATION: **MP 328.1**
MONTH: **NOVEMBER THROUGH DECEMBER**
YEAR: **2010**
LANES AVAILABLE: **EB = 3** **WB = 3**

	SUNDAY		MONDAY		TUESDAY		WEDNESDAY		THURSDAY		FRIDAY		SATURDAY	
HOUR	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB
12 MID TO 1 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1 AM TO 2 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2 AM TO 3 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
3 AM TO 4 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
4 AM TO 5 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
5 AM TO 6 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
6 AM TO 7 AM	1	1	2	3	2	3	2	3	2	3	2	3	1	1
7 AM TO 8 AM	1	1	3	3	3	3	3	3	3	3	3	3	1	2
8 AM TO 9 AM	1	1	3	3	3	3	3	3	3	3	3	3	1	2
9 AM TO 10 AM	1	1	2	3	2	3	2	3	2	3	2	3	2	2
10 AM TO 11 AM	1	2	2	2	2	2	2	2	2	2	2	2	2	2
11 AM TO 12 NOON	2	2	2	2	2	2	2	2	2	2	2	2	2	2
12 NOON TO 1 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
1 PM TO 2 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
2 PM TO 3 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
3 PM TO 4 PM	2	2	3	2	3	2	3	2	3	2	3	2	2	2
4 PM TO 5 PM	2	2	3	3	3	3	3	3	3	3	3	3	2	2
5 PM TO 6 PM	2	2	3	3	3	3	3	3	3	3	3	3	2	2
6 PM TO 7 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
7 PM TO 8 PM	2	2	2	1	2	1	2	1	2	1	2	2	2	1
8 PM TO 9 PM	1	1	1	1	1	1	1	1	1	1	2	1	2	1
9 PM TO 10 PM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
10 PM TO 11 PM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
11 PM TO 12 MID	1	1	1	1	1	1	1	1	1	1	1	1	1	1

NOTE: DURING THE VETERANS DAY, THANKSGIVING DAY, AND CHRISTMAS/NEW YEARS HOLIDAY PERIODS TWO (2) TRAVEL LANES MUST BE AVAILABLE NORTHBOUND AND SOUTHBOUND

MINIMUM LANE REQUIREMENTS TO BE AVAILABLE
DURING WORKING HOURS

LOCATION: **MP 341.3**
MONTH: **SEPTEMBER THROUGH OCTOBER**
YEAR: **2009**
LANES AVAILABLE: **EB = 3** **WB = 3**

	SUNDAY		MONDAY		TUESDAY		WEDNESDAY		THURSDAY		FRIDAY		SATURDAY	
HOUR	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB
12 MID TO 1 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1 AM TO 2 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2 AM TO 3 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
3 AM TO 4 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
4 AM TO 5 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
5 AM TO 6 AM	1	1	2	2	2	2	2	2	2	2	2	2	1	1
6 AM TO 7 AM	1	1	3	3	3	3	3	3	3	3	3	3	1	2
7 AM TO 8 AM	2	1	3	3	3	3	3	3	3	3	3	3	2	2
8 AM TO 9 AM	2	2	3	3	3	3	3	3	3	3	3	3	2	3
9 AM TO 10 AM	2	2	3	3	3	3	3	3	3	3	3	3	3	3
10 AM TO 11 AM	2	3	3	3	3	3	3	3	3	3	3	3	3	3
11 AM TO 12 NOON	3	3	3	3	3	3	3	3	3	3	3	3	3	3
12 NOON TO 1 PM	3	3	3	3	3	3	3	3	3	3	3	3	3	3
1 PM TO 2 PM	3	3	3	3	3	3	3	3	3	3	3	3	3	3
2 PM TO 3 PM	3	3	3	3	3	3	3	3	3	3	3	3	3	3
3 PM TO 4 PM	3	3	3	3	3	3	3	3	3	3	3	3	3	3
4 PM TO 5 PM	3	3	3	3	3	3	3	3	3	3	3	3	3	3
5 PM TO 6 PM	3	3	3	3	3	3	3	3	3	3	3	3	3	3
6 PM TO 7 PM	3	3	3	3	3	3	3	3	3	3	3	3	3	3
7 PM TO 8 PM	3	3	2	2	2	2	2	2	2	2	3	3	2	2
8 PM TO 9 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
9 PM TO 10 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
10 PM TO 11 PM	1	2	1	1	1	1	1	1	1	1	2	2	2	2
11 PM TO 12 MID	1	1	1	1	1	1	1	1	1	1	1	1	1	1

NOTE: DURING THE LABOR DAY AND COLUMBUS DAY HOLIDAY PERIODS ALL TRAVEL LANES MUST BE AVAILABLE EASTBOUND AND WESTBOUND

MINIMUM LANE REQUIREMENTS TO BE AVAILABLE
DURING WORKING HOURS

LOCATION: **MP 341.3**
MONTH: **NOVEMBER THROUGH DECEMBER**
YEAR: **2009**
LANES AVAILABLE: **EB = 3** **WB = 3**

	SUNDAY		MONDAY		TUESDAY		WEDNESDAY		THURSDAY		FRIDAY		SATURDAY	
HOUR	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB
12 MID TO 1 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1 AM TO 2 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2 AM TO 3 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
3 AM TO 4 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
4 AM TO 5 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
5 AM TO 6 AM	1	1	2	2	2	2	2	2	2	2	2	2	1	1
6 AM TO 7 AM	1	1	3	3	3	3	3	3	3	3	3	3	1	2
7 AM TO 8 AM	2	1	3	3	3	3	3	3	3	3	3	3	2	2
8 AM TO 9 AM	2	2	3	3	3	3	3	3	3	3	3	3	2	2
9 AM TO 10 AM	2	2	3	3	3	3	3	3	3	3	3	3	2	3
10 AM TO 11 AM	2	2	3	3	3	3	3	3	3	3	3	3	3	3
11 AM TO 12 NOON	2	3	3	3	3	3	3	3	3	3	3	3	3	3
12 NOON TO 1 PM	3	3	3	3	3	3	3	3	3	3	3	3	3	3
1 PM TO 2 PM	3	3	3	3	3	3	3	3	3	3	3	3	3	3
2 PM TO 3 PM	3	3	3	3	3	3	3	3	3	3	3	3	3	3
3 PM TO 4 PM	3	3	3	3	3	3	3	3	3	3	3	3	3	3
4 PM TO 5 PM	3	3	3	3	3	3	3	3	3	3	3	3	3	3
5 PM TO 6 PM	3	3	3	3	3	3	3	3	3	3	3	3	3	3
6 PM TO 7 PM	3	3	3	3	3	3	3	3	3	3	3	3	3	2
7 PM TO 8 PM	2	2	2	2	2	2	2	2	2	2	3	2	2	2
8 PM TO 9 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
9 PM TO 10 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
10 PM TO 11 PM	1	2	1	1	1	1	1	1	1	1	2	2	2	2
11 PM TO 12 MID	1	1	1	1	1	1	1	1	1	1	1	1	1	1

NOTE: DURING THE VETERANS DAY, THANKSGIVING DAY, AND CHRISTMAS/NEW YEARS HOLIDAY PERIODS TWO (2) TRAVEL LANES MUST BE AVAILABLE NORTHBOUND AND SOUTHBOUND

MINIMUM LANE REQUIREMENTS TO BE AVAILABLE
DURING WORKING HOURS

LOCATION: **MP 341.3**
MONTH: **JANUARY THROUGH MARCH**
YEAR: **2010**
LANES AVAILABLE: **EB = 3** **WB = 3**

	SUNDAY		MONDAY		TUESDAY		WEDNESDAY		THURSDAY		FRIDAY		SATURDAY	
HOUR	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB
12 MID TO 1 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1 AM TO 2 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2 AM TO 3 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
3 AM TO 4 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
4 AM TO 5 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
5 AM TO 6 AM	1	1	2	2	2	2	2	2	2	2	2	2	1	1
6 AM TO 7 AM	1	1	3	3	3	3	3	3	3	3	3	3	1	2
7 AM TO 8 AM	2	1	3	3	3	3	3	3	3	3	3	3	2	2
8 AM TO 9 AM	2	2	3	3	3	3	3	3	3	3	3	3	2	2
9 AM TO 10 AM	2	2	3	3	3	3	3	3	3	3	3	3	2	3
10 AM TO 11 AM	2	2	3	3	3	3	3	3	3	3	3	3	3	3
11 AM TO 12 NOON	2	3	3	3	3	3	3	3	3	3	3	3	3	3
12 NOON TO 1 PM	2	3	3	3	3	3	3	3	3	3	3	3	3	3
1 PM TO 2 PM	3	3	3	3	3	3	3	3	3	3	3	3	3	3
2 PM TO 3 PM	3	3	3	3	3	3	3	3	3	3	3	3	3	3
3 PM TO 4 PM	3	3	3	3	3	3	3	3	3	3	3	3	3	3
4 PM TO 5 PM	3	3	3	3	3	3	3	3	3	3	3	3	3	3
5 PM TO 6 PM	3	3	3	3	3	3	3	3	3	3	3	3	3	2
6 PM TO 7 PM	3	3	3	3	3	3	3	3	3	3	3	3	2	2
7 PM TO 8 PM	2	2	2	2	2	2	2	2	2	2	3	2	2	2
8 PM TO 9 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
9 PM TO 10 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
10 PM TO 11 PM	1	1	1	1	1	1	1	1	1	1	2	2	2	2
11 PM TO 12 MID	1	1	1	1	1	1	1	1	1	1	1	1	1	1

NOTE: DURING THE CHRISTMAS/NEW YEARS HOLIDAY PERIOD TWO (2) TRAVEL LANES MUST BE AVAILABLE NORTHBOUND AND SOUTHBOUND

MINIMUM LANE REQUIREMENTS TO BE AVAILABLE
DURING WORKING HOURS

LOCATION: **MP 341.3**
MONTH: **APRIL THROUGH MAY**
YEAR: **2010**
LANES AVAILABLE: **EB = 3** **WB = 3**

	SUNDAY		MONDAY		TUESDAY		WEDNESDAY		THURSDAY		FRIDAY		SATURDAY	
HOUR	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB
12 MID TO 1 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1 AM TO 2 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2 AM TO 3 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
3 AM TO 4 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
4 AM TO 5 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
5 AM TO 6 AM	1	1	2	2	2	2	2	2	2	2	2	2	1	1
6 AM TO 7 AM	2	1	3	3	3	3	3	3	3	3	3	3	2	2
7 AM TO 8 AM	2	1	3	3	3	3	3	3	3	3	3	3	2	2
8 AM TO 9 AM	2	2	3	3	3	3	3	3	3	3	3	3	2	3
9 AM TO 10 AM	2	2	3	3	3	3	3	3	3	3	3	3	3	3
10 AM TO 11 AM	2	3	3	3	3	3	3	3	3	3	3	3	3	3
11 AM TO 12 NOON	3	3	3	3	3	3	3	3	3	3	3	3	3	3
12 NOON TO 1 PM	3	3	3	3	3	3	3	3	3	3	3	3	3	3
1 PM TO 2 PM	3	3	3	3	3	3	3	3	3	3	3	3	3	3
2 PM TO 3 PM	3	3	3	3	3	3	3	3	3	3	3	3	3	3
3 PM TO 4 PM	3	3	3	3	3	3	3	3	3	3	3	3	3	3
4 PM TO 5 PM	3	3	3	3	3	3	3	3	3	3	3	3	3	3
5 PM TO 6 PM	3	3	3	3	3	3	3	3	3	3	3	3	3	3
6 PM TO 7 PM	3	3	3	3	3	3	3	3	3	3	3	3	3	3
7 PM TO 8 PM	3	3	3	2	3	2	3	2	3	2	3	3	2	2
8 PM TO 9 PM	2	3	2	2	2	2	2	2	2	2	2	2	2	2
9 PM TO 10 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
10 PM TO 11 PM	2	2	1	1	1	1	1	1	1	1	2	2	2	2
11 PM TO 12 MID	1	1	1	1	1	1	1	1	1	1	1	1	1	1

NOTE: DURING THE EASTER AND MEMORIAL DAY HOLIDAY PERIODS ALL TRAVEL LANES MUST BE AVAILABLE EASTBOUND AND WESTBOUND

MINIMUM LANE REQUIREMENTS TO BE AVAILABLE
DURING WORKING HOURS

LOCATION: **MP 341.3**
MONTH: **JUNE THROUGH AUGUST**
YEAR: **2010**
LANES AVAILABLE: **EB = 3** **WB = 3**

	SUNDAY		MONDAY		TUESDAY		WEDNESDAY		THURSDAY		FRIDAY		SATURDAY	
HOUR	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB
12 MID TO 1 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1 AM TO 2 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2 AM TO 3 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
3 AM TO 4 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
4 AM TO 5 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
5 AM TO 6 AM	1	1	2	2	2	2	2	2	2	2	2	2	1	1
6 AM TO 7 AM	1	1	3	3	3	3	3	3	3	3	3	3	2	2
7 AM TO 8 AM	2	1	3	3	3	3	3	3	3	3	3	3	2	2
8 AM TO 9 AM	2	2	3	3	3	3	3	3	3	3	3	3	2	3
9 AM TO 10 AM	2	2	3	3	3	3	3	3	3	3	3	3	3	3
10 AM TO 11 AM	2	3	3	3	3	3	3	3	3	3	3	3	3	3
11 AM TO 12 NOON	3	3	3	3	3	3	3	3	3	3	3	3	3	3
12 NOON TO 1 PM	3	3	3	3	3	3	3	3	3	3	3	3	3	3
1 PM TO 2 PM	3	3	3	3	3	3	3	3	3	3	3	3	3	3
2 PM TO 3 PM	3	3	3	3	3	3	3	3	3	3	3	3	3	3
3 PM TO 4 PM	3	3	3	3	3	3	3	3	3	3	3	3	3	3
4 PM TO 5 PM	3	3	3	3	3	3	3	3	3	3	3	3	3	3
5 PM TO 6 PM	3	3	3	3	3	3	3	3	3	3	3	3	3	3
6 PM TO 7 PM	3	3	3	3	3	3	3	3	3	3	3	3	3	3
7 PM TO 8 PM	3	3	3	2	3	2	3	2	3	2	3	3	2	2
8 PM TO 9 PM	2	3	2	2	2	2	2	2	2	2	2	2	2	2
9 PM TO 10 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
10 PM TO 11 PM	1	2	1	1	1	1	1	1	1	1	2	2	2	2
11 PM TO 12 MID	1	1	1	1	1	1	1	1	1	1	1	1	1	1

NOTE: DURING THE MEMORIAL DAY AND INDEPENDENCE DAY HOLIDAY PERIODS
ALL TRAVEL LANES MUST BE AVAILABLE EASTBOUND AND WESTBOUND

MINIMUM LANE REQUIREMENTS TO BE AVAILABLE
DURING WORKING HOURS

LOCATION: **MP 341.3**
MONTH: **SEPTEMBER THROUGH OCTOBER**
YEAR: **2010**
LANES AVAILABLE: **EB = 3** **WB = 3**

	SUNDAY		MONDAY		TUESDAY		WEDNESDAY		THURSDAY		FRIDAY		SATURDAY	
HOUR	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB
12 MID TO 1 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1 AM TO 2 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2 AM TO 3 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
3 AM TO 4 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
4 AM TO 5 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
5 AM TO 6 AM	1	1	2	2	2	2	2	2	2	2	2	2	1	1
6 AM TO 7 AM	1	1	3	3	3	3	3	3	3	3	3	3	2	2
7 AM TO 8 AM	2	1	3	3	3	3	3	3	3	3	3	3	2	2
8 AM TO 9 AM	2	2	3	3	3	3	3	3	3	3	3	3	2	3
9 AM TO 10 AM	2	2	3	3	3	3	3	3	3	3	3	3	3	3
10 AM TO 11 AM	2	3	3	3	3	3	3	3	3	3	3	3	3	3
11 AM TO 12 NOON	3	3	3	3	3	3	3	3	3	3	3	3	3	3
12 NOON TO 1 PM	3	3	3	3	3	3	3	3	3	3	3	3	3	3
1 PM TO 2 PM	3	3	3	3	3	3	3	3	3	3	3	3	3	3
2 PM TO 3 PM	3	3	3	3	3	3	3	3	3	3	3	3	3	3
3 PM TO 4 PM	3	3	3	3	3	3	3	3	3	3	3	3	3	3
4 PM TO 5 PM	3	3	3	3	3	3	3	3	3	3	3	3	3	3
5 PM TO 6 PM	3	3	3	3	3	3	3	3	3	3	3	3	3	3
6 PM TO 7 PM	3	3	3	3	3	3	3	3	3	3	3	3	3	3
7 PM TO 8 PM	3	3	2	2	2	2	2	2	2	2	3	3	2	2
8 PM TO 9 PM	2	3	2	2	2	2	2	2	2	2	2	2	2	2
9 PM TO 10 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
10 PM TO 11 PM	1	2	1	1	1	1	1	1	1	1	2	2	2	2
11 PM TO 12 MID	1	1	1	1	1	1	1	1	1	1	1	1	1	1

NOTE: DURING THE LABOR DAY AND COLUMBUS DAY HOLIDAY PERIODS ALL TRAVEL LANES MUST BE AVAILABLE EASTBOUND AND WESTBOUND

MINIMUM LANE REQUIREMENTS TO BE AVAILABLE
DURING WORKING HOURS

LOCATION: **MP 341.3**
MONTH: **NOVEMBER THROUGH DECEMBER**
YEAR: **2010**
LANES AVAILABLE: **EB = 3** **WB = 3**

	SUNDAY		MONDAY		TUESDAY		WEDNESDAY		THURSDAY		FRIDAY		SATURDAY	
HOUR	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB
12 MID TO 1 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1 AM TO 2 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2 AM TO 3 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
3 AM TO 4 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
4 AM TO 5 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
5 AM TO 6 AM	1	1	2	2	2	2	2	2	2	2	2	2	1	1
6 AM TO 7 AM	1	1	3	3	3	3	3	3	3	3	3	3	1	2
7 AM TO 8 AM	2	1	3	3	3	3	3	3	3	3	3	3	2	2
8 AM TO 9 AM	2	2	3	3	3	3	3	3	3	3	3	3	2	3
9 AM TO 10 AM	2	2	3	3	3	3	3	3	3	3	3	3	3	3
10 AM TO 11 AM	2	2	3	3	3	3	3	3	3	3	3	3	3	3
11 AM TO 12 NOON	2	3	3	3	3	3	3	3	3	3	3	3	3	3
12 NOON TO 1 PM	3	3	3	3	3	3	3	3	3	3	3	3	3	3
1 PM TO 2 PM	3	3	3	3	3	3	3	3	3	3	3	3	3	3
2 PM TO 3 PM	3	3	3	3	3	3	3	3	3	3	3	3	3	3
3 PM TO 4 PM	3	3	3	3	3	3	3	3	3	3	3	3	3	3
4 PM TO 5 PM	3	3	3	3	3	3	3	3	3	3	3	3	3	3
5 PM TO 6 PM	3	3	3	3	3	3	3	3	3	3	3	3	3	3
6 PM TO 7 PM	3	3	3	3	3	3	3	3	3	3	3	3	3	3
7 PM TO 8 PM	2	3	2	2	2	2	2	2	2	2	3	3	3	2
8 PM TO 9 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
9 PM TO 10 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
10 PM TO 11 PM	1	2	1	1	1	1	1	1	1	1	2	2	2	2
11 PM TO 12 MID	1	1	1	1	1	1	1	1	1	1	1	1	1	1

NOTE: DURING THE VETERANS DAY, THANKSGIVING DAY, AND CHRISTMAS/NEW YEARS HOLIDAY PERIODS TWO (2) TRAVEL LANES MUST BE AVAILABLE NORTHBOUND AND SOUTHBOUND

MINIMUM LANE REQUIREMENTS TO BE AVAILABLE
DURING WORKING HOURS

LOCATION: **A 33.3**
MONTH: **SEPTEMBER THROUGH OCTOBER**
YEAR: **2009**
LANES AVAILABLE: **NB = 2** **SB = 2**

	SUNDAY		MONDAY		TUESDAY		WEDNESDAY		THURSDAY		FRIDAY		SATURDAY	
HOUR	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB
12 MID TO 1 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1 AM TO 2 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2 AM TO 3 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
3 AM TO 4 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
4 AM TO 5 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
5 AM TO 6 AM	1	1	1	2	1	2	1	2	1	2	1	2	1	1
6 AM TO 7 AM	1	1	2	2	2	2	2	2	2	2	2	2	1	1
7 AM TO 8 AM	1	1	2	2	2	2	2	2	2	2	2	2	2	2
8 AM TO 9 AM	2	1	2	2	2	2	2	2	2	2	2	2	2	2
9 AM TO 10 AM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
10 AM TO 11 AM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
11 AM TO 12 NOON	2	2	2	2	2	2	2	2	2	2	2	2	2	2
12 NOON TO 1 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
1 PM TO 2 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
2 PM TO 3 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
3 PM TO 4 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
4 PM TO 5 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
5 PM TO 6 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
6 PM TO 7 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
7 PM TO 8 PM	2	2	2	1	2	1	2	1	2	1	2	2	2	2
8 PM TO 9 PM	2	2	2	1	2	1	2	1	2	1	2	2	2	2
9 PM TO 10 PM	1	2	1	1	1	1	1	1	1	1	2	1	2	1
10 PM TO 11 PM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
11 PM TO 12 MID	1	1	1	1	1	1	1	1	1	1	1	1	1	1

NOTE: DURING THE LABOR DAY AND COLUMBUS DAY HOLIDAY PERIODS TWO (2)
TRAVEL LANES MUST BE AVAILABLE NORTHBOUND AND SOUTHBOUND

MINIMUM LANE REQUIREMENTS TO BE AVAILABLE
DURING WORKING HOURS

LOCATION: **A 33.3**
MONTH: **NOVEMBER THROUGH DECEMBER**
YEAR: **2009**
LANES AVAILABLE: **NB = 2** **SB = 2**

	SUNDAY		MONDAY		TUESDAY		WEDNESDAY		THURSDAY		FRIDAY		SATURDAY	
HOUR	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB
12 MID TO 1 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1 AM TO 2 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2 AM TO 3 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
3 AM TO 4 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
4 AM TO 5 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
5 AM TO 6 AM	1	1	1	2	1	2	1	2	1	2	1	2	1	1
6 AM TO 7 AM	1	1	2	2	2	2	2	2	2	2	2	2	1	1
7 AM TO 8 AM	1	1	2	2	2	2	2	2	2	2	2	2	1	2
8 AM TO 9 AM	1	1	2	2	2	2	2	2	2	2	2	2	2	2
9 AM TO 10 AM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
10 AM TO 11 AM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
11 AM TO 12 NOON	2	2	2	2	2	2	2	2	2	2	2	2	2	2
12 NOON TO 1 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
1 PM TO 2 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
2 PM TO 3 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
3 PM TO 4 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
4 PM TO 5 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
5 PM TO 6 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
6 PM TO 7 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
7 PM TO 8 PM	2	2	2	1	2	1	2	1	2	1	2	2	1	2
8 PM TO 9 PM	2	2	2	1	2	1	2	1	2	1	2	2	1	1
9 PM TO 10 PM	1	2	1	1	1	1	1	1	1	1	1	1	1	1
10 PM TO 11 PM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
11 PM TO 12 MID	1	1	1	1	1	1	1	1	1	1	1	1	1	1

NOTE: DURING THE VETERANS DAY, THANKSGIVING DAY, AND CHRISTMAS/NEW YEARS HOLIDAY PERIODS TWO (2) TRAVEL LANES MUST BE AVAILABLE NORTHBOUND AND SOUTHBOUND

MINIMUM LANE REQUIREMENTS TO BE AVAILABLE
DURING WORKING HOURS

LOCATION: **A 33.3**
MONTH: **JANUARY THROUGH MARCH**
YEAR: **2010**
LANES AVAILABLE: **NB = 2** **SB = 2**

	SUNDAY		MONDAY		TUESDAY		WEDNESDAY		THURSDAY		FRIDAY		SATURDAY	
HOUR	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB
12 MID TO 1 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1 AM TO 2 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2 AM TO 3 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
3 AM TO 4 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
4 AM TO 5 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
5 AM TO 6 AM	1	1	1	2	1	2	1	2	1	2	1	2	1	1
6 AM TO 7 AM	1	1	2	2	2	2	2	2	2	2	2	2	1	1
7 AM TO 8 AM	1	1	2	2	2	2	2	2	2	2	2	2	1	2
8 AM TO 9 AM	1	1	2	2	2	2	2	2	2	2	2	2	2	2
9 AM TO 10 AM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
10 AM TO 11 AM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
11 AM TO 12 NOON	2	2	2	2	2	2	2	2	2	2	2	2	2	2
12 NOON TO 1 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
1 PM TO 2 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
2 PM TO 3 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
3 PM TO 4 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
4 PM TO 5 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
5 PM TO 6 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
6 PM TO 7 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
7 PM TO 8 PM	2	2	2	1	2	1	2	1	2	1	2	2	2	2
8 PM TO 9 PM	2	2	2	1	2	1	2	1	2	1	2	2	1	1
9 PM TO 10 PM	1	2	1	1	1	1	1	1	1	1	2	1	1	1
10 PM TO 11 PM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
11 PM TO 12 MID	1	1	1	1	1	1	1	1	1	1	1	1	1	1

NOTE: DURING THE CHRISTMAS/NEW YEARS HOLIDAY PERIOD TWO (2) TRAVEL LANES MUST BE AVAILABLE NORTHBOUND AND SOUTHBOUND

MINIMUM LANE REQUIREMENTS TO BE AVAILABLE
DURING WORKING HOURS

LOCATION: **A 33.3**
MONTH: **APRIL THROUGH MAY**
YEAR: **2010**
LANES AVAILABLE: **NB = 2** **SB = 2**

	SUNDAY		MONDAY		TUESDAY		WEDNESDAY		THURSDAY		FRIDAY		SATURDAY	
HOUR	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB
12 MID TO 1 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1 AM TO 2 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2 AM TO 3 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
3 AM TO 4 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
4 AM TO 5 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
5 AM TO 6 AM	1	1	1	2	1	2	1	2	1	2	1	2	1	1
6 AM TO 7 AM	1	1	2	2	2	2	2	2	2	2	2	2	1	1
7 AM TO 8 AM	1	1	2	2	2	2	2	2	2	2	2	2	2	2
8 AM TO 9 AM	2	1	2	2	2	2	2	2	2	2	2	2	2	2
9 AM TO 10 AM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
10 AM TO 11 AM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
11 AM TO 12 NOON	2	2	2	2	2	2	2	2	2	2	2	2	2	2
12 NOON TO 1 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
1 PM TO 2 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
2 PM TO 3 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
3 PM TO 4 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
4 PM TO 5 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
5 PM TO 6 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
6 PM TO 7 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
7 PM TO 8 PM	2	2	2	1	2	1	2	1	2	1	2	2	2	2
8 PM TO 9 PM	2	2	2	1	2	1	2	1	2	1	2	2	2	2
9 PM TO 10 PM	1	2	1	1	1	1	1	1	1	1	2	1	2	1
10 PM TO 11 PM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
11 PM TO 12 MID	1	1	1	1	1	1	1	1	1	1	1	1	1	1

NOTE: DURING THE EASTER AND MEMORIAL DAY HOLIDAY PERIODS TWO (2) TRAVEL LANES MUST BE AVAILABLE NORTHBOUND AND SOUTHBOUND

MINIMUM LANE REQUIREMENTS TO BE AVAILABLE
DURING WORKING HOURS

LOCATION: **A 33.3**
MONTH: **JUNE THROUGH AUGUST**
YEAR: **2010**
LANES AVAILABLE: **NB = 2** **SB = 2**

	SUNDAY		MONDAY		TUESDAY		WEDNESDAY		THURSDAY		FRIDAY		SATURDAY	
HOUR	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB
12 MID TO 1 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1 AM TO 2 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2 AM TO 3 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
3 AM TO 4 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
4 AM TO 5 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
5 AM TO 6 AM	1	1	1	2	1	2	1	2	1	2	1	2	1	1
6 AM TO 7 AM	1	1	2	2	2	2	2	2	2	2	2	2	1	1
7 AM TO 8 AM	1	1	2	2	2	2	2	2	2	2	2	2	2	2
8 AM TO 9 AM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
9 AM TO 10 AM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
10 AM TO 11 AM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
11 AM TO 12 NOON	2	2	2	2	2	2	2	2	2	2	2	2	2	2
12 NOON TO 1 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
1 PM TO 2 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
2 PM TO 3 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
3 PM TO 4 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
4 PM TO 5 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
5 PM TO 6 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
6 PM TO 7 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
7 PM TO 8 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
8 PM TO 9 PM	2	2	2	1	2	1	2	1	2	1	2	2	2	2
9 PM TO 10 PM	2	2	2	1	2	1	2	1	2	1	2	1	2	2
10 PM TO 11 PM	1	1	1	1	1	1	1	1	1	1	1	1	2	1
11 PM TO 12 MID	1	1	1	1	1	1	1	1	1	1	1	1	1	1

NOTE: DURING THE MEMORIAL DAY AND INDEPENDENCE DAY HOLIDAY PERIODS TWO (2) TRAVEL LANES MUST BE AVAILABLE NORTHBOUND AND SOUTHBOUND

NOTE: DURING THE POCONO RACE PERIODS TWO (2) TRAVEL LANES MUST BE AVAILABLE NORTHBOUND AND SOUTHBOUND

MINIMUM LANE REQUIREMENTS TO BE AVAILABLE
DURING WORKING HOURS

LOCATION: **A 33.3**
MONTH: **SEPTEMBER THROUGH OCTOBER**
YEAR: **2010**
LANES AVAILABLE: **NB = 2** **SB = 2**

	SUNDAY		MONDAY		TUESDAY		WEDNESDAY		THURSDAY		FRIDAY		SATURDAY	
HOUR	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB
12 MID TO 1 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1 AM TO 2 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2 AM TO 3 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
3 AM TO 4 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
4 AM TO 5 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
5 AM TO 6 AM	1	1	1	2	1	2	1	2	1	2	1	2	1	1
6 AM TO 7 AM	1	1	2	2	2	2	2	2	2	2	2	2	1	1
7 AM TO 8 AM	1	1	2	2	2	2	2	2	2	2	2	2	2	2
8 AM TO 9 AM	2	1	2	2	2	2	2	2	2	2	2	2	2	2
9 AM TO 10 AM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
10 AM TO 11 AM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
11 AM TO 12 NOON	2	2	2	2	2	2	2	2	2	2	2	2	2	2
12 NOON TO 1 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
1 PM TO 2 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
2 PM TO 3 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
3 PM TO 4 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
4 PM TO 5 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
5 PM TO 6 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
6 PM TO 7 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
7 PM TO 8 PM	2	2	2	1	2	1	2	1	2	1	2	2	2	2
8 PM TO 9 PM	2	2	2	1	2	1	2	1	2	1	2	2	2	2
9 PM TO 10 PM	2	2	1	1	1	1	1	1	1	1	2	1	2	1
10 PM TO 11 PM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
11 PM TO 12 MID	1	1	1	1	1	1	1	1	1	1	1	1	1	1

NOTE: DURING THE LABOR DAY AND COLUMBUS DAY HOLIDAY PERIODS TWO (2)
TRAVEL LANES MUST BE AVAILABLE NORTHBOUND AND SOUTHBOUND

MINIMUM LANE REQUIREMENTS TO BE AVAILABLE
DURING WORKING HOURS

LOCATION: **A 33.3**
MONTH: **NOVEMBER THROUGH DECEMBER**
YEAR: **2010**
LANES AVAILABLE: **NB = 2** **SB = 2**

	SUNDAY		MONDAY		TUESDAY		WEDNESDAY		THURSDAY		FRIDAY		SATURDAY	
HOUR	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB
12 MID TO 1 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1 AM TO 2 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2 AM TO 3 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
3 AM TO 4 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
4 AM TO 5 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
5 AM TO 6 AM	1	1	1	2	1	2	1	2	1	2	1	2	1	1
6 AM TO 7 AM	1	1	2	2	2	2	2	2	2	2	2	2	1	1
7 AM TO 8 AM	1	1	2	2	2	2	2	2	2	2	2	2	1	2
8 AM TO 9 AM	1	1	2	2	2	2	2	2	2	2	2	2	2	2
9 AM TO 10 AM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
10 AM TO 11 AM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
11 AM TO 12 NOON	2	2	2	2	2	2	2	2	2	2	2	2	2	2
12 NOON TO 1 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
1 PM TO 2 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
2 PM TO 3 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
3 PM TO 4 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
4 PM TO 5 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
5 PM TO 6 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
6 PM TO 7 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
7 PM TO 8 PM	2	2	2	1	2	1	2	1	2	1	2	2	2	2
8 PM TO 9 PM	2	2	2	1	2	1	2	1	2	1	2	2	1	1
9 PM TO 10 PM	1	2	1	1	1	1	1	1	1	1	2	1	1	1
10 PM TO 11 PM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
11 PM TO 12 MID	1	1	1	1	1	1	1	1	1	1	1	1	1	1

NOTE: DURING THE VETERANS DAY, THANKSGIVING DAY, AND CHRISTMAS/NEW YEARS HOLIDAY PERIODS TWO (2) TRAVEL LANES MUST BE AVAILABLE NORTHBOUND AND SOUTHBOUND

MINIMUM LANE REQUIREMENTS TO BE AVAILABLE
DURING WORKING HOURS

LOCATION: **A 51.4 TO A 54.6**
MONTH: **SEPTEMBER THROUGH OCTOBER**
YEAR: **2009**
LANES AVAILABLE: **NB = 2** **SB = 2**

	SUNDAY		MONDAY		TUESDAY		WEDNESDAY		THURSDAY		FRIDAY		SATURDAY	
HOUR	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB
12 MID TO 1 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1 AM TO 2 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2 AM TO 3 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
3 AM TO 4 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
4 AM TO 5 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
5 AM TO 6 AM	1	1	1	2	1	2	1	2	1	2	1	2	1	1
6 AM TO 7 AM	1	1	1	2	1	2	1	2	1	2	1	2	1	1
7 AM TO 8 AM	1	1	2	2	2	2	2	2	2	2	2	2	1	1
8 AM TO 9 AM	1	1	2	2	2	2	2	2	2	2	2	2	2	2
9 AM TO 10 AM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
10 AM TO 11 AM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
11 AM TO 12 NOON	2	2	2	2	2	2	2	2	2	2	2	2	2	2
12 NOON TO 1 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
1 PM TO 2 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
2 PM TO 3 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
3 PM TO 4 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
4 PM TO 5 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
5 PM TO 6 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
6 PM TO 7 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
7 PM TO 8 PM	2	2	1	1	1	1	1	1	1	1	2	2	1	2
8 PM TO 9 PM	1	2	1	1	1	1	1	1	1	1	2	2	1	1
9 PM TO 10 PM	1	2	1	1	1	1	1	1	1	1	1	1	1	1
10 PM TO 11 PM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
11 PM TO 12 MID	1	1	1	1	1	1	1	1	1	1	1	1	1	1

NOTE: DURING THE LABOR DAY AND COLUMBUS DAY HOLIDAY PERIODS TWO (2)
TRAVEL LANES MUST BE AVAILABLE NORTHBOUND AND SOUTHBOUND

MINIMUM LANE REQUIREMENTS TO BE AVAILABLE
DURING WORKING HOURS

LOCATION: **A 51.4 TO A 54.6**
MONTH: **NOVEMBER THROUGH DECEMBER**
YEAR: **2009**
LANES AVAILABLE: **NB = 2** **SB = 2**

	SUNDAY		MONDAY		TUESDAY		WEDNESDAY		THURSDAY		FRIDAY		SATURDAY	
HOUR	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB
12 MID TO 1 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1 AM TO 2 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2 AM TO 3 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
3 AM TO 4 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
4 AM TO 5 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
5 AM TO 6 AM	1	1	1	2	1	2	1	2	1	2	1	2	1	1
6 AM TO 7 AM	1	1	1	2	1	2	1	2	1	2	1	2	1	1
7 AM TO 8 AM	1	1	1	2	1	2	1	2	1	2	1	2	1	1
8 AM TO 9 AM	1	1	1	2	1	2	1	2	1	2	1	2	1	1
9 AM TO 10 AM	1	2	1	2	1	2	1	2	1	2	2	2	2	2
10 AM TO 11 AM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
11 AM TO 12 NOON	2	2	2	2	2	2	2	2	2	2	2	2	2	2
12 NOON TO 1 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
1 PM TO 2 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
2 PM TO 3 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
3 PM TO 4 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
4 PM TO 5 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
5 PM TO 6 PM	2	2	2	2	2	2	2	2	2	2	2	2	1	2
6 PM TO 7 PM	2	2	2	2	2	2	2	2	2	2	2	2	1	2
7 PM TO 8 PM	1	2	1	1	1	1	1	1	1	1	2	2	1	1
8 PM TO 9 PM	1	2	1	1	1	1	1	1	1	1	2	1	1	1
9 PM TO 10 PM	1	2	1	1	1	1	1	1	1	1	1	1	1	1
10 PM TO 11 PM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
11 PM TO 12 MID	1	1	1	1	1	1	1	1	1	1	1	1	1	1

NOTE: DURING THE VETERANS DAY, THANKSGIVING DAY, AND CHRISTMAS/NEW YEARS HOLIDAY PERIODS TWO (2) TRAVEL LANES MUST BE AVAILABLE NORTHBOUND AND SOUTHBOUND

MINIMUM LANE REQUIREMENTS TO BE AVAILABLE
DURING WORKING HOURS

LOCATION: **A 51.4 TO A 54.6**
MONTH: **JANUARY THROUGH MARCH**
YEAR: **2010**
LANES AVAILABLE: **NB = 2** **SB = 2**

	SUNDAY		MONDAY		TUESDAY		WEDNESDAY		THURSDAY		FRIDAY		SATURDAY	
HOUR	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB
12 MID TO 1 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1 AM TO 2 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2 AM TO 3 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
3 AM TO 4 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
4 AM TO 5 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
5 AM TO 6 AM	1	1	1	2	1	2	1	2	1	2	1	2	1	1
6 AM TO 7 AM	1	1	1	2	1	2	1	2	1	2	1	2	1	1
7 AM TO 8 AM	1	1	1	2	1	2	1	2	1	2	2	2	1	1
8 AM TO 9 AM	1	1	1	2	1	2	1	2	1	2	2	2	2	2
9 AM TO 10 AM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
10 AM TO 11 AM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
11 AM TO 12 NOON	2	2	2	2	2	2	2	2	2	2	2	2	2	2
12 NOON TO 1 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
1 PM TO 2 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
2 PM TO 3 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
3 PM TO 4 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
4 PM TO 5 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
5 PM TO 6 PM	2	2	2	2	2	2	2	2	2	2	2	2	1	2
6 PM TO 7 PM	2	2	2	2	2	2	2	2	2	2	2	2	1	2
7 PM TO 8 PM	1	2	1	1	1	1	1	1	1	1	2	2	1	2
8 PM TO 9 PM	1	2	1	1	1	1	1	1	1	1	2	2	1	1
9 PM TO 10 PM	1	2	1	1	1	1	1	1	1	1	1	1	1	1
10 PM TO 11 PM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
11 PM TO 12 MID	1	1	1	1	1	1	1	1	1	1	1	1	1	1

NOTE: DURING THE CHRISTMAS/NEW YEARS HOLIDAY PERIOD TWO (2) TRAVEL LANES MUST BE AVAILABLE NORTHBOUND AND SOUTHBOUND

MINIMUM LANE REQUIREMENTS TO BE AVAILABLE
DURING WORKING HOURS

LOCATION: **A 51.4 TO A 54.6**
MONTH: **APRIL THROUGH MAY**
YEAR: **2010**
LANES AVAILABLE: **NB = 2** **SB = 2**

	SUNDAY		MONDAY		TUESDAY		WEDNESDAY		THURSDAY		FRIDAY		SATURDAY	
HOUR	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB
12 MID TO 1 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1 AM TO 2 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2 AM TO 3 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
3 AM TO 4 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
4 AM TO 5 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
5 AM TO 6 AM	1	1	1	2	1	2	1	2	1	2	1	2	1	1
6 AM TO 7 AM	1	1	1	2	1	2	1	2	1	2	1	2	1	1
7 AM TO 8 AM	1	1	2	2	2	2	2	2	2	2	2	2	1	1
8 AM TO 9 AM	1	1	2	2	2	2	2	2	2	2	2	2	2	2
9 AM TO 10 AM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
10 AM TO 11 AM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
11 AM TO 12 NOON	2	2	2	2	2	2	2	2	2	2	2	2	2	2
12 NOON TO 1 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
1 PM TO 2 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
2 PM TO 3 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
3 PM TO 4 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
4 PM TO 5 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
5 PM TO 6 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
6 PM TO 7 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
7 PM TO 8 PM	2	2	1	1	1	1	1	1	1	1	2	2	1	2
8 PM TO 9 PM	1	2	1	1	1	1	1	1	1	1	2	2	1	1
9 PM TO 10 PM	1	2	1	1	1	1	1	1	1	1	1	1	1	1
10 PM TO 11 PM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
11 PM TO 12 MID	1	1	1	1	1	1	1	1	1	1	1	1	1	1

NOTE: DURING THE EASTER AND MEMORIAL DAY HOLIDAY PERIODS TWO (2) TRAVEL LANES MUST BE AVAILABLE NORTHBOUND AND SOUTHBOUND

MINIMUM LANE REQUIREMENTS TO BE AVAILABLE
DURING WORKING HOURS

LOCATION: **A 51.4 TO A 54.6**
MONTH: **JUNE THROUGH AUGUST**
YEAR: **2010**
LANES AVAILABLE: **NB = 2** **SB = 2**

	SUNDAY		MONDAY		TUESDAY		WEDNESDAY		THURSDAY		FRIDAY		SATURDAY	
HOUR	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB
12 MID TO 1 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1 AM TO 2 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2 AM TO 3 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
3 AM TO 4 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
4 AM TO 5 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
5 AM TO 6 AM	1	1	1	2	1	2	1	2	1	2	1	2	1	1
6 AM TO 7 AM	1	1	2	2	2	2	2	2	2	2	2	2	1	1
7 AM TO 8 AM	1	1	2	2	2	2	2	2	2	2	2	2	2	2
8 AM TO 9 AM	1	2	2	2	2	2	2	2	2	2	2	2	2	2
9 AM TO 10 AM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
10 AM TO 11 AM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
11 AM TO 12 NOON	2	2	2	2	2	2	2	2	2	2	2	2	2	2
12 NOON TO 1 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
1 PM TO 2 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
2 PM TO 3 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
3 PM TO 4 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
4 PM TO 5 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
5 PM TO 6 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
6 PM TO 7 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
7 PM TO 8 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
8 PM TO 9 PM	1	2	1	1	1	1	1	1	1	1	2	2	1	2
9 PM TO 10 PM	1	2	1	1	1	1	1	1	1	1	1	1	1	2
10 PM TO 11 PM	1	2	1	1	1	1	1	1	1	1	1	1	1	1
11 PM TO 12 MID	1	1	1	1	1	1	1	1	1	1	1	1	1	1

NOTE: DURING THE MEMORIAL DAY AND INDEPENDENCE DAY HOLIDAY PERIODS TWO (2) TRAVEL LANES MUST BE AVAILABLE NORTHBOUND AND SOUTHBOUND

NOTE: DURING THE POCONO RACE PERIODS TWO (2) TRAVEL LANES MUST BE AVAILABLE NORTHBOUND AND SOUTHBOUND

MINIMUM LANE REQUIREMENTS TO BE AVAILABLE
DURING WORKING HOURS

LOCATION: **A 51.4 TO A 54.6**
MONTH: **SEPTEMBER THROUGH OCTOBER**
YEAR: **2010**
LANES AVAILABLE: **NB = 2** **SB = 2**

	SUNDAY		MONDAY		TUESDAY		WEDNESDAY		THURSDAY		FRIDAY		SATURDAY	
HOUR	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB
12 MID TO 1 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1 AM TO 2 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2 AM TO 3 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
3 AM TO 4 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
4 AM TO 5 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
5 AM TO 6 AM	1	1	1	2	1	2	1	2	1	2	1	2	1	1
6 AM TO 7 AM	1	1	1	2	1	2	1	2	1	2	1	2	1	1
7 AM TO 8 AM	1	1	2	2	2	2	2	2	2	2	2	2	1	1
8 AM TO 9 AM	1	1	2	2	2	2	2	2	2	2	2	2	2	2
9 AM TO 10 AM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
10 AM TO 11 AM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
11 AM TO 12 NOON	2	2	2	2	2	2	2	2	2	2	2	2	2	2
12 NOON TO 1 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
1 PM TO 2 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
2 PM TO 3 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
3 PM TO 4 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
4 PM TO 5 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
5 PM TO 6 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
6 PM TO 7 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
7 PM TO 8 PM	2	2	1	1	1	1	1	1	1	1	2	2	1	2
8 PM TO 9 PM	1	2	1	1	1	1	1	1	1	1	2	2	1	1
9 PM TO 10 PM	1	2	1	1	1	1	1	1	1	1	1	1	1	1
10 PM TO 11 PM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
11 PM TO 12 MID	1	1	1	1	1	1	1	1	1	1	1	1	1	1

NOTE: DURING THE LABOR DAY AND COLUMBUS DAY HOLIDAY PERIODS TWO (2)
TRAVEL LANES MUST BE AVAILABLE NORTHBOUND AND SOUTHBOUND

MINIMUM LANE REQUIREMENTS TO BE AVAILABLE
DURING WORKING HOURS

LOCATION: **A 51.4 TO A 54.6**
MONTH: **NOVEMBER THROUGH DECEMBER**
YEAR: **2010**
LANES AVAILABLE: **NB = 2** **SB = 2**

	SUNDAY		MONDAY		TUESDAY		WEDNESDAY		THURSDAY		FRIDAY		SATURDAY	
HOUR	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB
12 MID TO 1 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1 AM TO 2 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2 AM TO 3 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
3 AM TO 4 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
4 AM TO 5 AM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
5 AM TO 6 AM	1	1	1	2	1	2	1	2	1	2	1	2	1	1
6 AM TO 7 AM	1	1	1	2	1	2	1	2	1	2	1	2	1	1
7 AM TO 8 AM	1	1	2	2	2	2	2	2	2	2	2	2	1	1
8 AM TO 9 AM	1	1	2	2	2	2	2	2	2	2	2	2	2	2
9 AM TO 10 AM	1	2	2	2	2	2	2	2	2	2	2	2	2	2
10 AM TO 11 AM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
11 AM TO 12 NOON	2	2	2	2	2	2	2	2	2	2	2	2	2	2
12 NOON TO 1 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
1 PM TO 2 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
2 PM TO 3 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
3 PM TO 4 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
4 PM TO 5 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
5 PM TO 6 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
6 PM TO 7 PM	2	2	2	2	2	2	2	2	2	2	2	2	2	2
7 PM TO 8 PM	1	2	1	1	1	1	1	1	1	1	2	2	1	2
8 PM TO 9 PM	1	2	1	1	1	1	1	1	1	1	2	1	1	1
9 PM TO 10 PM	1	2	1	1	1	1	1	1	1	1	1	1	1	1
10 PM TO 11 PM	1	1	1	1	1	1	1	1	1	1	1	1	1	1
11 PM TO 12 MID	1	1	1	1	1	1	1	1	1	1	1	1	1	1

NOTE: DURING THE VETERANS DAY, THANKSGIVING DAY, AND CHRISTMAS/NEW YEARS HOLIDAY PERIODS TWO (2) TRAVEL LANES MUST BE AVAILABLE NORTHBOUND AND SOUTHBOUND