

REQUEST FOR PROPOSALS FOR
Communications Systems Maintenance Contract

ISSUING OFFICE
Pennsylvania Turnpike Commission
Information Technology Department

RFP 04-132-2903

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TABLE OF CONTENTS

	Page
Part I - GENERAL INFORMATION FOR CONTRACTORS	1
Part II - INFORMATION REQUIRED FROM CONTRACTORS	7
Part III - CRITERIA FOR SELECTION	10
Part IV - WORK STATEMENT	12
 APPENDIX A, COMPENSATION	 48
APPENDIX B, BUDGET SUMMARY	50
APPENDIX C, STANDARD CONTRACT TERMS AND CONDITIONS	52

PART I

GENERAL INFORMATION FOR CONTRACTORS

I-1. Purpose. This request for proposals (RFP) provides interested contractors with sufficient information to enable them to prepare and submit proposals for consideration by the Pennsylvania Turnpike Commission (Commission) to satisfy a need for **maintenance of communications systems such as Microwave, Radio, Telephone, Highway Advisory Radio, Variable Message Signs, CCTV, Radio Call boxes, and a 911 Operations Dispatch Center.**

I-2. Issuing Office. This RFP is issued for the Commission by the Information Technology Department, **Daniel J. Dunchock, P. O. Box 67676, Harrisburg, Pa 17106-7676, 717-986-9650, Fax 717-986-8758, e-mail address ddunchoc@paturndpike.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 Pennsylvania Turnpike owns and operates a Digital Microwave System, Telephone Systems, Call Boxes, and Radio systems, which includes around twenty- eight hundred mobile radios, twenty-six telephone systems with over five thousand telephones, eleven hundred call boxes, and over eighty radio systems across the turnpike. We have first level help desk and provide the primary support for the 7 by 24-hour operations dispatch center that dispatches all the Turnpike's resources. The Pennsylvania Turnpike is looking for a contractor to provide service and preventive maintenance on these systems to a level of service that the Commission has come to expect.

I-5. Type of Contract. It is proposed that if a contract is entered into as a result of this RFP, it will be on a Cost Plus Net Fee basis (CPNF) and will contain the Standard Contract Terms and Conditions shown in Appendix C. The Commission may in its sole discretion undertake negotiations with contractors whose proposals as to price and other factors show them to be qualified, responsible, and capable of performing the work.

I-6. Payment Method for Services. The CONTRACTOR will be compensated for the performance of Work in accordance with the provisions of Contract documents. The CONTRACTOR shall accept as full compensation for all Work provided hereunder those charges set forth in Appendix A. The COMMISSION shall not pay the CONTRACTOR any amount for the Work additional to those set forth in Appendix A unless such amounts are approved expressly in writing by the COMMISSION. The acceptance by the CONTRACTOR of final payment hereunder, whether or not such payment is made pursuant to any judgment or order of any court or otherwise, shall be and shall operate as a release to the COMMISSION from all claims by and liability to the CONTRACTOR for anything theretofore done or furnished for or related to the different categories of the Work, or for any prior act, neglect, fault or default of the COMMISSION, or of any person relating to or affecting the Work, except only such claims against the COMMISSION as are specifically reserved in writing prior to accepting the final payment hereunder.

The CONTRACTOR agrees that pricing for any items requested by the COMMISSION shall be as stipulated in Appendix A.

CHANGES AND EXTRA WORK

- a) The COMMISSION reserves the right to order changes which may result in additions to, reductions to or deletions from the amount, type or value of the Work required by the Contract. Any such work shall be known as "Extra Work" if the change requires additions to the Scope of Work; or "Decreased Work", if the change requires reductions to or deletions from the Scope of Work (collectively, "Changed Work"). The COMMISSION and the CONTRACTOR shall, in good faith, negotiate a change order to reflect the modified work scope and costs of the "Changed Work".
- b) The COMMISSION reserves the right to have any Extra Work items performed by parties other than the CONTRACTOR.
- c) No Extra Work shall be performed except pursuant to written orders of the Project Manager expressly and unmistakably indicating his intention to treat the work described therein as Extra Work. In the absence of such an order, if the Project Manager shall direct, order or require any work which the CONTRACTOR deems to be Extra Work, it shall nevertheless comply therewith and shall promptly, and in no event after beginning the performance thereof or incurring costs attributable thereto, given written notice to the Project Manager stating why the CONTRACTOR deems such work (hereinafter "Disputed Work") to be Extra Work. Said notice is for the purposes of (1) affording an opportunity to the Project Manager to cancel promptly such order, direction or requirement; (2) affording an opportunity to the Project Manager to keep an accurate record of the materials, labor and other items involved; and (3) affording an opportunity to the COMMISSION to take such action as it may deem advisable in light of such Disputed Work.
- d) No change in or modification, termination or discharge of the Contract in any form whatsoever, shall be valid or enforceable unless it is in writing and signed by the party to be charged therewith or his duly authorized representative; provide, however, that any change in or modification, termination or discharge of the Contract shall be effective as so provided. The COMMISSION may only be bound hereunder by a properly authorized officer of the COMMISSION.

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

I-8. Sub Contracting. Any use of subcontractors by a contractor must be identified in the quote. During the contract period use of any subcontractors by the selected contractor, that were not previously identified in the quote, must be approved in writing by the Commission prior to any work being done.

I-9. Incurring Costs. The Commission is not liable for any costs incurred by contractors prior to issuance of a contract.

I-10. Mandatory Preproposal Conference. A **Mandatory Preproposal** conference will be held **May 19, 2004 at 9:00 AM in the Large Board Room** situated on the third floor at the PTC's Central Office Administration Building, 700 South Eisenhower Blvd., Middletown Pa. The purpose of this conference is to clarify any points in the RFP, which may not have been clearly understood. Questions should be forwarded to the Issuing Office prior to the meeting to ensure sufficient analysis can be made before an answer is supplied. Questions may also be asked at the Preproposal conference. In view of the limited facilities available for the Preproposal conference, it is requested representation be limited to **four** individuals per contractor. The Preproposal conference is for information only. Answers furnished during the conference will not be official until verified, in writing, by the Issuing Office. All questions and written answers will be issued as an addendum to and become part of this RFP's contract documents. **Mandatory site visits will be required by the contractor with a PTC representative at a typical microwave backbone location and a typical microwave spur site, maintenance and interchange sites shall also be visited. June 7th, 8th and 9th, 2004 will be the dates for the site visits. Failure to attend both the Preproposal Conference and the Site Visit may result in rejection of your proposal.**

I-11. Addenda to the RFP. If it becomes necessary to revise any part of this RFP before the proposal response date, an addendum will be issued only to the contractors who attended the mandatory Preproposal meeting.

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 assure the RFP complies with any changes in the published advertisement.

I-12. Response Date. To be considered, proposals must arrive at the **Contract Administration Department, Attention: Mr. George M. Hatalowich, Manager Contract Administration at 700 South Eisenhower Boulevard, Middletown, Pa 17057 (street address); P.O. Box 67676, Harrisburg, Pa (mailing address) on or before 2:00 PM, local time August 2, 2004.** Contractors mailing proposals should allow sufficient mail delivery time to ensure timely receipt of their proposals. If, due to inclement weather, natural disaster, or any other cause, the Commission office location to which proposals are to be returned is closed on the proposal response date, the deadline for submission shall be automatically extended until the next Commission business day on which the office is open, unless the contractors are notified otherwise by the Commission. The time for submission of proposals shall remain the same.

I-13. Proposals. To be considered, contractors should submit a complete response to this RFP, using the format provided in PART II. Each proposal should be submitted in **seven (7) copies** to the Contract Administration Department. No other distribution of proposals will be made by the contractor. Each proposal page should be numbered for ease of reference. Proposals must be signed by an official authorized to bind the contractor to its provisions and include the contractor's Federal Identification Number. For this RFP, the proposal must remain valid for at least one hundred sixty (160) days. Moreover, the contents of the proposal of the selected contractor may become contractual obligations if a contract is entered into.

Each and every contractor submitting a proposal specifically waives any right to withdraw or modify it, except as hereinafter provided. Proposals may be withdrawn by written or telefax notice received at the

Commission's address for proposal delivery prior to the exact hour and date specified for proposal receipt. However, if the contractor 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 contractor or its authorized representative, provided the representative's identity is made known and the representative 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-14. Economy of Preparation. Proposals should be prepared simply and economically, providing a straightforward, concise description of the contractor's ability to meet the requirements of the RFP.

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

I-16. Best and Final Offers. To obtain best and final offers from contractors whose proposals are determined by the Commission, in its sole discretion, to be reasonably susceptible of being selected for award, the Commission may (a) enter into discussions; (b) schedule oral presentations; and (c) request revised proposals.

I-17. Prime Contractor Responsibilities. The selected contractor 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 contractor to be the sole point of contact with regard to contractual matters.

I-18. Proposal Contents. Proposals will be held in confidence and will not be revealed or discussed with competitors, unless disclosure is required to be made (i) under the provisions of any Commonwealth or United States statute or regulation; or (ii) by rule or order of any court of competent jurisdiction. 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 contractors 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-19. Debriefing Conferences. Contractors whose proposals are not selected will be notified of the name of the selected contractor and will be given the opportunity to be debriefed. The Contract Administration Department will schedule the time and location of the debriefing. The contractor will not be compared with other contractors, other than the position of its proposal in relation to all other proposals for each criterion for selection.

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, contractors must provide all services to complete the identified work.

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

I-23. Term of Contract. The term of the contract will be for five (5) years, with two (2) one (1)-year renewals if agreed upon with both parties with one hundred twenty (120) days prior written notice to cancel or proceed with the renewal. The Effective Date shall be fixed by the Issuing Office after the contract has been fully executed by the contractor and by the Commission and all approvals required by Commission contracting procedures have been obtained.

I-24. Force Majeure Clause. Neither party shall be responsible for delays or failures in performance resulting from acts beyond their control. Such acts include, but are not limited to, acts of God, strikes, lockouts, riots, acts of war, epidemics, government regulations imposed after the fact, fire, communication line failures, power failures, earthquakes, or other disasters. However, if any failures to perform last for more than TBD calendar days, the COMMISSION has the right to cancel this Contract.

I-25. Work for Hire Clause.

All Deliverables, including but not limited to source code, software, specifications, plans, designs and engineering, drawings, data, information or other written, recorded photographic or visual materials, trademarks, servicemarks, copyrights or other Deliverables produced by **CONTRACTOR** or any supplier in performing this contract shall be deemed "Work Product". All Work Product shall be considered services for hire. Accordingly, all Work Product shall be the exclusive property of the **COMMISSION**.

The **CONTRACTOR** and the **COMMISSION** will honor all applicable preexisting licenses, copyrights, trademarks, servicemarks, and patents. If the **CONTRACTOR** purchases the right to license, agreements will be placed in the name of the **COMMISSION** along with all rights and obligations. In addition, the **CONTRACTOR** will mark all Turnpike content or previously unprotected work product designated by the **COMMISSION** with a notice as follows: "Pennsylvania Turnpike Commission, (Year)". The **COMMISSION** will make any patent, servicemark, or trademark application of any component of the Project and System in the name of the **COMMISSION**.

I-26. Contractor's Representations and Authorizations. Each contractor by submitting its proposal understands, represents, and acknowledges that:

- a. All information provided by, and representations made by, the contractor in the proposal are material and important and will be relied upon by the Commission in awarding the contract(s). Any misstatement shall be treated as fraudulent concealment from the Commission 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 contractor or potential contractor.
- 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 contractor or potential contractor, 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 contractor, the contractor, 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 contractor in its proposal.
- g. To the best of the knowledge of the person signing the proposal for the contractor and except as otherwise disclosed by the contractor in its proposal, the contractor 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 contractor that is owed to the Commonwealth.
- h. The contractor is not currently under suspension or debarment by the Commonwealth, or any other state, or the federal government, and if the contractor cannot certify, then it shall submit along with the proposal a written explanation of why such certification cannot be made.
- i. The contractor has not, under separate contract with the Commission, made any recommendations to the Commission concerning the need for the services described in the proposal or the specifications for the services described in the proposal.
- j. Each contractor, 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 CONTRACTORS

Contractor 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; and (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 contractor's competence, number of qualified employees, business organization, and financial resources are adequate to perform according to the contract.

The Commission may make such investigations as deemed necessary to determine the ability of the contractor to perform the work, and the contractor shall furnish to the Commission 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 contractor fails to satisfy the Commission that such contractor is properly qualified to carry out the obligations of the agreement and to complete the work specified.

II-1. Statement of the Problem. State in succinct terms your understanding of the problem presented or the service required by this RFP.

II-2. Management Summary. Include a narrative description of the proposed effort 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 providing the service. Use the requirements described in Part IV of this RFP as your reference point. Modifications of the task descriptions are permitted; however, reasons for changes should be fully explained.

II-4. DBE/MBE/WBE Information. 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 ten percent (10%) total. Responding firms shall clearly identify DBE/MBE/WBE firms, expected to participate in this contract, in their Proposal. If the selected firm 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 Department of General Services 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-5. Safety Policy Statement and Procedures Manual. The Turnpike Commission is committed to providing a safe working environment that ensures the Contractors are utilizing the most commonly accepted best practices in their daily safety program and working regiment. This may include, but is not limited to, federal (OSHA), state and local regulations that govern the operations of the Contractor. The Contractor will submit a copy of their current Safety Policy Statement and Safety Procedures with this proposal.

II-6. Insurance. The Contractor will be required to obtain the following insurance coverage prior to commencement of the agreement.

- a. **Worker's Compensation and Employer's Liability Insurance.** Take out, pay for and maintain during the life of the contract, Worker's Compensation Insurance in statutory required limits for the protection of all employees. Provide, pay for and maintain during the life of the contract, Employers Liability Insurance in limits of not less than \$500,000 bodily injury each accident, \$500,000 bodily injury by disease, and \$500,000 bodily injury by disease each employee.
- b. **Commercial General Liability Insurance.** Includes: Products/Completed Operations; Blanket Contractual Liability - All Written and Oral Contracts; premises and operations liability; explosion, collapse and underground; personal injury; independent contractors; broad form property damage; severability of interests provisions; personal injury and advertising liability; premises medical payments; host liquor liability; fire damage legal liability - real property; incidental malpractice (including employees); non-owned watercraft; and automatic coverage for newly acquired entities.
 - (1) The minimum required limits for the Commercial General Liability policy will be as follows:
 - \$2,000,000 Each Occurrence
 - \$2,000,000 Advertising and Personal Injury Limit
 - \$2,000,000 General Aggregate per Location/Per Site
 - \$2,000,000 Products and Completed Operations Aggregate
 - \$50,000 Fire Damage Legal. Any One Fire
 - \$5,000 Medical Payments
- d. **Commercial Automobile Liability Insurance** covering all owned, hired, leased and non-owned vehicles with a minimum limit of liability of \$2,000,000 per occurrence.
- e. **Commercial Umbrella/Excess Insurance** with the following minimum limits:
 - \$3,000,000 Per Occurrence
 - \$3,000,000 General Aggregate
 - \$3,000,000 Products/Completed Operations Aggregate

II-7. Objections and Additions to Standard Contract Terms and Conditions. The contractor will identify which, if any, of the terms and conditions contained in Appendix C it objects to and what additional terms and conditions contractor requires. Contractor's failure to object or to request additions will result in its waiving its right to do so later, but the Commission may consider late objections and additional requests if it is in the best interest of the Commission to do so.

II-8. Cost Submittal. The information requested in this section shall constitute your cost submittal. **This portion of the proposal must be bound and sealed separately from the remainder of the proposal.** The total cost you are proposing must be broken down into the following components:

- a. Direct Labor Costs.** Itemize so as to show the following for each category of personnel with a different rate per hour, costs should be shown using **APPENDIX A** instructions.
 - (1) Category: e.g., call box tester, mobile radio installer, installation coordinator, communications field technician, engineering senior support technician, engineer and service manager.
 - (2) Estimated hours.
 - (3) Rate per hour.
 - (4) Total cost for each category and for all direct labor costs.
 - (5) Cost and type of all vehicles provided that are defined in IV-3 General Maintenance Requirements

Only work satisfactorily performed after execution of a written contract, after the contractor's receipt of a notice to proceed from the Commission and after the contract term has begun will be reimbursed.

PART III

CRITERIA FOR SELECTION

III-1. Mandatory Responsiveness Requirements. To be eligible for selection, a proposal must be: (a) timely received from a CONTRACTOR; (b) properly signed by the CONTRACTOR; 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, which most closely meets the requirements of the RFP and satisfies COMMISSION needs. Award will only be made to a CONTRACTOR determined to be responsible in accordance with Commonwealth Management Directive 215.9, Contractor Responsibility Program.

III-3. The following areas of consideration will be used in making the selection in this order of most important to least important:

1. CONTRACTOR Track record. This refers to the CONTRACTOR's record of experience in successfully performing services closely similar to the type, scope and scale described in this RFP. The CONTRACTOR should clearly and concisely recite this experiential history in adequate detail for maintaining and modifying all the systems identified in IV-4. Description of Systems to be Maintained.

2. Personnel Qualifications. This refers to the competence of professional personnel who would be assigned to the job by the CONTRACTOR. Qualifications of professional personnel will be measured by experience and education, with particular reference to experience on operation, maintenance and repair of Communications Systems similar to that described in the RFP. Particular emphasis is placed on the qualifications of the service manager. Resumes must be provided for all personnel called out in the Minimum Personnel and Qualifications Section of this Document.

3. Cost. While this area may be weighted heavily, it will not normally be the deciding factor in the selection process.

4. CONTRACTOR Qualifications. This refers to the overall ability of the CONTRACTOR to undertake a project of this size. To address this issue to the COMMISSION's satisfaction the CONTRACTOR must substantiate its capability of meeting the requirements and service levels called out by this RFP, and give specifics that convincingly indicate the company's stability, financial wherewithal and long-term viability.

5. Transition Plan. This refers to the contractor's development of a detailed plan that will produce a smooth transition process, including a timetable and a breakdown of roles and responsibilities. The objectives of the Transition Plan are to:

- Develop a practical transition strategy sequencing the events and activities that need to take place for a smooth transition that can be refined in detail following a contract award.

- Identify the required activities to support a seamless transition of services from the existing contractor covering all systems that have been defined in section **IV-4 Descriptions of Systems to be Maintained**.
- Identify the critical measures and considerations to minimize the operational impact on end users while assuring service continuity and quality during the transition period.
- Discuss the risk exposure for transition and describe the proposed risk mitigation treatments to be used given the mission critical nature of the systems to be maintained.

6. Understanding the Problem. This refers to the CONTRACTOR's understanding of the COMMISSION needs that generated the RFP, of the COMMISSION's objectives in asking for the services, and of the nature and scope of the work involved.

7. CONTRACTOR's Management Systems. This refers to the accounting and project management methodologies employed that fosters, promotes and delivers cost efficiency, accountability and accurate cost predictability in a simple to audit manner.

8. Soundness of Approach. Emphasis here is on the techniques for collecting and analyzing data, sequence relationships, and cause and affect relationships of major steps, and feed back and reporting methods for managing the service. 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.

PART IV

WORK STATEMENT

The Pennsylvania Turnpike Commission owns and operates a technically sophisticated Communications System comprised of a complex mix of interdependent technologies interlocked together into one orchestrated system. The total system includes a SONET Digital Microwave System, Digital PABX Telephone System, Call Boxes, ITS Systems and Analog and Digital Radio Systems, which encompasses over twenty eight hundred mobile radios, twenty-six telephone systems with over five thousand telephones, eleven hundred call boxes, and over eighty radio systems across the turnpike. The confluence of this Communications System is situated in the Central Administration Building in Highspire, Pennsylvania, where system performance is monitored and controlled by a 24/7 Network Control First Level Help Desk and a 24/7 Operations Center. The Pennsylvania Turnpike Commission is looking for a CONTRACTOR to maintain complete, reliable operation of the total Communications System and all related accessories and subsystems thereto. Uninterrupted service is required (7) days per week, twenty-four (24) hours per day. This level of service requires both regularly scheduled preventative maintenance of all equipment and around-the-clock availability of troubleshooting and corrective repair teams to handle all service problems, interruptions and emergencies.

IV-1. Objectives

- a. General.** The COMMISSION is seeking a contracting firm that will assemble, manage, and supervise a specialized technical labor force capable of maintaining a complex Communication System at a high level of service and availability utilizing a management structure that promotes and delivers cost efficiency, accountability and accurate cost predictability.
- b. Specific.** Factors of most critical importance to the COMMISSION are: (1) a technical labor force skilled and knowledgeable in operation, repair and maintenance of all systems employed in the entire Turnpike Communications System; (2) management that can procure, maintain and control a varied inventory of spare parts with the help of the COMMISSION; (3) a service/maintenance plan that is traceable, flexible and adaptable to additions, changes and alterations to the Communications System and (4) an accounting structure that captures, controls and predicts costs precisely and is simple to audit.
- c. Contract Intent.** This contract is for the maintenance of the Pennsylvania Turnpike Commission's Communications System. The CONTRACTOR agrees to maintain all equipment necessary to provide the Pennsylvania Turnpike Commission with a fully operational Communications System. It shall be the responsibility of the CONTRACTOR to solve these problems without placing the burden of responsibility for these problems back on the Pennsylvania Turnpike Commission. The CONTRACTOR shall assume responsibility for these problems.

REQUIREMENTS

TASKS

The CONTRACTOR shall respond to calls from the Turnpike's Office of Communication Systems and or the Network Control First Level Help Desk personnel reporting faulty equipment, dispatch technician(s), restore operation, track the status of the corrective actions, respond to inquiries, consolidate historical data on outages, perform preventative maintenance, perform flat rate services, and perform other tasks as required by this Contract or as requested by the Pennsylvania Turnpike Commission.

a. Corrective Maintenance – All reports of outages require on-site restoration in the required time specified from time of report, including mobile radios, unless otherwise specified. Time of report for critical outages shall begin when Turnpike personnel notify the CONTRACTOR by radio or telephone. Time of report for non-critical outages shall begin during regular business hours (8:00 a.m. to 4:30 p.m.), Monday through Friday, excluding Turnpike Commission holidays. Determinations of critical outages versus non-critical outages shall be at the sole discretion of the Turnpike, as the determination is dependent on the particular operational requirements at the time for each particular location. The Turnpike reserves the right to upgrade an outage from non-critical to critical as deemed necessary.

c. Preventative Maintenance – Preventative maintenance is required to keep equipment operating in optimum condition. Equipment shall be kept operating within manufacturer's specifications, and preventative maintenance shall include all manufacturer's recommended practices. Preventative maintenance of all equipment shall include, but not be limited to, periodic inspections, measurement of transmitter and receiver parameters, cleaning of equipment and observation of operation. Any defects noted in the equipment or its operation or function, shall be corrected immediately upon discovery. The Pennsylvania Turnpike Commission reserves the right to conduct its own inspections in order to verify the CONTRACTOR's inspections.

d. Flat Rate Service – If the Turnpike requires installation, modifications, engineering, redistribution, or other services not included, the Communication Systems area will identify the enhancement to the existing communications systems, and if any of this work is deemed critical to the continued support of Turnpike operations this shall occur at the CONTRACTOR's flat service rate contingent upon Turnpike Commission approval.

Performance of these supplemental tasks will be performed only after the receipt of an order signed by the appropriate COMMISSION representative.

These supplemental tasks will include but are not limited to:

- Software Support Tasks
- Technical Support Tasks
- Special Installation Tasks
- Engineering/Development Tasks

The Contractor shall submit a schedule of labor rates for each supplemental task category with its price proposal. These rates will be adjusted by the "Cost-of-Living" adjustment on the anniversary date of the maintenance contract.

IV-2. Geographical Area to be Covered

The entire Pennsylvania Turnpike to include the east-west main line, the northeast extension, PA Route 60 (The Beaver Valley Expressway), PA 66 (The Amos K. Hutchinson Bypass), and PA 43 (The Mon-Fayette Expressway) operated by the COMMISSION. Some of the tower microwave sites are located off the turnpike roadway and there are some ITS devices located on roadways leading up to the turnpike. The physical layout of the Turnpike roadway is described below:

Three of the five extensions make direct connections to the Turnpike mainline while the other two are completely separate from the mainline Turnpike right of way. Mileposts on the turnpike mainline are designated with a T before the number to indicate turnpike mainline.

The mainline begins at the border between Ohio and Pennsylvania where the Ohio Turnpike connects to the Pennsylvania Turnpike. This is where I-76 enters the Commonwealth at the T0.0 milepost. The entrance is south of Youngstown, Ohio and New Castle, Pennsylvania.

From there the Turnpike continues southeast to New Stanton Interchange near New Stanton, Pennsylvania at the T75.39 milepost of the mainline. At this point I-70 joins I-76 as the mainline of the Turnpike. The mainline continues southeast to Donegal, Pennsylvania where it turns and head east.

The mainline of the Turnpike continues to run east to Breezewood Interchange near Breezewood, Pennsylvania at the T161.5 milepost of the mainline. At this point, I-70 leaves the Turnpike mainline and I-76 continues on alone as the mainline.

I-76 continues towards the east to the Valley Forge Interchange near Valley Forge, Pennsylvania at the T326.62 milepost of the mainline. At this Interchange I-76 leaves the Turnpike and heads into Philadelphia, Pennsylvania. The Turnpike mainline turns into I-276 and it continues east towards New Jersey.

I-276 continues east to the Delaware River Bridge where it connects to the New Jersey Turnpike south of Edgely, Pennsylvania at the T359.1 milepost of the Turnpike mainline.

Turnpike Extensions

Beaver Valley Expressway

One of the three connected extensions to the Pennsylvania Turnpike mainline is the Beaver Valley Expressway. This highway is designated as PA route 60. It is also designated as the James E. Ross Highway. This extension extends both north and south from the Turnpike mainline. It connects to the mainline at the T10.7 milepost of the mainline.

From the mainline to the south it extends to the intersection of PA route 60 and PA route 51 near Beaver Falls, Pennsylvania. This is a distance of 5.33 miles.

From the mainline to the north it extends to the intersection of PA route 60 and US route 422 near New Castle, Pennsylvania. This is a distance of 11.07 miles.

Mileposts on the Beaver Valley Expressway are designated with a B in front of the milepost number. The numbering currently runs from B28.47 at the southern end to B44.87 at the northern end.

Amos K. Hutchinson Expressway

A second connected extension to the Pennsylvania Turnpike mainline is the Amos K. Hutchinson Expressway, which is also known as the Greensburg bypass. This highway is designated as PA route 66.

This extension extends north from the Turnpike mainline at the T75.39 milepost near New Stanton, Pennsylvania. It starts at the intersection of PA route 66 and US route 119 and continues north to the intersection of Pa route 66 and US route 22 near Delmont, Pennsylvania. This is a distance of 13.11 miles.

Mileposts on the Amos K Hutchinson Expressway are designated with a G in front of the milepost number. The numbering currently runs from G0.3 at the southern end to G13.41 at the northern end.

Mon Fayette Expressway

The Mon Fayette Expressway consists of two separate sections neither of which connects to the Turnpike mainline. Other sections of this expressway are under various stages of planning, design, and construction. Both sections of this expressway have been designated as PA route 43. They are also designated as the James J. Manderino Highway.

The southern section of this expressway extends from the border between West Virginia and Pennsylvania northeast of Morgantown, West Virginia north to PA route 3014. This is a distance of 7.84 miles. The northern end of this extension is a connection to the original PA route 43 near Fairchance, Pennsylvania. The West Virginia portion of this highway will extend to I-68.

The northern section of PA route 43 begins at the intersection of PA route 88 and US route 40 near West Brownsville, Pennsylvania. This section extends north across I-70 to an intersection with PA route 51 near Jefferson Hills, Pennsylvania. This is a distance of 24 miles.

Mileposts on the Mon Fayette Expressway are designated with an M in front of the milepost number. The numbering currently runs from M0 at the southern end to M7.84 at the northern end for the southern section and from M30 at the southern end to M54 at the northern end for the northern section.

Northeast Extension

The northeast extension of the Pennsylvania Turnpike begins at Turnpike mainline milepost T333.86 near Plymouth Meeting, Pennsylvania. From this point I-476 departs the Turnpike mainline and heads north-northwest. This extension covers a distance of 110.2 miles. The northern end of this extension connects to I-81 north of Scranton, Pennsylvania.

The VHF districts divide the turnpike geographically as described below:

- District One (1) covers the turnpike mainline from milepost T0 to milepost T100. District 1 also includes the Beaver Valley Expressway, The Amos K. Hutchinson Expressway and the Mon Fayette Expressway.

- District Two (2) covers the turnpike mainline from milepost T100 to milepost T201.3.
- District Three (3) covers the turnpike mainline from milepost T201.3 to milepost T302.7.
- District Four (4) covers the turnpike mainline from milepost T302.7 to the end of the mainline at milepost T359.1 and the first 12.84 miles of the Northeast Extension of the turnpike. The first 12.84 miles run from milepost A20.0 to milepost A32.84.
- District Five (5) covers the turnpike mainline on the Northeast Extension milepost A20 to milepost A130

Repair Depots

The Pennsylvania Turnpike is broken down into five maintenance districts; each district will be provided a building and office space by the COMMISSION for the CONTRACTOR.

- a. District one (1) runs from Gateway on the Ohio line milepost 1 to milepost 100, and to include Route 60 (The Beaver Valley Expressway), PA 66 (The Amos K. Hutchinson Bypass), and PA 43 (The Mon-Fayette Expressway) operated by the COMMISSION, a maintenance depot will be provide at Gibsonsia Maintenance milepost 39.62 Westbound and Harrison City maintenance milepost 63.24 Westbound.
- b. District two (2) runs from milepost 100 to milepost 201 on the mainline, a maintenance depot will be provided at Everett Maintenance milepost 154.20 eastbound.
- c. District three (3) runs from milepost 201 to milepost 302 on the mainline, a maintenance depot will be provided at the Administration Building in Highspire milepost 247.31 Westbound.
- d. District four (4) runs from milepost 302 to the Delaware River Bridge milepost 357.7, a maintenance depot will be provided at Plymouth Meeting maintenance milepost 333.60.
- e. District Five (5) runs on the Northeast Extension milepost A20 to milepost A130, a maintenance depot will be provided at Pocono maintenance milepost A86.14.
- f. An installation garage, storage area and a shop are located at New Cumberland maintenance milepost 243.85 eastbound.

IV-3 General Maintenance Requirements

Maintenance of the total Communications System requires an organization formed specifically for this purpose. The CONTRACTOR will provide all maintenance necessary for the complete and reliable operation of the Communications System, seven (7) days per week, twenty-four (24) hours per day, under all conditions necessitating constant and regular preventative, corrective and emergency maintenance. The CONTRACTOR shall be completely responsible for satisfactory maintenance of all the Communications Systems identified in **Section IV – 4 Descriptions of Systems to be Maintained** and shall furnish all test equipment, services and transportation necessary to that end whether or not enumerated herein.

Organizational Procedure

1. The CONTRACTOR will see that the COMMISSION, through its Communications Systems Department, is kept fully informed on overall system operations, and will consult with the COMMISSION's designated Communication Systems Department personnel on policy and procedural activities which bear on the general system function.
2. All interruptions or failures of the Communications System will be reported by radio, telephone or E-Mail to the CONTRACTOR by either the COMMISSION's Communication Systems Office or the Network Control Help Desk at Highspire, Pennsylvania.

COMMISSION Services

To facilitate the CONTRACTOR's performance of its duties, the COMMISSION will allow certain privileges and uses of COMMISSION facilities.

1. Non-Revenue Privilege- All CONTRACTOR vehicles utilized in the contract performance shall be granted non-revenue passage privilege in the performance of the maintenance contract. Abuse of this privilege may result in revocation of same.
2. Office and Shop Space- will be furnished for the CONTRACTOR's use at a maintenance building within each of the five (5) maintenance districts. In District 3, office space and shop facilities will be provided at the radio building adjacent to Central Administrative Building. Garage space for installation, transfer or removal of mobile units is available at the PTC's New Cumberland Maintenance facility.
3. Radio Maintenance Vehicles- will be accorded emergency priority similar to other maintenance vehicles when required. Every effort, consistent with the COMMISSION's primary function to maintain the Turnpike roadway, will be made to aid in the maintenance of radio locations and related facilities. Failure to provide this aid in extreme conditions, however, shall not be construed as relieving the CONTRACTOR of its responsibilities.

Personnel Transportation

1. The CONTRACTOR personnel shall be provided adequate vehicles, to carry out their maintenance activities across the entire Turnpike roadway system and associated access roads to off-right-of-way sites (mountain top microwave sites). These vehicles shall be supplied and maintained by the Contractor specifically for fulfilling the services under this contract.
2. Such vehicles must be in good operating condition and be adequately equipped with replacement parts and with all test instruments, meters, analyzers, computers and tools necessary to perform the tasks.
3. All vehicles assigned to CONTRACTOR personnel shall be suitably radio equipped for two-way communication in all districts for contact and assignment of tasks. The radio equipment for CONTRACTOR vehicles will be furnished and owned by the Commission and installed by the CONTRACTOR. Upon termination of the contract or removal of contract personnel vehicles from service, radio equipment shall be returned to the COMMISSION in good operating condition.

Parts Depots and Test Equipment

1. The CONTRACTOR shall maintain adequate reserve stocks of electronic/electrical and mechanical components, subsystems, cabling, cable assemblies and special parts, plus certain equipment spares at service center locations.
2. The COMMISSION will provide some test equipment. All other test equipment, frequency and deviation meters, power meters, light meters, oscilloscopes, TDRs, OTDRs, distortion analyzers, calibrators, gauges and all other necessary instrumentation / troubleshooting gear identified below will be furnished by the CONTRACTOR.
3. The CONTRACTOR at minimum shall provide the following test equipment:

Each Radio Field Technician:

- IFR/Communications Monitor
- T-Berd/Digital Test Set
- Audio Voltmeter
- Audio Generator
- Multimeter
- Fox & Hound/Cable Tracer
- In Line Watt Meter/Various Power Slugs
- Laptop Computer with Software required by covered Systems

Call Box Technician:

- IFR/Communications Monitor
- Multimeter
- In Line Watt Meter/Various Power Slugs
- Signal Communications Programmers for Call Box Encoders and Transmitters

Each Radio shop:

- 12 VDC Power Supply
- Portable Battery Analyzer
- 12 VDC Battery Tester/ Charger
- Solder Station
- Termaline Power Meter
- Clip on AC Ammeter
- Portable Telephone Tester/Butt-Set
- Oscilloscope
- Communications Monitor
- Desktop Computer

Highspire Main Shop/ 1 Per System:

- Multifunction Generator
- Storage Scope
- Spectrum Analyzer
- Optical Time Domain Reflect meter

4. The CONTRACTOR will maintain adequate car stocks of replacement parts for all technical forces.

Minimum Personnel and Qualifications

The CONTRACTOR will provide qualified, licensed personnel, in accordance with the license requirements identified in the minimum personal requirements section together with supervisors and engineers sufficient to meet the minimum standards herein. This organization shall be established and provided exclusively for the maintenance of the Turnpike Communications System. Further, it shall be adequately staffed and implemented to meet all routine and emergency requirements. All CONTRACTOR personnel, supervisory, engineering, technical and utility types, will be direct, full-time employees of the CONTRACTOR.

Plan of Organization

- a. The CONTRACTOR shall supply an organization chart of personnel assigned to this contract.
- b. CONTRACTOR will employ qualified personnel sufficient in skill and numbers to satisfactorily perform the work. The minimum personnel requirements shall be as follows below:
 - c. A qualified tower rigger shall be retained by the CONTRACTOR and be available to perform antenna or antenna transmission line repairs and adjustments as may be necessary to maintain system integrity.
 - d. All of the personal shown below must be dedicated to the Commission maintenance contract full time.
- a. District 1, Gibsonia Maintenance Building – one (1) Senior Field Technician; and two (2) Communications Field Technician; and one (1) Call Box Tester/Installer.
- b. District 2, Everett Maintenance Building – one (1) Senior Field Technician; one (1) Communications Field Technician.
- c. District 3, Highspire Administration Building Radio Shop and New Cumberland – two (2) Senior Field Technician; and one (1) Engineering Senior Support Technician; one (1) Field Technician Specialist And two (2) Communications Field Technicians; and one (1) Call Box Tester/Installer; one (1) Installation Coordinator, one (1) Service Manager and one (1) Mobile Radio Installer
- d. District 4, Plymouth Meeting Maintenance Building – one (1) Senior Field Technician; and one (1) Communications Field Technician.
- e. District 5, Pocono Maintenance Building – one (1) Senior Field Technician; and one (1) Communications Field Technician.

At least one (1) senior Field Technician or Communications Field Technician will be scheduled on the Turnpike System in each of the five (5) radio districts five (5) days per week Monday through Friday during normal working hours excluding holidays. A technician will be on call 24 hours a day 7 days a week for each of the five districts.

The foregoing contemplates minimum manning requirements for performance of the work under this contract. All of the following personnel will be required to have a valid drivers license.

- f.** The Call Box Testers will have a minimum of one year of electronic training or field service experience.
- g.** The Mobile Radio Installer and the Installation Coordinator must have two years experience installing communications equipment.
- h.** The Communications Field Technicians must have two years training in electronics at a recognized technical institute, equivalent military training or two years experience in the Communications/Electronics Systems industry and a FCC General Radiotelephone License.
- i.** The Senior Field Technician will have the minimum requirements of the Communications Field Technicians and six years experience in the Communications/Electronics Systems industry.
- j.** The Engineering Senior Support Technician and Field Technician Specialist will have the minimum requirements of the Senior Field Technician and ten years experience in repair and design of Communications/Electronics Systems.
- k.** The Service Manager will have a combination of ten years experience in the maintenance and management of Communications Systems.

Specific Description and Requirements

General – It is the purpose of this specification to set forth the primary responsibilities of the CONTRACTOR with regard to all equipment, buildings, antennas, towers, motors, generators, batteries and the like as related to this contract. The CONTRACTOR must become acquainted with the total system locations, site accessibility, buildings, towers and generators, and must understand and accept the fact that the entire integrated Communications System maintenance shall be its total responsibility under this contract. Although the system drawings and equipment details are essentially complete, the omission of any such data herein does not relieve the CONTRACTOR of overall responsibility for total system performance, except as to those items specifically indicated for others.

The CONTRACTOR shall furnish all supervisory and technical labor to install all parts, electrical/electronic components, subassemblies, subsystems, cabling, cable assemblies, and like materials, furnish all test equipment and spare units, not specifically furnished by the COMMISSION. Further the CONTRACTOR shall provide all standard and special transportation necessary to maintain the Communications System in proper operating condition for a period of Five (5) Years from the effective date of this contract and for the Two (2) One (1) Year extensions thereof as may be provided for on the anniversary of initial Five (5) Year Contract, if such extensions are agreed to by the Contractor and the Commission. Special equipment will include but not limited to two (2) pickup trucks capable of transporting call boxes, a ten (10)-foot ladder and twelve (12)-foot antennas and two (2) bucket trucks with a thirty-two (32) foot working height.

Response Times for These Communication Systems.

- a.** Twenty –four (24) hours a day seven (7) days a week with an onsite time of four (4) hours from time of dispatch by The Network Control First Level Help Desk:

- 51 - Microwave Sites (system breaks)
- VHF Repeater System outage
- Operations Center Console System inoperable
- Alcatel Network Management System
- Call Box system
- No AC Power at Microwave Sites
- Low DC Power Alarm at Microwave Sites
- VHF Base Station outage (interchanges / maintenance sheds)
- Mini Console System / PSP Zetron / Orbacom console outage
- Call Box Base Station outage
- Interchange Telephone Line
- Fire Box outages
- Wide Area Network
- Tunnel 450 MHz System
- Operations Center Systems
- Leased T1's
- In addition Network Control depending on the nature of the failure may add other items to this listing.

- b.** Monday through Friday during normal working hours with an onsite time of up to twenty four (24) hours from time of dispatch by Network Control:

- PTC Mobile Radios (we have 2,800 in service)
- Off Pike Ambulance
- Fire Trucks
- Pyramid Units
- Portables
- CB Mobiles
- CB Base Stations
- Field Weather Systems
- Interchange Telepanel
- Interchange Patron Intercom System
- Interchange Stacked Booth Intercom System
- Maintenance Shed Telephone Outside Line
- Maintenance Shed Telepanel
- Roadside Call Box Unit
- Fuel Management Systems
- Tower Lighting Systems
- Meridian Nortel Telephone Systems
- NORSTAR Telephone Systems

- CCTV system units – cameras, monitors, VCR etc. at ERO, Administration Building, West Shore Interchange, Blue/Kitt Tunnels, Plymouth, Valley Forge and WRO.
 - Administration Building 450 MHz System
 - Administration Building Paging System
 - Data Circuits
 - Miscellaneous, Video Switchers and Monitors Located in the Operations Center
 - Console Problem
 - Vega Remotes
 - Variable Message Signs / Highway Advisory Radio Signs (48 hours)
 - Highway Advisory Radio / Portable AM units (48 hours)
 - Variable Message Signs and Highway Advisory Radio equipment may be 24/7 during emergencies.
- c. An on call technician shall be provided for each of the five districts so that the four (4)-hour on site requirement can be met for any of the PTC's equipment twenty-four (24) hours seven (7) days a week.
- d. The following is a list of repair times for the above response time systems
- Microwave stations.....8 hours
 - Network Management Systems..... 8 hours
 - Call Box system.....8 hours
 - VHF Repeaters..... 8 hours
 - Base Stations..... 8 hours
 - Telephone Systems..... 8 hours
 - Radio Consoles..... 8 hours
 - Patron Intercom Systems..... 8 hours
 - Single Telephone lines.....36 hours
 - Telepanel Systems.....36 hours
 - Mobile Units..... 36 hours
 - Data Circuits..... 36 hours
 - ITS Devices.....36 hours
 - Miscellaneous Systems..... 36 hours

IV-4. Descriptions of Systems to be Maintained.

a. Digital Microwave Technology Description

The PTC's digital microwave system provides the basic transmission backbone through which all of the existing radio, voice and data services are interconnected and distributed through out the Turnpike. The types of systems that depend on the this backbone are:

- VHF Radio System
- Computer Aided Dispatch
- Wide Area Network
- Telephone Network
- Fare Collection Network
- Call Boxes
- Fire Alarm Boxes
- Advanced Travelers Information Systems
- Fuel Management Tracking System

The PTC's Digital microwave is made up of 25 backbone tower sites and 26 spur sites, the backbone sites provide the line of sight required to get the signal from one end of the Turnpike to the other. Most of these towers are located up on the mountaintops adjacent to the roadway. The backbone towers from west to east are:

- Thompson's Run
- Salem Church
- Beacon
- Hampton Road
- Gun Club Road
- Newcomer
- Laurel
- Rodney
- Tyson's Corner
- Bald Knob
- Sidling Hill
- Clark's Knob
- Blue Mountain
- Newville
- Bunches
- Highspire
- Cornwall
- Conestoga
- Valley Forge
- Plymouth Meeting
- South Mountain
- Palmerton
- Big Boulder
- Wyoming
- Radio Hill

The 26 spur links connect the following PTC facilities to the backbone to allow communications with other sites. A typical spur site is made up of all the equipment at a backbone site minus the OC-3 Alcatel radio.

- New Castle
- Homewood Maintenance
- Gibsonia Maintenance
- Harrison City Maintenance
- Mon Fayette North Barrier
- Mon Fayette South Barrier
- Donegal Maintenance
- Amos K. Hutchinson Maintenance
- Somerset Maintenance
- Allegheny
- Tussey
- Everett Maintenance
- Burnt Cabins Maintenance
- Tuscarora
- Harrisburg West Interchange
- New Cumberland Maintenance
- Mount Gretna Maintenance
- Bowmansville Maintenance
- Morgantown Interchange
- Willow Grove
- Trevoise Maintenance
- Delaware Valley Interchange
- American Tower
- Slatington Maintenance
- Pocono Maintenance
- Wyoming Maintenance

The Western Regional Office (WRO) is connected to the microwave system via fiber optic cable from the WRO to Tyson's Corner Tower. Tyson's Corner Tower is a microwave site located on the hill behind the WRO. This fiber provides direct access into the microwave system.

The Eastern Regional Office (ERO) is connected to the microwave system through the use of leased DS-1 and DS-3 circuits. The leased DS-3 circuit provides 45 Mbps bi-directional data transfer for the PTC WAN.

The PTC's digital microwave is configured into two distinct digital microwave paths extending east and west from the Turnpike's Central Office Building in Highspire. The west system has a backbone that runs from Central Office to Thompson's Run. The east system runs from Central Office to Wyoming Tower located on the Northeast Extension.

Both of these systems have traffic carrying capacity of an OC-3; an OC-3 is equivalent to 155.52 million bits per second (Mb/s). This is equivalent to 2016 voice channels. It is also equivalent to 84 Digital Signal Level Ones (DS-1). One DS-1 carries 24 voice channels. The traffic carrying capacity can be used to carry voice, data or a mixture of voice and data applications. Each OC-3 is divided into three groups called Synchronous Transport (STS-1). Each STS-1 is equivalent to 28 DS-1s or 672 voice channels.

The PTC bandwidth is allocated in the following manner, the first one third of the bandwidth (1 STS-1) is utilized for call boxes, telephone network, off premise telephone extensions and State Police barracks Computer Aided dispatch System (CADS). The second third of the bandwidth (1 STS-1) is utilized by the PTC Wide Area Network (WAN). This STS-1 provides a 45 Mbps high-speed backbone for nearly all the data applications of the Turnpike including both administrative and fare collection data.

The last third of the capacity of the primary routes is allocated exclusively to the Commonwealth of Pennsylvania's Radio Project Office for use in the statewide 800 MHz. Radio system. This is part of an agreement between the Turnpike and the Commonwealth of PA in which the Commonwealth paid approximately one third of the PTC's system.

The primary routes also have the additional capacity of 3 DS-1s, which are known as "wayside DS-1s". The wayside DS-1s uses some of the excess capacity in the overhead of the digital bit stream. These DS-1 circuits are used for two-way radio communications and system-wide network management applications.

All microwave equipment is powered by DC power systems consisting of AC powered rectifiers with 48-volt DC batteries able to support system operations for up to eight hours. A generator is located at each site.

A typical backbone microwave site will consist of multiple OC-3 Alcatel 4000 radios and could have spur shots of 16 DS-1 Alcatel 8000 radios, Telco System channel bank, Raven order wire, Harmer Simmons rectifiers, GNB batteries, Generac generator and a Miller building.

At Valley Forge Relay a Digital Access Cross Connect (DACS) has also been installed. This device allows individual voice channels to be mapped into and out of time slots in DS-1 bit streams. This is a process known as grooming. This device was required at Valley Forge because of the complexity involved in programming all of the individual channels at the site. Valley Forge is one of the largest junction sites in the system and large volumes of traffic flow through this site. The DACS is an ARCA-DACS 100.

b. Telephone Systems

The PTC telephone network consists of 20 telephone systems and is configured into a ring network. The core hub network is between the Central Office Building which is a Meridian Nortel Option 81C PABX, the WRO which is a Meridian Nortel Option 61C PABX and Plymouth Meeting which is a Meridian Nortel Option 11C. This network is connected together via T1s on the PTC Digital Microwave system. This ring configuration allows for call processing on the network to continue in the event of a failure of the network or a PABX. The remaining 17 telephone systems are connected through one of these three HUB locations and are all Nortel Option 11C PABXs.

- Western Regional Office is the hub location for, New Castle, Homewood, Jefferson Hills, and Gibsonia. Harrison City, Somerset, Everett and Donegal.
- Central Administration Office Building is the hub for Burnt Cabins, Newville, Mount Gretna and Bowmansville.
- Plymouth Meeting is the hub for, Eastern Regional Office, Trevose, Slatington, Pocono and Wyoming Valley.

The PTC also has 11 Nortel Norstar 0 by 32 key telephone systems that tie into the telephone systems network by cable or line side T-1 cards. Their locations are as follows: Kegg Maintenance, Quakertown Maintenance, Allegheny Interchange, Harrisburg West Interchange, Harrisburg East Interchange, Greensburg Maintenance, Devault Maintenance, New Cumberland Maintenance, Gateway Interchange, North Toll 60 Interchange, and Breezewood Interchange.

VHF Radio System

The PTC's VHF radio system provides for turnpike-wide, high-band, VHF communication between turnpike vehicles, facilities and dispatch centers. The system is constructed using a variety of equipment types as building blocks that are repeated often throughout the turnpike system.

The basic equipment types that are used in the VHF system are described below. Tyco MASTR III high band, VHF repeaters are the repeaters that are used throughout the system. These repeaters are analog and operate on 25 kHz. bandwidth channels. Generally the repeaters are located at mountain top sites to provide the best coverage with the minimum number of sites. All of the repeater/voting sites, the dispatch sites, and many other COMMISSION sites are linked by an Alcatel digital microwave system. The voting and audio distribution equipment utilized is JPS SNV-12 DSP signal to noise digital voting equipment. At the VHF repeater voting sites the voters are configured in the three-shelf configuration. This configuration utilizes one master shelf and two slave shelves. The VHF system transmits in the simulcast mode. Convex delay units are the units that are used to process the audio so that it is transmitted out of the transmitters in an area at the same time, phase and amplitude. Spectracom GPS receivers are used to provide GPS synchronization to the transmitters so that the transmit frequency can be controlled for use in the simulcast system.

A large variety of portable, mobile and fixed station radio types are in use. Turnpike facilities, toll plazas, maintenance buildings and state police barracks; have intercom systems that allow the occupants of the facilities to communicate both locally and over the VHF system. There are two different cases for turnpike facilities. The first case is a facility that is not connected to the COMMISSION's microwave system. In this case, a Push To Talk (PTT) button located on the intercom equipment keys a VHF base station that transmits to the receivers at the mountain top VHF repeater sites. The voting equipment then selects the highest quality signal and that signal is repeated across the system. This operation is also the same for mobile and portable radios. The fixed station receiver at this type of facility receives the VHF signal from the simulcast transmitters and broadcasts the audio throughout the facility. The second case is a facility that has a microwave connection to the COMMISSION's microwave system. In this case the fixed station is replaced by a microwave link; the audio and keying signals have a direct connection into a port on the voting equipment.

The VHF system is divided into geographic districts. Each district acts as its own subsystem. One conversation can take place in one district while simultaneously a separate conversation can take place in any of the other districts. The districts can be patched together by the dispatchers at the dispatch center. The dispatch center utilizes a Zetron 4048 system for the primary center. There is also a backup dispatch center at a different location that utilizes an Orbacom TDM-150 system. When no patches are in place five separate conversations can take place simultaneously, one in each district. The primary dispatch center is located in the Central Administration Building (CAB) located in Harrisburg, Pennsylvania. This location also has five single shelf JPS voting systems for audio selection and control. The voters have ports connected to the digital channel banks, to the console system and also to

a system of Vega remote units that are distributed throughout the building. The backup dispatch center is located at the COMMISSION's Eastern Regional Office (ERO) near Valley Forge, Pennsylvania. The VHF districts divide the turnpike geographically as described below:

- District One (1) covers the turnpike mainline from milepost T0 to milepost T100. District 1 also includes the Beaver Valley Expressway, The Amos K. Hutchinson Expressway and the Mon Fayette Expressway.
- District Two (2) covers the turnpike mainline from milepost T100 to milepost T201.3.
- District Three (3) covers the turnpike mainline from milepost T201.3 to milepost T302.7.
- District Four (4) covers the turnpike mainline from milepost T302.7 to the end of the mainline at milepost T359.1 and the first 12.84 miles of the Northeast Extension of the turnpike. The first 12.84 miles run from milepost A20.0 to milepost A32.84.
- District Five (5) covers the turnpike mainline on the Northeast Extension milepost A20 to milepost A130.

Site Listing

This section will include site listings for each district. The sites will be listed by type and the corresponding milepost will be listed. For the case of mountain top repeater sites that are not actually on the turnpike, the closest approximate milepost will be listed. If a site appears in more than one listing that means that it has more than one function. For instance the repeater site Laurel will appear for both District 1 and District 2. This site sits on the district split and has microwave and VHF equipment transmitting into both districts. Toll Plazas will be designated as Interchanges or Int. Maintenance Buildings will be designated as Maintenance. State Police Barracks will be designated as Barracks. Mountain Top radio sites will be designated as Relays.

District 1

Microwave Sites:

- | | |
|-------------------------------------|--------|
| • New Castle Int | T10.7 |
| • Homewood Maintenance | T11.84 |
| • Thompson's Run Relay | T16.0 |
| • Salem Church Relay | T35.0 |
| • Gibsonia Maintenance and Barracks | T39.59 |
| • Beacon Relay | T62.8 |
| • Hampton Road Relay | M53.5 |
| • MFE North Barrier Int | M48 |
| • Gun Club Road Relay | M36.2 |
| • Newcomer Relay | M7.2 |
| • MFS South Barrier Int | M5.1 |
| • Harrison City Maintenance | T63.22 |
| • AKH Maintenance | G7.1 |
| • Tyson's Corner Relay | G0.65 |
| • Rodney Relay | T87.0 |

- Donegal Maintenance T88.76
- Laurel Relay T100.0

VHF Repeater Sites:

- Thompson's Run Relay T16.0
- Salem Church Relay T35.0
- Beacon Relay T62.8
- Hampton Road Relay M53.5
- Gun Club Road Relay M36.2
- Newcomer Relay M7.2
- Rodney Relay T87.0
- Laurel Relay T100.0

District Voting Site:

- Beacon Relay T62.8

Miscellaneous Site:

- Western Regional Office (WRO) G0.65

District 2

Microwave Sites:

- Laurel Relay T100.0
- Somerset Maintenance and Barracks T113.82
- Allegheny Relay T122.8
- Bald Knob Relay T128.5
- Tussey Relay T154.0
- Everett Maintenance and Barracks T154.42
- Sideling Hill Relay T169.8
- Tuscarora Relay T186.6
- Blue Mountain Relay T198.8
- Clark's Knob Relay T199.0

VHF Repeater Sites:

- Laurel Relay T100.0
- Allegheny Relay T122.8
- Bald Knob Relay T128.5
- Tussey Relay T154.0
- Sideling Hill Relay T169.8
- Tuscarora Relay T186.6
- Blue Mountain Relay T198.8

District Voting Site:

- Sideling Hill Relay T169.8

District 3

Microwave Sites:

• Blue Mountain Relay	T198.8
• Newville Maintenance and Barracks	T214.26
• Harrisburg West Int	T241.87
• Bunches Relay	T242.0
• New Cumberland Maintenance	T243.85
• Highspire Central Administration Building (CAB)	T247.3
• Mount Gretna Maintenance	T265.54
• Cornwall Relay	T271.0
• Bowmansville Maintenance and Barracks	T288.33
• Morgantown Int	T298.33
• Conestoga Relay	T300.0

VHF Repeater Sites:

• Blue Mountain Relay	T198.8
• Bunches Relay	T242.0
• Cornwall Relay	T271.0
• Conestoga Relay	T300.0

District Voting Site:

• Bunches Relay	T242.0
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District 4

Microwave Sites:

• Conestoga Relay	T300.0
• Valley Forge Relay	T317.4
• Plymouth Meeting Maintenance	T333.59
• Willow Grove- Relay	T343.0
• Trevoise Maintenance	T353.05
• Delaware Valley Int	T357.7

VHF Repeater Sites:

• Conestoga Relay	T300.0
• Valley Forge Relay	T317.4
• Willow Grove Relay	T343.0
• Trevoise Maintenance	T353.05

District Voting Site:

• Valley Forge Relay	T317.4
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Miscellaneous Site:

- Eastern Regional Office (ERO) and King of Prussia Barracks T330.14

District 5

Microwave Sites:

- Valley Forge Relay (This site is in D4 but transmits into D5) T317.4
- South Mountain Relay A51.0
- American Tower Relay A68.8
- Slatington Maintenance A70.07
- Palmerton Relay A71.1
- Big Boulder Relay A90.1
- Pocono Maintenance and Barracks A94.64
- Wyoming Relay A105.1
- Wilkes-Barre Int A105.44
- Wyoming Maintenance A114.56
- Radio Hill Relay A128.5

VHF Repeater Sites:

- South Mountain Relay A51.0
- Palmerton Relay A71.1
- Big Boulder Relay A90.1
- Wyoming Relay A105.1
- Radio Hill Relay A128.5

District Voting Site:

- Big Boulder Relay A90.1

In Districts 1, 3, & 5 all repeaters transmit and receive on the same pair of VHF frequencies (159.045 MHz. repeater transmit and 156.195 MHz. repeater receive). In Districts 2 & 4 all repeaters transmit and receive on the same pair of VHF frequencies (159.075 MHz. repeater transmit and 156.225 MHz. repeater receive). Districts 1, 2, 4, & 5 utilize a CTCSS tone of 179.9 Hz. while District 3 utilizes a CTCSS tone of 136.5 Hz. This is done because transmissions skip frequently between Districts 3 & 5 through the air.

e. Radio Console Systems

The Operations Center at the Administration Building controls the five VHF radio districts. In the Operations Center, Dispatchers, Network Controllers and State Police use PC-based consoles to provide dispatch services for the VHF system. There are a total of 10 consoles with touch screens. One console each is assigned to the Duty Officers, State Police and the Shift Leader. There are five Dispatcher consoles and two Network Control consoles. All of the console positions have access to all of the districts, a backup district 3 base station and a Pennsylvania Emergency Management Association (PEMA) base station. The console system at the CAB is a Zetron model 4048. The console system has the capability to patch channels so that districts can talk to each other. The consoles also have a simul-select feature that allows a dispatcher to talk on more than one channel at a time. The consoles have a

built in intercom so that dispatchers can talk to each other without using a radio channel. The consoles also have built in call check recorders so that the dispatchers can review conversations that happened during the last two minutes of airtime to make sure that they have the information correct.

There is another console system installed at the ERO in a backup communications center. This is an Orbacom model TDM-150 system. This is a four-position system with capabilities similar to the main console system at Highspire. It has direct access to all five, radio districts and to a backup District 4 control station.

The communications equipment utilized by the Operations Center is powered by the Uninterruptible Power Supply (UPS) that provides power for the CAB. The communications equipment that is utilized in the backup Operations Center at the ERO is equipped with battery backup. Both buildings have emergency generators to provide power in the event of an interruption.

In locations where operations dictate that personnel have access to more than one VHF radio district, a combination of small push button dispatch consoles (Zetron model 4010) and tone remote control units (Telex and Vega remotes) are used to provide the required access. Tone remote control units are installed at Everett Fares, Somerset Maintenance and Plymouth Meeting Maintenance. Push button console units are installed at every State Police Barracks on the Turnpike, except the barracks located at the ERO. There is also a push button console located at the WRO. There are also tone remote control units installed at various locations throughout the CAB.

f. Mobile and Portable Radio Equipment

The COMMISSION has close to 2800 mobile and portable radios. There are multiple types and vintages. Turnpike Engineers and Tradesman use the portable units while working at a job site.

The breakdown of mobile radios includes units manufactured by Tyco or its predecessor companies and Motorola. This includes 150 Phoenix VHF radios, 692 MVS VHF radios, 616 KMC VHF radios, 33 KMC UHF radios, 90 Monogram VHF radios, 130 Orion VHF radios, 6 KRD VHF radios 30 Open Sky 800 MHz. radios and 67 Delta VHF radios manufactured by Tyco. It also includes 12 TK790 VHF radios and 6 TK760 VHF radios manufactured by Motorola.

The breakdown of portable radios also includes units manufactured by Tyco and Motorola. This includes 145 PCS VHF radios, 43 PCS UHF radios, 360 Panther VHF radios, and 23 Panther UHF radios manufactured by Tyco. It also includes 105 HT600 UHF radios, 135 HT750 UHF radios, 14 TK290 VHF radios, 27 TK390 UHF radios, and 32 TK260 VHF radios manufactured by Motorola.

Interchange VHF Units

Every interchange on the Turnpike has a VHF base station. This is currently a total of 59 interchanges, ramp plazas and barrier plazas. This number includes New Castle Interchange.

Maintenance Building VHF Units

There are 21 maintenance buildings along the Turnpike. At ten of these, a voice channel with signaling in the microwave system provides direct access to the VHF system. The remaining 11 maintenance buildings have a VHF base station on the mobile transmit and receive frequencies. The buildings with

VHF base stations are Homewood Maintenance, Harrison City Maintenance, Greensburg Maintenance, Jefferson Hills Maintenance, Donegal Maintenance, Kegg Maintenance, Burnt Cabins Maintenance, Mt. Gretna Maintenance, Devault Maintenance, Quakertown Maintenance and Wyoming Maintenance. Only three of these maintenance buildings do not or are not planned to have a microwave connection. Those three are Kegg, Devault and Quakertown Maintenance.

Tunnel VHF Equipment

There are five tunnels on the turnpike. One of these, Tuscarora, has a direct connection, with buried cable, into the microwave system for VHF access. At Allegheny and Lehigh Tunnels, a control station on the mobile frequency is provided. The Kittatinny and Blue Mountain Tunnels share a single VHF control station on the mobile frequency. An auxiliary VHF control station for communication in District 3 is also installed at the Blue Mountain Kittatinny Tunnel Complex.

Administration Building VHF Equipment

There are two VHF radios, which are accessed via the Operations Center console system. One is an emergency backup base for the District 3 VHF system and the other provides access to the PEMA two-way radio system. These two radios are actually mobile radios with 12-volt power supplies.

Telepanel Systems

All interchanges, tunnels and maintenance buildings use a combination intercom/VHF system. The intercom/VHF systems have control points called “telepanels”. A telepanel has a handset, hook switch and a speaker. The speakers allow the local operators to monitor all VHF radio traffic in the appropriate district, plus any local intercom traffic at that facility. When the handset of a telepanel is lifted off the hook, the speaker at the telepanel is muted and the receive audio is routed to the earpiece in the handset. To use the telepanel as a local facility intercom the operator simply lifts the handset off the hook and talks into the handset in the same way as if the operator were using a telephone. To access the VHF radio system, the Push To Talk (PTT) button on the handset is depressed. This keys the local radio or channel bank interface allowing the operator to talk on the VHF radio circuit.

At interchanges, telepanels are located in each tollbooth and at strategic locations in the utility building. At tunnels, telepanels are located in each portal service area and in the tunnel control room. At maintenance buildings, telepanels are located at strategic locations in the maintenance areas and in offices such as police, fare collection, maintenance and division.

A newer version of this system manufactured by the Eshelman Company has been installed at Gateway Interchange, Mon Fayette North Barrier Plaza, Mon Fayette South Barrier Plaza, Breezewood Interchange, New Cumberland Maintenance, Reading Interchange and Quakertown Interchange. At the interchanges and barrier plazas where this system has been installed it is also combined with the patron intercom system. The system functions in the same way that the old telepanels operated. The master stations also have a series of buttons for each of the ticket issuing or coin machines. When the customer calls for help, the corresponding button on the master station illuminates. By depressing this button the turnpike operator removes the telepanel from the plaza intercom and VHF system, and turns the master into the other end of an intercom connection between the master and the station calling.

An even later version of this system manufactured by Gai Tronics has been installed at Warrendale Interchange, Jefferson Hills Maintenance, Harrisburg East Interchange, and Slatington Maintenance. At the interchanges where this system has been installed it is also combined with the patron intercom system. This system also functions in the same way that the old telepanels operated. This system has a toggle switch to switch between plaza intercom/VHF operation and patron intercom operation. When a patron calls for assistance from one of the ticket issuing machines the signal generates a voice message that is heard in the speaker of the master station. The turnpike operator will hear which station is calling and the number of that station. To initiate a conversation, the operator then toggles to patron intercom operation and using a touch-tone pad dials the extension number of the calling station. An intercom connection between the master station and the calling remote station is then initiated.

Patron Intercom Systems

Patron intercom systems are provided at interchanges to enable customers to report problems to toll collection personnel. These systems have speakers and buttons located on the automatic ticket issuing machines and automatic coin machines. The speakers and signaling buttons are connected to intercom locations in the office and in some of the operating toll collection lanes. Eshelman Company manufactured the original patron intercom systems.

At some interchange locations the patron intercom system and the telepanel system has been combined. Two newer versions of this equipment manufactured by Eshelman and Gai Tronics have recently been installed that combine the two functions. The two newer versions are described in the preceding paragraphs.

VHF Interface to Ohio Turnpike

At Gateway Interchange, VHF equipment has been installed that enables the personnel at Gateway to monitor VHF transmit information from the Ohio Turnpike's Eastgate Toll Plaza. Similarly, personnel at Eastgate are able to monitor VHF transmit information from Gateway Interchange. This enables the two toll plazas to communicate with each other via VHF radio.

Mobile Vehicular Repeaters (MRE)

The Mobile Vehicular Repeater systems are comprised of a VHF mobile radio, an UHF repeater radio with interface cabling and an UHF hand-held portable radio with vehicular charger. These repeater systems are installed in police, safety and first responder vehicles.

When the hand-held portable radio is removed from the vehicular charger, the mobile repeater is activated allowing the operator to leave his vehicle and maintain district communications. When the hand-held portable is replaced in the vehicular charger, the mobile repeater is turned off allowing for normal operation of the VHF mobile radio. There are 131 Tyco Pyramid repeaters.

Tunnel Communications

The tunnel complexes utilize several other communication systems in addition to the VHF radio system. They are a patron alarm system and an UHF repeater system.

UHF Repeater System

The UHF repeater system is used to provide communications for tunnel personnel while working within the tunnel complex. This system consists of an UHF repeater, additional low power UHF repeaters outside the tunnel portals, voting comparators, remote control units, control stations and portable radios. The UHF repeater is installed in the center cross connector midway through each tunnel and the antennas are installed at the midpoint of each tube's airshaft or mounted on the ceiling of the tunnel. The UHF repeaters are Tyco MASTR III.

The UHF control unit is installed in the main control room. Portable units are mounted in battery chargers at key locations within the tunnel complex so that they are available for use as needed. The repeater provides communication between the control unit and portable(s) throughout the tunnel complex. The low power repeaters outside the tunnel portals and the control unit are connected by cable to the voting comparator and the central repeater. The purpose of the low power repeaters is to provide additional portable coverage outside the tunnels to facilitate in the setting and removal of work zones to direct traffic through the tunnels. WAN Data Services

WAN Data Services

The microwave system provides one STS-1 in the west and one STS-1 in the east for Wide Area Network (WAN) data communications. This provides throughput for all of the data services supported by the Information Technology (IT) department. This includes toll data, violation images and administrative data.

The access and distribution for these data services is accomplished by providing fractional DS-1 capacity or full DS-1 capacity to the various facilities based upon their individual data throughput requirements. The multiplex equipment provides the DS-1, which is then fed either directly into Cisco routers models 7200 and 2600 series or it is fed first to a Telco Systems channel bank and then into the routers.

The following sites have 128 kbps (equivalent to two DS-0s) access to the West WAN System:

- South Toll 60 Barrier Plaza
- Beaver Falls Ramp Plaza
- Moravia Ramp Plaza
- North Toll 60 Barrier Plaza
- Mt. Jackson Ramp Plaza
- Homewood Maintenance
- Harrison City Maintenance
- Route 136 Ramp Plaza
- AKH Barrier Plaza
- Jefferson Hills Maintenance
- M52 North Toll Barrier Plaza
- M48 Fineleyville Ramp Plaza
- M44 Cracker Jack Road Ramp Plaza
- M39 Coil Curtain Road Ramp Plaza
- California Barrier Plaza

- M5 South Toll Barrier Plaza
- M4 Rubles Mill Road Ramp Plaza
- Donegal Maintenance
- Donegal Interchange
- Greensburg Maintenance
- AKH Route 30 Ramp Plaza
- AKH Route 130 Ramp Plaza
- AKH Route 66 Ramp Plaza
- Allegheny Tunnel
- Kegg Maintenance
- Fort Littleton Interchange
- Burnt Cabins Maintenance/Tuscarora Tunnel
- Willow Hill Interchange
- Blue Mountain Interchange
- Blue Mountain/Kittatinny Tunnels
- New Cumberland Maintenance
- New Cumberland Test Lane

The following sites have 256 kbps (equivalent to four DS-0s) access to the West WAN System:

- Gibsonia Maintenance
- Somerset Maintenance
- Somerset Interchange
- Bedford Interchange
- Newville Maintenance
- Gettysburg Pike Interchange

The following sites have 512 kbps (equivalent to eight DS-0s) access to the West WAN System:

- Butler Valley Interchange
- Breezewood Interchange
- Carlisle Interchange

The following sites have 768 kbps (equivalent to twelve DS-0s) access to the West WAN System:

- Gateway Interchange
- Warrendale Interchange
- Allegheny Valley Interchange
- Irwin Interchange
- New Stanton Interchange

Pittsburgh Interchange has two DS-1 to the West WAN, Everett Maintenance, Harrisburg West Interchange and Harrisburg East Interchange have DS-1 access to the West WAN and the WRO has DS-3 access.

The following sites have 128 kbps (equivalent to two DS-0s) access to the East WAN System:

- Mt. Gretna Maintenance
- Devault Maintenance
- Trevoise Maintenance
- Virginia Drive Ramp Plaza
- Quakertown Maintenance
- Lehigh Tunnel
- Clarks Summit Interchange
- Keyser Avenue Interchange
- Wyoming Maintenance

The following sites have 256 kbps (equivalent to four DS-0s) access to the East WAN System:

- Lebanon-Lancaster Interchange
- Bowmansville Maintenance
- Slatington Maintenance
- Pocono Maintenance
- Pocono Interchange
- Wilkes-Barre Interchange
- Mahoning Valley Interchange
- Wyoming Interchange

The following sites have 512 kbps (equivalent to eight DS-0s) access to the East WAN System:

- Reading Interchange
- Morgantown Interchange
- Delaware Valley Interchange
- Quakertown Interchange

The following sites have 768 kbps (equivalent to twelve DS-0s) access to the East WAN System:

- Downingtown Interchange
- Norristown Interchange
- Lansdale Interchange

The following sites have DS-1 access to the East WAN System:

- Morgantown Interchange
- Delaware River Bridge
- Mid-County Interchange

The following sites have two DS-1 access to the East WAN System:

- Willow Grove Interchange

- Philadelphia Interchange
- Valley Forge Interchange
- Fort Washington Interchange
- Lehigh Valley Interchange

Plymouth Meeting Maintenance and the ERO have DS-3 access to the East WAN System.

Leased Services

In order to support the services that have been described above such as WAN and telephone services the Commission leases a variety of circuits from many different telephone companies. A leased DS-3 and three DS-1s between the ERO and Plymouth Meeting Maintenance support the ERO applications. All of the voice circuits that are currently leased will eventually be migrated to DS-1s. The Commission facilities that will be supported by a single leased DS-1s are listed below:

- Gateway Interchange
- Mount Jackson Ramp Plaza
- North Toll 60 Barrier Plaza
- Moravia Ramp Plaza
- Beaver Falls Ramp Plaza
- South Toll 60 Barrier Plaza
- Warrendale Interchange
- Allegheny Valley Interchange
- Irwin Interchange
- M48 Finleyville Road Ramp Plaza
- M44 Cracker Jack Road Ramp Plaza
- California Barrier Plaza
- M39 Coil Curtain Road Ramp Plaza
- Route 66 Ramp Plaza
- Route 130 Ramp Plaza
- Route 30 Ramp Plaza
- AKH Barrier Plaza
- Route 136 Ramp Plaza
- New Stanton Interchange
- Donegal Interchange
- Kegg Maintenance
- Bedford Interchange
- Breezewood Interchange
- Fort Littleton Interchange
- Willow Hill Interchange
- Blue Mountain/Kittatinny Tunnel
- Blue Mountain Interchange
- Carlisle Interchange
- Gettysburg Pike Interchange
- Lebanon Lancaster Interchange
- Reading Interchange

- Downingtown Interchange
- Virginia Drive Ramp Plaza
- Lansdale Interchange
- Quakertown Maintenance
- Quakertown Interchange
- Mahoning Valley Interchange
- Wilkes-Barre Interchange
- Wyoming Valley Interchange
- Keyser Avenue Interchange
- Clarks Summit Interchange

The Commission facilities that will be supported by two leased DS-1s are Pittsburgh Interchange, Valley Forge Interchange, Fort Washington Interchange, Willow Grove Interchange, Philadelphia Interchange, and Lehigh Valley Interchange

Trak Fuel Management System

The Trak Fuel Management System utilizes a master terminal located at the COMMISSION's Central Administration Building and 35 remote terminals located at all 21 maintenance buildings dispensing unleaded gas, diesel and propane. The remote terminals are connected to the existing fuel dispensing system to provide user identification and automatic record keeping.

The remote terminals are comprised of a Data Entry Terminal (DET), Central Processing Unit (CPU), and a dial-up data modem. The CPU is provided with battery backup in the event of a commercial power failure. A system bypass switch is also provided to dispense fuel in the event of a failure of the remote terminal. Fueling transactions are accomplished by using a vehicle identification card, employee identification card and keypad entries at the DET. All data from each fuel transaction is stored in memory at the CPU. Once a day, the master terminal polls each remote terminal to retrieve the stored data. Automatic polling is accomplished by using dial-up modems.

Once polled the WIN CC program is designed to store these records, do calculations and generate a wide variety of reports wanted by the end user.

g. Motorist Aid Call Box System

The Motorist Aid Call Box System, manufactured by Signal Communications, utilizes 72 MHz. Radio Frequency (RF) transmissions and the Turnpike microwave system to link roadside call boxes to the master decoder units and Vision 21 Systems, located at the CAB and the ERO. 72 MHz. base station equipment is located at 23 of the COMMISSION's microwave sites across the Commonwealth. There are approximately 1,000 Call Boxes in operation from the Ohio State Line to the Delaware River Bridge and from the junction of the Northeast Extension to the Clarks Summit Interchange. There are also 50 Call Boxes located on the Mon Fayette Expressway, 30 on the Beaver Valley Expressway, 22 on the Amos K. Hutchinson By-pass and six located at State Police Barracks.

The Call Boxes are spaced at one (1) mile intervals and provide patrons with the capability of requesting any combination of four types of assistance. The four functions available are Service, Police, Medical and Accident. When the handle of the Call Box is operated it operates a self contained generator to power the radio transmitter to the Call Box base station, this signal is brought back by the PTC's

microwave backbone to the Vision 21 system that decodes the locations of the Call Box and the type of service requested. This information is printed out on the Vision 21 systems. It is also forwarded to the Computer Aided Dispatch (CAD) system where the information is displayed on the monitors in the Operations Center. The dispatchers in the Operations Center then dispatch the appropriate emergency or service vehicles. Simultaneously the Vision 21 system sends a call confirm signal back to the Call Box and the customer, which provides an audible and visual verification that the call was received.

The Motorist Aid Call Box System was expanded in 1996 to include reporting of fire alarms at some maintenance buildings and interchanges to enhance safety and to provide protection against losses resulting from a fire. The fire alarm system consists of 18 fully automatic stand-alone units that work in conjunction with the existing fire monitoring systems. When an alarm is triggered, the firebox will transmit a Dual Tone Multi Frequency (DTMF) signal in the 72 MHz. band to the nearest call box base station receiver. The Call Box base station receiver has a DTMF decoder that converts the DTMF signal to the tones that are used by the call box system. The signal is then processed in the same way as a signal from one of the Call Boxes. The dispatchers in the Operations Center will then take the appropriate action when the information is displayed on their CAD monitors. Each firebox conducts a self-test every twenty-four (24) hours to ensure system reliability. Fire boxes have been installed at Mount Jackson Ramp Plaza, Moravia Ramp Plaza, Beaver Falls Ramp Plaza, Warrendale Interchange, Allegheny Valley Interchange, Route 66 Ramp Plaza, Route 130 Ramp Plaza, Greensburg Maintenance, Route 30 Ramp Plaza, AKH Barrier Plaza, Route 136 Ramp Plaza, Jefferson Hills Maintenance, WRO, Breezewood Interchange, Harrisburg West Interchange, Lansdale Interchange, Quakertown Interchange, and Lehigh Valley Interchange.

The southern section of the Mon Fayette Expressway, from milepost M0 to M7.84, has 14 cellular Call Boxes installed instead of the 72 MHz. Call Boxes described above. The cellular Call Boxes were manufactured by Comarco. There are four more cellular Call Boxes slated to be installed on the southern portion of the highway that will connect to West Virginia. There is a PC workstation installed at the Shift Leader position in the Operations Center at the CAB that provides decoding and communication for the cellular Call Boxes.

Four suicide prevention cellular call boxes manufactured by GAI-TRONICS are installed on the Clarks Summit Bridge on the northeast extension, these call boxes auto dial an outside agency who specialize in suicide prevention.

h. ATIS Devices

The Pennsylvania Turnpike COMMISSION has been implementing a system of devices to maintain an efficient traffic flow across the COMMISSION's toll roadway. Combined to function in concert, these devices form a system referred to as the Advanced Travelers' Information System (ATIS). The devices consist of the following:

- Stationary Highway Advisory Radios (HAR) and Static Message Signs (SMS)
- Portable Highway Advisory Radios
- Variable Message Signs (VMS)
- Truck Rollover Warning System (TRWS)
- Closed Circuit Surveillance Cameras (CCTV)
- Roadway Weather Information System (RWIS)

- Traffic Flow Detection System (TFDS)
- Service Plaza Message Boards (SPMB)

The first three of these are designed to disseminate information to drivers with as much speed and clarity as is possible. The Truck Rollover Warning System collects data on individual vehicles and returns data to drivers in those instances where there is a high likelihood of a rollover. The devices, which comprise the remainder, are used to speed and to automate the collection of information that was, at one time, collected via telephone and radio, a painfully slow process.

Current efforts include the integration of these technologies to speed the individual processes further and to streamline the work area of the Duty Officers upon whom the responsibility for information movement falls.

Stationary Highway Advisory Radios are AM radios located at 29 interchanges, but controlled by the Duty Officer at the Operations Center in Highspire. They broadcast at 1640 kHz. The content of these broadcasts is a message or series of messages, which are both routine and informative in nature, or are emergency messages designed to improve the likelihood that an individual driver will alter his course in a way that will improve overall traffic flow. Messages are passed to the transmitters via telephone circuits. Periodic Maintenance includes adjustments of the transmitter and the antenna. Routine PC and software maintenance is also required.

When emergency messages are broadcast, the message is announced to drivers by the use of flashing lights on the Static Message Signs. The lights are not activated when routine messages are broadcast. There are 92 of these signs arranged in clusters around the interchanges. Maintenance includes battery test and replacement, cleaning, and replacement of the flashing Light Emitting Diode (LED) components.

The Portable Highway Advisory Radios are functionally the same as the stationary units except that they are trailer-mounted, use cellular communications, and have no Static Message Signs associated with them. There are four portable HAR units. Computers at the Operations Center in Highspire centrally control all HAR and SMS units. They require maintenance of the diesel generators, as well as, the maintenance associated with the stationary units.

The Variable Message Signs are large, roadside devices to provide traffic data to the public in the form of text. With the completion of ATIS Phase 3, there are 21 such signs across the Turnpike system. Each sign can display three lines of text with eighteen characters on each line. These too, are centrally controlled by the Duty Officers in the Operations Center. Data is sent over telephone circuits. Maintenance includes periodic replacement of the lamps, modem repair, tests of the controllers and lamp shutters, and communications repairs.

The Truck Rollover Warning System (TRWS) is a device, which collects data on the movement of vehicles approaching an exit ramp. Currently, there are two TRWS deployed at the Philadelphia and Breezewood Interchanges. Philadelphia was chosen for its history of rollovers. The equipment measures the speed of the vehicle, the size, the approximate center of gravity, the path of approach, and the change in speed of the vehicle. From this raw data, the unit mathematically derives the likelihood that the vehicle will overturn. Where that likelihood is unacceptably high, a warning is flashed to the driver to slow down. Maintenance includes a retest of each unit annually with repairs as necessary.

Closed Circuit Television Cameras have been placed at fifteen locations along the roadway (including those from Phase 3 installation). These allow real-time monitoring of roadway and traffic conditions at those locations. Applications include evaluation of incidents, pinpointing the location of a breakdown or accident, and tracking backlogs at interchanges. Image data is sent to the Duty Officers who exercise control over the Pan, Tilt, and Zoom functions of each camera. Control of focus and related image quality parameters has been automated. These are maintenance intensive items, which require an annual checkup and repairs as needed.

There are four sets of Roadway Weather Information System sensors along the roadway. Above ground units were selected of models implanted in the roadway itself for a broader range of data and expandability. Data collected includes icing conditions and low visibility due to fog. Weather data for most locations is collected by verbally polling interchanges and maintenance facilities. The RWIS, however, allows a broader range of data to be collected more quickly, more often, and from sites that have been chosen for a history of weather related incidents. Maintenance includes a retest of each unit annually with repairs as necessary.

Traffic Flow Detection System provides a snapshot of traffic flow at each of the 35 locations where they have been deployed. They measure the volume of traffic and data relative to the speed of the passing vehicles. They indicate the average speed of traffic. Communications to the TFDS is via telephone circuits. Maintenance includes a retest of each unit annually with repairs as necessary.

It should be noted that the majority of this inventory of devices is found along and close to the roadway. With this placement comes the risk that they will be struck as part of a traffic accident. Historically, one to five such accidents occur each year.

All ATIS devices are currently being integrated. By the end of 2004, all of the discreet elements of the ATIS system will be integrated into a single system. This means that there will be a single PC with which the Duty Officer will need to interact.

i. Operations Center Equipment

Video Equipment

The Operations Center has 16 video monitors and three large plasma displays installed. The monitors and plasma displays were manufactured by Sony. Video interface equipment is used to display various video sources on the monitors. There is a Black Box Servswitch Duo unit that allows the Duty Officers to control six different PCs with one set of Keyboard, Video monitor and Mouse (KVM). There are three RGB Spectrum Quadview units that combine VGA video from four different sources into one output allowing the display of four different video feeds on one display device. There are four Black Box four-channel VGA splitters, which take one video input and produce four identical outputs. There are 11 Black Box VGA to S video converters, which produce an S video output from one VGA video input. There are also 11 Black Box S video amplifiers. There are six Black Box Category 5 KVM extender pairs and four Black Box Category 5 KVM extender Hubs.

Miscellaneous Workstations

The Operations Center has a number of other devices installed that support the central dispatching operation. The duty officers have a workstation to control the HAR system described above, a

workstation for the I-95 corridor coalition, a Pennsylvania Emergency Management Association (PEMA) workstation and the VMS workstation described above. There is also a DirecTV satellite receiver system. A Spectracom Netclock provides an accurate time source for the dispatch operation. Console and Dispatch Support Equipment

Both the Zetron console system and the Orbacom Computer Aided Dispatch System (CADS) that are installed at the CAB are supported by Compaq Personal Computers (PCs) and Black Box Category 5 Keyboard, Video Mouse (KVM) extenders. Each workstation at each position has one PC for the CADS and one PC for the console system. There are a total of 20 of these PCs installed in two cabinets in the PBX Room. The PCs are connected to the dispatch positions by Cat 5 cables and KVM extenders. These devices allow PCs to be remotely located and controlled. This reduces the heat generation in the Operations Center. In the PBX room there are two 12-port KVM extender hubs and two six-port KVM extender hubs with serial data. Each dispatch position has individual stand-alone remote units for the KVM extender equipment. Each position has two stand-alone remote units and one stand-alone remote unit with serial data.

DVD Logging Recorder

There is a Comlog DVD recorder installed in the PBX room. There is a workstation that can access this device installed at the Duty Officer's position in the Operations Center. The DVD recorder records all radio and selected telephone traffic and writes the information onto archive DVDs. The Duty Officer's or State Police personnel can use the Comlog workstation to review information on DVDs and to make recordings for use in legal proceedings.

j. Wiring and Cabling

The maintenance of the Turnpike Communications System will necessarily require the CONTRACTOR to perform a variety of wiring and cabling plant work encompassing structured premises wiring, outside plant wiring, telecom equipment rooms, wiring closets, racks, shelving, trays, ladders, conduits, raceways and channels.

The wiring types will involve insulated, uninsulated, jacketed, unjacketed, shielded, armored, coaxial, ribbon, optical fiber, bundled, twisted pair UTP and STP, magnetic, flat festoon, heliax, aircore and waveguides.

The wire and cable terminating technologies will encompass solder, crimp, IDC (insulation displacement), punch down, screw clamp, bolt-on, C clamp & wedge, Cad weld, fusion splicing, conductive epoxy/adhesive, insulating (heat shrink tubing), marking/tagging, sealing & dielectric compounds, splice case closures and mechanical splicing devices.

k. Circuit Protection

The Turnpike Communications System is protected from damaging electrical abnormalities by employing various levels of circuit defense devices and networks. The CONTRACTOR is required to maintain the integrity of the circuit protection equipment by performing various work encompassing earthing, grounding, bonding, shielding, surge protection, fuse and breaker equipment.

Preventative Maintenance and Inspection

a. Preventative Maintenance and inspection shall be scheduled for all equipment encompassed within this contract as outlined below:

- i. Thirty (30) days – microwave equipment, associated channeling equipment, VHF repeater equipment, system batteries, generators, tower lights and call box base stations.
- ii. One hundred eighty (180) days – VHF bas stations at Interchanges, Ramps, Maintenance Buildings, Tunnels, Authorized Service Garages, Service Plazas, Engineering and or Construction Trailers. All Communications Consoles in the system. Administration Building Consoles and recording equipment. Microwave system battery load test. Telephone Systems, Fuel Management systems. FDS Variable Messages Signs. HAR radios and flashing signs. ATIS Devices. CCTV systems. UHF systems. Fire Boxes. Callbox CPU's at the ERO and the Administration Building. All Trunk Mount Mobile radios and mobile repeaters.
- iii. Three hundred sixty (360) days – Other Mobile units, and Roadside Call Boxes

b. Following each inspection, a written report shall be filed with the Manager of Communications Systems Office.

c. A complete physical inspection of all other buildings, transmission lines and structures shall be made at least once every one hundred eighty (180) days and a written report made to the Manager of Communication Systems Office.

d. As required to comply with FCC rules and regulations, and as necessary for proper system netting, transmitters shall be checked for proper frequency and stability and for correct frequency deviation. Transmitter output should be checked, and the forward and reflected power readings performed and recorded. Necessary components and parts shall be replaced to restore performance to system and manufacturer's standards and specifications.

e. Fans and blowers, filters, thermostats and relay switching circuits shall be examined and properly maintained for cleanliness, lubrication and extended operation.

f. Receivers shall be measured for sensitivity, correct frequency operation, distortion and output level, as required to meet system and manufacturer's standards. Components, and parts shall be replaced as required in order to restore proper performance.

g. Emergency standby motors and generators shall be carefully checked and tested by the CONTRACTOR in actual use in conjunction with the microwave radio equipment every thirty (30) days. The COMMISSION will furnish propane fuel, diesel fuel, oil, antifreeze and batteries; however, it is the CONTRACTOR's responsibility to determine proper levels and adequate reserve supplies in place at each generator. Exceptions to this would be the generators at interchanges, maintenance and tunnel portal buildings and the generator situated on the ground floor level adjacent to the garage area in the Central Administration Building. These generators are not the responsibility of the CONTRACTOR under this contract. The ventilating fans, heaters and thermostats in these buildings shall be the

responsibility of the CONTRACTOR. The air conditioning units in all mountaintop and terminal locations shall be the responsibility of the COMMISSION.

h. CONTRACTOR shall make equipment modifications as may be specified by an equipment manufacturer through direction of the COMMISSION's Manager of Communication Systems. CONTRACTOR shall supply labor only within the limits of the dedicated manpower to make such modifications.

i. Further additions to the maintenance requirements shall be subject to contract adjustment by mutual agreement of the parties.

Records

- A. The CONTRACTOR shall make all measurements and complete all technical records to satisfy the requirements of the FCC. The original copy of such records shall be posted at the particular station, and a duplicate thereof shall be forwarded within ten (10) days to the Manager of Communication Systems at the Central Administration Building.
- B. A PTC form will be furnished by the COMMISSION and shall be utilized by the CONTRACTOR for all frequency checks, preventative maintenance checks, transfers, installations, removals, and trouble calls concerning mobile radio units. The forms shall be submitted to the Manager of Communication Systems Office on a weekly basis.

Equipment Standards

Proper or efficient performance is construed as operation within the established standards of the manufacturer and the recognized regulatory bodies such as EIA, FCC and FAA.

Out-of-Service-Condition

An out-of-service-condition is considered as having developed when any integral part of the Communications System ceases to function properly or efficiently. The COMMISSION maintains a Fault Alarm System at its Network Control Help Desk which, monitors and records certain faults and malfunctions of the communications equipment. When such faults or malfunctions are observed, COMMISSION personnel will report them to the CONTRACTOR via radio, telephone, cell phone or pager.

Performance Requirements

The system shall be completely operational at all times. The CONTRACTOR shall maintain all equipment at the manufacturer's specified level of capacity. Maximum outage time shall be as follows:

- Microwave stations.....8 hours
- Network Management Systems..... 8 hours
- Call Box system.....8 hours
- VHF Repeaters..... 8 hours
- Base Stations..... 8 hours
- Telephone Systems..... 8 hours

- Radio Consoles..... 8 hours
- Patron Intercom Systems..... 8 hours
- Single Telephone lines.....36 hours
- Telepanel Systems.....36 hours
- Mobile Units..... 36 hours
- Data Circuits..... 36 hours
- ITS Devices.....36 hours
- Miscellaneous Systems..... 36 hours

Unsatisfactory performance or operation shall be reported to the CONTRACTOR in writing and the CONTRACTOR shall take immediate corrective action to cure the defect. Failure to restore inoperative equipment to service in accordance with the above schedule shall be sufficient cause for cancellation of this contract, or the COMMISSION may, at its option, order the necessary repairs done by others at the CONTRACTOR's expense.

IV-5. Reports and Project Control / Feedback Mechanisms

The following maintenance reports and plans shall be required:

- (1) **Task Plan** – A work plan for each task that identifies the work elements of each task, the resources assigned to the task, and the time allotted to each element and the deliverable items to be produced. Where appropriate, a PERT or GANTT chart display should be used to show project, task, and time relationship.
- (2) **Outage Reports** – A report on critical and non-critical outages shall be provided to the Office of Communication Systems at each scheduled maintenance meeting. The following items are required at a minimum; time of report (notification), reported problem, correction time, corrective action, and individual copies of all service reports attached as completed by the field technician.
- (3) **Preventative maintenance Reports** – A report of all preventative maintenance actions, with individual copies of all service reports attached as completed by the field technician, shall be completed and provided to the Turnpike's Office of Communication Systems Quarterly. The schedule shall highlight, by exception, those actions not completed according to schedule.
- (4) **Requests for Flat Rate Service Reports** – A report on the status of all pending flat rate service requests shall be completed and provided to the Turnpike's Office of Communication Systems at each scheduled maintenance meeting. All invoices for such work shall have all respective service reports attached as completed by the individual field technician.
- (5) **Inventory Report** – The CONTRACTOR shall forward a report listing changes to inventory on all mobile and fixed assets so the Turnpike can keep its assets managed and tracked. This report shall be required on quarterly basis.
- (6) **Annual report** -The CONTRACTOR will provide an annual engineering and maintenance report defining the existing systems and recommending what systems need to be replaced and what enhancements can be done to improve the PTC's existing Communications Systems. The desired format should include an abstract or summary of the result of the study or service in terminology that will be meaningful to Turnpike management and others generally familiar with the subject areas. The report shall describe data collection and analytical and other techniques used during the study. The report shall summarize findings, conclusions, and recommendations developed in each task. The report shall include

all supporting documentation; flow-charts, forms, questionnaires, etc. The report shall recommend a time-phased work plan for implementing recommendations.

(7) CONTRACTOR's Project Manager Meetings – CONTRACTOR's Project Manager will be required to meet quarterly with the Communication Systems Staff, at the Turnpike's Central Administration Building (CAB), to review previous maintenance incident reports, projects, and managerial-level contractual issues. The CONTRACTOR shall come prepared with all required reports and an agenda of old and new items for discussion. The CONTRACTOR shall be required to keep minutes of these meetings and present them to the Communication Systems staff personnel at subsequent meetings.

IV-7. Financial Responsibilities

- a. The CONTRACTOR shall provide a performance bond in the amount of one million dollars (\$1,000,000.00)
- b. The CONTRACTOR will provide the most recent available Dunn and Bradstreet reports (or equivalent) on your firm, its partners, and any proposed major sub-contractors that would be doing more than 10% of the work.
- c. The CONTRACTOR will provide audited financial statements for each of the last two (2) years for your firm, its partners, and its proposed major sub-contractors.

IV-8. Other Services

- a. The CONTRACTOR will provide (1500) fifteen hundred hours of engineering assistance per year in support of the existing systems the PTC operates and any new systems that need to be interfaced to. **This cost will be shown as a line item on the proposal on a per hour basis.**
- b. The CONTRACTOR will provide minor moves and installs on PTC's existing equipment. This work will include radios, telephones, and telepanels. This work will be done during normal working hours Monday thru Friday 8:00 AM to 4:30 PM, and will include any combination of installs, removal or transfers of existing equipment.
- c. The CONTRACTOR shall be responsible for the labor for the following duties for all the systems identified in section **IV-4 Descriptions of Systems to be Maintained**, diagnosing problems, troubleshooting, testing, configuring, reconfiguring, programming, circuit grooming, software upgrading, hardware upgrading, cabinet/case/chassis refurbishment, cabling, wiring, terminating, insulating/sealing, component change-outs, PC board swap outs, cleaning, lubricating, resetting/adjusting/tuning, installing/removing, and modifying.
- d. The CONTRACTOR will interact with other contractors onto PTC property such as but not limited too escorting contractors to tower and communications equipment locations.
- e. The CONTRACTOR will maintain and keep current all monitor and diagnostics systems required by all the systems identified in Section **IV-4 Descriptions of Systems to be Maintained**.

- f. The COMMISSION will supply the major spare parts for all the systems identified in this RFP, however, the CONTRACTOR with the Commission's permission will need to purchase any stock small parts or spare parts needed on an emergency basis to meet the needs of the repair and response time identified in this document. The additional spare parts cost will be shown in the yearly budget and will be paid for by the COMMISSION. Once the spare parts are turned over to the CONTRACTOR it will be the CONTRACTOR'S responsibility to track and identify to the COMMISSION where these spare parts are located. Any missing spare parts that have been turned over to the CONTRACTOR will be the CONTRACTOR'S responsibility to replace.

APPENDIX A

1. The compensation to the CONTRACTOR for work performed under this agreement will be paid on a Cost Plus Net Fee basis (CPNF). The purpose of this Appendix is to establish the basis of payment and reimbursement to the CONTRACTOR for Work performed in accordance with the terms and conditions of the Contract, for the maintenance of the COMMISSION's Communications Systems.
2. The COMMISSION will pay the CONTRACTOR in full compensation for such Work an amount equal to the CONTRACTOR's actual "incurred costs" (defined as Direct & Indirect Labor, and Direct Costs); plus Overhead and Profit, at the rates defined hereinafter. The CONTRACTOR shall be compensated only for those costs actually incurred by the CONTRACTOR which are directly attributable and properly allocable to the Contract's Scope of Work provisions consisting of (a) "Direct & Indirect Labor," which include salaries of management and employees of the CONTRACTOR who directly perform and/or support Scope of Work activities; (b) the CONTRACTOR's independently audited Overhead, plus a compensation for Work, or "Profit," quantified by rates agreed upon by both the COMMISSION and the CONTRACTOR for the Budgeted Period. The CONTRACTOR's "Profit" will be calculated as a percentage of the direct labor only, excluding Indirect Labor, Premium Pay, or Direct Costs. Direct Costs are defined hereinafter as those costs incurred within the categories of: spare parts, Sub-contract Labor, Travel, and approved Outside Services. Generally, these are costs that are for materials, services or other items, necessary for completion of Scope of Work activities but are not deemed as having "added-value" by being procured or sourced by the CONTRACTOR rather than the COMMISSION.
3. The Budgeted Period is defined as the term for which the CONTRACTOR provides the COMMISSION with an estimate of all costs associated with Scope of Work activities, quantified by type of expense (in line item format) in monthly increments. The Budget Periods will consist of consecutive twelve (12) month operating terms. The CONTRACTOR is required to submit estimates for each Budget Period with all applicable and estimable costs per the examples in Attachments _of Appendix _ titled "Budget Summary," "Schedule _ – Labor Worksheet," "Schedule _ – Direct Cost Worksheet," "Schedule _ – Other Direct & Indirect Cost Worksheet," and any other worksheet schedules containing costs associated with supporting the scope(s) of work as defined. As noted, attachments, appendices, and schedules to be identified.
4. The Budgeted Period total estimated amount shall be equal to the sum of all allowable costs (Labor + Overhead + Direct Costs + Profit) as planned and projected by the CONTRACTOR and agreed-to, in writing, by the COMMISSION. The COMMISSION must approve the total estimated amount of any given Budgeted Period before the CONTRACTOR may issue any billings for that period to the COMMISSION.

5. The maximum allowable rates for determining Overhead billable costs and the CONTRACTOR's Profit are as follows:
 - a.) Overhead Cost: The Overhead Rate shall be calculated in accordance with Federal Acquisition Regulations (FARS) guidelines. Overhead calculations shall be audited by a qualified and independent entity. The CONTRACTOR must submit a copy of the audited overhead rate along with the independent auditor's unqualified opinion as to the reasonableness of this rate. The applied overhead rate will be a negotiated rate, and is applicable only to the CONTRACTOR's Direct Labor costs, and shall exclude any and all premium labor payments such as overtime.
 - b.) Profit: The Profit Rate, which is applied to Direct Labor Costs only and shall exclude any and all premium labor payments such as overtime.
6. The CONTRACTOR shall bill the COMMISSION on a monthly basis, and the COMMISSION will pay monthly, for actual costs incurred plus the applicable Overhead and Profit percentages up to a maximum amount that is not to exceed the corresponding month's total costs as reflected in the Budgeted Period estimate. The sum total of monthly billings for the complete Budget Period shall not exceed the total amount for the term of the Budgeted Period. At the conclusion of the Budgeted Period, the CONTRACTOR will provide a Final Cost Reconciliation of the total costs billable to the COMMISSION for the term of the Budgeted Period. The COMMISSION shall have the right to audit the CONTRACTOR's billings and cost records to verify the Final Cost Reconciliation. The CONTRACTOR shall make available to the COMMISSION all accounting records and cost information (billing detail, invoices, payroll data, employee time charged, etc.) for all "incurred costs" to facilitate the COMMISSION's audit of the Final Cost Reconciliation. If the total "incurred costs" (as defined in paragraph 2. above) for the Budgeted Period exceed the Budgeted Period estimated "incurred costs", the COMMISSION will pay the CONTRACTOR for the difference of the amount of "incurred costs" only. No amount of Overhead or Profit will be paid in excess of the Budgeted Period estimated totals for these items unless agreed to and documented by both the CONTRACTOR and the COMMISSION, prior to the end of the Budgeted Period term. If the "incurred costs" for the Budgeted Period are less than the Budgeted Period estimated "incurred costs", then the COMMISSION will reimburse the CONTRACTOR for fifty percent (50%) of the difference of the amount of "incurred costs" plus Overhead at their respective rates as defined. The Profit amount defined in the Budgeted Period estimate will not be reduced based upon "incurred cost," The CONTRACTOR shall be responsible for issuing a Final Billing or Final Credit to the COMMISSION, reflecting the final, reconciled difference between total costs of the Scope of Work activities and total billings paid by the COMMISSION for the Budgeted Period.

Appendix B

Budget Summary

Period _____

Actual Incurred Costs:

- Overhead: _____
- Profit: _____
- Indirect: _____

Total:

Schedule_
Labor Worksheet
Period_____

Labor:

- Direct Labor: _____
- Indirect Labor: _____

Total:

APPENDIX C

SAMPLE AGREEMENT

This **AGREEMENT** is made this _____ day of _____, 2004, between the **Pennsylvania Turnpike Commission (“COMMISSION”)**, an instrumentality of the Commonwealth of Pennsylvania, with principal offices at Middletown, Pennsylvania (mailing address: P. O. Box 67676, Harrisburg, PA 17106-7676; physical address: 700 Eisenhower Blvd, Middletown, PA 17057),

AND

_____ (**“CONTRACTOR”**), [insert the legal status of **CONTRACTOR** such as a **Pennsylvania (or foreign) corporation (or partnership, LLC, LLP, etc.)**], with its principal office at [insert address]

WITNESSETH:

WHEREAS, the **COMMISSION** desires to . . . [describe the specific **PTC** purposes, goals, assumptions, underlying facts, or contractor's representations that are the basis of the bargain, etc.]

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

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

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

Definitions

This section is for terms that have a special meaning for this agreement or that are used in a way different from everyday or common usage.

Contractor’s Scope of Work

[There should be a document that specifies what we expect from the Contractor (such as deliverables; schedules and deadlines; representations or warranties; conditions or covenants; location of the work; use of specific persons; standards of performance; insurance requirements). This document must be made part of the Agreement (either as an exhibit which is attached or by referring to it in the Agreement without attaching it)].

The **CONTRACTOR** will perform the work described in [identify the document/RFP#] dated [date], titled [title] and the **CONTRACTOR’S** proposal dated [date]. This document is [SELECT ONE: attached as Exhibit _ and made a part of this Agreement **OR** made part of this Agreement by reference].

Commission’s Responsibilities

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

Compensation

For the work, services, and material as defined in this Agreement, the **CONTRACTOR** shall be paid _____ and ___/100 DOLLARS (\$_____). [Specify whether the compensation method is hourly, cost reimbursement, lump sum, etc.]

Duration of Agreement [and Renewal]

The term of this Agreement is **[term]**. The term may be extended for **[number]** additional years by a writing signed by both parties.

Termination

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

Assignment and Delegation

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

The **CONTRACTOR** shall not engage the services of any person or persons now employed by the Commission except with the **COMMISSION's** approval.

Governing Law

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

Observance of Laws

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

Dispute Resolution

All questions or disputes regarding any matter involving this contract or its breach shall be referred to the Board of Claims as provided in 72 P.S. § 4651. If the Board of Claims either refuses or lacks jurisdiction, these questions or disputes shall proceed as provided in 42 C.S.A. § 7301 et seq. (Statutory Arbitration). The panel of arbitrators will consist of a representative of each of the parties and a third party chosen by the representatives, or if the representatives are unable to choose, by the American Arbitration Association.

Indemnification

The **CONTRACTOR** shall be responsible for all damage to life and property due to negligence or other tortuous acts, errors, and omissions arising from or related to the work of this Agreement. The **CONTRACTOR** shall indemnify and hold harmless the **COMMISSION**, the **COMMISSION's** officers, and the **COMMISSION's** employees from any claim or liability of any type or nature arising from or

related to the work of the **CONTRACTOR** or that of the **CONTRACTOR's** employees or subcontractors or the presence of these persons or individuals on the **COMMISSION's** premises.

Contractor Provisions

The Contractor Integrity and Contractor Responsibility Provisions are attached as an exhibit and made a part of this agreement.

Entire Agreement

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

Modification

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

IN WITNESS WHEREOF, the **Pennsylvania Turnpike Commission** and **[Contractor's Name]** have executed this Agreement by their duly authorized officers and affixed their respective official and corporate seals on the date written above.

ATTEST:

PENNSYLVANIA TURNPIKE COMMISSION

Rebecca R. Troup
Assistant Secretary-Treasurer

Mitchell Rubin
Chairman

APPROVED AS TO FORM AND LEGALITY:

Albert C. Peters II
Assistant Chief Counsel

ATTEST:

[CONTRACTOR'S NAME]

Signature_____

Signature_____

Name_____

Name_____

Title_____

Title_____

Federal Tax ID. No. _____