



Fayette
COUNTY

"WHERE QUALITY
IS A LIFESTYLE"

PURCHASING DEPARTMENT
140 STONEWALL AVENUE WEST, STE 204
FAYETTEVILLE, GEORGIA 30214
PHONE: 770-305-5420
www.fayettecountyga.gov

January 3, 2018

Subject: Request for Proposals #1428-P: Public Safety Radio System

Gentlemen/Ladies:

Fayette County, Georgia is seeking proposals from qualified firms for provisioning of a radio communications system to support mission-critical public safety communications within the county. You are invited to submit a proposal in accordance with the information contained herein.

A mandatory pre-proposal conference will be held at 9:00 am on Tuesday, January 23, 2018 at the Fayette County Emergency Operations Center, 110 Volunteer Way, Fayetteville, Georgia 30214. This will be an opportunity for you to become more familiar with the project, and to ask questions. Companies that attend will be invited to submit proposals.

Questions concerning this request for proposals should be addressed to me in writing via email to PurchasingGroup@fayettecountyga.gov or fax to (770) 719-5208. Questions will be accepted until 3:00 pm on January 30, 2018.

Purchasing Department office hours are Monday through Friday 8:00 a.m. to 5:00 p.m. The office telephone number is (770) 305-5420.

Please return your response to the following address:

Fayette County Purchasing Department
140 Stonewall Avenue West, Suite 204
Fayetteville, Georgia 30214

Request for Proposals #1428-P
Request for Proposals Name: Public Safety Radio System

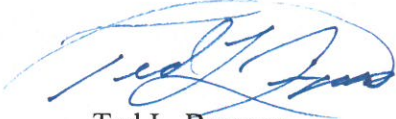
Your envelope must be sealed, and should show your company's name and address.

Proposals will be received at the above address until 3:00 pm, Thursday, March 1, 2018 in the Purchasing Department, Suite 204. Proposals will be opened at that time, and the names of the responding companies will be read.

Proposals must be signed to be considered. Late proposals, faxed proposals, or emailed proposals, cannot be considered.

If you download this Request for Proposals from the county's web site, it will be your responsibility to check the web site for any addenda that might be issued for this solicitation. The county cannot not be responsible for a vendor not receiving information provided in any addendum.

Sincerely,

A handwritten signature in blue ink, appearing to read "Ted L. Burgess", is written over a faint, circular blue line.

Ted L. Burgess
Director of Purchasing

Attachment



Fayette County, Georgia

**Request for Proposals # 1428-P
for
Public Safety Radio System**

Issued: January 3, 2018

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1. PROJECT OVERVIEW

1.1. INTRODUCTION

- A. Fayette County, Georgia, (County) invites proposals from qualified vendors for the provisioning of an Association of Public-Safety Communications Officials, International (APCO) Project 25 (P25) radio communications system to support mission-critical public safety communications within the county. The proposed communications system shall provide enhanced, two-way wireless communications capabilities to all public safety users. Proposals are requested for the following:
1. A new P25 Phase II trunked simulcast system to replace the County's existing legacy radio system. Enhance the required level of coverage/signal strength in the new system to a level where a portable radio with 20 decibels (dB)- of building loss would work reliably on the new system.
 2. The current system is a proprietary Motorola 4.1 SmartZone system, designed as a trunked simulcast system. It was installed in 2002. The system is comprised of seven sites throughout the county. Each site is capable of 12 channels of talk paths. The system primarily serves the public safety users of the county. However, public works entities are also on the system.
 3. A new Internet Protocol (IP)-based microwave or terrestrial fiber backhaul system using Multiprotocol Label Switching (MPLS). The current connectivity between the prime site and the dispatch center located across the parking lot from the prime site is provided by fiber. Media connectors are used in each location to terminate the fiber and provide a T1 interface to the channel banks at each location. T1 telephone lines leased from AT&T are the current method in use for backhaul connectivity between the prime site and each of the six current simulcast remote sites.
 4. New radio dispatch consoles for ten positions at the County's Enhanced 911 (E911) Center. The new system should include new radio console equipment for all ten positions and full interoperability capabilities that will be possible through the migration to a P25 system.
 5. Mobile and portable subscriber radios for the County's first responders. The approximate number of radios currently in use on the system includes 925 portables and 802 mobiles.
 6. Frequency planning to include the analysis of current frequency reuse and the selection and distribution of current and other available frequencies, in a plan that is licensable and allows for antenna types that maximize system coverage performance and minimize the potential limitations of directional antennas.
 7. Civil work to support upgrades to new and existing radio sites, and tower upgrades to support the aforementioned communications subsystems.
- B. In addition to the above, Respondents should address in their proposals system installation and commissioning, and ongoing maintenance support, to ensure a state-of-the-art system.

- C. The proposed system will be owned by Fayette County. The system procurement process is being administered by Fayette County. For brevity, the generic term “County” used throughout this Request for Proposals (RFP) refers to Fayette County, unless otherwise specified.
- D. While the County anticipates receiving turnkey proposals from radio vendors, it also will accept separate proposals from other vendors for the following key project elements:
 - 1. Backhaul Network (Section 3)
 - 2. Site Development (Section 4)
 - 3. Subscriber Equipment (Section 8)
- E. Additional direction and assumption details can be found in these sections to assist vendors who may wish to provide a limited proposal.

1.2. BACKGROUND – FAYETTE COUNTY LEGACY SYSTEM OVERVIEW

1.2.1. *Current System Design*

- A. The current system is a proprietary Motorola 4.1 SmartZone system, designed as a trunked simulcast system. It was installed in 2002. The system is comprised of seven sites throughout the county. Each site is capable of 12 channels of talk paths. The system primarily serves the public safety users of the county. However, some public works entities are on the system.

1.2.2. *Capacity*

- A. Fayette County operates on a trunked radio system technology. The current system has 12 frequencies allowing for 11 talk paths. Currently, users are satisfied with the grade of service (GoS) that the county system is providing. There are no user reports of system busy events, nor does historical system usage information indicate that there have been any system capacity issues.
- B. The new system’s technological platform will utilize a P25 design, which if desired, can provide almost twice the talk-path capacity as the current system using the same number of frequencies. The actual number of desired future talk paths will be determined as the details of the new system design are developed. Some additional future capacity would be prudent to include in the design.

1.2.3. *Subscriber Radios*

- A. Subscriber units (mobiles, portables, and consoles) within the county are owned by each operating agency. The subscriber radios are mostly manufactured by Motorola. The approximate number of radios currently in use on the system includes 925 portables, and 802 mobiles.

1.2.4. Radio Sites

- A. The equipment shelters are 15-20 years old, but in good condition. The generators, air-conditioning, and other civil hardware supporting the system are about the same vintage. Each remote site uses a circuit-based leased T1 line for radio system connectivity.

Fayette County Prime Site

- FCC Registration 1028391
- Owned by the County
- Guyed tower, medium load
- Transmit antenna height is 248 feet
- Receive antenna height is 350 feet
- Ten-channel zone/voter site

Highway 54 Site – 1255 Highway 54 West, Fayetteville

- FCC registration 1018956
- Leased site American Tower L.P.
- Ten-channel simulcast site with two conventional channels
- Self-supporting tower, medium load
- Transmit antenna height is 104.9 feet
- Receive antenna height is 165 feet

Porter Rd. Site – Rising Star

- FCC registration 1237611
- Leased site – American Tower, L.P.
- Ten-channel simulcast site with two conventional channels
- Guyed tower, medium load
- Transmit antenna height is 241 feet
- Receive antenna height 293 is feet

Brooks Site – 101 Railroad Road, Brooks

- FCC registration 1236486
- Leased site – SprintCom, Inc.
- Ten-channel simulcast site with two conventional channels
- Self-supporting tower, medium load
- Transmit antenna height is 174.8 feet
- Receive antenna height is 279.8 feet

153 Willowbend Rd. Site

- FCC registration 1203165
- City of Peachtree City
- Ten-channel simulcast site with two conventional channels
- Self-supporting tower, medium load
- Transmit antenna height is 279.8 feet
- Receive antenna height is 305 feet
- Minor site construction currently occurring

Swanson Rd. – Tyrone

- FCC registration 1018915
- Leased site – American Tower, L.P.
- Ten-channel simulcast site with two conventional channels
- Guyed tower, medium load
- Transmit antenna height is 354.9 feet
- Receive antenna height is 375 feet

1479 N Highway 92 – Fayette Site

- FCC registration 1237085
- Leased site – Global Signal Acquisitions.
- Ten-channel simulcast site with two conventional channels
- Guyed tower, medium load
- Transmit antenna height is 200.1 feet
- Receive antenna height is 299.8 feet

- B. It is anticipated that some or all of the County's existing tower sites will be utilized for the new system, and that additional tower sites will be added to improve coverage. Additional tower sites may be existing sites that are not currently system sites, or newly developed sites. For new greenfield sites, vendors are encouraged to consider County-owned property or facilities, such as County water towers.

1.2.5. Consolidated Dispatch Center

- A. Fayette County has one public safety answering point (PSAP). The dispatch center currently has six radio positions and two call-taker positions. Two other console positions exist today, but are not fully equipped.
- B. The PSAP is responsible for dispatching all fire/rescue, law enforcement, and emergency medical services (EMS) agencies within the county. The center has the capability to communicate with other PSAPs, but generally does not have the ability to communicate via radio directly with most outside agencies.
- C. The new system should include new radio console equipment for all ten positions and full interoperability capabilities that will be possible through the migration to a P25 system.

1.2.6. Critical Issues Affecting the Current System

- A. These issues include:
- Improving System Coverage Characteristics – The current system has insufficient coverage which results in significant areas of the county having less than adequate signal strength and less than reliable radio system performance.

- Desired Interoperability Enhancements – Interoperability with other regional public safety radio systems needs to be improved. Regionally, most neighboring public safety radio systems have migrated to the industry standards-based APCO P25 design platform, and the greater Atlanta region has Inter-RF Subsystem Interface (ISSI) interconnection capabilities. As the current County system is incompatible with the P25 platform, there are many obstacles to providing and enhancing regional public safety communications interoperability. By moving to a P25 system, Fayette County public safety users will realize significant enhancements to their ability to communicate and interoperate with other regional agencies.

1.3. REQUEST FOR PROPOSAL OVERVIEW

A. This section provides a high-level overview of this RFP.

1. Section 1, Project Overview – This section provides background information and a general overview of the requirements contained in this RFP.
2. Section 2, Radio Communications System Requirements – This section provides requirements for the desired communications systems. The County requires procurement of a P25 radio system. This section includes requirements for system configuration, site selection, radio frequency (RF) coverage, and site equipment. Subsections address the need for new radio dispatch consoles, and a network management system.
3. Section 3, Backhaul Network – This section provides requirements for digital microwave backhaul equipment, consideration of fiber-optic network connectivity as an option, network management, and engineering.
4. Section 4, Site Development – If new or additional sites are necessary, this section provides requirements for site development work, including site compound preparation, site grounding, tower deployment, shelter deployment, and electrical and generator systems.
5. Section 5, Dispatch Consoles – This section provides requirements for the new dispatch console system and related equipment.
6. Section 6, Warranty, Maintenance, and Support – This section provides details for the existing towers to be analyzed under, and remediated to, current tower standards.
7. Section 7, System Implementation, Test and Acceptance – This section provides requirements for training programs to be developed by the selected Respondent.
8. Section 8, Subscriber Equipment – This section provides requirements for system cutover, staging, installation, fleet mapping, coverage testing, and final acceptance.
9. Section 9, County Terms and Conditions – This section provides requirements for County terms and conditions, as well as subscriber equipment, including mobiles, portables, and control stations.

10. Glossary – A glossary of key terms and acronyms contained in this RFP also is provided.

A. Several appendices also are included with this RFP:

1. Appendix A: Proposal Form
2. Appendix B: Proposal Pricing Forms
3. Appendix C: Fayette County-Owned Parcel Location Map
4. Appendix D: Potential County-Owned Parcel Index
5. Appendix E: Fayette County Conceptual Design Site Information
6. Appendix F: Compliance Matrix
7. Appendix G: Company Information
8. Appendix H: E-Verify Affidavit
9. Appendix I: Statement of Noncollusion

1.4. PROJECT SUMMARY

A. The selected Respondent shall provide the following project components:

1. Furnish and install system equipment and ancillary facilities
2. Engineering, system design, and Federal Communications Commission (FCC) licensing preparation
3. Project management
4. Software installation and programming
5. Training
6. Acceptance testing, including coverage testing
7. Cutover plan and execution
8. Warranty and maintenance

B. The selected Respondent shall furnish the following complete, highly redundant, and/or fully functional systems and equipment:

1. P25 land mobile radio (LMR) communications system, including the guarantee of system coverage and reliability
 2. Point-to-point digital microwave backhaul network for primary connectivity, with consideration given to using fiber-optic network connectivity as an option
 3. Infrastructure facilities (e.g., towers, shelters, fencing)
 4. Network management system (NMS)
 5. Subscriber mobile and portable radio equipment
- C. All equipment shall be provided in new condition and be covered by a full factory and/or manufacturer's warranty of not less than one year starting at the time of system acceptance.
- D. The County prefers that existing radio tower sites be utilized in the new system design, if possible. Respondents may utilize other towers, or propose greenfield construction of new towers, if doing so improves system coverage and helps realize the coverage goals. The cost effectiveness of new greenfield towers versus adding other existing towers to the network will be an evaluation factor. Use of County-owned property for new sites within the county is encouraged if viable. Consideration of existing sites outside of the County also is allowable.
- E. Existing towers may require structural modifications to support the proposed new system and transitional loading. Respondents should account for the time required to remediate these towers, including time required for engineering, design, procurement, and implementation of any required modifications.
- F. In the event additional or alternate tower sites are proposed to meet a Respondent's coverage guarantee, the response must include letters of commitment from those site and tower owners indicating availability of tower space to accommodate the proposed facilities and antennas. Such letters also must indicate a commitment to enter into negotiations with the County for tower space or construction on greenfield sites. Anticipated tower and antenna height requirements should be noted in the letters.
- G. Work shall be planned, coordinated, and conducted with minimal interruption of service to the existing system.
- H. Proposals shall completely describe the equipment and methods that will be used to implement the system. The intent of this document is to allow the Respondent to propose the best equipment, technology and methods available to provide state-of-the-art public safety communications systems of the highest quality and performance.
- I. Proposals shall not be accepted that include systems or equipment within five years of the end of their respective lifecycles at the time of system acceptance.
- J. Proposals shall not be accepted that include systems or equipment that will no longer be supported for software, spare parts, and repair by the Respondent or manufacturer within 15 years of system acceptance. Product roadmaps must be provided.

- K. In the event that requirements are stated in more than one section and appear to conflict, the more-stringent requirement shall apply.

1.5. PROPOSALS DESIRED

- A. The County will accept complete turnkey solution proposals addressing all project systems, subsystems and components, as well as proposals from selected subsystem providers to include: microwave, tower and civil work, and subscriber equipment.
- B. Vendors who propose subsystem solutions only (e.g., microwave only, tower and civil work only, subscriber equipment only) must meet all other RFP requirements that are not specific to a different subsystem. For RFP compliance purposes, these vendors should note "N/A" for response sections that are not applicable to their proposal.
- C. All vendors who submit proposals must acknowledge a requirement and obligation to coordinate planning and implementation activities with other vendors who are selected by the County by this process.

1.5.1. Systems

- A. This RFP seeks proposals for the construction of a countywide radio system that will include:
 - 1. A trunked simulcast P25 system that will support first responders within Fayette County
 - 2. P25 dispatch consoles
 - 3. Construction of a microwave network that will provide radio system backhaul for P25 traffic at each site, with consideration of a fiber-optic network for connectivity as an option
 - 4. Purchase of P25 subscriber units (mobiles, portables and control stations)
 - 5. Site construction/improvements to include tower enhancements, new towers, and new shelters

1.5.2. Services

- A. Design and engineer the P25 radio system to provide 95 percent portable coverage countywide in a 20-dB building with a portable carried on the hip with a speaker/microphone using a ½-wave dipole antenna. Please assume that hip level is at three feet.
- B. Design and engineer a microwave system to interconnect the LMR sites, with consideration of a fiber-optic network for connectivity as an option.

- C. Conduct a structural analysis of all towers proposed for use in the system, and mitigate any structural shortfalls to meet the current Telecommunications Industry Association (TIA) 222-G, *Structural Standard for Antenna Supporting Structures and Antennas*, Class III standard.
- D. Proposal Options: Requirements described as an "OPTION" or "OPTIONAL" refer to features or equipment that may or may not be purchased by the County, or items whose quantities are not determined yet. It is not the Respondent's option to respond to these requirements; therefore, the Respondent is required to respond to all OPTIONAL requirements to the greatest extent possible, unless otherwise noted.
- E. Alternate Proposals:
 - 1. In the event that the Respondent has a technological solution that does not meet the exact requirements in this specifications document, the Respondent may offer more than one proposal, as long as each proposal fully addresses the intent of the requirements set forth in this document.
 - 2. Alternate proposals shall be submitted separately under a different cover from the base proposal and clearly marked "ALTERNATE PROPOSAL."
 - 3. The Respondent shall comply with the same submittal instructions in Section 1.12, Proposal Format, below.

1.6. QUALITY ASSURANCE AND COORDINATION

1.6.1. Standards and Guidelines

- A. The Respondent shall comply with the following standards, rules, regulations and industry guidelines:
 - 1. American National Standards Institute (ANSI)
 - 2. National Electrical Manufacturers Association (NEMA)
 - 3. Electronics Industry Association (EIA)
 - 4. Telecommunications Industry Association (TIA)
 - 5. Telecommunications Distribution Methods Manual (TDMM)
 - 6. National Electrical Code (NEC)
 - 7. Institute of Electrical and Electronics Engineers (IEEE)
 - 8. Federal Communications Commission (FCC)
 - 9. Underwriters Laboratories, Inc. (UL)

10. American Society of Testing Materials (ASTM)

11. National Fire Protection Association (NFPA) 1221

- B. The Respondent shall comply with industry best practices for system installation, grounding, bonding and transient voltage surge suppression (TVSS), as outlined in the following standards:
1. Motorola R56®, *Standards and Guidelines for Communication Sites* (latest revision)
 2. Harris AE/LTZ 123 4618/1, *Grounding Guidelines*
 3. Equivalent (Respondent must provide detail)
- C. Governing codes and conflicts: If the requirements of this specifications document conflict with those of the governing codes and regulations, then the more stringent of the two shall become applicable.
- D. If the Respondent cannot meet any of the standards or guidelines listed above, Respondent shall list in its proposal any and all deviations for approval by the County.
- E. The Respondent shall identify and coordinate all necessary codes, permitting, etc., including building permits. The Respondent shall notify the County of any issues.
- F. Respondent shall be responsible for performing a structural analysis for each existing tower proposed in their design, and for advising the County which tower locations will require remediation. Cost estimates for tower enhancements will be a required component of the contract negotiation phase with the selected radio system provider. As an option, vendors also shall provide an analysis that assumes 25 percent additional capacity. Any new greenfield towers proposed also shall include the option of 25 percent additional capacity.

1.6.2. P25 Standard Compliance

- A. The proposed trunked radio system shall comply with the latest applicable P25 suite of standards adopted as TIA and/or ANSI documents at the time of proposal submission.
- B. The system shall be delivered in accordance with the P25 Phase II standards outlined in this RFP. If these standards change or are updated for final release, the selected Respondent shall implement the final standards at no additional charge to the County.

- C. The proposed system shall not include proprietary features that prohibit or impede the use of P25-compliant subscriber equipment provided by any equipment vendor. Any proprietary features that would be available as an option should be explained clearly.

1.6.3. Frequency Coordination and Licensing

- A. LMR Licenses: It is the County's desire to operate exclusively in the 700/800 megahertz (MHz) bands. The Respondent shall be responsible for the research and preparation of all license acquisitions to support the new system. Following approval of the preliminary design phase, the Respondent shall provide all modifications and applicable forms to the County for review and approval. The County shall be responsible for coordination and licensing fees, if any, and signatures, as applicable. The current system utilizes panel and directional antennas because some current frequencies are short-spaced with another licensee. Frequency planning shall include the analysis of current frequencies. The design shall include a new frequency plan to eliminate the short-space problems and to minimize the limitations of the directional antennas currently utilized to achieve the coverage requirements.
- B. Microwave Licenses: The Respondent shall be responsible for all microwave frequency research, prior coordination, and preparation of all associated FCC license applications and submittals on behalf of the County. The County shall be responsible for coordination and licensing fees, if any, and signatures, as applicable.

1.6.4. Federal Aviation Administration (if applicable)

- A. The Respondent shall complete Federal Aviation Administration (FAA) forms as necessary. Respondent also shall complete any associated FCC Antenna Structure Registration (ASR) submittals. Any new greenfield sites being proposed must have an FAA obstruction analysis performed to assess the likelihood that the structure can be constructed to the proposed height.

1.6.5. Project Management

- A. The Respondent shall provide a project management plan (PMP) that provides detail on the following: Project scope, deliverables, schedule, quality assurance/quality control (QA/QC) processes, and risk management.
- B. The PMP shall describe how the Respondent intends to monitor and control the installation and deployment of the proposed system and mitigate risks to ensure that the system meets the design specifications and is delivered on time.
- C. Regularly scheduled status meetings shall be established between the County's project team and the successful Respondent. The Respondent shall provide a schedule for these meetings subject to the County's approval.

1.6.5.1. Scheduling

- A. The Respondent shall develop and maintain a project schedule including tasks, milestones, start and end dates, task precursors and task owners.
- B. The schedule shall represent tasks associated with completing the work and shall be updated with actual dates as tasks are completed.
- C. The updated schedule shall be provided as an agenda item for all County/Respondent status meetings.
- D. The schedule shall address the following at a minimum:
 - 1. Site surveys
 - 2. Detailed design review
 - 3. Site preparation
 - 4. Equipment manufacturing
 - 5. Factory acceptance test
 - 6. Equipment delivery
 - 7. System installation
 - 8. System configuration
 - 9. System optimization
 - 10. Acceptance testing
 - 11. Coverage testing
 - 12. User training
 - 13. Fleet map development
 - 14. System cutover
 - 15. System documentation development and delivery
 - 16. System and equipment warranty

1.6.5.2. Project Punch List

- A. The successful Respondent shall establish and maintain a punch list, as mutually agreed to with the County, for site facilities, equipment and acceptance tests.
- B. The punch list shall be maintained in real time and published weekly. The punch list shall include the following at a minimum:
 - 1. Sequential punch-list item numbers
 - 2. Date identified
 - 3. Item description
 - 4. The party responsible for resolution
 - 5. Expected resolution date
 - 6. Resolution date
 - 7. Details about how each punch-list item was resolved and tested
 - 8. Notes about the item
- C. The Respondent shall be responsible for reviewing each punch-list item and advising the County of any changes. The status of punch-list items shall be updated during each status meeting.

1.6.6. *Project Meetings*

- A. A project kickoff meeting shall be scheduled prior to the beginning of the project.
- B. Regular project status meetings shall be scheduled following contract award and the initial kickoff meeting.
- C. The successful Respondent shall be responsible for scheduling the meetings as well as preparing meeting agendas and minutes. In addition to those identified in Section 1.6.5.1 above, meeting agenda items shall include, at a minimum, the following:
 - 1. Schedule review
 - 2. Status of deliverables
 - 3. Risk items
 - 4. Changes
 - 5. Action-item assignments

1.6.7. Project Staffing

- A. Project staffing shall be managed by the successful Respondent based on workload and the level of effort required throughout the implementation/installation process; however, the positions identified below shall be staffed throughout the duration of the project and shall not be changed without prior approval of the County.
- B. Respondent's Project Manager:
 - 1. Respondent's project manager shall be the primary point of contact between the County and the Respondent.
 - 2. Respondent's project manager shall: bear full responsibility for supervising and coordinating the installation and deployment of the communications system; be responsible for development and acceptance of the PMP; manage the execution of the project against that plan; and oversee the day-to-day project activities, deliverables and milestones completion.
 - 3. Respondent's project manager shall be responsible for coordination of the regular project status meetings.
- C. Respondent's Project Engineer:
 - 1. Respondent's project engineer shall have the primary responsibility for managing the system design and ensuring that the system is installed in accordance with the approved system design.
 - 2. Any deviation from the system design shall be subject to project change control procedures and will not be undertaken until approved by the County.
 - 3. Respondent's project engineer shall ensure the development of block diagrams, system-level diagrams, and rack diagrams to assist the installation team in completing the system installation.
 - 4. The project engineer also shall supervise the development and execution of the acceptance test plan (ATP) and coverage acceptance test plan (CATP), and guide the County's project team through the processes and procedures necessary to prove that the system performs as specified in the contract. No test plan will be executed until approved by the County.

1.6.8. Quality Assurance/Quality Control Program

- A. The successful Respondent shall include a QA/QC plan. The QA/QC plan shall be submitted for review during preliminary design as described in this section. The plan shall address all stages of the project, including at a minimum:

1. Procurement
 2. System design
 3. Installation
 4. Implementation
 5. Testing
 6. Cutover
- B. The QA/QC plan specifically shall describe the plans and procedures that ensure the proposed system is designed in accordance with the standards and requirements described in this specifications document.
- C. The QA/QC plan shall be included as part of the PMP developed by the project manager.
- D. The QA/QC plan shall be an integral part of the project and include County personnel as part of the review-and-approval process for all deliverables and submittals.
- E. The proposed QA/QC plan shall address the following project tasks at a minimum:
1. Design analysis and verification
 2. RF coverage analysis and verification
 3. Design changes and document control
 4. Material shipping, receiving and storage
 5. Site preparation (if required)
 6. Field installation and inspection
 7. Equipment inventory and tracking
 8. System testing and validation
 9. Software regression testing
 10. Deficiency reporting and correction
 11. Implementation and cutover
 12. Training and certification

1.7. DELIVERY, STORAGE AND HANDLING

- A. The selected Respondent shall be responsible for the storage of equipment following shipment from staging. All costs associated with the storage shall be the responsibility of the selected Respondent. The County shall not be liable for equipment or material stored onsite prior to installation.

1.8. PROJECT SUBMITTALS

- A. Key project deliverables and submittals are outlined below and are described in further detail throughout this specifications document.
- B. All project submittals shall be subject to review and approval by the County and its engineer/consultant.
- C. All submittals shall be provided in hard copy, properly bound, and in electronic format on a USB flash drive. The quantity of hard copies required shall vary for each type of submittal and shall be determined by the County prior to submission.
- D. All submittals shall include a cover letter or letter of transmittal, signed, dated and fully describing the contents of the submittal.
- E. For the duration of the project Respondent shall provide a Web-based portal or File Transfer Protocol (FTP) site for sharing and exchanging project documents.

1.8.1. Proposal

- A. Respondents shall submit their proposals in accordance with the date and time specified in Section 2.1, Overview, below. Proposal format and submittal details are provided in Section 1.12, Proposal Format, below.

1.8.2. Preliminary Design (45 days after notice to proceed)

- A. The successful Respondent shall submit the preliminary design package 45 days after receiving the notice to proceed. The preliminary design package shall include the following:
 - 1. QA/QC plan
 - 2. Detailed project schedule
 - 3. System-level block diagrams
 - 4. An IP cloud diagram showing each connection and device at each location.
 - 5. Patching schedules and termination details for all cabling necessary for a complete record of the installation

6. Radio and microwave channel plans
7. Microwave path engineering report(s)
8. Equipment room overview drawings
9. Equipment rack/cabinet elevation drawings
10. Tower profile drawings indicating antenna-mounting locations
11. Detailed lists of materials for each site
12. 30-day operational test plan
13. CATP

1.8.3. Final Design (90 days after notice to proceed)

- A. The contract design review (CDR) shall occur no sooner than 90 days after the selected Respondent receives the notice to proceed unless the County agrees to an earlier date, or before the proposed sites acquisition can be validated and the County provides confirmation.
- B. The CDR shall be delayed until proposed sites in the Respondent's design can be validated, acquired and finalized.
- C. Selected Respondent shall submit the final design package no earlier than 90 days after receiving notice to proceed, unless the County agrees to an earlier date, which shall include the following:
 1. Any updates to previously submitted design information
 2. Cutover plan
 3. System operation and maintenance manuals for all equipment
 4. Factory test data
 5. Site installation drawings
 6. Structural analyses and results
 7. A detailed preliminary staging acceptance test plan (SATP) outlining a comprehensive series of tests that will demonstrate proof of performance and readiness for shipment
- D. The final SATP shall be submitted no later than 15 business days before the testing starts. Vendor may begin testing as soon as five business days from

customer approval. If the vendor wishes to start earlier, they must allow ample time for the customer to review the final SATP

1.8.4. System Staging, Delivery and Installation

- A. System staging shall not occur earlier than the final CDR approval or site validation and acquisition.
- B. System staging must be performed in the United States.
- C. The Respondent shall submit a bill of materials/packing list with two copies for each shipment of equipment. The packing list shall include the following information, at a minimum, for each component included in the packaging:
 - 1. Manufacturer
 - 2. Model
 - 3. Serial number
 - 4. Unique identification of the package containing the item
- D. All items shipped by Respondent or its suppliers will include the above information in a barcode format.

1.8.5. Final System Acceptance

- A. Respondent shall submit a detailed final acceptance test plan (FATP) that outlines a comprehensive series of tests that will demonstrate proof of performance and readiness for final acceptance by the County/Owner.
- B. The final FATP shall be submitted no later than 15 business days before the testing starts, and shall be approved by the County before it is considered finalized. A preliminary FATP will be submitted with the Respondent's proposal.
- C. Turnkey proposals will include a separate FATP for the microwave subsystem.
- D. The Respondent shall submit three final and complete sets of as-built documentation, including the following:
 - 1. Documentation index
 - 2. Field test reports, with dates and actual readings
 - 3. Coverage test reports
 - 4. Warranty documentation

5. Detailed list of materials for each site
6. A copy of all redline documents for each site prior to issuance of the as-built documentation
7. As-built system-level block diagrams
8. As-built site drawings, including all cabling and terminations
9. Cloud and IP diagrams showing each of the devices and IP addresses, including those in the customer network, as it pertains to the radio system
10. Site layout drawings, as appropriate
11. Tower drawings showing any new installations

1.9. PROPOSAL PROCESS OVERVIEW

- A. Proposals must be received by 3:00 p.m. Eastern Time (ET) on March 1, 2018.
- B. Respondents shall submit to the County a bound original and nine bound copies of the proposal. Each package also shall include a copy of the proposal in electronic format on USB flash drive. The front of the package shall be marked "**Proposal for County of Fayette Public Safety Radio System – RFP # 1428-P.**" Proposals shall be addressed to:

Fayette County Government
Purchasing Department
140 Stonewall Avenue West, Suite 204
Fayetteville, GA 30214

Attention: Contracts Administrator

- C. Respondents may submit questions to the County in either written or electronic format (email). The County will provide answers to any questions received. Oral responses shall not be binding on the County.
- D. County contact for submission of technical questions:

ATTENTION:
Ted L. Burgess, Director
Purchasing Department
140 Stonewall Avenue West
Fayetteville, GA 30214
Phone: 770-305-5393
Email: tburgess@fayettecountyga.gov

- E. Respondents shall submit questions by 3:00 p.m. ET on January 30, 2018.

1.10. MANDATORY PRE-PROPOSAL CONFERENCE

- A. A mandatory pre-proposal conference will be held on January 23, 2018, at 9:00 a.m. ET. The conference will be held at the County Emergency Operations Center (EOC) – 110 Volunteer Way, Fayetteville, GA 30214. Registration is not required; however, organizations planning to attend should notify Mr. Brown no later than January 15, 2018, with an estimate of the number of persons who will need to see the various sites. As space is limited at some sites, we desire to keep this group to a small and manageable size.
- B. Respondents may submit questions to the County in written or electronic format (email). Questions must be received at least five days prior to the pre-proposal conference for them to be addressed at the conference. During the conference, the County shall provide answers to any questions received and hold an open discussion regarding the project. Oral responses during the conference shall not be binding on the County.
- C. The County contact for submission of technical questions is the same as listed above.
- D. Following the conference, all attendees shall be provided with a copy of the sign-in sheet, questions and responses.
- E. Following the pre-proposal conference, a familiarization tour of existing tower sites and the E911 Center will be conducted. It is anticipated that the tours will require the remainder of the January 23 and 24 to complete. For logistical purposes, a head count of personnel planning to view each site is requested and should be submitted to the County's contact at least five days in advance of the tour date. Site facilities have limited space and challenging access; thus, vendors are encouraged to limit the number of persons who will need to spend time at each site.

1.11. SCHEDULE OF EVENTS

- A. While the County is not obligated to comply with the following timeline, it intends to comply with the following schedule, which may be changed in the County's sole discretion.

Table 1: Schedule of Events

Event	Date and Time
Solicitation Issued	January 3, 2018
Pre-Proposal Conference	January 23, 2018, from 9:00 a.m. – 10:00 a.m. ET
Site Visits	January 23, 2018, from 10:00 a.m. – 5:00 p.m. ET, and January 24, 2018 from 8 a.m. until 4 p.m.
Written Questions Due	January 30, 2018, at 3:00 p.m. ET
Response/Addendum Issued	As required, no later than February 9, 2018
Proposal Due	March 1, 2018, at 3:00 p.m. ET
Evaluation of Proposals	Beginning in March 2018
Negotiation and Contract Award	It is the County's intention to review proposals and select a primary vendor or vendor(s) to negotiate with in April 2018. The

Event	Date and Time
	timing of negotiations and contract award(s) will be based on the duration of negotiations and County decisions regarding potential multiple vendor selections

1.12. PROPOSAL RESPONSE REQUIREMENTS

- A. **Cover Letter:** Include the Request for Proposals number (#1428-P) and title (Public Safety Radio System).
- B. **Table of Contents**
- C. **Required Documents:**
 - 1. Company Information Page
 - 2. Contractors Affidavit under O.C.G.A. § 13-10-91(b)(1)
 - 3. Non-Collusion Affidavit
 - 4. Completed matrix provided in Appendix F
 - 5. Signed addenda, if any are issued
- D. **Project Understanding and the Proposed Solution:** Similar to an Executive Summary, at the beginning of this section response, state your understanding of the services required. Describe the approach you propose to take in addressing the needs addressed by this request for proposals. Indicate your level of expertise with public safety radio systems. Identify challenges you will face. Creativity and innovative ideas are encouraged in your response.

Describe the system/solution, including equipment, software, design, and services that you propose. Include:

- 1. Radio communications system, including RF coverage predictions
- 2. Dispatch console
- 3. Tower construction, including structural analysis and remediation plan for existing towers
- 4. Microwave backhaul connectivity with consideration of fiber-optic network connectivity as an option
- 5. System management systems
- 6. System event-monitoring systems
- 7. Additional subsystems (if applicable)
- 8. Detailed equipment specification sheets for all proposed equipment
- 9. System design information, including a complete detailed description, block diagrams, equipment layouts, cloud diagram, and equipment lists necessary to provide a complete and comprehensive description

Provide system and subsystem warranty information, including:

- 1. Financial plan to reimburse the County for warranty work
- 2. List of maintenance plans and alternate tiers available

3. Spare parts list
4. Fifteen-year cost-of-ownership information

Stipulate training programs and additional information not covered in other sections.

- E. **Company's Background and Experience:** Describe your firm's background and size. Include the number of years in business; the corporate structure, legal status and professional credentials. If you would use any subcontractors or partners in delivery of the proposed services, identify them and explain their roles.

Demonstrate the firm's experience and qualifications by providing a list of at least three systems/solutions of similar size and complexity to the one proposed, successfully completed, to include:

1. Name of the system/solution
2. Location
3. Contact person, including phone number and email address

Please note that these references will be contacted. Failure of a reference to respond may count against a Respondent's final score. Respondents are urged to contact references and request their prompt response.

Provide a copy of your firms last two years balance and income statements as documentation of financial responsibility and stability.

- F. **Project Team:** Identify team members who would be assigned to this project. Include a resume for each key team member. Identify the main contact person for the county. Describe each key team member's experience with comparable projects, the role that each member played, and the expected role of each when doing work for this project. The project team may include personnel hired by the firm directly, or a mixture of personnel and outside sub-consultants.

- G. **Proposed Schedule:** Provide a preliminary project schedule with a detailed Gantt chart. Also include:

1. Identification of critical paths and milestones
2. Demonstrated success in staying on schedule with similar projects
3. How the schedule is controlled
4. Demonstrated success in staying on schedule with similar projects
5. Thoroughness

- H. **Price:** Provide a proposed cost and detailed pricing breakdown, in an additional opaque sealed envelope, identified as the price schedule, and enclosed in the sealed envelope with the proposal. Specify the total proposal cost and itemized pricing for both equipment and services, using the pricing forms in Appendix B, Proposal Pricing Forms, to the greatest extent possible. Costs for optional items also shall be provided on the forms. Each line item shall indicate the Respondent's list cost and discount offered. Costs for services must include the hourly rate and the total number of hours. Costs for OPTIONAL items also shall

be provided. Alternate proposals shall be provided with a separate set of proposal pricing forms.

Pricing shall be valid for a period of not less than six months from the date of submittal.

- I. **Point-by-Point Compliance Matrix:** Respondents shall provide compliance statements in the spreadsheet found in Appendix F for each outline level of this RFP. Respondents shall provide a response to every section with which they do not comply. Compliance statements are limited to three choices:
1. **COMPLY** – The proposal meets or exceeds the specified requirement. When using this statement, Respondent is confirming that it is providing the equipment and/or service associated with that paragraph.
 2. **COMPLY WITH CLARIFICATION** – The proposal does not meet the exact stated requirement; however, it meets a substantial portion, or meets the intent, of the requirement. Respondents must provide a detailed explanation when using this statement.
 3. **EXCEPTION** – The proposal does not meet the specified requirements. Respondents must provide a detailed explanation when using this statement.

1.13. EVALUATION PLAN

An Evaluation Committee will review and evaluate proposals. The points earned for technical merit will comprise 70% of your evaluation score. Criteria for technical merit are, in priority order, as follows:

	Max Points
1. Project understanding and the proposed solution	40
2. Project team	25
3. Company's background and experience	20
4. Proposed schedule	15

1.13.1. Pricing

- A. The remaining 30% of your score will be determined by your proposed price, as compared to other responding entities. Proposed prices will be assigned points earned through use of a "variance" weighting method. The lowest offered price will earn the maximum number of points for the Pricing portion of the score. Other proposals' price scores will be calculated based on the variance of their prices from the lowest offered price.

1.13.2. Presentations

- A. The County may at its discretion, choose one or more of the best-scoring companies to make in-person presentations. If more than one company makes a presentation, the Evaluation Committee will evaluate the presentations, and score

up to an additional 50 points to the technical score for each company that makes a presentation.

1.14. ADDENDA TO THE CONTRACT

- A. During the proposal period, the County may issue written addenda to change or correct the specifications as issued. Such changes or corrections shall be included in the work and/or materials covered by the proposal, and such addenda shall become part of the specifications and contract.

1.15. AWARD OF CONTRACT

The County intends to award a contract or contracts that include one or more identified system components. However, the County specifically reserves the following rights, consistent with procuring a system that best meets the needs of the County and system users:

- A. The County reserves the right to accept or reject any and all proposals, or any portion thereof, to waive any informalities or irregularities, and to award this bid, in whole or in part, in the best interest of the County.
- B. The County reserves the right to accept all or part of any proposal, depending solely upon the requirements and needs of the County.
- C. The County reserves the right to seek clarifications regarding any proposal submitted, or specific aspects of any proposal, prior to contract award. After seeking such clarifications, the County shall allow the Respondent an opportunity to provide the requested clarification.
- D. The County reserves the right to adjust item quantities and/or reconfigure the communications system in the best interest of the County subsequent to contract award.
- E. The County may request an interview with and/or oral presentation from any firms that submit a proposal. These meetings provide opportunity for the County to ask questions and for the Respondent to clarify its proposal or demonstrate its product/solution.
- F. If multiple contracts are awarded, in lieu of a turnkey contract, the County may:
 - 1. Negotiate additional scope of work to designate one of the selected Respondents as the project's prime contractor.
 - 2. Or allow one of the selected Respondents to provide system integration or prime contractor services, provided that the selected Respondent has submitted a separate proposal for those services.
- G. The County reserves the right to delay evaluation and award for up to six months following the receipt of proposals. All proposals must be valid for a period of not-less-than six months following submittal.

2. RADIO COMMUNICATIONS SYSTEM REQUIREMENTS

2.1. OVERVIEW

- A. Respondents shall propose complete systems as described below. Requirements for each system are described herein and are delineated throughout this specifications document according to trunked system requirements.
 - 1. **Primary Simulcast System:** 700/800 MHz P25 – The system must utilize the latest system platform at the time of system acceptance. The system must meet the coverage and capacity needs of Fayette County. The system must be expandable to allow for additional capacity and features.

2.2. INTEROPERABILITY/P25 STATEMENT OF REQUIREMENTS

- A. The proposed radio system shall comply with the latest applicable P25 suite of standards adopted as TIA, ANSI and/or Electronics Industry Alliance (EIA) documents at the time of proposal submission. These standards establish technical parameters that allow compatibility and interoperability of digital radio equipment from different manufacturers.
- B. By stating compliance with a level-two heading in the Statement of Requirements (SoR), the Respondent claims compliance with all applicable level-three requirements in the SoR. If the Respondent is not compliant with a requirement, the Respondent shall identify the requirement by number and name, and provide a detailed explanation of why the proposed system does not meet the requirement.

2.3. SYSTEM CONFIGURATION

2.3.1. Redundancy and Survivability

- A. The proposed radio communications system is intended to support mission-critical operations; therefore, a high degree of redundancy and survivability is required. A network topology utilizing fault tolerance shall be incorporated to the greatest extent possible through a distributed and/or redundant architecture.
- B. Redundancy is required for all system elements in which failure would result in a major failure of the system; single points of failure are not acceptable. Such elements include, but are not limited to, the following:
 - 1. System controllers and fixed site equipment
 - a. System servers
 - b. Simulcast controllers
 - c. Network components, switches, and routers
 - 2. Simulcast controllers and voting equipment

3. Backhaul network – Reversible ring, monitored hot standby (MHSB), or ad-hoc routing
 4. Power systems
 5. Network management and fault reporting systems
- C. The system shall include several modes of degraded operation, known as failure modes. The system shall maintain communications in the event of a system failure. Additionally, the system shall switch to a failure mode gracefully. Failure modes shall include the following scenarios, at a minimum:
1. Loss of single site
 2. Loss of multiple sites
 3. Loss of system/console controller
 4. Loss of simulcast controller
 5. Loss of a frequency channel due to interference
 6. Loss of multiple channels due to wideband interference
 7. Loss of a repeater station due to an equipment failure
- D. Respondents shall provide a description of each failure mode and describe how communications are affected by the failure.

2.3.2. Expansion

- A. The systems shall be expandable by adding additional hardware and/or software to increase coverage, capacity or features. Where possible, Respondents shall propose equipment such that the system can be easily expanded by a minimum factor of 20 percent. For example, if a transmitter combiner requires five ports for the system design, a six-port combiner should be provided for ready expansion.
- B. The system shall be expandable to meet the capacities listed below through the addition of site hardware and/or software. Replacement of the system control and site control equipment to meet this requirement shall not be acceptable.
1. Total frequency channels – 28
 2. Total sites – 30
 3. Unit identifications (IDs) – 60,000
 4. Affiliated users – 20,000

5. Talkgroups – 2,000

6. Dispatch positions – 20

2.3.3. Grade of Service

- A. The measure of traffic-loading capacity for any trunked system is defined by grade of service (GoS). GoS is used to measure the probability that a radio call will not gain immediate access to a radio channel, but rather be placed in a busy queue for later processing when a voice channel becomes available. For example, a GoS of 2 percent represents that 98 percent of the radio calls attempted on the system are processed immediately, and 2 percent are placed into the user queue.

For proposers offering a trunked solution, the proposed system shall meet a GoS of 1 percent, with 90 percent of units that are placed in queue receiving a channel grant within two seconds.

1. If the Respondent's proposed system contains multiple subsystems or cells, an additional loading increase shall be included to account for calls that involve talkgroups on two or more cells. Respondents shall provide calculations and explain justifications.
- B. Respondents shall submit traffic-engineering studies in their proposals describing how their proposed system designs meet this criterion. The traffic-engineering study shall describe the methodology used in developing the study, along with any assumptions.

2.4. SITE SELECTION

- A. Respondents shall determine the number and location of sites needed to provide the required coverage. The County desires that proposers consider reusing the current sites. Respondents shall perform mandatory site visits prior to submitting their proposals to ensure a full understanding of each site's condition.
- B. If additional sites are needed, government, utility and/or commercial sites for lease may be proposed, as well as greenfield sites that would be owned by the County. However, it is the County's desire to consider the long-term cost/value factor when evaluating designs.
- C. If alternate or additional sites are identified, it will be the responsibility of the Respondent to ensure that the identified frequencies are licensable at the proposed locations. It is also the Respondent's responsibility to perform due diligence with the tower or land owner to determine availability of the site to accommodate the proposed antennas (lease) and/or tower and shelter (greenfield), as well as associated costs, zoning and planning restrictions. Availability and associated costs related to these sites must be documented and included in the Respondent's proposal.

2.5. COVERAGE

- A. The radio system shall be designed to provide highly reliable coverage within the geographical boundaries of Fayette County while meeting FCC restrictions and requirements for 700/800 MHz systems regarding out-of-county signal propagation.
- B. Coverage design, implementation and testing for the system shall adhere to the TIA Telecommunications Systems Bulletin (TSB)-88-D, *Wireless Communications Systems Performance in Noise-Limited Situations*, latest version.
- C. Channel Performance Criteria (CPC):
 - 1. RF coverage is defined as the digital bit error rate (BER) that provides an audio signal that delivers a minimum delivered audio quality (DAQ) score of 3.4 for both outbound (talk-out) and inbound (talk-in) communications.
 - 2. TIA defines DAQ 3.4 as “speech understandable with repetition only rarely required,” which is the minimum acceptable level for public safety communications.
- D. The radio system must provide coverage as described below:
 - 1. The radio system shall provide **portable** radio coverage of 95 percent in 20-dB buildings with 95 percent reliability within the boundaries of the County.
 - a. Portable configuration is a portable carried on the hip with a speaker/microphone using a ½-wave dipole antenna. Please assume that hip level is at three feet.
 - 2. System coverage should be at DAQ 3.4 or better, per TIA TSB-88-D definitions of DAQ.

2.5.1. Coverage Maps

- A. Respondents shall include a detailed description of the propagation models used and the assumptions made in preparation of the maps. A brief description of the methodology the software used to calculate coverage also shall be included in the proposal narrative.
- B. Respondents shall submit both talk-out and talk-in system composite coverage maps for all proposed design configurations. The maps shall be clearly labeled and shall show link budget calculations for each of the following:
 - 1. Portable radios – Standard portable radio outdoors:
 - a. Talk-out to a portable radio on hip
 - b. Talk-in from a portable radio on hip
 - 2. Portable radios – Standard portable radio indoors

- a. Talk-out to a portable radio on hip, with 20 dB of building loss
 - b. Talk-in from a portable radio on hip, with 20 dB of building loss
- C. Coverage shall be depicted using a light transparent color or cross-hatching for those areas that meet or exceed the minimum coverage reliability threshold.
- D. All maps must clearly delineate the difference between areas with coverage predicted to be equal to or greater than DAQ 3.4, and areas that do not meet this coverage requirement. Respondents shall include the effects of simulcast interference in all coverage maps (if applicable).
- E. Coverage maps must include sufficient detail to allow another party to duplicate the predicted coverage utilizing propagation software.
- F. At least one set of maps depicting portable radio coverage (in a 20-dB building) shall be provided showing coverage extending outside the service area, although the County acknowledges this is not guaranteed coverage. These maps will show the extent of interoperability coverage outside the service area.
- G. Coverage maps shall be provided in the proposal in two formats:
 - 1. 11-inch x 17-inch (minimum), full-color, hardcopy format
 - 2. In PDF file format on USB flash drive

2.5.2. Map Criteria

- A. All maps shall include a background layer suitable for County reference (e.g., topographic map, roads, rivers). Link budgets shall be provided, clearly defining the following minimum information relating to each map and each site:
 - 1. Base station/repeater RF power output
 - 2. Antenna gain
 - 3. Antenna model
 - 4. Antenna mounting height and azimuth
 - 5. Antenna down tilt (if applicable)
 - 6. Transmit power and effective radiated power (ERP)
 - 7. Receiver sensitivity
 - 8. Transmit and receive antenna heights

9. Combiner/multicoupler/tower-top amplifier (TTA) gains/losses of each
 10. Transmission line lengths and line loss
 11. Mobile and portable antenna height for talk-out and talk-in
 12. Mobile and portable RF output power
 13. Configuration of field units (e.g., talk-out to portable inside 20 dB-loss buildings)
 14. Simulcast timing parameters (if applicable)
 15. Signal strength thresholds (in decibels referenced to one milliwatt, or dBm)
- B. Thirty-meter U.S. Geological Survey (USGS), National American Datum (NAD)-83 terrain elevation data shall be used for coverage simulations. Alternatively, three arc-second data may be used where 30-meter data is not available.

2.5.3. Coverage Model

- A. Respondents shall employ a suitable coverage prediction model using appropriate terrain and land-cover data for the County environment. (Reference TIA TSB-88, latest revision, for guidelines.)

2.5.4. TIA TSB-88 – User Choices

- A. User Choices:
- a. One frequency channel for control in a trunking design
 2. P25 compliance
- B. Service Area:
1. The service area is defined as the geographical area of the county
 2. The target device, usage and location are:
 - a. Mobile radios – Standard dash- or trunk-mount, with antenna mounted in the center of the trunk
 - b. Portable radios – Standard portable radio carried on the hip with a spherical microphone array (SMA) speaker/microphone using a ½-wave dipole antenna. Please assume that hip level is at three feet.
 - i. Outbound (talk-out) from the transmitter to a portable radio on hip
 - ii. Inbound (talk-in) to the transmitter from a portable radio on hip

- c. Basic network coverage for mobile radios shall be designed to accommodate vehicles traveling at speeds up to 75 miles per hour (mph)
 - i. This criterion is to be applied to the coverage areas defined in this Section 2.5 and to the coverage maps as defined in Section 2.5.2 above
- C. CPC: Minimum CPC – BER that provides a minimum DAQ 3.4
- D. Reliability Design Target: The CPC reliability design target is a service area probability of 97 percent
- E. Terrain Profile Extraction Method: map-to-grid method
- F. Interference Calculation Method: Monte Carlo Simulation method
- G. Metaphors to Describe the Plane of the Service Area: Tiled method
- H. Required Service Area Reliability: 95 percent
- I. Willingness to Accept a Lower Area Reliability to Obtain a Frequency: The County is not willing to accept lower area reliability to obtain a frequency.
- J. Adjacent Channel Drift Confidence Factor: Confidence that combined drift due to desired and adjacent channel stations will not cause degradation: 95 percent
- K. Conformance Test Confidence Level: 99 percent
- L. Sampling Error Allowance:
 - 1. True value error: ± 1 percent
 - 2. Number of subsamples: 50
- M. Pass/Fail Criterion: “Greater than” test
- N. Treatment of Inaccessible Grids: All inaccessible grids will be eliminated from the calculation.

2.6. SITE EQUIPMENT

2.6.1. Overview

- A. All site equipment supplied shall be new, of high quality, designed to provide high reliability to support mission-critical communications, and in current production. The site equipment, or RF infrastructure, consists of the following components:
 - 1. System and site control equipment

2. Simulcast equipment
3. Receiver voting
4. Transmitters
5. Receivers
6. Combiners/multicouplers
7. Antenna systems

2.6.2. System and Site Control Equipment

- A. The system and site control equipment shall be capable of controlling all voice and data channels in the proposed system. The control equipment may use a distributed or centralized architecture.
- B. The control equipment shall fully support APCO P25 functional requirements, features and performance objectives, including the common air interface (CAI).
- C. Respondents shall fully describe the manner in which the proposed system and site controllers function and operate (if used).
- D. Respondents shall define backhaul bandwidth requirements for each backhaul link within the network.

2.6.3. Simulcast Equipment

- A. The successful Respondent shall provide all necessary simulcast components and signal-processing elements that are required to optimize voice quality in coverage overlap areas.
- B. Non-captured overlap areas with delay spreads in excess of those required to meet the DAQ objective shall be minimized inside the service area.
- C. Simulcast systems shall operate without the need for frequent manual optimization and system/subsystem alignment. All alignments and adjustments shall be automated where possible (e.g., signal-conditioning adjustments for channel banks, signal launch times at sites).

2.6.4. Base Station Equipment

- A. General:
 1. Base station equipment shall be solid state in design and function with standard site conditions for temperature, altitude and humidity.

2. Equipment shall have alarm contact interfaces to provide status to a separate alarm system.
 3. The units shall be as compact as possible, with mounting configurations for standard relay racks or cabinets.
 4. All repeaters will be configured identically, with all repeaters having the same functionality and capabilities as the other repeaters.
- B. Prior to implementation, the selected Respondent shall perform the following studies at each site:
1. Intermodulation analysis – The selected Respondent shall consider equipment from all tenants located at the proposed site, per FCC license information.
 2. Maximum Permissible Exposure (MPE) study (per latest revision of Office of Engineering & Technology [OET] Bulletin 65) – The selected Respondent shall consider equipment from all tenants located at the proposed sites, per FCC license information.
 3. Respondent shall gather the site data needed for these studies.
- C. The successful Respondent shall resolve all issues predicted during the intermodulation analysis and MPE studies. If an intermodulation problem is identified following implementation and within 12 months after final acceptance, the Respondent shall resolve the issue without degrading system coverage or performance, at no cost to the County.
- D. Respondents shall include detailed specification sheets for all proposed equipment.

2.6.5. Antenna Systems

- A. Respondents shall propose all antenna system equipment necessary for a complete design.
- B. Antennas shall be appropriate to provide the required coverage and meet applicable FCC rules and regulations.
- C. Transmission line type and length shall be constructed of copper and appropriate to provide the required coverage. Antenna line shall be of the type to withstand at least 20 years of prolonged exposure to the environment in Fayette County without degradation.
- D. Transmitter combiners/receiver multicouplers: Respondents shall fully describe expansion capacity for combiner and multicoupler systems.

- E. Respondents shall include detailed specification sheets for all proposed equipment, including, at a minimum: antennas, receiver multicouplers, transmitter combiners, and TTAs (if applicable).
- F. If applicable, TTAs shall be accompanied by a test line for troubleshooting purposes.
- G. Antenna systems shall be designed with sufficient redundancy so that a failure to any one component in the transmission system will not disable the entire site.

2.6.6. Antenna Installation

- A. Antennas and cable shall be provided and installed by the selected Respondent. Antennas shall be fed with the coaxial cable specified below.
- B. The selected Respondent shall supply, install and make operational the antennas specified on the detailed tower and site drawings annexed to these specifications.
- C. The selected Respondent shall install antennas at the appropriate height and direction specified by the County or County's representative and the selected Respondent's engineer.
- D. Vertical transmission line shall be supported by an appropriate system designed to securely attach antenna transmission lines when installed on tower structures.
- E. Antennas shall be installed in accordance with the manufacturer's requirements.
- F. Tower lighting cables shall not be bundled along with transmission lines or other conductors anywhere within cable ladders or the building interior.
- G. Each transmission line run shall have entry port boots (inside and/or outside), lightning protectors and associated mounting brackets, and any additional jumpers required by the site-specific RF configuration. Some manufacturers provide transmission line kits, which include the main line connectors, top and bottom jumpers, line grounding kits (typically three per line), hoist grips, and weatherproofing materials.
- H. Transmission lines shall be anchored to the tower using hardware recommended by the transmission line manufacturer for that type of tower.
 - 1. Spacing of anchoring hardware is determined by the line manufacturer and is dependent on the type and size of the line.
 - 2. Hangers and/or angle adapters typically are provided for every three feet of line, including any ice bridge paths. No snap-on style hanger kits shall be utilized.
 - 3. Clamps and hardware shall be corrosion-resistant.

- I. Cables shall be secured to the tower with the appropriate cable hangers and hardware. The selected Respondent shall not use tie wraps, wire wraps, pieces of wire, tape, or similar temporary material to secure cables on the tower.
- J. Cables shall be secured to the tower by the use of hanger kits supplied by the tower contractor. Such hangers shall be used in the quantity and attached in the manner specified in this document.
- K. An ice bridge with a cable support system may be utilized at the communications shelter point of entry.
- L. The transmission line support system shall run to the highest-mounted antenna and allow for two times the identified cable requirements in the contract drawings.
- M. The selected Respondent shall install and run RF jumpers from the RF surge protectors to the radio equipment.
- N. Transmission lines shall be identified in a permanent manner using metal tags (or equivalent method) located at the antenna, at the bottom of the tower, at the shelter cable entrance, and inside the shelter or building.

2.6.7. Removal of Existing Infrastructure and Equipment

- A. Respondents shall be responsible for the decommissioning, removal, and disposal of legacy equipment from existing County sites that are not used in the proposed radio system. This shall occur no earlier than the completion of system cutover.
 - 1. The exact heights of all existing antennas are not known at this time.
Respondent can assume all existing antenna mounts are below 400 feet.

2.7. NETWORK MANAGEMENT SYSTEM

- A. This section provides specifications and requirements for an integrated monitoring-and-control system for local and remote site facilities and equipment. The network management system (NMS) is used to provide remote indication of status, alarms and analog values, and to provide remote control relay operations. Some of the terminals may be required to manage or provision different subsystems in the network. Respondent shall provide a description of its NMS, including capabilities and available options.
- B. System Alarms: The NMS shall acquire, process and display information in an integrated and uniform fashion for a variety of critical systems. Alarms on major components that allow for Simple Network Management Protocol (SNMP) will be displayed via the NMS. Devices that have an option for SNMP must be properly configured to allow for transport back to the NMS. The following devices should be monitored:
 - 1. Trunked simulcast radio system

2. Local and remote site facilities
 3. Primary and backup power systems to include generator
 4. Microwave, leased line and data networks
- C. Site Alarms: Any change in the state of site equipment shall induce an alarmed state. Equipment monitored shall include at a minimum:
1. Surge arrestors
 2. Transfer switch (normal or bypass state)
 3. Power fail
 4. Heating, ventilation, and air-conditioning (HVAC)
 5. Smoke detector
 6. Intrusion detection
 7. High temperature
 8. Low temperature
 9. High humidity
 10. Uninterruptible power supply (UPS)/direct current (DC) power fail
 11. UPS/DC power state (normal or bypass)
 12. Generator (including generator run, low fuel, high temperature, fail, etc.)
 13. Generator not in automatic mode
 14. Floor water/flood alarm

To reduce false alarms, all alarm contacts normally shall be closed when no alarm is present. Any device that can send alarms via IP methods should be provided instead of contact closures.

- D. NMS components include:
1. Network management terminals (NMTs)
 2. Remote terminal units (RTUs)

- E. Historical Reports: The Respondent shall describe the equipped capabilities the system will provide to generate reports for system historical data, including the following search fields for user-specific date ranges:
1. System capacity/grade of service
 2. Number of busies
 3. Number of affiliated users
 4. Affiliated subscriber IDs
 5. Affiliation history of individual subscriber IDs
 6. Subscriber registrations/de-registrations
 7. Denied registration attempts

2.7.1. Network Management Terminal

- A. The NMT shall provide primary processing, display and control of information to and from a variety of RTU locations. System status and alarm conditions shall be displayed. The system shall provide the ability to remotely access the system to check the operational status of the system and to view alarms.
- B. The NMT shall be installed at a “to be determined” location of the County’s choosing. Each location will have the ability to login into every NMS. All locations will have the capability to be active simultaneously.
1. Main NMT terminal “to be determined”
 2. The primary and backup site will have NMTs.
 3. Each console location will be enabled to view NMTs
 4. Remote capabilities need to be designed for local and vendor support. Current vendor-supported network operations centers (NOCs) may be reused. However, please describe the security measures to protect the system.
 5. Two other remote NMTs need to be available through the County’s information technology (IT) network. If they can be operated on a County-issued laptop, these devices do not need to be quoted, only the software.
- C. The NMT shall meet the following general requirements:
1. Expandable software and hardware architecture shall be easily updated by adding software modules and hardware boards.
 2. Hardware and software platforms shall be personal computer (PC)-based using current versions of hardware and software.

3. Both graphic and tabular displays shall provide instantaneous and comprehensive network status information.
4. The NMT shall provide full archiving and control functions.
5. Multiple alarm protocols for higher-level NMSs shall be mediated by the NMT.
6. The NMT shall be designed to monitor a large cross section of equipment so that it can consolidate multiple alarm systems, rather than just poll alarms from RTU locations.
7. The NMT must perform full management functions with a local or remote terminal.
8. The NMT shall provide email or text notification of alarms.
9. The NMT shall provide alarm filtration and consolidation.
10. A Web browser interface shall be provided for common management functions. Functions that cannot be displayed for remote access need to be listed in the response.
11. A secure Web browser interface shall be provided to monitor alarms and perform control and management functions via intranet or internet.

D. NMT/RTU communications protocol(s) supported:

1. Respondents shall fully describe all protocols used or supported.
2. Respondents shall identify which of the following protocols are supported, either standard or as an option:
 - a. American Standard Code for Information Interchange (ASCII)
 - b. Simple Network Management Protocol (SNMP) and version.
3. Proprietary protocols may be acceptable, provided that all requirements are met.

E. Standard Features – Respondent's solution shall include the following features:

1. Respondent shall provide programmable display screens including the following:
 - a. System Summary – High-level screen summary window with links to other screens
 - b. Change of State – Summary of points that have changed state from alarm to normal or normal to alarm
 - c. Standing Alarms – Summary of all points in alarm condition

- d. Programmable Alarm Windows – Allowing logical grouping of alarms, such as by type or site
2. Respondent shall provide for the graphic depiction of the network allowing annunciation and point selection via icons:
 - a. Nested-tree depiction of the network with drill-down capability
 - b. Capability to drive external display devices
3. Programmable console environment, including:
 - a. Database definition
 - b. Screen colors
 - c. Alarm summary formats
 - d. Blink attributes
 - e. Pager alarm formats
 - f. Audible alert formats
4. Status Points – The following status types shall be supported:
 - a. Simple status – Contact open or closed
 - b. Change detect – Simple status plus change detect since last scan
5. Control Points – The following relay control types shall be supported:
 - a. Direct control
 - b. Select before operate
 - c. Batch – Control multiple relays with a single operation
6. Analog points – Display the value of a monitored quantity such as temperature, fuel level, voltage standing wave ratio (VSWR), etc.
7. Time stamp indicating date and time of message within 0.5 seconds
8. Conditional assignable text messages (minimum 256 characters) for each point to be issued on a change of state or alarm
9. Alarm qualification – On a point basis, programmable delay before alarm is issued
10. Alarm deactivation – On a point basis, the ability for the operator to deactivate an alarm to inhibit additional annunciation
11. Alarm history:
 - a. Logging of all alarms to disk and printer (selectable)
 - b. Minimum history log of 500,000 entries

12. Email support – Text message of alarm sent to email lists
13. Ping interrogator – To confirm that servers, routers and IP-based equipment are physically present on the network
14. Editor – Providing point configuration utilities to create and edit point databases
15. Security – Multiple levels of user name and password protection to all for flexible system management
16. Reports – Respondent shall define the reports that are available. Respondent shall describe how trend analysis is supported and how current system status is reported. System shall be able to provide comprehensive planning and analysis, and shall have a flexible user interface.

2.7.2. Remote Terminal Units

- A. RTUs shall be provided in sufficient quantities to monitor the entire network, including:
 1. Trunked and conventional radio network components
 2. Site facilities including shelter, tower, lighting, power and generator
 3. Microwave radios, channel banks, etc.
 4. Simulcast paging transmitters (if equipped)
 5. Data network equipment, including routers, switches, etc.
 6. Remote access to all data and provisioning aspects of the system.
 7. Other miscellaneous equipment
- B. RTUs shall be fully compatible with NMTs supplied and provide complementary functionality wherever necessary to provide a complete working system.
- C. RTUs shall support the following points:
 1. Status/alarms – 48 minimum, expandable to 256
 2. Control outputs – 8 minimum, expandable to 32
 3. Analog inputs – 8 minimum, expandable to 16
- D. RTUs shall support time stamp and system time synchronization.

- E. Terminations for all points shall be provided on suitable terminal blocks providing ease of installation, testing and maintenance.
- F. Respondents will submit as part of the proposal an IP cloud diagram showing each of the NMS servers and terminals in the system. This diagram will show how to remotely access each of these terminals for any of the NMS, including a proposed IP scheme.

2.8. SHARED SWITCH – OPTION

- A. Respondents may, but are not required to, provide an optional design leveraging shared network control infrastructure in addition to the required design submission. Detailed costs of the shared switch design shall be provided, along with maintenance and warranty costs. Any present and future requirements or restrictions for Fayette County infrastructure to continue operating on the shared switch shall be explained.

2.9. MOBILE DATA – OPTION

- A. As an option, Respondents should include the ability to utilize the P25 backbone to support data applications, including at a minimum mobile data, subscriber unit global positioning system (GPS), over-the-air programming (OTAP), over-the-air rekeying (OTAR), and any other optional applications such as fire station alerting. Responses should include both system and subscriber costing.

2.10. BACKUP CONSOLETTES – OPTION

- A. As an option, Respondents shall provide backup consolettes for each console position. Respondents will provide details regarding the interface between the consolettes and the consoles. The design of the consolette system shall include all necessary cabling, surge protection and antennas.

3. BACKHAUL NETWORK

3.1. OVERVIEW

- A. Overall design assumption: The County acknowledges that at this early point in the process there is a mixture of existing sites AND conceptual sites being discussed. Until the P25 system is fully designed and conceptual sites are confirmed and are a certainty, sites listed in Appendix E will be used for purposes of this RFP. Some level of modification or adjustment to the backhaul network design may be necessary after sites are selected and the P25 design is firm.
- B. Respondents will propose a microwave backhaul system with consideration given to a fiber-optic network for connectivity as an option.
- C. Respondents shall propose a detailed backhaul plan. The plan shall include, at a minimum, path-loss calculations and annual availability for each path, as well as an overall network topology.
- D. The County requires that the microwave system be installed and operational prior to the field installation of the radio system's fixed network equipment (FNE), so that it may support the legacy radio system.
- E. The County does not have any existing microwave equipment.

3.2. DIGITAL MICROWAVE NETWORK

- A. The digital microwave network shall consist of the following components:
 - 1. Point-to-point digital microwave radios
 - 2. Microwave antennas
 - 3. Antenna systems
 - 4. Alarms
 - 5. NMS

3.2.1. Requirements

- A. The digital microwave backhaul network shall consist of monitored hot standby (MHSB) or ring-protected, point-to-point licensed microwave hops.
- B. Microwave terminal equipment shall include transmitter, receiver, modem, power supply, automatic switching device, multiplexer, service channel(s), and all associated interconnections to provide a complete and functional system.

- C. The radio shall deliver two-frequency, full-duplex operation. Space diversity configurations are acceptable, if necessary, to meet reliability requirements.
- D. AS AN OPTION, the network shall support multiprotocol label switching (MPLS) routing to support seamless integration and ad hoc routing with landline-based Ethernet connections.
- E. Capacity
 - 1. Each hop shall be equipped for the proposed IP radio network requirements
 - 2. Each hop shall deliver a minimum payload capacity of 155 megabits per second (Mbps) or more, as required to serve the proposed network.
- F. Performance Objectives
 - 1. Each microwave hop shall be designed to meet or exceed end-to-end annual reliability performance ($BER = 10^{-3}$) of 99.995 percent at the required capacity.
 - 2. Each microwave hop shall be designed to meet or exceed end-to-end annual quality performance ($BER = 10^{-6}$) of 99.999 percent at the required capacity.
 - 3. The mean time between failures (MTBF) for the proposed MHSB transceiver equipment shall exceed 25 years.
- G. Frequency
 - 1. The successful Respondent shall be responsible for all microwave frequency research, prior coordination, and preparation of all associated FCC license applications and submittals on behalf of the County.
 - 2. The County shall be responsible for coordination fees and licensing fees, if any, and signatures, if applicable.
 - 3. The Respondent shall propose the most appropriate licensed frequency band for each hop based on the requirements and FCC Part 101 regulations. Operation in the 6 gigahertz (GHz) licensed frequency band is preferred.
- H. Transmitter
 - 1. Respondent shall provide transmit output power referenced to the antenna port.
 - 2. Transmit output power shall be software adjustable.
 - 3. Automatic transmit power control (ATPC) shall be available.
 - 4. A switch from the main transmitter to the standby transmitter shall not result in a system outage. Respondent shall describe expected switchover time.

5. Radios shall be equipped with redundant power amplifiers. Switching between power amplifiers shall not result in a system outage.

I. Receiver

1. Respondent shall provide a guaranteed receiver threshold.
2. Respondent shall provide performance criteria of the proposed radios for the following:
 - a. Co-channel interference
 - b. Adjacent-channel interference
 - c. Dispersive fade margin
3. The receiver shall be designed to ensure that the receiver with the better performance is operational at any given moment. Respondent shall equip radios with a 10:1 split to prevent frequent switching.
4. Transfer to the backup receiver shall not result in a system outage.

J. Antenna System

1. Microwave antennas shall be compatible with the radio frequency bands and conform to applicable FCC requirements. Solid parabolic-type, Category A antennas shall be used in accordance with FCC Part 101.115.
2. A pressurized elliptical waveguide shall be used. Connectors shall be standard, premium-type, and compatible with antennas and radios, and in accordance with latest revision of the ANSI/TIA-222 interfaces. Tower-mounted outdoor units (ODUs) shall not be proposed.
3. All mounting brackets, connectors, and other hardware shall be supplied as necessary for a complete installation.
4. An automatic dehydrator/pressurization system shall be provided to maintain at least 5-psig (pounds per square foot gauge) positive pressure of conditioned air in the elliptical waveguide and antenna feed unit. Individual pressure gauges on a distribution manifold shall be provided for each line.
5. All installed antenna/transmission lines shall be purged, pressure tested, and tested for low VSWR using return loss measurements. The minimum acceptable return loss shall be a VSWR of 1.5:1 and return loss of 14 dB.
6. All RF paths shall be tested to demonstrate proper antenna alignment by measuring the net path loss between sites, as measured at the equipment rack interface.

7. All antenna sweep testing results shall be documented and provided in the as-built documentation at each site.

K. Microwave Network Management System (MNMS)

1. Respondents shall fully describe alarm, monitor, and control capabilities of the microwave terminal equipment, including capacity for external alarms (e.g., door alarms, generator).
2. Respondents must define each of the alarms to the MNMS, and define the alarm protocol, e.g., SNMP v.3 or dry contact closure.
3. It is preferred by the County to have alarm and control capabilities for microwave equipment integrated into the NMS for the P25 trunked system. See Section 2.7, Network Management System. Respondents shall fully describe the nature of the interface between the systems and how to provision the microwave or MPLS paths.

L. Power

1. A DC power subsystem shall be provided for each microwave terminal.

3.2.2. Microwave Engineering

- A. Respondents shall conduct physical path surveys following notice to proceed to assure that all proposed paths meet proper clearance criteria.
- B. Respondents also shall conduct mandatory visits at all sites and notify the County/Owner of any site modifications necessary for the microwave hop.
- C. Respondents shall provide antenna centerline mounting height recommendations, based upon the information gathered during the physical path surveys and site visits.
- D. Respondents shall include fade margin calculations with the proposal, showing the preliminary antenna sizes, system gains, and system losses.
- E. Radomes shall be provided for each microwave antenna.
- F. The equipment shall be type-accepted for licensing under Part 101 of the FCC Rules and Regulations.

4. SITE DEVELOPMENT

4.1. GENERAL

- A. Site selection that will support the required system performance while minimizing costs is desired. Proposals shall include items such as shelter, generator, and site development to support the radio sites, as appropriate for the sites being recommended.
- B. Respondents shall perform due diligence in verifying all proposed site data for inclusion in the proposed radio system.
- C. Respondents may provide proposals exclusively for the infrastructure and facilities portion of this RFP. These Respondents shall make the following assumptions:
 - 1. Respondents shall propose facilities and infrastructure components (towers, shelters, generators, etc.) for the 13 sites identified in Appendix E. The matrix identifies the facilities and infrastructure components required at each site.
 - 2. Respondents shall make reasonable assumptions regarding NEPA/SHPO¹ findings and geotechnical reports.
 - 3. Respondents shall include pricing for the development of raw land sites, including site clearing, construction drawings, zoning applications, NEPA/SHPO applications, FAA obstruction evaluation filings, towers, shelters, generators, fencing, subterranean grounding systems, fencing, and any other equipment or services necessary for the construction of a new radio site. Towers should be proposed at heights of 150, 200, 250, and 300 feet.
 - 4. Because the facilities and infrastructure design will depend on the sites selected by the radio vendor, all pricing shall be itemized so that the County may add or remove components to accurately calculate updated total costs.
- D. Respondents shall be responsible for ensuring that all radio sites are brought up to the latest revision of Motorola R56 or equivalent. Respondents must identify any specific enhancements required to existing radio sites during the mandatory site visits. If Respondents identify a leased tower location, any associated work required to upgrade those sites to Motorola R56 or equivalent must be included.
- E. Respondents shall identify and propose any additional work necessary to bring radio sites to the latest revision of Motorola R56 or equivalent for new or existing sites, including, at a minimum:
 - 1. Towers
 - 2. Shelters
 - 3. Backup power
 - 4. Site preparation

¹ National Environmental Protection Act/State Historic Preservation Office.

5. Fencing
- F. For the 45-day design, the successful Respondent shall provide detailed drawings, including all structures and foundations, in accordance with state law.
 1. Detailed drawings containing dimensions shall be provided that show all system components and locations.
 2. Drawings and/or specifications shall describe any auxiliary equipment.
 3. Manufacturer slick sheets of all equipment used also shall be provided.
- G. Code Compliance:
 1. Installation of all electrical equipment, power distribution, lighting assemblies, and associated wiring shall comply with the most recent edition of the NEC and Occupational Safety and Health Administration (OSHA) regulations.
 2. All electrical equipment shall be listed or approved by Underwriters Laboratories (UL).
 3. The successful Respondent and any subcontractor employed by the Respondent shall comply with all local codes and industry best practices and guidelines stipulated in Section 1.6.1, Standards and Guidelines.
- H. The successful Respondent shall assume total responsibility for maintaining liability insurance covering the following items:
 1. Project design
 2. Implementation
 3. Licenses
 4. Shipping
 5. Receiving
 6. All required site work
 7. Any items required for Respondent or any required subcontractors
- I. Prior to any excavations, the Respondent or its subcontractor(s) shall follow appropriate procedures outlined at the following website: www.call811.com.
- J. The successful Respondent will coordinate with utility companies for all utility-related items, such as electrical service hookups and disconnects.

K. Concrete:

1. For all foundations and concrete work, the Respondent or its subcontractor(s) shall provide to the project engineer a test sample of each mix of concrete demonstrating that it has been tested for compliance with the foundation specifications set forth by the requisite site engineer. Written reports certifying the strength of the concrete shall accompany each test cylinder.
2. If any concrete used in the foundation does not meet specifications, the Respondent or its subcontractor(s) shall remove the foundation and pour a new foundation using compliant materials, at no expense to the County/Owner.

4.2. TOWERS

A. General:

1. If the Respondent determines that additional towers are required, or existing towers must be replaced or modified, the Respondent shall propose required solutions.
2. Any tower manufacturer supplying a tower(s) for this system shall guarantee structural integrity of the tower for a period of not less than 20 years from the date of acceptance.

B. Tower Loading:

1. The tower and foundation shall be designed for all proposed equipment, legacy equipment, appurtenances, ancillary equipment, and initial antenna loading, plus 25 percent future antenna system growth as an option, without addition to or modification of the finished tower or foundation.
2. The proposed tower structure shall be designed and installed in accordance with latest revision of the ANSI/TIA-222 standard.

C. Proposed towers shall include the following:

1. Ice Bridge – A 24-inch, open mesh-type, horizontal transmission-line ice bridge, extending from the tower cable ladder to the equipment building, including 24 four-inch-diameter line entry ports, shall be provided.
2. Transmission Line Support – A vertical transmission line support system shall be provided to securely attach the antenna transmission lines. Holes shall be provided in the tower support members, tower hanger adapter plates, or separate ladder structures to allow installation of snap-in cable hangers and bolt-in cable hangers at maximum three-foot intervals. The mounting holes shall be precision punched or drilled, and sufficiently separated to accommodate the snap-in or bolt-in hangers.
3. Climbing Access – A ladder, beginning at a point at least ten feet off the ground, shall be provided as an integral part of the tower to permit access by authorized personnel. The tower shall be equipped with an OSHA-approved anti-fall safety device in accordance

with the latest revision of ANSI/TIA-222. This device must not interfere with the climber's ease of reach by hand or foot from one rung of the ladder to the next, either going up or coming down. Two safety climbing belts shall be supplied with each new tower.

4. Lighting (as applicable):
 - a. Tower lighting shall be supplied as required by the applicable determination as issued by the FAA for this project, and shall be fully compliant with FAA AC 70/7460-1K, latest revision.
 - b. The system control circuitry shall provide synchronization and intensity control of the obstruction lighting system, and shall monitor the overall integrity of the lighting system for component failures or improper operation.
 - c. The successful Respondent or its subcontractor(s) shall wire all alarms to the provided Type 66 block located in the communications shelter or equipment room. All alarms shall be clearly labeled.
 5. A lightning ground rod shall be installed at the very top of the tower to extend at least two feet above the top of the tower or lighting fixture.
 6. Labeling shall be clearly provided near the base of all new towers for the following:
 - a. Make
 - b. Model
 - c. Serial number
 - d. Tower height
 - e. Latitude and longitude
 - f. FAA and FCC identification numbers (if applicable)
- D. Construction:
1. All welding must be done in the factory prior to the galvanizing process. Field welding is not acceptable.
 2. The tower shall be constructed of high-strength steel. All components and hardware shall be hot-dip galvanized with a zinc coating after fabrication, in accordance with latest revision of the ANSI/TIA-222 standards. A zinc coating shall be permanently fused to the steel, both inside and outside, so that all surfaces are protected and no painting is required for rust protection.
 3. Prior to galvanization, each piece of steel and every weld must be deburred and smooth finished.
- E. Final Testing and Acceptance – Upon completion of the work, documentation detailing final inspection and testing shall be submitted, documenting the following:

1. Steel structure:
 - a. Vertical alignment and plumbness
 - b. All bolts tight and torqued to specification
 - c. No damaged or missing structural members
 - d. All surface scratches and damage to the galvanization repaired
 - e. No signs of stress or vibration
 - f. All climbing ladders and other devices installed correctly
 - g. Labels and tags
2. Foundation:
 - a. Concrete finish shall exhibit no cracks or blemishes
 - b. Grouting, if used, shall have drain holes if the tower uses hollow-leg construction or monopole design
 - c. Backfilling and grading shall be conducted
3. Grounding – Shall meet applicable standards such as Motorola R56®; items include the following, at a minimum:
 - a. Verify lugs and exothermic welds
 - b. Test and record ground resistance
 - c. Install lightning ground rod at top of tower
4. Ice Bridge – Install per tower manufacturer specifications
5. Lighting and controls:
 - a. Inspect conduit and wiring installation
 - b. Verify proper lamp operation
 - c. Verify alarm contact operation
 - d. Verify labeling
6. Photographs:
 - a. Overall structure from north, east, south, and west
 - b. Footers
 - c. Grounding

4.3. SHELTERS

A. General:

1. Respondents shall propose a new or used equipment shelter at new site locations and where existing shelters are deemed inadequate. If used shelters are proposed, the Respondent shall ensure that the used shelters meet the same specifications as a new shelter, as specified within this RFP.

2. The shelter shall be a prefabricated, preassembled shelter. The shelter can be constructed from concrete and/or aggregate materials.
- B. Size:
1. Shelter dimensions shall be determined by the selected Respondent dependent upon final design. Legacy and proposed systems shall use up to 60 percent of the floor space, leaving a minimum of 40 percent for future expansion.
 2. Minimum shelter size shall be 12-foot by 16-foot, with a minimum interior height of nine feet.
- C. Foundation: The foundation for the shelter shall consist of concrete piers or a poured concrete slab constructed by the selected Respondent or subcontractor that will properly support and secure the shelter. Foundation drawings recommended by the shelter manufacturer shall be the criteria by which the foundation is constructed.
- D. Flooring:
1. Respondents are to propose a structure where the floor or solid foundation features a minimum uniform load rating of 200 pounds per square foot with no more than 3,000 pounds over any four-square-foot area, unless additional load rating is required for batteries. This rating shall be increased in sections as necessary to support heavyweight equipment. If the shelter is delivered with the floor already assembled, the floor shall exhibit a minimum 90-pounds-per-square-foot uniform live load capacity while the building is being lifted.
 2. Floors shall be insulated to a minimum R-11 rating. Insulation shall be secured in place to prevent shifting during construction and transportation.
 3. Exterior covering of the floor shall be included to prevent rodent penetration.
 4. The floor shall be covered by a high-quality, industrial/commercial-grade asphalt or vinyl tile. All edges shall be covered by wall molding.
- E. Walls:
1. Walls shall be constructed to a minimum 120-mph wind loading, including overturning moments.
 2. Walls shall withstand the effects of bullets or other projectiles equivalent to a 30.06 high-power rifle load fired from a distance of 50 feet, with no penetration to the inner cavity of the wall. No interior damage shall be sustained, including to insulation, interior walls, etc.
 3. The outside walls shall be finished concrete or an aggregate composition.
 4. A wall feed-through with 12 four-inch openings shall be provided on the tower side of the building to accommodate elliptical waveguide and coaxial transmission lines. The

openings shall be properly booted to provide a good weather seal. The wall feed-through shall be bonded to the site ground system per guidelines specified in Section 1.6.1, Standards and Guidelines.

5. The inside walls shall be finished with minimum 5/8-inch plywood (or equivalent) to allow mounting of panels, blocks, etc., and trimmed with coordinated molding.
6. High-performance insulation shall provide a minimum insulation factor of R-11.

F. Roof:

1. The building roof shall support a minimum 100 pounds per-square-foot uniform live load.
2. The roof is to be pitched to facilitate water runoff.
3. The shelter roof shall withstand the impact of ice falling from the adjacent tower without suffering any damage, or shall otherwise be protected from such damage. Respondents are to describe in their proposals how this requirement will be met.
4. High-performance insulation shall provide a minimum insulation factor of R-19.

G. Doors:

1. Shelters shall have one 42-inch by 84-inch insulated door, with three stainless steel tamper-proof hinges, passage-style lever handle, deadbolt lockset and fiberglass weather hood or awning. The door shall be equipped with a hydraulic door closer.
2. The exterior door shall be of aluminum or steel (stainless or galvanized) construction with a finish to match the building finish.
3. The door shall withstand the effects of bullets or other projectiles equivalent to a 30.06 high-power rifle load fired from a distance of 50 feet, with no penetration to the inner cavity of the door. No interior damage shall be sustained, including to insulation, interior walls, etc.
4. The door sill shall be of stepped construction to prevent rain water from entering the shelter at the bottom of the door or from around the door frame. The door frame shall have a weather seal around the door to limit air and water intrusion.
5. Locks shall be constructed of non-corroding materials, and shelter locks shall be keyed alike for shelters. Four keys shall be provided to the County/Owner.

H. Finishing:

1. Respondents shall describe the interior and exterior finishes. Color and finishes shall be selected by the County from samples provided by the selected Respondent or its subcontractor.

2. All joints shall be sealed with a compressible, resilient sealant.

I. Alternating Current (AC) Power System:

1. The selected Respondent shall deliver the building complete with a 200-ampere-capacity, 240-volt, single-phase electrical panel box with a ground bar.
2. This panel shall be equipped with a 200-ampere-capacity main circuit breaker used to supply power for all electrical functions related to the site.
3. Overall panel size shall be determined by the need to provide the number of individual breakers required, plus a reserve of at least six 240-volt slots.
4. Breakers for shelter air-conditioning will be of the bolt-down, not snap-in, type.
5. Receptacles:
 - a. Each radio equipment unit (or rack) shall be supplied with two 20-ampere circuits, each terminated at a typical NEMA 5-20 receptacle. Receptacles shall be mounted to the side of the overhead cable tray.
 - b. Service receptacles shall be mounted on the walls at six-foot intervals or less.
 - c. One weatherproof ground fault interrupter (GFI) exterior power receptacle shall be provided with each shelter, to be mounted near air-conditioning units.
 - d. Each receptacle shall be fed from an individual breaker. The feeding breaker shall be identified at the receptacle and the receptacle shall be identified at the breaker. All breakers or circuits shall be rated at 20 amperes, unless otherwise noted.

J. Power Line Surge Suppression:

1. An AC surge protector shall be provided and installed inside the shelter.
2. An acceptable unit shall be an in-line type such as the AC Data Systems "integrated load center." An alternate unit must meet or exceed all of the capabilities of this model unit.
3. Minimum surge protector requirements:
 - a. Built-in redundancy of dual stages per phase with filtering
 - b. Surge energy shunted to ground, not to neutral
 - c. Front panel indicator lamps
 - d. Remote/local status contacts
 - e. Fusible link protected so as not to interrupt power
 - f. Field replacement protection blocks or fuses, if needed
 - g. UL-listed components
 - h. 45 kiloamperes (kA)-per-phase ANSI C62.1 8/20 waveform

- i. Electromagnetic interference/radio frequency interference (EMI/RFI) filtering per MIL-STD-220
- j. The unit shall be capable of handling the full 240-volt, 200-ampere capacity of the electrical system.

K. Wiring Methods:

- 1. All wiring noted on the site drawings or otherwise included by the selected Respondent shall be installed in conduit or ductwork. Where no protection method is specified, conduit shall be used.
- 2. All conduits and ducts shall be securely surface-mounted and supported by approved clamps, brackets, or straps as applicable, and held in place with properly selected screws. No wiring shall be embedded inside any walls, floor or ceiling. Entrance power, outside light, air-conditioning outlet, and telecommunications are the only wiring that may penetrate shelter walls or floor.
- 3. All wire raceways, conduits, etc. are to be mechanically joined and secured.
- 4. Flexible steel conduit or armored cable shall protect wiring connected to motors, fans, etc., and other short runs where rigid conduit is not practical.
- 5. Unless otherwise specified, all power wiring shall be a minimum #12 American wire gauge (AWG)-size solid copper conductors with insulation rated for 600 volts AC (VAC).

L. Portable Generator Support

- 1. The shelter shall have an external generator power connector for portable generator support. The Respondent shall provide an Appleton connector, or equivalent, on the outside of the shelter on the short wall closest to the shelter door, or where possible.

M. Light Fixtures:

- 1. Ceiling-mounted, four-foot, fluorescent light fixtures (two 40-watt [W] bulbs per fixture) with RFI ballasts shall be supplied for the equipment shelters. A sufficient quantity of light fixtures shall be supplied to provide a uniform light level throughout the building of 150 foot candles at four feet above the floor. The ballasts or LED lights shall not generate RFI interference on any radio frequency.
- 2. Light fixtures shall be fed as a gang from a common breaker and controlled by an on/off switch near the door.

N. Outdoor Lighting:

- 1. An exterior 100-W, wall-mounted, motion-controlled light shall be mounted on the front entrance of the shelter.

2. The exterior lighting system shall be fed from a separate, appropriately rated breaker and light switch by the door.

O. Heating, ventilation, and air-conditioning:

1. Respondents shall provide an HVAC system for each shelter proposed. Respondents shall propose dual air-conditioning units with lead lag controller. Each air-conditioning unit shall be sized for 100 percent of the building's required cooling capacity, as determined by British thermal unit (BTU) analysis.
2. The selected Respondent shall perform BTU analysis (heat-load calculations) for all shelter equipment during preliminary design to verify HVAC system size. All calculations shall include a 50-percent expansion factor, and all assumptions regarding power consumption, duty factor, and heat loading shall be thoroughly explained.
3. Each unit shall be capable of maintaining an inside ambient temperature range between 65 and 85 degrees (°) Fahrenheit (F). Each unit shall be sized to maintain temperatures inside the shelter at 70° F when exterior temperatures go as high as 100° F.
4. The HVAC system shall be controlled by a wall-mounted thermostat. The thermostat shall turn the heater on when the temperature inside the shelter drops to 65° F and off when it rises to 68° F. It shall turn on the air-conditioner when the interior temperature reaches 78° F and off when the temperature drops below 75° F. Thermostat control shall be adjustable within the range of 45° to 85° F.

P. Antenna Cable Conduit Entry: A bulkhead panel shall be supplied to accommodate coaxial transmission lines between 1/2-inch and 1⁵/₈-inch diameter elliptical waveguides. A minimum of 12 transmission lines shall be accommodated with four-inch openings. The building manufacturer shall seal the conduits into the wall to assure that they are watertight.

Q. Cable Tray: All new shelters shall be equipped with cable trays. The selected Respondent shall install a minimum 18-inch-wide cable-tray system above the equipment.

R. Shelters shall be supplied with at least one ten-pound, carbon-dioxide (CO₂) fire extinguisher, an approved eye-wash station and first-aid kit.

4.4. GENERATOR AND AUTOMATIC TRANSFER SWITCH

- A. Respondent shall provide an emergency generator system at each new radio communications site for backup power, sized appropriately for the system. For existing sites where a generator may be reused, an assessment of sufficiency should be completed and any recommended enhancements proposed.
- B. This section provides specifications and requirements for standby power systems to supply electrical power in the event that the normal supply fails. Standby power systems shall consist of a liquid-cooled engine, an AC alternator and system controls with all necessary accessories for a complete operating system, including at a minimum the items as specified.

- C. Respondent shall perform electrical-loading analysis for shelter equipment, including HVAC subsystems, during preliminary design to verify generator size and fuel-tank capacity. All electrical-loading calculations shall include a 50 percent expansion factor, and all assumptions regarding power consumption and duty factor shall be thoroughly explained.
 - 1. For the purpose of the proposal, the Respondent shall assume the following:
 - a. Single phase
 - b. 60 Hz operating frequency
 - c. 0.8 power factor
 - d. Propane or diesel fuel
 - e. Minimum 72-hour runtime
- D. In the event of a commercial power outage, the emergency generator shall provide power to the entire shelter without a system outage.
- E. Quality Assurance – The system shall be supplied by a manufacturer that has been regularly engaged in the production of engine-alternator sets, automatic transfer switches (ATS), and associated controls for a minimum of ten years, thereby identifying one source of supply and responsibility.
- F. The generator system and all accessories and ancillary equipment shall comply with the following standards:
 - 1. NFPA 37, *Flammable and Combustible Liquids Code*
 - 2. NFPA 55, *Standard for the Storage and Handling of Compressed Gases*
 - 3. NFPA 70, *National Electrical Code*, with particular attention to Article 700, “Emergency Systems”
 - 4. NFPA 110, *Requirements for Level 1 Emergency Power Supply System*
 - 5. NFPA 101, *Code for Safety to Life from Fire in Buildings and Structures*
 - 6. ANSI/NEMA MG 1, *Motors and Generators*
 - 7. ANSI/NEMA AB 1, *Molded Case Circuit Breakers*
 - 8. ANSI/NEMA 250, *Enclosures for Electrical Equipment (1,000 Volts Maximum)*
- G. Labeling and Identification – All wiring harnesses and connectors shall be clearly identified by number and function according to the associated schematic diagrams and documentation provided by the Respondent.

H. Factory Testing:

1. Before shipment of the equipment, the generator set shall be tested under rated load for performance and proper functioning of control and interfacing circuits. Tests shall include:
 - a. Verification that all safety shutdowns are functioning properly
 - b. Verification of single-step load pick-up per NFPA 110-1996, paragraph 5-13.2.6
 - c. Verification of transient and voltage-dip responses and steady-state voltage and speed (frequency) checks
 - d. Full load test for a minimum of one hour
2. Respondent shall provide complete report(s) of all testing performed.

I. Startup and Checkout:

1. The supplier of the electricity-generating plant and associated items covered herein shall provide factory-trained technicians to check the completed installation and to perform an initial startup inspection to include:
 - a. Ensuring that the engine starts (both hot and cold) within the specified timeframe.
 - b. Verifying that engine parameters are within specification.
 - c. Verification of no-load frequency and voltage adjustment, if required.
 - d. Testing of all generator automatic shutdowns.
 - e. Performing a simulation of power failure to test generator startup and the ability of the ATS to pick up building load correctly.
 - f. Returning to commercial power and testing the generator and ATS to demonstrate correct cycling to normal commercial power.
 - g. Performing a load test of the generator, to ensure full-load frequency and voltage is within specification when using building load. This test shall be run for a minimum of one hour.
 - h. Testing and verifying all remote indicators and controls.
2. Respondent shall provide complete report(s) of all testing performed.

4.4.1. Diesel Generator

- A. The prime mover shall be a liquid-cooled, diesel engine.
- B. The engine shall have a sufficient horsepower rating to drive the generator to full output power without a gear box between the engine and generator.

- C. The engine shall have a battery-charging DC alternator with a solid-state voltage regulator.
- D. The generator shall meet temperature-rise standards for Class H insulation, operating within Class F standards for extended life.
- E. The alternator shall have internal thermal-overload protection and an automatic-reset field circuit breaker.
- F. One-step load acceptance shall be 100 percent of the generator set nameplate rating, and shall meet the requirements of NFPA 110, paragraph 5-13.2.6.
- G. The electricity-generating plant shall be mounted with vibration isolators on a welded-steel base that shall permit suitable mounting to any level surface.
- H. A main-line-output circuit breaker carrying the UL mark shall be factory installed.
 - 1. Form C auxiliary contacts rated at 250-volt AC/10 amperes shall be provided to allow remote sensing of the breaker status.
 - 2. A system utilizing manual-reset field circuit breakers and current transformers is unacceptable.
- I. An alternator strip heater shall be installed to prevent moisture condensation from forming on the alternator windings.
- J. Controls:
 - 1. All engine alternator controls and instrumentation shall be designed, built, wired, tested and shock-mounted in a NEMA 1 enclosure mounted to the generator set by the manufacturer. It shall contain panel lighting, a fused DC circuit to protect the controls and a +/- 5 percent voltage-adjusting control.
 - 2. The generator set shall contain a complete two-wire automatic engine start-stop control that starts the engine on closing contacts and stops the engine on opening contacts.
 - 3. A programmable cyclic cranking limiter shall be provided to open the starting circuit after four attempts if the engine has not started within that time. Engine control modules must be solid-state plug-in type for high reliability and easy service.
 - 4. The panel shall include:
 - a. Analog meters to monitor:
 - i) AC voltage

- ii) AC current
 - iii) AC frequency
 - b. Phase selector switch
 - c. Emergency stop switch
 - d. Audible alarm
 - e. Battery charger fuse
 - f. Programmable engine control
 - g. Monitoring module
- 5. The programmable module shall include:
 - a. Manual on/off/auto switch
 - c. Four light-emitting diode (LED) status lights to indicate:
 - i) Not in automatic mode
 - ii) Alarm active
 - iii) Generator running
 - iv) Generator ready
- 6. The module shall display all pertinent unit parameters including:
 - a. Generator Status – on/off/auto
 - b. Instrumentation – Real-time readouts of the following engine and alternator analog values:
 - i) Oil pressure
 - ii) Coolant temperature
 - iii) Fuel level
 - iv) DC battery voltage
 - v) Run-time hours
 - c. Alarm Status:
 - i) High or low AC voltage
 - ii) High or low battery voltage
 - iii) High or low frequency
 - iv) High or low oil pressure
 - v) Low water level
 - vi) High or low water temperature
 - vii) High and pre-high engine temperature

- viii) High, low and critical-low fuel levels (where applicable)
- ix) Over crank
- x) Over speed
- xi) Unit not in automatic mode

K. Unit Accessories:

1. Weather-protective enclosure:

- a. The generator set shall be factory enclosed in a heavy-gauge steel enclosure constructed with 12-gauge corner posts, uprights and headers.
 - b. The enclosure shall be coated with electrostatically applied powder paint, baked and finished to manufacturer's specifications.
 - c. The enclosure shall have large, hinged doors to allow access to the engine, alternator and control panel.
2. The exhaust silencer(s) shall be provided of the size recommended by the manufacturer and shall be of critical grade.
3. The generator set shall include an automatic dual-rate battery charger manufactured by the generator set supplier. The battery charger shall be factory installed on the generator set. Due to line-voltage-drop concerns, a battery charger mounted in the transfer switch is unacceptable.
4. A heavy-duty, lead-acid, 12-volt DC battery shall be provided by the generator set manufacturer. The generator set shall have a frame suitable for mounting the battery and shall include all connecting battery cables.

4.4.2. Automatic Transfer Switch

- A. The ATS shall be compatible with the generator set so as to maintain system compatibility and local service responsibility for the complete emergency power system.
- B. Representative production samples of the ATS supplied shall have demonstrated through tests the ability to withstand at least 10,000 mechanical operation cycles. One operation cycle is defined as the electrically operated transfer from normal to emergency operation, and back to normal.
- C. Wiring must comply with NEC table 373-6(b). The manufacturer shall furnish schematic and wiring diagrams for the particular ATS proposed, and a typical wiring diagram for the entire system.
- D. Ratings and Performance:

1. The ATS shall be adequately sized to match the generator and shelter electrical systems.
2. The ATS shall be a two-pole design rated for 600-VAC, 200-amperes continuous operation in ambient temperatures of -20° F (-29° Celsius [C]) to +140 degrees F (+60° C).
3. The operating mechanism shall be a single operating coil design, electrically operated and mechanically held in position.
4. A provision shall be supplied to be able to manually operate the switch in the event of logic or electrical coil failure.

E. Controls:

1. A solid-state under-voltage sensor shall monitor all phases of the normal source and provide adjustable ranges for field adjustments for specific application needs.
 - a. Pick-up and drop-out settings shall be adjustable from a minimum of 70 percent to a maximum of 95 percent of nominal voltage.
 - b. A utility-sensing interface shall be used, stepping down system voltage of 120/240 VAC single phase to 24 VAC, helping to protect the printed circuit board from voltage spikes and increasing personnel safety when troubleshooting.
2. Controls shall signal the generator set to start in the event of a power interruption.
 - a. A solid-state time-delay start, adjustable from 0.1 to ten seconds, shall delay this signal to avoid nuisance start-ups on momentary voltage dips or power outages.
3. Controls shall transfer the load to the generator set after it reaches proper voltage.
 - a. Adjustable from 70–90 percent of system voltage.
 - b. Adjustable from 80–90 percent of system frequency.
 - c. A solid-state time delay, adjustable from five seconds to three minutes, shall delay this transfer to allow the generator to warm up before application of load.
 - d. There shall be a switch to bypass this warmup timer when immediate transfer is required.

4. Controls shall retransfer the load to the line after normal power restoration.
 - a. A return-to-utility timer, adjustable from one to 30 minutes, shall delay this transfer to avoid short-term normal power restoration.
5. The operating power for transfer and retransfer shall be obtained from the source to which the load is being transferred.
6. Controls shall signal the generator to stop after the load retransfers to normal.
 - a. A solid-state engine cool-down timer, adjustable from one to 30 minutes, shall permit the engine to run unloaded to cool down before shutdown.
 - b. Should the utility power fail during this time, the switch shall immediately transfer back to the generator.
7. The transfer switch shall have a time-delay-neutral feature to provide a time delay, adjustable from 0.1 to ten seconds, during the transfer in either direction, during which time the load is isolated from both power sources. This allows residual voltage components of motors or other inductive loads (such as transformers) to decay before completing the switching cycle.
8. A switch shall be provided to bypass all transition features when immediate transfer is required.
9. The transfer switch shall have an in-phase monitor, which allows the switch to transfer between live sources if their voltage waveforms become synchronous within 20 electrical degrees within ten seconds of the transfer-initiation signal.
 - a. If the in-phase monitor will not allow such a transfer, the control must default to time-delay-neutral operation.
10. Front-mounted controls shall include a selector switch to provide for a NORMAL TEST mode with full use of time delays; FAST TEST mode that bypasses all time delays to allow for testing the entire system in less than one minute; or AUTOMATIC mode to set the system for normal operation.
 - a. The controls shall provide bright lamps to indicate the transfer switch position in either UTILITY (white) or EMERGENCY (red). A third lamp is needed to indicate STANDBY OPERATING (amber). These lights must be energized from the utility source or the generator set.
 - b. The controls shall provide a manually operated handle to allow for manual transfer. This handle must be mounted inside the lockable enclosure and be accessible only to authorized personnel.

- c. The controls shall provide a safety disconnect switch to prevent load transfer and automatic engine start while performing maintenance. This switch also shall be used for manual transfer switch operation.
- d. The controls shall provide LED status lights to give a visual readout of the operating sequence including:
 - i) Utility on
 - ii) Engine warmup
 - iii) Standby ready
 - iv) Transfer to standby
 - v) In-phase monitor
 - vi) Time-delay neutral
 - vii) Return to utility
 - viii) Engine cool down
 - ix) Engine minimum run

4.4.3. Diesel Fuel System

- A. Respondent shall provide a complete fuel system including tank(s) and all associated piping, valves, controls, etc.
- B. Above-ground tanks shall be bulletproof or protected.
- C. Tank and fuel system components shall be sized to provide a minimum of 72 hours of run time at full load.
- D. Fuel tank shall be integral to the generator.
- E. Clear access shall be provided for refueling.
- F. Controls and Monitoring Equipment:
 - 1. Fuel capacity gauge with low-fuel-level alarm contact closure
 - 2. Multi-valve for filling, pressure relief and gauging

4.5. DC POWER

- A. Respondents shall provide a -48 volts DC (VDC) power system to support P25 equipment, microwave equipment, and ancillary site equipment at existing and proposed sites used in the proposed system design.
- B. Respondents shall provide dedicated 220-VAC/30-amp circuits for each pair of rectifiers on the DC plant, and provide electrical connections and grounding to the DC plant.
- C. The selected Respondent shall perform electrical-loading analysis for shelter equipment, radio system equipment, and microwave equipment, excluding HVAC subsystems, during

preliminary design to verify the DC system size required. All assumptions regarding power consumption and duty factor shall be thoroughly explained.

- D. Respondents shall appropriate distribution breakers and circuits for DC power to each designated row of equipment racks. Equipment installed within those racks shall be immediately accessible to the DC power source.
- E. Quality Assurance:
 - 1. Electrical components, devices, and accessories shall be listed and labeled, as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
 - 2. UL compliance shall be listed and labeled under UL 1778 by a nationally recognized testing laboratory (NRTL).
 - 3. NFPA compliance shall identify UPS components as suitable for installation in computer rooms according to NFPA 75, *Standard for the Protection of Information Technology Equipment*.
- F. Performance Requirements:
 - 1. Input:
 - a. Single-phase, three-wire
 - b. Voltage: 120/240 V nominal
 - c. Frequency: 50/60 Hz +/- 3 Hz
 - 2. Output:
 - a. Capacity: Assumed at 1,000 amperes, to be finalized during the design phase
 - b. Voltage: -24/-48 VDC, 12 VDC, and 120 VAC
 - 3. Minimum Duration of Supply – If the DC power system is the sole backup energy source, duration of the supply is eight hours. Respondents shall assume 50 percent average base station/repeater usage (transmit and receive) for eight-hour runtime calculations. Respondents also shall ensure four hours of DC runtime under 100 percent load.
 - 4. EMI Emissions – Comply with FCC Rules and Regulations and with Title 47 of the Code of Federal Regulations (CFR), Part 15 for Class A equipment.
 - 5. Electronic Equipment – Solid-state devices using hermetically sealed semiconductor elements. Devices include rectifier-charger, inverter, and system controls.
 - 6. Surge Suppression – Protect internal DC components from surges that enter at each AC power input connection, and protect controls and output components.
- G. Tests and Inspections:

1. Comply with manufacturer's written instructions.
 2. Inspect interiors of enclosures, including the following:
 - a. Integrity of mechanical and electrical connections
 - b. Component type and labeling verification
 - c. Ratings of installed components
 3. Test manual and automatic operational features, as well as system-protection and alarm functions.
 4. Provide inspection reports.
- H. Demonstration: Train County's maintenance personnel to adjust, operate, and maintain the DC power system.

4.6. SITE PREPARATION

- A. The successful Respondent shall perform all preparations for site improvements as necessary. Work includes the following at a minimum:
1. Protecting existing plants and grass to remain
 2. Removing existing plants and grass as necessary
 3. Clearing and grubbing
 4. Stripping and stockpiling topsoil
 5. Removing above- and below-grade site improvements
 6. Disconnecting, capping or sealing, and removing site utilities
 7. Temporary erosion and sedimentation control measures
 8. Access road development
- B. The following Construction Specifications Institute (CSI) standard sections are referenced, but are not included in this specifications document:
1. Division 1 Section, *Temporary Facilities and Controls* – for temporary utilities, temporary construction and support facilities, temporary security and protection facilities, and temporary erosion and sedimentation control procedures
 2. Division 1 Section, *Execution Requirements* – for verifying utility locations and for recording field measurements

3. Division 1 Section, *Selective Demolition* – for partial demolition of buildings or structures undergoing alterations
 4. Division 2 Section, *Building Demolition* – for demolition of buildings, structures, and site improvements
 5. Division 2 Section, *Tree Protection and Trimming* – for protecting trees remaining onsite that are affected by site operations
 6. Division 2 Section, *Earthwork* – for soil materials, excavating, backfilling, and site grading
 7. Division 2 Section, *Lawns and Grasses* – for finish grading, including preparing and placing planting soil mixes and testing of topsoil material
- C. The successful Respondent or its subcontractor(s) shall comply with local guidelines for erosion and sedimentation (E&S) control.
- D. The Respondent shall carefully examine and study existing conditions, difficulties and utilities affecting execution of work. Later claims for additional compensation due to additional labor, equipment or materials required due to difficulties encountered or underground water conditions will not be considered.
- E. The Respondent shall verify that existing plant life to remain and clearing limits are clearly tagged, identified and marked in such a manner as to ensure the safety of said plant life throughout construction operations.
- F. Protection:
1. Respondent shall protect and maintain benchmark, monument, property corner, and other reference points, reestablishing them by registered professional surveyor if disturbed or destroyed, at no cost to the County.
 2. Respondent shall locate and identify existing utilities that are to remain and protect them from damage, reestablishing them if disturbed or destroyed, at no cost to the County.
 3. Respondent shall protect trees, plant growth and features to remain as final landscape. Branches or roots of any trees that are to remain shall not be disturbed. Adequate guards, fences, lighting, warning signs and similar items shall be provided and maintained as required.
 4. Respondent shall install protection such as fencing, boxing of tree trunks, or other measures as approved by the project engineer.
 5. Respondent shall conduct operations with minimum interference to public or private accesses and facilities; maintain ingress and egress at all times; and clean or sweep any roadways daily or as required by the governing authority. At such times as deemed necessary by the County, dust control shall be provided by water-sprinkling systems or equipment provided by the Respondent or its subcontractor(s).

6. When appropriate, the Respondent shall provide traffic control as required, in accordance with contract documents, the U.S. Department of Transportation "Manual of Uniform Traffic Control Devices" and the Georgia Department of Transportation requirements.

G. Clearing:

1. Respondent shall clear areas required for access to the site and execution of work.
2. Unless otherwise indicated, the Respondent shall remove trees, shrubs, grass, other vegetation, improvements, or obstructions interfering with the installation of new construction. Removal includes digging out stumps, roots and root material. Depressions caused by clearing and grubbing operations are to be filled to sub-grade elevation to avoid water pooling. Satisfactory fill material shall be placed in horizontal layers not exceeding eight inches loose depth, and thoroughly compacted per fill requirements of this section and CSI Division 2, *Site Construction*, Section 02200.
3. The Respondent shall remove grass, trees, plant life, stumps and all other construction debris from the site to a location that is suitable for handling such material according to state laws and regulations.

H. Demolition – Respondent shall remove existing pavement, utilities, curbing and shrubbery as necessary for construction of improvements.

I. Topsoil Excavation:

1. The Respondent shall strip topsoil from areas that are to be filled, excavated, landscaped or regraded to such a depth that it prevents intermingling with underlying subsoil or questionable material.
2. Respondent shall stockpile topsoil in storage piles in areas not scheduled for construction, job trailer location or equipment laydown, or where directed by the project engineer. Storage piles shall be constructed to freely drain surface water. Storage piles shall be covered as required to prevent windblown dust. Unsuitable soil shall be disposed of as specified for waste material, unless otherwise desired by the County. Excess topsoil shall be removed from the site by Respondent or its subcontractor(s).
3. Final topsoil coatings shall consist of organic soil applied in depth of not less than six inches. Satisfactory topsoil is reasonably free of subsoil, clay lumps, stones and other objects greater than two inches in diameter, as well as weeds, roots and other objectionable material.

J. Access Roads:

1. A 12-foot-wide access road shall be provided to the fence gate at new sites. For existing access roads, Respondent shall evaluate sufficiency and propose improvements where necessary.

2. Road beds shall be prepared, rolled and provided with six inches of coarse aggregate base.
3. Roads shall be graded appropriately for proper drainage and minimal erosion.

4.7. FENCING

- A. The Respondent shall provide chain-link fencing around the perimeter of all new proposed sites.
- B. Framework: Type I or Type II steel pipe
 1. Type I – Schedule 40 steel pipe with 1.8 ounces of zinc coating per square foot of surface area conforming to ASTM F1083.
 2. Type II – Pipe manufactured from steel conforming to ASTM A569. External surface triple coated per ASTM F1234. Type II pipe shall demonstrate the ability to resist 1,000 hours of exposure to salt spray with a maximum of 5 percent red rust in a test conducted in accordance with ASTM B117.
 3. All coatings are to be applied inside and out after welding.
 4. Unless otherwise noted, Type II framework shall be provided.
 5. Pipe shall be straight, true to section and conform to the following weights:

Table 2: Type I and Type II Steel Pipe Specifications

Pipe Size Outside Diameter (O.D.)	Type I Weight (Lbs./Ft.)	Type II Weight (Lbs./Ft.)
1 5/8"	2.27	1.84
2"	2.72	2.28
2 1/2"	3.65	3.12
3"	5.79	4.64
3 1/2"	7.58	5.71
4"	9.11	6.56
6 5/8"	18.97	N/A

C. Fabric:

1. Aluminized fabric shall be manufactured in accordance with ASTM A491 and coated before weaving with a minimum of 0.4 ounces of aluminum per square foot of surface area. The steel wire and coating shall conform to ASTM A817. Fabric shall be nine-gauge wire woven in a two-inch diamond mesh. The top selvage shall be twisted and barbed. The bottom selvage shall be knuckled.

2. Zinc-coated fabric shall be galvanized after weaving with a minimum of 1.2 ounces of zinc per square foot of surface area, and shall conform to ASTM A392, Class I. Fabric shall be nine-gauge wire woven in a two-inch diamond mesh. The top selvage shall be twisted and barbed. The bottom selvage shall be knuckled.

D. Fence Posts:

Table 3: Fence Post Specifications

Fence Posts Type I - II		
Fabric Height	Line Post O.D.	Terminal Post O.D.
Under 6'	2"	2 1/2"
6'-9'	2 1/2"	3"
9'-12'	3"	4"

E. Gate Posts:

Table 4: Gate Posts Specifications

Gate Posts Type II		
Single Gate Width	Double Gate Width	Post O.D. Type II
Up to 6'	Up to 12'	3"
7'-12'	13'-25'	4"

F. Rails and Braces: 1 5/8-inch outside diameter (O.D.)

- G. Gates: Frame assembly of two-inch O.D. pipe (Type I or Type II) with welded joints. Weld areas shall be repaired with zinc-rich coating applied per manufacturer's directions. The fence fabric shall match the fence posts, gateposts and gates. Gate accessories, hinges, latches, center stops, keepers and necessary hardware shall be of a quality required for industrial and commercial application. Latches shall permit padlocking. Respondent shall provide one padlock for each gate with three keys for each padlock. All padlocks shall be keyed alike.

H. Installation:

1. General – Fence installation shall conform to ASTM F567, *Standard Practice for Installation of Chain-Link Fence*.
2. Height – Fence height shall be as indicated on contract drawings. If no height is indicated, the fence shall be seven-feet high, plus one foot for barbed wire.

3. Post Spacing – Line posts shall be uniformly spaced between angle points at intervals not exceeding ten feet.
4. Bracing – Gate and terminal posts shall be braced back to adjacent line posts with horizontal brace rails and diagonal truss rods.
5. Top Rail – The top rail shall be installed through the line post loop caps, connecting sections with sleeves to form a continuous rail between terminal posts.
6. Fencing shall have a bottom rail instead of a tension wire.
7. Fabric – The fabric shall be pulled taut with the bottom selvage two inches above grade. The fabric shall be fastened to the terminal posts with tension bars threaded through mesh and secured with tension bands at maximum 15-inch intervals. The fabric shall be tied to the line posts and top rails with tie wires spaced at a maximum of 12 inches on posts and 24 inches on rails. The fabric shall be attached to the bottom rail with top rings at maximum 24-inch intervals.
8. Barbed Wire – Barbed wire shall be anchored to the terminal extension arms, pulled taut and firmly installed in the slots of the line post extension arms.
9. Valleys – Should the fence cross a ditch or drainage swell, 3/8-inch diameter aluminum alloy rods shall be driven vertically 18 inches into the ground on four-inch centers, and woven through the fence fabric to provide security for these areas.
10. Vegetation stop and aggregate shall be applied to the entire compound area (the area inside the fencing) and six inches beyond the fencing. Vegetation stop shall be constructed with weed barrier geotextile and aggregate shall be applied three inches in depth and consist of American Association of State Highway and Transportation Officials (AASHTO) #10 coarse aggregate.

5. DISPATCH CONSOLES

5.1. GENERAL REQUIREMENTS AND FEATURES

- A. Respondents shall provide pricing for ten new state-of-the-art, IP-controlled consoles.
- B. Features of the console shall include the following at a minimum:
 - 1. Dispatch console equipment (operator positions) shall be designed to be placed on existing furniture and provide operators with an ergonomic design that permits ease of operation over extended periods, typically eight to 12 hours for each operator.
 - 2. Console positions shall be able to acoustically cross-mute channels to eliminate acoustic feedback between operators.
 - 3. The screen display shall be designed so that all dispatching functions shall be operable from one display.
 - 4. The screen display shall be very flexible, enabling authorized personnel to determine which functions are available at each operator position.
 - 5. New features and screen configurations shall be supported through software programming and not hardware reconfiguration.
 - 6. Capability to program, store, retrieve, and edit multiple custom operator screens and configurations for each operator position shall be provided.
 - 7. Operator screen configurations and alias database shall be stored locally or on a centrally located server.
 - 8. The dispatch console shall display an alias name on screen when a unit with a radio ID stored in the alias database is transmitting.
 - 9. Operator positions shall have the ability to decrypt and encrypt secure voice communications. Channels shall have a distinctive icon if encryption is being used for that channel. All consoles shall be configured to provide end-to-end Advanced Encryption Standard (AES) encryption to personnel in the field.
 - 10. Encryption of the consoles will be provided over IP by the same device that remotely programs the field subscriber units. All encryption will be managed centrally by a single server with remote access and capabilities as described by the NMT section.
 - 11. Upon activation of an emergency alarm by field units, dispatch positions shall provide an audible alert, display calling unit ID, and a visual alert of an emergency activation.
 - 12. Operators shall have the ability to utilize a headset, foot pedal, or stationary gooseneck-type microphone for transmitting audio.

13. The capability to converse on the telephone utilizing the same operator headset that is used for radio conversations shall be provided.
14. Instant recall shall be provided allowing the operator to review and verify his or her recent traffic. Playback shall be available at the operator position.
15. The current Gold Elite consoles dispatches the fire stations using paging. The new consoles will be required to keep that same functionality.

5.2. TRUNKED REQUIREMENTS

- A. Dispatch consoles shall be compatible with a proposed P25 trunked radio system. Dispatch consoles shall directly interface with single- and multisite trunked system controllers, and shall allow interoperability between trunked and non-trunked channels in the system.
- B. Dispatch consoles shall be able to monitor and transmit on all proposed trunked systems. Backward compatibility with the existing trunked system for ease of cutover is desired, but not required.
- C. Dispatch consoles shall be equipped with an instant transmit switch for each talkgroup displayed.
- D. In a trunked system with radio IDs, the push-to-talk (PTT) ID of the unit calling shall appear in addition to a call indicator. After the call is completed, the unit's PTT ID shall remain displayed until another call is received.
- E. To aid dispatchers in a busy system, a list of the last 15 radio IDs shall be available in a "recent calls" list.
- F. Dispatch equipment shall include an instant transmit switch for each conventional repeater channel and/or base station.
- G. On conventional resources capable of operating on multiple frequencies/modes, a control/indicator shall be provided to select the desired transmit frequency/mode (select channel). The select-channel function shall cause the associated channel to switch frequencies/modes. Once a channel has been selected, the operator shall be able to transmit on this channel by pressing the footswitch or transmit button.
- H. A transmit-audio-level meter shall be provided that indicates the level of transmitted voice. This meter also shall indicate the level of receive audio present on the selected channel.
- I. Operator positions shall have the ability to independently set each channel's volume level. Minimum audio levels shall be capable of being set to avoid missed calls.
- J. A control/indicator shall be provided to allow the operator to mute or unmute audio from unselected channels. Selected audio and unselected audio shall be audible from separate speakers.

- K. A control/indicator shall be provided that enables the operator to select multiple channels, which in turn gives the dispatcher the ability to broadcast to several channels at once.
- L. Operators shall have the ability to patch two or more conventional repeaters and/or base stations together so that users may communicate directly. Operator positions shall be equipped such that a minimum of eight simultaneous patches shall be available.
- M. To enhance dispatcher effectiveness in a PTT ID system, the various display modes available shall interact as follows:
 - 1. An operator shall have the capability of setting up (and subsequently knocking down) an emergency call from the dispatch console position.
 - 2. An option shall be provided to allow private communication between a dispatch console operator and a radio user. Once the operator is involved in a private call on a specific resource, the operator shall not receive audio from another radio attempting to call on that same resource.
 - 3. An option shall be provided that assigns priority to associated talkgroups. The dispatcher shall have the choice between normal preset priority and tactical priority, with tactical being the second-highest priority for a talkgroup in a system.
- N. In the cases of multi-talkgroup transmit or talkgroup patch, the use of more than one trunked repeater shall not be allowed; the talkgroups shall be merged onto a single repeater to conserve repeaters.
- O. It shall be possible to temporarily mute unselected talkgroups. The unselected audio will unmute automatically after a programmable preset time. Mute shall be 20 dB minimum.
- P. Dispatch consoles shall have the capability to patch together two or more talkgroups so that users may communicate directly.
- Q. If the dispatcher attempts to make a call on a trunked radio system connected to the dispatch consoles and all trunked channels are busy, visual and audible alerts will be initiated at the dispatch consoles.

5.3. CONVENTIONAL REQUIREMENTS

- A. Dispatch equipment shall include an instant transmit switch for each conventional repeater channel and/or base station.
- B. On conventional resources capable of operating on multiple frequencies/modes, a control/indicator shall be provided to select the desired transmit frequency/mode (select channel). The select-channel function shall cause the associated channel to switch frequencies/modes. Once a channel has been selected, the operator shall be able to transmit on this channel by pressing the footswitch or transmit button.

- C. A transmit-audio-level meter shall be provided that indicates the level of transmitted voice. This meter also shall indicate the level of receive audio present on the selected channel.
- D. Operator positions shall have the ability to independently set each channel's volume level. Minimum audio levels shall be capable of being set to avoid missed calls.
- E. A control/indicator shall be provided to allow the operator to mute or unmute audio from unselected channels. Selected audio and unselected audio shall be audible from separate speakers.
- F. A control/indicator shall be provided that enables the operator to select multiple channels, which in turn gives the dispatcher the ability to broadcast to several channels at once.
- G. Operators shall have the ability to patch two or more conventional repeaters and/or base stations together so that users may communicate directly. Operator positions shall be equipped such that a minimum of eight simultaneous patches shall be available.
- H. To aid dispatchers in a busy system, a list of the last 15 radio IDs shall be available in a "recent calls" list.

5.4. PAGING REQUIREMENTS

- A. Consoles shall support current signaling methods as well the proposed paging format. Additional features shall be described.
- B. The Respondent shall describe the following paging formats supported:
 - 1. Quick Call I
 - 2. Quick Call II
 - 3. Dual-tone multi-frequency (DTMF)
 - 4. MDC-1200 selective call
 - 5. Trunking call alert
 - 6. Post Office Code Standardization Advisory Group (POCSAG) 512/1200/2400 bits
- C. Preprogrammed pages and groups shall be created and modified using the console alias database program.
- D. A manual page feature shall be provided.
- E. A visible indication shall be given when each page ends.
- F. A list of standard pages shall be created to enable the operator to select or stack pages to be sent to multiple recipients.

- G. An instant page feature shall allow operators to send multiple pages with the single press of a button.
- H. Consoles shall be capable of transmitting at least three distinctive alert tones indicating to field units the priority or type of dispatch to follow.

5.5. SYSTEMS INTEGRATION

- A. The dispatch console system shall support connections to both existing resources and conventional resources as determined by the County.

5.6. LOGGING RECORDER

- A. Respondent shall propose a logging recorder solution that will interface with the County's existing Eventide logger.
- B. The Logging recorder solution shall enable recording for each talkgroup used for primary dispatch and select tactical talkgroups, as well as selected receive audio and the operator's transmit audio for each dispatch position. The recorder shall support recording the maximum number of proposed simultaneous talk paths, plus audio from the ten console positions at the dispatch centers.
- C. The County desires a logging recorder link that will support a direct connection without requiring a conventional interface. The Respondent must include any required application program interface (API) associated with completing the connection. The Respondent shall identify within its proposal all replay requirements necessary to complete the interface.
- D. The County desires a turnkey solution that will not require any services to be separately procured through Eventide. The Respondent shall be responsible for the complete integration, and all costs must be accounted for in the proposal.

5.7. OPERATOR POSITION EQUIPMENT

- A. All equipment supplied for use by the dispatch operators shall be capable of withstanding the 24 hours a day, 7 days a week (24 x 7) environment of today's dispatch centers.
- B. All equipment supplied for use by the dispatch operators shall be integrated into the existing console furniture at the dispatch locations.
- C. Operator position display monitors will be, at a minimum, 19-inch liquid crystal display (LCD) or light-emitting diode (LED) screens, with resolution of 1920 x 1080 or better.
- D. Keyboards shall be a standard 101-key keyboard.
- E. Operator functions shall be executed by positioning a screen pointer (cursor) over the appropriate icon and pressing the mouse button, or by touching the monitor screen.

- F. A high-quality gooseneck-type microphone shall be provided for each operator position.
- G. Headset jacks shall be provided that enable the operator to hear select audio via a headset and allow the operator to respond via a microphone attached to the headset. The headset plug inserted into the jack shall automatically disconnect the console's microphone and mute the select speakers.
- H. Optional pricing for wireless headsets shall be provided by the Respondents.
- I. A heavy-duty footswitch shall be provided to allow the operator to key the selected channel hands-free.
- J. If PCs are supplied, they shall be capable of providing a graphical user interface (GUI), be capable of local-area network (LAN) client-server architecture for network access, and be capable of supporting multiple Microsoft® Windows-compliant applications.
- K. PCs supplied shall be based on present state-of-the-art PC technology.

5.8. COMMON ELECTRONICS EQUIPMENT

- A. The common electronics equipment shall contain all equipment necessary to route audio and control signals between the dispatch operator positions and the proposed P25 system.
- B. The common electronics equipment shall be capable of controlling the proposed P25 trunked or conventional system.
- C. The common electronics equipment shall be capable of controlling the channels required/proposed.
- D. The common electronics equipment shall not have a single point of failure. Redundant cards and power supplies shall be used when feasible.
- E. The common electronics equipment shall be connected to the radio system directly; RF control stations shall not be used as the primary connection to the radio system.
- F. The common electronics equipment shall be capable of receiving alarm information from distant communications sites and displaying this information on the dispatch screen.
- G. The common electronics equipment shall allow for a remote dispatch position. This remote dispatch position shall be connected via a LAN/WAN connection.
- H. In the event of a failure of the consoles, a backup method of communicating needs to be provided as a solution. Include the plan of features that are lost during backup operations.

6. WARRANTY, MAINTENANCE, AND SUPPORT

6.1. WARRANTY

- A. The proposed communications system shall have a warranty period of one year. The one-year warranty period shall commence upon final acceptance.
- B. Respondent shall provide a single toll-free telephone number that answers 24 hours a day, 7 days a week, 365 days a year (24 x 7 x 365), for service requests and warranty claims.
- C. Respondent shall state in its proposal the name, address, and capabilities of the service station(s) providing warranty service.
- D. The following procedures shall be followed during the warranty period:
 - 1. Warranty maintenance shall be performed 24 hours a day with no additional charges for work on critical infrastructure outside of normal 8:00 a.m. to 5:00 p.m. business hours.
 - 2. The service facility shall provide prompt repair service, with service personnel arriving onsite within two hours after a service request by the County, and returning the system to service within four hours after a service request by the County.
 - 3. The County shall be provided with written documentation indicating the cause of the service outage, the resolution, and all post-repair testing procedures to ensure proper operation. In the event County-owned spares are used to complete the repair, the model and serial number of both the defective unit and the spare shall be noted in the documentation.
 - 4. For all equipment needing factory or depot repairs, a comprehensive tracking system shall be put in place by the Respondent to track units to and from the factory/depot.

6.2. MAINTENANCE

- A. Respondent shall maintain and repair all systems, equipment, hardware and software throughout the implementation, migration and warranty periods. The County reserves the right to have technical staff onsite to witness, and if desired, assist in the maintenance and troubleshooting procedures. This does not relieve the Respondent from its warranty and maintenance responsibilities as defined in this specifications document.

6.2.1. General Requirements

- A. The approach to maintenance of this system shall be one of preventive maintenance.
- B. Comprehensive maintenance services shall be proposed for each system.
- C. Maintenance plans should be based on the quantities of equipment included in the proposed system. Plans shall include yearly pricing for years two through 15

following system acceptance (year one is provided under warranty). Pricing shall be broken out according to each of the services defined below. These plans shall include:

1. Fixed equipment onsite service
 - a. Two-hour response time, four-hour restoration time
2. Fixed equipment mail-in board repair
 - a. Emergency response – next day
3. All fixed equipment maintenance plans shall provide 24-hour system support so that users can dial one toll-free number to report problems and/or receive technical support.
4. Respondent's staff will dispatch the proper technician in the prescribed response time to resolve the problem, if Respondent is unable to resolve the problem through telephone consultation.
5. Maintenance plans shall include a semiannual preventive-maintenance check to include a retune of all RF components, including base stations, subscriber radios, and microwave radios. The retune should restore components to the manufacturer specifications.
6. Maintenance plans shall include 24 x 7 system monitoring and dispatch services.
7. Maintenance plans shall include the regular update of antivirus software on all servers and workstations.

6.2.2. Maintenance Standards

- A. Replacement parts used in repairs shall be equal in quality and ratings to the original parts.
- B. Equipment shall be maintained in a clean condition. Oil, dust and other foreign substances shall be removed on a routine basis.
- C. Equipment and system performance shall be maintained at the level initially described in these equipment and systems specifications. The service organization shall maintain records to confirm this has been done at intervals defined by the County.
- D. Respondent shall provide only factory-trained and -authorized maintenance personnel.
- E. If fixed equipment or a fixed equipment module fails more than twice during the acceptance test or twice during the first year, the Respondent shall meet with the

County to discuss and explain such failures. If, in the opinion of the County, these failures indicate that the equipment is potentially prone to continuing failures, the Respondent shall replace it at no cost to the County.

- F. Automatic system alerts generated via email or short message service (SMS) and sent to maintenance personnel that indicate system impairment shall constitute an actionable event requiring technician response.

6.3. PARTS AVAILABILITY

- A. From the date of final acceptance to the seventh anniversary of the date of final acceptance, the Respondent shall maintain replacement parts for all delivered equipment.
- B. In the event that the Respondent plans to discontinue stocking any part required for maintenance after the seventh anniversary of final acceptance, the Respondent shall send written notice to the County 24 months prior to the date of discontinuance, to allow for last-time buys and replenishment.
- C. In the event the Respondent plans to discontinue manufacturing any part required for maintenance, the Respondent shall notify the County within one week following the publication of the cancellation notice. The manufacturer shall sufficiently stock the parts to be made available to the County for a minimum period of five years following cancellation.
- D. All parts ordered on a priority basis shall be delivered within 24 hours after placing an order. Respondent shall provide year-round, 24-hour ordering facilities via telephone, internet, email and fax service.

6.4. SPARE EQUIPMENT

- A. Respondent shall propose to the County recommended spare parts for the system, subsystems and individual equipment.
- B. The list of spare parts shall include the following, at a minimum:
 - 1. Any vendor-identified field-replaceable units (FRUs).
 - 2. Any infrastructure component that does not have FRUs that can cause a critical failure if it were to fail. Examples could include base station antennas and other non-modular components.
 - 3. Power supplies.
 - 4. Spares for less-critical items.
- C. The list shall include items that will rapidly and completely restore all critical system functionality with the least amount of effort, e.g., board replacement instead of troubleshooting to the component level when a critical unit has failed.

- D. The quantities of spares in the list shall be appropriately sized to accommodate equipment quantities in the system.
- E. The list shall define the primary equipment category each spare kit supports, e.g., transceiver board for a repeater, interface board for a console, etc.
- F. The system engineering design documentation shall include a narrative on the Respondent's ability to replace failed units from stock, as well as the process and timing to repair, replace and return failed units delivered for repair.
- G. System engineering design documentation also shall include the lifecycle of equipment, parts and other maintenance support for the system.
- H. Spares shall be included in any system update to keep them current.

6.5. LIFECYCLE COST – OPTION

- A. As an option, the Respondent shall propose an extended warranty for additional years beyond the initial warranty, renewable on an annual basis. Pricing shall be provided for the terms of five years, ten years, and 15 years.
- B. As an option, the Respondent shall propose a complete hardware and software maintenance package that provides a complete cost of ownership for the system(s) being offered to the County. The package should include system maintenance, software updates, system release updates, and hardware updates for those components that reach end of life (EOL) within the support period. Costs associated with the cost of ownership should be provided for the terms of five years, ten years, and 15 years.
- C. Respondent shall fully describe the terms and conditions of the extended maintenance plan in its proposal.
- D. Respondent shall fully describe the terms and conditions of the extended maintenance plan in its proposal if the customer does not keep current with the proposal
- E. Respondent should describe the roadmap for integration with the nationwide broadband communications network for first responders being implemented by the First Responder Network Authority (FirstNet) in their response.
- F. Fayette County desires to have all maintenance, repair, and updates of all components covered by the proposed maintenance plan.

7. SYSTEM IMPLEMENTATION, TEST AND ACCEPTANCE

7.1. GENERAL

- A. Respondent shall attend biweekly project and construction meetings as deemed necessary by the County prior to and during installation. Additional meetings may be scheduled at the discretion of the County.
- B. If any changes in the overall timeline occur, the Respondent shall update the project schedule for discussion during these project meetings.
- C. Respondent shall provide written minutes of all meetings no later than five business days after the meeting.

7.2. CUTOVER PLAN

- A. Respondent shall be responsible for planning and coordinating the implementation of all equipment, subsystems and the overall system.
- B. Execution of the cutover plan shall ensure that new systems are brought online with minimum interruption to all existing systems and communications.
- C. During final design, Respondent shall deliver a preliminary cutover plan describing how the radio system will be phased into a fully operational system.
 - 1. Respondent shall successfully complete all tests and training prior to the actual cutover of systems.
 - 2. Respondent shall provide the necessary labor to cutover from existing systems to the proposed system.
 - 3. The plan shall include the schedule and procedures associated with the transition of each operational user group. The plan shall specifically address how the existing users will begin using the new system with minimal operational impact.
 - 4. The plan shall provide detailed component or subsystem cutover plans, and specifically delineate between systems that affect and do not affect ongoing operations.
 - 5. The plan shall include contingencies.
 - 6. The County reserves the right to approve and change the cutover plan as it relates to any or all system components.

7.3. STAGING

- A. Each individual assembly or equipment unit shall undergo factory testing prior to shipment.

- B. Standard factory test documentation, documenting the tests performed and indicating successful completion of testing, shall be submitted to the County.
- C. System Staging:
 - 1. The complete system shall be staged and tested at the factory, in the United States, to the greatest extent practical. The intent of the staging tests is to demonstrate to the County that the system is ready for shipment and installation. The selected Respondent shall provide travel expense coverage for three County personnel and two engineer/consultants to participate in the staging acceptance test plan (SATP).
 - 2. The selected respondent shall provide all necessary technical personnel and test equipment to conduct staging tests. All deviations, anomalies and test failures shall be resolved at the selected Respondent's expense.
 - 3. The selected respondent shall use an approved SATP. It is expected that a preliminary SATP has been performed and all tests have been successful before the County witnesses the official SATP. The SATP shall be signed and dated by the selected Respondent and County representatives and engineers/consultants following completion of all tests. All tests in the SATP shall be marked as either pass, fail, or pass qualify.
 - 4. Failed tests shall be documented, corrected and retested. All defective components shall be replaced and retested. Defective components that cannot be corrected shall be replaced at the expense of the selected Respondent.
 - 5. Retest of individual failed SATP tests or the entire plan shall be at the County's discretion.
 - 6. The fully executed and completed SATP document shall be provided to the County.
 - 7. Major subsystems, such as the microwave system, may be tested at a different facility, at a different time, from the radio system. However, all of the items identified above shall apply if the subsystems are staged at different locations and times.

7.4. SYSTEM INSTALLATION

- A. Installation shall include a complete, tested system to include placement of associated cabling, appropriate system layout, and terminal connections. Respondent shall provide associated power supplies and any other hardware, adapters and/or connections to deliver a complete operable system to the County at the time of acceptance.
- B. All installations shall be performed by factory-authorized or Respondent-affiliated service shops. Other shops or installers may be used upon mutual agreement between the County and Respondent. Qualified, adequately trained personnel familiar with this type of work shall perform all installations. Respondent shall provide the names of the service shops, their qualifications, a description of their certified training on the proposed system, a summary of their experience and a list of five references (minimum) for each proposed shop.

- C. Prior to the start of the system installation, the Respondent shall participate in a mandatory project site survey with the County or County's representative to confirm actual equipment location within each space. At that time, the exact equipment locations shall be determined and documented by the Respondent.
- D. Respondent shall coordinate with others, as appropriate, to confirm that any preparation work that affects the installation of the base station equipment, such as tower work, coring, bracing, conduit, electrical, etc., is complete before final inspection.
- E. Respondent shall provide and pay for all materials necessary for the execution and completion of all work. Unless otherwise specified, all materials incorporated into the permanent work shall be new and shall meet the requirements of this specifications document. All materials furnished and work completed shall be subject to inspection by the County or the County's representative.
- F. Equipment supplied as spare equipment shall not be used for installation of the proposed system. All spare equipment shall be supplied in an unused condition.
- G. All equipment and devices shall be cleaned internally and externally, and all damaged finishes shall be repaired.
- H. Worksites shall be left neat and be broom swept upon completion of work each day. All shelter floors will be cleaned thoroughly and all scuff marks and abrasions shall be removed prior to acceptance. All trash shall be removed weekly.
- I. Inspection:
 - 1. The County shall conduct an inspection of the installations upon substantial completion. Any deficiencies shall be documented on a single punch list and provided to the Respondent for resolution.
 - 2. Final acceptance testing shall not commence until all punch-list items are resolved.

7.5. COVERAGE TESTING

- A. Respondent shall submit a preliminary coverage acceptance test plan (CATP) with the proposal. The final CATP shall be submitted during the final design stage of the project.
- B. CATP:
 - 1. The CATP shall be consistent with the procedures and guidelines outlined in TIA TSB-88, latest revision.
 - 2. Retries only will be allowed if there is a proven equipment failure.
 - 3. Coverage testing shall commence only after the radio system is fully tested and aligned. Changes to the system by the vendor to improve coverage shall require retesting of coverage at the County's discretion, and at no cost to the County.

4. Respondent shall perform two types of coverage testing. Each type of test will include an inbound test and an outbound test. Both types of testing shall be complementary and serve to fully verify that coverage requirements are met both technically and operationally.
 - a. Automated objective mobile drive testing
 - b. Non-automated subjective DAQ testing (intelligibility testing)
5. Test Configurations:
 - a. Testing configurations for the objective and subjective testing shall represent typical operating configurations to the greatest extent possible, using portable and mobile radio equipment to be used with the system.
 - b. Automated Objective Mobile Drive Testing:
 - i. Respondent shall test both the signal level and bit error rate (BER), as applicable, at a statistically significant number of test locations throughout the county utilizing automated test equipment.
 - ii. Both outbound (talk-out) and inbound (talk-in) BER testing shall be conducted.
 - iii. The County requires BER testing conducted at a failure rate of two percent for frequency division multiple access (FDMA) and 2.4 percent for time division multiple access (TDMA).
 - iv. For testing purposes, the county shall be divided into 1/4-square-mile bins (1/2 mile by 1/2 mile). Respondent or its subcontractor(s) may subdivide grids if necessary.
 - v. Respondent shall complete the "estimate of proportions" test identified in TSB88 to validate that 1/2 mile by 1/2 mile grids yield a sufficient number of test points to achieve statistical significance, accounting for inaccessible grids. If there is an insufficient number of grids, then smaller grid sizes shall be proposed.
 - vi. Inaccessible grids shall not count as either a pass or fail in the statistical analysis.
 - vii. Respondent shall not be allowed to retest any failed grids without authorization from the County.
 - viii. Respondent shall develop a link budget to ensure that the receiver utilized in the automated drive testing receives the equivalent signal strength of the specified coverage configuration (i.e., portable radio worn at hip level). Respondent shall utilize attenuators to properly account for gains and losses of the testing setup, plus any required in-building losses.
 - ix. All test equipment must be calibrated prior to testing, and signal losses through each component must be tested.
 - x. Respondent shall provide an NMO adaptor to test signal losses through the testing antenna port and cable.

c. Non-Automated Subjective DAQ Testing:

- i. Non-automated subjective DAQ coverage testing shall be conducted using typical portable radios supplied with the system.
- ii. Talk-out and talk-in performance shall be documented.
- iii. Respondent shall provide a standardized test form for testing.

d. Respondent shall guarantee coverage for both subjective and objective drive testing at the levels specified.

e. Both the objective and subjective tests must independently yield a ratio of passing grids to total grids tested that is greater than the mandated coverage percentages.

7.6. 30-DAY OPERATIONAL TEST

A. Respondent shall perform a 30-calendar-day operational test of the system to ensure that all hardware and software defects have been corrected prior to entering final proof-of-performance testing. The fully integrated operation of the system, including all individual subsystems, shall be demonstrated during these tests. The tests shall be designed to demonstrate the reliability, long-term stability and maintainability of the systems. A failure of any critical component of the system during this test will cause the test to restart after the repair is completed. Respondent and the County shall agree on what constitutes a critical failure prior to commencing this test.

B. Respondent shall provide a 30-day operational test plan during the preliminary design phase.

7.7. TRAINING

A. The selected Respondent shall develop and conduct training programs to allow personnel to become knowledgeable with the system, subsystems, and individual equipment.

B. The selected Respondent shall provide complete and comprehensive system management training for up to three staff charged with managing the system. This training shall include the following, at a minimum:

1. System theory of operation
2. Monitoring and managing the system's performance (system manager level)
3. System monitoring techniques
4. Writing and printing system reports

C. The selected Respondent shall provide complete and comprehensive operational training for up to 20 user-agency dispatchers on the provided dispatch console systems. This training shall include the following, at a minimum:

1. Setup and use of all functional elements and features included in the consoles

2. All GUI elements, manipulation, function, and use
 3. Patching and multiple talkgroup operation
 4. Use of headsets, microphones, speakers, and mouse controls
- D. The selected Respondent shall provide operator train the trainer for up to 50 end-user personnel on the proper operation and care of assigned mobile and portable radio equipment. This training shall include the following, at a minimum:
1. Proper microphone technique
 2. Button, knob, and keypad functionality as programmed for that agency
 3. Proper battery maintenance
 4. Screen icon interpretation and meaning
- E. Respondent shall fully describe all proposed training programs detailing how the Respondent intends to provide training. The training description shall include the following:
1. A list of all subjects with a description of each
 2. Class materials to be provided by the Respondent
 3. Number of classes
 4. Class duration
 5. Need for recurring training
 6. Class size
 7. Class cost
- F. All operator training shall be conducted at “to be determined” locations within Fayette County. System management training shall be provided on the Fayette County system where practical. Technical training requiring lab and live system training may be scheduled at the selected Respondent’s training facility. The selected Respondent shall coordinate with the County regarding the number of attendees and schedule at least one month prior to the first scheduled class.
- G. Classes shall be scheduled as near to system cutover as possible. Respondent shall work with the County to develop the schedule.

- H. Respondent shall train County employees or designated individuals. A train-the-trainer approach is best and will be used to train other users.
- I. Respondent shall provide all instructional materials, including printed manuals, audiovisual presentations, interactive self-paced PC programs, and complete equipment operating instructions for all technical and operational training classes.
 - 1. Actual and/or exact model and series of equipment being delivered shall be made available for hands-on use and operation during training.
 - 2. All instructional materials shall be subject to the approval of the County and shall become property of the County.
 - 3. Additional training courseware and related media to be used in future academy training and refresher training shall be provided in a reproducible format with no limitation on the number of copies to be reproduced for training use. At least one hard copy and an electronic copy (on CD or USB stick) of all materials shall be provided.

7.8. FINAL ACCEPTANCE TESTING

- A. Prior to final acceptance testing, Respondent shall verify and document that all equipment, hardware and software are upgraded to the latest factory revision including subscriber units. Multiple revision levels among similar equipment are not acceptable. An FATP may not proceed without an agreed-upon final acceptance plan. This plan will be submitted to the County at least 45 days before testing. No testing may begin without County approval of the plan. The County shall be given two weeks written notice that the system is ready for final acceptance testing.
- B. FATP:
 - 1. Respondent shall use the completed and approved FATP. It is expected that a preliminary FATP has been performed and all tests have been successful before the County witnesses the official FATP. The FATP shall be signed and dated by Respondent and County representatives following completion of all tests. All tests in the FATP shall be marked as either pass, fail, or pass qualify.
 - 2. Respondent shall provide all necessary technical personnel and test equipment to conduct FATP tests. All deviations, anomalies, and test failures shall be resolved at the Respondent's expense.
 - 3. Failed tests shall be documented, corrected and retested. All defective components shall be replaced and retested. Defective components that cannot be corrected shall be replaced at the Respondent's expense.
 - 4. Retest of individual failed FATP tests or the entire plan shall be at the County's discretion.

5. The fully executed and completed FATP document shall be provided to the County.

7.9. AS-BUILT DOCUMENTATION

- A. At the completion of the installation phase, Respondent shall provide complete as-built documentation as outlined below:
 1. Equipment provided
 2. Plan and elevation drawings of all equipment, including antennas on towers
 3. Cabling and terminations
 4. Block and system-level diagrams
 5. Programming
 6. Setup and alignment information
 7. Successfully completed, signed and dated SATP

7.10. SYSTEM ACCEPTANCE

- A. The County shall deem the system ready for final acceptance following successful completion and approval of the following:
 1. Final design submittals
 2. SATP
 3. System installation
 4. Final inspection and punch-list resolution
 5. As-built documentation
 6. FATP, including CATP
 7. 30-day operational test completion
 8. Training

8. SUBSCRIBER EQUIPMENT

8.1. OVERVIEW

- A. Subscriber equipment includes all non-fixed user equipment, such as:
 - 1. Approximately 925 portable radios
 - 2. Approximately 822 mobile radios
 - 3. Control stations (Provide pricing on a unit basis. Quantity will be determined during the system design process)
- B. Subscriber radio proposals submitted in response to this solicitation must permit direct purchasing by any municipality, local government or public safety entity on the Fayette County system, at the discounted pricing levels provided.
- C. Respondents shall provide unit pricing for all user subscriber equipment and accessories. Pricing information shall be provided for the full range of installation configurations offered by the Respondent, with the specific installation costs for each.
- D. Respondent shall provide an LMR-over-cellular network solution as an option to the County. Pricing shall include all needed equipment, labor, project management and licensing for the proposed solution. A minimum of 100 user licenses is sought, with pricing for additional blocks of licenses.

8.2. GENERAL REQUIREMENTS

- A. All subscriber equipment shall be of high quality and intended to provide high reliability under heavy use in severe environments. Equipment shall be type-accepted by the FCC in accordance with the Commission's Part 90 Rules and Regulations.
- B. All subscriber equipment shall meet MIL-STD-810 C, D, E, and F.
- C. All subscriber equipment shall be software programmable over the system and Wi-Fi.
- D. All subscriber equipment shall support the following operating modes:
 - 1. Conventional analog frequency modulation (FM) network
 - 2. Conventional analog FM off-network (talkaround)
 - 3. Conventional P25 Phase I network
 - 4. Conventional P25 Phase I off-network (talkaround)
 - 5. Trunked P25 Phase II network

- E. All equipment shall be programmed for operation on the proposed system that will be procured through this RFP.
- F. Respondents shall propose a comprehensive subscriber maintenance program that includes provisions for subscriber repair and preventive maintenance on annual and biannual schedules.

8.2.1. Portable Radios

- A. Respondents shall provide pricing for portable radios in the Proposal Pricing Forms (Appendix B). All portables shall be included under Model 2 (see description below) for the purposes of the proposal; however, unit pricing shall be included for the other models, as well as all available feature sets; the municipality, local government or public safety entity will select the desired model and feature(s).
- B. Respondents shall include unit programming.
- C. As an option, Respondent shall propose radios certified as intrinsically safe.
- D. Respondents shall provide the highest-tier product available, highly reliable and intended for mission-critical operations. Pricing shall be provided for a minimum of three models:
 - 1. Model 1: Basic model, typically identified with no keypad or display
 - 2. Model 2: Mid-range model, typically identified with limited keypad and display
 - 3. Model 3: Advanced model, typically identified with full keypad and display
- E. Features:
 - 1. Full compliance with P25 features and operation
 - 2. PTT button
 - 3. Top-mounted on/off volume knob
 - 4. Talkgroup/channel selector
 - 5. Emergency button, protected from inadvertent activation
 - 6. Alphanumeric display (on applicable models), minimum of eight characters
 - 7. Transmit indicator
 - 8. OTAP and associated fixed equipment

- a. Fixed equipment to enable 5,000 units will be quoted as a part of the NMT section of the RFP.
 - b. All radios will be required to be programmed over the air and via Wi-Fi.
 9. OTAR and associated fixed equipment
 - a. The fixed equipment should be enabled to allow 2,000 radios and will be quoted as a part of the NMT section of the RFP.
 - b. The subscriber will be quoted on a per unit basis at the County's discretion.
 10. Subscriber radio GPS and associated fixed equipment to show location at each NMT location will be quoted as a part of the NMT section of the RFP.
- F. Battery:
1. Respondents shall include pricing for one battery sized to support a 12-hour shift, and one single unit battery charger for each portable radio.
 2. Respondents shall propose batteries certified as intrinsically safe as an option.
 3. Batteries shall provide a minimum operational use of eight hours based on a 5-5-90 duty cycle.
 4. Recharge time to full capacity shall not exceed one hour.
 5. Lithium-ion batteries are required.
 6. Respondents shall provide detailed specifications for all batteries proposed, including the following, at a minimum:
 - a. Battery life
 - b. Total battery lifecycle expectancy
 - c. Recharge time
 - d. Dimensions
 - e. Weight
 - f. Warranty
- G. Accessories: OPTIONAL pricing for all accessories, including the following, at a minimum:
1. AES encryption
 2. Data cables
 3. Battery chargers

- a. Single-bay battery charger
 - b. Multiple-bay battery charger
 - c. Vehicular charger
- 4. Alternate antennas
- 5. Remote speaker microphone
- 6. Remote speaker microphone with antenna
- 7. Wireless remote speaker microphone
- 8. Large/rugged remote speaker microphone for high-noise environments
- 9. Headset
 - a. Wired
 - b. Wireless/Bluetooth
- 10. Carrying cases/belt clips
- H. Respondents shall provide detailed equipment specifications for all proposed portables and accessories, including the following information:
 - 1. Radio dimensions
 - 2. Radio weight with battery
 - 3. Antenna type
 - 4. Frequency channel capacity
 - 5. General features, transmit/receive parameters, and mechanical specifications
- I. Multiband portable radios:
 - 1. As an option, Respondent shall provide multiband portable radios capable of operating in the following frequency bands:
 - a. VHF: 136–174 MHz
 - b. UHF: 380–520 MHz
 - c. 700/800 MHz: 762–870 MHz
 - 2. Respondents shall provide detailed specifications for radios and all accessories.

8.2.2. Mobile Radios/Control Stations

- A. Respondent shall provide pricing for mobile radios and control stations in the Proposal Pricing Forms (Appendix B). All mobile radios and control stations shall be included as dash-mount Model 2 (mid-tier) for the purposes of the proposal; however, unit pricing shall be included for remote mounts, as well as all available configurations and feature sets.
- B. Pricing shall include installation and programming.
- C. Respondents shall provide pricing for a minimum of three tiers with the base proposal cost at the mid-tier.
- D. Mobile radios shall be supplied complete with microphone, external speaker, cables, fusing, mounting hardware, coaxial cable and antennas to provide for a complete installation.
- E. Control station radios shall be supplied complete with desk microphone, speaker, cables, coaxial cable and omnidirectional antennas to provide for a complete installation.
- F. OPTIONAL – Control station configurations shall be offered with both a deskset console setup with built-in power supply, and as a mobile radio with a DC power supply.
- G. Respondents shall provide pricing for dash-mounted units and remote-mounted units.
- H. Features:
 - 1. Full compliance with P25 features and operation
 - 2. Remote speaker microphones
 - 3. Front-mounted on/off volume knob
 - 4. Talkgroup/channel selector
 - 5. Emergency button, protected from inadvertent activation
 - 6. Alphanumeric display
 - 7. Transmit indicator
 - 8. Dash- and remote-mount configurations
 - 9. OTAP and associated fixed equipment
 - 10. OTAR and associated fixed equipment

11. Subscriber radio GPS and associated fixed equipment
12. Control station combiners for configurations supporting 4/8/12/16/32 ports
- I. Accessories: Respondents shall provide OPTIONAL pricing for all accessories and detailed pricing for the fixed equipment hardware, software, licenses, services, and training, including the following, at a minimum:
 1. AES encryption on the subscribers
 2. OTAR encryption as fixed equipment
 3. OTAP in the subscriber units
 4. OTAP as fixed equipment
 5. Cables:
 - a. Data cables
 - b. Extension cables
 - c. Adapters
 - d. Power cables
 6. Antennas
 7. External speakers
 8. Public address kits
 9. Remote speaker microphones
 10. Desktop microphone (control stations only)
 11. GPS functionality and associated fixed network hardware
 12. Mobile data interface
- J. Respondents shall provide detailed equipment specifications for all proposed mobiles and accessories, including the following information:
 1. Radio dimensions
 2. Radio weight with battery
 3. Antenna type
 4. Frequency channel capacity

5. General features, transmit/receive parameters, and mechanical specifications

K. Multiband mobile radios:

1. As an option, Respondent shall provide multiband mobile radios capable of operating in the following frequency bands:
 - a. VHF: 136 – 174 MHz
 - b. UHF: 380 – 520 MHz
 - c. 700/800 MHz: 762 – 870 MHz
2. Respondents shall provide detailed specifications for radios and all accessories.

8.2.3. Fleet Mapping

- A. Respondent shall develop the actual fleet map with input and direction from the County. The fleet map shall contain at a minimum:
 1. Talkgroup ID
 2. Agency
 3. Emergency actions
 4. Encryption capability
 5. Roaming capability
 6. Priority
 7. Scan
- B. Respondent also shall develop subscriber unit programming templates. These templates shall have the basic features and functions defined for a particular subscriber unit and user type. Templates shall be developed on a per-agency basis.
- C. Once the fleet map and templates are approved and completed, the Respondent shall use these for installation of subscriber units and for further configuration of the system. Respondent shall submit these with the final as-built documentation

8.3. SUBSCRIBER WARRANTY AND MAINTENANCE

8.3.1. Subscriber Warranty

- A. Respondents shall offer a subscriber radio warranty that commences on final acceptance of the County's P25 system or upon delivery of the radios, whichever is later; any subsequent purchases shall include warranty periods of at least one year that co-terminate with the

warranty or maintenance periods of any previously purchased radios, unless otherwise agreed by the purchasing entity. The warranty shall include the repair of any radio that fails due to manufacturer defects within the warranty period, at no additional cost to the owning agency.

8.3.2. *Subscriber Maintenance*

- A. Respondents shall offer subscriber maintenance plans on a recurring fee structure to provide added services and coverage beyond the initial warranty period. Respondents shall provide pricing in the Proposal Pricing Forms (Appendix B) for the following subscriber maintenance packages:
1. Extended warranty beyond the initial warranty period for failures that occur due to manufacturer defects or normal wear and tear
 2. Preventive maintenance plan to restore the radios to the manufacturer's specifications at the following recurring intervals:
 - a. One year
 - b. Two years
 3. Accidental damage replacement plan to cover the repair or replacement of radios that have failed due to accidental damage, at no additional cost to the owning agency
- B. Respondents shall offer subscriber maintenance pricing on a per-request fee structure to provide added services and coverage beyond the initial warranty period. Respondents shall provide pricing in the Proposal Pricing Forms (Appendix B) for the following subscriber maintenance services:
1. Factory repair of a radio that has failed due to manufacturer defects or normal wear and tear
 2. Preventive maintenance to restore the radios to the manufacturer's specifications
 3. Factory repair of a radio that has failed due to accidental damage
 4. Programming of a radio to update the radio's programming parameters
 5. Programming of a radio to update the radio's firmware (firmware purchased separately)

9. COUNTY TERMS AND CONDITIONS

GENERAL TERMS AND CONDITIONS

1. **Definitions:** The term "contractor" as used herein and elsewhere in these Terms and Conditions shall be used synonymously with the term "successful offeror." The term "county" shall mean Fayette County, Georgia.
2. **Preparation of Offers:** It shall be the responsibility of the offeror to examine specifications, scope of work, schedule and all instructions that are part of this request for proposal. Failure to observe any of the instructions or conditions in this request for proposal may result in rejection of the offer.

All of the specifications and information contained in this request for proposal, unless specifically excepted in writing by the offeror and such exceptions being included with the offer, will form the basis of the contract between the successful offeror and the county. The offeror should take care to answer all questions and provide all requested information.

3. **Submission of Offers:** Offerors must submit their proposal, along with any amendments issued by the county, in a sealed opaque envelope with the following information written on the outside of the envelope:
 - a. The offeror's company name,
 - b. The Request for Proposals (RFP) number, which is 1428-P, and
 - c. The "reference" which identifies the proposal, which is "Public Safety Radio System".

Price schedules shall be placed in an additional opaque sealed envelope, identified as the price schedule, and enclosed in the sealed envelope with the proposal.

Mail or deliver one (1) original proposal, signed in ink by a company official authorized to make a legal and binding offer, and nine (9) additional hard copies with nine (9) electronic copies on flash drives to:

Fayette County Government
Purchasing Department
140 Stonewall Avenue West, Suite 204
Fayetteville, GA 30214

Attention: Contracts Administrator

4. **Timely Receipt:** Offers not received by the time and date of the scheduled proposal opening will not be considered, unless the delay is a result of action or inaction of the county.
5. **Open Offer:** The offer, once submitted and opened, shall remain open for acceptance for a period of at least six months from the date of the opening unless this time-frame is specifically excepted to in your offer.
6. **Corrections or Withdrawals:** The offeror may correct a mistake, or withdraw a proposal before

the proposal opening date by sending written notification to the Director of Purchasing. Proposals may be withdrawn after the opening only with written authorization from the Director of Purchasing.

The county reserves the right to waive any defect or irregularity in any proposal received.

In case of discrepancy between the unit price and the extended or total price, the unit price shall prevail.

7. **Trade Secrets – Confidentiality:** If any person or entity submits a bid or proposal that contains trade secrets, an affidavit shall be included with the bid or proposal. The affidavit shall declare the specific included information which constitutes trade secrets. Any trade secrets must be either (1) placed in a separate envelope, clearly identified and marked as such, or (2) at a minimum, marked in the affidavit or an attached document explaining exactly where such information is, and otherwise marked, highlighted, or made plainly visible. See Georgia law at O.C.G.A. § 50-18-72 (A)(34).
8. **Site Conditions:** Offerors are urged to visit the site to familiarize themselves with site conditions. Upon submission of an offer, it is understood that the offeror is acknowledging his acceptance of all site conditions.
9. **Ethics – Disclosure of Relationships:** Before a proposed contract in excess of \$10,000.00 is recommended for award to the Board of Commissioners or the County Administrator, or before the County renews, extends, or otherwise modifies a contract after it has been awarded, the contractor must disclose certain relationships with any County Commissioner or County Official, or their spouse, mother, father, grandparent, brother, sister, son or daughter related by blood, adoption, or marriage (including in-laws). A relationship that must be reported exists if any of these individuals is a director, officer, partner, or employee, or has a substantial financial interest in the business, as described in Fayette County Ordinance Chapter 2, Article IV, Division 3 (Code of Ethics).

If such relationship exists between your company and any individual mentioned above, relevant information must be presented in the form of a written letter to the Director of Purchasing. You must include the letter with any bid, proposal, or price quote you submit to the Purchasing Department.

In the event that a contractor fails to comply with this requirement, the County will take action as appropriate to the situation, which may include actions up to and including rejection of the bid or offer, cancellation of the contract in question, or debarment or suspension from award of a County contract for a period of up to three years.

10. **Evaluation of Offers:** The evaluation of offers and the determination as to acceptability of services offered shall be the responsibility of the county. Accordingly, to insure that sufficient information is available, the offeror may be required to submit literature, samples, or other information prior to award. The county reserves the right to obtain clarification or additional information from any firm regarding its proposal. The county reserves the right to select a responsive, responsible firm on the basis of best value that is deemed to be most advantageous to the owners. The county further reserves the right to reject any proposal, or all proposals, and to re-release the request for proposals.

11. **Non-Collusion:** By responding to this request for proposals, the offeror shall be deemed to have represented and warranted that the proposal is not made in connection with any other offeror submitting a separate response to this request for proposals, and is in all respects fair and without collusion or fraud.
12. **Ability To Perform:** The offeror may be required, upon request, to provide to the satisfaction of the county that he/she has the skill, experience and the necessary facilities, as well as sufficient financial and human resources, to perform the contract in a satisfactory manner and within the required time. If the available evidence is not satisfactory to the county, the county may reject the offer.
13. **Notice to Proceed:** The County shall not be liable for payment of any work done or any costs incurred by any offeror prior to the county issuing a written notice to proceed.
14. **Payment Milestones and Timing:** Payments shall be made based on the successful offeror meeting specific milestones, unless otherwise agreed by both parties and included in the resulting contract. The following payment terms are for a prime vendor turn-key solution. If separate contracts are awarded for selected project elements, payment milestones will be adjusted accordingly.

Contract Execution (Effective Date)	10%
Design Review	5%
Tower Remediation Complete	5%
Civil Work Completed	10%
Microwave Installation Completed	5%
Staging Completion	20%
Completion of FNE Install	20%
CATP Satisfactorily Completed	10%
Final Project Acceptance	15%

Payments will be considered on-time if payment is made within thirty (30) days from the date of receipt of an invoice, or the date a correct invoice is received, whichever is the later date.

15. **Unavailability of Funds:** This contract will terminate immediately and absolutely at such time as appropriated and otherwise unobligated funds are no longer available to satisfy the obligations of the county under the contract.
16. **Severability:** The invalidity of one or more of the phrases, sentences, clauses or sections contained in the contract shall not affect the validity of the remaining portion of the contract. If any provision of the contract is held to be unenforceable, then both parties shall be relieved of all obligations arising under such provision to the extent that the provision is unenforceable. In such case, the contract shall be deemed amended to the extent necessary to make it enforceable while preserving its intent.
17. **Indemnification:** The contractor shall defend, indemnify and save the county and all its officers, agents and employees harmless from all suits, actions, or other claims of any character, name and description brought for or on account of any injuries or damages received or sustained by

any person, persons, or property on account of any negligent act or fault of the successful offeror, or of any agent, employee, subcontractor or supplier in the execution of, or performance under, any contract which may result from proposal award. The contractor shall pay any judgment with cost which may be obtained against the county growing out of such injury or damages.

18. **Non-Assignment:** Assignment of any contract resulting from this request for proposal will not be authorized.
19. **Insurance:** The contractor shall procure and maintain the following insurance, to be in effect throughout the term of the contract, in at least the amounts and limits set forth as follows:
- **General Liability Insurance:** \$1,000,000 combined single limit per occurrence, including bodily and personal injury, destruction of property, and contractual liability.
 - **Automobile Liability Insurance:** \$1,000,000 combined single limit each occurrence, including bodily injury and property damage liability.
 - **Worker's Compensation:** Workers Compensation as required by Georgia statute.
 - **Professional Liability (Errors and Omissions) Insurance:** \$2,000,000 limit per claim and aggregate.

Before a contract is executed with the successful offeror, the successful offeror shall provide Certificates of Insurance for all required coverage. The successful offeror can provide the Certificate of Insurance after award of the contract, but must be provided prior to execution of the contract document by both parties. Certificates shall list an additional insured as follows:

Fayette County, Georgia
140 Stonewall Avenue West
Fayetteville, GA 30214

20. **Bid Bond:** You must include a bid bond with your bid, equal to five percent (5%) of the total amount bid. Bid bonds shall be provided by a surety which appears on Georgia's list of approved sureties administered by the State Insurance Commissioner, or the U.S. Treasury's list of approved bond sureties (Circular 570).
21. **Performance and Payment Bonds:** Prior to execution of a contract, the successful responder shall submit performance and payment bonds each equal to 100 percent of the contract value, provided by a surety which appears on Georgia's list of approved sureties administered by the State Insurance Commissioner, or the U.S. Treasury's list of approved bond sureties (Circular 570).
22. **Termination for Cause:** The county may terminate the contract for cause by sending written notice to the contractor of the contractor's default in the performance of any term of this agreement. Termination shall be without prejudice to any of the county's rights or remedies by law.

23. **Termination for Convenience:** The county may terminate the contract for its convenience at any time with 10 days' written notice to the contractor. In the event of termination for convenience, the county will pay the contractor for services performed. The county will compensate partially completed performance based upon a signed statement of completion submitted by the contractor, which shall itemize each element of performance completed.
24. **Force Majeure:** Neither party shall be deemed to be in breach of the contract to the extent that performance of its obligations is delayed, restricted, or prevented by reason of any act of God, natural disaster, act of government, or any other act or condition beyond the reasonable control of the party in question.
25. **Governing Law:** This agreement shall be governed in accordance with the laws of the State of Georgia. The parties agree to submit to the jurisdiction in Georgia, and further agree that any cause of action arising under this agreement shall be required to be brought in the appropriate venue in Fayette County

GLOSSARY OF TERMS AND ACRONYMS

AASHTO	American Association of State Highway and Transportation Officials
AC	Alternating current
agency	Term that applies generically to any local, state, federal entity or organization, such as: a department, division, city/town, or bureau. Includes: government, quasi-government and private groups
ANSI	American National Standards Institute
APCO	Association of Public-Safety Communications Officials International
ASME	American Society of Mechanical Engineers
ASTM	American Society of Testing Materials
ATPC	Automatic transmit power control
ATS	Automatic transfer switch
AWG	American wire gauge
backhaul	The transporting of radio communications traffic between distributed sites (typically access points) and more centralized points of presence.
bandwidth	The capacity of a channel to carry signals. The amount of spectrum required to transmit a signal without distortion or loss of information
BER	Bit error rate – A measure of the number of errors in received transmissions when compared to the original transmission, frequently expressed as a percentage
bit	Binary digit
BTU	British thermal unit
CAI	Common air interface
CATP	Coverage acceptance test plan
C	Celsius
CFR	Code of Federal Regulations
channel	The route through which a message is sent. A connection between initiating and terminating nodes of a circuit. A single path provided by a transmission medium via an electrical separation, such as by frequency or frequency pairs

communications	Information transfer among or between users. In public safety communications, the ability of public safety agencies to talk across agencies
connectivity	The complete path between two terminals
conventional	A radio system with dedicated, single-purpose channels (can be shared between several users with different operational needs; e.g., fire and police). A user must select the specific channel to be used
coverage	The geographic area included within the range of a wireless radio system.
CPC	Channel performance criterion
CSI	Construction Specifications Institute
CSSI	Console subsystem interface
DAQ	Delivered audio quality
dB	Decibel
dBm	Decibel referenced to one milliwatt. (zero dBm)
DC	Direct current
digital	Radio transmission method that replaces analog systems and transmits its signal in binary 1s and 0s the same as a computer. One major difference is that digital signals do not degrade gradually the way analog signals do as the distance between the transmitter and receiver increases
DS-0	A basic digital signaling rate of 64 kilobits per second (kbps), corresponding to the capacity of one voice-frequency-equivalent channel. The DS-0 rate, and its equivalents E-0 and J-0, form the basis for the digital multiplex transmission hierarchy in telecommunications systems used in North America.
DS-1	Digital Signal, Level 1
DTMF	Dual-tone multi-frequency
EIA	Electronic Industries Alliance
EMI	Electromagnetic interference
encryption	The reversible transformation of data from the original (plain text) format to a difficult-to-interpret format as a mechanism for protecting its confidentiality, integrity and sometimes its authenticity. Encryption uses an encryption algorithm and one or more encryption keys.
ERP	Effective radiated power

F	Fahrenheit
FAA	Federal Aviation Administration
FATP	Final acceptance test plan
FCC	Federal Communications Commission
FDMA	Frequency division multiple access
first responders	The first professionals called to an incident or emergency that provides immediate support services during prevention, response, and recovery operations
FM	Frequency Modulation – A signal transmission with constant signal strength, where the center frequency varies in proportion to the voice being transmitted. FM signals are not susceptible to most interference sources. Radio systems operating on FM are being replaced by digital systems
frequency	The number of cycles or events of a periodic process in a unit of time
frequency bands	The spectrum of transmission space where mobile radio systems operate in the United States. They are (from low to high): High HF 25-29.99 MHz Low VHF 30-50 MHz High VHF 150-174 MHz Low UHF 450-470 MHz UHF TV Sharing 470-512 MHz 700 MHz 764-776 & 7940806 MHz 800 MHz 806-869 MHz 2.4 GHz 4.9 GHz
FRU	Field replaceable unit
gateway	A device that can transparently interconnect radio audio paths so that agencies can patch into each other's radio channels in real time. This can be done at the baseband level or using IP. A gateway provides interconnection between two networks with different communications protocols
GFI	Ground fault interrupter
GHz	Gigahertz (1 billion hertz)
GoS	Grade of service
GPS	Global Positioning System – A U.S. satellite system that lets persons or systems determine their position with extreme accuracy using GPS receivers

GUI	Graphical user interface
HVAC	Heating/ventilation/air conditioning
Hz	Hertz (same as cycles per second)
ID	Identification
IEEE	Institute of Electrical and Electronic Engineers
infrastructure	Dedicated telecommunications networks; the hardware and software needed to complete and maintain a public safety communications system
interference	Extraneous energy, from natural or man-made sources, that impedes the reception of desired RF signals
interoperability	The ability of diverse systems and organizations to work together (interoperate). In public safety, the ability of personnel to exchange voice and data communications with staff from other agencies, on demand and in real time
intranet	A private computer network that uses Internet technologies to share an organization's information or operational systems with its employees in a secure manner.
IP	Internet Protocol
ISSI	Inter-RF subsystem interface
kHz	kilohertz (1000 hertz)
kVA	Kilovolt ampere
kW	Kilowatts
LAN	Local-area network
LCD	Liquid crystal display
LED	Light-emitting diode
LMR	Land mobile radio – A public or private radio service providing two-way communication, service paging and radio signaling on land.
Mbps	Megabits per second (1 million bits per second)
MHSB	Monitored hot standby
MHz	Megahertz (1 million hertz)

modem	An acronym for modulator/demodulator, which is a device that translates digital signals coming from a computer into analog signals that can be transmitted over standard telephone lines. The modem also translates the analog signals back into digital signals that a computer can understand.
MPE	Maximum permissible exposure
MTBF	Mean time between failures
NAD	National American Datum
NEBS	Network Equipment Building System
NEC	National Electrical Code
NEMA	National Electrical Manufacturers Association
NFPA	National Fire Protection Association
NiMH	Nickel-metal hydride
NMI	Network management interface
NMS	Network management system
NMT	Network management terminal
NPSPAC	National Public Safety Planning Advisory Committee
NRTL	Nationally recognized testing laboratory
O.D.	Outside diameter
OET	Office of Engineering & Technology
OSHA	Occupational Safety and Health Administration
OTAP	Over-the-air programming
PC	Personal computer
P25 or APCO 25	Project 25 – A suite of standards for digital radio communications for use by federal, state/province and local public safety agencies in North America to enable them to communicate with other agencies and mutual-aid response teams in emergencies
psig	Pounds per square inch gauge
PTT	Push to talk

Public safety spectrum	Specific bands of frequencies set aside by the FCC for use by public safety agencies. They are: Low Band (25-50 MHz) VHF High Band (150-174 MHz) 220 MHz Band (220-222 MHz) UHF Band (450-470 MHz) 700 MHz Band (764-776 and 794-806 MHz) 800 MHz Band (806-824 and 851-869 MHz) 4.9 GHz Band
QA/QC	Quality assurance/quality control
R56	Motorola Installation Standards and Guidelines for Communication Systems
receiver	The component(s) of a radio device that converts the radio waves into audible signals
repeater	A special receiver/transmitter combination that receives a signal on one frequency and retransmits a new signal on another frequency, usually within the same frequency band, sometimes referred to as a relay station.
Respondent	Any individual or entity bidding on the right to supply products and services in response to this RFP
RF	Radio frequency
RFI	Radio frequency interference
RFP	Request for proposals
RTU	Remote terminal unit
SATP	Staging acceptance test plan
Selected Respondent	Any individual or entity selected from among all Respondents to supply products and services in response to this RFP
SoR	Statement of requirements
spectrum	The range of electromagnetic radio frequencies that can be decomposed into frequency components, used in the transmission of sound, data and television
subscriber	User/customer on a network.
subscriber unit	User's equipment (usually a mobile or portable radio)
talkgroup	An assigned talk path similar to a channel on a conventional system.

TDMA	Time division multiple access
TDMM	Telecommunications Distribution Methods Manual
Telco	Telecommunications company
TIA	Telecommunications Industry Association
trunked	A radio system with a group of channels available and assigned as needed to specific “groups” or operations. The channels are programmed for automatic system assignment while in use, and then released for other users. A trunked system maximizes channel utilization
TSB	Telecommunications Systems Bulletin
TTA	Tower-top amplifier
turnkey	Entire system with hardware and software assembled and installed by a vendor and sold as a package.
TVSS	Transient voltage surge suppression
UHF	Ultra-high frequency
UL	Underwriters Laboratories
UPS	Uninterruptible power supply
USGS	U.S. Geological Survey
VHF	Very-high frequency
VSWR	Voltage standing wave ratio
Voting receiver	Multiple remote receivers tied together through a comparator device at a transmitter site to improve portable coverage; signal strength is compared from each receiver, and the best receiver becomes the receiver during a specific transmission.
WAN	Wide-area network
WBS	Work breakdown structure

APPENDIX A: PROPOSAL FORM

OFFICIAL PROPOSAL FORM

The undersigned proposer agrees, if awarded a contract by the Fayette County, Georgia, to provide a **Public Safety Radio System**, as specified in accordance with the foregoing Request for Proposal #1428-P for the price specified below.

THIS PROPOSAL ADDRESSES THE FOLLOWING NETWORK

COMPONENTS (check each as applicable)

P25 Radio System	_____
Dispatch Console System	_____
Network Management	_____
Digital Microwave Network	_____
Site Development	_____
Towers	_____
Shelters	_____
Generators	_____
P25 Subscriber Units	_____

TOTAL PROPOSAL PRICE

TOTAL BASE PROPOSAL AMOUNT.....\$_____

NAME OF PROPOSER (type or print)

ADDRESS

AUTHORIZED SIGNATURE

AFFIX CORPORATE
SEAL HERE
(If proposer is a corporation)

PRINT NAME AND TITLE OF SIGNER

()
AREA CODE & TELEPHONE

()
FAX NUMBER

Proposer is (check one):

_____ Corporation incorporated in the State of _____

_____ General Partnership

_____ Limited Partnership

_____ Sole Proprietorship

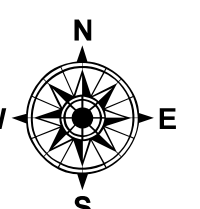
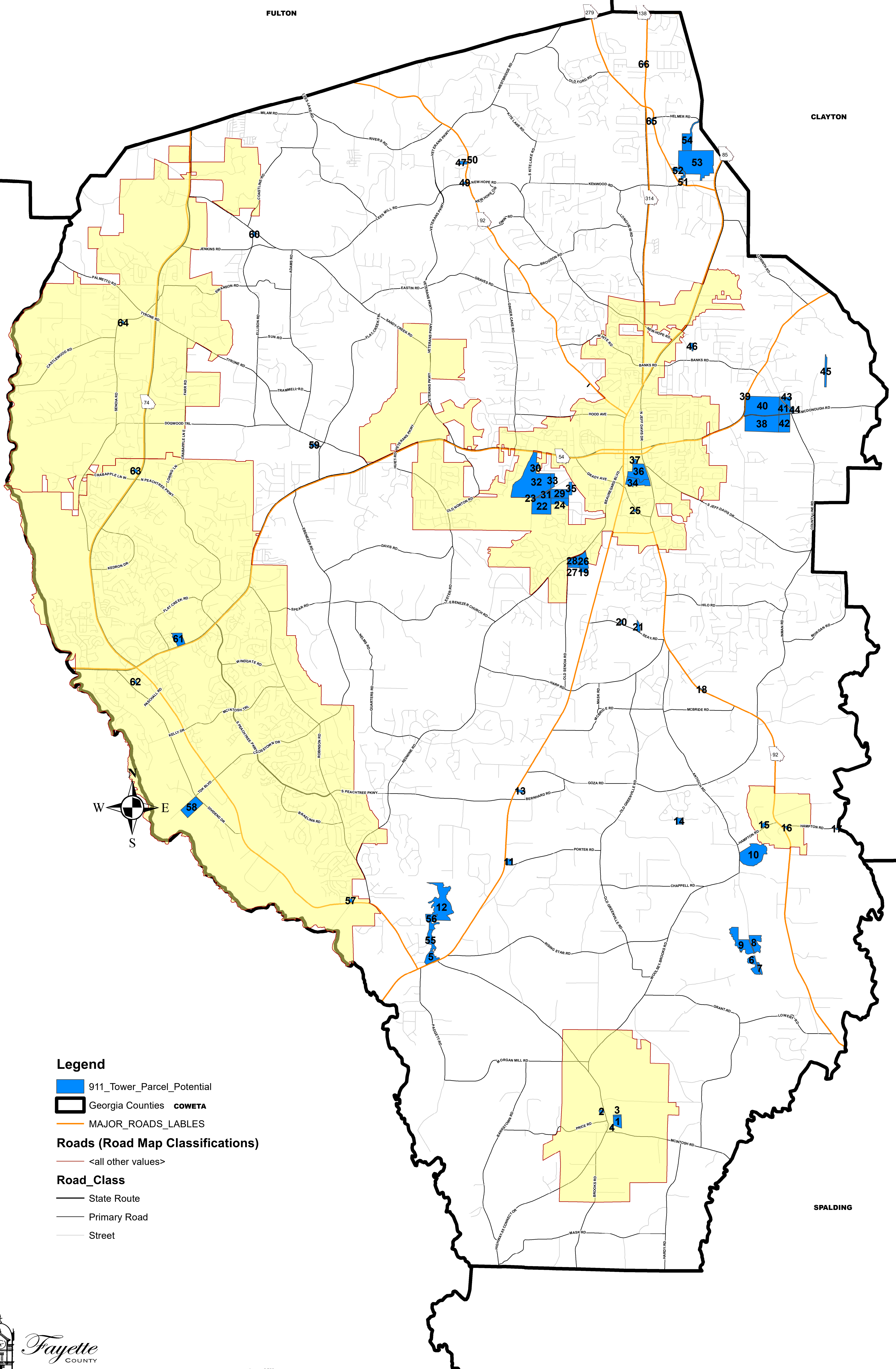
_____ Other (specify) _____

APPENDIX B: PROPOSAL PRICING FORMS

The proposal pricing forms will be provided to attendees at the mandatory pre-proposal conference.

APPENDIX C: FAYETTE COUNTY-OWNED PARCEL LOCATION MAP

FAYETTE CO BOC PROPERTY LOCATIONS



APPENDIX D: POTENTIAL COUNTY-OWNED PARCEL INDEX

Potential County-Owned Parcel Index

ID	OWNER1	OWNER2	STREET ADD	PROPERTY LOCATION	ACRES
1	FAYETTE COUNTY BOC	BROOKS PARK	140 STONEWALL AVE WEST	BROOKS PARK	14.32
2	FAYETTE COUNTY BOC	FIRE STATION #6	140 STONEWALL AVE WEST	FIRE STATION #6	2.46
3	FAYETTE COUNTY BOC	BROOKS PARK	140 STONEWALL AVE WEST	BROOKS PARK	1.77
4	FAYETTE COUNTY BOC	OLD STATION #6	140 STONEWALL AVE	OLD FIRE STATION #6	0.43
5	FAYETTE COUNTY BOC	STARRS MILL	140 STONEWALL AVE WEST	17.4 ACRES STARRS MILL	17.00
6	FAYETTE COUNTY BOC	14.9 AC BURCH LAKE ROAD	140 W STONEWALL AVE	14.9 ACRES BURCH LAKE ROAD	17.73
7	FAYETTE COUNTY BOC	14.9 AC BURCH LAKE ROAD	140 W STONEWALL AVE	14.9 ACRES BURCH LAKE ROAD	4.04
8	FAYETTE COUNTY BOC	14.9 AC BURCH LAKE ROAD	140 W STONEWALL AVE	14.9 ACRES BURCH LAKE ROAD	24.75
9	FAYETTE COUNTY BOC	14.9 AC BURCH LAKE ROAD	140 W STONEWALL AVE	14.9 ACRES BURCH LAKE ROAD	44.54
10	FAYETTE COUNTY BOC	WATER TREATMENT PLANT ANTIOCH	140 STONEWALL AVE WEST	WATER TREATMENT PLANT ANTIOCH	72.61
11	FAYETTE COUNTY BOC	WATER TANK SITE PORTER ROAD	140 STONEWALL AVE WEST	WATER TANK SITE PORTER ROAD	6.49
12	FAYETTE COUNTY BOC	91.6 AC WHITEWATER CRK	140 STONEWALL AVE	91.60 ACRES NEXT TO WW CREEK	86.83
13	FAYETTE COUNTY BOC	FIRE STATION #5	140 STONEWALL AVE WEST	FIRE STATION #5	2.81
14	FAYETTE COUNTY WATER DEPT	HORSEMENS RUN	140 STONEWALL	HORSEMENS RUN OUT PARCEL	5.40
15	FAYETTE COUNTY BOC	FIRE STATION #7	140 STONEWALL AVE	FIRE STATION #7	2.82
16	FAYETTE COUNTY BOC	OLD FIRE STATION #7	140 STONEWALL AVE WEST	OLD FIRE STATION #7	0.97
17	FAYETTE COUNTY BOC	WATER INTAKE	140 STONEWALL AVE WEST	WATER INTAKE - HAMPTON RD	0.51
18	FAYETTE COUNTY BOC	OLD ROAD BED HWY 92 SOUTH	140 STONEWALL AVE WEST	OLD ROAD BED HWY 92 SOUTH	0.91
19	FAYETTE COUNTY BOC	KIWANIS PARK	140 STONEWALL AVE WEST	KIWANIS PARK OLD SENOIA RD	5.13
20	FAYETTE COUNTY BOC	WATER SYSTEM WELL LOT	140 STONEWALL AVE WEST	FIRE STATION FUTURE GREENFIELD	1.03
21	FAYETTE COUNTY BOC	FIRE STATION #10 (SEAY RD)	140 STONEWALL AVE WEST	FIRE STATION - FUTURE - SEAY	4.48
22	FAYETTE COUNTY BOC	LANDFILL TRANSFER STATION	140 STONEWALL AVE WEST	LANDFILL TRANSFER STATION	50.76
23	FAYETTE COUNTY BOC	LANDFILL TRANSFER STATION	140 STONEWALL AVE WEST	LANDFILL TRANSFER STATION	0.75
24	FAYETTE COUNTY BOC	LANDFILL MORNING DOVE DRIVE	140 STONEWALL AVE WEST	LANDFILL MORNING DOVE DRIVE	15.98
25	FAYETTE COUNTY BOC	OLD DOT BARN	140 STONEWALL AVE WEST	OLD DOT BARN HWY 92 S	1.10
26	FAYETTE COUNTY BOC	KIWANIS FIELD	140 STONEWALL AVE WEST	KIWANIS FIELD	19.42
27	FAYETTE COUNTY BOC	KIWANIS PARK	140 STONEWALL AVE WEST	KIWANIS PARK	5.98
28	FAYETTE COUNTY BOC	KIWANIS PARK	140 STONEWALL AVE WEST	KIWANIS PARK	12.87
29	FAYETTE COUNTY BOC	LANDFILL	140 STONEWALL AVE WEST	LAND FILL	26.11
30	FAYETTE COUNTY BOC	TRANSFER STATION	200 COURTHOUSE SQ	TRANSFER STATION	3.43
31	FAYETTE COUNTY BOC	LANDFILL	140 STONEWALL AVE WEST	LAND FILL (167.3 ACRES)	9.63
32	FAYETTE COUNTY BOC	LANDFILL	140 STONEWALL AVE WEST	LAND FILL (167.3 ACRES)	157.98
33	FAYETTE COUNTY BOC	LANDFILL	140 STONEWALL AVE WEST	LANDFILL FIRST MANASSAS MILE	8.86
34	FAYETTE COUNTY BOC	JUSTICE CNTR / FRIENDSHIP CNTR	140 STONEWALL AVE WEST	SENIOR CENTER	26.11
35	FAYETTE COUNTY BOC	LANDFILL	140 STONEWALL AVE WEST	LANDFILL GRADY AVE	6.75
36	FAYETTE COUNTY GEORGIA		140 STONEWALL AVENUE WEST	JUSTICE CENTER LEE STREET	40.82
37	FAYETTE COUNTY BOC	FIRE STATION #4/JAIL/SHERIFF	140 STONEWALL AVE WEST	JOHNSON AVENUE	2.76
38	FAYETTE COUNTY BOC	MCCURRY/PUBLIC WORKS	140 STONEWALL AVE WEST	FLEET/BLDG-GND MAINT/REC AREA	89.51
39	FAYETTE COUNTY BOC	MCCURRY/PUBLIC WORKS	140 STONEWALL AVE WEST	FLEET/BLDG-GND MAINT/REC AREA	0.08
40	FAYETTE COUNTY BOC	MCCURRY/PUBLIC WORKS	140 STONEWALL AVE WEST	FLEET/BLDG-GND MAINT/REC AREA	103.85

Potential County-Owned Parcel Index

ID	OWNER1	OWNER2	STREET ADD	PROPERTY LOCATION	ACRES
41	FAYETTE COUNTY BOC	WATER DEPT-911	140 STONEWALL AVE WEST	WATER DEPT/911 CTR/FIRE TNG AR	18.43
42	FAYETTE COUNTY BOC	WATER DEPT-911	140 STONEWALL AVE WEST	WATER DEPT/911 CTR/FIRE TNG AR	32.67
43	FAYETTE COUNTY BOC	WATER DEPT-911	140 STONEWALL AVE WEST	WATER DEPT/911 CTR/FIRE TNG AR	10.38
44	FAYETTE COUNTY BOC	MCELROY HOUSE	140 STONEWALL AVE WEST	THE MCELROY HOUSE - 5.0ACRES	3.38
45	FAYETTE COUNTY BOC		140 STONEWALL AVE	9.05 ACRES LL 149	9.19
46	FAYETTE COUNTY BOC	WATER TANK ELLIS ROAD	140 STONEWALL AVE WEST	WATER TANK ELLIS ROAD	2.67
47	FAYETTE COUNTY BOC	FIRE STATION #2	140 STONEWALL AVE WEST	FIRE STATION #2	2.60
48	FAYETTE COUNTY BOC	FIRE STATION #2	140 STONEWALL AVE WEST	FIRE STATION #2	1.55
49	FAYETTE COUNTY BOC	WATER TANK	140 STONEWALL AVE WEST	WATER TANK LEES MILL	1.22
50	FAYETTE COUNTY BOC	HILL ROAD .56 AC	140 STONEWALL AVE WEST	.56 ACRES HILL ROAD	0.54
51	FAYETTE COUNTY BOC	NORTH PARK/KENWOOD,HWY 279	140 STONEWALL AVE	NORTH PARK/KENWOOD,HWY 279	1.73
52	FAYETTE COUNTY BOC	NORTH PARK/KENWOOD,HWY 279	140 STONEWALL AVE	NORTH PARK/KENWOOD,HWY 279	8.77
53	FAYETTE COUNTY BOC	NORTH PARK/KENWOOD,HWY 279	140 STONEWALL AVE	NORTH PARK/KENWOOD,HWY 279	134.08
54	FAYETTE COUNTY BOC	NORTH PARK/KENWOOD,HWY 279	140 STONEWALL AVE	NORTH PARK/KENWOOD,HWY 279	31.32
55	FAYETTE COUNTY BOC	MILLPOND MANOR DONATED LAND	140 STONEWALL AVE	MILLPOND MANER DONATED LAND	15.34
56	FAYETTE COUNTY BOC	CHIMNEYS DONATED PROPERTY	140 STONEWALL AVE	CHIMNEY DONATED PROPERTY	18.39
57	FAYETTE COUNTY BOC	ANIMAL SHELTER	140 STONEWALL AVE WEST	ANIMAL SHELTER	1.96
58	FAYETTE COUNTY BOC	WATER TREATMENT PLANT	200 COURTHOUSE SQ	TREATMENT PLANT 35.4 ACS	34.77
59	FAYETTE COUNTY BOC	FIRE STATION #8	140 STONEWALL AVE WEST	FIRE STATION #8	3.51
60	FAYETTE COUNTY BOC	FIRE STATION - FUTURE SANDYCRK	140 STONEWALL AVE WEST	FIRE STATION - FUTURE SANDYCRK	2.17
61	FAYETTE COUNTY BOC	LAKE PEACHTREE	140 STONEWALL AVE WEST	LAKE PEACHTREE	18.82
62	FAYETTE COUNTY BOC	WATER TANK	140 STONEWALL AVE WEST	WATER TANK	1.30
63	FAYETTE COUNTY WATER DEPT	WATER TOWER MAPLE SHADE	140 STONEWALL AVE	WATER TOWER	2.06
64	FAYETTE COUNTY BOC	FIRE STATION #3	140 STONEWALL AVE WEST	FIRE STATION #3	1.00
65	FAYETTE COUNTY BOC	FIRE STATION #1	140 STONEWALL AVE WEST	FIRE STATION #1 HWY 279	1.59
66	FAYETTE COUNTY BOC	FIRE STATION	140 STONEWALL AVE WEST	FIRE STATION #	0.67

APPENDIX E: FAYETTE COUNTY CONCEPTUAL DESIGN SITE INFORMATION

Request for Proposals #1428-P
Public Safety Radio System
Fayette County, Georgia

Site Name	Owner	Tower ASR	Mandatory Site	Latitude	Longitude	Shelter Size (feet)	New Tower Required?	New Generator Required?	New Shelter Required?	New UPS Required?	Structure Height (meters)	Existing 800 MHz Site
Prime	Fayette County	1E+06	Yes	33-27-18.9 N	84-24-35.4 W	12 x 36	No	No	No	No	146.6	Yes
Porter Road	American Tower	1E+06	Yes	33-21-8.9 N	84-29-12.5 W	12 x 15	No	No	No	No	91.4	Yes
SR54	American Towers	N/A	Yes	33-27-0 N	84-30-42 W	9 x 16	No	No	No	No	51.8	Yes
Westbridge	Global Signal Acquisitions	1E+06	Yes	33-31-36.6 N	84-30-16.7 W	11 x 15	No	No	No	No	91.7	Yes
Swanson Road	American Towers	1E+06	Yes	33-29-24.1 N	84-34-6.6 W	11 x 15	No	No	No	No	156.9	Yes
Brooks	Sprintcom, Inc.	1E+06	Yes	33-17-29.6 N	84-27-29.3 W	11 x 15	No	No	No	No	91.4	Yes
Peachtree City	City of Peachtree City	1E+06	Yes	33-24-1.4 N	84-34-48.7 W	9 x 16	No	No	No	No	91.4	Yes
1047185	American Towers	1E+06	No (Candidate)	33-29-42.9 N	84-27-2.1 W	12 x 20	No	Yes	Yes	Yes	79.3	No
1258753	New Towers	1E+06	No (Candidate)	33-26-44.4 N	84-36-19.5 W	12 x 20	No	Yes	Yes	Yes	54.8	No
1055348	American Towers	1E+06	No (Candidate)	33-24-4 N	84-31-44 W	12 x 20	No	Yes	Yes	Yes	48.2	No
1296173	TowerComV, LLC	1E+06	No (Candidate)	33-24-2.2 N	84-28-39 W	12 x 20	No	Yes	Yes	Yes	54.9	No
1044307	Crown Atlantic Company	1E+06	No (Candidate)	33-24-41 N	84-26-13 W	12 x 20	No	Yes	Yes	Yes	48.8	No
1205042	Crown Castle South	1E+06	No (Candidate)	33-21-25.3 N	84-23-41.8 W	12 x 20	No	Yes	Yes	Yes	72.2	No

APPENDIX F: COMPLIANCE MATRIX

RFP Section	Description	Respondent's Statement of Compliance	Respondent's Clarifications and Comments
		Select One Choice: 1) Comply 2) Comply with Clarification 3) Exception	
1	Project Overview		
1.1.	Introduction		
1.2.	Background – Fayette County legacy System overview		
1.2.1.	Current System Design		
1.2.2.	Capacity		
1.2.3.	Subscriber Radios		
1.2.4.	Radio Sites		
1.2.5.	Consolidated Dispatch Center		
1.2.6.	Critical Issues Affecting the Current System		
1.3.	Request for Proposal Overview		
1.4.	Project Summary		
1.5.	Proposals Desired		
1.5.1.	Systems		
1.5.2.	Services		
1.6.	Quality Assurance and Coordination		
1.6.1.	Standards and Guidelines		
1.6.2.	P25 Standard Compliance		
1.6.3.	Frequency Coordination and Licensing		
1.6.4.	Federal Aviation Administration (if applicable)		
1.6.5.	Project Management		
1.6.6.	Project Meetings		
1.6.7.	Project Staffing		
1.6.8.	Quality Assurance/Quality Control Program		
1.7.	Delivery, Storage and Handling		
1.8.	Project Submittals		
1.8.1.	Proposal		
1.8.2.	Preliminary Design (45 days after notice to proceed)		
1.8.3.	Final Design (90 days after notice to proceed)		
1.8.4.	System Staging, Delivery and Installation		
1.8.5.	Final System Acceptance		

RFP Section	Description	Respondent's Statement of Compliance	Respondent's Clarifications and Comments
		Select One Choice: 1) Comply 2) Comply with Clarification 3) Exception	
1.9.	Proposal Process Overview		
1.10.	Mandatory Pre-Proposal Conference		
1.11.	Schedule of Events		
1.12.	Proposal Response Requirements		
1.13.	Evaluation Plan		
1.13.1	Pricing		
1.13.2	Presentations		
1.14.	Addenda to the Contract		
1.15.	Award of Contract		
2	Radio Communications System Requirements		
2.1.	Overview		
2.2.	Interoperability/P25 Statement of Requirements		
2.3.	System Configuration		
2.3.1.	Redundancy and Survivability		
2.3.2.	Expansion		
2.3.3.	Grade of Service		
2.4.	Site Selection		
2.5.	Coverage		
2.5.1.	Coverage Maps		
2.5.2.	Map Criteria		
2.5.3.	Coverage Model		
2.5.4.	TIA TSB-88 – User Choices		
2.6.	Site Equipment		
2.6.1.	Overview		
2.6.2.	System and Site Control Equipment		
2.6.3.	Simulcast Equipment		
2.6.4.	Base Station Equipment		
2.6.5.	Antenna Systems		
2.6.6.	Antenna Installation		
2.6.7.	Removal of Existing Infrastructure and Equipment		

RFP Section	Description	Respondent's Statement of Compliance	Respondent's Clarifications and Comments
		Select One Choice: 1) Comply 2) Comply with Clarification 3) Exception	
2.7.	Network Management System		
2.7.1.	Network Management Terminal		
2.7.2.	Remote Terminal Units		
2.8.	Shared Switch – Option		
2.9.	Mobile Data – Option		
2.10.	Backup Consolelets – Option		
3	Backhaul Network		
3.1.	Overview		
3.2.	Digital Microwave Network		
3.2.1.	Requirements		
3.2.2.	Microwave Engineering		
4	Site Development		
4.1.	General		
4.2.	Towers		
4.3.	Shelters		
4.4.	Generator and Automatic Transfer Switch		
4.4.1.	Diesel Generator		
4.4.2.	Automatic Transfer Switch		
4.4.3.	Diesel Fuel System		
4.5.	DC Power		
4.6.	Site Preparation		
4.7.	Fencing		
5	Dispatch Consoles		
5.1.	General Requirements and Features		
5.2.	Trunked Requirements		
5.3.	Conventional Requirements		
5.4.	Paging Requirements		
5.5.	Systems Integration		
5.6.	Logging Recorder		
5.7.	Operator Position Equipment		
5.8.	Common Electronics Equipment		

RFP Section	Description	Respondent's Statement of Compliance	Respondent's Clarifications and Comments
		Select One Choice: 1) Comply 2) Comply with Clarification 3) Exception	
6	Warranty, Maintenance, and Support		
6.1.	Warranty		
6.2.	Maintenance		
6.2.1.	General Requirements		
6.2.2.	Maintenance Standards		
6.3.	Parts Availability		
6.4.	Spare Equipment		
6.5.	Lifecycle Cost – Option		
7	System Implementation, Test and Acceptance		
7.1.	General		
7.2.	Cutover Plan		
7.3.	Staging		
7.4.	System Installation		
7.5.	Coverage Testing		
7.6.	30-day Operational Test		
7.7.	Training		
7.8.	Final Acceptance Testing		
7.9.	As-Built Documentation		
7.10.	System Acceptance		
8	Subscriber Equipment		
8.1.	Overview		
8.2.	General Requirements		
8.2.1.	Portable Radios		
8.2.2.	Mobile Radios/Control Stations		
8.2.3.	Fleet Mapping		
8.3.	Subscriber Warranty and Maintenance		
8.3.1.	Subscriber Warranty		
8.3.2.	Subscriber Maintenance		

RFP Section	Description	Respondent's Statement of Compliance	Respondent's Clarifications and Comments
		Select One Choice: 1) Comply 2) Comply with Clarification 3) Exception	
9.	County Terms and Conditions		
Glossary of Terms and Acronyms			
Appendix A:	Proposal Form		
Appendix B:	Proposal Pricing Forms		
Appendix C:	Fayette County-Owned Parcel Location Map		
Appendix D:	Potential County-Owned Parcel Index		
Appendix E:	Fayette County Conceptual Design Site Information		
Appendix F:	Compliance Matrix		
Appendix G:	Company Information		
Appendix H:	E-Verify Affidavit		
Appendix I:	Statement of Noncollusion		

APPENDIX G: COMPANY INFORMATION

RFP #1428-P: Public Safety Radio System

COMPANY

Company Name: _____

Physical Address: _____

Mailing Address (if different): _____

AUTHORIZED REPRESENTATIVE

Signature: _____

Printed or Typed Name: _____

Title: _____

Email Address: _____

Phone Number: _____ Fax Number: _____

PROJECT CONTACT PERSON

Name: _____

Title: _____

Office Number: _____ Cellular Number: _____

APPENDIX H: E-VERIFY AFFIDAVIT

Contractor Affidavit under O.C.G.A. § 13-10-91(b)(1)

By executing this affidavit, the undersigned contractor verifies its compliance with O.C.G.A. § 13-10-91, stating affirmatively that the individual, firm or corporation which is engaged in the physical performance of services on behalf of Fayette County, Georgia has registered with, is authorized to use and uses the federal work authorization program commonly known as E-Verify, or any subsequent replacement program, in accordance with the applicable provisions and deadlines established in O.C.G.A. § 13-10-91. Furthermore, the undersigned contractor will continue to use the federal work authorization program throughout the contract period and the undersigned contractor will contract for the physical performance of services in satisfaction of such contract only with subcontractors who present an affidavit to the contractor with the information required by O.C.G.A. § 13-10-91(b). Contractor hereby attests that its federal work authorization user identification number and date of authorization are as follows:

Federal Work Authorization User Identification Number

Date of Authorization

Name of Contractor
1428-P: PUBLIC SAFETY RADIO SYSTEM

Name of Project
FAYETTE COUNTY, GEORGIA

Name of Public Employer

I hereby declare under penalty of perjury that the foregoing is true and correct.

Executed on _____, _____, 201__ in (city) _____, (state) _____

Signature of Authorized Officer or Agent

Printed Name and Title of Authorized Officer or Agent

SUBSCRIBED AND SWORN BEFORE ME
ON THIS THE _____ DAY OF _____, 201 ____.

NOTARY PUBLIC

My Commission Expires:

APPENDIX I: STATEMENT OF NONCOLLUSION

STATEMENT OF NONCOLLUSION

Each Bidder shall complete the following statement in accordance with OCGA 36-91-21(e):

STATE OF _____ }
COUNTY OF _____ } SS

That (s)he is the agent authorized by the Bidder to submit the attached bid. Affiant further states that the Bidder has not been a party to any collusion among Bidders in restraint of freedom of competition by agreement to bid at a fixed price or to refrain from bidding; or with any State, County, or City official or employee as to quantity, quality, or price in the prospective Contract, or any other terms of said prospective Contract; or in any discussions between Bidders and any State, County, or City official concerning exchange of money or other thing of value for special consideration in the letting of a contract.

Affiant further warrants that no person or selling agency has been employed or retained to solicit or secure such contract upon an agreement or understanding for a commission, percentage, brokerage or contingent fee, except bona fide employees or bona fide established commercial or selling agencies maintained by the Contractor for the purpose of securing business.

Name of Contractor

Bidder (Affiant)

Subscribed and sworn to before me this _____ day of _____, 20____

My commission expires: _____

Notary Public

END OF SECTION