



P25
Wide Area Radio Network (WARN)
Project

Request for Information

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1. Introduction

1.1 Overview

Shelby County, Alabama is embarking on an initiative to upgrade its public safety communications network. The primary objective of the Wide Area Radio Network (WARN) project is to provide Shelby County with a county-wide, mission critical radio voice communication system.

The system must be a state-of-the-art, wide area Project 25 compliant digital trunked VHF or 700/800MHz radio system for use throughout the County that is based on national standards in which federal, state, local, and military representatives can operate autonomously and transition seamlessly for effective communications in emergency mission roles. Since the system is expected to serve the communication needs of Shelby County for the next 10 years or more, it must have the flexibility of adapting to changing system requirements and new technology without the need to replace major equipment elements. In particular, the system must offer Voice over Internet Protocol capability.

This Request for Information (“*RFI*”) is the first step in the initiative. Shelby County seeks information concerning a conceptual design and total cost of ownership for the system specifications outlined within this document. This information will allow Shelby County to make an assessment of the total costs and functionality associated with a County-wide IP based radio telecommunications system.

Bidders are encouraged to propose a system design that will best meet the requirements of Shelby County. The system shall be proposed as a complete system with firm prices for all equipment, software and services required by these specifications. Where appropriate, pricing should be provided with sufficient options and detail to facilitate a scaled approach to implementation of the final solution.

The bid response should explain to what extent the system is or is not compliant with the latest Project 25 suite of standards at the time of this RFI.

1.2 Current Operations

Shelby County is the fastest growing county in the State of Alabama, encompassing approximately 808 square miles in Central Alabama. Shelby County presently has an estimated 182,113 residents and projections are that by 2015 there will be 216,308 people living in Shelby County. Shelby County currently employs almost 600 employees with approximately 225 (38%) assigned to public safety operations.

Shelby County Sheriff’s Office, Harpersville PD and Vincent PD are dispatched by 9-1-1 on 2 VHF repeaters.

Shelby County Board of Education communicates utilizing approximately 625 cellular devices (325 assigned to school buses and 300 administrative users).

Shelby County EMA and Public Works as well as other county agencies use SouthernLINC and/or VHF conventional radios for the majority of their communications.

Municipal police departments in Shelby County operate their own VHF analog repeaters and use Nextel or SouthernLINC for their administrative staff.

Fire Service is dispatched on VHF repeaters; the one used for a given department is determined by coverage. Fire Departments are alerted via tone-alert pagers and unless the vendor can propose an acceptable alternative, the current system will be retained for alerting purposes.

1.3 General Goals and Objectives

The WARN project goal is to build a cost shared, reliable and effective Project 25 standard digital trunked radio system capable of providing interoperable communications for first responders, mutual aid, and emergency medical response roles ensuring the safety and well being of all Shelby County citizens. In addition, to gain economics of scale, Shelby County plans to eventually offer the new voice communications network across all public sector voice communication venues from education to local government usage.

The primary reason for this project is that the current communication systems configuration and architecture do not support the current business requirements such as communications interoperability. The current Sheriff's Office communication systems was designed in the late 1960's and does not meet the county's needs in terms of coverage, capacity, interoperability, reliability or the new FCC narrow banding requirement. This project will enable re-engineering of the public safety communications voice workflows and provide much needed interoperability features between agencies as well as multiple layers of security, redundancy and fault tolerance.

Many of the County's public safety communications systems are standalone systems built decades ago based upon inflexible technical architectures. These legacy systems are increasingly prone to problems as they age, where changes can lead to unpredictable effects, and modifications are becoming problematic and excessively laborious. Thus, Shelby County has developed the following objectives:

Integrate people, processes, and technology to provide a balanced service level.

- Increase the interoperability of public safety communications within the County
- Create a collaborative environment where access to communications is seamless across jurisdictional boundaries while enhancing performance, monitoring and security

Leverage resources, institutional knowledge, developing skill sets, and technology in an effort to continuously improve service and productivity throughout Shelby County.

- Increase the ability to be more responsive to business demands
- Establish IP based communications as County wide standard both wired and wireless
- Eliminate the need to support legacy applications, and promote the creation of a faster, more accurate, and more proactive technological environment

Mitigate risk to Shelby County by focusing on contingency operations, compliance requirements and understanding the impact these requirements have on responsiveness, productivity and customer service.

- Develop an integrated structure that will promote the consistent enforcement of policies, procedures, local, state and Federal laws and regulations throughout the County.
- Design an environment with multiple layers of security, redundancy and fault tolerance. This will be accomplished through the use of new technologies, creative design, timely issue resolution, thoughtful decision making, and consistent project management

1.4 Rationale

The primary rationale for initiating the WARN project includes the need:

1. To replace non-interoperable two-way radio communication systems with an interoperable system capable of handling communication among federal, state and local governments and improving public safety response and safety.
2. To replace existing equipment that is obsolete.
3. To incorporate FCC regulations calling for narrow band spectrum systems.
4. To provide a radio system capable of supporting day-to-day operations of the participating agencies while also seamlessly able to handle emergency situations reliably and efficiently, enhancing the safety of responders and the public through interoperability and predefined emergency communications planning and implementation.

1.5 Partnering Principles

Shelby County believes the general partnering principles below are essential to successful technology relationships. These principles are incorporated into all contractual relationships regarding strategic applications.

PARTNERING PRINCIPLE #1 Commitment to State-of-the-Art Products

Shelby County will be making a significant intellectual capital and resource investment in Vendor's products. Vendor historically has made and, within reasonable fiscal constraints, expects to continue to make investments in the ongoing development of its products.

PARTNERING PRINCIPLE #2 Predictability of On-Going Cost and Expenses

Costs and expenses must be clearly articulated and understood by the Parties prior to executing contractual agreements or change orders.

PARTNERING PRINCIPLE #3 Decision-Making Authority

Each Party will commit knowledgeable and empowered managers and other key decision-makers to cultivate and support the relationship created through the Agreement.

PARTNERING PRINCIPLE #4 Time-to-Market Solutions and Regulatory Updates

In a long-term technology relationship, time-to-market for products is critical to Shelby County. Vendor will work with Shelby County to facilitate timely deployment of Vendor's products.

PARTNERING PRINCIPLE #5 Realizing Expected and Future Benefits

Vendor will work with Shelby County to identify and set forth in contractual agreements quantifiable, measurable benefits associated with deploying and using Vendor's products.

PARTNERING PRINCIPLE #6 Protection of Investment

Vendor will work with Shelby County to ensure investments in Vendor's products are protected economically against shifts in platforms and product migrations.

PARTNERING PRINCIPLE #7 Management Participation

Vendor will make appropriate opportunities available to Shelby County to become involved in Vendor's technology strategic planning process. On-going representation and/or observation on appropriate customer councils and committees related to Vendor products also will be made available to Shelby County.

PARTNERING PRINCIPLE #8 Quality Resources to Support the Relationship

Vendor will commit quality and support resources and systems to support the relationship. You manage what you measure.

PARTNERING PRINCIPLE #9 Growth Opportunities

Vendor must be flexible in addressing Shelby County's future growth.

PARTNERING PRINCIPLE #10 Commitment to Open Architecture Environment

Vendor has adopted and intends to continue to promote open architecture solutions. Vendor will make available to Shelby County all application programming interfaces and other Interfaces and related documentation to promote interoperability among Vendor's system and Shelby County's other systems to the same extent that like items are made available by Vendor to its other customers.

PARTNERING PRINCIPLE #11 Alignment of Accountability/Responsibility

Accountability and responsibility will be aligned to facilitate decision making, accountability and a results-focused orientation.

2. System Description

2.1 General

The system shall be capable of Project 25 digital and analog operation.

The network communications architecture shall provide the radio user transparent portable radio communications with 95% talkback reliability and permit the radio user to roam across the entire area of coverage without requiring manual switching or changing of site information.

The system shall provide interoperability with existing digital Project 25 conventional, trunked and analog conventional FM radio systems from the same or different manufacturers.

The bidder should propose both a VHF and 700/800MHz solution. The County will select the best solution, considering overall system cost, number of tower sites, predicted coverage, and vendor's professional opinion.

The bidder is solely responsible for system design and integrity.

Shelby County has licenses for approximately 50 VHF frequencies. Shelby County currently holds no 700/800MHz licenses, but 700 MHz spectrum has been reserved for local government use within the County. The bidder must determine what frequencies are acceptable and useable in the proposed solution. If any modifications or additions are required to the licenses, the bidder must state that in the bid response. The bidder is also responsible for site selection and tower construction, if required.

2.1.1 Acceptance of Plans and Specifications

Bidder will be held to have accepted the terms and conditions as expressed in the specifications which are a part hereof. Notwithstanding the details presented in these specifications, it is the responsibility of the bidder to verify the correctness of the materials list and suitability of devices to meet the specifications. Any equipment required by the performance specifications and not specifically mentioned herein shall be provided by the successful bidder without claim for additional payment.

2.2 System Architecture

2.2.1 System Block Diagram

Bidder shall provide a complete high level block diagram for the entire system showing the repeater sites, dispatch consoles, network transport systems and any other major system components (such as extended network controller, system management computer, data gateway, centralized telephone interconnect, etc.).

2.2.2 Repeater Site Locations

Bidder is responsible for repeater site selection and must include cost for towers, shelters, generators, and UPS systems as required to complete each site in accordance with these specifications. Bidder shall provide a detailed description of the repeater sites including address, latitude, longitude, antenna height, and tower height.

Shelby County may not own any suitable towers for the system. Where adequate tower space is available, Shelby County prefers to co-locate on an existing tower. Bidder will assist Shelby

County in lease negotiations with tower owners. Bid response should include an estimate of tower rental fees, name of owner and contact information.

If a new tower must be constructed, bidder is responsible for zoning permits, building licenses, FAA permits, lighting, painting, site preparation, grounding and/or any other requirements to construct a suitable tower. All costs associated with tower construction must be included in bid proposal.

Shelby County anticipates the system will utilize five or fewer tower sites.

2.3 Radio Coverage Requirements

2.3.1 Coverage Predictions

Radio system coverage shall be predicted through use of a radio wave propagation model that has been developed on the basis of theoretical and empirical data, which will take into account terrain irregularity, foliage, urban clutter, noise and long and short term signal variations. The model used for the purposes of the coverage prediction shall be identified, and the rationale for system losses (e.g., power, gain, and loss information used in the model for each site) shall be described in the bidder's proposal.

Single site and multi site composite coverage plots shall be presented on an appropriate scale. In addition to the propagation maps, coverage predictions should include transmitter site power output, antenna gain and type, effective receiver sensitivity, antenna height, portable ERP, portable effective receiver sensitivity, transmitter site talk-out range, portable unit talk-back range.

2.3.2 Voice Quality

Coverage is defined as the minimum signal required to provide Delivered Audio Quality 3.0 (DAQ 3.0) voice quality, defined as "Speech understandable with slight effort. Occasional repetition required due to noise distortion". Bidder shall relate this voice quality to a signal level for acceptance testing purposes.

2.3.3 Mobile Coverage Requirement

Mobile voice coverage shall be provided over at least **95%** of Shelby County. The boundary of the mobile service area (Shelby County) shall be clearly indicated on the bidder's coverage maps provided with their proposal and the estimated percentage coverage within this area also shown to validate that the predicted coverage meets the 95% requirement.

Bidder shall provide detailed RF propagation coverage prediction analysis for both talk-out and talk-back for mobiles.

2.3.4 Portable Outdoors Coverage Requirement

Portable voice coverage shall be provided to at least **95%** of Shelby County. The boundary of the portable outdoor service area (Shelby County) shall be clearly indicated on the bidder's coverage maps provided with their proposal and the estimated percentage coverage within this area also shown to validate that the predicted coverage meets the **95%** requirement.

Bidder shall provide detailed RF propagation coverage prediction analysis for both talk-out and talk-back for portables outdoors.

2.3.5 Portable In-building Coverage Requirement

Portable in-building voice coverage assuming *10* dB penetration loss for the structures shall be provided to at least *90%* of heavily populated areas. The boundary of the portable in-building service area shall be clearly indicated on the bidder's coverage maps provided with their proposal and the estimated percentage coverage within this area also shown to validate that the predicted coverage meets the *90%* requirement.

Bidder shall provide detailed RF propagation coverage prediction analysis for the both talk-out and talk-back with in-building portables.

2.3.6 Coverage Issues

As an add-on option, Bidder shall describe possible solutions to coverage issues that Shelby County may experience. Of particular concern, is small "holes" within the county and lack of coverage in sizeable buildings. Bidder should include approximate costs of proposed solutions such as building amplifiers and voting receivers.

2.3.7 Radio Frequencies

Bidder shall be responsible for determining if licensed VHF frequencies are useable. Bidder shall design the system for optimum frequency placement. The physical location of the licenses may be changed at bidder's discretion to provide better system design.

700/800MHz frequencies will be obtained from the Public Safety spectrum as allocated in the Region 1 plan for Shelby County.

The bidder shall satisfactorily minimize the effects of interference at each site. An interference analysis shall be part of the detailed system design provided by the bidder. The analysis must include, at a minimum, co-channel and adjacent channel interference, intermodulation, transmitter noise and receiver desensitization.

Bidder should note if new or modified licenses will be required for the system and estimate the associated APCO fees. Shelby County will not award a contract for the system until adequate FCC licenses are obtained.

Shelby County

Call Sign WPXF230

2.4 Subscribers

The proposed radio system is intended to be a joint county-wide endeavor. It is the expectation of Shelby County that many other county law enforcement, fire, EMA, and local government agencies will participate in the final system. Each agency would be responsible for acquisition of subscriber units and base stations.

The primary user in the initial deployment will be the Shelby County Sheriff's Office. The Sheriff's Office currently has 141 radio equipped vehicles and 150 portables. There are 3 dispatch positions using base stations at the Sheriff's Office in Columbiana. 9-1-1 in Pelham has 8 dispatch positions and 1 backup for a total of 9 Baker radio consoles.

Other potential users and the estimated number of subscriber units:

160 – Alabaster PD
60 – Calera PD
25 – Columbiana PD
20 – Harpersville PD
45 – Helena PD
300 – Hoover PD
110 – Hoover Fire
34 – Montevallo PD
120 – Pelham PD
100 – Other County Employees
20 – Agriculture
625 – Shelby County Board of Education

3. System Functional Requirements

3.1 Wide Area Communications

The system shall provide the ability to place and receive calls to and from any point in the network covered by the Project 25 radio sites. All sites shall be linked to the wide area radio network. The backhaul shall be packet switched using Internet Protocols.

3.1.1 Roaming and Handoff

The system shall permit the radio user to roam across the entire area of coverage without requiring manual switching or changing of site information. The handoff from site to site should be seamless to the subscriber. Bidder should define to what degree, if any, speech is lost during site handoff.

3.1.2 Restriction of Talk groups to Geographic Areas

The system shall permit talk groups to be restricted to specific sites and to specific radio channels at a site.

3.2 General Features

3.2.1 Voice, Data and Control

The system shall provide a minimum of one voice call per 12.5 kHz of radio channel spectrum. Where applicable, bidder should define equipment compatibility with or upgrade path to Project 25 Phase II 6.25kHz channels.

The Project 25 radio system shall support both voice and data communications.

3.2.2 System Access Time

The bidder shall specify the actual access time within the system. System access time is defined as the time from the moment of push-to-talk activation until the transmitting unit receives the "grant tone" on the radio. Individual access time, under normal operating conditions, shall not exceed 500 milliseconds.

The assumed conditions for determining system access time shall include adequate RF signal level for both talk-out and talk-back links, an available voice channel, and properly working system components.

3.2.3 Radio Disable

The system shall have the ability to selectively enable or disable an individual radio from the system management computer.

Bidder shall indicate to what extent the system is capable of preventing a stolen radio from accessing the system.

3.2.4 Caller Identification

Each subscriber unit shall be identified by a radio ID. The radio ID shall be included in each transmission. The radio ID shall be displayed at the appropriate dispatch console.

Each mobile radio, portable radio, control station, and dispatch console shall be capable of displaying an alphanumeric alias corresponding to the unit ID, if available from the transmitting device.

3.2.5 System Access by Unauthorized Devices

The system shall prevent access by unauthorized devices. The bidder shall indicate how access is controlled.

3.2.6 Over-The-Air Programming

The system shall provide the ability to update radio parameters to the mobile and portable radios over the air (without the need to physically connect the radio programmer to the radio). Parameter updates shall include information such as available radio channels, talk group lists, scan priorities and user privileges. Bidder shall describe what OTA programming options are available.

3.2.7 Encryption

The system shall support digital voice encryption using Project 25 Encryption standards.

The system shall support over the air rekeying (OTAR) of mobile and portable radios using Project 25 OTAR.

3.2.8 All Call

The system shall support “all calls” to agencies and fleets through suitable definition of talk group membership.

3.2.9 Talk group Priority

The network must be capable of providing talk group priority. The system shall allow higher priority calls to preempt a lower priority call.

3.2.10 Dispatcher Override

The system shall permit a call originating from a dispatch console to interrupt a call by a normal member of the same talk group, overriding the call so that other members of the talk group can hear the dispatcher.

3.2.11 Individual Call

The system shall support the ability to conduct a private call between two radio users on the network. The county desires the ability to grant the feature on an individual user or subscriber unit basis. Bidder shall indicate how an individual call is established in the proposed system.

3.2.12 Priority Scan

The system shall provide individual radios with the capability of scanning between multiple digital and analog talk groups.

Bidder shall indicate the maximum number of talk groups on the scan list, and how the scan sequence is resolved if several talk groups are active at the same time.

3.2.13 Talkback Scan

The system shall provide individual radios with the capability of talking back on a scanned talk group.

3.2.14 Scan Group Lockout

The system shall provide the user with the ability to temporarily disable scanning on selected talk groups.

3.2.15 Emergency Alert and Emergency Call

The system shall support an emergency call feature in the mobile and portable radios. This feature would be used to inform dispatch and/or other radio units of a user in distress. Bidder shall indicate how the Emergency Call feature is implemented.

3.2.16 Late Call Entry

The system shall permit a user who has just re-entered radio coverage or was engaged in another call to "late enter" into a call in progress.

3.3 Interoperability

3.3.1 Project 25 Systems

The system shall provide automatic interoperability with existing Project 25 radio systems from the same or different manufacturers using a Project 25 compliant Inter RF Sub-System Interface (ISSI). Interoperability is defined as the capability to connect or patch Project 25 talk groups on the County radio system through the ISSI with Project 25 talk groups on another agency's radio system. Automatic is defined as taking place without operator (user or dispatcher) intervention. It is acceptable for an operator to be required to set up the initial connection. However, all subsequent inter-system communications should occur without any human intervention.

3.3.2 Conventional Analog Systems

The system shall provide automatic interoperability with existing conventional analog radio channels, where a talk group on the new system is connected to a conventional analog radio channel, or alternatively to a CTCSS (Continuous Tone-Coded Squelch System) defined talk group on a conventional analog radio channel. Automatic is defined as taking place without operator (user or dispatcher) intervention. It is acceptable for an operator to be required to set up the initial connection. However, all subsequent inter-system communications should occur without any human intervention.

The existing conventional analog radio systems to be interfaced may operate in the VHF, UHF, 800 MHz, or 900 MHz frequency bands. The conventional analog station interface shall accommodate any one or all of these.

The system shall support statically defined interfaces between CTCSS talk groups on conventional channels and talkgroups on the new system, where once the interface is configured it is not changed.

3.3.3 Trunked, non Project 25 Systems

The system shall provide automatic interoperability with trunked, non Project 25 radio systems from the same or different manufacturers. Interoperability is defined as the capability to connect or patch Project 25 talk groups on the new radio system through the wide area controller with trunked talk groups on an existing radio system. Automatic is defined as taking place without operator (user or dispatcher) intervention. It is acceptable for an operator to be required to set up the initial connection. However, all subsequent inter-system communications should occur without any human intervention.

3.3.4 Interoperability to Neighboring Systems

Shelby County desires to have statically defined interfaces with neighboring public safety agencies. Bidder shall explain in general how such an interface would be built, how unit to unit communications would be accomplished, any limitations that exist, and estimated cost.

3.4 System Reliability and Fault Tolerance

System reliability and fault tolerance shall be major objectives in the design of the system. Bidder shall describe in detail all measures taken to ensure reliable operation of the system.

The system shall be designed such that there are no situations where a single failure in bidder supplied equipment will disable wide area operation.

Where applicable, bidder shall indicate the impact on system operation of each of the following system element failures, how the system responds, and what features, if any, are lost:

- Primary controller failure
- Extended network controller failure
- System management computer failure
- Backhaul link failure
- Channel controller failure
- Repeater failure

4. Equipment Requirements

4.1 Repeater Sites

Equipment provided at each site shall consist of repeaters and all other associated hardware and software for a digital Project 25 system.

4.1.1 Project 25 Repeater Stations

The Project 25 repeater station is considered to include the station channel controller.

All repeaters shall be configured to provide Project 25 voice transmission to user radios.

The system shall provide the ability to reconfigure individual repeaters remotely through the system management interface. The bidder shall indicate the extent to which a repeater can be configured remotely, and whether this programming is restricted to repeater parameters or also includes repeater operating software.

4.1.1.1 Control

The Project 25 repeater station shall be controlled and managed through a remote system management interface, which shall be capable of controlling the following functions:

- Placing a hot standby repeater on-line
- Taking a repeater off-line
- Commanding local repeater controls on/off
- Retrieving and setting repeater operating parameters
- Retrieving and setting repeater transmit/receive frequencies

4.1.2 Site Alarms

The system shall be capable of detecting the failure of all major equipment items at the repeater site.

4.2 System Management Interface

The bidder shall define how system management is handled. Shelby County prefers that system management functions be accessible through the county LAN/WAN environment using a web based interface.

The system shall be capable of supporting multiple system management operator terminals operating concurrently at different locations within the wide area network.

4.2.1 Polling and Alarms

The system management functions shall support polling and alarms.

System devices which detect that they have changed status or are operating below specification shall automatically transmit an alarm. In some cases, device failure will prevent the transmission of an alarm; these situations will be detected through polling.

4.2.2 User Access and Security

The system management function shall support multiple users and security access such that different managers (e.g. supervisor vs. non-supervisor) have control only over the units and groups for which they have been authorized.

The system management function shall keep a log of all entries into the system by date, time, and authorized individual.

4.2.3 Call Activity Logging and Statistics

The purpose of this feature is to determine the relative traffic loading and geographic distribution for each of the talk groups using the system. This can be used for billing different user groups, and in engineering the system for increased busy hour capacity.

The system management function shall maintain a reportable record of all voice call activity for a period of up to 1 year.

The following data shall be stored, as a minimum, in an ODBC compliant database (Microsoft SQL Server preferred):

- Date, time, and duration of call
- Type of call (group, selective, emergency)
- Unit initiating call and talk group number (group calls only)
- Unit initiating call and target unit number (selective calls only)
- Repeaters and/or consoles participating in the call
- Usage time for each repeater at a site
- The number of minutes by site that all of the channels at the site are busy
- Voice traffic volume by subscriber unit
- Voice traffic volume by repeater
- Wide area controller voice traffic volume
- Extended network controller voice traffic volume

4.2.4 Remote Diagnostics

The system management function shall permit the operator to run remote diagnostics on managed devices to isolate and troubleshoot faults.

4.3 Terminal Equipment Requirements

4.3.1 Minimum Specifications

Unless otherwise stated, control stations, mobiles, and portables shall meet the following functional requirements:

The radio shall support Project 25 operation on VHF or 700\800 MHz as appropriate. All radios shall be capable of placing and receiving group calls in Project 25 mode.

Where practical, radio equipment shall be used that is capable of operating on 6.25 kHz channels.

The radio shall be capable of placing and receiving analog conventional mode calls. Conventional mode of operation shall have the capability to use continuous tone coded squelch system (CTCSS) and digital coded squelch (DCS).

The radio shall have an emergency button and be capable of placing and receiving emergency calls.

The radio shall be capable of conventional analog simplex communications (mobiles and portables only).

The radio shall be programmable through a standard Windows-based computer and preferably by over-the-air provisioning.

The radio software shall be flash programmable for adding future software enhancements.

4.3.2 Mobile and Portable Subscriber Units

The Mobile radios shall be supplied with all necessary mounting hardware for a complete installation. All radio controls, inter-cabling, data cables and antennas shall be supplied. Unit pricing must include mobile installation and removal, if required.

The county anticipates a diversified group of subscribers as outlined in Section 2.4 *Subscribers*. Each individual agency will be responsible for the acquisition of their respective subscriber units. For purposes of this RFI, bidder is required to specify three (3) tiers of portable radios (basic, mid-level with display, and full-featured with display) from at least two (2) independent manufacturers. Two (2) tiers of mobile radios from two (2) manufacturers shall be proposed. Bidder can assume the county will purchase a minimum of fifty (50) units from each tier.

Typical features and accessories shall be quoted as options for both mobiles and portables. For example: encryption, shoulder microphones, high capacity batteries, and rapid chargers.

4.3.3 Control Stations

Control Station radios shall be supplied with power supply, mounting hardware and desk microphone.

Additional Features:

- Individual call
- Display alphanumeric talk group ID
- Display alphanumeric caller ID
- Display caller alias
- Project 25-compliant DES or AES voice encryption with OTAR

4.3.4 Consoles

Bidder shall propose Project 25 compliant IP based consoles. The county requires nine (9) consoles for 9-1-1 dispatch and three (3) for the Sheriff's Office dispatch.

Bidder is encouraged to provide pricing and specifications from at least two (2) independent manufacturers. For future reference, bidder shall include a list of IP based consoles that are compatible with the proposed system.

4.3.5 Open Architecture

It is the intent of Shelby County to purchase a system that supports open architecture. Bidder shall submit a minimum of two alternate manufacturers and models of subscriber equipment and/or infrastructure that will work in the system.

5. Implementation Requirements

5.1 Implementation Plan

The system shall be proposed as a complete system with prices for all of the equipment, software and services required by these specifications.

Bidders shall provide an implementation plan that provides for minimal downtime and interruption to Shelby County's public safety and emergency services departments.

5.2 Project Schedule

The final system acceptance and all related documentation shall be completed no later than 18 months after receipt of order.

As part of the final contract, bidders shall provide a detailed project schedule showing key tasks and milestones. The schedule shall include, but is not limited to:

- Final design review date
- System manufacture and integration time frames
- Pre-shipment system integration and staging dates
- Factory/staging acceptance test date
- Shipping dates
- System installation and optimization dates
- Field acceptance test date
- Installation configuration audit date
- Coverage testing dates
- Training dates

5.3 Project Management

Bidder shall appoint one individual to act as project manager and serve as the primary point of contact between Purchaser and Bidder on contractual matters. Project management shall be provided throughout the implementation of the system by the bidder. At a minimum, the services shall include:

- Monthly project status reports
- System design and final design review
- Implementation planning, scheduling, and coordination

-
- Management of all system integration activities
 - Installation and optimization
 - Acceptance testing
 - Migration and cutover planning
 - Maintenance support
 - Subcontractor management

5.4 Project Engineering

Bidder shall appoint one individual to act as project engineer and serve as the chief technical authority on the project and primary point of contact between Purchaser and Bidder on technical issues. Project engineering services shall be provided from the final system design through the completion of system acceptance and the warranty period. Project engineer must be certified in product solution(s) proposed. At a minimum, the services shall include:

- Final system design and review
- Frequency analysis and planning
- Coverage prediction and acceptance testing
- Fleet map planning
- System configuration
- Implementation support
- Final system documentation
- Resolution of technical problems

5.5 Installation Plan

Bidders shall provide details on the planned installation schedule and procedures to ensure that equipment is installed in a workmanship like manner following good engineering practices, all applicable codes and in conformance with manufacturer recommendations. All installations will be coordinated with, and subject to, the inspections and approval of the County or its representative.

Removal of mobile radios, repeaters, and control stations is to be included where new equipment is being installed in its place. Old equipment is to be returned to a single location specified by Shelby County. Removal of antenna systems and tower sites are not to be included in the bid response.

5.6 Acceptance Test Plan

Acceptance testing will comprise Operational Performance Acceptance Tests and RF Coverage Performance Acceptance Tests.

5.6.1 Operational Performance Acceptance Tests

The Operational Performance Tests will include the following basic test procedures:

- (1) Verify that all equipment is delivered and installed in a workmanship like manner in accordance with the Contract.
- (2) Demonstrate that all equipment performs as specified by examination of test data and the rerunning of specific tests if deemed appropriate.
- (3) Demonstrate and verify the proper operation of alarms, automatic switching and/or fallback modes for all critical elements.
- (4) Test all the basic call features, system control features, system access features and Project 25 compliance.

Bidder shall submit with the proposal a **sample** Operational Performance Acceptance Test Plan. The selected contractor shall provide a detailed Operational Performance Acceptance Test Plan to the Purchaser for approval prior to contract execution. This acceptance test plan will define the tests to be performed by the contractor for each phase to verify that the equipment and system perform in accordance with the contract specifications.

5.6.2 RF Coverage Performance Acceptance Tests

The RF Coverage Performance Acceptance Test will be performed independently of the Operational Performance Tests and in accordance with the following basic procedure:

Mobile tests will be performed by traveling over selected routes as agreed upon in *Section 5.6.2.2 Drive Route Planning* and measuring the RF signal level as outlined in *Section 5.6.2.1 RF Signal Strength Coverage Test*.

Bidder shall submit with the proposal a sample RF Coverage Acceptance Test Plan for verifying radio coverage meets stated requirements. A final RF Coverage Acceptance Test Plan shall be agreed upon by Purchaser and Bidder prior to contract award to minimize any potential misunderstanding in the interpretation of contractual commitments for system design and delivery.

5.6.2.1 RF Signal Strength Coverage Test

Radio coverage shall be verified by measuring talk-out (base to portable) signal strength throughout the defined service areas described in *Section 2.3 Radio Coverage Requirements* and calculating the percentage of measurements that exceed the required signal level for acceptable performance. The test shall be considered to pass if this percentage equals or exceeds 95% within the service areas.

The radio coverage shall be measured with an automated mobile test system. The test system should capture signal strength, test vehicle position, distance traveled, time, and frequency. After measuring radio coverage, the recorded data shall be presented as a drive test plot and statistical distribution of the coverage.

To simplify the test, talk-back measurements need not be made, but an analytical derivation of the relationship between talk-out and talk-back shall be included in the test report.

5.6.2.2 Drive Route Planning

A drive route plan shall be developed to gather a collection of data points evenly distributed throughout the defined service areas and provide a statistically accurate determination of radio coverage performance. The service area shall be divided into grids (for example, one mile square) to obtain an even or uniform distribution of test locations. The grids shall be overlaid onto street maps and a drive test route determined that passes through each grid at least once but not more than twice, as much as is practically possible. Bidder shall recommend an appropriate grid size in the proposal.

5.6.3 Final Acceptance

Final Acceptance shall require the following:

- Completion of all facility work, system, component, hardware and software delivery, installation, testing, optimization, integration, documentation, and training.
- Acceptance of the Shelby County Project 25 radio system, facilities, individual systems, and equipment by Shelby County. Correction of any operational, performance, or workmanship defects shall be at the sole expense of the Vendor.
- Written certification by the Vendor of compliance with the system performance specifications and RF coverage performance.

6. Support Services

6.1 Warranty

The basic system pricing shall include 12 month parts and labor warranty from date of system acceptance. Warranty shall include field service, mileage, and 24/7 emergency service for system outages and critical equipment.

6.2 Maintenance

Bidder shall include pricing for maintenance service during years two and three. Maintenance service will include parts, labor, mileage, shipping, 24/7 emergency service for system outages and critical equipment necessary for repairs required during normal operation of equipment. Repairs required due to physical damage and acts of nature will not be covered under the maintenance agreement. The service facility performing the maintenance for Shelby County must be located within 50 miles of Shelby County.

The following list identifies response and maintenance performance level required for critical service:

24-hour by 7-day - 4 Hour on Site Response for critical failures:

- Voice Radio System Infrastructure
- Dispatch Console Infrastructure
- Dispatch Control Stations

Bidder is requested to specify what day-to-day responsibilities the county is expected to assume, the expected number of personnel required to complete those duties, and the training/experience required.

6.2.1 Spare Parts

An adequate supply of spare parts for subscriber equipment shall be kept on hand at the local maintenance facility. Defective parts are to be replaced with original manufacturer parts, or equivalent which has the same guarantee.

6.3 Training

The Bidder shall provide a sample Training Plan for operation and maintenance of all equipment provided with the radio system. The county will select the number of classes and students after review of the RFI. Bidder shall provide costs breakdown in sufficient detail to allow the county to determine total training costs after the number of attendees is determined.

All training materials shall be provided in hard copy and reproducible electronic format.

6.4 Software Updates

Bidder shall quote pricing for Software Updates which shall extend the life of the system beyond today's technology. Software Updates shall be released on a regular basis after system acceptance by the Bidder.

6.5 Documentation

Contractor shall provide complete operational and maintenance documentation. In addition to user and technical manuals for equipment, contractor shall supply six sets of a complete systems manual which will include the following:

- System operational overview
- System interconnection and block diagrams
- System trouble shooting procedures
- Electronic drawings
- As-built drawings

Contractor shall provide user operational and equipment technical manuals in electronic format.

User Operational Manuals:

- RF Control Stations
- Mobile Equipment
- Portable Equipment
- Consoles

Technical Maintenance Manuals:

- RF Control Stations
- Mobile Equipment
- Portable Equipment
- Console Equipment
- Repeater Equipment
- System Management Interface

7. Vendor Qualifications

7.1 General Information

Bidder shall have been actively engaged in the design, manufacture, integration, and installation of equipment similar to the items proposed for a minimum of 5 years. Bidder shall provide a brief history of the company including the following:

- Corporate Vision
- Telecommunications vision and applicability to Public Safety
- Services and support vision
- Customer base, specifically in public safety

7.2 Financial Data

Each vendor shall provide the following financial data:

- A copy of a credit rating report from any of the major credit rating agencies, Dun & Bradstreet, Moody's, Standard & Poor's, etc.
- Last 3 years of audited Key Financial Reports (Income Statements, Balance Sheet, etc.)

7.3 Market Experience

Each vendor shall provide information that demonstrates its commitment to the government market, including the following:

- List the dollar value and the percentage of total sales in the government market for each of the past three (3) years.
- List all government based entities that have implemented its Project 25 based system within the last three (3) years, the equipment used by each, and the associated features implemented.

7.4 Client References

Bidder shall provide three (3) client references of bidders' most recent projects that have been completed during the last two (2) years which involved the design, manufacture, installation and testing of radio systems similar in size and scope to what is called for within this bid request.

Client references should be in the following format:

- Institution name
- Date contract was signed
- Date implementation was completed
- Background of the project
- Features implemented
- Scale (budget and people assigned to project)
- Brief explanation of why this reference is relevant to Shelby County
- Reference contact name
- Reference contact title and role in implementation
- Contact information, preferably address, telephone and email

7.5 Subcontractors

Bidders will provide information on subcontractors to be used for installation and local maintenance services. Information will include qualifications in terms of years in business, experience, and technical expertise. Bidder will be responsible for all services performed by subcontractors. County reserves the right to approve or reject all subcontractors.

8. Statement of Compliance

The Bidder shall include in the proposal a statement of compliance which clearly indicates compliance, or exception for each requirement in this RFI.

8.1 Compliance

A response of compliance shall be understood and agreed as a binding commitment to meet the requirement without exception or reservation of any description.

8.2 Exceptions to Specifications

Items in this specification which materially contribute to equipment reliability will not be compromised. Bidders must put in writing any deviations from specifications, stating why the alternate equipment proposed will render equivalent performance. Failure to detail all such deviations will provide grounds for rejection of the entire proposal as unworthy of further consideration.

9. Instructions

This RFI is only available in electronic format. The County will review all responses and supporting documentation to this RFI and, if necessary, gather or solicit additional information that may be required to fulfill the purpose and expected outcomes contained in this document. Responding to this RFI is not mandatory. If a vendor is electing not to respond, please notify us by email of your decision as soon as possible.

9.1 Submission of Responses; Handling of Vendor Inquiries

Vendors must respond to this Request for Information by close of business on December 5, 2008. Responses should be submitted to:

Phil Burns
CIO/Manager, IT Services - Shelby County
102 Depot Street
Columbiana, Alabama 35051-1118
205.670.6999
pburns@shelbyal.com

Bid pricing must conform to the *Appendix B: Pricing Outline*.

We may request respondents to provide presentations and/or demonstrations of the information contained in their response to this RFI.

9.2 Confidential Information

Shelby County is a public institution, and as such, it is subject to the Alabama Public Records Laws. Vendor responses are not public documents until a contract is awarded. After a contract is awarded, if Shelby County receives a public records request pursuant to this statute for the vendors' proposals or other information relating to this RFI, it is required by law to disclose such information unless such information meets the definition of a "trade secret". A "trade secret" is typically defined as "business or technical information, including but not limited to a formula, pattern, program, device, compilation of information, method, technique, or process that: (a) derives independent actual or potential commercial value from not being generally known or readily ascertainable through independent development or reverse engineering by persons who can obtain economic value from its disclosure or use; and (b) is the subject of efforts that are reasonable under the circumstances to maintain its secrecy." The vendor disclosing such trade secret must clearly mark such information "Confidential" in order for Shelby County to assert that it is a protected trade secret and not a public record if it receives a public records request.

9.3 Timeframes for Evaluation Process

The time frames for the evaluation process will be as follows:

- **Distribute RFI on October 6, 2008**
- **Receive Proposals from Vendors by December 5, 2008**
- **Evaluation Process Complete by January 23, 2009**

9.4 Incorporation of Vendor Proposal

THE PROPOSAL SUBMITTED BY THE SUCCESSFUL VENDOR, TOGETHER WITH THE REPRESENTATIONS MADE BY THE SUCCESSFUL VENDOR, SHALL BE INCORPORATED INTO A MASTER TECHNOLOGY AGREEMENT BETWEEN SHELBY COUNTY AND THE SUCCESSFUL VENDOR.

In the event of a conflict between the terms of the successful vendor's proposal and this RFI or the terms of another document relating to this RFI, the order of precedence set forth in the Master Technology Agreement shall apply.

10. Legal Requirements

10.1 Overview

Shelby County wants to memorialize its arrangement with the successful vendor with a contract that fully and accurately captures the various commitments being made by vendor. Shelby County reserves the right to negotiate with more than one vendor as it determines from which vendor to purchase the system.

10.2 The Master Technology Agreement

Shelby County plans to use a Master Technology Agreement, or "MTA" to establish the contractual relationship with the successful vendor. The MTA will be structured as a master agreement to afford Shelby County the flexibility to acquire additional products and services in the future without the need to renegotiate the base agreement. Shelby County is mindful that the MTA will need to be tailored to take into consideration technical and functional aspects of a vendor's solution; however, the core approach and basic terms and conditions contained in the contract are not expected to change.

10.3 Use of Legal Counsel

Shelby County will use legal counsel to develop the MTA and may be using legal counsel to assist in reviewing the vendors' responses. Because a legal review of each vendor's response may be undertaken by Shelby County in determining the likelihood of securing a contract with such vendor, Shelby County strongly recommends that each vendor involve its legal counsel as well.

Appendix A: Project 25 Compliance

The proposed solution must meet or exceeds all the technical requirements associated with the current and planned Association of Public Safety Communications Officials (APCO) Project 25 Standards and the Telecommunications Industry Associations (TIA) 102A Standards.

All proposed solutions should indicate compliance with the following features associated with a Project 25 trunked telecommunications system;

Feature Name	Standard	Indicate Compliance
Voice Calls		
Group Voice Call	102A, AABC-B, AABD	
Individual Voice Cal	102A, AABC-B, AABD	
Broadcast Voice Cal	102A, AABD	
Discreet Listening	102A	
Call Interrupt	102A	
Announcement Group Cal	102A, AABD	
System Call	AABC-B, AABD, CABA, BAAD	
Mobility Management		
Roaming	102A AABC-B AABD	
Inter-System Roaming	102A AABC-B AABD	
Inter-System Roaming Manual	102A AABC-B AABD	
Inter-System Roaming Automatic	102A AABC-B AABD	
Inter-WACN Roaming	102A AABC-B AABD, AABF-A-2	
Registration	102A AABC-B AABD	
Authentication (Implicit)	AABC-B AABD	
Link Layer Authentication	AACA	
Affiliation	102A AABC-B AABD	
De-Registration	AABC-B	
Encryption		
Block Encryption	AAAD, AACA	
DES-OFB Encryption of Voice	102A, AAAD	
DES-OFB Encryption of Packet Data	102A, AAAD	
AES Encryption of Voice	AAAD	
AES Encryption of Packet data	AAAD	
Multiple Encryption Algorithm	AAAD, AACA	
Multiple Encryption Keys	AAAD, AAAA-A	
Encryption Key Update	102A	
Over The Air Rekeying (OTAR)	102A, AACA, AACB, AACD	
Manual Rekeying Features	102A, AACD	
Supplementary Services		
Call Alerting	102A, AABC-B, AABD, AABG, BACD	
Pre-programmed Data/Short Message	102A, AABD, AABC-B, AABG, AABA-A, BACD	
Silent Emergency	102A, CABA	
Radio Unit Monitoring	102A, AABG, AABC-B, BACD	
Emergency Alarm	102A, AABG, AABC-B, BACD	
Emergency Call	BAAD, AABF-A	
Extended Functions		
Radio Unit Inhibit /Disable	102A, AABC-B, AABD, AABG	
Radio Unit Inhibit /Re-enable	102A, AABC-B, AABD, AABG	
Radio Check	102A, AABC-B, AABG	
System Services		
Network Status	AABC-B, AABD	

System Status	AABC-B, AABD	
Channel Identifier	AABC-B, AABD	
System Service	AABC-B, AABD	
Adjacent Site Status	AABC-B, AABD	
Secondary Control Channel	AABC-B, AABD	
Composite Control Channel	AABB-A, AABC-B, AABD	
Backup Control Channel	AABC-B, AABD	
Miscellaneous		
Talking Party Identification	102A	
Call Restriction	102A	
Priority Call	102A, AABC-B, AABD	
Preemptive Priority Call	102A	
Call Routing	102A	
Message Trunking	102A	
Transmission Trunking	102A	
Common Air Interface (Um)		
CAI	102A, BAAA-A	
Phase 1		
Enhanced Full Rate Vocoder	102A, BABA	
12.5 kHz Channel Bandwidth	102A, BAAA-A	
Frequency Division Multiple Access (FDMA)	102A, BAAA-A, AABA-A	
C4FM and CQPSK Modulation	102A, BAAA-A	
9.6 kbps Gross Bit Rate	102A, BAAA-A	
Backwards Compatibility (Analog FM)	102A, ANSI/TIA/EIA-603 Compliance	
Inter RF Sub-System Interface (G)	102A, ANSITIA/EIA-603 Com.Nance	
ISSI	102A, BACA, BACA-1, BACA-3, BACD	
Voice Services		
Group Voice Service	BACA, BACA-1	
SU-to-SU Voice Service	BACA, BACA-1	
Mobility Management Functions		
SU Registration	BACA, BACA-1	
SU Tracking	BACA, BACA-1	
Group Affiliation	BACA, BACA-1	
Group Tracking	BACA, BACA-1	
Authentication Credential Distribution	BACA, BACA-1	
Supplementary Data Services (Include)		
Emergency Alarm	BACD, BACA-3	
Call Alert	102A, BACD, BACA-3	
Short Message	102A, BACD, BACA-3	
Status Query	BACD, BACA-3	
Status Update	BACD, BACA-3	
Radio Unit Monitor	102A BACD, BACA-3	
Radio Check	BACD, BACA-3	
Radio Inhibit	BACD, BACA-3	
Radio Uninhibit	BACD, BACA-3	
Data Interfaces (A and Ed)		
Data Interfaces (A and E_d)	102A	
Data Configuration - Radio to FNE	BAEB-A, BAEB, BAEB-2	
Data Configuration - Radio to Radio (Direct)	BAEB-A, BAEB, BAEB-2	

Data Configuration - Radio to Radio (Repeated)	BAEB-A, BAEB, BAEB-2	
Packet Switched Confirmed Delivery Data	BAEB-A	
Packet Switched Data Network Access	BAEB-A	
RCP (Radio Control Protocol)	BAEE-A, BAEB-A	
SNMP (Simple Network Management Protocol)	BAEE-A, BAEB-A	
SCEP (Simple CAI Encapsulation Protocol)	BAEB-A	
SNDCP (Subnetwork Dependent Convergence Protocol)	BAEB-A	
Link Layer and Physical Layer Protocols	BAEA-A, BAEB-A	
Telephone Interconnect Interface (E1)		
Telephone Interconnect	102A, BADA	
Fixed Station Interface (E1)		
TBD		
Console Sub-System Interface (En)		
Console Sub-System Interface	102A, BACA-2	
Voice Services	BACA-2	
Mobility Management Functions	BACA-2	
Supplementary Data Services	BACD, BACA-3	
Network Management Interface (En)		
TBD		

Appendix B: Pricing Outline

	Initial Cost	Year 1 Maintenance	Year 2 Maintenance	Year 3 Maintenance
System Infrastructure				
Base equipment, software and services (itemized)				
Proposed Site 1				
Itemized Hardware				
Services				
Tower Infrastructure (if required)				
Proposed Site 2 (etc.)				
Itemized Hardware				
Services				
Tower Infrastructure (if required)				
Subscriber Units				
Portables				
Vendor 1				
Basic Portable				
Mid-Level Portable				
High-End Portable				
Accessories\Options (itemized)				
Vendor 2				
Basic Portable				
Mid-Level Portable				
High-End Portable				
Accessories\Options (itemized)				
Mobile				
Vendor 1				
Tier-1 Mobile				
Tier-2 Mobile				
Installation Services				
Accessories\Options (itemized)				
Vendor 2				
Tier-1 Mobile				
Tier-2 Mobile				
Installation Services				
Accessories\Options (itemized)				
Control Station				
Vendor1				
Vendor 2				
Console				
Vendor 1				
Vendor 2				
Training Services (Itemized)				
System Integration/Project Management/Other Services				