



Statement of Requirements
2022-035
Public Safety Radio Communications System
Enhancements

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FINAL

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1. Project Overview

1.1 Introduction

Rowan County, NC (County) is requesting a proposal to upgrade the existing Motorola ASTRO25 trunked radio system. The proposed system upgrade shall increase system reliability through the implementation of redundant system components and reconfigure the backhaul network to add ring protection. This Statement of Requirements (SoR) shall provide Motorola with the information required to develop and present a proposal to Rowan County.

1.2 Background

- A. The goal of the project is to upgrade the existing system to improve system reliability and redundancy. The County system upgrade project includes the following key goals:
1. Increase system reliability by supplying and integrating a new geographically diverse Prime Site.
 2. Provide a solution that leverages existing communications infrastructure (sites/facilities) to the greatest extent possible.
 3. Provide a stable, reliable infrastructure radio environment.
 4. Increase system reliability by reconfiguring the existing microwave backhaul network into a ring protected network.
 5. Increase system features by adding Global Positioning System / Automatic Vehicle Location (GPS/AVL) operation within dispatch center
 6. Replace the existing leased tower on Youngs Mountain with a County owned tower site on adjacent property and relocate the Youngs Mountain radio site equipment to this site and new equipment shelter. (Tower and shelter procurement and implementation outside of Motorola scope)
 7. Provide key stakeholders with ample communication, preparation and input avenues during the project.



8. Update Motorola maintenance contract "ASTRO25 System Upgrade Agreements with Maintenance Services" to include new equipment.

1.3 Standards and Guidelines

- A. Motorola shall comply with the applicable portions of the following standards, rules, regulations, and industry guidelines (presented here in alphabetical order; not reflective of priority):
 1. American National Standards Institute (ANSI)
 2. American Society of Testing Materials (ASTM)
 3. Federal Aviation Administration (FAA)
 4. Federal Communications Commission (FCC)
 5. Institute of Electrical and Electronics Engineers (IEEE)
 6. International Building Code (IBC)
 7. National Electrical Code (NEC) (NFPA-70)
 8. National Electrical Manufacturer's Association (NEMA)
 9. National Fire Protection Association (NFPA) 1221
 10. Telecommunications Distribution Methods Manual (TDMM)
 11. Telecommunications Industry Associations (TIA)
 12. Underwriters Laboratories, Inc. (UL)
- B. Motorola shall comply with industry best practices for system installation, grounding, bonding, and transient voltage surge suppression (TVSS), as outlined in Motorola's R56 standard.

1.4 Proposals Desired

- A. The County desires a complete turnkey solution addressing all project goals.



- B. Proposal Options: Requirements described as an “OPTION” or “OPTIONAL” refer to features or equipment, which may or may not be purchased by the County, or items whose quantities are not determined yet. It is not Motorola’s option to respond to these requirements; therefore, Motorola is required to respond to all OPTIONAL requirements to the greatest extent possible.
- C. Alternate Approach:
 - 1. In the event Motorola has a technological solution that does not meet the exact requirements in this Statement of Requirements (SoR), Motorola may offer an alternate approach to the identified requirement as long as each alternate approach fully addresses the intent and function of the requirements set forth in this SoR.
 - 2. An Alternate Approach, if offered, shall be submitted in addition to the primary proposal and be clearly marked as “ALTERNATE APPROACH”.

1.5 Proposal Format

- A. Motorola shall adhere to the proposal format provided below, organized by Section:
 - 1. Section 1: Cover letter
 - 2. Section 2: Table of contents
 - 3. Section 3: Executive summary
 - 4. Section 4: Description of the system, including equipment, software, design, and services to be provided:
 - a. Geographically diverse Prime Site
 - b. Microwave backhaul system
 - c. Microwave preliminary path profiles
 - d. Microwave channel plans
 - e. Site infrastructure
 - f. Tower profile drawings including antenna mounting locations and ancillary equipment
 - g. Equipment room drawings



- h. Equipment rack elevation drawings
 - i. Additional subsystems
 - j. Scope of Work documentation detailing complete system installation on a site-by-site basis
 - k. System design information shall include a complete detailed description, block diagrams, equipment layouts, and equipment lists necessary to provide a complete and comprehensive description.
 - l. Detailed equipment specification sheets for all proposed equipment
 - m. Optional Critical Connect – ISSI feature
 - n. Optional Smart Connect feature
 - 5. Section 5: Project Management plan including preliminary project schedule with detailed Gantt chart, clearly showing County responsibilities
 - 6. Section 6: Quality Assurance / Quality Control (QA/QC) plan
 - 7. Section 7: System and/or subsystem warranty information
 - 8. Section 8: System testing documentation including staging acceptance testing and final acceptance testing.
 - 9. Section 9: Any documentation or material not covered in any other sections.
 - 10. Section 10: Updated support contract, “ASTRO25 System Upgrade Agreements with Maintenance Services”
 - 11. Section 11: Detailed equipment specification sheets for all proposed equipment
 - 12. Section 12: Total proposal cost and detailed pricing breakdown
- B. Motorola shall provide total proposal cost and itemized pricing by using the pricing forms provided in Appendix A – Proposal Pricing Forms, to the greatest extent possible. Costs for OPTIONAL and ALTERNATE items shall also be provided on the forms.



2. Trunked Radio System Upgrades/Enhancements

2.1 Geographically Diverse Virtual Prime Site

The existing Prime site is collocated at Al's Knob with the Al's Knob Radio Frequency (RF) Site. A catastrophic failure of this site could potentially remove the entire system from operation.

- A. Motorola shall propose the use of the new Motorola Virtual Prime Site equipment to replace the existing Al's Knob Prime Site equipment.
- B. A georedundant Prime shall also be integrated with the system design.

2.2 Global Positioning System (GPS) Interface

The system currently supports the transfer of subscriber device location information. However, the dispatch center has no way of displaying this information for use by dispatch operators. Motorola shall provide the necessary licenses and equipment required to display subscriber location information.

- A. Motorola shall define the full feature set provided by the proposed/provided interface.
- B. The system shall support (2,500) active units.
- C. Subscriber units shall provide location information upon initiating a PTT and/or an emergency alarm activation.
- D. Motorola shall provide information detailing the minimum polling interval that would be supported by the existing radio system while maintaining a GOS of less than 1% for voice traffic.
- E. The County anticipates replacing the existing CAD in the future. Motorola shall provide details and costs associated with integrating the GPS location information with a new CAD system..
- F. This interface shall provide access to all location data generated by the user units equipped and activated with GPS receivers.



2.3 GPS/AVL Terminals

- A. Motorola shall propose GPS/AVL terminals capable of displaying unit locations.
- B. The GPS/AVL solution shall automatically poll units based on any of the following:
 - 1. Time
 - 2. Distance
 - 3. PTT
 - 4. Emergency button activation
 - 5. Manual Polling by terminal operator
- C. Motorola to supply a total of 15 GPS/AVL terminals at the following locations and quantities:
 - 1. Rowan County dispatch center – 13 (one at each dispatch location)
 - 2. Salisbury Master Site - 2

2.4 Backhaul Network

The current backhaul network is deployed in a hub and spoke configuration with all sites reporting to the AI's Knob site. Increasing system reliability would require both implementation of a new geographically diverse Prime Site and the conversion of the backhaul network from hub and spoke design to a ring protected network. Motorola shall propose a new microwave backhaul network configured as a ring protected network..

2.4.1 Backhaul Network Architecture

- A. A new ring protected microwave replacement backhaul network shall be proposed providing route diversity and minimizing single points of failure.
- B. Licensed frequencies must be used; unlicensed microwave is unacceptable. The backhaul network shall be designed to achieve 99.999% overall availability.
- C. The radio shall deliver two-frequency, full duplex operation. Space diversity configurations are acceptable if necessary, to meet reliability requirements.



- D. The bandwidth of the overall microwave backhaul network shall be designed to accommodate all possible system traffic; including voice call, system control, dispatch, and system management signaling and shall also include at least 50% excess bandwidth for future growth.
- E. The backhaul network must be designed so that all microwave links have a minimum two-way end-to-end annual availability of 99.999%.
- F. Motorola 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.

2.4.2 Microwave Backhaul Network Engineering

- A. Motorola shall provide preliminary microwave path details including centerline mounting height recommendations, fade margins, antenna sizes, system gains and system losses, and path profiles.
- B. Motorola shall conduct physical path surveys to assure that all proposed paths meet proper clearance criteria.
- C. Motorola shall provide modified antenna centerline mounting height recommendations, if required, based upon the information gathered during the physical path surveys and site visits.
- D. Motorola shall include fade margin calculations, showing the preliminary antenna sizes, system gains, and system losses.
- E. Motorola shall include radomes in their designs as a requirement for each microwave antenna.
- F. The microwave backhaul network equipment must be type accepted for licensing under Part 101 of the FCC Rules and Regulations.

2.4.3 Microwave Antenna System

- A. 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.



- B. The antenna systems shall meet the minimum wind speed with ice and design ice thickness requirements as specified in Annex B of TIA-222 Standard current revision, or the latest revision adopted by the jurisdiction.
- C. All mounting brackets, connectors and other hardware shall be supplied as necessary for a complete installation.

2.4.4 Microwave Backhaul Network Management

- A. Motorola shall include in their design a management system with sufficient alarm, control, and tracking capabilities for the proposed microwave network. The system shall be capable of remotely monitoring equipment status and performance from all sites.
- B. The backhaul management system shall be fully compatible and integrated with the current network management system.
- C. The overall network shall have a common end-to-end management and configuration tool capable of complete control of all network elements. The tool shall be able to support building an end-to-end path without requiring manual configuration of each intermediate device. Graphical display of resulting configurations is preferred.
- D. Automated error checking shall be included to prevent typical configuration problems such as oversubscription of a link. The tool shall alert the user when such errors occur.

2.5 Youngs Mountain Tower Site

- A. The existing Youngs Mountain RF Site is located at an American Tower leased tower site on Youngs Mountain Road. The County desires to eliminate the recurring costs associated with the current tower and equipment room leases, by constructing a new tower built on a County owned parcel of land directly adjacent to the current site. The County will be responsible for the implementation of the new tower and equipment shelter via a separate procurement. Once the new tower site is complete, Motorola shall be responsible for relocating the existing Youngs Mountain RF Site equipment, generator, and transfer switch to the newly built County owned tower site. Motorola shall be responsible for providing LMR and microwave antenna make, model, mounting heights, azimuths and



feedlines/waveguides to allow the County to develop a tower design capable of supporting the required LMR and microwave equipment.

2.5.1 Backup Emergency Generators and Automatic Transfer Switch (ATS)

- A. The site shall reuse the existing backup emergency generator and automatic transfer switch from the existing Youngs Mountain tower site.
- B. Motorola shall be responsible for having the generator manufacturer authorized representative perform generator startup, load testing after the generator has been relocated at the new tower site.
- C. Motorola shall provide the County with the startup, load testing, and generator warranty documentation.
- D. Motorola shall be responsible for verifying generator size support electrical load of shelter equipment.
- E. Generator alarms shall be integrated with the Network Management system.

2.5.2 Site Equipment

- A. Motorola will be responsible for relocating the existing RF Equipment from the existing Youngs Mountain tower site to the new Youngs Mountain tower site.
- B. Motorola shall be responsible for amending the FCC licensing to include the new tower location.
- C. Shelter environmental alarms shall be integrated with the existing network management system.
- D. New antennas and coaxial cables shall be provided and installed by Motorola.
- E. Motorola shall install the equipment in compliance with the Motorola R-56 standard.
- F. Motorola shall be responsible for removing the antennas and lines from the old Youngs Mountain tower upon approval from the County to do so.



- G. Motorola shall provide an installation/migration plan detailing how the existing RF Site will be relocated from the existing Youngs Mountain tower to the new tower with minimal downtime.



3. System Implementation, Test and Acceptance

3.1 General Requirements

- A. Motorola shall conduct 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, Motorola shall update the project schedule for discussion during these project meetings.
- C. Motorola shall provide written minutes of all meetings no later than two business days after the meeting.

3.2 Detailed Design

Motorola shall submit the Detailed Design package within 60 days after contract execution, which shall include the following:

- A. Any updates to previously submitted design information
- B. System block diagrams
- C. Microwave channel plans
- D. Cutover plan:
 - 1. A preliminary cutover plan describing how the radio system enhancements/upgrades will be phased over into a fully operational system.
 - 2. Motorola will work with the County to determine the best possible cutover schedule which works within the County's acceptable outage allowances.
 - 3. Motorola shall provide the necessary labor to cutover from existing systems to the proposed system.
 - 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 County reserves the right to approve and change the cutover plan as it relates to any or all system components.
- E. Site-by-site equipment list (new equipment)
- F. System installation, optimization, operation, and maintenance manuals for all equipment
- G. Sample factory testing documentation for each piece of equipment
- H. Blank installation and optimization documents to be completed during installation and provided with as-built documentation
- I. Patching schedules and termination details for all cabling necessary for a complete record of the installation
- J. Location of demarcation points for any items to be provided by the County
- K. Site installation drawings, including room layouts, all cable runs, and grounding
- L. Equipment rack/cabinet elevation diagrams
- M. Tower drawings including antenna and coaxial cable loading information, antenna center line heights, and any other equipment mounted on the tower on a site by site basis
- N. Tower structural analysis results for towers requiring the addition of microwave dishes
- O. Passing structural analysis detailing required tower modifications for any towers that fail analysis
- P. Motorola shall submit a Draft Factory Acceptance Test Plan (FATP) outlining a comprehensive series of tests that will demonstrate proof of performance and readiness for shipment.
- Q. Motorola shall submit a Draft System Acceptance Test Plan (SATP) outlining a comprehensive series of tests that will demonstrate proof of performance after installation and optimization is complete.



- R. The Final FATP and Final SATP shall be submitted no later than 15 business days before the testing starts and shall be approved no later than five business days before the testing starts.
- S. Any other items as required or requested by the County prior to Detailed Design Review.
- T. All items required for detail design shall be submitted to the County 10 business days prior to the detailed design review meeting.
- U. A detailed design review meeting shall be conducted to allow Motorola to present the system detailed design for review and approval.
- V. The detailed design review shall be considered the last step prior to ordering and/or manufacturing of equipment. Upon approval of the detailed design by the County, Motorola may begin the ordering and manufacturing of system equipment. The County shall not be held liable for any equipment ordered or manufactured prior to approval of the detailed design.

3.3 Staging

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

- A. Motorola shall submit standard factory test documentation, documenting the tests performed and indicating successful completion of testing to the County.
- B. System staging:
 - 1. Motorola shall perform complete system staging and testing at a location in the United States.
 - 2. The intent of the staging tests is to demonstrate to the County that the system is ready for shipment and installation.
 - 3. Motorola shall provide all necessary technical personnel, and test equipment to conduct staging tests.
 - 4. All deviations, anomalies, and test failures shall be resolved at the Motorola's expense.



5. Motorola shall use an approved staging acceptance test plan (SATP).
6. Motorola shall successfully perform all tests before the County witnesses the official SATP. (Witness by County is at County's discretion)
7. Motorola and the County shall jointly execute and date the SATP following completion of all tests.
8. All tests in the SATP shall be marked as either pass or fail.
9. Motorola shall document all failed components.
10. Motorola shall correct and retest all failed components.
11. Motorola shall replace at its own expense failed components that are not repairable.
12. The decision to retest an individual failed SATP tests or the entire plan shall be at the County 's discretion.
13. Motorola shall provide the County with the fully executed and complete SATP document.
14. There shall be no deemed acceptance of the SATP.

3.4 Site Development

- A. Cost associated with development of existing sites shall be detailed separately, on a per site basis as detailed in Appendix A – Proposal Pricing Forms.
- B. Motorola shall identify and propose any additional work necessary to make existing sites and infrastructure usable in the proposed radio/microwave system.
- C. Motorola shall be responsible for updating all existing sites that are part of the proposed system to be compliant with their provided grounding standards.
- D. Motorola shall be responsible for completing any documents required by local, state and federal departments including, but not limited to, permitting documents and State Historic Preservation Office (SHPO) forms.
- E. Code Compliance:



1. Installation of all electrical equipment, power distribution, lighting assemblies and associated wiring shall comply with the most recent edition of the National Electric Code (NEC) and Occupational Safety and Health Administration (OSHA) regulations.
 2. All electrical equipment shall be listed or approved by Underwriters Laboratories (UL).
- F. Motorola shall assume total responsibility for maintaining liability insurance covering the following items:
1. Project design
 2. Implementation
 3. Licensing
 4. Shipping
 5. Receiving
 6. All site work required
- G. Prior to any excavations, Motorola or subcontractor shall follow appropriate procedures outlined at the following website: www.call811.com.
- H. The Motorola shall coordinate with utility companies for all utility related items, such as electrical service hookups and disconnects.
- I. During detailed design, Motorola shall provide detailed drawings including all structures and foundations, sealed by a professional engineer registered in the state of North Carolina.
1. Detailed dimensioned drawings showing all system components and locations
 2. Drawings and/or specifications shall describe any auxiliary equipment
 3. Manufacturer specification sheets of all equipment used shall be provided
- J. All control functions and alarms from towers, shelters and backup power shall be interfaced to the Network Management System (NMS), for remote control and monitoring.



3.5 System Installation

- A. Installation shall consist of a complete tested system to include placement of associated cabling, appropriate system layout, and terminal connections.
- B. Motorola shall provide associated power supplies and any other hardware, adapters, and/ or connections to deliver a complete operable system to the County.
- C. Motorola shall participate in a mandatory project site survey with the County to confirm actual equipment location within each space prior to the start of system installation.
- D. During the mandatory project site survey, Motorola shall determine and document any exact locations that differ from the detailed design installation drawings.
- E. All detailed design drawings and documents requiring changes shall be revised and approved prior to installation.
- F. Motorola shall provide and pay for all materials necessary for the execution and completion of all work.
- G. Unless otherwise specified, all materials incorporated into the permanent work shall be new and shall meet the requirements of this RFP.
- H. All materials furnished and work completed shall be subject to inspection by the County.
- I. Motorola shall be responsible for preparing and submitting the necessary applications for site permissions/access to install system equipment at non-County owned sites.
- J. Motorola shall be responsible for any leases at non-County owned sites for temporary space needed during installation and cutover to the new system.
- K. Qualified, trained personnel experienced with this type of work, shall perform all installations.
 - 1. The County shall preapprove all subcontractors.



2. The County shall preapprove any change in subcontractor or its staff.
- L. Motorola shall clean all equipment and devices and repair all damaged finishes.
- M. Motorola shall leave sites neat and broom swept upon completion of work each day.
- N. Motorola shall thoroughly clean all equipment shelter and building floors and remove all scuff marks and abrasions prior to acceptance.
- O. Motorola shall remove all trash weekly.
- P. Inspection:
 1. The County shall conduct an inspection of the installations upon substantial completion.
 2. The County shall document any deficiencies on a single punch list and provide the punch list to Motorola for resolution.
 3. Final acceptance testing shall not commence until all punch list items are resolved.

3.6 Cutover Plan

- A. Execution of the cutover plan shall ensure that new system enhancements are brought online with minimum interruption to all existing systems and communications.
- B. Motorola shall be responsible for planning and coordinating the implementation of all equipment, subsystems, and the overall system.
- C. Motorola shall be responsible for any costs associated with their proposed cutover plan.
- D. During final design, Motorola shall deliver a preliminary cutover plan describing how the system enhancements will be phased over into a fully-operational system.
- E. Motorola shall successfully complete all tests prior to the actual cutover of systems.



- F. Motorola shall provide the necessary labor to cutover from existing systems to the proposed system.
- G. The cutover plan shall provide detailed component or subsystem cutover plans, and specifically delineate between systems that affect and do not affect ongoing operations.
- H. The County reserves the right to approve and change the cutover plan as it relates to any or all system components.

3.7 Final Acceptance Testing

- A. Prior to final acceptance testing, Motorola shall verify and document upgrades of all equipment, hardware, and software to the latest factory revision.
 - 1. Multiple revision levels among similar equipment are not acceptable.
- B. Motorola shall provide the County with 2-weeks written notice that the system is ready for final acceptance testing.
- C. Motorola will deliver a Final acceptance test plan (FATP).
- D. Motorola shall use the completed and approved FATP.
- K. Motorola shall successfully perform all FATP tests before the County witnesses the official FATP.
- L. Motorola and the County representatives shall jointly execute and date the FATP following completion of all tests.
- M. All tests in the FATP shall be marked as either pass or fail.
- N. Motorola shall provide all necessary technical personnel, and test equipment to conduct FATP tests.
- O. All deviations, anomalies, and test failures shall be resolved at the Motorola's expense.
- P. Motorola shall document, correct, and retest all failed components.



- Q. Motorola shall replace at its own expense any failed component that is not repairable.
- R. Retest of individual failed FATP tests or the entire plan shall be at the County 's discretion.
- S. Motorola shall provide the County with the fully executed and completed FATP document.
- T. There shall be no deemed acceptance of the FATP.

3.8 Decommissioning, Removal, and Disposal of Legacy Equipment

- A. Motorola shall remove existing equipment (e.g., transmitters, consoles, mobiles, cables, and antenna systems) not being reused.
- B. Motorola shall maintain a detailed inventory of all equipment removed
- C. Motorola shall transport all removed equipment to the County -specified disposal location.

3.9 As-Built Documentation

- A. At the completion of each implementation phase, Motorola 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. Shelter floor plans
 - 4. Cabling and terminations
 - 5. Block and level diagrams
 - 6. Setup, configuration, and alignment information, to include commissioning, provisioning, test and turn-up



7. Successfully completed, signed, and dated Final Acceptance Test Plans
- B. Motorola shall provide final documentation in printed form:
1. Six bound, hard copy, printed sets
 - a. Hand modified drawings are not acceptable.
 - a. Hard copies of all drawings shall be 11" x 17".
- C. Motorola shall provide final documentation in electronic form:
1. All drawings provided in MS-Visio native format
 2. All other documentation provided in MS-Word or MS-Excel native format
 3. A copy of all drawings and documentation in Adobe Portable Document Format (PDF)

3.10 System Acceptance

- A. The County shall deem the system enhancements ready for final acceptance following successful completion and approval of the following:
1. Final Detailed Design
 2. Staging Acceptance Test
 3. All contracted installation completed
 4. Final inspection and punch list resolution
 5. As-built documentation
 6. Coverage Acceptance Test
 7. Final Acceptance Test
 8. Delivery of final documentation
- B. No conditional acceptances will be granted.



4. Project Management

4.1 Project Staffing

Motorola shall provide the appropriate project staff based on workload and the level of effort required throughout the implementation/installation process.

- A. The staff identified in Motorola's proposal, shall serve the duration of the project unless Motorola proposes an alternative plan to the County for consideration and gains approval.
- B. The County reserves the right to accept or reject any proposed staffing changes.
- C. Motorola's project manager:
 - 1. Motorola's Project Manager shall be the primary point of contact between the County and Motorola.
 - 2. Motorola's Project Manager shall bear full responsibility for supervising and coordinating the installation and deployment of the communications system.
 - 3. Motorola's Project Manager shall be responsible for:
 - a. Development and acceptance of the project management plan
 - b. Managing the execution of the project against that plan
 - c. Overseeing the day-to-day project activities, communication, deliverables, and milestone completion
 - 4. Motorola's project manager shall be responsible for coordinating and facilitating weekly status meetings.
- D. Motorola's project engineer:
 - 1. Motorola's project engineer shall have the primary responsibility for managing the system design and ensuring system installation in accordance with the approved system design.



2. Any deviation from the proposed system design shall be subject to project change control procedures and will not be undertaken until approved by the County.
3. Motorola's project engineer shall ensure the accurate development of block diagrams, system-level diagrams, and rack diagrams.
4. The project engineer shall supervise the development and execution of the Acceptance Test Plans (SATP & FATP).
5. The project engineer shall guide the project team through the processes and procedures necessary to prove that the system performs as specified in the contract.
6. The County shall approve all test plans prior to execution.

4.2 Scheduling

Motorola shall develop and maintain a project schedule including tasks, milestones, start and end dates, task predecessors, and task owners based on an approved WBS.

- A. The schedule shall represent tasks associated with completing work on all items identified in the WBS. The schedule will include tasks that Rowan County may be responsible to complete.
- B. Motorola shall update the project schedule with actual dates as tasks are completed.
- C. Motorola shall present all schedule updates to the County during the weekly status meetings.
- D. The schedule shall address the following at a minimum:
 1. Site surveys
 2. Detailed design review
 3. Site preparation
 4. Equipment order and 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. System cutover
14. System documentation development and delivery
15. System and equipment warranty

4.3 Project Meetings

Motorola shall schedule a project kickoff meeting prior to the beginning of the project.

- A. Motorola shall schedule weekly project status meetings following contract award and the initial kickoff meeting.
- B. Weekly status meetings shall continue throughout the duration of the project until the County issues final system acceptance.
- C. Motorola shall be responsible for facilitating the weekly status meetings.
- D. Motorola shall prepare and distribute meeting agendas and minutes to the County via e-mail on a weekly basis at least 24-hours prior to each scheduled meeting.
- E. Meeting agenda items shall include, as a minimum, the following items:
 1. Schedule review



2. Status of deliverables
3. Risk items and planned responses
4. Proposed changes
5. Plans for the next period
6. Action item assignments
7. Punch list review

4.4 QA/QC Plan

- A. Motorola shall include a project QA/QC plan.
- B. Motorola shall submit the QA/QC plan for review during preliminary design as described in this section.
- C. The QA/QC plan shall address all stages of the project, including, but not limited to:
 1. Procurement
 2. System design
 3. Installation
 4. Implementation
 5. Testing
 6. Cutover
- D. The QA/QC plan shall specifically describe the plans and procedures that ensure compliance of the proposed system design with the RFP requirements.
- E. The QA/QC plan shall be included in the project management plan developed by Motorola's project manager.
- F. The QA/QC plan shall be an integral part of the project.



- G. The QA/QC plan shall include the County personnel as part of the review and approval process for all deliverables and submittals.
- H. 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 ordering, 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

4.5 Project Punch List

Motorola shall establish and maintain a punch list, as mutually agreed to with the County.

- A. The punch list shall address all open issues including those related to sites, facilities, equipment, and acceptance tests.
- B. Motorola shall maintain the punch list in real time.
- C. Motorola shall distribute the punch list to the County weekly via e-mail.
- D. The punch list shall include the following at a minimum:



1. Sequential punch list item number
 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
- E. If Motorola receives written permission from the County to transfer the responsibility of an item to another person or group, Motorola shall add a new entry to the punch list and appropriately note the original entry.
- F. Motorola shall be responsible for reviewing each punch list item and advising the County of any changes.
- G. Motorola shall update the status of punch list items during each weekly status meeting.



5. Warranty, Maintenance, and Support

- A. Motorola support shall include an initial 1-year warranty, software and firmware upgrade support, and spare parts and equipment.

5.1 Warranty

- A. The updated system components shall be covered by a full manufacturer's warranty for 1 year, commencing with County final acceptance or mutually agreed project phase.
- B. System performance, installation, and all hardware, parts, software, and materials (including third-party equipment) shall be warranted for a period of 1 year,
- C. Warranty coverage shall include all related return and delivery fees.
- D. Motorola shall provide a single toll-free telephone number staffed and available 24 hours a day, 7 days a week, 365 days a year, for service requests and warranty claims.
- E. During the warranty period, service and repair shall be performed 24 hours a day, 7 days a week, 365 days a year.
 - 1. There shall be no additional charges for work outside of normal business hours.
- F. The following repair response time and repair-completed time criteria shall be in effect:
 - 1. Motorola shall contact the County representative within 30 minutes of telephone notification for a Critical Service issue.
 - 2. The County defines Critical Service issue as any one or more of the following events that results in a loss of voice traffic on the system:
 - a. Any failure which causes a loss of 15% or more in capacity or coverage in any cell
 - b. Any failure which causes a loss of simulcast capability



- c. Any failure which causes a loss of the primary system control (assuming a primary/secondary architecture)
 - d. Any system failure that causes the loss of one or more console positions
 - e. Any failure that renders the logging recorder inoperable or causes a loss of recorded audio
 - f. The failure of two or more repeaters
 - g. Concurrent failure of two or more switches and/or routers
 - h. Failure of the receiver voting system
- 3. Motorola's qualified service representative and the County 's representative shall attempt to resolve the Critical Service issue over the phone or via remote network management.
- 4. If Motorola's qualified service representative and the County 's representative cannot resolve the issue remotely or over the phone, then the County shall make the determination regarding the criticality of the service issue.
 - a. If determined to be critical Motorola shall dispatch a qualified service representative to the site experiencing the service issue.
- 5. Motorola's qualified service representative shall be physically present at the site that requires service within 4 hours of County 's decision to escalate the call to on-site service.
- 6. On-site Motorola's service representative shall make every effort to resolve the Critical Service issue within 4 hours from the time the critical service issue was reported.
- G. Motorola shall repair all equipment, hardware, and software throughout the implementation, cutover and warranty periods.
- H. The following procedures shall be followed during the warranty period:
 - 1. Motorola shall provide the County with written documentation indicating:



- a. The cause of the service outage
 - b. The resolution
 - c. All post-repair testing procedures to ensure proper operation
2. In the event Motorola uses County/City -owned spares to complete a repair, the documentation shall include the model and serial number of both the defective unit and the spare.
3. Hardware:
 - a. For all equipment needing factory or depot repairs, Motorola shall maintain a comprehensive tracking system to track units to and from the factory/depot.
- I. Replacement parts shall be new or original repaired parts only.
- J. Fixed equipment mail-in board repair shall be completed within seven calendar days of receipt.
- K. Equipment must be returned to the County via second-day shipping, with tracking number provided to the County.
- L. Serialized units sent in for depot repair must not be exchanged unless specifically authorized by the County.
- M. The original unit must be repaired and returned unless specifically authorized by the County.
- N. Motorola, at no additional cost to the County, shall correct latent design defects or recurring problems relating to software, firmware, hardware, or overall system design, during the warranty period.
- O. During the warranty period, Motorola shall correct all system malfunctions due to software at no additional cost to the County.

5.2 Spare Equipment

- A. Motorola shall include recommended initial spare parts and equipment to be procured as part of the initial contract. The County is required to maintain the



necessary spares on hand to repair the Land Mobile Radio (LMR) systems to provide timely restoration of the system.

- B. The initial spare parts and equipment shall include, but is not limited to, the following:
 - 1. All Motorola identified Field Replaceable Units (FRUs)
 - 2. Power supplies
 - 3. Required and/or recommended test, measurement, calibration equipment, and repair kits
 - 4. Recommended diagnostic equipment to support the County maintenance activities
- C. Initial spares for less critical items shall also be enumerated
- D. The spare parts and equipment 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 component level when a critical unit fails).
- E. Motorola shall determine the types and quantities of spares based on their proposed system size and design.
- F. Motorola shall define the primary equipment category each spare kit supports (e.g., transceiver board for a base radio or interface board for a router).

5.3 Post Warranty and Lifecycle Support

- A. Motorola shall provide an updated version of the ASTRO25 System Upgrade Agreements with Maintenance Services covering a 10-year span.



6. Critical Connect Option

- A. As an Option, Motorola shall propose their Critical Connect solution to link the P25 system with a broadband PTT application.
- B. The proposed solution shall detail the possible number of concurrent conversations/talkpaths and the associated pricing.
- C. Included shall be options for communicating with an APX subscriber via a Wi-Fi connection as well as the WAVE PTT application operating on a smartphone device



Appendix A - Proposal Pricing Forms

Proposal pricing provided in Excel format, file - *Appendix A Proposal Pricing Sheets.xlsx*

