Richland County, Wisconsin

Request for Proposals for a County-Wide Public Safety Radio System

December 16, 2021

Issued by:

Richland County Wisconsin

Proposal Due Date

4:00 p.m. CDT on Thursday, February 24, 2022

Prepared by:

True North Consulting Group

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1. Proposal Submittal Overview

1.1. *Due Date, Submission Requirements*

1.1.1 Proposals will be due no later than 4 p.m. CDT on Thursday, February 24, 2022.

1.1.2 Proposals must be received at the Richland County by the due date to be considered.

1.1.3 Proposals shall include One (1) signed original, four (4) paper copies and an electronic copy included in the response package.

1.1.4 One (1) copy of the proposal and an electronic copy shall be sent to the County's consultant.

1.1.5 Proposal organization shall be as described in Section 10.

1.1.6 The packages must be marked: "Richland County – RFP Public Safety Radio System"

1.1.7 Proposals are to be prepared on standard 8.5" by 11" paper. Foldouts containing charts, spreadsheets, and oversize exhibits are permissible.

1.1.8 Richland County will not accept submissions by electronic mail, telegraph, or facsimile.

1.1.9 Richland County is not responsible for delays or losses caused by the U.S. Postal Service or any other carrier or delivery service.

1.1.10 Proposals submitted after the submission deadline will be returned unopened and not considered.

1.2. *Timeline*

The following key dates concerning this process should be understood:

RFP issued	Thursday, December 16, 2021
Mandatory Pre-proposal conference	Wednesday, January 12, 2022, at 10:00 a.m.
Final Questions due NLT	Friday, January 28, 2022
Final Question response by County NLT	Friday, February 4, 2022
Proposals due NLT	4 p.m. CDT on Thursday, February 24, 2022
Proposal review period	March 2022
Negotiations with selected vendor	TBD may begin May 2022
Goal of contract award	June 2022 dependent on negotiation progress, legal review and County authorization.

1.3. *Mandatory Pre-proposal Conference*

1.3.1 A pre-proposal conference will be held at the Richland County Sheriff's Office on Wednesday January 12, 2022 at 10:00 am. Address: 181 West Seminary Street, Richland Center, Wisconsin 53581.

1.3.2 After the meeting, any tours of designated locations will be conducted.

1.3.3 After the tour, proposers are then invited to visit possible radio repeater sites and any other locations deemed appropriate.

1.3.4 Anyone wishing to receive answers to questions raised at this conference and future correspondence concerning the project shall email the POC to register as described in Section 1.4.1.

1.4. *Questions*

1.4.1 A proposer/respondent will register by sending an email to the point of contact (POC), Mike Day (mike.day@tncg.com), who is the lead technical consultant on the project with the following information.

- Full Name of primary contact
- Firm Full Name
- Email address
- Business address
- Telephone #

1.4.2 Questions can be asked verbally at the pre-proposal conference and site visit or until the end of the questioning period. All questions, including those asked at the mandatory pre-proposal conference shall be submitted in writing to the designated POC.

1.4.3 All registered vendors will be provided submitted questions and responses via email to any questions asked.

1.4.4 Although accurate, verbal answers to questions should not be considered the official County position or answer until it is received in writing.

1.4.5 An attempt will be made to issue a consolidated response to questions within five (5) business days of the last date/time for questions.

1.4.6 Proposers shall not contact staff from any Richland County participant agencies during this RFP process.

END OF SECTION

2. Request for Proposal Overview

2.1. *Comprehensive Responses*

2.1.1 Richland County seeks to update the public safety radio system infrastructure hardware with a new comprehensive design.

2.1.2 All required elements beyond the actual hardware to develop and offer a completed and operational system shall be included in the offer thus making the system “turn-key” to the County.

2.1.3 As a part of the response, the Proposer shall develop and offer a complete one (1) year 100% warranty (parts and labor) plus a nine (9) year extended maintenance and support plan that includes items such as phone support, routine maintenance, routine software upgrades and emergency response to system issues/problems.

2.1.4 All necessary systems design, site selection, equipment / hardware, installation including antennas and transmission line, software, installation management, licensing support, warranty, maintenance, Commissioning, acceptance testing, and training shall be included.

2.1.5 For the radio system infrastructure responses, Proposers shall offer a new simulcast P25 conventional radio system infrastructure, microwave backhaul, network hardware, control equipment, all dispatch center needs, subscriber devices, supporting power systems, and alarm monitoring.

2.1.6 Training of both technical support and operational staff shall be included per the requirements as described herein.

2.1.7 A final detailed design for a system will be required to be completed working with the County through site acquisition processes.

2.1.8 Any necessary site civil and new tower work shall require a public works bid and the specifications/bidding for this civil/structural work will be performed by others with input by the awarded Contractor unless in a leased system.

2.1.9 Except for site civil and structural needs, all elements of the work shall be considered final costs as proposed with change orders only accepted due to changes or modifications in site locations or due to changes outside the control of the selected contractor and contractor’s design.

2.1.10 Respondents shall factor into the timeline a reasonable amount of time for site acquisition and site development as based on an average of time required for past projects of this type.

2.1.11 Respondents shall provide the support needed to optimize and verify the system implementation.

2.1.12 Respondents will support the County in all configuration aspects to ensure an effective and efficient design.

2.2. *Coordination with Customers consultants*

2.2.1 During the entire process of the work related to this project, True North will serve as the County's project manager advocate.

2.2.2 The County will be retaining a civil/structural engineering firm who will be responsible for the creation of site design drawings and specifications of work designated civil in nature.

2.2.3 The civil engineer will support a bidding process and work oversight of the construction elements.

2.2.4 The selected radio systems contractor is required to be responsive to and collaborate with True North and the selected civil/structural engineering consultant on behalf of Richland County.

2.3. *New Radio System Intentions*

2.3.1 The new voice radio system is intended to migrate subscriber users from VHF analog operation to VHF P25 digital operations.

2.3.2 The main voice system shall create a common countywide coverage footprint for public safety channels that improves the existing disparate systems coverage.

2.3.3 Voice channel designs will need to expand capacity from the two (2) existing (Law, Fire) channels to provide Richland County with greater capabilities.

2.3.4 A new paging channel is needed that improves operational coverage of the current tone and voice system analog VHF system.

2.3.5 Simulcast technology shall be employed for this County Radio System.

2.3.6 Networking of sites will be needed to connect voice radio traffic, system control, and alarm/monitoring functions.

2.3.7 The new radio and microwave systems are anticipated to be a new-build from bottom up with likelihood of all new repeater sites located where they best serve Richland County public safety users.

2.3.8 All inter-site connectivity shall be offered which is to be IP-based microwave with minimum 50 Mbps throughput though upgradable to 150 Mbps via software only.

2.3.9 The microwave and network components shall utilize some form of IP traffic separation that meets FIPS 140-2 requirements such as MPLS thus supporting secure traffic other than the radio system such as FirstNet, computer aided dispatch, NG911, etc.

2.3.10 The current dispatch console system at the County was acquired from a previous agency and is beyond support life. A replacement system network integrated into the new radio system is needed.

2.3.11 Control station backup communications for each dispatch position for the new system shall be provided whereby a radio head allowing direct air interface operation to the radio system thus bypassing the console and associated network connectivity.

2.3.12 Mutual aid and interoperability radio systems are needed that provide the County the highest level of interoperability communications.

2.3.13 Backup power systems need to be provided assuring continuous system reliability and redundancy during power failures until generator support can be activated.

2.3.14 System monitoring and alarming equipment need to support not only the radio operations, but civil support items as well.

2.3.15 An alarm system shall be an integral part of the design allowing for remote sensing of all elements of the radio, microwave, DC power, AC power and environmental issues of the sites.

END OF SECTION

3. Instructions to Proposers

3.1.1 Public Announcement and Selection Process

3.1.2 It is the policy of the County to publicly announce all requirements for supplies, materials, equipment, services, and construction and to negotiate such contracts based on demonstrated competence and qualifications and past performance with existing contracts as determined in prequalifying procedures.

3.1.3 In the procurement of supplies, materials, equipment, services, and construction, the County shall request firms to submit a statement of qualifications and performance data.

3.1.4 All information submitted in response to the Request for Proposals shall constitute a Public Record upon award of this contract.

3.2. *Economy of Preparation*

3.2.1 Submissions shall be prepared as simply and economically as possible while providing straightforward and concise delineation of the Proposer's capabilities and intent to satisfy the requirements of the RFP.

3.2.2 Technical literature about the Proposer's products shall be included, but the emphasis of the submission shall be on completeness and clarity regarding the chosen solution or solutions.

3.2.3 To expedite the evaluations, it is essential that specifications and instructions contained in this document be followed as closely as possible.

3.2.4 Additional information that may be helpful to the evaluation process, but is not specifically requested in this RFP, may be included as an Appendix in the Proposer's response.

3.3. *Submission of Proposals*

3.3.1 Each Proposer must submit an original and four copies of the written submission plus two electronic copies on a CD or USB thumb drive as stated below in accordance with Section 5.

3.3.2 Proposals are to be prepared on standard 8.5" by 11" paper. Foldouts containing charts, spreadsheets, and oversize exhibits are permissible. The pages shall be placed in a binder with tabs separating the major sections of the submission as defined in Section 5.3.

3.3.3 The original, four copies, and an electronic copy (CD or USB drive) must be delivered or sent to the following address:

Richland County Sheriff's Office
Attn: Barbara Scott, MIS Director
221 West Seminary Street
Richland Center, Wisconsin 53581

3.3.4 One copy of the proposal plus an electronic copy (CD or USB drive) shall be sent to the County's consultant:

True North Consulting Group
Attn: Mike Day
1206 North 7th Street
Indianola, IA 50125

3.3.5 The package must be marked: "County-Wide Public Safety Radio System"

3.3.6 Identical, electronic copies of the submission are to be included with the hard copy original.

3.3.7 The County is not responsible for delays or losses caused by the U.S. Postal Service or any other carrier or delivery service.

3.3.8 Proposals submitted after the submission deadline will be returned unopened and not considered.

3.4. ***Submission Signature***

3.4.1 The original submission copy shall be signed by a principal of the Proposer's firm or another person who is fully authorized to act on behalf of the Proposer.

3.4.2 Proposal is to be signed only by persons authorized to enter into a contract with Richland County.

3.4.3 The following detail shall be included in the signature section.

PROPOSER'S TYPED NAME		COMPANY NAME
PROPOSER'S SIGNATURE		DATE
COMPANY STREET ADDRESS		COMPANY CITY/STATE/ZIP

3.5. *Examination of Sites and Documents*

Proposers shall examine all documents and shall visit the site(s) and record their own investigations. Proposer shall be aware of all conditions under which the work is to be performed, including the work site(s), the structure(s), the obstacles that may be encountered and all conditions.

3.6. *Addenda*

3.6.1 The County reserves the right to add, change, or delete any provision or statement in the RFP at any time prior to the Proposal due date.

3.6.2 If it becomes necessary to revise any part of the RFP, addenda to the RFP will be provided to all Proposers who registered themselves as a responder to the RFP. To ensure receipt of RFP addenda, prospective

3.6.3 Proposers shall register with the County by sending an email to the contact person listed in this RFP. The email shall include the following information:

a. In the subject line: Proposer for Richland County Public Safety Radio System

b. Name of designated contact person for Proposer.

c. Name of firm.

d. Email address.

e. Telephone contact number.

3.7. *Interpretation of Documents*

3.7.1 If any Proposer contemplating submission of a Proposal response is in doubt as to the true meaning of any part of the Proposal, the Proposer may submit to the County a written request for an interpretation.

3.7.2 Replies to inquiries will be published in the form of addenda to the Proposal if in the sole determination of the County it would benefit all potential Proposers.

3.7.3 Proposers shall rely only on the Proposal specifications, information contained at the Proposer Conference, and any Proposal addenda that may be issued in preparing and submitting a Proposal response.

3.7.4 Inquiries concerning any aspect of this RFP and contract award shall be submitted to the following contact person in writing via email:

Attn: Mike Day
True North Consulting Group
Email: mike.day@tncg.com

3.7.5 **Telephone calls will not be accepted.** All written questions will receive written responses.

3.8. ***Modification or Withdrawal of Proposal***

3.8.1 Unauthorized conditions, limitations, or provisions attached to a submission may cause its rejection.

3.8.2 No email, oral, telephonic, or facsimile (FAX) submissions or modifications will be considered.

3.8.3 The only submissions that will be considered are those that are hand-delivered or delivered to Richland County by US Mail, UPS, FedEx, or another similar carrier.

3.8.4 Proposals will remain subject to acceptance for a minimum of 120 days after the due date of the proposal submission opening. Proposals may not be withdrawn during this 120-day period.

3.8.5 Any need for proposal withdrawal or cancellation shall be submitted to Richland County's contact individual in writing via email on or before the date and time set for receipt of submissions.

3.8.6 Prior to the time and date designated for receipt of submissions, no submission will be released by Richland County or may be physically withdrawn from Richland County, but any submission may be modified, canceled, or withdrawn by notice.

3.8.7 For a modification, in lieu of the Proposer submitting a fully modified submission, Proposer shall provide a written notice tracking additions, deletions, or changes to the previous submission. This document shall clearly identify modifications by tab, page number, and paragraph number. Modification notice shall be in writing with the signature of original Proposer. The updated, modified submission notice shall be received on or before the date and time set for receipt of submissions.

3.8.8 Written notice of withdrawal or cancellation by a Proposer of a submission prior to the opening will nullify the submission. Such notice shall be in writing with the signature of original Proposer. However, the original submission shall not be physically returned to the Proposer.

3.8.9 A withdrawn or canceled proposal may be resubmitted up to the time designated for the receipt of submissions, provided that the resubmitted Proposal is in conformance with this RFP. Such a resubmitted Proposal shall constitute a modification and may include changes from the original withdrawn or canceled Proposal.

3.9. *Definitions*

County	Refers to the Richland County or one or more of its representatives.
County	Refers to Richland County, located in the State of Wisconsin.
Consultant	Refers to True North Consulting Group.
Construction Engineering	Refers to engineering firm retained by County to develop bid specifications for all civil, structural and site construction work.
Contract Manager	Refers to the designated Richland County project manager (or defined County team).
DAQ	Delivered Audio Quality
Documents	The complete package of Proposal and Contract Requirements.
Greenfield	This term defines a new site where there is no tower or any equipment in place by any organization.
Engineer	Civil/Structural engineer, a designed retained by the County to develop a design and specifications for bidding tower, shelter and generator plus associated site development.
Owner/Customer	Richland County as per project phase.
Proposal	The document received by the County from a responder expressing the desire to provide the radio system and services as specified in the RFP at a given price. An expression indicating a desire to provide the radio system and equipment proposed by the Proposer at a given price.
Proposer	This word defines a responder to this RFP and thus will define in their response what is being delivered.

Proposal Bond	A financial guarantee that the Proposer will carry out a contract at the Proposal price upon award of the Proposal, and, if required, post the appropriate performance and payment bonds, providing financial assurance that the Proposal has been submitted in good faith.
Proposer/Respondent/ Vendor	A firm or individual that submits a proposal to provide the radio system and equipment requested by the RFP.
Qualified Vendor	A Proposer that meets the qualifications described in Section 6.4.1.
RFP	Request for Proposal.
Selected Vendor, Contractor or Radio System Contractor	A Proposer that scores highest in the best value criteria and is chosen, approved by the County for negotiation purposes and resulting in a contract.
Selection Committee	Richland County personnel and True North Consulting Group.
Successful Contractor	Refers to the Radio Systems Contractor awarded the contract for the work. See item 1 of Richland County Terms and Conditions.
System	The term system describes the complete end-to-end solution offering a means of radio terminal users to have voice communications with dispatch, among each other and with mutual aid personnel as based on the radio technology capability.
System Failure	If a radio terminal user is not capable of voice communications in a covered area due to any failure of the radio chain from terminal to terminal or dispatcher, then a failure exists of the system. The following criteria is used to determine the level of failure. • Minor – Any failure that does not impact coverage and capacity no more than 25%. • Major – Any failure that impacts coverage and capacity no more than 50%. • Catastrophic – Any failure that requires backup procedures and equipment to be activated for operation.

Turn-key		The term turn-key refers to the provision of a complete radio communications system as defined by the RFP that at completion and acceptance is ready for immediate use. The civil work is being completed outside the scope of the radio communications system project, but the Selected Vendor will be responsible for the operational specifications and oversight of the civil construction activity assuring system standards are met.
Work		The provision of products and/or services to meet the requirements specified in these documents.
30-Day Test Period		Upon completion of the Commissioning and coverage testing and when Vendor states the system is ready for use testing, the 30-day use period by a non-public safety group shall begin to allow the County to become satisfied the system is ready for final cutover. This use shall not be considered beneficial use.

END OF SECTION

4. Request For Proposal Conditions

4.1. *Understanding*

Proposer is assumed to have a clear understanding of the project if a proposal is submitted.

4.2. *County Procurement Policy*

All aspects of this Request for Proposals will be in accordance with County Bylaws and Property Purchase and Disposal Policy.

4.3. *Public Record*

Richland County abides by the laws of the State of Wisconsin on public record documents and will apply those laws to documents relating to this RFP process.

4.4. *Proposers' Costs*

The County shall not be responsible for any costs incurred by Proposers relating to this RFP. Proposers shall bear all costs associated with the Proposal preparation, submission, attendance at the proposal conference and site survey, and any other activity associated with this RFP or Proposal preparation.

4.5. *Missing Information*

4.5.1 Proposer is responsible for obtaining any information that is not supplied in this RFP but is necessary to provide a complete and responsive submission.

4.5.2 The RFP has been written with every effort to be as complete as possible, but the Proposer assumes responsibility for any missing information, especially with regards to existing frequencies, sites and equipment.

4.5.3 It is the Proposer's responsibility to ask appropriate questions and to participate in the Proposer Conference and any Site Visits.

4.6. *Acceptance and Rejection of Proposals*

The County reserves the right to accept or reject Proposals on each item separately or as a whole, to reject any or all Proposals without penalty, to waive informalities or irregularities, and to contract as the best interests of the County may require obtaining the system, equipment and services that, in the County's judgment, best meets the needs of the County as expressed in this RFP.

4.7. *Use of Proposal Ideas*

The County reserves the right to use any or all Proposer design or service ideas presented. Selection or rejection of the submission does not affect this right.

4.8. *Extension of Time*

Richland County reserves the right to extend the Proposal due date, or any other timeline, date, or period of time associate with this request for proposal.

4.9. *Addenda*

Richland County reserves the right to add, change, or delete any provision or statement in the RFP at any time prior to the Proposal due date.

4.10. *Right to Withdraw RFP*

Richland County reserves the right to withdraw, cancel, and/or amend, in part or entirely, this RFP for any reason and at any time with no liability to any prospective Proposer for any costs or expenses incurred in connection with the RFP or otherwise.

4.11. *Ownership of Materials Submitted*

All material submitted becomes the property of Richland County and will not be returned.

4.12. *Award Discretion*

4.12.1 While Richland County may ultimately decide to negotiate and/or enter into a contract with the person or organization with which Richland County can make the most satisfactory arrangement for meeting its needs, Richland County is not obligated to award any contract or respond to Proposals submitted, nor is it legally bound in any manner whatsoever by the submission of a Proposal.

4.12.2 The award, if any, will be based on the best interests of Richland County.

4.13. *Legal Requirements*

The Proposer shall comply with all Federal, State, and local laws, codes, and ordinances without additional cost to Richland County.

4.14. *Insurance*

4.14.1 The Proposer or anyone providing services herein shall be required to comply with insurance provisions contained in the contract or required by tower site owners.

4.14.2 Richland County's estimated minimum insurance levels are listed in section 7, but by no means are the only anticipated insurance support needed to complete the project.

4.15. *Gratuities and Kickbacks*

4.15.1 It shall be unethical for any person to offer, give, or agree to give any elected official, employee, former employee, or their immediate family member a gratuity or an offer for employment in connection with any decision, approval, disapproval, recommendation relating to this request for proposal.

4.15.2 It shall be unethical for any elected official, employee, or former employee to solicit, demand, accept, or agree to accept from another person, a gratuity or an offer for employment in connection with any decision, approval, disapproval, recommendation, preparation or any part of a program requirement or a purchase request.

4.15.3 It shall be unethical for any elected official, employee, or former employee to influence the contents of any specification or procurement standard, by rendering of advice, investigation, auditing, or in any other advisory capacity in any proceedings or application, request for ruling, determination, claim or controversy, or other particular matter, pertaining to any program requirement or a contract or subcontract or to any solicitation or proposal.

4.15.4 It shall be unethical for any payment, gratuity, or offer of employment to be made by or on behalf of a Contractor's subcontractor under a contract to the Contractor or a higher tier Contractor's subcontractor or any person associated therewith, as an inducement for the award of a subcontract or order.

4.16. *Pricing Validity*

4.16.1 Proposals will remain subject to acceptance for a minimum of 120 days after the due date of the proposal submission opening. Proposals may not be withdrawn during this 120-day period. Richland County is requiring this 120-day window to accommodate the proposal evaluation and contract negotiation process.

4.16.2 Richland County is seeking subscriber terminal device, accessory, and optional feature pricing over at least the contract window. Richland County may give preference to Proposers whose pricing extends beyond the contract for subscriber terminal devices, accessories, and optional features.

4.17. *Contact between Proposer and County*

4.17.1 All contact between the Proposers and Richland County and it's participant agencies will be directed to the person designated in Section 3.7.4. No information provided verbally or by any other personnel will be considered binding.

4.17.2 All Proposers must use this written document, its addenda, its attachments, and information obtained at the mandatory pre-proposal conference as the sole basis of information from Richland County for their submission.

4.17.3 If a Proposer makes contact or attempts to contact any County employee after the mandatory pre-proposal conference and prior to award, unless authorized by the listed contact person, Richland County reserves the right to reject the Proposer's response.

4.18. *Performance and Payment Bonds*

4.18.1 To guarantee the faithful performance of all provisions of this agreement, to protect Richland County if Contractor is in default of this agreement, and to secure the guarantee and warranty of Contractor's deliverables, Contractor shall provide Richland County with surety in the form of Payment and Performance Bonds which shall be determined by Richland County after review of Contractor's proposal, but not to exceed 100 percent of the contract value.

4.18.2 For pricing purposes of this RFP, the Proposer shall assume it will be required to produce a performance and payment bond in the amount of 100 percent of the value of the contract.

4.18.3 Bonds must be produced to Richland County by 15 days after contract execution. The Performance Bond must include a maintenance period of 6 months from project completion, not including any applicable warranty or maintenance period. Bonds must be secured by Contractor at no additional cost to Richland County.

4.18.4 The Surety furnishing these bonds shall have a sound financial standing, a record of service satisfactory to the Richland County, authorization to do business in the State of Wisconsin and be named in the current list of Companies holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies, as published in Circular No. 570 by the Audit Staff, Bureau of Accounts, U.S. Treasury Department.

4.19. *Non-Debarment Clause*

4.19.1 Proposer hereby certifies that neither it nor any of its principal officers or officials has ever been suspended or debarred, for any reason whatsoever, from doing business or entering contractual relationships with any governmental entity.

4.19.2 Proposer further agrees and certifies that this clause shall be included in any subcontract of this contract.

4.20. *Statement of Compliance*

4.20.1 Proposer has carefully reviewed Richland County's required language, as set forth in the Request for Proposal pertaining to termination of contract, change orders, gratuities and kickbacks, non-appropriation of funds, hold harmless/indemnification, ADA compliance, insurance requirements/proof of insurance, dispute resolutions, and non-debarment and is in full compliance with all statements and requirements.

4.20.2 This language is incorporated herein by specific reference as if set forth in full: "Any statements set forth in this document that conflict with County's contract language are superseded by County's required contract language."

4.21. *Americans with Disabilities Act Compliance*

In connection with the performance of work under this contract, Contractor agrees that no qualified individual with a disability, as defined by the Americans with Disabilities Act, shall, by reason of such disability, be excluded from participation and the benefits of services, programs, or activities, including employment, or be subjected to discrimination. Contractor is specifically notified that it is subject to all employment requirements listed under Title I of the Americans with Disabilities Act by virtue of its contract with Richland County, a public entity. Contractor is specifically notified that it is subject to federal requirements to assure participation and access to public facilities, programs, and activities under Title II of the Americans with Disabilities Act by virtue of its contract with Richland County, a public entity. These requirements mandate separate or special programs or reasonable modification of existing programs, services, and activities without surcharge to disabled individuals as long as safety is not compromised. The Contractor shall provide a similar notice to all its subcontractors.

4.22. *Performance Standards*

4.22.1 If awarded the contract, the Proposer warrants and agrees to use its best efforts to perform all services in accordance with the contract terms and accordance with generally accepted professional standards.

4.22.2 The Proposer further warrants and agrees that it shall employ whatever resources are necessary to meet the requirements specified in such contract.

4.23. *Materials and Services*

4.23.1 The complete system including but not limited to the radio communications systems, supporting network, alarm system and microwave portion of project shall be offered as a "turn-key" Proposal which should be taken to mean change orders will only be accepted for action due to changes required not under the control of the Contractor shown to be unknown at the time of initial project negotiation.

4.23.2 The civil and structural portion of the project will be completed by others though assistance from the awarded Contractor shall be offered to assist the County and their civil/structural engineer to bid in a manner that follows state statutes for Public Works construction unless the County accepts a proposal involving a suitable partnership arrangement that includes sites that do not require direct construction costs paid by the County.

4.23.3 All materials and products provided shall be new and unused, with full manufacturer's warranties.

4.23.4 Materials and products shall be based on the functional and performance requirements in this document.

4.23.5 Proposer shall provide additional system components typically and reasonably required to make the system operational even though not specifically indicated.

4.24. *Shipping and Storage*

4.24.1 Proposal pricing shall be FOB destination. All shipping, handling, storage, and insurance costs associated with moving and storing manufactured equipment from the Selected Contractor's location(s) to the location of installation shall be included in the Proposer's response to the RFP.

4.24.2 In the event there is a need for temporary storage of equipment, the Selected Contractor is responsible for all equipment until Richland County accepts delivery.

4.25. *Proposer Qualifications*

4.25.1 A Proposer shall demonstrate compliance with the following criteria to be deemed a Qualified Proposer: Proposer shall be certified to install the system being proposed and have a minimum of three years' experience in the application, installation, and testing of the proposed systems and equipment with a successful record of at least three systems matching or exceeding the complexity/size of the proposed design as determined solely by Richland County.

4.25.2 All technicians assigned to the installation of the proposed system or any of its components shall have any manufacturer required certification from each equipment manufacturer, thus proving they are qualified to install and test the provided products.

4.25.3 All installers assigned to the installation of this system or any of its components shall have a minimum of two years' experience in the installation of the specified systems.

4.25.4 Proposer shall hold all necessary valid licenses and certifications for the work being performed as described. Proposer shall be a direct seller of the offered major system components, thus being authorized to do warranty service on the proposed system.

4.25.5 Proposer offers an acceptable solution for supporting the installation after acceptance via the extended maintenance offered.

4.25.6 Proposer has the needed test equipment that has been recently calibrated to be used in the setup and on-going maintenance of the proposed system.

4.25.7 Proposer maintains or contracts with a support facility and trained technical staff allowing service personnel to easily be dispatched to Richland County and arrive on-site within two (2) hours of being called for assistance.

4.25.8 Proposer meets the financial requirements to develop, acquire, install, and offer the long-term support requested by Richland County for the system being proposed.

4.25.9 Proposer shall agree and is responsible for providing detail that any proposed sub-contractor/consultant meets the above qualifications, where applicable.

END OF SECTION

5. Content of Response

5.1. *Preparation of Proposal*

5.1.1 Proposers shall submit their Proposals in both hard copy and electronically. Hard copy submissions must consist of one original and three (3) copies in binders or hard bound documents complete with required submittals plus any additional information included by the Proposer. Two electronic submissions of the Proposal shall also be provided including all required submittals in PDF format.

5.1.2 Tab 9: Cost Submittal – Owned, Partnership or Leased pricing will be placed in a sealed 9" x 12" envelope and marked "Pricing". The sealed envelope shall include the printed Pricing Matrix and the electronic copy in MS Excel in the .xls or xlsx file format and any other pricing information Proposer feels is necessary.

5.1.3 Electronic copies shall be submitted via CD or USB thumb drive.

5.1.4 No email submissions will be accepted.

5.1.5 The Proposer must submit with their Proposals all catalogs, drawings, specifications, descriptive information, and other details of equipment or materials included in its submission, including manufacturer and model number in this specification, so that the consultant may determine the merits of the various designs. Failure to comply may be cause for rejection.

5.1.6 Equipment data sheets and other external documents included with the hard copy submission may be included as part of the electronic copies on CD or thumb drive. However, if they are not included, an informational note shall be placed into the electronic submission advising that they appear in the hard copies but not in the electronic copy.

5.1.7 Submittals must contain the signature of an authorized agent empowered to bind the Proposer in a contract. The original hard copy submission must contain original signatures and be labeled accordingly.

5.2. *Point-by-point response*

5.2.1 Responders are required to provide a point-by-point response to each sub-section indicating one of the following:

- **"Proposed solution is compliant."**
- **"Proposed solution is non-compliant."**
- **"Proposed alternate solution is offered."**

5.2.2 If you wish to take an exception or if your solution is partially compliant but not fully compliant, please note that and explain the details in your response.

5.2.3 Issues of non-compliance will be analyzed and evaluated for impact. Significant issues of non-compliance will negatively affect a Proposer's overall evaluation and may be deemed to make the proposed solution and design unacceptable for consideration.

5.2.4 For any other Section of this RFP, there will be an assumption that the Proposer intends to fully comply unless an exception is clearly noted.

5.3. *Required Submittals with Proposal Response*

5.3.1 Proposers shall submit their documents with tabs identified by the numbers listed below.

5.3.1.1 TAB 1: Letter of Transmittal (limited to one page) –

Briefly state the Proposer's understanding of the services/system to be provided and a positive commitment to perform the services as defined in the RFP. The officer of the Proposer's company or a designated agent empowered to contractually bind the firm shall sign the Proposal and any clarification to the Proposal.

5.3.1.2 TAB 2: Firm Experience –

Include a description of the organization submitting the Proposal, including its size, organization, legal status (corporation or partnership, etc.), major type of activity or areas of work, and its recent (past five years) experience in the design, delivery, installation, optimization and commissioning of similar P25 simulcast system projects for public safety agencies. Identify the individual(s) in your firm who are anticipated to be involved in key roles if your firm is selected and briefly explain their role and relevant background and experience.

5.3.1.3 TAB 3: References –

Provide at least five references of recent clients that have completed a similar project. The reference must include the name, telephone number, address, and email address of a person who may be contacted and who has direct knowledge of your firm's capabilities and past performance. Also include a brief description of the project, including the start and completion dates.

5.3.1.4 TAB 4: Demonstration/Proof of Proposer's Financial Stability –

Formal certification on Proposer's stationery signed by the owner or authorized officer of the company indicating the proposing firm is not subject to a currently pending bankruptcy in any form, nor are there any current intentions of filing any type of bankruptcy proceedings. In the event a Proposer has or is considering filing bankruptcy of any type, formal certification will take on the form of a written explanation of such filing, complete with history and status.

5.3.1.5 TAB 5: Statement of Compliance for Insurance –

Provide a Statement that Proposer will meet all insurance requirements as stated in Section 7.17 if selected as an equipment and services provider.

5.3.1.6 TAB 6: Response to Requirements –

The Proposer must include a point-by-point response for each numbered and lettered item in this Request for Proposal. The Proposer shall indicate understanding and compliance or take exception and explain the reason for each item. Additional system descriptions and/or drawings that further describe the capability of the Proposer's offering are encouraged.

5.3.1.7 TAB 7: Details of Proposed Solution –

A narrative of the solution proposed including high level site diagrams of the proposed solution showing network connectivity, redundant systems and representative diagrams of site equipment, space and power requirements. This description shall include complete written description of the offering with a global list of major elements, diagrams showing interconnection of the major elements, description of requirements related to shelters, power, HVAC, antennas and towers for each site. It shall also include preliminary engineering details, RF signal level ratio / delay spread used to meet BER requirements, propagation predictions, delay spread predictions acceptance testing procedures, proposed coverage test procedure and cutover procedures.

5.3.1.8 TAB 8: Implementation Plan and Schedule –

The Proposer shall provide an implementation plan and schedule that minimally includes:

a. Major Task/Phase

b. Detailed design phase proposed beginning and end dates

c. Interface with County's consultants (technical and civil)

d. Site/tower expectations

e. Parts, ordering and delivery of equipment

f. Factory Acceptance Test

g. System installation plan

h. System programming and testing

i. System Optimization

j. System Commissioning

k. System Technical Training

l. System Operator Training

m. System acceptance testing

n. 30-day burn-in and validation

o. Transition/Cutover

p. Customer acceptance

q. System documentation

r. Start date, finish date and duration of each task/phase

s. Responsibilities (Proposer and County/agency)

t. Overall project management (Contractor)

u. Overall project coordination (consultant)

v. System build through Commissioning (Contractor)

w. Site acquisition (County)

x. Site/tower development (County)

y. Dependencies

z. Initial verification of selected sites by photos or other means

aa. FCC licensing and Regional Planning Committee approval

bb. Site power requirements

cc. Microwave path issues

dd. Deliverables

ee. Detailed Design Report/Drawings

ff. Factory Acceptance Test/Results

gg. Commissioning Test/Results

hh. Fully operating radio system w/ subscriber units programmed

ii. All punch list items completed

jj. Final documentation

5.3.1.9 TAB 9: Cost Submittal –

The Proposer shall provide a complete breakdown of costs by item as described in the attached pricing matrix and using this matrix as a submittal. No other pricing formats will be accepted. A cost for each sub-item shall be included for all equipment if stated. If an item is to be furnished at no charge, the item shall be marked "Included". In addition to the total system cost, and other requested cost data, any optional or additional recommended equipment or services costs shall be listed. The County desires to know the entire cost of operation for the first 10 years after acceptance. Year One 100% warranty plus nine (9) years of extended maintenance support. If a partnership option is offered, further breakdown of how this is proposed shall be included as a part of the submittal.

5.3.1.10 TAB 10: Additional Work –

Include a list of items including hourly installation costs to be charged to the County in the event additional work is required beyond the scope of service stated. The County must authorize any additional work in writing before additional costs may be incurred.

5.3.1.11 TAB 11: Change Orders –

It shall be understood that due to the complexity of the project and some of the unknowns that change orders will be necessary with the major one occurring at the time of the detailed design review when sites are known and believed to be securable. Proposer shall place a statement to that effect signed by offer acknowledging the requirement.

5.3.1.12 TAB 12: Exceptions –

If exceptions to any item of any part of any section of this Request for Proposal are taken, they must be clearly identified as exceptions. The stated exceptions and any alternatives offered must be included in the Proposer's response. Submission of a Proposal indicates acceptance by the Proposer of the conditions contained in this Request for Proposal, unless clearly and specifically noted in the Proposal submitted and confirmed in the contract between the County and the Proposer (Contractor) selected. The County may decide to accept or reject any of the alternatives. If an exception is not taken and a contract signed the Contractor shall be responsible to provide at no additional cost to the County any portion or piece of equipment not specifically included in their proposal needed to meet expected performance. Taking an exception to a stated requirement may not automatically reduce evaluation points, rather the results of the exception on system expected performance may result in evaluation point adjustments.

5.3.1.13 TAB 13: Coverage Alternates –

If Proposer elects to offer any complete alternative solution, then it shall include a brief response to the differences of the stated performance expectations as outlined, a high-level block diagram, coverage expectations and complete price matrix to be considered thus making the alternative a standalone proposal.

5.3.1.14 TAB 14: Specification sheets –

Include spec sheets for infrastructure components, terminals, etc.

5.3.1.15 TAB 15: Sample Contract, Terms and Conditions –

Proposed contract for the County to consider.

END OF SECTION

5.4. *Price Matrix Definitions*

5.4.1 **Detailed System Design –** Summarize the engineering, design, & project support costs for getting the proposed system from paper to detailed design.

5.4.2 **Project Management –** Summarize the cost of services for providing a project manager.

5.4.3 **Licensing & permitting –** Summarize any needed licensing & permit fees and the cost of services needed to complete these processes on behalf of the County.

5.4.4 **Fleetmap Development Process –** Summarize the cost of services for supporting the proposer's identified process to support the County in developing Fleetmap documents.

5.4.5 **System Installation & Optimization –** This item should include all technical support hours to install and optimize the operation of the system designed.

5.4.6 **Radio System Acceptance & Commissioning Testing –** This item should include the support hours needed to provide resources in the acceptance and commissioning processes to the County.

5.4.7 **Drive Testing/Coverage Verification & Documentation -** This item should include the support hours needed to complete the drive testing processes as proposed.

5.4.8 **System Documentation Package -** This item should include the support hours needed to assemble a documentation package of the built system.

5.4.9 **Common Controller Systems -** Total should include system equipment.

5.4.10 **Redundant Controller Systems -** Total should include system equipment.

5.4.11 **Radio System Network Management** - Total should include system equipment.

5.4.12 **Alarm System -** Total should include system equipment .

5.4.13 **Radio Console Systems -** Total should include system equipment on a per console basis.

5.4.14 **Radio Console Back Up Control Station w/Remote Head & Antenna Systems -** Total should include system equipment and antenna/line installation costs of proposed design.

5.4.15 **Radio Console - Control Station Systems with Antenna Systems -** Total should include system equipment and antenna/line installation costs of proposed design.

5.4.16 **Mutual Aid Radio System with Antenna Systems –** Total should include system equipment and antenna/line installation costs of proposed design.

5.4.17 **Spare Parts –** Total shall show cost for recommended spare equipment detailed with a proposed list.

5.4.18 **LMR Site Equipment –** Totals should include a rollup of the (per site) Land Mobile Radio site equipment and antenna/line installation costs.

5.4.19 **Microwave/Network Site Equipment –** Totals should include a rollup of the (per site) Microwave/Network site equipment and antenna/line installation costs.

5.4.20 **Coordination and Discussions for Civil Engineering Processes –** Provide cost for providing requested information, reviewing civil engineering documents, and general coordination with the project Civil Engineer.

5.4.21 **Terminal User Training onsite class –** Provide a per class cost for delivering subscriber training classes to County agents responsible for training additional users.

5.4.22 **Dispatch Training onsite class -** Provide a per class cost for delivering dispatcher training classes to County operators.

5.4.23 **24X7X365 System Maintenance Support (Year 1 - 100% Warranty) –** Provide a cost for supporting the new system while under warranty with afterhours support to assure the County would not incur costs for non-support hours.

6. Evaluation Process

6.1. *Proposal Evaluation*

6.1.1 Richland County's Consultant will assist in a thorough evaluation process and create a detailed summary document.

6.1.2 Proposals will be reviewed for compliance with the specifications and criteria within the RFP and any addendums.

6.1.3 Proposals will also be reviewed for completeness, organization, clarity, and conciseness. Extraneous information that is not responsive to the RFP is discouraged.

6.1.4 Richland County's Evaluation Committee will be reviewing all proposal information and summary documents and shall have final decision-making authority regarding scoring processes.

6.1.5 Richland County's Evaluation Committee will pass along their scoring results to the County's decision makers.

6.2. *Conditions of the Selection Process*

6.2.1 **Criteria Compliance** - The County reserves the right to determine, in its sole and absolute discretion, whether any aspect of a proposal satisfactorily meets the criteria established in this RFP.

6.2.2 **Submission of Alternatives** - Although this RFP specifies minimum requirements for completion of the Project and shall be responded to in all respects, Proposers are invited and encouraged to submit alternatives that may be of interest to the County from an operational, timing, financial and/or long-term upgrade point of view.

6.2.3 **Additional Information Requests** - The County reserves the right to request additional information from Proposers during any phase of the Proposal evaluation process. During the evaluation and selection process, the County may require the presence of Proposer's representatives to make presentations and answer specific questions. Notification of any such requirements will be given as necessary.

6.2.4 **Conditions of Award** - The County may elect not to award a contract solely based on this RFP and will not pay for the information solicited or obtained. The information obtained will be used in determining the alternative that best meets the needs of the County.

6.3. *Evaluation Process*

6.3.1 **Response document review** – Richland County's Evaluation Committee will individually review the proposals received and develop an independent understanding of the response.

6.3.2 **Technical RFP review** - Richland County will be provided a technical breakdown and discussion of the merits of each proposal comparing them to the request document. These comparisons will serve to develop the County's evaluation report.

6.3.3 **Clarification Questions** – Richland County will reach out to vendors with clarifying questions to ensure a complete understanding and evaluation of proposals.

6.3.4 **Technical Points** - Points will be given in each criteria area based on the ability of the response submitted to meet or exceed the request for proposal needs. Scoring will be completed individually or by group process.

6.3.5 **Exceptions/Errors** – Deductions in each criteria area will be used when items are found to impact Proposal quality.

6.3.6 **Cost Review** – Richland County's Evaluation Committee will evaluate proposal costs after a technical understanding is fully developed. Costs will be evaluated for initial and ongoing costs. The financial evaluation will be based on the total (life cycle) cost of the system. The costs used will be those provided in the Proposer's response to this RFP and as established by the County for hardware/software and system operation plus care in site selection/design as to number of leased sites, greenfield sites and makeup of antennas on the towers. The County reserves the right to adjust cost submissions to reflect factors that, in the County's judgment, would result in more accurate costs in their environment.

6.3.7 **Interviews** – If Richland County intends to hold interviews, Proposer(s) will be contacted to schedule an interview. Information obtained through written communication or interview will be used to further evaluate the proposal(s). The initial scores awarded for proposal(s) are subject to change based on written communications and interviews, if held.

6.3.8 **Award Recommendation** – If Richland County moves forward with recommending award of a contract, the recommendation shall be made to the Proposer who complies with the requirements and has the highest overall proposal score, unless there is justifiable reasoning as to why awarding to a lower scoring Proposer is in the best interest of the County.

6.4. *Evaluation Criteria*

6.4.1 The following evaluation criteria will be used by Richland County as a basis to score each proposal.

Technical Proposal

Evaluation Criteria	*Possible Points*
INSTALL/SUPPORT	**15**
FEATURES AND BENEFITS	**20**
TECHNICAL DESIGN MERIT	**20**
PROPOSER EXPERIENCE, QUALIFICATIONS, and QUALITY of RESPONSE	**15**
Total Possible Technical Proposal Points	70

Compensation Proposal

Evaluation Criteria	*Possible Points*
SYSTEM and OPERATIONAL COST	**20**
SUBSCRIBER EQUIPMENT PRICING	**10**
Total Possible Cost Proposal Points	30

6.4.2 **Install and Support** (15 Points) - This evaluates pre- and post-installation support and service and local presence. Site visits and reference checks may be utilized for this evaluation. Proposers will be evaluated on their ability to execute the project on time and without interruption to Public Safety operations. Support after installation will be a key factor, as the Proposer will be expected to enter in the primary role of providing maintenance.

6.4.3 **Features and Benefits** (20 points) - Evaluations will consider the depth of system and subscriber equipment features and benefits included in the proposal. Proposers will be evaluated based on features and benefits offered. Proposal will be measured using the design age of the proposed system and equipment against the frequency of updating the system.

6.4.4 **Technical Design Merit** (20 points) - The technology evaluation shall use criteria such as compliance to standards, development and execution environment and footprint, application architecture, extensibility, scalability, integration, and system coverage performance. A review of the submitted proposal and overview design provided as a part of submittal will be key.

6.4.5 **Proposer's Experience, Qualifications, Quality of Response** (15 points) - Proposals will be evaluated on the Proposer's track record in fielding similar P25 simulcast systems, the Proposer's financial capabilities, and the Proposer following the required submittal proposal response, thoroughness, clarity, conciseness, and organization.

6.4.6 **System and Operational Cost** (20 points) – Proposals will be evaluated on system costs weighted against the equipment and services proposed.

6.4.7 Subscriber Equipment Cost – (10 points) – Proposals will be evaluated on subscriber costs weighted against the features and functions of the devices proposed.

END OF SECTION

7. Contract Agreement

The following contract agreement terms and conditions shall be understood and accepted to be supported in an agreement between Richland County and the Successful Contractor.

7.1. *Selected System Proposer*

If the proposal represents offerings to be provided by different firms, subcontractors, or other organizations, the contract will be solely with the selected system Proposer (Selected Contractor), who will be required to assume responsibility for the total project. Any proposed sub-selected system Proposer will be subject to Richland County's approval.

7.2. *Entire Agreement*

7.2.1 This agreement (including the Exhibits) represents the entire and integrated agreement between the parties hereto and supersedes all prior negotiations, representations, or agreements, either written or oral.

7.2.2 Any alterations, modifications, or waivers of provisions of this agreement shall be valid only when they have been reduced to writing as an amendment to this agreement signed by the parties hereto.

7.3. *Submission of Contract Documents*

7.3.1 Within fifteen (15) days after receipt of contract award and receipt of the contract forms, the Successful Contractor shall execute the final contract with Richland County.

7.3.2 Such contract shall be prepared by Richland County, and the contract terms shall be consistent with this RFP, any and all addenda thereto, Selected Contractor's Proposal original or negotiated, and all material attached to and made a part of the RFP.

7.3.3 The terms of the Proposal as such terms are finally accepted by Richland County, as well as all other provisions to which Richland County agrees shall be included in the contract.

7.4. *Failure to Execute Contract*

7.4.1 Richland County reserves the right to award to another Proposer(s) if the selected Proposer fails to execute and return the contract within fifteen (15) days after receipt of said award notification and contract forms.

7.4.2 The re-award to another Proposer shall be in addition to any other right or remedy available to Richland County under this RFP, contract law, statute, and/or in equity.

7.5. *Governing Law/Jurisdiction*

7.5.1 State of Wisconsin (State) laws govern all questions and interpretations concerning the validity and construction of a contract awarded pursuant to the specifications and the legal relations among the parties and performance under it. The appropriate venue and jurisdiction for any litigation involving an entity included within the term "County" as defined herein will be those courts located within that County in the State of Wisconsin in which such entity is located.

7.5.2 If any provision of the contract is held invalid, illegal, or unenforceable, the remaining provisions will not be affected.

7.6. *Change Orders*

The scope of the services to be performed under this Contract may be amended or supplemented by mutual written agreement between the parties to the Contract. This amendatory provision shall not operate to prevent the County from exercising its reserved right to establish reasonable time schedules of and for any of the work or services to be performed by Contractor hereunder, nor to cancel any of the services not performed at the time notice is given to Contractor of the cancellation of such services or portion of the work to be performed hereunder.

7.7. *Non-Waiver of Defaults*

Any failure by the County to enforce or require the strict keeping and performance of any of the terms and conditions of the contract shall not constitute a waiver of such terms and conditions, nor shall it affect or impair the right of the County to avail itself of such remedies as may be available for any breach of the contract terms and conditions.

7.8. *Termination*

The County may, for its convenience, terminate this contract at any time by a notice in writing from the County to Contractor by certified mail. If the Contract is terminated as provided herein, Contractor shall be paid an amount which bears the same ratio to the total compensation as the services performed bear to the total services of Contractor covered by this Contract, unless payments of compensation have previously been made.

7.9. *Rights and Remedies*

7.9.1 If a dispute related to this agreement arises, all parties shall attempt to resolve the dispute through direct discussions and negotiations. If the dispute cannot be resolved by the parties, and if all parties agree, it may be submitted to either mediation or arbitration. If the matter is arbitrated, the procedures of appropriate Wisconsin Statutes shall be followed. If the parties cannot agree to either mediation or arbitration, any party may commence an action in any court of competent jurisdiction. If a lawsuit is commenced, the parties agree that the dispute shall be submitted to alternate dispute resolution as covered by State of Wisconsin statues.

7.9.2 Unless otherwise provided in this contract, the parties shall continue to perform according to the terms and conditions of the contract during the pendency of any litigation or other dispute resolution proceeding.

7.9.3 The parties further agree that all parties necessary to the resolution of a dispute shall be joined in the same litigation or other dispute resolution proceeding. This language relating to dispute resolution shall be included in all contracts pertaining to this project to provide for expedient dispute resolution.

7.10. *Liquidated Damages*

7.10.1 Time being an essential element of this agreement, and based on the schedule established in the agreement, it is hereby agreed that if the County determines that an extension is not justified, the County will be entitled to damages for failure on the part of Contractor to complete its obligations regarding installation and/or maintenance.

7.10.2 In view of the impracticality and extreme difficulty of fixing and ascertaining the actual damages the County would sustain in such event; the County shall be entitled to one thousand ($1,000.00) dollars per calendar day for each day beyond the dates established in the approved Implementation Plans. The aforesaid specified amount shall not be construed as a penalty, but as liquidated damages for any such failure on the part of the Vendor. The act of the County in canceling the agreement for any such failure and/or any unexpected delay shall not forfeit its right to recover liquidated damages from the Vendor. In any suit involving assessment or recovery of liquidated damages, the reasonableness of the daily charges shall be presumed, and the amount assessed, as well as the aforesaid cancellation right or any other cancellation rights stated in these specifications, will be in addition to every other right or remedy now or hereinafter enforceable at law, in equity, by statute, or under the agreement.

7.10.3 Contractor will not be charged with liquidated damages when any delay or failure is due to any act or neglect of the County; written and mutually agreed to change in the Agreement; fire, flood or other natural disasters; unusual delay in transportation; adverse weather conditions not reasonably anticipated; unavoidable casualties; or any other causes beyond the reasonable control and without fault or negligence of Vendor. Agreement time or performance dates or times may be extended for such reasonable time as the County's purchasing manager may determine. A claim for extension will not be allowed unless Vendor, not later than the end of the first County business day following the day on which the claim arises, shall have telephoned and informed the County about the full details of the cause necessitating such a claim within seven (7) calendar days of any such telephone call. Contractor shall also send to each of the County's addresses referenced above a communication specifying the cause(s) of the delay. The herein provisions will not preclude the County from canceling or terminating the Agreement regardless of any act or event beyond Contractor's reasonable control, as aforesaid, provided that the County shall give Contract thirty (30) days prior written notice of the County's intention to so cancel or terminate, and that during said period, Contractor shall have failed to cure such delay or failure in performance.

7.10.4 If liquidated damages are charged, they will be charged daily, first against monies then due to Contractor, then against monies coming due, and then against funds held for eventual release to Contractor. If these three sources are not enough to cover the liquidated damages, the County will bill Contractor for the necessary balance and Contractor shall promptly pay.

7.10.5 The County may waive in writing all or any portion of any liquidated damage assessment after the date services or obligations are completed and accepted by the County.

7.10.6 Permitting Contractor to continue and complete the services or obligations or any part of them after stipulated times will not in any way operate as a waiver on the part of the County, the County or its rights hereunder. No act by the County in pursuing or affecting its rights hereunder will constitute a forfeiture of the County's right to recover liquidated damages.

7.10.7 Notwithstanding the existence of a dispute, the parties shall continue without delay to carry out all their responsibilities under this agreement not affected by the dispute. If a party fails to continue without delay to perform its responsibilities under this agreement or to accomplish all undisputed work, any additional cost incurred by the other parties as a result of such failure to proceed shall be borne by the responsible party. Notwithstanding the forgoing, the County reserves the right to suspend all work without penalty. This provision does not affect the County's rights in Suspension of Work as previously stated.

7.11. ***Successors***

7.11.1 The Contractor binds itself, its partners, successors, assigns, and legal representatives to the County in respect to all covenants, agreements, and obligations contained in the contract documents. The Contractor shall not assign the contract or subcontract it in whole or in part nor assign any monies due or to become due to it hereunder without the prior written consent of the County.

7.11.2 Consent to assign shall be accomplished by execution of a form prepared by the County and signed by the Vendor, the assignee, and the County. Said form shall contain the terms and conditions of the consent.

7.12. ***Subcontracting***

7.12.1 Consent to subcontract shall under no circumstances relieve the Contractor of its liabilities and obligations under the contract documents. Further, the Contractor shall be fully responsible for the acts, omissions, and failure of its subcontractors in the performance of the herein specified contractual services, and of persons directly or indirectly employed by subcontractors. Contracts between the Contractor and each subcontractor shall require that the subcontractor's services and obligations be performed in accordance with the provisions of the contract documents. The County will assume no contractual relationship with subcontractors or the Vendor.

7.12.2 Nothing in the contract documents shall create any contractual relationship between the County and the Contractor's employees, subcontractors, and their agents and employees, or any other parties furnishing commodities and/or services to the Contractor and their agents and employees.

7.13. *Indemnification/Claims*

Contractor hereby agrees to release, indemnify, defend, and hold harmless Richland County, their officials, officers, employees and agents from and against all judgments, damages, penalties, losses, costs, claims, expenses, suits, demands, debts, actions and/or causes of action of any type or nature whatsoever, including actual and reasonable attorney's fees, which may be sustained or to which they may be exposed, directly or indirectly, by reason of personal injury, death, property damage, or other liability, alleged or proven, resulting from or arising out of the performance of Contractor, its officers, officials, employees, agent or assigns. The Richland County does not waive, and specifically reserves, its right to assert all affirmative defenses and limitations of liability as specifically set forth in Wisconsin Statutes.

7.14. *Infringement Indemnification*

The Contractor shall defend, indemnify, and hold harmless the County, its officers, directors, employees, and agents against all claims, suits, actions, liability, damages, fees (including reasonable attorney's fees), and losses arising out of the use of the software, in connection with any allegations that the software infringes any patent, copyright, trademark, trade secret, or violates any other proprietary right of a third party. The Contractor shall be given reasonably prompt notice of such claim, and given information, reasonable assistance (except financial), and sole authority to defend or settle the claim. The obligations of Contractor stated in this section survive termination, expiration, non-renewal, or rescission of this agreement.

7.15. *Replacement of Software*

7.15.1 If a third-party claim or threatened claim causes the County's reasonable use of the software to be seriously endangered or disrupted, Contractor shall promptly, without additional charge, (1) replace the software with a compatible, functionally-equivalent and non-infringing product; or (2) modify the software to provide functionally-equivalent, compatible, and non-infringing software; or (3) obtain a license for the County to continue use of the software for the term of this license and pay for any additional fees required for such license.

7.15.2 If Vendor's best efforts do not resolve third-party claims, then the County may, at its option, terminate this agreement and Contractor will promptly refund to the County a pro rata portion of any software payment(s).

7.15.3 In taking actions described under this section, Contractor acknowledges that time is of the essence in any interruption of the County's use of software.

7.16. *Software License*

The County shall have the right to make at least two (2) copies of any system or equipment level software for backup and archival purposes. The County may transfer the software within their respective business operation.

7.17. *Enhancements, Upgrades, and New Versions of Software*

7.17.1 The Contractor agrees to provide to the County, at no cost, prior to and during installation and implementation, any software enhancements, upgrades, replacements, and/or new versions of the software.

7.17.2 Throughout the warranty period and as long as Contractor is providing extended maintenance, Contractor shall notify the County) of the availability of enhancements, upgrades, replacements, and newer versions of the software and, within thirty (30) days, supply the County) with the enhancements, upgrades, replacements, and new version.

7.17.3 The enhancements, upgrades, replacements, and new version will be provided to the County without charge during the extended maintenance period.

7.17.4 The Contractor will provide free updated documentation in the form of new revision manuals or changed pages to current manuals consistent with the original documentation supplied and reflecting the changes included in the software.

7.17.5 The Contractor shall provide Bug Status Reports specifying all known, outstanding bugs in the new software versions. The information shall be updated periodically as new information and workarounds become known.

7.17.6 The Contractor shall also provide free installation (as part of the warranty and maintenance program, procedures, and any installation program required by the installation.

7.17.7 Reauthorization Code: If a reauthorization code must be keyed in by Contractor for the licensed software to remain functional upon movement to another computer system, Contractor shall provide the reauthorization code to the County) within one (1) business day after receipt of County's notice of its machine upgrade or movement.

7.18. ***New***

The Contractor warrants to the County that all commodities will, unless otherwise specified, be new and the manufacturer's latest design of the commodity presently in production and sold to customers and that such commodities and services furnished under this contract are in conformance with contract documents and that commodities are of merchantable quality and fit for the purpose for which they are intended and sold.

7.19. ***Title***

The Contractor warrants that title to all commodities, materials, and/or equipment covered by an application for payment will pass to the County upon receipt of payment by the Vendor, free and clear of liens, claims, security interests, or encumbrances, and that no commodities, materials, and/or equipment covered by an application for payment in which an interest therein or an encumbrance thereon is retained by the seller.

7.20. ***Protection of Persons and Property***

7.20.1 The Contractor shall take all reasonable precautions for the safety of, and shall provide all reasonable protection to prevent damage, injury, or loss to the following: (1) employees at the site and other persons who may be affected thereby, (2) Contractor's work and materials and equipment to be incorporated therein which are under the care, custody, and control of the Contractor or any of Contractor's subcontractors, and (3) other property at the site or adjacent thereto.

7.20.2 The Contractor shall promptly remedy damage or loss to property caused in whole or in part by the Vendor, subcontractor, or anyone directly employed by any of them, or by anyone for whose acts any of them may be liable.

7.20.3 The Contractor shall be liable for damages arising out of injury to the person and/or damage to the property of the County's employees, or any other person(s) designated by the County for any purpose, other than agents or employees of the Contractor, prior to or subsequent to acceptance, delivery, installation, and use of the equipment or product either at the Contractor's site or at the County's place of business, provided that the injury or damage was caused by the fault or negligence of the Contractor or caused by the Contractor's equipment or product.

7.20.4 Vendor's Insurance. Contractor shall not commence work under this contract until all insurance required under this paragraph is obtained, and such insurance has been approved by the County, nor shall Contractor allow any Contractor's subcontractor to commence work on their subcontract until all similar insurance requirements have been obtained and approved.

7.20.5 Workers' Compensation Insurance. Contractor shall obtain and maintain throughout the duration of this contract statutory Workers' Compensation insurance for all its employees employed at the site or while working on this project. In case any work is sublet, Contractor shall require the Vendor's subcontractor similarly to provide statutory Workers' Compensation Insurance for all the latter's employees, unless such employees are covered by the protection afforded by Vendor.

7.21. ***Proof of Insurance***

7.21.1 Contractor shall furnish the County with a Certificate of Insurance countersigned by a Wisconsin Resident Agent or Authorized Representative of the insurer indicating that Contractor meets the insurance requirements identified above.

7.21.2 The Certificates of Insurance shall include a provision prohibiting cancellation of said policies except upon 30 days prior written notice to the County and specify the name of the contract or project covered.

7.21.3 The Certificate of Insurance shall be delivered to the County, with a copy of the Certificate of Insurance to be delivered to the County's Project Manager for approval within 10 business days of contract execution. County Project Manager written authorization must be received before any work is started.

7.21.4 Upon renewal of the required insurance and annually thereafter, the County shall receive a new Certificate of Insurance for three years after completion of the project.

7.21.5 The Certificates shall describe the contract by name and or identification number in the "Description of Operations" section of the form.

7.21.6 Richland County be listed as an additional insured on all general, and auto liability policies purchased by outside parties.

7.21.7 General Liability, Professional Liability and Property Damage Insurance. Contractor shall secure and maintain in force throughout the duration of this contract such General Liability, Professional Liability and Property Damage Insurance as shall protect him/her and any Vendor's subcontractor performing work covered by this contract from claims for damages for personal injuries including accidental death, as well as from claims for property damage, which may arise from operations under this contract, whether such operations be by Vendor, or by any Vendor's subcontractor or by anyone directly or indirectly employed by either of them; and the amount of such insurance shall be as follows:

a. Worker's Compensation and Employees Liability Insurance with Wisconsin Statutory limits.

b. General Liability Insurance with a minimum combined single limit of $5,000,000.00 for bodily injury and property damage per occurrence.

c. Comprehensive Auto and Truck Liability Insurance including owned, non-owned and hired vehicles with a minimum combined single limit of $5,000,000.00 for bodily injury and property damage per occurrence.

d. Umbrella Liability Insurance of not less than $5,000,000 per occurrence for bodily injury, personal injury and property damage in excess coverage carried for commercial general liability and automobile liability.

e. Professional Liability Coverage, $2,000,000 per occurrence and in aggregate.

7.22. *Independent Vendor*

7.22.1 It is agreed that nothing herein contained is intended or shall be construed in any manner as creating or establishing the relationship of co-partners between the parties hereto or as constituting the Contractor as the agent, representative, or employee of the County for any purpose or in any manner whatsoever. Contractor is to be and shall remain an independent Contractor with respect to all services performed under this agreement. Contractor represents that it has, or will secure at its own expense, all personnel required to perform services under this agreement.

7.22.2 Any and all personnel of Contractor or other persons while engaged in the performance of any work or services required by Contractor under this agreement shall have no contractual relationship with the County and shall not be considered employees of the County, and any and all claims that may or might arise under the Workers' Compensation Act of the State of Wisconsin on behalf of said personnel or other persons while so engaged, and any and all claims whatsoever on behalf of any such person or personnel arising out of employment or alleged employment, including without limitation claims of discrimination against the Vendor, its officers, agents, Vendors, or employees shall in no way be the responsibility of the County; and Contractor shall defend, indemnify and hold the County, its officers, agents, and employees harmless from any and all such claims regardless of any determination of any pertinent tribunal, agency, board, County, or court.

7.22.3 Such personnel or other persons shall not acquire nor be entitled to any compensation, rights, or benefits of any kind whatsoever from the County, including, without limitation, tenure rights, medical and hospital care, sick and vacation leave, Workers' Compensation, Unemployment Compensation, disability, severance pay, and retirement funds.

7.23. ***Permits, Fees, Notices, and Compliance with Laws, etc.***

7.23.1 Unless otherwise provided in the specifications, the Vendor, at its own expense, shall secure and pay for all permits, fees, charges, duties, licenses, certifications, inspections, and other requirements and approvals necessary for the execution and completion of the contract. The exception is any costs related to FCC licensing which is the direct responsibility of the County.

7.23.2 The Contractor shall observe and accept all applicable federal, state, and local laws and the rules and regulations of any regulatory body acting thereunder.

7.23.3 The Contractor shall give all notices required under law, ordinance, rule, and regulation.

7.24. ***Royalties and Patents***

7.24.1 The Contractor shall pay all royalties and license fees.

7.24.2 Complementary to other "hold harmless" provisions throughout the specifications, the Contractor shall, without cost to the County, defend, indemnify, and hold the County, its commissions, officers, and employees harmless against any and all claims, suits, liability, losses, judgments, and other expenses arising out of or related to any claim that the County's use or possession of the software, licenses, materials, reports, documents, data, or documentation obtained through the contract violates or infringes upon any patents, copyrights, trademarks, trade secrets, or other proprietary rights or information, provided that the Contractor is promptly notified in writing of such claim. The Contractor will have the right to control the defense of any such claim, lawsuit, or other proceeding. The County will in no instance settle any such claim, lawsuit, or proceeding without the Vendor's prior written approval.

7.24.3 If, as a result of any claim of infringement of rights, the Contractor is enjoined from using, marketing, or supporting any product or service provided through the contract to be established (or if the Contractor comes to believe such enjoinment imminent), the Contractor shall either arrange for the County to continue using the product or service at no additional cost to the County, or propose another remedy subject to County approval.

7.24.4 Provision of equivalent products or services will be acceptable, but the County alone will determine whether proposed substitutes are sufficiently equivalent. If no acceptable alternative is possible even after the Contractor's best efforts, the Contractor shall return a pro rata portion of the County's costs pertaining to the license fee, if any, and all consequential costs based on a period of twenty (20) years. (If the hardware cannot operate in accordance to the contract documents without the internal code or system software, the Contractor shall return a pro rata portion of the associated County hardware cost based on a period of twenty (20) years unless a longer or shorter period is specified in the specifications.)

7.25. *Conflict of Interest*

Contractor affirms that to the best of its knowledge, Vendor's involvement in this agreement does not result in a conflict of interest with any party or entity that may be affected by the terms of this agreement. The Contractor agrees that, shall any conflict or potential conflict of interest become known to Vendor, it will immediately notify the County of the conflict or potential conflict, specifying the part of this agreement giving rise to the conflict or potential conflict, and will advise the County whether Contractor will or will not resign from the other engagement. This conflict of interest includes the County's consultant, True North.

7.26. *Delivery of Required Information*

Upon executing this agreement, Contractor shall deliver to County such bonds, affirmative action plans, certificates of insurance, insurance binders, and other certifications and representations as Contractor is required to furnish in accordance with the contract documents.

7.27. *Notices*

7.27.1 Any notice or demand that must be given or made by a party hereto under the terms of this agreement or any statute or ordinance shall be in writing and shall be sent registered or certified mail.

7.27.2 Notices to the County shall be sent to the Richland County with a copy to the originating Department at the address given in the opening paragraph of the agreement.

7.27.3 Notice to the Contractor shall be sent to the address stated in the opening paragraph of the agreement or, if not stated therein, then to the address stated in Vendor's Form W-9 provided to and on file with the County.

7.28. *Shipping and Storage*

Proposal pricing shall be FOB destination. All shipping, handling, storage and insurance costs associated with moving and storing manufactured equipment from the Contractor's location(s) to the location of installation shall be included in the Proposer's response to the RFP. In the event there is a need for temporary storage of equipment, the County will work with the Contractor to secure places where storage can take place.

7.29. *Subcontractors*

If the submission represents offerings to be provided by different firms or other organizations, the contract will be solely with the Contractor (Selected Vendor), who will be required to assume responsibility for the total project. Any proposed subcontractors will be subject to the County's approval.

7.30. *Delays and Extensions of Time*

7.30.1 If the Contractor is delayed at any time in the performance of the contract by written and mutually agreed to changes in the contract, labor disputes, fire, flood, or other natural disasters, unusual delay in transportation, adverse weather conditions not reasonably anticipated, unavoidable casualties, or any other causes beyond the Contractor's reasonable control and without fault or negligence of the Contractor, then the Contract Manager may, but shall not be required to, extend the contract time or performance dates or times for such reasonable time as the Contract Manager may determine.

7.30.2 A claim for extension will not be allowed unless the Contractor, not later than the end of the County's second business day following the day on which the claim arises, shall have informed the Contract Manager —via email, a follow up phone call may then be place, but the initial contact shall be in email—about the full details of the cause(s) necessitating such a claim. Within six (6) calendar days following any such email, the Contractor shall also send to each of the County's contact personnel a communication specifying in detail the cause(s) of the delay. The communications shall be sent to the address stated at the top of said cover sheet.

7.30.3 Contractor's failure to comply with the above procedures shall constitute waiver of any claim for an extension of time.

7.30.4 The herein provisions will not preclude the County from canceling or terminating the contract regardless of any act or event beyond the Contractor's reasonable control, as aforesaid, provided that the County shall have given the Contractor thirty (30) days prior written notice of the County's intention to so cancel or terminate, and that during said period, the Contractor shall have failed to cure such delay or failure in performance.

7.31. *Suspension of Work*

7.31.1 The County shall have the right to suspend the work, or any part thereof, for non-compliance, for refusal to carry out the requirements of the agreement, or for public safety reasons.

7.31.2 The Contract Manager shall provide written notice to Contractor regarding the reason or reasons for such suspension. Work shall be suspended until the reason for the suspension has been corrected.

7.32. *Extension*

7.32.1 Unless otherwise provided in the contract documents, the contract period may be extended for additional periods with the mutual consent of the County and the Contractor. Each approved extension period shall be governed by the original contract terms.

7.32.2 If the County wishes to extend the contract, the Contract Manager will so advise the Contractor before expiration of the contract or any extension period.

7.33. *Survivorship*

7.33.1 All transactions executed pursuant to the authority of this Contract shall be bound by all the terms, conditions, price discounts, and rates set forth herein, notwithstanding the expiration of the initial term of this Contract or any extension thereof.

7.33.2 The terms, conditions, and warranties contained in this Contract that by their sense and context are intended to survive the completion of the performance, cancellation, or termination of this Contract shall so survive.

7.33.3 The terms of the sections titled Software License, Disputes and Remedies, Warranty, and Indemnification shall survive the termination of this Contract.

7.34. *Taxes*

7.34.1 As the parties recognize that the County is a nonprofit entity exempt from payment of sales taxes pursuant to Wisconsin Statutes, Section 77.54(a), the County (not the Contractor) shall be responsible for all Wisconsin Sales or Use Taxes (if any are imposed) on any direct purchases of materials or supplies made by the County.

7.34.2 Proposals shall include all Wisconsin Sales and Use Taxes in effect at the time the proposal is submitted for taxable items which are not purchased directly by the County. Proposers who are uncertain as to what items are subject to tax, or who require further explanation or clarification, are requested to contact the Wisconsin Department of Revenue.

7.35. *Applications for Payment*

Applications for payment may be in the form of the Contractor's standard invoice. The application shall contain the order/contract number, an itemized list of commodities or services furnished, the description of each item occurring in the contract documents, the RFP item number for each item, the delivery point, and the date of shipment. Invoices for any service or commodity not identified in the contract will be disallowed.

7.36. *Payments*

7.36.1 Payments under this contract will be made in the manner provided by law for payments of claims and/or invoices. (Payment of invoices is governed by Wisconsin Statute.)

7.36.2 No payment shall constitute an acceptance of any commodities or services not in accordance with the requirements of the contract.

7.37. *Proposed Payment Schedule*

7.37.1 **First Payment** – Contractor may invoice the County for an amount not to exceed 15% of the value of the contract for Richland County Radio System upon contract execution.

7.37.2 **Detailed Design Review** – Upon acceptance of the system detailed design as provide by the Contractor which includes site recommendation the County shall accept an invoice in the amount of 10% of the project proposed amount thus equating to a total of 25% invoiced to date.

7.37.3 **Factory Acceptance Test** –This test shall constitute a milestone for the project, but it shall not be considered a payment point in the contract.

7.37.4 **Shipment** - Contractor may invoice the County for an amount not to exceed 25% of the value of the contract for Richland County Radio System upon shipment of all equipment. Partial equipment invoice may be accepted only if prior authorization by the County's Project Manager. This equates to 50% of the project invoiced to date.

7.37.5 **Conditional Acceptance** - Contractor may invoice the County for an amount not to exceed 30% of the value of the contract for Richland County Radio System upon attaining Conditional Acceptance. Conditional Acceptance is considered as the time when all systems have been installed and operational. This the total amount invoiced to date will be 80%.

7.37.6 **Final Acceptance** - Contractor may invoice the County for the remaining contract amount having not been previously invoiced per the value of the contract for Richland County Radio System only upon attaining 100% Final Acceptance and cutover to the new radio system.

7.38. *Non-Appropriation of Funds*

Notwithstanding anything contained in this contract to the contrary, no Event of Default shall be deemed to have occurred under this contract if adequate funds are not appropriated during a subsequent fiscal period during the term of this contract to enable the County to meet its obligations hereunder, and at least thirty (30) days written notice of the non-appropriation is given to Contractor.

END OF SECTION

8. *Applicable Standards*

8.1. *General*

8.1.1 All electrical equipment shall be compliant with FCC part 15 Class A and approved under FCC Part 68.

8.1.2 All equipment approved (as applicable) shall meet or exceed the latest standards of the Federal Communications County (FCC), Telecommunications Industry Association (TIA), National Electrical Manufacturers Association (NEMA), Radio-Electronics-Television Manufacturers Association (RETMA), and Institute for Electrical & Electronic Engineers (IEEE), or other agency, when applicable.

8.1.3 All installation of electrical and associated grounding shall meet applicable National Fire Protection Association (NFPA), National Electrical Code (NEC), and Electrical Industries Alliance (EIA) requirements.

8.1.4 All radio products shall conform to FCC, TIA/EIA and other applicable standards.

8.1.5 For AM broadcast tower sites, there are further recommendations made by the National Association of Broadcasters relative to bonding with the use of copper strap to increase surface area and extensive silver soldering for connections.

8.1.6 The equipment racks shall be individually grounded with a minimum of 6AWG Richland wire to the appropriate grounding bus bar within the electronics equipment room.

8.1.7 All other devices will be grounded as per manufacturer's instructions.

8.1.8 A ground halo shall be installed around the equipment room perimeter.

8.1.9 All external connections to the equipment room shall have lightning/transient protection.

8.1.10 A communications tower shall have its own dedicated ground array as per EIA/TIA-222; though, as per NEC Article 810, this ground shall be bonded to the building ground electrode system. It shall be noted that tower manufacturers typically provide a grounding kit with all needed materials to meet the latest EIA/TIA-222 standard which today is "G." G requires a minimum of six 10' ground rods all interconnected with each tower leg having a connection to the ground ring.

8.1.12 Another ground typically overlooked is the need for a ground bar at the external and internal entrance point of the building where transmission cables come into the building from the tower. To accomplish this, the tower design generally requires the tower company to install this ground bar on the outside of the building and the ground bar on the inside is installed by the electrical contractor.

8.1.13 The NFPA 1221 Standard states that all electronic systems in an Emergency Response facility shall be grounded to the building ground system as dictated by NFPA 70, Article 647. To this end, a ground bar is requested in the middle of the dispatch room, generally under the recessed floor and another ground bar in the communications room.

8.1.14 Ultimately, the main ground bar for the building and its ability to have the lowest continuous ground resistance is of utmost importance to the building electrical and communications systems. Due to the defined requirements of the NEC, NFPS, and EIA/TIA, it is highly recommended this master ground bar be located per code in the electrical room though external to and insulated from any other metal cabinets. All other in-building ground bars shall be returned to this ground bar with the code minimum size cable, typically #2 solid wire.

8.1.15 Outside of the building, the NEC standard requires all metallic devices to be bonded together at their ground points, especially the tower, power transformer, doors and HVAC units.

8.1.16 All transmission lines for radio systems used to interconnect antennas and equipment within a shelter or equipment room shall have a ground kit installed as close as possible to the antenna, at the base of the tower and at a minimum of every 75 feet along the length of the installed line. All ground kits shall bond to a ground bar bonded to the tower utilizing a ground clamp rated for the purpose. (Mechanical mounting clamps shall not be used for this purpose.) See also Section 23.5 for specifics related to AM broadcast tower sites.

8.1.17 Each of the various vendors having created their own grounding guidelines that incorporate the requirements and standards of the NFPA, the IEEE and EIA/TIA; thus, the Contractor is expected to adhere to their specific guidelines if more stringent than the above-described and listed.

8.1.18 The Contractor shall provide additional system components typically and reasonably required to make the system operational even though not specifically indicated in Drawings, Appendices, or Specifications, including but not limited to cable, connectors, connecting accessories, adaptors, power supplies, mounting adapters, cover plates and closure panels, relays and switches, terminal blocks, grounding hardware, and related connector and termination hardware required by but not supplied with the equipment.

8.2. *National Electric Code (NEC)*

8.2.1 Article 250 focuses on the general building/ facility grounding, while Article 810 describes specific requirements related to radio and television equipment.

8.2.2 Article 250 states that all ground electrodes shall be bonded together to form the "grounding electrode system." This Article goes into detail as to how this system shall be accomplished by referring to multiple areas of the code. Generally, the ground described in this article is used to form the basic ground for the structure though if the copper water line entering the building is within 5' as described, then this is an alternative solution for a building structure ground.

8.2.3 Article 250 further describes the size and type of conductors to be used and describes minimum resistance of electrodes.

8.2.4 Article 250-92 has an extensive description of the means of installing the grounding conductors. Minimum size of conductors is described though #6 copper is listed as the smallest conductor for inter electrode connections. The use of #2 is recommended by the EIA and is most commonly found in commercial buildings.

8.2.5 Article 250.5 and 250.6 discuss how a low impedance conductive path carrying maximum ground fault current should be in place between the electrical supply and site ground thus stopping objectionable currents.

8.2.6 Article 250.5(B) in the last sentence clearly states the earth shall not be considered as an effective fault-current path to meet this requirement which should be taken to mean a metallic bonding conductor of enough size shall be utilized.

8.2.7 Article 250-115 says how ground conductors shall be connected to ground electrodes especially as related to underground connections, while Article 250-117 describes how the connection is to be protected against physical damage.

8.2.8 Article 250-155 discusses the need for all noncurrent-carrying metal parts of fixed, portable, and mobile equipment … shall be grounded with no less than a #6 copper or #4 aluminum cable.

8.2.9 Article 800 provides guidance for the grounding of communications circuits with specific guidance for the cable entrance points and further stated in Article 810 that masts and metal structures supporting antennas shall be grounded.

8.2.10 Article 810 defines a means of grounding the tower/antenna system.

8.2.11 Article 250-8 states all ground electrodes shall be bonded together to form the "grounding electrode system."

8.2.12 Article 800-40 states how cables entering a building shall be grounded which equates to the placement of a ground bar at the inside of the entrance panel and per NEC Article 250-81 this point must be bonded to the building ground.

8.3. *National Fire Protection Association (NFPA) 1221*

8.3.1 Chapter 5.8 is the grounding section for Emergency Response Facilities which references the need to follow NFPA 70, Article 647 for all sensitive electronic equipment. This is the reason the electronic equipment in dispatch and the equipment room must be connected to the bonded grounding bar in these two spaces.

8.3.2 Further, Chapter 6 (6.6) requires all communications conductors to be installed in accordance with NFPA 70 Section 5.6 and 4.9. It shall be noted that NFPA 70 is the National Electric Code, 2005 Edition which is referenced above.

8.4. *EIA/TIA and IEEE Emerald (grounding) Standard*

8.4.1 Electronic Industries Association / Telecommunications Industry Association (EIA/TIA) Standards for communications towers. This group has established a set of mechanical standards for steel communications towers that includes grounding. The EIA/TIA-222F standard was the standard in place at the time the tower was specified, though 222G is now highly recommended.

8.4.2 The EIA suggests the minimum ground for a tower is three (one per leg) #2 solid wires to a buried ground ring with multiple 10' ground rods where the top of the rod is below the frost line.

8.4.3 The IEEE standard requires all transmission cables leaving the tower to be grounded to the tower (which will be completed by the Contractor) and for these cables to be ground bonded as they enter the building on the exterior plus again just inside the building where the surge suppressors are placed. To enable this ground, a ground bar is being requested on the outside of the building immediately below the entrance panel and another on the inside adjacent to the surge suppressors. An option on the inside would be a copper trapeze mechanically and electrically capable of holding the surge suppressors.

8.4.4 Per the IEEE, all ground bars shall have the two #2 solid ground bond connections to the external ground ring of the shelter or building.

8.5. *National Association of Broadcasters*

8.5.1 When ground bonds are established for AM broadcast sites, the use of wide copper strap shall parallel all #2 solid ground cables interconnecting ground bars and all external ground rings.

8.5.2 All tower ground bonds to external ground rings shall use wide copper straps to ensure a large surface area to enable the dissipation of RF energy at lower frequencies.

8.5.3 All transmission lines on towers shall be bonded to tower at no less than every 1/10th of a wavelength of the lowest AM broadcast frequency.

8.5.4 If possible, it is highly recommended the equipment shelter walls be built with metallic screening which can then be bonded to the master ground of the site.

8.6. *Labeling and Installation Practices*

8.6.1 All network, data and audio cables and RF transmission lines are to be labeled at each end.

8.6.2 Separation and segregation of cables carrying various types of signals shall be considered when determining pathways and physical separation.

8.6.3 Network, data and audio cables will be secured with Velcro® or equivalent straps and installed in a professional manner using best practices.

8.6.4 RF Transmission lines will be secured per manufacturer's recommendations.

8.6.5 The use of nylon cables ties will not be accepted on any cabling except indoors for transmission lines and heavy-duty ground and power cables.

END OF SECTION

9. Existing Conditions

Proposer should have a basic understanding of the existing communication system operations of Richland County to help assure a successful project. There is an expectation by the County that the new systems will not only be an improvement in technology but address the specific needs of the users of the system to implement practices that will help deliver more effective services to the County.

9.1. *Service Area Description*

9.1.1 The area of Richland County is about 589 square miles and has a population of approximately 18,000.

9.1.2 Cities and Villages include the County seat of Richland Center, Lone Rock, Cazenovia, Rock Bridge, Ithaca, Boaz, Gotham, Sextonville, Yuba, Orion, Marshall, Sylvan. See Figure 1 below.

9.1.3 The major highways consist of Wisconsin State Highway 14, 80, and 56. See https://wisconsindot.gov/Documents/travel/road/hwy-maps/county-maps/richland.pdf.

9.1.4 Population density can be found in the City of Richland Center located in the central part of the County having approximately 5000 residents. No other communities reach these types of population base within the county.

9.1.5 The terrain of Richland County is best described as having river valleys throughout that run north and south. These valleys flow to the southern border of the County where the Wisconsin River flows to the west and defines the border.

9.1.6 Richland County is bordered by Wisconsin Counties on all sides with Grant & Iowa County to the south, Sauk County to the east, and Crawford County to the west. Vernon County wraps around the northwest side and shares some of that north border with Sauk County.

9.1.7 Service area challenges today would be described as the following:

9.1.7.1 The southern border of the County is made up by the Wisconsin river and the terrain is very low.

9.1.7.2 Challenging border communities having service providers that cover other counties such as Viola and Cazenovia.

9.1.7.3 The southeastern area of the county has no site support.

9.1.7.4 Portable radio coverage levels.

Figure 1 - Richland County Boundary

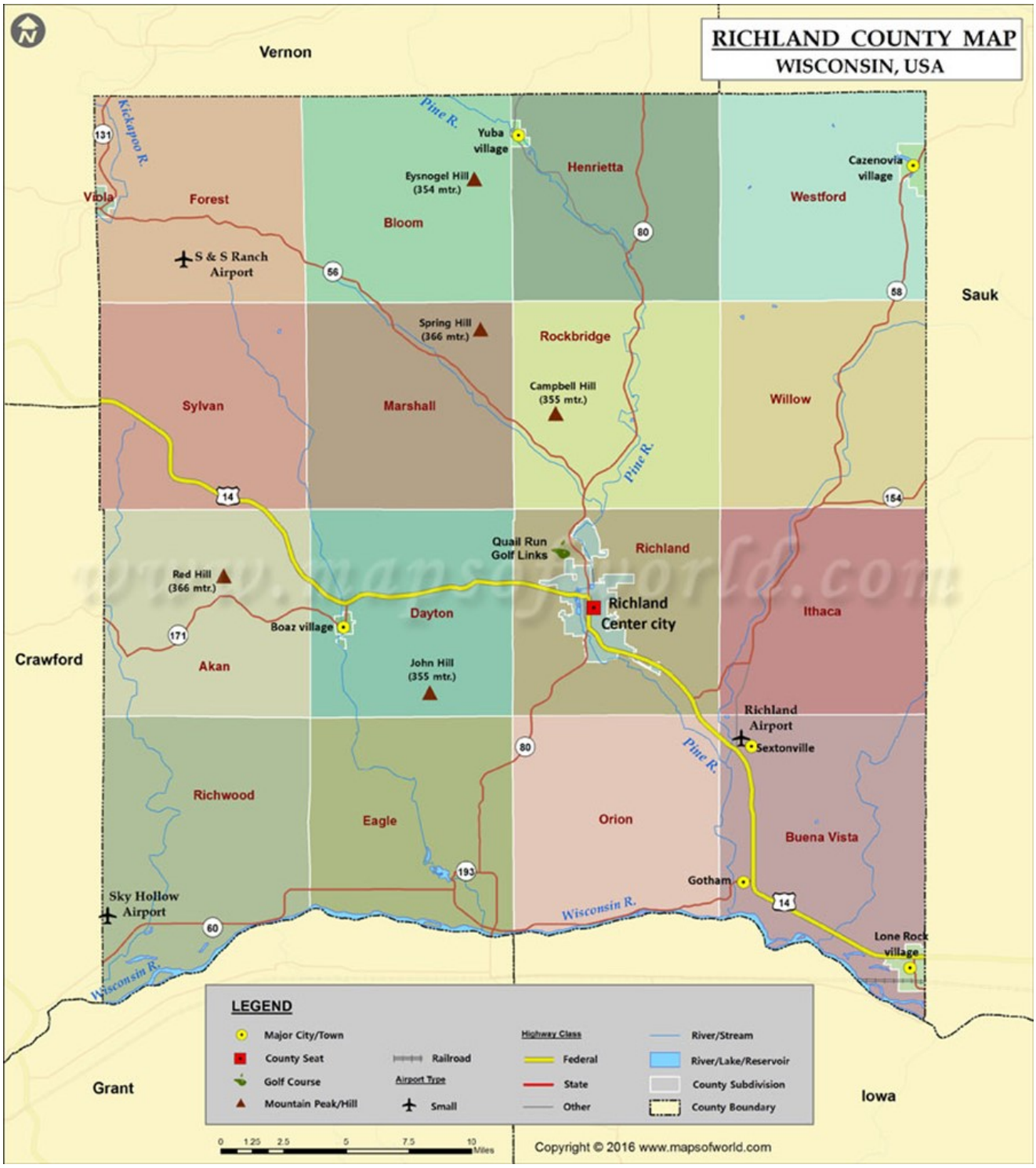
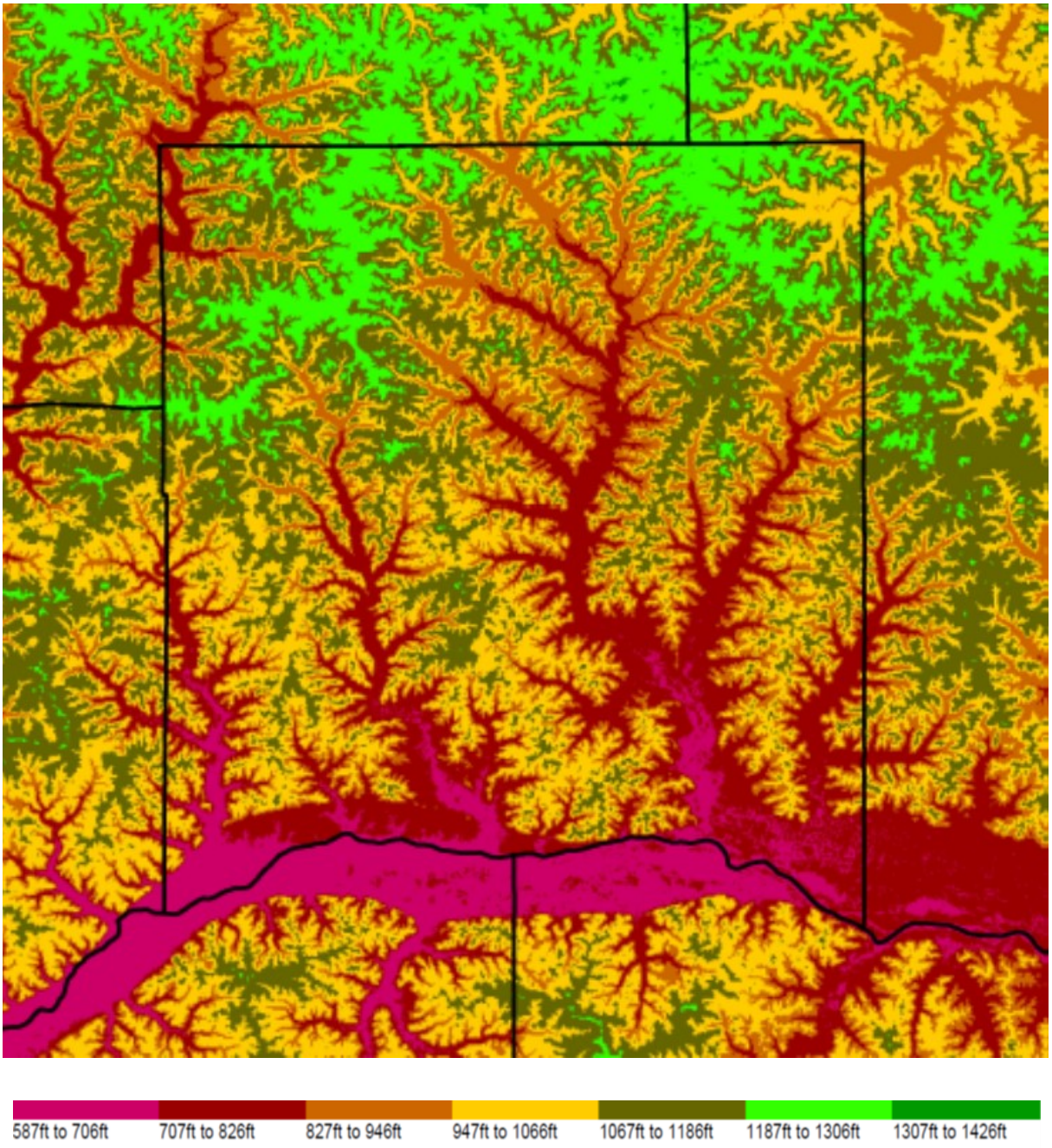


Figure 2 - Topographical Map of Richland County



9.2. *Detailed Site/System Descriptions*

9.2.1 Voice Radio Systems

9.2.1.1 Richland County radio systems support Law, Fire/EMS and Highway service agencies providing services in and outside the county borders. Most of the radio operations take place on dedicated standalone repeaters sharing identical frequency resources which provide area coverage to that portion of the County. The system design has been in use for some 10-plus years by the County and was greatly impacted by the FCC's 2013 narrowband process.

9.2.1.2 The County radio systems currently operate only in the VHF radio frequency band.

9.2.1.3 The County operates from five (5) various site locations.

9.2.1.4 The Sheriff channel provides the dispatch and tactical operations for law enforcement agencies from all five (5) site locations using repeaters transmitting a common squelch code and receiving a unique squelch code.

9.2.1.5 The Fire channel provides the dispatch and tactical operations for fire agencies from four (4) site locations using repeaters transmitting a common squelch code and receiving a unique squelch code.

9.2.1.6 The Highway channel provides operations for public works from a single site located near Richland Center.

9.2.2 Radio Mutual Aid Systems

9.2.2.1 Richland County operates multiple mutual aid and backup radio equipment systems from local sites near Richland Center and the County courthouse roof.

9.2.2.2 Channels include IFERN, MARC, Point to Point, and VMED28 channels.

9.2.2.3 Multi-frequency transmitters and secondary receivers are used to provide antenna efficiency.

9.2.2.4 All radio equipment at the courthouse is in the penthouse equipment room with antennas spread out on the roof of the building.

9.2.3 VHF Paging

9.2.3.1 Richland County operates VHF radio paging services for alerting first responders using a dedicated frequency on the Paging channel.

9.2.3.2 The Paging channel is operated from the Richland Center USCC tower site to provide coverage for the County.

9.2.3.3 A paging repeat device is operated in Lone Rock to capture the main transmitter output and rebroadcast it on a secondary frequency.

9.2.3.4 Standard two-tone paging operations takes place from the radio console systems in the E-911 dispatch center.

9.2.3.5 Paging alert activation is provided with single button activation.

9.2.3.6 Paging alert activation is used to service the Fire, EMS, and Emergency Management agencies in Richland County with operation of approximately 300 pager devices on the system.

9.2.4 Siren System

9.2.4.1 Richland County operates VHF radio activation service for controlling early warning sirens via the Paging channel. Encoding of two-tone and DTMF schemes is provided by the radio dispatch console system to activate sirens as needed.

9.2.4.2 Emergency Communications Center

9.2.4.3 The Richland County dispatch center is located at 181 West Seminary Street in the City of Richland Center in the courthouse building. The center today has two (2) Motorola Centracom Gold Elite dispatch radio consoles in place. These consoles are an IP based computer console system with dedicated backroom electronics racks.

9.2.5 ECC Building Equipment Rooms

Main console electronics are located in the building equipment room located a floor below the dispatch center. They control radio equipment located in the penthouse building room and up at the ECC tower site.

9.2.6 Richland ECC Tower Site

9.2.6.1 The main antenna tower site for Richland County is located within the city of Richland Center at the top of what is referred to as tower hill. The self-supporting 320' structure is a United States Cellular site that is FCC registered (ASR #1000186) location. The high bluff is at the east side of town. Station equipment at this site is operated via wireline control.

9.2.7 Additional Tower Sites

9.2.7.1 Richland County also operates radio system equipment on seven (7) additional sites throughout the county. Sites consist of leased tower structures and water tank locations. With equipment sharing owner building space or occupying space in the water tank structure. Main public safety repeater equipment is cabinet housed using direct antenna support via a duplexer unit and powered from any available wall outlet. Also grounded to the available bus bar at each location.

9.2.8 Logging Recorder Systems

9.2.8.1 Currently, the center is operating a Higher Ground model unit that is viable and supported by the County's vendor. This system supports both the radio system channels and telephone (911) lines for the County dispatch.

9.2.9 Grounding Systems

9.2.9.1 Grounding systems located on existing radio equipment and at various sites do not meet current manufacturer or standards organizational guidelines. Grounding practices amount to cabinet point grounding or transmitter technics connected to common bus or attached to single grounding rod.

END OF SECTION

10. Proposal Expectations

10.1. *Requested Proposal Design System and subsystems*

10.1.1 The intent of this document is to provide information to allow qualified Proposers to provide proposals for the following systems and elements:

a. Standalone County-Wide Simulcast VHF Conventional Land Mobile Radio System

b. Associated backhaul network via microwave/fiber to support radio system

c. DC power plant to support all site power operations

d. Alarm monitoring and alert notification of system equipment and civil components

e. Land mobile radio system equipment to support Richland County's interoperability communication needs

f. Alerting and paging notification systems for emergency responder call notifications

g. Dispatch Console systems

h. Subscriber terminal equipment, tactical solutions, and accessories

i. Spare parts

j. Installation, optimization, and verification of all systems

k. Sites and tower structures development support

l. Public Safety system implementation support

m. Verification and documentation support

n. A minimum of full one year 100% warranty coverage

o. Equipment updates/upgrades for the system infrastructure through year ten

p. Software updates/upgrades for all the system infrastructure and terminal units through year ten

q. Nine (9) years of extended maintenance and support for offered system after the one-year 100% warranty period has ended

10.2. *Requested Proposal Design Alternates/Options*

10.2.1 Alternate requests are provided for vendors to consider providing that the County may consider in the evaluation process to be included or substituted.

10.2.2 No alternate proposal may be provided by any proposer without first including a response to the main request of the RFP.

10.2.3 The following Alternates and options are being requested with their associated costs if, during negotiations, they are found to be desired:

10.2.3.1 Main voice channel implementation may be warranted to provide a migration path for subscriber radios. This alternate would provide analog channel operation at initial implementation. In proposing this alternate the County would need to understand coverage impact and P25 upgrade ramifications.

10.2.3.2 Reducing coverage requirement of the County's identified border to under the 95% public safety standard may be warranted to realize a significant site savings cost. In proposing the alternate the County would need to maintain community coverage standards and high population areas. Proposing this alternative should come with a separate Price Matrix sheet and technical detail.

10.3. *System Design Services*

The intent of the outcome of the acquisition requested in this proposal would be for system designed services to meet the following minimal requirements:

10.3.1 A complete and operational radio system to offer a wireless voice communications system to public safety and other government users that meets the coverage and capacity requirements for such use.

10.3.2 A complete and operational alerting infrastructure system to provide dispatch services to first responders that meet the coverage requirements for such use.

10.3.3 Integrated PSAP dispatch radio consoles systems that provide end-user responder dispatching capability and control of the systems.

10.3.4 A complete and operational telecommunication backhaul network to provide the necessary capacity to interconnect fixed infrastructure components of the radio system.

10.3.5 A complete and operational network providing wide area connectivity of all sites, controllers, servers, and dispatch supporting both microwave and fiber optic transmission.

10.3.6 A complete and operational management, monitoring and alarm sub-network capable of alerting dispatcher and support personnel to problems associated with all subsystems and site physical out of tolerance issues.

10.3.7 System interfaces to existing logging system using the highest technical degree of capabilities to record system talk groups.

10.3.8 Subscriber radio equipment setup providing appropriate capabilities and features meeting all user needs.

10.3.9 All system design, configuration, implementation, and verification of necessary systems to provide a complete turnkey solution option.

10.3.10 Designed support services needed to assure continued performance and future updates to the system.

10.3.11 The frequencies proposed for the new system and the band of operation (VHF) shall be suggested in the proposal with completed rationale and any issues related to licensing believed to exist.

10.3.12 A planned migration process that accounts for how agencies might be affected in operation capabilities, and thus described in the proposal.

10.3.13 A complete and operational interoperability and mutual aid communication systems designed to provide maximum capabilities in the proposed radio and console systems.

10.4. ***Coverage Design Standards***

10.4.1 Proposers shall design their systems utilizing optimized site locations to support the coverage requirements, thus providing for a balanced talk-out and talk-back performance using portable radios on-the-hip.

10.4.2 Portable coverage is to be met using a portable radio transmitting and receiving directly to the P25 system repeater infrastructure. No portable or vehicular repeater system is to be used to demonstrate portable coverage performance.

10.4.3 The Successful Contractor shall use the latest TSB-881 testing methodology to provide an automated test of the entire coverage area.

10.4.4 A general test plan providing the testing criteria used shall be provided with the Contractor's proposal.

10.4.5 The details to be included in the test shall include the minimum number of tiles the test will need to be statistically significant for the area of Richland County.

10.4.6 The following expectations of operational coverage on system designs shall be understood.

a. The system is expected to provide understood public safety system design coverages of 95% reliability and 95% coverage guarantees.

b. Mobile radio coverage expectations should be understood as a radio using a ¼ wave antenna operating in a simulcast network.

c. Portable radio coverage expectations should be understood as a radio on-the-hip coverage with a ¼ wave antenna.

d. Portable radio coverage expectations should be understood as a radio operating with a remote speaker microphone without a speaker microphone antenna.

e. Commercial in-building coverage defined areas should be understood to be 15 dB greater than outdoor coverage.

f. Residential in-building coverage defined areas should be understood to be 8 dB greater than outdoor coverage.

10.5. *System Platform End of Life*

10.5.1 Vendors shall not propose a system platform (any elements thereof) for which an “end of life” has been announced.

10.5.2 Vendors shall include the anticipated “end of life” date of the platform proposed.

10.5.3 The proposal shall state the platform proposed and the major components of the platform shall be supported for a minimum of seven (7) years following manufacturing cessation.

10.6. *Redundancy and Reliability*

10.6.1 Designs shall be created to ensure a high degree of redundancy and reliability and not designed to capacity limits of equipment.

10.6.2 Redundant backup controllers (trunked system and simulcast) are anticipated, and it is desired they not to be co-located with a main controller.

10.6.3 The radio system and microwave system shall be designed with the highest levels of reliability, including all links, fiber, and microwave.

10.6.4 Redundancy of critical components shall be included in the system design, including the connectivity between all major site/system components.

10.6.5 An explanation of design features that provide system reliability shall be provided.

10.6.6 The Proposer shall submit a list of suggested failure scenarios and categorize them as major, minor, or very minor.

10.6.7 Categorization of items on this list will be a subject of negotiation with the Selected Contractor during contract negotiation.

10.6.8 The Proposer shall also provide an explanation of how the system would be designed to operate and what the impact would be, under commonly anticipated failures to include:

a. The loss of a channel or multiple channels.

b. The loss of a site or the loss of site connectivity.

c. The loss of console connectivity.

d. The loss of the primary radio system controllers; and

e. The loss of the main control point.

10.6.9 System performance monitoring systems shall be explained to include standard alarming and system administration capabilities being proposed. Site monitoring capabilities are a desirable component of this system.

10.7. *Site Power Sources*

10.7.1 Any power source improvements required/recommended by Proposer's as related to commercial power will be accomplished by County via a separate contract.

10.7.2 Equipment power sources shall be standardized to a common battery system operation.

10.7.2.1 System equipment shall be proposed capable of operating on the common battery system operation.

10.7.2.2 System equipment proposed not capable of running on the common battery system operation shall be identified.

10.7.2.3 System equipment proposed not capable of running directly from the common battery system shall first be designed to operate using converting and inverting devices running on the common battery system.

10.7.2.4 System equipment proposed not capable of running directly from converting and inverting devices shall only be proposed as a last resort and will be required to be backed up by efficient separate power source designs.

10.7.3 Generator back-up to commercial power shall be primary choice utilized at any system site.

10.7.4 Upon the loss of commercial power, the generator will automatically start and, after the output has stabilized, a transfer switch will change the equipment to generator power.

10.7.5 The generator will be able to provide full power at 100% duty for all equipment and recharge the site batteries. Upon the return of stable commercial power, the equipment will be returned to commercial power and normal operation.

10.7.6 For sites not designed for battery system operation and being existing with UPS power and generator operation such as the 911 Communications Center no backup sources shall be proposed.

10.7.7 For sites not designed for battery system operation and not existing UPS power shall be provided with the following considerations.

10.7.7.1 The N+1 requirement for AC to DC power and any critical systems that could ultimately be a single source of failure must be protected in this manner.

10.7.7.2 No critical subsystem components with two AC power supplies shall be powered by a single circuit breaker.

10.7.7.3 All AC power distribution in equipment racks shall be surge protected at the load center and the rack.

10.8. *Tower Site Pre-Selection Process by Contractor*

10.8.1 Site selection/location shall be the responsibility of the Contractor to determine during the design process with the expectation of using the lowest cost sites possible including: 1) County owned, 2) leased from commercial tower owners or 3) new build construction, i.e., "Greenfield."

10.8.2 The County expects Contractor to have investigated the use of currently constructed towers site locations, such as buildings, water towers and other structures that may be usable as sites, as part of their design efforts.

10.8.3 Respondent shall have made a physical site visit to each proposed repeater site to determine if at the time the RFP response is prepared that the towers offered seem to be able to accommodate the proposed antenna systems at the detailed levels designed in the system.

10.8.4 New ("Greenfield") sites will be considered and allowed to be proposed as part of a design but must be shown as necessary and justified with an appropriate explanation provided in the proposal. This includes all recommended sites.

10.8.5 If a new "Greenfield" site is proposed or if the tower at a current site does not meet the structural requirements to handle the antennas required for operation, the new tower or existing tower upgrade will be required to be designed to meet EIA/TIA-222-G standards (Structure Classification – II or III, Exposure Category – C and Topographic Category – TBD dependent on location.

10.8.6 The County provides the following list of existing structure/towers that may provide beneficial use to the County if shown to fit in proposer design. The County makes no claims or requirements to the use of these structures in any system design.

Site Name	Type	Height	ASR #	Address	Latitude	Longitude	Detail
Bunker Hill Site	Guyed Tower	150'		30638 HWY I Bunker Hill	43-29-33.9 N	90-15-34.5 W	Shared Shelter & tower lease
Cazenovia Site	Rooftop	10'		N Main Street	43-31-21.9 N	91-11-31.5 W	
Dispatch Center Site	Rooftop	50'		181 W Seminary Street	43-20-2.63 N	90-23-10.78 W	
Eagle Tower Site	Self Support Tower	245"	1241130	36 Hipenbecker Road	43-09-36.9 N	90-25-47.6 W	Existing Shelter & tower lease
Lone Rock Site	Water Tower	110'			43-10-50-41 N	90-11-58.23 W	
Richland Center Fire Station	Rooftop	25'		205 East Mill Street	43-20-09.9 N	90-23-01.5 W	
Richland Center Police Station	Rooftop	25'		470 S. Main Street	43-19-56.0 N	90-23-13.0 W	
Sylvan Site	Guyed Tower	180'		HWY E 1.6 KM E	43-25-27.9 N	90-36-30.5 W	Shared Shelter & tower lease
Tower Hill - USCC Site	Self Support Tower	320'	1000186	200 Tower Hill Road	43-20-14.9 N	90-22-42.5 W	Shared Shelter & tower lease
Tower Hill Site	Guyed Tower	75'		Roosevelt Drive on Adj Hill	43-20-14.9 N	90-22-41.5 W	
WRCO Site	Guyed Tower	350'	1257097	Hillview Drive between Premo Rd & County, 2.4 MI SW of	43-18-55.4 N	90-25-35.0 W	Shared Shelter & tower lease

10.8.7 A list of Richland County towers downloaded from the FCC Antenna Structure Registration (ASR) database is included in the Appendix.

10.8.8 More tower sites may be available in adjacent counties or within Richland County as some towers may not be registered with the FCC.

10.8.9 Every effort shall be made by the Contractor to reduce the ongoing cost to the County for site leases which means to:

a. Attempt to combine antenna locations to reduce the vertical footprint on the tower which is how most tower companies calculate lease cost.

b. Attempt to reduce the number of antennas on a tower by use of combining networks thus also reducing the footprint on the tower.

c. Attempt to use the smallest microwave antennas thus possibly higher power radios making for a lower physical load on the tower.

d. Attempt to provide technical products providing services that minimize systems having ongoing costs.

10.9. *Required Spare Parts*

10.9.1 Proposer shall detail what anticipated cache of spare parts would be recommended to support all aspects of the proposed systems throughout the life of the system. Recommendations should be made to identify the importance of system operation of each item.

10.9.2 As the system is expected to be designed and implemented with full redundancy of the system controller and voting system with dual networks, this design shall be considered when determining the list of spares recommended.

10.10. ***FCC Licensing***

10.10.1 Once site acquisition/leasing is complete, the successful radio system contractor shall provide all design information and assist Richland County to complete any necessary documentation to permit use of the sites and any frequencies that will be used in the system design.

10.10.2 The successful radio system contractor shall be responsible for the preparation of all applications. This responsibility includes but is not limited to any FCC and FAA application preparation, tower studies, coordination, or any other requirement to finalize all required authorizations on behalf of Richland County.

10.10.3 FCC coordination fees associated with the above will be Richland County's responsibility.

10.10.4 The successful radio system contractor will be responsible to provide Richland County's Contract Manager and Richland County's Advocate with the construction completion dates for all frequency/location combinations per the system design for purposes of FCC notification.

10.11. ***Materials and Services***

10.11.1 The complete system including but not limited to the radio communications systems, supporting network, alarm system, and microwave portion of the project shall be offered as a "turn-key" Proposal.

10.11.2 All materials and products provided shall be new and unused, with full manufacturer's warranties.

10.11.3 Materials and products shall be based on the functional and performance requirements in this document.

10.11.4 Proposer shall provide additional system components typically and reasonably required to make the system operational even though not specifically indicated.

10.11.5 Proposer is assumed to have a clear understanding of the project if a Proposal is submitted.

10.11.6 Any civil portions of the project will be completed by other contractor(s) retained by County. Proposers shall provide coordination and assistance to other contractor(s), consulting engineer, and County throughout the construction process. All civil improvements shall be bid, under a separate contract in accordance with Wisconsin public work regulations unless Richland County accepts a proposal that does not require compliance with Wisconsin public work bidding laws.

10.12. ***Quality Standards***

10.12.1 All commodities and work shall be of good quality, free from faults and defects, and in conformance with the contract documents. All commodities and work not conforming to these requirements may be considered defective. If required by Richland County, the Contractor shall furnish satisfactory evidence as to the kind and quality of commodities and work.

10.12.2 Commodities shall be subject to inspection by Richland County within a reasonable time after delivery to Richland County. Defective commodities may be returned to the Contractor at the Contractor's expense.

10.12.3 Commodities must be compatible with the equipment and/or system in the environment in which it will be utilized.

10.12.4 If a commodity not in current manufacture is specified for Richland County, the successful radio system contractor warrants that such commodity shall be given the warranty that accompanied the commodity when it was in current manufacture.

10.12.5 The successful radio system contractor further warrants that with respect to such commodity, that successful radio system contractor, for at least five years (or such other period of time as may be specified by Richland County from the date of the contract, shall keep and maintain a sufficient supply of parts, supplies, accessories, and all other items reasonably necessary to ensure the high reliability and efficient operation of the commodity.

10.12.6 The successful radio system contractor further warrants that in the event the necessary parts, etc., are not available to maintain the commodity, it shall, at no cost to Richland County, promptly replace the commodity with one that is in compliance with the contract documents and is successful radio system contractor's then current version.

10.13. ***Submittals***

10.13.1 No portion of the work requiring the submission of a shop drawing, manufacturer's literature, test data, or other information or a sample shall commence until the submittal has been approved by Richland County.

10.14. ***Material Data Safety Sheets***

10.14.1 If so, requested by the Contract Manager, or if so, stated elsewhere in the specifications, the successful radio system contractor may be required to submit to Richland County a completed Material Data Safety Sheet (or other acceptable data) for each item proposed. Failure to submit this form upon request may result in rejection of the Proposal.

10.15. ***System Software***

10.15.1 Richland County shall have the right to possess at least two (2) copies of any system or equipment level software for backup and archival purposes. Richland County may transfer the software within their respective business operation. Richland County reserves the right to require a software escrow agreement with the successful radio system contractor to protect the county in the event the contractor would cease business operations.

10.15.2 The successful radio system contractor agrees to provide to Richland County, at no cost, prior to and during installation and implementation, any software enhancements, upgrades, replacements, and/or new versions of equipment software.

10.15.3 Throughout the warranty period and as long as successful radio system contractor is providing extended maintenance, successful radio system contractor shall notify Richland County) of the availability of enhancements, upgrades, replacements, and newer versions of the software and, within thirty (30) days, supply Richland County with the enhancements, upgrades, replacements, and new version. The enhancements, upgrades, replacements, and new version will be provided to Richland County without charge during the extended maintenance period. The successful radio system contractor will provide free updated documentation in the form of new revision manuals or changed pages to current manuals consistent with the original documentation supplied and reflecting the changes included in the software. The successful radio system contractor shall provide bug status reports specifying all known, outstanding bugs in the new software versions. The information shall be updated periodically as new information and workarounds become known. The successful radio

system contractor shall also provide free installation as part of the warranty and maintenance program, procedures, and any installation program required by the installation.

10.15.4 If a software reauthorization code must be keyed in for the licensed software to remain functional upon movement to another computer system, successful radio system contractor shall provide the reauthorization code to Richland County within one (1) business day after receipt of County's notice of its machine upgrade or movement.

10.16. ***100% Warranty of Complete Supplied System***

10.16.1 The successful radio system contractor shall provide a 100% warranty coverage of the system equipment, including all supplied electronics and subscriber terminal warranty that shall start at the date of system acceptance and extend to at least one (1) year after the date of project acceptance by Richland County.

10.16.2 The one year 100% warranty offered will not begin until the system is fully complete and 100% operational and accepted by Richland County with the understanding the "system" is the complete operating chain from user interface of the radio terminal to the user interface of the radio terminal and dispatch console operator.

10.16.3 The warranty offered by the successful radio system contractor shall be in addition to any manufacturer's standard warranty that may apply, or any warranty provided by law.

10.16.4 All labor and travel associated with troubleshooting and replacement of parts/components, any system re-tuning or alignment as a result of replacing those parts, spare parts and modules, and all recommended preventative maintenance activities shall be provided without cost to Richland County during the warranty period.

10.16.5 A warranty start date for all end-user equipment will be agreed upon for ease of administration.

10.16.6 In the case of a warranty service request by the Contract Manager, the service technician must arrive on-site within two (2) hours from the time the call was placed to begin diagnosis of the reported problem.

10.16.7 Successful radio system contractor must provide one toll-free telephone number to call for all hardware and software maintenance/support problems.

10.16.8 During the warranty period, the successful radio system contractor shall provide and install any firmware or software upgrades offered by the manufacturer of the radio subsystem, microwave subsystem, call logging subsystem, and alarm subsystem at no additional cost to Richland County.

10.17. *Training*

10.17.1 Training session plans and documentation shall be provided to Richland County thirty (30) days prior to any scheduled classes and must be approved by the County before any training sessions are conducted.

10.17.2 The County will be permitted to record any training classes.

10.17.3 All training sessions need to be formally scheduled and approved by the County.

10.17.4 Technical training on the system sufficient to allow individuals to have a high-level understanding of the workings of the system and for them to offer end users the first call for assistance is not required, but may be proposed as optional.

10.17.5 Dispatcher training shall be structured to provide individual user classes with operation of the console equipment active on the system or simulating operation. Classes should be proposed on a per class basis with number of participants supported and class length identified.

10.17.6 A Train-the-trainer program shall be developed and delivered for subscriber equipment operators. Separate class structures will be developed based on equipment operator's work environment that may include Police, Fire/EMS, and Public Works. Classes should be proposed on a per class basis with number of participants supported and class length identified.

10.18. *Extended Maintenance Support*

10.18.1 The system is expected to be technically supported by a local technical support company who will be required to offer the second level of reactive and first level of proactive support for the system. This local technical support company shall have manufacturer-certified technical personnel housed within no more than a two-hour drive from the Richland County Sheriff's Office who can deliver the support.

10.18.2 The expected support must include 24 hours per day, seven days per week, three hundred 365/366 days per year (24x7x365) monitoring and local response to reported failures.

10.18.3 An agreement is expected to be reached for this extended level of support for normal operational support and services during the entire life of the project by Richland County.

10.18.4 There is the expectation by Richland County that a local technical support company will be identified, and various recommended system updating, and maintenance options be presented for consideration.

10.18.5 The extended maintenance plan as offered to the project shall recognize that the communications division commander and supervisors may be able to provide a limited degree of technical support in cooperation with the local technical support company in the resolution of high-level problems.

10.18.6 The local staff assigned this responsibility will also attend the training offered by the successful radio system contractor to enable them to offer this high level of support.

10.18.7 At Richland County's option, the successful radio system contractor shall provide extended maintenance, additional support, and enhancements relating to all hardware and software, thus inclusive of the radio system, the network system, microwave system, alarm system, and DC power plant system.

10.18.8 Extended Maintenance is defined as providing all required routine and emergency services, labor, and travel necessary to keep the radio and microwave system not only operating but operating in like-new condition.

10.18.9 System Updates are defined as providing a minimum of every other manufacturer's offered software and/or firmware update, including any required hardware changes to maintain the proposed system with the latest features.

10.18.10 Payments during and for said support and maintenance period shall be due and payable on an annual basis at the beginning of the year support is provided.

10.18.11 Proposers shall include costs covering the first ten (10) years of system and equipment ownership beginning with the end of 100% warranty period, thus effectively Year 2 through Year 10, which may be extended beyond the period under agreement of successful radio system contractor and County.

10.18.12 During the extended maintenance term, successful radio system contractor shall supply and install all updates, enhancements, improvements, or modifications to the equipment (hardware, firmware, and software) at no additional charge to Richland County beyond what is proposed in the extended maintenance support offering.

10.18.13 During the extended maintenance term, the successful radio system contractor shall correct or replace the equipment or provide the services necessary to remedy any programming error, malfunction, or other problems relating to the hardware, software, firmware, documentation, etc. Calls reporting problems will always be made to the successful radio system contractor. When successful radio system contractor or local technical support company return calls are made either to gather more data or to prescribe corrective actions, the first such return call shall arrive from a person trained and qualified to diagnose and resolve the general type of difficulty reported within two (2) hours of the report of trouble, not counting hours outside the maintenance hours herein set forth. In any event, successful radio system contractor's initial response to remedy errors, malfunctions, or problems, whether identified by Richland County or another system user shall not exceed two (2) hours.

10.18.14 Successful radio system contractor, when attempting to resolve a problem of substantial difficulty or magnitude, shall use its best efforts to proceed with diligence and good faith to affect a remedy in a timely and efficient manner.

10.18.15 Successful radio system contractor shall dispatch a service technician to Richland County upon request by the Contract Manager. The service technician must arrive on-site within two (2) hours from the time the call was placed by the Contract Manager. The service technician dispatched must be trained and certified on the installed systems.

10.18.16 In the case of an emergency service request by the Contract Manager, the service technician must arrive on-site within two (2) hours from the time the call was placed to begin diagnosis of the reported problem. Emergency service is defined as a major system failure where a piece of equipment has failed, causing Richland County to be forced to operate on its back up channels or when more than half of its dispatching consoles fail. A loss of a single channel, talkgroup, or a single dispatch console does not constitute an emergency service request unless it is the paging channel or subsystem.

10.18.18 Successful radio system contractor must have duplicates of all Richland County's software and documentation locally available. This shall be delivered and on-site within four (4) hours of request by the Contract Manager or if required by the dispatched service technician.

10.18.19 In the case of an emergency service request, the above system software and documentation shall be delivered and on-site within two (2) hours of request by the Contract Manager or if required by the dispatched service technician.

10.18.20 Successful radio system contractor shall attach a schedule of the activities necessary for the proper functioning of their equipment (a recommended maintenance schedule), the titles and frequencies of any reports that Richland County will be expected to produce for the successful radio system contractor, and the types and probable extent of the activities with which Richland County will be expected to assist the successful radio system contractor in remedial maintenance efforts.

10.18.21 Successful radio system contractor shall in good faith support and resolve problems with connectivity to the equipment in accordance with the maintenance and support provisions of this document. If successful radio system contractor determines the problem lies with other manufacturers' equipment, then the Contractor shall work cooperatively with Richland County and such other manufacturers to identify and resolve the problem.

10.18.22 Successful radio system contractor must provide Richland County with new versions of the standard equipment at then-current rates, upon request, and when made generally available.

10.18.23 Successful radio system contractor must provide a complete description of its routine and preventive maintenance schedule.

10.18.24 Preventive maintenance shall be scheduled as frequently as is recommended by the manufacturers of the equipment's various components though no less than once per year.

10.18.25 Richland County will schedule preventive maintenance with the successful radio system contractor and any local technical support companies involved.

10.18.26 In no case will preventive maintenance be scheduled to put any aspect of the system out of operation without Richland County's prior approval.

10.18.27 Successful radio system contractor must provide support on all hardware and software components 24 hours per day, seven days a week, and as such, shall have multiple layers of backup personnel trained to provide this level of service.

10.18.28 Successful radio system contractor must provide one toll-free telephone number to call for all hardware and software maintenance/support problems.

10.18.29 For security purposes, the system shall be password access protected. In addition, any modems attached to the equipment shall be password access-protected and shall dial back to the successful radio system contractor's support personnel having requested access to Richland County's equipment.

10.18.30 All costs associated with delivering to and from Richland County any software and/or hardware required as the result of malfunctioning equipment shall be provided at no additional expense. Such cost items shall include but not be limited to the following: troubleshooting, transportation, packaging, crating, delivery, installation, de-installation, component handling, and insurance.

10.18.31 If any communication circuits, equipment, or software needed specifically for maintaining or monitoring the system, these circuits and components shall be identified in detail and included in the cost matrix.

10.18.32 Richland County shall have—without penalty or any cost or charge—the right to cancel maintenance or change maintenance time periods on the equipment by giving the Contractor thirty (30) days written notice prior to such change. Richland County shall be refunded any maintenance fees for periods that have not been completed.

10.18.33 The successful radio system contractor shall be offered the opportunity to "make right" the situation that has caused Richland County to move to the cancellation of Extended Maintenance.

10.18.34 If the Extended Maintenance Plan is canceled, the successful radio system contractor shall turn over all spare parts, software, or other items as purchased by Richland County in the provisioning of this service.

10.19. *Authorizations and Permits*

10.19.1 For any construction approval requiring authorizations including but not limited to NEPA, SHPO, Tribal, etc., the successful radio system contractor will provide any requested detail to assist Richland County in their preparation and submittal, with any cost of associated fees paid by Richland County.

10.19.2 Successful radio system contractor has the responsibility to determine what authorizations and permits are required for all portions of the project for which the successful radio system contractor has responsibility.

10.20. ***RF Exposure Calculations***

10.20.1 Successful radio system contractor shall be responsible to conduct a site evaluation and necessary calculations to determine if the repeater sites have safe levels of RF. A report for each site shall be provided to Richland County in the final documentation.

10.21. ***Right to License Warranty***

10.21.1 Successful radio system contractor warrants to Richland County that successful radio system contractor is the lawful owner of the software or, to the extent it is not the lawful owner, that it has all rights necessary for it to license all software to Richland County under the terms of this agreement. Successful radio system contractor warrants that the software will not violate or in any way infringe on any patent, copyright, trademark, trade secret, or any proprietary or other right of a third party.

10.22. ***Supervision/Use of Site***

10.22.1 The successful radio system contractor and assigned project manager shall supervise and direct the work of the contract using his/her best skill and attention.

10.22.2 The successful radio system contractor shall be responsible to Richland County for acts and omissions of Contractor's employees, subcontractors, and their agents and employees.

10.22.3 Successful radio system contractor shall ensure that its employees, agents, and subcontractors obey all County security rules at the site.

10.22.4 The successful radio system contractor shall always enforce strict discipline and good order among its employees, subcontractors, and their agents and employees at the site and shall not employ any unqualified person or anyone not skilled in the assigned task.

10.23. ***Background Checks***

10.23.1 The successful radio system contractor's project manager will be responsible to provide information on all its personnel and all its subcontractors prior to work of any individual at any County facility.

10.23.2 Richland County reserves the right to perform background checks on any contractor personnel or any of its subcontractors and deny access if found necessary to do so in writing via email to the successful radio system contractor's project manager.

10.24. ***Security Procedures***

10.24.1 The successful radio system contractor shall confine operations at the sites to areas permitted by law, ordinances, permits, and the contract documents and shall not encumber the site with any materials.

10.24.2 Upon entrance to and departure from secured or sensitive law enforcement sites, successful radio system contractor's and its subcontractor's employees may be required to furnish photographic identification and be subject to inspections and searches for weapons, contraband, and unauthorized property.

10.24.3 Richland County reserves the right to refuse admittance to its sites for security reasons. Contractor agrees to accept all costs associated with any Security approvals for its employees and subcontractors.

10.25. ***Removal of Employees***

10.25.1 Richland County shall have the right to order the immediate removal of any of successful radio system contractor's or its subcontractors' employees from a job site or sites for just cause, including but not limited to disorderly behavior, intoxication, violation of a law or rule, unsafe behavior, or emergency public safety reasons.

10.26. ***Refuse Clean Up***

10.26.1 The successful radio system contractor always shall keep the premises free from accumulation of waste materials or rubbish created by its operations.

END OF SECTION

11. Project Support and Operational Outcomes

11.1. *Coordination with Customer Consultants*

11.1.1 During the entire process of the work related to this project, Richland County will retain the services of third-party consultant to serve as the County's Advocate.

11.1.2 During the entire process of the work related to this project, Richland County will retain civil engineering services responsible for the creation of site design drawings and specifications, bidding, and work oversight of the construction elements.

11.1.3 During the entire process of the work related to this project, Richland County will retain the services of other contractors to support the project completion.

11.1.4 The successful radio system contractor is required to be responsive to and collaborate with County's Advocate and project contractors or coordinate needs with Richland County.

11.2. *Coordination from Contractor*

The successful radio system contractor shall appoint a contractor's project manager (PM) and a backup to the PM who will be the main point of contact regarding the project for Richland County and their team.
The Project Manager is responsible for the following:

11.2.1 The successful completion of the contract in a timely manner.

11.2.2 The work and performance of all employees and subcontractors that have been hired by the successful radio system contractor.

11.2.3 Direct interface with civil contractor site construction team in coordination with County Advocate.

11.2.4 Completing and submitting all required submittals and documentation.

11.2.5 Setting up and organizing all project coordination meetings as required by Richland County and/or County's Advocate.

11.2.6 Preparing meeting minutes of coordination meetings and distributing copies to all participants.

11.2.7 At a minimum, there is expected to be a kickoff meeting, periodical coordination/update meetings, and a closeout meeting.

11.2.8 Coordinating with County's Advocate and civil engineers to ensure smooth flow of work and on-time project completion.

11.2.9 Reporting all unexpected conditions and problems that may result in delay or expense to Richland County and County's Advocate immediately upon discovery.

11.3. *Implementation plan / schedule*

11.3.1 The successful radio system contractor must develop a realistic implementation plan that will include at least the following elements:

a. Significant Tasks

b. Start date, finish date, and duration of each task

c. Responsibilities

d. Dependencies

e. Deliverables

f. Estimated Completion Date

11.3.2 When accepted and approved by Richland County, the implementation plan shall be the documentation for measuring contract performance and progress, and as such, shall become a contract document to which the successful radio system contractor shall adhere.

11.3.3 The implementation schedule will be maintained as part of the call meeting agenda/notes to show a 2-month window of upcoming tasks.

11.3.4 The Proposer shall provide an initial proposed implementation plan with their submission.

11.4. *Detailed design review*

Upon successful verification of preliminary system designs and agreement of details with Richland County and Richland County's Advocate a detailed design shall be produced by the successful radio system contractor and supplied for approval by Richland County. The updated set of documents with drawings are expected to be utilized for construction of the system.

11.4.1 The successful radio system contractor shall provide a detailed parts list of all components/sub-systems, including radio system, microwave system, alarm system, and DC power system.

11.4.2 Detailed design is to be presented to Richland County with complete information to County's Advocate for review and comment.

11.4.3 The detailed design timeframe shall be understood to be required to happen immediately upon the project contact award, generally requiring about two months with likely involvement in this phase by County and County's Advocate.

11.4.4 Detailed design is to be presented in a face-to-face meeting at Richland County with a PowerPoint and handouts such as to inform County of intended plan of action moving forward.

11.4.5 This information, as supplied, will be utilized by County's Advocate and engineers to develop/modify sites to meet requirements.

11.4.6 All supplied documentation will be memorialized in the resulting change order at this step in the process.

11.4.7 Site selection/location shall be the responsibility of the Contractor to determine during the detailed design review (DDR) process with the expectation of using the lowest cost sites possible, including 1) County-owned, 2) leased from commercial tower owners, or 3) new build construction, i.e., "greenfield."

11.4.8 Richland County expects successful radio system contractor to have investigated the use of currently constructed tower site locations, such as buildings, water towers, and other structures that may be usable as sites as part of their design efforts.

11.4.9 Proposer shall have made a physical site visit to each proposed repeater site to determine if, at the time the RFP response is prepared, the towers offered are understood to accommodate the proposed antenna systems.

11.4.10 New ("greenfield") sites will be considered and allowed to be proposed as part of a design but must be shown as necessary and justified with an appropriate explanation provided in the proposal. This justification includes all recommended sites.

11.4.11 If a new "greenfield" site is proposed or if the tower at a current site does not meet the structural requirements to handle the antennas required for operation, the new tower or existing tower upgrade will be required to be designed to meet EIA/TIA-222-G standards (Structure Classification – II or III, Exposure Category – C and Topographic Category.

11.4.12 During this detailed design, the successful radio system contractor shall work with Richland County and Richland County's Advocate to validate repeater sites, expected coverage, microwave site to site connectivity, proposed network systems, alarm system, and dispatch system, thus providing a starting point for ordering all necessary components.

11.4.13 The successful radio system contractor will be responsible for selecting repeater system and microwave sites in the design and to show anticipated coverage being offered.

11.4.14 Richland County and County's Advocate will work with the successful radio system contractor to obtain access to contractor-recommended sites, which will be consistent with the proposed system design. Successful radio system contractor shall also consider sites in neighboring counties that might be usable as part of offered system design. A list of Richland County towers downloaded from the FCC Antenna Structure Registration (ASR) database is included in Appendix 2.

11.4.15 More tower sites may be available in adjacent counties or within Richland County as some towers may not be registered with the FCC.

11.4.16 The DDR meeting will be the culmination of the DDR process and will not be signed off by Richland County until the needed sites are believed to have been defined with assurance by the Contractor that site availability has been verified.

11.4.17 The successful radio system contractor shall verify that there appears to be space on each of the proposed towers and it appears the tower can support the load requirements.

11.4.18 The successful radio system contractor shall develop a presentation document for the DDR whereby all the available information for the proposed sites and final design of the radio and paging system are contained in this document.

11.4.19 At the DDR meeting/presentation, the successful radio system contractor will make a presentation to Richland County and their Advocate and shall provide to Richland County a design detail submission which shall include block diagrams of major elements arranged on a site-by-site basis, drawings of each site, interconnect drawings, coverage expectations, and updated schedule based on all information available. The list of subsystems shall include but is not limited to the following:

a. P25 Trunked Radio System

b. Paging System

c. Microwave / Fiber Optic Backhaul

d. Wide Area (MPLS) Network Subsystem

e. DC Power/Distribution Subsystem for each (repeater location)

f. Antenna Subsystems (and info to provide to civil engineer)

g. Tower/Space/Power/HVAC Requirements (to provide to civil engineer)

h. Any Alternate accepted in the system agreement such as OTAR, OTAP, Encryption, and support

i. Alarm & Management Subsystems

j. Radio Dispatch Console system interfaces

k. Control Station Backup for all Radio Console Positions

l. Voice Logging System Replacement/Upgrade(s)

m. Plan for Project Management

n. Proposed Project Timeline

o. Interface with County's consultants

p. Site Improvement Contractor Coordination

q. Routine Meetings / Timeline Updates

11.4.20 It is understood the proposed design offered at the DDR meeting may require change orders to meet the expected outcomes if there are site acquisition problems.

11.4.21 Successful radio system contractor shall understand Richland County will have the authority at this point in the process of acquiring a new system to take an active role and possibly to request an adjustment to the design with assistance from the successful radio system contractor to both meet technical requirements and to meet a price point.

11.4.22 Successful radio system contractor shall assist Richland County relative to the design specifications for site requirements and resolution of deficiencies discovered during successful radio system contractor information gathering, thus allowing Richland County to make necessary upgrades.

11.4.23 Successful radio system contractor shall consider the time needed for site acquisition and/or improvements in the provided schedule of system build-out.

11.4.24 Upon acceptance of the detailed design the radio system contractor shall provide the County detail to understand DAQ buildings and essential public safety buildings effective coverage. Detail is intended to assist in Emergency Radio Communications System planning prior to Go-Live.

11.5. ***Repeater site infrastructure specifications/ requirements***

11.5.1 After the DDR is completed and accepted by Richland County, it shall be the responsibility of Richland County to acquire the services of a civil engineering company to complete all further site/tower work.

11.5.2 Richland County will be responsible for any structural improvements found to be required at the proposed tower sites.

11.5.3 The actual design work for a greenfield site will be completed via Richland County's Civil Engineer under a separate contract. Successful radio system contractor shall be responsible to assist and coordinate with County's Civil Engineer.

11.5.4 Successful radio system contractor shall be aware of and account for the time required to develop greenfield sites.

11.5.5 After the detailed radio system design is completed by the successful radio system contractor and sites selected all tower site compounds, new or existing, Richland County's Civil Engineer shall develop and provide a complete set of appropriate State Licensed PE stamped construction drawings and specifications.

11.5.6 The construction plans will show the compound, fencing, tower, foundations, electrical, easement road extensions, and proposed equipment shelters. This design work will be completed via County's Civil Engineer under a separate contract though with coordination by successful radio system contractor.

11.6. *Site acquisition support process*

11.6.1 The successful radio system contractor will be required to provide support for this process as part of their responsibilities.

11.6.2 With the detailed design effort completed and repeater sites identified, Richland County will undertake the task of acquiring access to the recommended sites, which will require detailed information from the successful radio system contractor.

11.6.3 Once there is a reasonable belief the identified sites can be acquired and the efforts well underway, the go-ahead will be given by Richland County for the successful radio system contractor to acquire the various parts and equipment and then to build the system based on these site locations.

11.6.4 The successful radio system contractor's project manager will assume the responsibility of coordinating the system build, including oversight of the antenna work, fleet mapping, ordering of all system elements, coordination of the microwave and network, and interface with Richland County's Advocate.

11.6.5 Richland County will acquire the sites and work with its Advocate and civil engineer to develop specifications for the site work and development.

11.6.6 The successful radio system contractor shall provide construction oversight to ensure the new facilities meet the successful radio system contractor's requirements as provided in their specifications.

11.6.7 The successful radio system contractor shall supply to Richland County and their Civil Engineer:

a. a. Site drawings of desired rack layouts in the shelters and equipment rooms, allowing these layouts to be transferred to the engineer's drawings.

b. b. Anticipated power loads and BTU for cooling requirements, thus proving the engineer needed information to develop site shelter requirements.

c. c. Information as to antenna types, expected heights, and associated transmission line, thus affording needed information for the engineer's drawings/specifications.

11.7. *Civil construction*

11.7.1 Richland County, via a separate Request for Bid, will provide equipment shelters sized to meet the requirements of the proposed radio system, network systems, supporting backup power plant and microwave electronics, plus two rack spaces for future equipment. All shelter sizing shall meet the National Electrical Code requirements of minimum space requirements.

11.7.2 The radio system contractor may submit a bid for the civil work.

11.7.3 The radio system contractor will provide Richland County with all supporting system parameters necessary to perform the civil work.

11.7.4 Richland County will provide a backup generator to supply 120/240V at each repeater and/or microwave site.

11.7.5 Richland County will provide UPS-protected power at Richland County Communications Center and EOC, thus allowing all equipment at these sites to operate directly off this AC source and not use batteries.

11.8. *Equipment shelters/buildings/generators*

11.8.1 Proposals shall include requirements for space, power, and environment conditions for each site included in their proposal.

11.8.2 The remainder of this section is provided for information only as work will be completed under a separate agreement with another contractor with project management by the Civil Engineer in coordination with the Civil Engineer contractor, successful radio system contractor, and County's Advocate.

11.8.3 All equipment shelters shall meet all local codes and be equipped in such a way as to support the communications systems installed within.

11.8.4 Richland County will ensure a generator meeting the requirements, as specified in the detailed system design, will be in place with all required transfer switching or other form of backup power support.

11.8.5 Richland County will ensure equipment rooms provide adequate space, a stable environment for infrastructure equipment, and be equipped with the appropriate grounding and surge protection equipment to protect all systems.

11.8.6 If an existing equipment room is not deemed adequate by the successful radio system contractor, then Richland County will find and establish the needed space.

11.8.7 All site work consisting of electrical construction shall be the responsibility of Richland County.

11.8.8 This RFP excludes construction of public improvements (public works), as the phrase is defined in Wisconsin Code section 59.52(29)(a). The construction of public works (such as electrical construction) will be publicly bid in a process separate from this RFP in accordance with the Wisconsin public work bidding laws.

11.8.9 Any spaces that are internal to an existing building, every effort must be made to work with Richland County building maintenance staff to ensure coordination.

11.9. *Fleet map and talkgroup planning*

11.9.1 As soon as practical and after the detailed design is complete, the successful radio system contractor shall develop and hold a planning session to review talkgroups and channel planning, thus validating the information needed by the radio system engineers.

11.9.2 The fleet map process will be two-fold with the first task associated with talkgroup design and the second task associated with radio subscriber programming.

11.9.3 Outcome of the planning will be a complete fleet map of all talkgroups available on radios and dispatch consoles along with the attributes associated with each group, including but not limited to:

a. Talkgroup Name (long/short)

b. ID (decimal and hexadecimal)

c. Announcement group

d. Emergency mode (tactical/revert)

e. Fail mode

f. Priority

g. Logging

h. Encryption

i. Console Display

11.9.4 The assumption is made this planning may require multiple independent meetings with all users, including law enforcement, fire, dispatch supervisory staff, and other non-public safety user.

11.9.5 The outcome of meetings and discussions will be a fully developed, with a single document (spreadsheet) as a deliverable.

11.9.6 As there is an expected interface with adjacent jurisdictional channels, talkgroup planning shall also include all anticipated conventional channel needs, out-of-band gateway channels, ISSI gateway patching, interoperability channels, and all detail to configure any system subscriber.

11.9.7 The talkgroup and system design task shall be completed, verified, and formally accepted by Richland County before subscriber terminal planning begins.

11.9.8 The fleetmap documentation shall include a global system subscriber list document(s) providing key detail.

11.9.9 Each of the subscriber radios will be expected to have a complete talkgroup and channel plan developed with talkgroup naming as a part of the effort.

11.10. *Factory staging & acceptance test*

11.10.1 During the build-out of the complete system, the successful radio system contractor shall be expected to assemble all the components, interconnect the elements, apply all software/ programming, and conduct a complete factory/Contractor testing before the radio, and network components are installed at each site.

11.10.2 The factory/ successful radio system contractor testing shall include all network elements though may not include the microwave system.

11.10.3 The successful radio system contractor shall supply a document describing the results of the certification testing and validation of proper operation.

11.10.4 Richland County and County's Advocate will be invited to take an active role in the testing at the factory or successful radio system contractor's facility.

11.10.5 Prior to shipment from the factory, all radio system major system components shall be assembled and interconnected to allow for a complete test of the system. A routine shall be completed and offered to Richland County and its Advocate prior to the test that outlines the planned tests to be completed.

11.10.6 The successful radio system contractor shall supply a document describing the results of the certification testing and validation of proper operation.

11.10.7 At the successful completion of the factory testing, it is understood Richland County will be expected to complete a sign-off of this phase, and the system will then be shipped to an assigned holding area for installation.

11.11. *Implementation/migration planning*

11.11.1 With the detailed design complete, the successful radio system contractor's designers will then be enabled to develop the final system elements and programming to create the system as proposed and approved by Richland County.

11.11.2 At this point in the system development, it is expected the successful radio system contractor will provide Richland County and its Advocate with an initial draft of the system design documentation for review and possible feedback.

11.11.3 Detail offered shall include drawings, specification, programming overview, updated schedule, site requirements, etc.

11.11.4 Once site design drawings and specifications have been developed by Richland County's Civil Engineer, the successful radio system contractor shall review to ensure all requirements are met for each site.

11.11.5 Once the fleet mapping is complete, successful radio system contractor shall, as soon as practical, develop and hold a planning session to review talkgroups and channel planning, thus validating the information needed by the radio console system engineers is fully developed with a validated and written document as an output.

11.11.6 Console programming effort shall review all preprogramming patches to validate conventional and external trunked radio systems.

11.11.7 Console programming effort shall review all preprogramming for door controls, alarms, and how the emergency button on terminals activates changes to the console.

11.11.8 Successful radio system contractor shall review all interface requirement details related to non-trunked systems, 911 system, logging, and external monitoring and control.

11.11.9 The successful radio system contractor shall develop and present a summary plan for migration to the planned P25 trunked radio system and specifically address how the migration will affect users based on the frequency plan offered.

11.11.10 The successful radio system contractor shall expand upon the migration plan offered in the proposal and, in detail, create a step-by-step approach for the migration, specifically describing how interoperability will be established with the present radio system until the plan is complete.

11.11.11 The successful radio system contractor shall develop and present a summary plan for migration to the planned paging system upgrade and specifically address how the migration will affect users based on the frequency plan and solution offered.

11.11.12 The successful radio system contractor shall expand upon the migration plan offered in the proposal and, in detail, create a step-by-step approach for the migration, specifically describing how interoperability will be established with the present paging system until the plan is complete.

11.12. *On-site system build*

11.12.1 Upon sites and facilities being complete with power, grounding, and HVAC requirements, the successful radio system contractor is expected to build out the DC power plant, tested and commissioned.

11.12.2 As soon as possible after the sites have been acquired with towers and shelters in place, the microwave system is expected to be constructed, tested, and commissioned.

11.12.3 As soon as possible, after the sites have been acquired with towers and shelters in place, the microwave system operation, alarm, and monitoring system shall be constructed, tested, and commissioned.

11.12.4 Upon notice this phase of the work is complete, Richland County's advocate will perform an inspection and review visit to each site.

11.12.5 Documentation for the DC power plant, microwave, and alarm/monitoring system shall be developed and turned over to the consultant for review and validation.

11.12.6 Once the radio system has been shipped to Richland County and installed at the various sites, the successful radio system contractor shall begin internal testing and adjustments to validate its proper operation on a site-by-site basis.

11.12.7 The backhaul network system shall also, either simultaneously or prior to the radio system, be installed, tested, and thus verified operational.

11.12.8 Once the network is installed and made operational, the various portions of the system will be interconnected and then tested by the successful radio system contractor, followed by full system commissioning when successful radio system contractor advises.

11.12.9 The radio system shall be made operational, preliminary testing conducted, and, upon completion, inform County and Advocate of readiness to conduct inspection visits.

11.12.10 Until the equipment has been installed at its selected site, the ownership and thus the responsibility of the system shall remain with the successful radio system contractor and not transferred to Richland County.

11.12.11 Promptly after delivery to the defined site hardware and software, modules, and/or components, successful radio system contractor shall commence installing said equipment and software.

11.13. ***Site equipment specification tests***

11.13.1 The successful radio system contractor shall submit to Richland County's Advocate their suggested plan for sample testing of antenna systems, receiver sensitivity/performance, transmitter power output, reflected power, P25 capability, network, microwave, etc.

11.13.2 Successful radio system contractor shall promptly and successfully conduct all its own testing procedures on all hardware and software.

11.13.3 Submittals to the County and Advocate shall include written test results of the requirements as listed for each repeater system, network, backhaul, DC plant, and all control/monitoring subsystems.

11.13.4 Successful radio system contractor shall then allow County and/or Advocate to randomly select up to two sites for the tests to be redone to be validated.

11.13.5 Successful radio system contractor shall provide written notice that the system has been installed, and all components have been tested and are ready for acceptance testing.

11.13.6 Testing documentation shall be turned over to County's Advocate for review.

11.13.7 All tests must be completed and signed off by County's advocate and County before the Site Equipment Specification Tests will be designated complete.

11.14. ***Preliminary acceptance***

The following steps are required to be completed by the successful radio system contractor to obtain preliminary acceptance of the radio system:

11.14.1 Inspection and inventory of all equipment and inspection of the installation of all system equipment.

11.14.2 All equipment must be installed per the specifications.

11.14.3 All site equipment and user equipment will be inventoried against the purchase orders with model and serial numbers of equipment supplied in an electronic searchable list supplied by the successful radio system contractor.

11.14.4 Each repeater and associated site equipment will be inspected for proper installation by the County's Advocate, with any items found deficient with either the inventory or inspection added to a punch list.

11.14.5 The punch list of items must be cleared before the inspection is designated complete and equipment is accepted.

11.14.6 The tests described below may proceed while punch list items are being cleared, assuming those punch list items do not prevent any of the tests from taking place.

11.14.7 Exceptions include code/safety violations, grounding issues, and improper antenna mounting, which shall be completed properly before any further acceptance verifications continue.

11.15. ***Operational testing***

11.15.1 The successful radio system contractor shall submit an operational test plan that shows end-to-end communications of all major elements and features of the system.

11.15.2 Tests shall include the repeater system, dispatch console, network system, antenna systems, backup power, and generator systems with simulated failures that will demonstrate how the system will react.

11.15.3 The successful radio system contractor shall anticipate the County's advocate will take an active role in the tests whereby random tests will be expected to be performed with Advocate on-site and by reviewing test results as submitted.

11.15.4 All tests must be completed and signed off by the County's advocate and witnessed by Richland County before the operational tests will be designated complete.

11.15.5 Submittals to the consultant and County shall include written test results of the requirements as listed for each repeater system, network, backhaul, DC plant and all control/monitoring subsystems.

11.15.6 Failures of the systems should include, at a minimum:

a. Mains power

b. Loss of primary network link

c. Failure of one network switch at a site

d. Loss of GPS (if simulcast)

e. Loss of one channel of a trunked radio system

f. Loss of link to one simulcast controller

g. Loss of link to the primary core controller

11.16. ***Subscriber terminal equipment specification tests***

11.16.1 The successful radio systems contractor shall submit their suggested plan for sample testing of transmitter power output, receiver sensitivity, P25 capability, correct programming, etc. for mobiles and portables.

11.16.2 Subscriber terminal equipment shall be tested using County equipment that has been setup with the defined fleetmap programming. A representative unit for each template shall be approved and tested.

11.16.3 Successful radio system contractor shall conduct on-air testing of each model of terminal equipment and document findings composed of on-the-air functional and performance tests.

11.16.4 All tests must be completed and signed off by County's Advocate and County before the user equipment specification tests will be designated complete.

11.17. ***Drive coverage testing***

11.17.1 Once items described as acceptance testing are complete, the Contractor shall demonstrate outdoor coverage to the requirements.

11.17.2 An outdoor coverage test plan defining where Richland County shall expect to have coverage and how the successful radio system contractor will setup equipment and verify that coverage shall be submitted 30-days prior to the conducting of the test.

11.17.3 All tests will simulate a portable radio at waist level on-the-hip using a lapel microphone where portable coverage is expected with an automated BER test using losses equal to or greater than if a portable were operated as described.

11.17.4 For the P25 voice system, plans shall specify the coverage as a percent of the total area of the Richland County RF boundary, assuming 95% reliability using TSB-88C design procedures for the primary proposal.

11.17.5 Coverage Testing Outdoors – P25 voice and paging systems shall be tested to provide coverage of Richland County as follows:

11.17.6 Outdoor testing will be completed using a drive testing process using TSB-88 procedures. It is assumed two outdoor antennas (P25 and paging) mounted on the roof of a vehicle will be used.

11.17.7 The vehicular antenna systems will be attenuated to recreate a signal representing what a portable on-the-hip (no speaker microphone antenna), or pager on-the-hip will encounter. The items used for this calculation include but are not limited to:

a. Test vehicle system antenna gain

b. In-building penetration (>15 dB) to commercial buildings within the metro areas (P25 voice system)

c. Residential in-building penetration (>8dB) throughout County

d. Body loss

e. Portable antenna loss

f. Fade margin

11.17.8 The Contractor will complete all measurements and document the outdoor signals employing the losses for each test to document coverage.

11.17.9 Drive test raw data will be provided to support the verification process and provide the County information to rely upon.

11.17.10 The drive test report will include maps that depict the BER % for portable operation for the P25 system measured during drive testing. The drive test report will provide the percentage of area that meets the minimum criteria for P25 portable operation.

11.17.11 The successful radio system contractor will provide the anticipated signal levels, RSSI for the analog paging system, as criteria for testing based on their system design in their response.

11.17.12 A formula and a sample calculation shall be provided for the signal level at the antenna of the test vehicle that will equate to a minimum pager signal level.

11.17.13 The drive test report will include maps that depict the RSSI level for the paging system measured during drive testing. The drive test report will provide the percentage of area that meets the minimum criteria for paging operation.

11.18. ***Delivered audio quality testing***

11.18.1 For portable indoor coverage, the successful radio system contractor shall submit an indoor coverage test plan where Richland County shall expect to have coverage within structures (measured not to exceed 8 dB to the outside) with actual areas of coverage to be agreed upon during final negotiations and acceptance of alternates.

11.18.2 For Richland County, a minimum of 100 buildings will be designated for testing with multiple test call locations within the structure. (See Appendix 6 for list of locations.)

11.18.3 All tests will be from a portable radio at waist level on-the-hip using a lapel microphone to a defined dispatch location where the portable coverage is expected.

11.18.4 This testing will be accomplished via actual user voice using non-repeating random scripts between portables and dispatch.

11.18.5 The following recommendations are to be followed for in-building tests:

a. Subjective tests are limited to the ground floor for scoring purposes.

b. Residential building (single/2 story family) single test in the center of the ground floor. (TSB-88C)

c. Small commercial building (single story, open floor plan). Five test locations, one in each corner and one in center. (TSB-88C)

d. The number of tests may increase based on the size of the building. The number of tests should always use an odd number such that the ratio or passing locations divided, but the total number of locations can never be 50%. If more than 50% of the locations

are good, the building passes. A department store would meet this criterion.

e. A large commercial facility or shopping mall may have several large buildings or areas that are well-defined. Each of these would become a location to be tested on its own.

11.18.6 Testing will be completed with actual voice testing and using a DAQ measurement scheme. Text to be used will be negotiated, though it will be random.

11.18.7 Testing will be completed by a three-person dispatch team and one or more three-person field teams consisting of at least one person from Richland County agencies using radios, and one representative of the successful radio system contractor and Richland County's Advocate providing verification.

11.18.8 One or more field teams will be organized for these tests. Final details will be worked out between the successful radio system contractor and Richland County.

11.18.9 The team will go to the building location within 20 feet of the entrance to call in the start of the building test.

11.18.10 The team will then enter the building location and begin conducting the anticipated test locations to meet the requirements of the building.

a. Each test location shall be a minimum of 6 paces apart.

b. An odd number of tests should be conducted to score the building.

c. If multiple floors, then each floor above the ground floor will be tested but for information only. Only the ground floor tests are used for scoring.

d. Any desired testing below ground level floor will be conducted for information only.

11.18.11 Suggested Testing Protocol:

a. One of Richland County's personnel will operate the radio, and the other will document the results of the tests. These roles shall be reversed one or more times during the testing activity but not at any single location.

b. When arriving at a location, an RSSI level is taken on the street and documented.

c. Depending on the building or location, the number of tests to be performed at each will be determined in advance. A large building may require several test areas.

d. Teams will initiate contact with the dispatcher and receive a response.

e. Starting with the field, the field team and the dispatcher will transmit messages using a random selection of scripts.

f. Representatives of each team will provide subject input on the understandability of the message received.

g. Opinions will be documented by the team for each transmission at each location.

h. Any majority of positive opinions passes.

i. If two or more persons are not able to understand, a second transmission will be attempted at any point within 20 feet of the original transmission. If successful, the area passes, and the team moves to the next area.

j. If a third transmission is required, another point for transmission is chosen, and a new test made. The results of the test are documented, and the team moves to the next area.

k. Copies of the data will be made and distributed to Richland County, successful radio system contractor, and County Advocate.

l. All data will be entered by the successful radio system contractor into a spreadsheet.

m. Any area/location for which the difference in outdoor and indoor RSSI reading is found to exceed the indoor attenuation level (8- or 15-dB associated loss) will be identified in a report of the findings. These buildings will be removed from the list and thus not be calculated into the results of the test.

n. The successful radio system contractor will provide a report of the indoor testing, indicating an estimate of the recommended solution for improving coverage in these areas and these buildings.

11.19. ***Remedy for failed coverage***

11.19.1 After final drive testing, if the coverage does not meet or exceed the specified and predicted coverage, the Contractor shall provide all remedies to meet the specified coverage at the successful radio system contractor's cost.

11.19.2 After in-building audio testing, if the coverage does not meet or exceed the specified and predicted coverage, the successful radio system contractor shall provide all remedies to meet the specified coverage at the successful radio system contractor's cost.

11.20. ***Preliminary Acceptance of New System***

The following steps are required to be completed by the Contractor to obtain preliminary acceptance of the new systems:

11.20.1 All site equipment and user equipment will be inventoried against the purchase orders with model and serial numbers of equipment supplied in an electronic searchable list supplied by the contractor.

11.20.2 All equipment must be installed per the plan designs and specifications.

11.20.3 Inspection of all system equipment, and inspection of the installation of all system equipment shall have been completed.

11.20.4 Coverage Testing successfully completed and results accepted by County**.**

11.20.5 Acceptance testing may proceed while punch list items are being cleared if those punch list items do not prevent any of the tests from taking place.

11.20.6 Exceptions include code/safety violations, grounding issues and improper antenna mounting which shall be completed properly before any further acceptance verifications continue.

11.20.7 The punch list of items must be cleared before the inspection is designated complete and equipment is accepted.

11.21. ***Satisfactory completion***

11.21.1 After the successful radio system contractor's successful completion of its coverage testing procedures, the successful radio system contractor shall demonstrate its certification testing procedure on the system delivered hereunder to determine whether all such hardware and software together operate in a manner meeting the certification criteria.

11.21.2 No final certification testing signoff will occur until a user interface to user interface from terminal to terminal and terminal to dispatcher is shown to work without error.

11.21.3 This certification testing will be conducted in order to determine whether (1) the system performs in accordance with the functions, specifications, and description established using successful radio system contractor documents; (2) the system can be effectively utilized in Richland County's environment; (3) the documentation for the system is thorough, understandable, and instructive so as to impart reasonably clear guidance for the system's use; and (4) the system meets all functional requirements as described in this RFP.

11.21.4 Assuming all systems and subsystems are ready for use and testing is satisfactorily completed, the radio system is ready to begin the 30-day Test Period.

11.21.5 This 30-day Test Period is commonly completed by a non-public safety department moving to daily operations by cutting over onto the new system and thus will conduct its daily business use allowing further testing and operational verification.

11.21.6 For this certification test, a selected pilot user group (no more than 5% of total users) of users and dispatch shall be cutover on the system to conduct actual daily use, thus conducting a proper operational test of the system though under less than full load conditions.

11.21.7 All operator training shall be completed initially for the pilot user group and dispatch center personnel.

11.21.8 The 30-day Test Period will be considered successful if the equipment operates successfully in compliance with all specifications for a total of thirty (30) consecutive days without a major failure requiring the 30-day Test Period to start over or a minor failure, possibly stopping the 30-day Test Period clock until repairs have been made.

11.21.9 Deficiencies will be cataloged as minor, major, and catastrophic.

11.21.10 Minor – Any failure that does not impact coverage and capacity more than 25%.

11.21.11 Major – Any failure that impacts coverage and capacity more than 50%.

11.21.12 Catastrophic – Any failure that requires backup procedures and equipment to be activated for operation.

11.21.13 For each type of failure, the following action is expected to be the result.

11.21.14 Minor – The 30-day Test Period clock will continue assuming the failure is fixed, and the operator can resume normal functionality within 24 hours.

11.21.15 Major – The 30-day Test Period clock will stop and not restart until the fix is complete, and the entire radio system is back to normal operation.

11.21.16 Catastrophic – The 30-day Test Period clock will start over once the failure has been fixed, and the entire radio system is back to normal operation.

11.21.17 The pilot user group will be expected to report any issues discovered, allowing the successful radio system contractor time to correct utilizing a method of problem tracking to be determined during the routine management of the project.

11.21.18 All failures must be logged and followed up by the successful radio system contractor to include a written report as to how each failure was returned to normal operation.

11.21.19 The failure log will be reviewed before moving on to the next step, that of full cutover of all system users.

11.21.20 The full cutover and warranty period will not begin until successful completion of the 30-day Test Period.

11.21.21 Written notification will be furnished to the successful radio system contractor if any failure item or certification test is determined unacceptable to Richland County. The successful radio system contractor will then have three (3) days to correct the issue and notify Richland County that all such errors have been remedied. Richland County will have three (3) additional working days to recommence the aforesaid certification tests. This process will be repeated if necessary, until the system meets Richland County's expectations, and the County notifies the successful radio system contractor in writing of project certification.

11.21.22 However, if the test results are not accepted hereunder within 120 working days after successful radio system contractor's initial written notification to Richland County of the readiness of the certification testing, Richland County shall have the right and option, following ten (10) days' advance written notice to the successful radio system contractor to declare the successful radio system contractor to be in default, and Richland County may exercise any or all of its full spectrum of remedies, including but not limited to cancellation and rescission of this agreement and place a claim on the performance bond.

11.22. ***User terminal equipment installation inspection***

11.22.1 All user equipment must be 100% programmed, installed, distributed, and tested.

11.22.2 A random inspection of user equipment and installations will be made. Once the installation of user equipment is complete, and the inspection is complete, the user equipment installation inspection test will be designated complete.

11.22.3 Arrangements for partial system installations are expected and will be scheduled to meet County and Contractor requirements.

11.23. ***Migration to Proposed New Systems***

11.23.1 The proposer shall develop and present a summary plan for migration to the planned radio system that specifically addresses how the migration will affect users based on the frequency plan offered.

11.23.2 The Contractor shall expand upon the migration plan offered in the proposal and in detail create a step-by-step approach for the migration specifically describing how interoperability will be established with the operating radio system. The plan goal would be to eliminate or minimize any communication issues and balance the process of moving agencies to the new system.

11.23.3 The proposer shall develop and present a summary plan for migration to the planned paging system upgrade and specifically address how the migration will affect users based on the frequency plan and solution offered.

11.23.4 The Contractor shall expand upon the migration plan offered in the proposal and in detail create a step by step approach for the migration specifically describing how interoperability will be established with the present paging system until plan is complete.

11.24. ***Post project certification and beneficial use***

11.24.1 At the end of successful demonstration of system performance and the completion of this pilot group 30-day Test Period, cutover for all other users shall be initiated, and this shall begin beneficial use and the minimum one-year warranty.

11.24.2 Richland County shall operate the complete system of all channels in the normal course of its business operation.

11.24.3 Richland County will verify that the system satisfies the system acceptance test, warranty maintenance standards, and adequate training of its staff for the operation of the system under normal business operation.

11.24.4 If the system is found to be unacceptable to Richland County in that it does not meet expectations, written notification will be made to the successful radio system contractor, with the successful radio system contractor responding in writing to Richland County describing its intended solution.

11.24.5 The successful radio system contractor and County shall attempt to reach an agreement as to the solution before any legal action is begun.

11.24.6 Once all items above are complete, the project shall be designated as accepted by Richland County, at which time all equipment warranty periods shall have begun.

11.25. ***Final documentation***

A final documentation package shall be provided in electronic form and complete sets of bound copies for the system. Any modifications to the standard equipment shall be fully documented with descriptions and drawings.

11.25.1 The successful radio system contractor shall develop a quick reference guide covering normal system and user equipment operation and basic troubleshooting procedures, including the operation of the management terminal if one is offered.

11.25.2 The successful radio system contractor shall compile a set of as-built drawings showing all equipment interconnections and test results of audio circuits, RF circuits, antenna system reflected, and forward power.

11.25.3 All construction drawings for all sites shall have their red lines incorporated into the final drawings as a part of the documentation.

11.25.4 All test results of audio circuits, RF circuits, power, alarms, and antenna systems.

11.25.5 A summary of all login and passwords shall be supplied for all system equipment.

11.25.6 A complete list of all software licenses, dates of renewal, and ownership.

11.25.7 All documentation regarding microwave path studies.

11.25.8 All documentation regarding RF exposure calculations.

11.25.9 All documentation regarding rack layouts and equipment locations.

11.25.10 All documentation regarding DC power system design and implementation drawings.

11.25.11 A complete list/drawing of all equipment showing network switches and routers with their port's assignments and associated IP addresses (where appropriate).

11.25.12 An updated coverage projection of final design network and test results of drive test.

11.25.13 Documentation of spare parts and where they are stored.

11.25.14 A completed inventory of all provided equipment with model, and serial numbers shall be offered both on paper and electronically in an Excel spreadsheet.

11.25.15 Copy of all sign-off documents.

11.25.16 Final updated fleet mapping and subscriber radio channel assignments.

11.25.17 The entire final documentation set of materials shall be supplied as two paper sets, a CD/DVD for each site, and one CD/DVD for the County's Advocate.

11.26. *Final System Acceptance*

Once all criteria above are met and items are completed, the project shall be designated as accepted by the County at which time all equipment warranty periods shall have begun.

END OF SECTION

12. System Specification Detail

12.1. *Main Voice Systems*

12.1.1 The intent of the new voice system infrastructure will be to provide a four (4) channel VHF repeated simulcast P25 Conventional radio platform to support all Richland County public safety radio system users.

12.1.2 The intent of the new voice system infrastructure will be to provide a one (1) channel VHF repeated simulcast analog conventional radio platform to support the Richland County Highway Department radio system users.

12.1.3 The Highway channel should be capable of being migrated to P25 digital operation. This channel need only meet the mobile coverage performance requirements of Richland County.

12.1.4 Proposer's offering shall provide conventional system components that have the highest level of upgrade ability to trunking operation.

12.1.5 Proposer's offering will provide necessary radio repeater systems equipment designed for continuous duty operation.

12.1.6 Proposer's offering will provide necessary system control equipment to provide a redundancy capability in the system design.

12.1.7 The P25 Conventional system will be compliant with and support all current P25 mandatory standards (P25 CAP).

12.1.8 All County public safety radio users plan to adopt the P25 platform and utilize the new P25 infrastructure for communications.

12.1.9 The Respondent/Proposer shall submit a design of the proposed system detailing the anticipated sites needed to provide the anticipated levels of coverage.

12.1.10 The Respondent/Proposer shall submit a block diagram of the proposed system design with the proposal and describe any alternate sites.

12.1.11 P25 Simulcast and voting operation is desired to be the proposed solution.

12.1.12 Direct network connectivity operation of the new radio system to the dispatch console system via backhaul networking proposed is desired to be the proposed solution.

12.1.13 All sites shall employ the latest manufacturer grounding techniques and protection equipment to improve survivability due to power line and lightning surges.

12.1.14 Proposer's offering will provide necessary alarms and associated interconnect to sense and send equipment operational conditions at each site to a system management terminal.

12.1.15 The County will provide equipment shelters sized to meet the requirements of the proposed radio system, network systems, supporting backup power plant and microwave electronics plus two rack spaces for future equipment. All shelter sizing shall meet National Electrical Code requirements of minimum space requirements.

12.1.16 The County will provide a backup generator to supply 120/240V at each repeater and/or microwave site.

12.1.17 The County will provide UPS protected power at all dispatch centers thus allowing all equipment at these sites to operate directly off this AC source and not use batteries if desired.

12.2. *Paging System*

12.2.1 The intent of the new paging system will be to provide a one (1) channel VHF analog system to replace the existing channel and improve alerting operations of the public safety users.

12.2.2 The intent of the new paging system is to improve the service boundaries coverage using multiple site locations.

12.2.3 The paging system will consist of VHF radio simplex stations capable of simulcast transmitter operation operating analog.

12.2.4 Proposer's offering will provide necessary radio systems equipment designed for continuous duty operation.

12.2.5 Proposer's offering will provide necessary system control equipment to provide a redundancy capability in the system design.

12.2.6 Direct network connectivity operation of the new paging system to the dispatch console system via backhaul networking proposed is desired to be the proposed solution.

12.2.7 Each dispatch position will provide single button activation of all paging units.

12.2.8 All existing subscriber pagers will be reused and any needed equipment re-programming shall be included in the proposal.

12.3. *Frequencies*

FREQUENCY	CHAN NAME	CALL SIGN	FRN #	LOC #	ANT #	STATION	EMISSION	SITE NAME	NOTES
151.2275		KSC277	,0002682763	6	1	MO	11K2F3E - 8K10F1D - 8K10F1E	Area of Operation 40.0 km	
151.2275		KSC277	,0002682763	6	1	MO3	11K2F3E - 8K10F1D - 8K10F1E	Area of Operation 40.0 km	
154.7400	Sheriff TX	KSC277	,0002682763	1	1	FB2	11K2F3E - 8K10F1D - 8K10F1E	Tower Hill USCC	
154.7400	Sheriff TX	KSC277	,0002682763	2	1	FB2	11K2F3E - 8K10F1D - 8K10F1E	Sylvan Site	
154.7400	Sheriff TX	KSC277	,0002682763	6	1	MO	11K2F3E - 8K10F1D - 8K10F1E	Area of Operation 40.0 km	
154.7400	Sheriff TX	KSC277	,0002682763	7	1	FB2	11K2F3E - 8K10F1D - 8K10F1E	Eagle Tower Site	
155.0550	Fire TX	KSC277	,0002682763	1	1	FB2	11K2F3E - 8K10F1D - 8K10F1E	Tower Hill USCC	
155.0550	Fire TX	KSC277	,0002682763	3	1	FB2	11K2F3E - 8K10F1D - 8K10F1E	Bunker Hill Site	
155.0550	Fire TX	KSC277	,0002682763	4	1	FBC	11K2F3E - 8K10F1D - 8K10F1E	Cazenovia Fire	
155.0550	Fire TX	KSC277	,0002682763	6	1	MO	11K2F3E - 8K10F1D - 8K10F1E	Area of Operation 40.0 km	
155.3700	Point to Point TX/RX	KSC277	,0002682763	1	1	FB	11K2F3E - 8K10F1D - 8K10F1E	Tower Hill USCC	
155.3700	Point to Point TX/RX	KSC277	,0002682763	6	1	MO	11K2F3E - 8K10F1D - 8K10F1E	Area of Operation 40.0 km	
155.4750	VLAW31	KSC277	,0002682763	6	1	MO	11K2F3E - 8K10F1D - 8K10F1E	Area of Operation 40.0 km	
155.9700	Richland PD RX	KSC277	,0002682763	5	1	FX1	11K2F3E - 8K10F1D - 8K10F1E	Area of Operation 6.1 Meter Rule	
155.9700	Richland PD RX	KSC277	,0002682763	6	1	MO	11K2F3E - 8K10F1D - 8K10F1E	Area of Operation 40.0 km	
158.7525		KSC277	,0002682763	9	1	MO	11K2F3E	Area of Operation - Richland County	
158.8950	Fire RX	KSC277	,0002682763	5	1	FX1	11K2F3E - 8K10F1D - 8K10F1E	Area of Operation 6.1 Meter Rule	
158.8950	Fire RX	KSC277	,0002682763	6	1	MO	11K2F3E - 8K10F1D - 8K10F1E	Area of Operation 40.0 km	
158.9250	Sheriff RX	KSC277	,0002682763	5	1	FX1	11K2F3E - 8K10F1D - 8K10F1E	Area of Operation 6.1 Meter Rule	
158.9250	Sheriff RX	KSC277	,0002682763	6	1	MO	11K2F3E - 8K10F1D - 8K10F1E	Area of Operation 40.0 km around #1	
173.2625	VRS	KSC277	,0002682763	6	1	MO	11K2F3E - 8K10F1E	Area of Operation 40.0 km around #1	
173.2625	VRS	KSC277	,0002682763	6	1	MO3	11K2F3E - 8K10F1E	Area of Operation 40.0 km around #1	
453.9625	UHF	KSC277	,0002682763	6	1	MO	11K2F3E - 8K10F1D - 8K10F1E	Area of Operation 40.0 km around #1	
453.9625	UHF	KSC277	,0002682763	6	1	MO	11K2F3E - 8K10F1D - 8K10F1E	Area of Operation 40.0 km around #1	
460.2000	Jail	KSC277	,0002682763	6	1	MO	11K2F3E - 8K10F1D - 8K10F1E	Area of Operation 40.0 km around #1	
460.2000	UHF	KSC277	,0002682763	8	1	FB	11K2F3E - 8K10F1D - 8K10F1E	Dispatch Center Site	
151.1300	Highway TX	WNYU878	,0006632244	1	1	FB2	11K2F3E	Tower Hill USCC	
151.1300	Highway TX	WNYU878	,0006632244	3	1	MO	11K2F3E	Area of Operation 6.1 Meter Rule	
159.0150	Highway RX	WNYU878	,0006632244	2	1	FX1	11K2F3E	Area of Operation 40.0 km around #1	
159.0150	Highway RX	WNYU878	,0006632244	3	1	MO	11K2F3E	Area of Operation 40.0 km around #1	
154.2950		WPJS680	,0002684496	1	1	FB	11K0F3E	Richland Center Fire Station	
154.2950		WPJS680	,0002684496	2	1	MO	11K0F3E	Area of Operation 32.0 km around #1	
154.4300	RC Fire Ground	WPJS680	,0002684496	1	1	FB	11K0F3E	RC Fire Station	
154.4300	RC Fire Ground	WPJS680	,0002684496	2	1	MO	11K0F3E	Area of Operation 32.0 km	
154.3550	Paging	WQPM421	,0002682763	1	1	FB2	11K2F3E	WRCO Site	
151.2800	Marc TX	WQPM421	,0002682763	1	1	FB2	11K2F3E	WRCO Site	
156.1575	Paging RX	WQPM421	,0002682763	2	1	MO	11K2F3E	Area of Operation 40.0 km around #1	
154.3550	Paging TX	WQPM421	,0002682763	2	1	MO	11K2F3E	Area of Operation 40.0 km around #1	
156.1575	Paging RX	WQPM421	,0002682763	3	1	FX1	11K2F3E	Area of Operation 6.1 Meter Rule	
153.8450	Marc RX	WQPM421	,0002682763	3	1	FX1	11K2F3E	Area of Operation 6.1 Meter Rule	
154.3550	Paging	WQPM421	,0002682763	4	1	FB	11K2F3E	Dispatch Center Site	
151.2800	Marc TX	WQPM421	,0002682763	4	1	FB	11K2F3E	Dispatch Center Site	
154.7400	Sheriff TX	KBB3045	,0004796306	1	1	MO	11K2F3E	Area of Operation 16.0 KM around #2	
154.8450	RCPD TX	KBB3045	,0004796306	1	1	MO	11K2F3E	Area of Operation 16.0 KM around #2	
155.3700	Point to Point TX/RX	KBB3045	,0004796306	1	1	MO	11K2F3E	Area of Operation 16.0 KM around #2	
155.4750	VLAW31	KBB3045	,0004796306	1	1	MO	11K2F3E	Area of Operation 16.0 KM around #2	
155.9700	RCPD RX	KBB3045	,0004796306	1	1	MO	11K2F3E	Area of Operation 16.0 KM around #2	
154.8450	RCPD TX	KBB3045	,0004796306	2	1	FB	11K2F3E	Dispatch Center Site	
154.8450	RCPD TX	KBB3045	,0004796306	3	1	FB	11K2F3E	Richland Center Police Station	
155.4750	VLAW31	KBB3045	,0004796306	3	1	FB	11K2F3E	Richland Center Police Station	
154.8450	RCPD TX	KBB3045	,0004796306	3	1	FB2	11K2F3E	Richland Center Police Station	
155.9700	RCPD RX	KBB3045	,0004796306	3	1	FX1	11K2F3E	Richland Center Police Station	
155.3400	VMED28	WQDF508	,0013675228	1	1	FB	11K2F3E	WRCO Site	

12.4. *Simulcast Operation*

12.4.1 Simulcast designed system operation is being requested to provide improved balanced talk out and talk in operation in the new system designs of the voice and paging systems.

12.4.2 A GPS timing subsystem will be used to coordinate simulcast launch timing.

12.4.3 The proposed microwave/fiber backhaul system will be used to interface the simulcast controllers to the base stations and repeaters of the radio network.

12.4.4 All equipment related to the simulcast controller, programming and monitoring of the controller will be located at one of the system sites such that if there is a

12.4.5 failure of system connectivity with a controller the redundant system will continue to provide simulcast operation.

12.4.6 If a simulcast system failure were to happen, the design shall be such that each simulcast repeater site will fault into a minimum operational mode allowing some level of communications capability.

12.5. *Siren Systems*

12.5.1 The replacement VHF paging system will provide delivery of encoded two-tone alerting operation from the Emergency Communications Center to activate existing sirens.

12.5.2 The system is expected to provide 100% reliable coverage operation to existing siren systems.

12.5.3 Each dispatch position will provide single button activation of all siren units.

12.6. *Radio Console Systems*

12.6.1 The intent for radio console systems is the replacement of the existing Motorola Centracom console units. The current system operates two (2) positions at the County dispatch facility.

12.6.2 Richland County seeks a plan for replacement of the radio console system and likely associated operational equipment early in the project scope.

12.6.3 Proposers should provide a plan and business model to complete console updates shortly after the DDR process is approved.

12.6.4 It is the intent of the console systems to capable of operating with the main radio system using a digital connection.

12.6.5 Each console position should be designed with a backup radio control station unit to be used during network connectivity loss.

12.6.6 The console system currently provides and supports the following listed control stations operating at the County dispatch site. Provide all necessary systems to replace current system equipment and add any needed mutual aid resources to the system design.

a. Point to Point

b. IFERN

c. Marc

d. WISCOM

12.6.7 The console system design should provide expansion capacity to easily migrate the County to four positions.

12.6.8 The console system design should provide expansion resource capability to allow the addition of control station equipment without additional console hardware. Provide for a minimum of four (4) additions.

12.7. ***Call Logging System***

12.7.1 Richland County currently operates a Higher Ground call logging system and intends to integrate logging of any new radio system.

12.7.2 Proposers shall identify a radio system logging design recommendation that is needed to be supported by the existing logger.

12.7.3 Integration shall provide the highest level of capabilities from the radio system interface such as the following.

12.7.3.1 Network recording

12.7.3.2 P25 information capture

12.7.3.3 Emergency activation capture

12.7.4 Contractor shall be responsible to bring radio system interface to County's designated demarcation point.

12.7.5 Contractor shall be responsible for supporting the integration and alignment process with the County's logging system vendor.

12.8. *Coverage Requirements*

12.8.1 Contractor will provide predicted countywide and per repeater site coverage for portable, mobile, and pager operation of the proposed design.

12.8.2 Mobile and portable predicted results shall illustrate both talk-in and talk-out performance.

12.8.3 Pager System predicted results shall illustrate and talk-out performance.

12.8.4 The signal level used to provide ≤2% BER and a DAQ of 3.4 for P25 designs will be clearly stated on each prediction.

12.8.5 Respondent will provide a map of the simulcast distortion zones due to signal strength differences and delay spread.

12.8.6 The signal levels of estimated loss and average signal strength being used when calculating the average coverage levels shall be provided.

12.8.7 The required system wide LMR coverage, with balanced talk-out and talk-in, is ≥95% coverage with ≥95% reliability.

12.8.8 The required system wide Paging coverage is ≥95% coverage with ≥95% reliability.

12.8.9 Acceptable coverage will have a DAQ of 3.4 or better (and a BER ≤ 2.0% for P25).

12.8.10 The following coverage designs shall be provided with the proposal detailing the system designs meeting the established requirements.

12.8.10.1 The main public safety channels are required to provide Mobile talk out and talk in performance of outdoor coverage one mile beyond the Richland County RF boundary.

12.8.10.2 The main public safety channels are required to provide Portable talk out and talk in performance of outdoor on-the-hip portable coverage one-mile beyond the Richland County RF boundary.

12.8.10.3 The main public safety channels are required to provide Portable talk out and talk in performance of 8dB (residential) indoor on-the-hip portable performance within the coverage boundaries of the Richland County RF boundary.

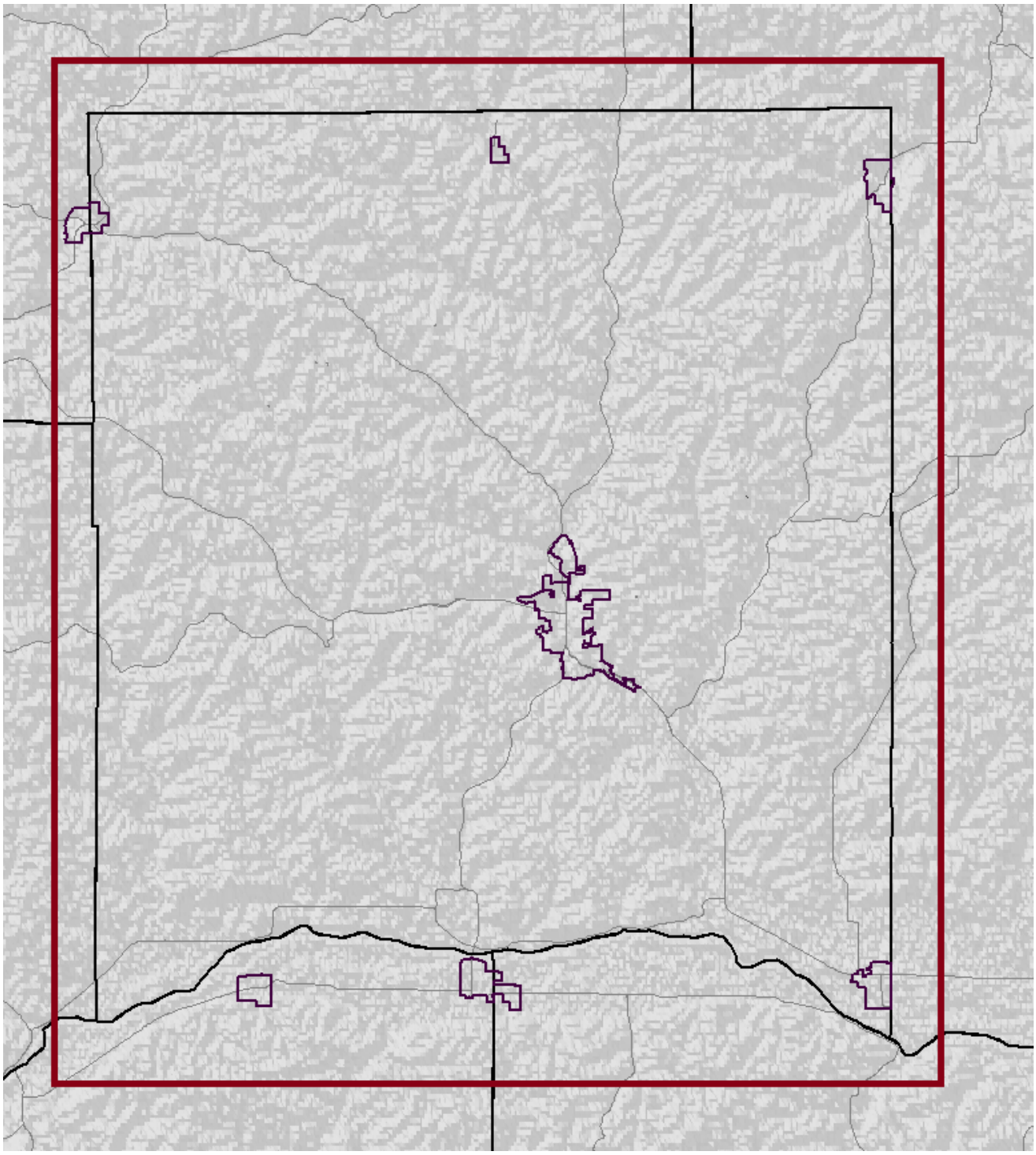
12.8.10.4 The main public safety channels are required to provide Portable talk out and talk in performance of 15dB (commercial small building) indoor on-the-hip portable performance within the city borders of the community of Richland Center

12.8.10.5 The paging system is required to provide outdoor pager on the hip coverage one mile beyond the coverage boundaries of the Richland County RF boundary.

12.8.10.6 The paging system is required to provide indoor pager on the hip coverage in 8dB (residential) buildings within the coverage boundaries of the Richland County RF boundary.

12.8.10.7 The Highway channel is required to provide Mobile talk out and talk in performance of outdoor coverage one mile beyond the Richland County RF boundary.

12.8.10.8 The below map identifies the Richland County RF boundary (black line) which is intended to match the official county border. The additional boundary (red line) outside of the county border is intended to represent the plus one-mile boundary for designated coverage requirements.



12.9. *System Capacity Needs*

12.9.1 The P25 voice system solution is to provide four (4) voice paths using VHF frequencies employing P25 Phase 1 operation.

12.9.2 The analog voice system solution is to provide one (1) voice path using VHF frequencies employing analog operation capable of P25 Phase 1 migration.

12.9.3 The paging system solution is to provide one (1) voice path using VHF frequencies employing analog operation.

12.10. *P25 Conventional System Infrastructure Equipment*

12.10.1 The repeater system will provide P25 simulcast conventional radio system operation at multiple sites to provide the required coverage.

12.10.2 RF specifications will be consistent with public safety grade equipment suitable for simulcast operation and provided with the proposer's response.

12.10.3 It is envisioned the repeater system will employ a centralized simulcast controller to allow the system to operate like a single radio site, although multiple sites will be needed to provide coverage.

12.10.4 Multiple channels/repeaters will be utilized at each site, and the system will provide multiple channels for two-way communications and announcements to field units.

12.10.5 The set of repeaters at each site will be interfaced to the antenna system via a transmitter combiner and receive multi-coupler system to minimize the number of antennas required for operation.

a. Repeater RF Power – 100W minimum full power

b. Spurious & Harmonic Emissions Attenuation – 90dB

c. Sensitivity (C4FM) – -117 dBm

d. Spurious and Image Rejection – ≥85 dB

12.10.6 All necessary modules, equipment or interfaces to the microwave system and network components supporting the wired infrastructure side of the repeaters, voters and the interface to the proposed console system as proposed will be included.

12.10.7 Only new components shall be used in the new system infrastructure.

12.10.8 The Proposer will provide a description of the failure mode operation proposed if the simulcast controller shall fail and what safeguards are in place to minimize the chance of failure.

12.10.8.1 The Proposer will provide a description of the failure mode operation proposed if the centralized simulcast controller shall fail and what safeguards are in place to minimize the chance of failure.

12.10.8.2 The Proposer will describe what manual changes need to be considered in the operating environment because of system failure.

12.10.9 The frequency set must allow all frequencies to be combined utilizing one transmit and one receive antenna system.

12.10.10 All new antenna and transmission line systems shall be employed at all sites with systems installed per manufacturer recommendations.

12.11. ***Repeater and Base Station Antenna Subsystems***

12.11.1 The Contractor is responsible for the design of all antenna subsystems.

12.11.2 The Contractor is responsible to supply each repeater and base station site with all new antenna systems including antennas, mounting arms, transmission line, grounding kits, surge protectors, antenna combining equipment and interconnecting cable.

12.11.3 The Contractor is responsible for the installation and testing of all repeater and base station antenna systems.

12.11.4 The Contractor is responsible to supply the information about the required antenna systems to County's civil engineer for any new "Greenfield" sites to allow for the design of the tower and shelter.

12.11.5 The transmitter combining system will allow for the use one transmit antenna.

12.11.6 The receive antenna system may use two receive antenna systems if a diversity receive system is used in the design.

12.12. ***Backhaul Microwave Network***

12.12.1 The microwave network is the responsibility of Contractor including all required design, coordination, licensing and installation.

12.12.2 Microwave links will interconnect all sites and provide network connectivity between all radio and dispatch center sites.

12.12.3 The backhaul system will be digital IP-based and equipped to provide 150 Mbps minimum capacity for the proposed radio system though it will be acceptable to initially operate at 50 Mbps assuming only software changes to the full 150 Mbps capability.

12.12.4 All interconnecting network components/systems are anticipated to be IP-based end to end supporting both voice services and systems management and insuring FIPS 140-2 compliance.

12.12.5 All associated microwave path studies are the responsibility of the Contactor (or microwave subcontractor) to be conducted prior to the DDR presentation to assure the sites selected will work for the design.

12.12.6 Only licensed 6 or 10 GHz microwave bands, or fiber optics shall be utilized for the primary interconnect path.

12.12.7 The use of IP-based microwave that makes use of adaptive modulation for the highest possible throughput and smallest antennas is highly desired.

12.12.8 All microwave electronics are to be located within the equipment shelters.

12.12.9 Ice shields will be provided for all microwave antennas mounted below other antennas thus only top of tower mounted antennas do not require shields.

12.12.10 A ring microwave/fiber optic design is highly recommended if possible though any links not part of a ring shall be established with hot standby or a parallel 4.9 GHz link.

12.12.11 The Contractor will provide the reliability of the microwave network design with the proposal with no less than five 9's being acceptable.

12.12.12 Proposer will describe how the system could service system users if a link on the microwave system would fail.

12.12.13 The Contractor is responsible to supply the information about the required antenna systems to County's civil engineer for any new "Greenfield" sites to allow for the design of the tower and shelter.

12.12.14 If leased, the Contractor shall provide the County with QoS and bandwidth guarantees to ensure system operation as agreed to in negotiations.

12.12.15 If leased, the Contractor shall provide at no additional cost the spare bandwidth of the microwave channels for their use including support for CAD/RMS, ESInet or other IP traffic channels in support of 911 Communications operations.

12.12.16 Alarm/monitoring capability shall be provided to the proposed radio system monitoring scheme thus affording the County and supporting Vendor with information remotely relative to the Backhaul system with alarm monitoring shall minimally include:

a. Loss of a link

b. Power failure

c. Waveguide pressure failure

12.13. ***Networking Scheme***

12.13.1 The use of Ethernet shall be considered primary and any non-IP traffic shall be carried using routers over IP as no T1 or DS3 circuits are expected.

12.13.2 The network switches and routers proposed for this project shall be capable of separating IP traffic between the radio system, alarm system, secure owner data and the management system likely using MPLS.

12.13.3 The backbone architecture shall provide for setting of priorities to support voice and data insuring voice operations have the highest priority and data the highest level of security.

12.13.4 The County is expecting the use of MPLS (multiprotocol label switching) routers (or equal method of dividing networks to meet FIPS 140-2) thus allowing for the use by the County for other non-public safety IP traffic.

12.13.5 An IP link shall be available and equipped with an intercom phone (order wire) at each network router location thus offering maintenance personnel ease of voice communications between sites.

12.13.6 Alarm/monitoring capability shall be provided to the proposed radio system monitoring scheme thus affording the County and supporting Vendor with information remotely relative to the condition of the Network Routers and Switches.

12.14. *DC And AC Power System*

12.14.1 A DC or UPS power system shall be provided whereby all electronic devices at a site operate from AC or DC and the DC or UPS system is provided continuous charging and conversion from the mains system.

12.14.2 The AC to DC converters (rectifiers) shall be provided with N+1 reliability designed with enough power output for both operating and battery charger capability.

12.14.3 The DC power system shall be designed to meet the proposed system needs plus 20% for future growth.

12.14.4 All electronic systems (radio, network, alarm and microwave system) shall operate from Contractor supplied battery power with batteries being continually charged from mains or backup generator and if UPS are used then on-line double conversion is a minimum requirement.

12.14.4.1 If any components are only capable of operating on 120VAC then a DC to AC inverter shall be provided capable of supplying AC power.

12.14.4.2 This requirement does not apply to HVAC or Lighting systems.

12.14.5 If the dispatch center is also determined to be a RF site and center power is supplied by a single UPS backed up with a generator, then the DC plant will only be necessary for the microwave and network backhaul system.

12.14.6 A DC circuit breaker system shall be provided to allow for the distribution of power to all electronic devices and with a mains breaker to remove all power at a site to meet NEC requirements.

12.14.7 Dual A/B distribution shall be used allowing equipment equipped to accept dual DC input to be fed from different distribution sources.

12.14.8 The DC or UPS power system shall be designed to provide uninterruptable power for a period up to 30 minutes under full load with full load defined as repeaters operating on a 50% duty cycle or 70% of full load as calculated.

12.14.9 One DC battery system is desired to power all equipment including the microwave, radio systems and network components.

12.14.10 All AC to DC converters, any DC to AC inverters, and all breakers shall be equipped with monitoring and connectivity to the alarm system for remote diagnostics capability.

12.14.11 The charging system shall be designed to fully charge the batteries within:

a. 60 minutes after a commercial power failure and assumed one-minute generator activation at full load.

b. 240 minutes after 30 minutes of continuous operation at full load.

12.14.12 Alarm/monitoring capability shall be provided to the proposed radio system monitoring scheme thus affording the County and supporting Vendor with information remotely relative to the DC or UPS power plant. Monitoring shall minimally include:

a. Battery system functional and operating properly

b. Battery System High Level Fault

c. Any DC Rectifiers in Fault Condition

d. Condition of Battery System

12.15. *Reliability*

12.15.1 The radio system and microwave system shall be designed with the highest levels of reliability including all links, fiber and microwave.

12.15.2 Redundancy of critical components shall be included in the system design including the connectivity between all major site/system components.

12.15.3 An explanation of design features that provide system reliability shall be provided.

12.15.4 Vendors shall submit a list of suggested failure scenarios and categorize them as major, minor or very minor.

12.15.5 Categorization of items on this list will be a subject of negotiation with the successful Proposer during contract negotiation.

12.15.6 Vendors shall also provide an explanation of how the system would be designed to operate, and what the impact would be, under commonly anticipated failures to include:

12.15.6.1 The loss of a channel or multiple channels,

12.15.6.2 The loss of a site or the loss of site connectivity,

12.15.6.3 The loss of console connectivity,

12.15.6.4 The loss of the primary radio system controllers,

12.15.6.5 The loss of the main control point.

12.15.7 System performance monitoring systems shall be explained to include standard alarming and system administration capabilities being proposed. Site monitoring capabilities are a desirable component of this system.

12.15.8 A 30-day system reliability period will be required where a group of users up to 10% of full load will operate on the system to validate the system. The 30-day period will begin upon completion of system functional testing.

12.15.8.1 Minor – The 30-day clock will continue assuming the failure is fixed, and the operator can resume normal functionality within 24 hours.

12.15.8.2 Major – The 30-day clock will stop and not restart until the fix is complete and the entire radio system is back to normal operation.

12.15.8.3 Catastrophic – The 30-day clock will start over once the failure has been fixed and the entire radio system is back to normal operation.

12.15.9 The full cutover and warranty period will not begin until successful completion of the 30-day reliability test period.

12.15.10 Successful completion of the 30-day system reliability testing will be a part of the final acceptance criteria to show reliable operation prior to cutover.

12.16. *Remote Monitor/Alarm/Configuration Systems*

12.16.1 The central monitoring/alarm/configuration system shall be offered as a single integrated system whereby there is:

a. Instantaneous alarm notification and logging of events.

b. Emails sent to appropriate staff and contractor for high level events.

c. Owner and Contractor access to equipment operational information and alerts to potential problems.

d. A means of pushing updates to all possible devices thus allowing for configuration changes.

12.16.2 The integrated central monitoring/alarm system will provide alarms and event logging for all radio, microwave, associated network systems and DC power plant proposed plus the incorporation of shelter environmental, commercial power, transfer switch and generator physical site alarms.

12.16.3 A management system thus shall be a part of the offering whereby the entire radio system infrastructure can be monitored and where updates to the various elements be initiated via the secure network including:

a. Environmental, microwave, network and RF system elements.

b. All sites in the system shall be monitored for temperature (high and low), power, standing water, smoke, fire, backup power generation, transfer switch operation, fuel level and unauthorized access.

c. Interconnection to the generator fuel tank at each site to offer remote sensing of fuel levels.

12.16.4 Faults encountered by any system or subsystem including radio system, backhaul system, DC/UPS plant, Automatic Transfer Switch, mains power, site environmental sensors and the network.

a. All IP addressing, and any abnormalities encountered.

b. Pre-established rules for system communication having been broken either accidentally or through purposeful intervention.

c. Provide for email alarm conditions to be sent to defined personnel for action.

d. All information collected shall be automatically archived thus allowing technical personnel the option of seeing historical records.

12.16.5 An audit trail of actions taken by the user of the system shall also be maintained and archived.

12.16.6 The monitoring tools provided shall make use of centralized view of the system health while allowing technical personnel to drive down to the device sending the alarm.

12.16.7 The monitoring tools shall utilize Graphical User Interface (GUI) thus offering technicians and managers quick access to information.

12.16.8 The monitoring system shall incorporate secure access and at a minimum AES 128-bit encryption to block access while also allowing access privileges at various levels.

12.16.9 The monitoring/management system shall poll all monitored elements and shall re-queue and missed collected information when the device reconnects thus maintaining an up-to-date log.

12.16.10 System shall be capable of and interconnected to the AC and the DC/UPS power system components and switching to allow remote diagnostics.

12.16.11 All remote alarm and remote monitoring systems shall be powered by the DC backup system at each site thus insuring the fewest false alarms possible.

12.16.12 DC to AC inverter(s) or DC to DC converter(s) may be required to provide continuous power to site alarm panel provided at the site.

12.16.13 Capable of interfacing with contact closures of environmental sensors.

12.17. ***Encryption***

12.17.1 If support of AES 256-bit encryption of channels/talk groups is offered as a feature, then this feature shall be explained.

12.17.2 Proposers shall include all system requirements for operation in their costs.

12.17.3 Encryption shall be offered and end to end (subscriber radio to subscriber radio and subscriber radio to dispatcher.

12.17.4 Two options shall be offered to support encryption:

a. Single key

b. Multi-key

12.18. ***Replacement Console System***

12.18.1 Each console position should be provided with the following ancillary equipment.

a. Two headset jacks per position capable of parallel operation

b. Foot switch per position providing PTT function

c. Minimum 2 speakers with adjustable volume controls

d. Desk microphone and local user PTT function

e. 24” display monitor

12.18.2 The console system should be designed with the following minimum capabilities:

a. The radio console will support 6-wire headsets.

b. Headset shall support communications with field radio, and 911 telephone Audio to telephone will be muted when transmitting over the radio system.

c. Capable of 32 aux outputs and 32 aux inputs

d. Instant Recall Recorder (IRR) with last in offered first per position

e. Minimum of 140 assignable resources per position

f. Minimum 6 radio screen tabs with at least 44 resources per tab

g. Instant transmit per resource

h. Volume control per resource

i. Support minimum 15 characters for resource name and minimum 15 characters for alias per resource

j. Two tone paging encoder

k. DTMF signaling encoder

l. Preprogrammed single and preprogrammed group paging

m. Logging interface for use by County and City agencies

n. Multi-select (3 sets minimum)

o. Patch (3 sets minimum)

p. VU meter display

q. Subscriber Radio ID to be displayed

r. Acceptance and ID for subscriber Emergency Button

s. Audio sent/received by each repeater channel

t. Dispatcher override of subscriber radio traffic

u. Support for a minimum of 35 NAC groups

v. P25 end to end digital from the field unit to the dispatch operator on P25 channels

w. Direct radio system connectivity (not control stations)

x. Control station backup radio access for all console positions with RF portion of radio located outside of dispatch

y. AES encryption capable on selected P25 NAC groups

z. Headset interface/switching to 911 telephone system

12.19. ***Over the Air Rekeying (OTAR)***

12.19.1 If support of over the air rekeying is offered as a feature, then this feature shall be explained.

12.19.1.1 Proposers shall include all system requirements for operation in their costs.

12.19.1.2 OTAR will be listed separately in the Pricing matrix.

12.19.1.3 If the OTAR alternate is selected, it shall be understood the capability shall extend to all capable radios of being remotely sent and re-keyed over the air including P25 radios already owned by the city and county.

12.20. ***Over the Air Programming (OTAP)***

12.20.1 If support of over the air programming is offered as a feature, then this feature shall be explained.

12.20.1.1 Proposers shall include data capability and any other system requirements in the costs.

12.20.1.2 OTAP will be listed separately in the Pricing matrix.

12.20.1.3 OTAP is only to be offered in support of the subscriber radios of the proposer.

12.21. ***Support for Smart Phones***

12.21.1 The County is open to a smart phone communication interface system as an alternative system offering with any voice system.

12.21.1.1 If support for Smart Phones to access selected talk groups of the proposed P25 system is offered, then this feature shall be explained.

12.21.1.2 Describe required connectivity to any off-premise equipment and anticipated reliability issues associated with the offering.

12.21.1.3 Support for smart phones will be listed separately in the Pricing matrix.

12.22. ***Repeater Site Infrastructure Specifications/ Requirements***

12.22.1 After the DDR is completed and accepted by the County, it shall be the responsibility of the County to acquire the services of a civil engineering company to complete all further site/tower work.

12.22.2 The County will be responsible for any structural improvements found to be required because of the structural issues.

12.22.2.1 Any design work for a Richland field site will be completed via the County's structural engineer under a separate contract though with coordination by the Contractor as per the Public Bidding for Construction requirements of the State of Wisconsin (Section 26).

12.22.2.2 Contractor shall be aware of and account for the time required to develop Richland field sites.

12.22.3 After the detailed radio system design is completed by the Contractor and thus sites selected all tower site compounds, new or existing, the County's civil engineer shall develop and provide a complete set of appropriate State Licensed PE stamped construction drawings and specifications.

12.22.4 The construction plans will show the compound, fencing, tower, foundations, electrical, easement road extensions and proposed equipment shelters. This design work will be completed via County's structural engineer under a separate contract though with coordination by Contractor.

12.23. ***Equipment Shelters/buildings/Generators***

12.23.1 Proposals shall include requirements for space, power and environment conditions for each site included in their proposal.

12.23.2 The remainder of this section is provided for information only as work will be completed under a separate contract with project management by the Contractor to assure coordination.

12.23.3 Equipment shelters will provide adequate space, a stable environment for the County's infrastructure equipment and must be equipped with the appropriate grounding and surge protection equipment to protect the equipment.

12.23.4 All equipment shelters shall meet all local codes and be equipped in such a way as to support the communications systems installed within.

12.23.5 The County will ensure a generator meeting the requirements as stated by the Contractor will be in place with all required transfer switching.

12.24. ***Equipment Rooms***

12.24.1 Proposals shall include requirements for space, power and environment conditions for each site included in their proposal.

12.24.2 The remainder of this section is provided for information only as work will be completed under a separate contract with project management by the Contractor to assure coordination.

12.24.3 The County will ensure equipment rooms provide adequate space, a stable environment for the County's infrastructure equipment and be equipped with the appropriate grounding and surge protection equipment to protect the County's equipment.

12.24.4 If an existing selected County's equipment room is not deemed adequate by the Contractor, then the County will find and establish the needed space or do any repairs/upgrades required.

12.24.5 All site construction work is expected to be bid either by the County or the Contractor and awarded per local and state regulations.

12.24.6 As these spaces are internal to an existing building, every effort must be made to work with building maintenance staff to insure coordination.

12.25. ***Site Power Sources***

12.25.1 This section is provided for information only as work will be completed under a separate contract with project management by the Contractor to assure coordination.

12.25.2 Any improvements required/recommended by Contractor as related to commercial power will be accomplished by County via a separate contract.

12.25.3 Generator back-up shall be utilized at each site.

12.25.4 Upon the loss of commercial power, the generator will automatically start and after the output has stabilized a transfer switch will change the equipment to generator power.

12.25.5 For 911 Communications, the County will provide a dedicated UPS to power all radio and paging equipment plus the other site elements dedicated to 911 and PSAP operations thus a DC plant may not be required.

12.25.5.1 The N+1 requirement for AC to DC power and any critical systems that could ultimately be a single source of failure must be protected in this manner.

12.25.5.2 No critical subsystem components with two AC power supplies shall be powered by a single circuit breaker.

12.25.5.3 All AC power distribution in equipment racks shall be surge protected at the load center and the rack.

12.25.6 The generator will be able to provide full power at 100% duty for all equipment and recharge the site batteries. Upon the return of stable commercial power, the equipment will be returned to commercial power and normal operation.

12.26. *Subscriber Radios - Mobile, Portable and Control Stations*

12.26.1 Richland County has various agencies and departments that use subscriber radio equipment. The following are current inventory numbers for all users in the County. The detailed inventory can be found in Appendix 5.

PORTABLES	MOBILES	CONTROL STATIONS
235	175	19

12.26.2 Standard field terminal configuration specifications for replacement mobiles, portables and control stations radios are listed in this section and detailed with minimum standards.

12.26.3 Pricing for the standard configurations will be inserted into the Standard Field Terminal Configurations section of the Pricing Matrix.

12.26.4 Quantities listed in configuration tables in this section are estimated quantities for each model type. Agencies will determine the tier radio to purchase based on the features of each tier model offered in the awarded contractor's proposal as part of the successful vendor performing an audit with the County.

12.26.5 The County currently does operate some P25 subscriber radios in the VHF frequency band.

12.26.6 Some County users may consider the option of using multiband (VHF/700/800) subscriber radios.

12.26.7 It is anticipated that field units will be programmed to operate on County frequencies, neighboring agency channels, State of Wisconsin channels, and National Calling and interoperability across all bands capable of operating in any subscriber radio.

12.26.8 Frequency and feature programming will be performed by the Contractor.

12.26.9 The Contractor will provide a price for programming of each of the radio units two (2) times. This anticipates changes in setup by the agencies after completing the migration process.

12.27. ***New Mobile Standards - P25 Phase 1&2 Capable***

12.27.1 Users of mobile radios will be from Public Safety, Public Service and Public Works agencies of Richland County.

12.27.2 All mobile radio devices shall be provided with a standard gain antenna kit.

12.27.3 Mobile radio devices shall have standard equipment packages including a microphone, mounting bracket, and necessary power cables.

12.27.4 Mobile radios shall provide either an internal or external speaker and which is included should be identified within the proposal response.

12.27.5 Mobile radio units will be installed in various Law, Fire, EMS, and Public Works vehicles used throughout Richland County.

12.27.6 Various combination of installs should be anticipated such as installing units leaving current models or replacement. Both dash mount and remote mount installation models will be used as well.

12.27.7 Installation of mobile equipment will be priced per the anticipated types identified and proposals should identify any custom accessory installation work considerations such as intercom interfacing.

12.27.8 Installation pricing shall be based on the following installation types:

12.27.8.1 Remote/Trunk Mount, Control Head - Squads

12.27.8.2 Remote/Trunk Mount, Control Head - Fire Apparatus, EMS

12.27.8.3 Remote/Trunk Mount, Dual Control Head - Fire Apparatus, EMS

12.27.8.4 Dash Mount, Control Head – Public Works

12.27.9 The following tables provide the designated tiers of model units that are being requested and the anticipated quantities of each.

Quantity		Law Enforcement/EMA

1		**Multiband** (VHF – 700/800 MHz) P25 Trunking Mobile
		• Remote/Trunk Mount
		• VHF - 136 MHz to 174 MHz
		• 700/800 – 762 MHz to 870 MHz (per FCC band plan)
		• 10.8 – 16.0 VDC
		• ± 1.5 ppm Frequency Stability
		• Channel Spacing – 12.5/15/20/25/30 kHz
		• Channel Increment – 2.5/6.25 kHz
		• ≥ 16 Zones, ≥16 Talk Groups per Zone, ≥ 500 channels
		• Operational from -30° to +60°C
		• MIL-STD 810 C, D, E, F & G for Pressure, Temperature, Rain, Humidity, Salt Fog, Blowing Dust, Vibration, Shock
		• RF Power Output
		  ○ ≥ 50 W VHF
		  ○ ≥ 30 W 700/800 MHz
		• Conducted Emissions
		  ○ VHF ≥ -85 dBc
		  ○ 700/800 MHz ≥ -75 dBc
		• P25 Phase 1 Ready – Analog/Digital Operation
		• P25 Phase 2 TDMA Ready
		• 12.5 kHz selectivity
		  ○ VHF ≥ -70dB
		  ○ 700/800 MHz ≥ -65dB
		• Digital Sensitivity (TIA/EIA 102) for 5% BER
		  ○ VHF ≤ -120 dBm
		  ○ 700/800 ≤ -122 dBm
		• ≥ 10-watt Audio Output Power
		• Single Key AES Encryption Ready
		• GPS Optional

Quantity		Law Enforcement
30		**High-tier** VHF Band P25 Trunking Mobile Radio • Remote/Remote Mount • VHF – 136 MHz to 174 MHz (per FCC band plan) • 10.8 – 16.0 VDC • ± 1.5 ppm Frequency Stability • Channel Spacing – 12.5/20/25 kHz • Channel Increment – 2.5/6.25 kHz • ≥ 16 Zones, ≥16 Talk Groups per Zone, ≥ 500 channels • Operational from -30° to +60°C • MIL-STD 810 C, D, E, F & G for Pressure, Temperature, Rain, Humidity, Salt Fog, Blowing Dust, Vibration, Shock • RF Power Output ≥ 50 W • Conducted Emissions ≥ -75 dBc • P25 Phase 1 Ready – Analog/Digital Operation • P25 Phase 2 TDMA Ready • 12.5 kHz selectivity ≥ -65dB • Digital Sensitivity (TIA/EIA 102) for 5% BER ≤ -119 dBm • ≥ 10-watt Audio Output Power • Single Key AES Encryption Ready

Quantity		Fire/EMS
90		**Mid-tier** VHF Band P25 Trunking Mobile Radio • Remote Dash or Remote Mount • VHF – 136 MHz to 174 MHz (per FCC band plan) • 10.8 – 16.0 VDC • ± 1.5 ppm Frequency Stability • Channel Spacing – 12.5/20/25 kHz • Channel Increment – 2.5/6.25 kHz • ≥ 16 Zones, ≥16 Talk Groups per Zone, ≥ 500 channels • Operational from -30° to +60°C • MIL-STD 810 C, D, E, F & G for Pressure, Temperature, Rain, Humidity, Salt Fog, Blowing Dust, Vibration, Shock • RF Power Output ≥ 50 W • Conducted Emissions ≥ -75 dBc • P25 Phase 1 Ready – Analog/Digital Operation • P25 Phase 2 TDMA Ready • 12.5 kHz selectivity ≥ -65dB • Digital Sensitivity (TIA/EIA 102) for 5% BER ≤ -119 dBm • ≥ 10-watt Audio Output Power • Single Key AES Encryption Capable

Quantity		Public Works
55		**Low Tier** VHF Band P25 Trunking Mobile Radio • Remote/Dash Mount • VHF – 136 MHz to 174 MHz (per FCC band plan) • 10.8 – 16.0 VDC • ± 1.5 ppm Frequency Stability • Channel Spacing – 12.5/20/25 kHz • Channel Increment – 2.5/6.25 kHz • ≥ 16 Zones, ≥16 Talk Groups per Zone, ≥ 500 channels • Operational from -30° to +60°C • MIL-STD 810 C, D, E, F & G for Pressure, Temperature, Rain, Humidity, Salt Fog, Blowing Dust, Vibration, Shock • RF Power Output ≥ 50 W • Conducted Emissions ≥ -75 dBc • P25 Phase 1 Ready – Analog/Digital Operation • P25 Phase 2 TDMA Ready • 12.5 kHz selectivity ≥ -65dB • Digital Sensitivity (TIA/EIA 102) for 5% BER ≤ -119 dBm • ≥ 10-watt Audio Output Power

12.28. *New Portable Standards - P25 Phase 1&2 Capable*

12.28.1 Users of portable radios will be from Public Safety, Public Service and Public Works agencies within Richland County.

12.28.2 All portable radio models proposed shall be considered public safety grade by the equipment manufacturer.

12.28.3 All portable radio models shall be provided with a standard fast rate charger device.

12.28.4 All portable radio models shall be provided with an identified battery for operation.

12.28.5 All portable radio models shall be provided with an identified operating antenna.

12.28.6 Accessory equipment supported by the portable radio equipment manufacturer should be detailed to provide the County an understanding of options and costs.

12.28.7 The following tables provide the designated tiers of model units, equipment specifications, and the anticipated quantities being requested.

Quantity		Law Enforcement/EMA

1		**Multiband** (VHF – 700/800 MHz) P25 Trunking Portable
		• VHF - 136 MHz to 174 MHz
		• 700/800 – 762 MHz to 870 MHz (per FCC band plan)
		• 10.8 – 16.0 VDC
		• Weight ≤ 24 oz.
		• ± 1.5 ppm Frequency Stability
		• Channel Spacing – 12.5/15/20/25/30 kHz
		• Channel Increment – 2.5/6.25 kHz
		• ≥ 16 Zones, ≥16 Talk Groups per Zone, ≥ 500 channels
		• Top Display (1 X 8 character minimum)
		• Front Display (4 X 12 character minimum)
		• Operational from -30° to +60°C
		• Duty Cycle
		• 5% Transmit, 5% Receive, 90% STBY for 8 Hours
		• MIL-STD 810 C, D, E & F for Pressure, Temperature, Rain, Humidity, Salt Fog, Blowing Dust, Vibration, Shock
		• RF Power Output
		  ○ ≥ 5 W VHF
		  ○ ≥ 2.5 W 700/800 MHz
		• Conducted Emissions ≥ -75dBc
		• P25 Phase 1 Ready – Analog/Digital Operation
		• P25 Phase 2 TDMA Ready
		• 12.5 kHz selectivity ≥ -60dB
		• Digital Sensitivity (TIA/EIA 102) for 5% BER ≤ -119 dBm
		• Spurious & Image Rejection 80dB
		• Noise Canceling Internal Microphone Technology
		• ≥ 1 W Audio Output
		• Battery Life ≥ 10 hours
		• Listed by UL to the standards ANSI/TIA 4950-A
		• Single Key AES Encryption Ready
		• GPS Optional

Quantity		Law Enforcement/EMA
55		**High-tier** VHF Band P25 Trunking Portable • VHF – 136 MHz to 174 MHz (per FCC band plan) • 10.8 – 16.0 VDC • Weight ≤ 24 oz. • ± 1.5 ppm Frequency Stability • Channel Spacing – 12.5/20/25 kHz • Channel Increment – 2.5/6.25 kHz • ≥ 16 Zones, ≥16 Talk Groups per Zone, ≥ 500 channels • Top Display (1 X 8 character minimum) • Front Display (4 X 12 character minimum) • Operational from -30° to +60°C • Duty Cycle • 5% Transmit, 5% Receive, 90% STBY for 8 Hours • MIL-STD 810 C, D, E & F for Pressure, Temperature, Rain, Humidity, Salt Fog, Blowing Dust, Vibration, Shock • RF Power Output ≥ 5 W • Conducted Emissions ≥ -75dBc • P25 Phase 1 Ready – Analog/Digital Operation • P25 Phase 2 TDMA Ready • 12.5 kHz selectivity ≥ -60dB • Digital Sensitivity (TIA/EIA 102) for 5% BER ≤ -119 dBm • Spurious & Image Rejection 80dB • Noise Canceling Internal Microphone Technology • ≥ 1 W Audio Output • Battery Life ≥ 10 hours • Listed by UL to the standards ANSI/TIA 4950-A • Single Key AES Encryption Ready • GPS Optional

Quantity		Fire / EMS/EMA
160		**Mid-tier** VHF Band P25 Trunking Portable Radio • VHF – 136 MHz to 174 MHz (per FCC band plan) • 10.8 – 16.0 VDC • Weight ≤ 24 oz. • ± 1.5 ppm Frequency Stability • Channel Spacing – 12.5/20/25 kHz • Channel Increment – 2.5/6.25 kHz • ≥ 16 Zones, ≥16 Talk Groups per Zone, ≥ 500 channels • Top Display (1 X 8 character minimum) • Front Display (4 X 12 character minimum) • Operational from -30° to +60°C • Duty Cycle • 5% Transmit, 5% Receive, 90% STBY for 8 Hours • MIL-STD 810 C, D, E & F for Pressure, Temperature, Rain, Humidity, Salt Fog, Blowing Dust, Vibration, Shock • RF Power Output ≥ 5 W • Conducted Emissions ≥ -75dBc • P25 Phase 1 Ready – Analog/Digital Operation • P25 Phase 2 TDMA Ready • 12.5 kHz selectivity ≥ -60dB • Digital Sensitivity (TIA/EIA 102) for 5% BER ≤ -119 dBm • Spurious & Image Rejection 80dB • Noise Canceling Internal Microphone Technology • ≥ 1 W Audio Output • Battery Life ≥ 10 hours • Listed by UL to the standards ANSI/TIA 4950-A • Single Key AES Encryption Capable • GPS Optional

Quantity		Public Works/Health
20		**Low-Tier** VHF Band P25 Trunking Portable • VHF – 136 MHz to 174 MHz (per FCC band plan) • 10.8 – 16.0 VDC • Weight ≤ 24 oz. • ± 1.5 ppm Frequency Stability • Channel Spacing – 12.5/20/25 kHz • Channel Increment – 2.5/6.25 kHz • ≤ 4 Zones, ≤ 16 Talk Groups per Zone, ≤ 100 channels • Front Display (4 X 12 character minimum) • Operational from -30° to +60°C • Duty Cycle • 5% Transmit, 5% Receive, 90% STBY for 8 Hours • MIL-STD 810 C, D, E & F for Pressure, Temperature, Rain, Humidity, Salt Fog, Blowing Dust, Vibration, Shock • RF Power Output ≥ 5 W • Conducted Emissions ≥ -75dBc • P25 Phase 1 Ready – Analog/Digital Operation • P25 Phase 2 TDMA Ready • 12.5 kHz selectivity ≥ -60dB • Digital Sensitivity (TIA/EIA 102) for 5% BER ≤ -119 dBm • Spurious & Image Rejection 80dB • Noise Canceling Internal Microphone Technology • ≥ 1 W Audio Output • Battery Life ≥ 10 hours • GPS Optional

12.29. *New Control stations Standard P25 Phase 1&2 Capable*

12.29.1 The County has many fixed locations where control stations shall be employed.

12.29.2 Most control stations are anticipated to use the same model level mobile station radio used by that agency in the field.

12.29.3 Dispatch will have control stations that operate to provide backup communications in the event of console failure. These units will use the same model radio as the high tier mobile radio unit and equipped with a remote head and extended cable.

12.29.3.1 RF sections of the control stations will not be in dispatch – only control heads to eliminate possible interference. RF equipment will be in the associated equipment room.

12.29.3.2 Dispatch control stations will be equipped with desktop microphones and internal speakers.

12.29.3.3 When capable dispatch control stations should function integrated into the console system but must also operate independent of the radio console equipment in the event of console failure.

12.29.4 RF specifications for in-field control stations will be identical to the associated tier mobile unit.

12.29.5 All in-field control stations will consist of a dash mount radio, desk tray (power supply/speaker/stand) and desk microphone.

12.29.6 Antenna systems will be included in control station configurations consisting of connectors, cables, arrestor, coaxial cable, mount, and base station grade antenna.

12.29.7 The following is a table to indicate the location and quantity of each type of control/base station radio:

Quantity	Description	Location
2	High-tier VHF Band Backup Stations operated via control head	Emergency Communications Center
4	High-tier VHF Band Backup Stations operated via control head	Various County Locations
10	Mid-tier VHF Band Control Station operated via control head	Various County Locations
5	Low-tier VHF Band Control Station operated via control head	Various County Locations

12.30. *Vehicular Repeater System*

12.30.1 No digital vehicular repeater systems (DVRS) are intended to be used in daily operations on the Richland County system. However; the County may consider operating a system in an EMA vehicle or portable unit configuration.

12.30.2 These two units are anticipated to be programmed on separate licensed frequency pairs for low power vehicular repeater operation (MO3).

12.30.3 Units will be programmed to operate locally in P25 conventional mode on a repeated conventional frequency pair and relay communications into the P25 Conventional system.

12.30.4 Vendors should provide optional pricing for two configurations.

12.30.4.1 One standalone suitcase unit.

12.30.4.2 One vehicle unit.

12.30.5 All antennas and required cabling for operation shall be included.

12.30.6 Specifications:

a. Duty Cycle – Continuous

b. RF Connector – N-Type Female

c. TX – Programmable 1-4W

d. Maximum Spurious Output – -20dBm

e. RX – Sensitivity -115 dBm

f. Selectivity – 75dB

g. Intermodulation – 70 dB

h. Frequency Stability – ± 1.5ppm

i. Power – 13.8 VDC ± 20%, negative ground

j. Operating Temperature – -30°C to +60°C

k. Storage Temperature – -40°C to +85°C

l. Water and Dust Intrusion – IP54

END OF SECTION

13. Submittal and Signature Forms

13.1. *Proposal Forms*

Experience: List below a brief description of the organization submitting the Proposal's qualifications and experience. The description shall include: Company size, organization, legal status (corporation or partnership, etc.), major type of activity or areas of work, and its recent (past five years) experience in performing similar projects. Identify the individual(s) in your firm who are anticipated to be involved in key roles if your firm is selected and briefly explain that person's role and relevant background and experience.

References: Provide at least five references of recent clients that have completed a similar project. The reference must include the name, telephone number, address, and email address of a person who may be contacted and who has direct knowledge of your firm's capabilities and past performance. Also include a brief description of the project, including the start and completion dates

1	Client					
	Address					
	Contact					
	Phone Number			Email		
	Project Dates	Start		End		
	Description					
2	Client					
	Address					
	Contact					
	Phone Number			Email		
	Project Dates	Start		End		
	Description					

3	Client					
	Address					
	Contact					
	Phone Number			Email		
	Project Dates	Start			End	
	Description					
4	Client					
	Address					
	Contact					
	Phone Number			Email		
	Project Dates	Start			End	
	Description					
5	Client					
	Address					
	Contact					
	Phone Number			Email		
	Project Dates	Start			End	
	Description					

13.2. *Non-Debarment Clause*

Contractor hereby certifies that neither it nor any of its principal officers or officials has ever been suspended or debarred, for any reason whatsoever, from doing business or entering contractual relationships with any governmental entity. Contractor further agrees and certifies that this clause shall be included in any subcontract of this contract.

13.3. *Statement of Compliance*

Contractor has carefully reviewed Richland County's required contract language, as set forth in the Request for Proposal pertaining to termination of contract, change orders, gratuities and kickbacks, non-appropriation of funds, hold harmless/indemnification, ADA compliance, insurance requirements/proof of insurance, dispute resolutions, and non-debarment, and is in full compliance with all statements and requirements. This contract language is incorporated herein by specific reference as if set forth in full. Any statements set forth in this contract document that conflict with County's contract language are superseded by County's required contract language.

13.4. *Signature*

Proposal is to be signed only by persons authorized to enter into a contract with Richland County.

PROPOSER TYPED NAME		COMPANY NAME
PROPOSER'S SIGNATURE		DATE
COMPANY STREET ADDRESS		COMPANY CITY/STATE/ZIP

14. Appendix 1 – Price Matrix Document

A price matrix is included with this RFP as a separate file in MS Excel format. Vendors must include this completed pricing matrix in MS Excel format as part of their final proposals. Alternative methods of the pricing format may also be included; however, they would supplement and not replace the required pricing matrix. Failure to provide the completed pricing matrix will result in a deduction of points.

15. Appendix 2 - Richland County ASR Listed Tower Sites

The following table is tower structure information for Richland County. This information is from the FCC Antenna Structure Registration database but may not represent all available towers in the area. All parameters should be verified prior to use if any are considered for antenna locations as part of the new radio system.

6/4/2021 ASR Registration Search Results

ASR Registration Search

Registration Search Results

Displayed Results

PA = Pending Application(s)

Specified Search

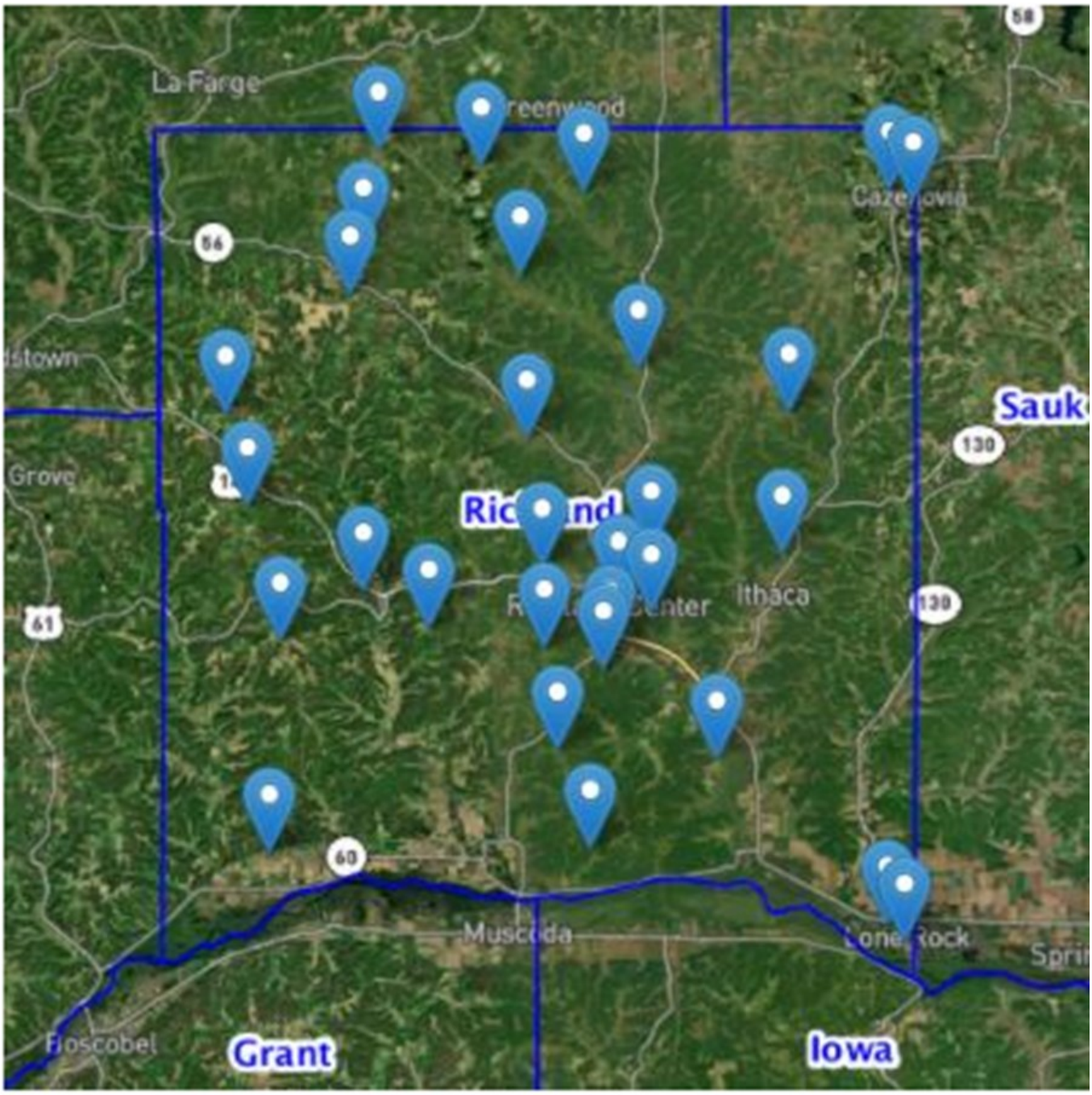
Structure State = **WISCONSIN**
Structure County = **RICHLAND**

	Registration Number	Status	File Number	Owner Name	Latitude/Longitude	Structure City/State	Overall Height Above Ground (AGL)
1	1000186	Constructed	A0925062	UNITED STATES CELLULAR CORPORATION	43-20-15.0N 090-22-41.0W	RICHLAND CENTER, WI	97.5
2	1003387	Constructed	A1060338	WISCONSIN RSA NO. 8 LIMITED PARTNERSHIP	43-21-35.6N 090-21-32.2W	RICHLAND CENTER, WI	130.7
3	1034924	Constructed	A1182798	WISCONSIN, STATE OF	43-29-54.0N 090-32-25.0W	ASHRIDGE, WI	98.1
4	1035400	Granted	A1186469	Wisconsin Power and Light Company	43-16-07.0N 090-25-02.5W	RICHLAND CENTER, WI	79.2
5	1050690	Constructed	A0937540	UNITED STATES CELLULAR CORPORATION	43-32-08.1N 090-27-55.0W	YUBA, WI	47.2
6	1054198	Granted	A0063721	RICHLAND CENTER FELLOWSHIP	43-18-51.0N 090-23-03.0W	RICHLAND CENTER, WI	152.4
7	1243602	Constructed	A1060321	WISCONSIN RSA NO. 8 LIMITED PARTNERSHIP	43-18-17.8N 090-23-16.7W	Richland Center, WI	49.9
8	1244050	Cancelled	A0586242	Fruit Broadcasting, LLC	43-20-13.1N 090-22-44.3W	Richland Center, WI	66.4
9	1255589	Constructed	A0937535	UNITED STATES CELLULAR CORPORATION	43-20-26.6N 090-32-20.5W	MUSCODA, WI	94.4
10	1256425	Constructed	A0972471	UNITED STATES CELLULAR CORPORATION	43-31-12.4N 090-11-39.4W	CAZENOVIA, WI	94.4
11	1257097	Constructed	A0626849	FRUIT BROADCASTING, LLC	43-18-55.4N 090-25-35.0W	RICHLAND CENTER, WI	106.4
12	1265016	Constructed	A0617990	Village of Lone Rock	43-10-50.3N 090-11-58.2W	Lone Rock, WI	50.9
13	1298241	Cancelled	A1133256	SBA Towers VI, LLC	43-21-07.9N 090-25-35.5W	Richland Center, WI	91.4
14	1299583	Constructed	A1054369	Cloud 1	43-31-25.9N 090-24-04.2W	Hillsboro, WI	92.9
15	1300397	Constructed	A1062671	Cloud 1	43-19-28.6N 090-29-55.7W	Richland Center, WI	92.9
16	1302404	Granted	A1104980	M3 Hilbert Towers, LLC	43-19-52.9N 090-21-32.2W	Richland Center, WI	77.7

17	1302650	Granted	A1104983	M3 Hilbert Towers, LLC	43-22-49.0N 090-36-43.7W	Richland Center, WI	74.6
18	1302652	Constructed	A1104984	M3 Hilbert Towers, LLC	43-21-29.9N 090-16-32.6W	Ithaca, WI	92.9
19	1302968	Constructed	A1104986	M3 Hilbert Towers, LLC	43-25-17.9N 090-37-36.4W	Richland Center, WI	77.7
20	1303491	Constructed	A1136179	M3 Hilbert Towers, LLC	43-15-50.9N 090-19-02.6W	Richland Center, WI	54.9
21	1308125	Constructed	A1166352	VBHV, LLC	43-11-17.6N 090-12-35.9W	Lone Rock, WI	47.2
22	1310721	Constructed	A1151702	Cloud 1	43-32-33.5N 090-31-46.3W	LaFarge, WI	93.0
23	1310722	Constructed	A1174292	M3 Hilbert Towers, LLC	43-13-22.6N 090-23-47.5W	Muscoda, WI	93.0
24	1310935	Constructed	A1167410	M3 Hilbert Towers, LLC	43-29-10.4N 090-26-28.9W	Richland Center, WI	93.0
25	1310937	Constructed	A1167418	M3 Hilbert Towers, LLC	43-28-35.9N 090-32-55.0W	Viola, WI	93.0
26	1311638	Constructed	A1180364	M3 Hilbert Towers, LLC	43-24-39.8N 090-26-12.3W	Richland Center, WI	93.0
27	1311751	Constructed	A1167404	M3 Hilbert Towers, LLC	43-31-30.0N 090-12-32.2W	Cazenovia, WI	93.0
28	1311997	Constructed	A1174307	M3 Hilbert Towers, LLC	43-26-33.0N 090-22-01.0W	Richland Center, WI	93.0
29	1312798	Constructed	A1174309	M3 Hilbert Towers, LLC	43-19-06.0N 090-35-30.7W	Blue River, WI	71.3
30	1314193	Constructed	A1180414	M3 Hilbert Towers, LLC	43-13-16.1N 090-35-55.6W	Blue River, WI	77.4
31	1315052	Constructed	A1180379	M3 Hilbert Towers, LLC	43-25-22.9N 090-16-16.5W	Cazenovia, WI	92.7

CLOSE WINDOW

16. Appendix 3 – Tower Structure Map



17. Appendix 4 – Delivered Audio Quality (DAQ)

The table below represents performance descriptions of a radio communication.

DAQ Delivered Audio Quality	Subjective Performance Description
1	Unusable; speech present but unreadable.
2	Understandable with considerable effort. Frequent repetition due to noise/distortion.
3	Speech understandable with slight effort. Occasional repetition due to noise/distortion.
3.4	Speech understandable with repetition only rarely required. Some noise/distortion.
4	Speech easily understood. Occasional noise/distortion.
4.5	Speech easily understood. Infrequent noise/distortion.
5	Speech easily understood.

18. Appendix 5 – Adjacent County and Regional Channels

The table below represents adjacent County frequencies that may be programmed into existing County field terminal units to provide interoperable communications with these agencies any new system capabilities should consider supporting and improving interoperability communications.

Organization	Neighbor	Agency	Radio Band	Frequency Information	Notes
Richland County	Sauk County WI	Sheriff	VHF	155.700 (82.5)	
		Fire	VHF	151.250 (97.4)	
		Paging	VHF	155.775 (82.5)	
Richland County	Vernon County WI	Sheriff	VHF	154.995 (167.9)	
		Fire	VHF	154.860 (136.5)	
		Paging	VHF	154.175 (167.9)	
Richland County	Crawford County WI	Sheriff	VHF	155.685 (152)	
		Fire	VHF	154.310 (151.4)	
		EMS	VHF	155.655 (151.4)	
Richland County	Grant County WI	Sheriff	VHF	155.865 (123.0)	
		Fire	VHF	155.745 (91.5)	
		Paging	VHF	155.925 (CSQ)	
Richland County	Iowa County WI	Sheriff	VHF	155.7225 (BDC NAC)	
		Fire/Paging	VHF	154.385 (77.0)	
Richland County	State of Wisconsin	State Patrol	WISCOM	VHF Trunked	

The table below represents regional communications channels that may be used or monitored by Richland County units.

State Interoperability Plan

VHF Plan

Frequency	Input	License	Type	Tone	Alpha Tag	Description	Mode	Tag
155.37000		KA6570	M	146.2 PL	POINT	Point to Point	FMN	Interop
151.28000	153.84500	WNPG812	M	136.5 PL	MARC1	MARC1	FMN	Interop
151.28000		WNPG812	M	136.5 PL	MARC2	MARC2	FMN	Interop
154.01000		KO2099	M	71.9 PL	MARC3	MARC3	FMN	Interop
154.13000		KO2099	M	82.5 PL	MARC4	MARC4	FMN	Interop
156.00000		KGT483	M	136.5 PL	WEM CAR	WEM Car to Car	FMN	Interop
155.40000		KH4762	M		EMS A	EMS A	FMN	Interop
155.34000		KH4762	M		EMS B	EMS B	FMN	Interop
155.28000		KH4762	M	156 DPL	EMS C	EMS C	FMN	Interop
154.26500		KO2099	M	210.7 PL	IFERN	IFERN - MABAS Paging/Dispatch	FMN	Interop
153.83000		KO2099	M	69.3 PL	FG RED	Fireground Red	FMN	Interop
154.28000		KO2099	M	74.4 PL	FG WHITE	Fireground White	FMN	Interop
154.29500		KO2099	M	85.4 PL	FG BLUE	Fireground Blue	FMN	Interop
153.83750		KO2099	M	91.5 PL	FG GOLD	Fireground Gold	FMN	Interop
154.27250		KO2099	M	94.8 PL	FG BLACK	Fireground Black	FMN	Interop
154.28750		KO2099	M	136.5 PL	FG GRAY	Fireground Gray	FMN	Interop
154.30250		KO2099	M	67.0 PL	IFERN2	IFERN2 - Alternate MABAS Paging/Dispatch	FMN	Interop
151.13750		KO2099	M	293 NAC	VTAC11DG	WI VHF Tactical 11 (P25)	P25	Interop
154.45250		KO2099	M	293 NAC	VTAC12DG	WI VHF Tactical 12 (P25)	P25	Interop
158.73750		KO2099	M	293 NAC	VTAC13DG	WI VHF Tactical 13 (P25)	P25	Interop
159.47250		KO2099	M	293 NAC	VTAC14DG	WI VHF Tactical 14 (P25)	P25	Interop
151.13750	159.47250	KO2099	M	293 NAC	VTAC36DG	WI VHF Tac Repeater 36 (P25)	P25	Interop

800 MHz Plan

Frequency	Input	License	Type	Tone	Alpha Tag	Description	Mode	Tag
851.45000		WQJX638	M	156.7 PL	8TACRED	8TACRED - WI 800 Red	FM	Interop
851.95000		WQJX638	M	156.7 PL	8TACWHITE	8TACWHITE - WI 800 White	FM	Interop
852.45000		WQJX638	M	156.7 PL	8TACBLUE	8TACBLUE - WI 800 Blue	FM	Interop
852.95000		WQJX638	M	156.7 PL	8TACGOLD	8TACGOLD - WI 800 Gold	FM	Interop
853.45000		WQJX638	M	156.7 PL	8TACBLACK	8TACBLACK - WI 800 Black	FM	Interop
853.95000		WQJX638	M	156.7 PL	8TACGRAY	8TACGRAY - WI 800 Gray	FM	Interop

The tables below represent National Mutual Aid channels that may be used or monitored by Richland County units.

Non-Federal VHF National Interoperability Channels VHF High Band				
Description	**Channel Name**	**Mobile Receive Freq.**	**Mobile Transmit Freq.**	**CTCSS Tone**
Calling	VCALL10	155.7525	155.7525	CSQ / 156.7 (5A) ±
Tactical	VTAC11 *	151.1375	151.1375	CSQ / 156.7 (5A) ±
Tactical	VTAC12 *	154.4525	154.4525	CSQ / 156.7 (5A) ±
Tactical	VTAC13	158.7375	158.7375	CSQ / 156.7 (5A) ±
Tactical	VTAC14	159.4725	159.4725	CSQ /156.7 (5A) ±
Tac Rpt	VTAC33 * •	159.4725	151.1375	CSQ / 136.5 (4Z)
Tac Rpt	VTAC34 * •	158.7375	154.4525	CSQ / 136.5 (4Z)
Tac Rpt	VTAC35 •	159.4725	158.7375	CSQ / 136.5 (4Z)
Tac Rpt	VTAC36 * •	151.1375	159.4725	CSQ / 136.5 (4Z)
Tac Rpt	VTAC37 * •	154.4525	158.7375	CSQ / 136.5 (4Z)
Tac Rpt	VTAC38 •	158.7375	159.4725	CSQ / 136.5 (4Z)

*VTAC11-12, VTAC33-34, and VTAC36-37 may not be used in Puerto Rico or the USVI.
±Default operation should be carrier squelch receive, CTCSS transmit. If the user can enable/disable without re-programming the radio, the indicated CTCSS tone also could be programmed for receive, and the user instructed how and when to enable/disable.
• VTAC33-38 recommended for deployable tactical repeater use only (FCC Station Class FB2T).
• VTAC36-38 are preferred; VTAC33-35 should be used only when necessary due to interference.
Only narrowband emissions are authorized.

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VHF Public Safety Mutual Aid and Common Channels				
Frequency (MHz)	**Usage**	**Wideband ID**	**Narrowband ID**	**Note**
155.1600	Search and Rescue Common	SAR WFM	SAR NFM	Not designated by FCC; availability varies.
154.2650 mobile	Fire Mutual Aid	VFIRE22W	VFIRE22	Not available in Puerto Rico and the U.S. Virgin Islands.
154.2725 *	Fire Mutual Aid		VFIRE24	
154.2800 base/mobile	Fire Mutual Aid	VFIRE21W	VFIRE21	
154.2875			VFIRE25	
154.2950 mobile	Fire Mutual Aid	VFIRE23W	VFIRE23	
154.3025			VFIRE26	
155.3400 base/mobile	EMS Mutual Aid	VMED28W	VMED28	May be designated for EMS Mutual Aid.
155.3475			VMED29	May be designated for EMS Mutual Aid.
155.4750 base/mobile	Law Enforcement Mutual Aid	VLAW31W	VLAW31	
155.4825	Law Enforcement Mutual Aid		VLAW32	

Rules for use of these channels are contained in 47 CFR 90.20 and NTIA Manual Section 4.3.11 & 7.3.6.
See also "Non-Federal VHF National Interoperability Channels" and "Non-Federal VHF Inland Interoperability Channels" on page 26 - 28 of this document.

Non-Federal 800 MHz National Mutual Aid Repeater Channels			
Description	**Ch. Name**	**Mobile RX (MHz)***	**Mobile TX (MHz)***
Calling	8CALL90	851.0125 (866.0125)	806.0125 (821.0125)
Calling – Direct	8CALL90D	851.0125 (866.0125)	851.0125 (866.0125)
Tactical	8TAC91	851.5125 (866.5125)	806.5125 (821.5125)
Tactical – Direct	8TAC91D	851.5125 (866.5125)	851.5125 (866.5125)
Tactical	8TAC92	852.0125 (867.0125)	807.0125 (822.0125)
Tactical – Direct	8TAC92D	852.0125 (867.0125)	852.0125 (867.0125)
Tactical	8TAC93	852.5125 (867.5125)	807.5125 (822.5125)
Tactical – Direct	8TAC93D	852.5125 (867.5125)	852.5125 (867.5125)
Tactical	8TAC94	853.0125 (868.0125)	808.0125 (823.0125)
Tactical – Direct	8TAC94D	853.0125 (868.0125)	853.0125 (868.0125)
Default operation should be carrier squelch receive, CTCSS 156.7(5A) transmit. If the user can enable/disable CTCSS without reprogramming the radio, the indicated CTCSS tone could also be programmed for receive, and the user instructed how and when to enable/disable. *The frequency in parenthesis, which is 15 MHz higher, is the frequency used before rebanding - channel names were ICALL, ITAC1 - ITAC4. Wideband FM 20K0F3E before and after rebanding.			

700 MHz Interoperability Channels				
FCC Channel (Subscriber Load)		Transmit and Receive Frequencies	Primary Use	Channel Name
Receive Ch.	Transmit Ch.			
23-24	983-984	799.14375	General Public Safety	7TAC51
	23-24	769.14375		7TAC51D
39-40	999-1000	799.24375	Calling Channel	7CALL50
	39-40	769.24375		7CALL50D
63-64	1023-1024	799.39375	EMS	7MED65
	63-64	769.39375		7MED65D
79-80	1039-1040	799.49375	EMS	7MED66
	79-80	769.49375		7MED66D
103-104	1063-1064	799.64375	General Public Safety	7TAC52
	103-104	769.64375		7TAC52D
119-120	1079-1080	799.74375	General Public Safety	7TAC55
	119-120	769.74375		7TAC55D
143-144	1103-1104	799.89375	Fire	7FIRE63
	143-144	769.89375		7FIRE63D
159-160	1119-1120	799.99375	Fire	7FIRE64
	159-160	769.99375		7FIRE64D
183-184	1143-1144	800.14375	General Public Safety	7TAC53
	183-184	770.14375		7TAC53D
199-200	1159-1160	800.24375	General Public Safety	7TAC56
	199-200	770.24375		7TAC56D
223-224	1183-1184	800.39375	Law Enforcement	7LAW61
	223-224	770.39375		7LAW61D

19. Appendix 6 – Estimated Field Unit Distribution Summary

Subscriber Agency	Agency Type	Portable Unit	Mobile Unit	Control Station	Pager	Radio Type	County	Dispatch Via
Richland Police Department	Law	17	3	1	0	VHF	Richland County	Richland County
Richland County Sheriff's Department	Law	21	19	0	0	VHF/P25	Richland County	Richland County
Viola Police Department	Law	4	1	1	1	VHF/P25	Richland County	Richland County
Blue River Fire & Rescue	Fire/EMS	12	6	1	36	VHF	Richland County	Richland County
La Farge Fire Department	Fire	25	10	1	40	VHF/P25	Richland County	Richland County
Richland Center Fire Department	Fire	39	31	1	88	VHF/P25	Richland County	Richland County
Viola Fire Department	Fire	20	9	1	42	VHF/P25	Richland County	Richland County
Yuba Fire Department	Fire	0	12	0	17	VHF	Richland County	Richland County
Ithaca Medical First Responders	EMS	9	1	0	9	VHF	Richland County	Richland County
Richland County Ambulance Service	EMS	31	7	0	24	VHF/P25	Richland County	Richland County
Viola EMS	EMS	2	2	0	0	VHF	Richland County	Richland County
Lone Rock Rescue	EMS	3	2	0	14	VHF/P25	Richland County	Richland County
Richland County EMA	EMA	5	2	1	1	VHF/P25	Richland County	Richland County
							Richland County	Richland County
Richland County Highway	DPW	15	48	4	0	VHF	Richland County	Richland County
	TOTALS	203	153	11			Total Radios	367
							Total Pagers	272

20. Appendix 7 – Building List for Voice Testing

A building test list will be developed by the County in response to coverage maps provided by the successful vendor at Detailed Design Review. The list will contain a representation of well-spaced facilities throughout the County and being between 50 – 100 buildings total. Emphasize common building for emergency response agency operation and response should be anticipated.

21. Appendix 8 – Richland County RF Border