ERIE COUNTY
REQUEST FOR PROPOSAL (RFP)
TO PROVIDE TRUNKED RADIO SYSTEM

RFP#: 2026-018VF

February 5, 2026

DEPARTMENT OF HOMELAND SECURITY & EMERGENCY SERVICES

ERIE COUNTY PUBLIC SAFETY CAMPUS

45 ELM STREET

BUFFALO, NEW YORK 14203

COUNTY OF ERIE
REQUEST FOR PROPOSALS

1. Project Introduction

1.1 Project Objective

Project Name: Erie County Public Safety Trunked Network Project

Public safety and public service agencies of Erie County, New York are pursuing upgrades to their public safety communications systems and are seeking a detailed proposal to design, build, implement, test and commission into service a countywide land mobile radio (LMR) system with a public safety-grade backhaul network. The collective end user agencies will be represented by the Erie County Department of Homeland Security, hereafter referred to as the "County". The resulting system, hereafter referred to as the Erie County Trunked Radio Network ("ECTRN") will be defined per the specifications detailed in this RFP. The ECTRN solution will be a UHF frequency band Project 25 Phase 2 trunked network that will integrate with the Niagara County Motorola P25 Phase 1 core network and it's backhaul network to achieve a geo-redundant network core between Niagara and the Erie County system.

It is the county's objective that the resulting system is to be capable of supporting the communications needs of all public safety agencies within the County (cities, towns, villages). While some public safety agencies within the County may continue to operate on their own networks, it is anticipated that many of these local agencies will transition to the new system. When doing so, these non-county agencies will fund their unique requirements for user equipment and, if necessary, additional infrastructure that would be integrated with the County's system. The ultimate contract for this solicitation will then enable these separate entities to leverage the terms of the County's contract. The first phase of the project will be to build out multiple simulcast cells that support the County operations, and the City of Buffalo. Upon completion of that phase, additional local agencies may transition to the network when practical. The phased approach will account for the availability of the additional licensed frequencies as necessary, whereby only after users have successfully transitioned to the new trunked network will the licensed frequencies be added to the network.

Existing fire paging systems must remain operational throughout the transition to the new system and following the transition. Additionally, other existing analog systems will also remain in place to support interoperability and other users. Some of these systems utilize additional sites that are not anticipated to be part of ECTRN. These additional sites (to be identified) must still be maintained and incorporated into the backhaul, MPLS and NMS networks as appropriate.

1.1.1 Dispatch

Erie County, and the City of Buffalo agencies utilize the following dispatch facilities listed in Table 1. Other dispatch centers may be integrated by localities in Erie County in the future.

Dispatch Center	Console Type and Quantity	Location
Erie County Public Safety Campus	26 MCC7500	45 Elm St, Buffalo, NY 14203
Erie County Backup	18 MCC7500	3359 Broadway, Cheektowaga, NY 14227

Table 1: Erie County Dispatch Centers

1.1.2 Backhaul

The County currently operates an extensive microwave backhaul network to support its current operations. A separate RFP will be issued to request proposals for an upgraded microwave network. The infrastructure provided via this RFP must integrate with the existing and/or upgraded backhaul network.

2. General Provisions

Statement of Rights: **UNDERSTANDINGS**

Please take notice, by submission of a proposal in response to this request for proposals, the proposer agrees to and understands:

- that any proposal, attachments, additional information, etc. submitted pursuant to this Request for Proposals constitute merely a suggestion to negotiate with Erie County of Erie and is not a bid under Section 103 of the New York State General Municipal Law;
- submission of a proposal, attachments, and additional information shall not entitle the proposer to enter into an agreement with Erie County of Erie for the required services;
- by submitting a proposal, the proposer agrees and understands that Erie County of Erie is not obligated to respond to the proposal, nor is it legally bound in any manner whatsoever by submission of same;
- that any and all counter-proposals, negotiations or any communications received by a proposing entity, its officers, employees or agents from Erie County, its elected officials, officers, employees or agents, shall not be binding against Erie County of Erie, its elected officials, officers, employees or agents unless and until a formal written agreement for the services sought by this RFP is duly executed by both parties and approved by the Erie County Legislature, the Erie County Fiscal Stability Authority, and the Office of the Erie County Attorney.
- In addition to the foregoing, by submitting a proposal, the proposer also understands and agrees that Erie County of Erie reserves the right, and may at its sole discretion exercise, the following rights and options with respect to this Request for Proposals:
  - To reject any or all proposals
  - To issue amendments to this RFP
  - To issue additional solicitations for proposals
  - To waive any irregularities in proposals received after notification to proposers affected;
  - To select any proposal as the basis for negotiations of a contract, and to negotiate with one or more of the proposers for amendments or other modifications to their proposals;
  - To conduct investigations with respect to the qualifications of each proposer;
  - To exercise its discretion and apply its judgment with respect to any aspect of this RFP, the evaluation of proposals, and the negotiations and award of any contract;
  - To enter into an agreement for only portions (or not to enter into an agreement for any) of the services contemplated by the proposals with one or more of the proposers;
  - To select the proposal that best satisfies the interests of Erie County and not necessarily on the basis of price or any other single factor;
  - To interview the proposer(s);
  - To request or obtain additional information Erie County deems necessary to determine the ability of the proposer;
  - To modify dates;

- All proposals prepared in response to this RFP are at the sole expense of the proposer, and with the express understanding that there will be no claim, whatsoever, for reimbursement from Erie County for the expenses of preparation. Erie County assumes no responsibility or liability of any kind for costs incurred in the preparation or submission of any proposal;
- While this is an RFP and not a bid, Erie County reserves the right to apply the case law under General Municipal Law § 103 regarding bidder responsibility in determining whether a proposer is a responsible vendor for the purpose of this RFP process; and
- Erie County is not responsible for any internal or external delivery delays which may cause any proposal to arrive beyond the stated deadline. To be considered, proposals MUST arrive at the place specified herein and be time-stamped prior to the deadline.
- All proposals submitted become the RFP Issuer's property and will not be returned to the proposers.
- All consultants should understand that Erie County is committed to an open, fair and transparent selection process. All RFP submissions will be reviewed, objectively scored and ranked. Shortlisted firms will be interviewed prior to recommendation for selection.
- The highest-ranking firm after scoring and interviews will be recommended to the Erie County Legislature for authorization to enter into contract. Scores and ranking of all firms will be provided to the Legislature and the results will at that time become public record.
- Proposing firms should understand that to provide for this open and transparent process, more time will be required. The timeframe from advertisement to contract execution may be up to six months. Consultants should consider this when scheduling staff time and anticipating project commencement.
- Firms are encouraged to include Certified Minority and Women Owned Business Enterprises (MBE/WBE) in their teams in order to meet Erie County's goals of 15% MBE and 5% WBE participation. Certified MBE/WBE proposers should include the Erie County certification letter with the proposal.
- If proposer is a Veteran Owned Business, proposer should include letter indicating company is 51% or more Veteran-owned.

Contract

After selection of the successful proposer, a formal written contract will be prepared by County of Erie and will not be binding until signed by both parties and, if necessary, approved by the Erie County Legislature, the Erie County Fiscal Stability Authority and the Office of Erie County Attorney. NO RIGHTS SHALL ACCRUE TO ANY PROPOSER BY THE FACT THAT A PROPOSAL HAS BEEN SELECTED BY ERIE COUNTY FOR SUBMISSION TO THE ERIE COUNTY LEGISLATURE AND/OR THE ERIE COUNTY FISCAL STABILITY AUTHORITY FOR APPROVAL. THE APPROVAL OF SAID LEGISLATURE AND/OR AUTHORITY MAY BE NECESSARY BEFORE A VALID AND BINDING CONTRACT MAY BE EXECUTED BY ERIE COUNTY.

The term of the contract shall be for a three (3) year period commencing approximately July 30th, 2026, and terminating July 29th, 2029. Erie County, in its sole discretion, may extend the agreement beyond its initial term for up to two (2) additional year periods at the same prices and conditions.

Indemnification and Insurance

The proposer accepts and agrees that language in substantially the following form will be included in the contract between the proposer and Erie County:

"In addition to, and not in limitation of the insurance requirements contained herein the Consultant agrees:

(a) that except for the amount, if any, of damage contributed to, caused by or resulting from the negligence of Erie County, the Consultant shall indemnify and hold harmless Erie County, its officers, employees and agents from and against any and all liability, damage, claims, demands, costs, judgments, fees, attorneys' fees or loss arising directly or indirectly out of the acts or omissions hereunder by the Consultant or third parties under the direction or control of the Consultant; and

(b) to provide defense for and defend, at its sole expense, any and all claims, demands or causes of action directly or indirectly arising out of this Agreement and to bear all other costs and expenses related thereto. Upon execution of any contract between the proposer and Erie County, the proposer will be required to provide proof of the insurance coverage described in **Schedule "B"**. Insurance coverage in amount and form shall not be deemed acceptable until approved by Erie County Attorney.

Intellectual Property Rights

The proposer accepts and agrees that language in substantially the following form will be included in the contract between the proposer and Erie County:

All deliverables created under this Agreement by the Consultant are to be considered "works made for hire". If any of the deliverables do not qualify as "works made for hire", the Consultant hereby assigns to Erie County all right, title and interest (including ownership of copyright) in such deliverables and such assignment allows Erie County to obtain in its name copyrights, registrations and similar protections which may be available. The Consultant agrees to assist Erie County, if required, in perfecting these rights. The Consultant shall provide Erie County with at least one copy of each deliverable.

The Consultant agrees to indemnify and hold harmless Erie County for all damages, liabilities, losses and expenses arising out of any claim that a deliverable infringes upon an intellectual property right of a third party. If such a claim is made, or appears likely to be made, the Consultant agrees to enable Erie County's continued use of the deliverable, or to modify or replace it. If Erie County determines that none of these alternatives is reasonably available, the deliverable will be returned.

All records compiled by the Consultant in completing the work described in this Agreement, including but not limited to written reports, source codes, studies, drawings, blueprints, negatives of photographs, computer printouts, graphs, charts, plans, specifications and all other similar recorded data, shall become and remain the property of Erie County. The Consultant may retain copies of such records for its own use.

Non-Collusion

The proposer, by signing the proposal, does hereby warrant and represent that any ensuing agreement has not been solicited, secured or prepared directly or indirectly, in a manner contrary to the laws of the State of New York and Erie County of Erie, and that said laws have not been violated and shall not be violated as they relate to the procurement or the performance of the agreement by any conduct, including the paying or the giving of any fee, commission, compensation, gift, gratuity or consideration of any kind, directly or indirectly, to any County employee, officer or official.

Conflict of Interest

All proposers must disclose with their proposals the name of any officer, director or agent who is also an employee of Erie County of Erie. Further, all proposers must disclose the name of any County employee who owns, directly or indirectly, an interest of ten percent or more in the firm or any of its subsidiaries or affiliates.

There shall be no conflicts in existence during the term of any contract with Erie County. The existence of a conflict shall be grounds for termination of a contract.

Compliance with Laws

By submitting a proposal, the proposer represents and warrants that it is familiar with all federal, state and local laws and regulations and will conform to said laws and regulations. The preparation of proposals, selection of proposers and the award of contracts are subject to provisions of all Federal, State and County laws, rules and regulations.

Compliance with Laws

The New York State Freedom of Information Law as set forth in Public Officers Law, Article 6, Sections 84 et seq., mandates public access to government records. However, proposals submitted in response to this RFP may contain technical, financial background or other data, public disclosure of which could cause substantial injury to the proposer's competitive position or constitute a trade secret. Proposers who have a good faith belief that information submitted in their proposals is protected from disclosure under the New York Freedom of Information Law shall:

a) insert the following notice in the front of its proposal:

"NOTICE"

The data on pages ___ of this proposal identified by an asterisk (*) contains technical or financial information constituting trade secrets or information the disclosure of which would result in substantial injury to the proposer's competitive position.

The proposer requests that such information be used only for the evaluation of the proposal, but understands that any disclosure will be limited to the extent that Erie County considers proper under the law. If Erie County enters into an agreement with this proposer, Erie County shall have the right to use or disclose such information as provided in the agreement, unless otherwise obligated by law."

And

b) clearly identify the pages of the proposals containing such information by typing in bold face on the top of each page **" * THE PROPOSER BELIEVES THAT THIS INFORMATION IS PROTECTED FROM DISCLOSURE UNDER THE STATE FREEDOM OF INFORMATION LAW."**

Erie County assumes no liability for disclosure of information so identified, provided that Erie County has made good faith legal determination that the information is not protected from disclosure under applicable law or where disclosure is required to comply with an order or judgment of a court of competent jurisdiction.

The contents of the proposal which is accepted by Erie County, except portions "Protected from Disclosure", may become part of any agreement resulting from this RFP.

Equal Pay Certification

During the term of this Contract, the Consultant shall comply with Executive Order13 (2014), and the Consultant shall make such records available, upon request, to Erie County's Division of Equal

Employment Opportunity for review. Erie County shall have the right, upon reasonable notice and at reasonable times, to inspect the books and records of the Consultant, its offices and facilities, for the purpose of verifying information supplied in the Erie County Equal Pay Certification (**Schedule "C"**) and for any other purpose reasonably related to confirming the Consultant's compliance with Erie County Executive Order No. 13 (2014). Violation of the provisions of Executive Order 13 (2014), which is attached hereto and made a part hereof, can constitute grounds for the immediate termination of this contract and may constitute grounds for determining that a bidder is not qualified to participate in future county contracts.

EFFECTIVE PERIOD OF PROPOSALS

All proposals must state the period for which the proposal shall remain in effect (i.e. how much time does Erie County have to accept or reject the proposal under the terms proposed). Such period shall not be less than 180 days from the proposal date.

2.1 Schedule of Events

The following is a schedule of events concerning the proposal process. Erie County reserves the right to adjust the below schedule as needed in the best interest of Erie County:

Event	Date
Release of RFP	02/05/2026
Pre-proposal meeting (week of)	03/09/2026
Deadline for questions	03/20/2026
Answers to questions posted	03/27/2026
Proposals Due by (3:00pm EST)	05/04/2026
Proposal Opening	05/05/2026

Registration

All firms wishing to participate in this process must register with Jerry Whittington & Kevin Hughes in the Erie County Department of Homeland Security & Emergency Services- Emergency Preparedness at communications@erie.gov. All further information including addendums and contact from Erie County will be sent electronically.

Questions

Any requests for RFP interpretations or clarifications shall be made by March 20th, 2025 via e-mail to communications@erie.gov. No requests for oral interpretations via telephone will be accepted. A single response to all questions will be made as outlined in the schedule. NO COMMUNICATIONS OF ANY KIND WILL BE BINDING AGAINST ERIE COUNTY, EXCEPT FOR THE FORMAL WRITTEN RESPONSES TO ANY REQUEST FOR CLARIFICATION.

2.2 Oral Presentation

The County anticipates inviting and reserves the right to invite qualifying Respondents for oral presentations.

2.3 Submission Requirements

Respondents shall submit the following documents in response to this RFP:

- Cover Letter: Proposals shall contain the following in a cover letter:
  - Identification of Respondent, including name, address and telephone number.
  - Acknowledgment of receipt of all RFP addenda, if any.
  - Name, title, address, telephone number and email address of Respondent's contact person during the proposal evaluation period.
  - A statement to the effect that the proposal shall remain valid for a period of not less than 180 days from the date of submittal.
  - Signature of a person authorized to bind Respondent to the terms of the proposal; and
  - Identification of proposed subcontractors, including legal company name, and contact person's name, address, phone number. Working relationship between Respondent and subcontractors, if applicable.
- Technical Proposal
  - Written response to Technical Response/Work Plan Description (See Technical Response/Work Plan Description Instructions).
  - Completed ECTRN Compliance Matrix (Excel File).
- Cost
  - Completed ECTRN Cost Proposal Sheet (Excel File).
  - Include Milestone Payment Percentages.
- Additional Required Submissions and Forms
  - Appendix A: Compliance Matrix.xlsx
  - Appendix B: Cost Proposal Sheet.xlsx
  - Appendix C: Schedule A: Proposer Certificate
  - Appendix D: Schedule B: Standard Insurance Provisions
  - Appendix E: Equal Pay Certification
  - Appendix F: MBE\WBE Certification

2.4 Compliance Matrix Instructions

Response to the technical and statement of work (SOW) requirements shall be comprehensive and shall be submitted within the Microsoft Excel file named *ECTRN Compliance Matrix*.

When completing the Compliance Matrix, the Respondent shall use a response of "C," "N," or "A" in the designated spreadsheet column for each numbered line item. The respective interpretation of this notation is as follows:

- A response of "C," or "Compliant" means that Respondent's ECTRN offering fully meets the stated requirement and that the Contractor will meet its obligations with no exceptions (for the requirements of this section).
- A response of "N," or "Non-Compliant" means that Respondent's ECTRN does not meet the required performance criteria.
- A response of "A," or "Alternative" means that the Respondent proposes an alternative solution or approach that the Respondent deems sufficient in fulfilling the stated performance

requirement. The Respondent is required to provide justification that the alternative meets the stated performance criteria.

The Compliance Matrix shall mainly be used to indicate a response of “C,” “N,” or “A.” The *Comments* column should only be used to provide brief responses to qualify an alternative approach or an unmet requirement. In sections that require responses to individual requirements, the Respondent shall use multiple rows to address each requirement that requires an individual response. In such cases, the Respondent shall populate the individual requirement's text in the column entitled “Requirement Text.” For example, if a Respondent complies with all requirements in a section other than one particular requirement, the Respondent will create two lines for that section. The first line includes the one requirement that is not in compliance as the “Requirement Text,” an “N” for non-compliance, and the Respondent's comments regarding the unmet requirement. The second line will use “All other requirements” in the Requirement Text column and a “C.” Other detailed written responses describing the solution and services must be submitted as part of the response to **Technical Response/Work Plan Description** which assigns Respondent specific locations to describe specific portions of the solution and services.

2.5 Definition of Terms

ECTRN: The term **ECTRN**, unless further specified, in this RFP shall apply to all subsystems, components, software, features and performance criteria prescribe in this RFP including:

- Network Controller
- Simulcast Radio Access Layers
- Dispatch Console Subsystem
- Network Management Systems
- Backhaul Subsystem (to be procured separately)
- Physical Site Infrastructure

Respondent or Proposal: Statements that begin with or contain "the Respondent" or "Proposal" define items that must be included in the Proposal as a part of the Respondent’s response.

Contractor: Statements that begin with or contain "the Contractor" typically define criteria for services that must be completed by the selected Contractor following contract award.

3. Respondent Experience

The Respondent and its subcontractors shall have extensive experience with the scope of services outlined in this RFP including, but not limited to, designing, deploying, installing, transitioning to, and maintaining mission critical land mobile radio (LMR) systems of similar scope and size.

3.1 Team Experience and Qualifications

Describe your firm’s organizational chart, identify who will have overall responsibility for the work, and include the lines of authority between team members up to this senior level.

Respondents shall identify names, positions, roles and responsibilities, and resumes of key project personnel (prime and subcontractor) that will be assigned to the proposed project.

Resumes shall:

Demonstrate experience and qualifications of each proposed key personnel to be assigned to the project including, but not limited to, educational background, personnel's role in supporting projects of similar scope, and other relevant certifications or career highlights.

Indicate the key personnel's tenure with the corporation.

Indicate whether any proposed key personnel are subcontractors to the primary Respondent.

Include references for the Project Manager and Lead System Engineer/Integrator.

Include a statement that key personnel will be available to the extent proposed for the duration of the project acknowledging that no person designated as "key" to the project shall be removed or replaced without the prior written concurrence of the County.

3.2 Product and Subcontractor Working Experience

Respondents shall identify major subsystems or subcontractors it is proposing with which it does not have prior experience.

4. General System and Contractor Requirements

4.1 General Project Requirements

The Contractor shall provide a turnkey solution and services to deliver a trunked simulcast radio system solution consisting of all of the services, hardware, equipment, devices, parts, materials, goods, software, firmware, data, physical and network infrastructure, deliverables, and other work necessary for a fully functional and operating system.

The complete ECTRN solution shall replace several County existing legacy systems and components of the microwave network where specified and integrate existing systems where specified, with County and local jurisdiction agency transition occurring in a phased approach. The ECTRN solution shall integrate with the Niagara County Motorola P25 Phase 1 core network and it's backhaul network to achieve a geo-redundant network core between Niagara and the Erie County system.

The construction, procurement and installation services included in the ECTRN shall be performed with the Contractor's best skill and judgment, in a good and workmanlike manner and shall otherwise be consistent with and in compliance with the ECTRN specifications.

All equipment furnished by the Contractor under this contract shall be new, meet the requirements of this specification and the manufacturers' published specifications, be in operable condition at the time of delivery, reflect high quality workmanship throughout, and be suitable for the intended purposes delineated herein.

The County assumes that the Contractor is familiar with the County's current system and equipment and is encouraged to make use of or upgrade as necessary, whatever existing equipment that is in good working order and can feasibly be used to deploy the ECTRN solution in order to save costs. The existing equipment may include, but not be limited to base station/repeaters, RF combining and receive equipment, antennas, transmission lines, routers and switches, and core equipment.

The Contractor is solely responsible for planning, designing, developing, constructing, supplying, fabricating, installing, testing, commissioning, deploying, and transitioning the ECTRN, following approval by the County via a Detailed Design Review.

The Contractor shall be solely responsible for ensuring that the ECTRN and its components comply with all local, State, and federal Environmental laws, codes, or statutes.

The RF Radio System (RFRS) shall meet the technical performance and reliability parameters prescribed in the RFP.

The Contractor shall be responsible for spearheading and coordinating the integration of the ECTRN with existing and ancillary networks and other County enterprise networks as required, including collaborating with existing maintenance vendors and County staff.

The ECTRN shall have a high level of fault tolerance, a high degree of reliability and no single point of failure as further specified in the *Reliability and Availability Section* of this RFP.

All ECTRN components shall be of current design and manufacture. No ECTRN components shall be on the manufacturers' equipment cancellation lists. Respondent shall explicitly state the end of manufacture, and end of life dates of all proposed components and systems.

The Contractor shall be solely responsible for preparing all paperwork and permits required to deliver the ECTRN including, but not limited to, permits for transportation, storage, and installation of the ECTRN components in accordance with all federal, state, and local codes.

The Contractor shall be responsible for the delivery and, if necessary, secure storage of all Contractor provided network systems and components.

The Contractor shall, at its own expense, remedy damage caused by the Contractor to the real or personal property of County agencies or their lessor.

4.2 General Business Terms

No Beneficial Use: Contractor agrees that it will not claim beneficial use of the ECTRN, or any part thereof, prior to Final System Acceptance.

Final Payment Retainage: 10% of the total value of the Agreement retained until Final System Acceptance.

Acceptance Criteria for Final System Acceptance: Successful completion of all acceptance tests, and close out of all punch list items.

Latent Defects: Contractor is responsible for the correction of any deficiencies identified during the General Warranty Period.

Changes in Key Project Personnel Subject to Approval: Replacements of Key Project Personnel shall be subject to approval by the County.

Project Continuation While Change Orders Pending: Contractor shall not stop work on any Deliverable that does not have a Change Order pending, even if a Change Order is pending on a different Deliverable.

Fixed Margin: Any additional work made necessary by a change order from the County shall be billed at the cost necessary to provide the additional work and shall not be subject to an additional fee or profit margin.

4.3 Project Management

Contractor shall be solely responsible for all project management functions necessary to ensure the successful completion of all phases of this project.

The Contractor shall provide turnkey project management services during all Phases of the Project, and shall, at a minimum:

Develop and maintain a project plan and schedule.

Provide County staff and other pertinent stakeholders with regular status reports and updates.

Allocate project management staff and other key Contractor and subcontractor resources.

Conduct project planning sessions with County personnel and other contractor staff.

Prepare and track action points and associated responsibilities.

Conduct bi-weekly (or as required) project status/update meetings.

Prepare and present formal monthly reports which include the status of the project, risks and mitigation approach, an action item register, and saliant project financials.

Prepare as-needed reports and materials for County and executive staff meetings and attend such meetings as directed.

Develop a risk mitigation plan and facilitate the resolution of problems and issues.

Provide a mechanism for storing and sharing up-to-date project-related documents and schedules.

The Contractor shall create, maintain and update, until Final System Acceptance, a communications plan, and a risk mitigation and escalation plan.

The Contractor shall designate a Project Manager that is a full-time employee of the Contractor that will serve as the primary point of contact. Once approved, Contractor shall not replace the Project Manager without the written approval of the County.

The Contractor's Project Manager shall be responsible for facilitating the flow of information and coordination among all ECTRN member agencies and project stakeholders.

The Contractor's Project Manager shall have the power to make significant decisions relevant to the project and shall have direct access to the Contractor's top management for the timely resolution of issues that may be beyond the Project Manager's direct authority to resolve.

The Contractor's Project Manager or their designee will convene and attend bi-weekly status meetings and shall submit bi-weekly status reports covering such items as progress of work being performed,

milestones attained, resources expended, problems encountered, issues and corrective action taken, until the time of Final System Acceptance.

The Contractor shall provide written agenda items prior to all status meetings.

The Contractor shall maintain an updated and current written list of open issues and pending decisions.

The Contractor shall allocate sufficient time for the review and approval of Contractor provided project documents by the Stakeholders.

The Contractor shall be responsible for updating the project schedule and providing overall project status, at a minimum, on a monthly basis describing the completed milestones and project delays, if any.

4.4 Kick Off

The Contractor, led by its Project Manager, shall convene a project planning Kick Off session with County staff and other stakeholders, as identified by the County, within 30 days of contract award. The Kickoff shall include:

A detailed project plan.

A work statement that includes the project deliverables and project objectives.

A description of the finalized project management approach.

A work breakdown structure (WBS) to the level at which control shall be exercised.

Performance measurement baselines pertaining to schedule and cost.

Major milestones target dates, including at a minimum, milestones identified in the Project Milestones and Acceptance section.

A list of key personnel resources and any other staff requirements.

A risk management plan, including constraints and assumptions and planned responses to address projected risks.

Project communications plan, including periodic reporting requirements and milestone achievement determination.

A Change Order management plan.

A Design Review Process plan.

4.5 Project Milestones and Acceptance

Respondent shall submit its proposed schedule for the delivery of the ECTRN. The County prefers a timely completion of the entire project and the intermediate key milestones identified below.

Respondent shall provide a detailed Gantt chart schedule including deliverables and activities.

The schedule shall identify the following project phases as key project milestones. The milestones below shall additionally correspond with the Contractor's payment timeline. Acceptance criteria for each milestone is described below:

Kick Off:

Completion of activities listed in the project Kick Off Section.

Detailed Design Review:

Completion of all activities listed in Design Review Activities.

Site Preparation and Planning:

Completion of all activities listed in Installation Planning and Site Preparation.

Factory Testing and Delivery:

Completion of all activities listed in Factory Testing and Staging.

Radio System Installation:

Completion of all activities listed in Radio System Installation.

Completion of all activities listed in Console SubSystem Requirements.

Installation and turn up of the Network Management System (NMS).

Completion of all activities listed in Installation and Baseline Testing.

Acceptance Testing:

Completion of Coverage Acceptance Testing.

Completion of Functional Acceptance Testing.

Final System Acceptance:

Completion of all acceptance tests.

Completion of user cutover.

Completion of all punch list items.

Project Close Out:

Final System Acceptance.

Delivery of all system documentation.

Respondent's project schedule shall account for common national, and State observed holiday periods during which time limited, or no work will be performed. The County reserves the right to designate quiet periods of up to two weeks at a time to ensure service outages do not occur during these periods.

The County will make reasonable efforts to provide the Contractor with adequate resources to support ECTRN implementation. Contractor shall not expect, however, the County resources to be made available more than eight hours per day or outside of standard business hours unless pre-authorized in writing.

4.6 Design Review Activities

4.6.1 General Detailed Design Review Phase Requirements

The Contractor shall facilitate a detailed Design Review process culminating in a Detailed Design that meets the specifications herein.

Within 15 days after the Kick-Off, Contractor shall submit for County review and approval an updated Design Review Process Plan that will guide the Detailed Design activities.

The Contractor shall ensure active participation of the County in reviewing, commenting on, and approving the Design Review documents.

Any required changes to the Detailed Final System Design may trigger another cycle of review for the impacted subsystem or component.

The Design Review process and resulting Final System Detailed Design shall include, at minimum:

A detailed equipment list (hardware, firmware, software) to be furnished by site.

A list of all existing County equipment that will be reused as part of the new system.

All applicable preliminary forms required for permitting and regulatory efforts.

Logical system block diagrams by site as well as overall network block diagrams.

Preliminary Cutover and end user migration plan.

Intermodulation studies for each radio site including all existing and planned frequencies.

Performance and acceptance criteria for customer-provided backhaul connectivity.

Noise/Interference Studies as described.

System coverage maps by site and composite.

RF link budgets for both the downlink and uplink radio paths.

RF power/characteristics (input and output powers, sensitivity, etc.).

Site layout drawings.

Grounding Diagrams (shelter, generator, fence, and tower equipment).

Component layout and wiring diagrams by site.

Updated shelter equipment floor plans.

Rack layout and elevation drawings by site.

Networking layers configuration.

IP addressing plan.

Interfaces to other subsystems and enterprise networks.

Baseline test plan documents and parameters.

Key Performance Indicators (KPIs) and other thresholds for acceptance.

Antenna diagrams and connections.

Transmit combiner plan by site.

Power and HVAC Loads.

Acceptance Test Plans.

Preliminary Training plan.

Facilities Suitability Assessments as identified in this Section.

The Contractor shall, during the Design Review, produce a Preliminary Cutover Plan that complies with the project objectives (e.g., minimal service outage and coverage reductions) and the specifications as detailed in this solicitation.

Prior to implementation activities, the Contractor shall compile all Design Review documents into a single report for approval and to serve as a reference for future work and changes.

4.6.2 Facilities Suitability Assessment

During the Design Review phase, Contractor shall, through physical visits and documentation review of each proposed facility, conduct a detailed assessment of the suitability of the facilities to support the Contractor's ECTRN.

Contractor shall, based on these assessments, identify recommended site improvements and modifications to the County, noting specifically items that fall outside the scope of this RFP.

4.6.3 Network Link Assessment

During the Design Review phase, the Contractor is responsible for evaluating and certifying the link performance at any identified customer-provided backhaul links.

4.6.4 Electrical Power Evaluation

During the Design Review phase, Contractor shall evaluate the current AC and backup electrical power systems at the proposed facilities and identify any modifications necessary to support its ECTRN design.

4.6.5 Grounding and Lightening Protection Assessment And Design

The Contractor shall, during the Design Review phase, perform site grounding and lightening protection studies to certify whether existing sites comply with the most recent versions of Motorola R56 Site Installation, Grounding, and Lightning Protection or equivalent industry standard.

If remediation is required to bring sites up to standard, Contractor shall provide detailed specifications, costs and scope of services required to perform the necessary remediation.

Contractor shall provide during the Design Review a grounding plan for all ECTRN components furnished and installed by the Contractor including, but not limited to, grounding system components, ground bus layouts, connections to existing shelter and site grounding rings, along with installation details (e.g., bonding, welding and attachment details, etc.).

4.6.6 Antenna Support Structure Suitability and Design

During the Design Review phase, the Contractor shall be responsible for assessing the suitability of each existing and proposed antenna support structure to support the approved antenna loading and Cutover Plan.

The Contractor shall provide the County with a list of all antennas and associated equipment to be installed at each, along with the desired height for each, such that the County can have structural analyses performed for all support structures.

The Contractor shall make efficient use of the available tower space for antenna implementation.

> Where space on existing towers is not available, Contractor shall implement a design that reuses existing heights and supports both new and planned systems during the transition.

4.6.7 RF Prevention Interference Certification

The Contractor shall investigate the presence of any interference, through noise measurements or other alternative testing, approved by the County, that may impact the performance of the ECTRN prior to installation.

The Contractor shall perform RF measurements of the noise floor and locally generated signals prior to the implementation of the ECTRN in the Contractor proposed frequency band(s) of interest over a 24-hour period at each site.

The Contractor shall design and incorporate the necessary RF filtering and shielding to contain interference.

4.7 Installation Planning and Site Preparation

The Contractor shall be solely responsible for preparing all paperwork and permits required to deliver the ECTRN including, but not limited to, permits for transportation, storage, and installation of the ECTRN components in accordance with all federal, state, and local codes.

The Contractor shall provide all required documentation including, but not limited to, site preparation specifications, shelter drawings, antenna installation plans for approval by the applicable County engineering and permitting personnel.

The Contractor will be required to furnish A&E drawings as necessary depicting the work planned by Contractor.

The Contractor shall prepare a site-by-site work and installation plan detailing all necessary work and the methods that will be used to accomplish the work.

Construction plans, specifications, and documents will be stamped and signed by Professional Engineer(s) (P.E.) of the appropriate engineering specialty and/or architect and licensed in the state of New York, as applicable.

4.8 Documentation

4.8.1 General Documentation Requirements

The Contractor shall provide and maintain throughout the duration of the project a centralized web-based file management storage including, but not limited to, the following design and project documentation:

All design drawings.

As-built drawings.

Equipment specification sheets and manuals.

Baseline and acceptance testing documents.

System manuals.

User manuals.

Maintenance documentation.

Detailed Design Review phase tests, studies and report.

Tower structural studies.

Electrical power systems studies.

Final network coverage and simulcast interference maps per site and for the overall network.

A&E documentation.

Training material.

Final functional and coverage ATP.

System configuration databases.

Other project related documentation as required in this RFP.

Access to the storage platform will be provided to any County or County-authorized user; all documents and files shall be the property of the County.

Respondent shall provide a description of its documentation repository database.

The Contractor shall transition all electronic files stored on Contractor-provided file management system to the County in electronic media approved by the Stakeholders upon project closeout.

The file management system shall provide access to all County and subcontractor designated personnel.

The County shall be granted the right to reproduce an unlimited number of copies of any documentation for use within and by County stakeholder agencies.

All documentation submitted by the Contractor shall be in draft form for approval by the County.

Appropriate system final documentation, as requested by the County, shall be provided in both electronic format and hardcopy format.

Prior to assembling hard copies as required in this solicitation, Contractor shall provide the County with soft copies for review and approval.

All documentation that is subject to frequent change shall be provided in Microsoft® Office format (e.g., cable pair assignments, punch blocks, logs, etc.) or a mutually agreed to format.

All engineering drawings shall be in native format (e.g., AutoCAD, Microsoft Visio, etc.).

All engineering drawings shall additionally be furnished in Microsoft Visio and Adobe PDF formats.

The Contractor may be required to provide select drawings, such as coverage maps, functional network diagrams, in ANSI - E size format, at no cost. The specific drawings will be determined during the Design Review process.

All engineering drawings shall be provided in 11” x 17” format.

All engineering drawings shall bear title block and drawing number of the issuing organization.

Manuals shall indicate all safety precautions to be taken by personnel employed in the installation, operation, or maintenance of the components.

System documentation as described in this RFP shall be submitted at appropriate times during the project and as necessary to facilitate County understanding of the project and subsequent design decisions.

All draft documentation shall be submitted at the conclusion of the Radio System Installation milestone.

4.8.2 Maintenance Documentation and Manuals

The Contractor shall supply suitable maintenance manuals for the purpose of allowing the County, Contractor, and other technicians to maintain the ECTRN.

The maintenance manuals shall contain the following:

A complete narrative description of the ECTRN including functional block diagrams.

A complete step-by-step procedures and frequency for all routine/preventative maintenance activities.

Complete test and maintenance instructions including trouble-shooting charts.

Functional block diagrams giving signal levels and configuration parameters at each interface.

Component location drawings or pictorials showing component reference designators.

Parts list giving complete description and ordering information for each component. Part numbers will be industry standard or the actual manufacturer part number.

Inter and intra-cabling diagrams reflecting as-built configuration including pin layouts for all plugs, wire color codes, gauge, and functional labeling.

A complete set of software for diagnostic, alignment, and the configuration of components residing at the site.

Networking documentation including IP layer configuration, IP addresses, routing algorithms, and other relevant settings.

The maintenance manuals shall be plainly indexed and contain only the information applicable to the components delivered.

The manuals are to be contained in a multi-ring binder, which facilitates insertion of corrections, changes, and additions.

All electronic components will be identified by reference designators for cross-reference to the parts listings.

The Contractor shall provide one physical copy covering all pertinent design and maintenance documentation for each ECTRN facility (or radio site).

Site documentation shall be in hard copies assembled in a three-ring binder, appropriately tabbed and indexed for ease of navigation.

Copies of all factory and installation test results will be provided as part of the manual set.

Service bulletins and modifications, where appropriate, will be provided for the life of the components, not less than ten (10) years from the date of Final System Acceptance.

4.8.3 As-Built Documentation

The Contractor shall provide one complete set for a centralized location and one site-specific set for each ECTRN facility (or radio site) of as-built documents in both hardcopy and electronic format (PDF, Microsoft Visio, and AutoCAD, etc.).

Where Contractor performs upgrades to existing equipment, installs equipment in existing or shared spaces, or integrates into existing County systems, Contractor shall either create new or update existing soft copies documentation such that the final documentation represents complete as-built information. Examples of required design documentation updates include, but are not limited to:

Rack diagrams.

Antennas and installation detail.

Tower diagrams and antenna elevations.

Grounding systems.

Electrical panel details.

Shelter floor plans and cable trays.

Similarly, the Contractor shall include existing equipment and components which it reuses as part of the ECTRN within its as-built drawings.

The County will provide available soft copy documentation for updates by Contractor as available.

As-built documentation shall include, at minimum, the following:

- Complete system drawings.
- Major component specifications.
- Networking diagrams.
- Antenna and feed line specifications.
- Antenna diagrams and mounting details.
- An overview of radio backbone hardware configuration.
- Primary and backup power systems settings and measurements.
- Grounding system updates and connections.
- Detailed rack space layout drawings.
- All interconnection drawings.
- All in-shelter cabling and routing.
- Physical site improvements.

All documentation will be corrected to include any changes made during implementation through Final System Acceptance. Handwritten notes to document changes are not acceptable.

All as-built draft documentation shall be submitted at the conclusion of the Radio Installation milestone.

All as-built final documentation shall be submitted prior to Final System Acceptance.

4.9 Training

The Contractor shall develop a comprehensive training program for the management, operation, administration and maintenance of the ECTRN by various tiers of network operators, dispatch personnel, and executive management personnel.

Respondents shall provide a high-level overview of the proposed training plan.

Training shall be delivered in-person at a County facility.

Training shall be structured to accommodate all County and designated personnel.

The Contractor shall complete all training activities prior to, but as close as possible to, the Final System Acceptance and cutover dates.

Training programs and corresponding material shall be flexible and customizable for the County staff to modify based on projected needs of the trainees.

Instructional materials, media presentation devices, presentation media, lesson plans, and other audio-visual aids produced by the Contractor to provide training shall be furnished to the County for continuing education purposes.

The County reserves the right to record or reproduce unlimited copies of the training documentation for use by County agencies.

Training materials shall be provided not less than two weeks prior to the start of any training course.

Training shall simulate the live system and potential failure scenarios to the extent possible but should not interfere with its operation.

Training shall include, but is not limited to:

System Overview.

Operational practice of all system components.

Template development procedures and best practices for user consoles.

Block diagram description.

System failure modes and continuity procedures.

Basic troubleshooting techniques.

Available features.

Networking plans and IP addressing schemes.

Network Management System (NMS) overview.

NMS reports and report generation.

Detailed discussion of alarm system.

ECTRN health diagnostic techniques.

Development and maintenance of system databases.

Installation and turn-on procedures.

Operation of all test equipment.

Alignment and optimization testing procedures, including the frequency of routine/preventative maintenance activities.

Detailed troubleshooting procedures.

Unit/module replacement procedures.

Detailed repair procedures.

Detailed maintenance procedures, including the frequency of maintenance activities.

Safety procedures.

Preventative maintenance procedures including the frequency of preventative maintenance activities.

5. ECTRN Technical Requirements

5.1 Reliability Requirements

The ECTRN shall have a high level of fault tolerance, equipment redundancy, a high degree of reliability, and no single point of failure.

The ECTRN shall continue to operate with all specified features if any single system device fails.

The Contractor shall design and implement redundancies for all major ECTRN elements including at minimum: site routers, simulcast controllers and audio distribution equipment, and dispatch subsystem connections.

All ECTRN hardware and software shall have an availability of 99.999% at the component level (e.g., individual microwave radios, routers, controllers, etc.) as measured on a yearly basis.

Any RFRS core equipment, simulcast controllers and central audio distribution hardware shall be capable of automatically switching from primary to secondary in the event of primary controller failure.

The ECTRN shall be configurable for Bypass mode of operation: In the event of a failure of wide-area or simulcast capabilities, the RFRS shall revert to a single site operation, where one individual site continues to function as a standalone radio site.

Respondent shall describe how the ECTRN meets the reliability requirements of this RFP addressing the ECTRNs failure/fallback operation modes and corresponding mitigation strategies. In its response, respondent shall address, at minimum, the following failure modes:

Loss of an entire site (including a core or virtual core site).

Loss of multiple sites.

Simulcast controller failure.

By-pass mode of operation (as described above).

Voter/comparator failure.

Transmitter failure.

Receiver multi coupler failure.

Interconnection circuit failure / Link failure.

GPS timing failure.

The Network Management System (see *Network Management System (NMS)* section) shall provide the ability to remotely roll controllers to simulate controller failures.

The ECTRN shall provide automated and operator-configured mechanisms to mitigate potential system issues. The system operator shall have the ability to remotely perform the following:

Temporary removal of a single RF channel in response to interference issues.

Temporary removal of an entire site experiencing interference across several channels.

All ECTRN components shall have a modular architecture which includes hot-swappable Field Replaceable Units (FRU). Components must automatically reinitialize both the software and configuration settings without interruption of services after replacing faulty FRUs, and upon restoration of the power after a power failure.

The ECTRN shall allow for modification or replacement of software and firmware in major components without the interruption of services.

System component software parameters will be backed up and stored locally in non-volatile memory and be available without re-download in the event of reset or interruption of power.

All ECTRN components provided by the Contractor will be suitable for the environment in which it will be installed. For example, components installed at antenna sites will be resistant to electromagnetic fields and will perform properly in a high RF environment. This requirement includes operating temperature and humidity, altitude, electromagnetic compatibility, primary power voltage, backup power voltage, frequency, and phase.

The ECTRN shall continue to meet the performance requirements of this RFP during failures of cooling and ventilation control systems.

5.2 Network Security

The ECTRN shall comply with all County IT security protocols for authentication, data integrity, anti-virus plans and encryption.

System Access Security and Management: All network elements (servers, workstations, routers, switches, etc.) shall employ username and password authentication.

Where applicable, the ECTRN's network and applications shall connect to the County network only via a De-Militarized Zone (DMZ) which will include firewall and intrusion preventive functions.

Network and application ports access will be filtered for only the ports required by the Contractor provided solutions.

The ECTRN shall include a comprehensive anti-virus package including regular updates as recommended by the equipment and software manufacturers.

5.3 Sustainability and Lifecycle

The ECTRN shall be supportable and expandable for a minimum of ten (10) years after the Final System Acceptance without the need for a major overhaul or significant hardware changes or replacement.

> Supportability is defined as the ECTRN's ability to receive bug fixes, security updates, and standard software refreshes.
>
> Expandability is defined as the ECTRN's ability to be expanded to accommodate additional sites, channels, or repeaters.

The County recognizes that server equipment is typically replaced within a 5–7-year period and this shall be accounted for in the Respondent's sustainability approach.

Spare equipment and a full suite of maintenance and support covering physical components, software, firmware, and security updates shall be available for all ECTRN components for a period of not less than ten (10) years after the Final System Acceptance.

The Contractor shall be capable of providing support and maintenance services for all ECTRN hardware and software for at least 10 years after system acceptance as detailed in this RFP.

The Contractor shall be responsible for notifying the County of end-of-life and end-of-support from the manufacturer within two-weeks of the manufacturers' issuance of such dates.

5.4 Standards Compliance

All goods and services shall comply with the most current adopted version of all applicable codes, ordinances, and regulations as well as the latest national and industry
standards
recognized by the same, including, but not limited to:

Applicable portions and latest revisions of the TIA-102 series of documents defining Project 25 compliance.

Applicable portion of Telecommunication Industry Association (TIA) TSB-88 concerning Wireless Communications Systems Performance in Noise and Interference-Limited Situations.

IEEE, TIA-607, and Telcordia standards on grounding, bonding and lightening protection for sensitive electronic and telecommunications equipment.

Telecommunication Industry Association, ANSI/TIA 222, Structural Standards for Antenna Supporting Structures and Antennas.

Federal Communications Commission (FCC), Title 47, Telecommunications (47 CFR).

Federal Aviation Administration, FAA Advisory Circular AC 70/7476, Obstruction Marking and Lighting, and all Advisory Circular referenced therein including specifications for obstruction lighting equipment (AC 150/5345-ba43F), including all changes.

Office of Engineering and Technology (OET) Bulletin 65, Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields.

National Fire Protection Association (NFPA).

Underwriters Laboratories (UL).

National Electrical Code (NEC).

American Concrete Institute (ACI).

American Institute of Steel Construction Load Resistance Factor Design Manual, 1999, AISC – 3rd Edition.

American Society of Testing Materials, ASTM (applicable sections as listed in this specification).

ANSI/NFPA 780-2004, Standard for the Installation of Lightning Protection Systems.

American Welding Society (AWS) Structural Welding Code D1.1 – latest revision.

ANSI/IEEE Std. 81.2-1991, IEEE Guide to Measurement of Impedance and Safety Characteristics of Large, Extended or Interconnected Grounding Systems.

All Local Building Codes, Rulings, Zoning, and Planning ordinances.

In the case where applicable standards or applicable codes, ordinances and regulations conflict, those that pose the most stringent requirements will prevail, as determined by the County.

5.5 Radio System Fixed Network Requirements

5.5.1 Radio Access Network Functional Requirements

The Contractor shall provide, furnish, and install all radio access network equipment required for a P25 **digital simulcast trunking system** that meets the performance criteria specified in this RFP.

The network is anticipated to consist of multiple simulcast cells as necessary to provide the required coverage and capacity. The proposed simulcast cells will utilize different frequencies, as appropriate, and include overlapping coverage.

The system is anticipated to have two simulcast cells as described below:

- Erie County North: The County has identified a total of thirteen preferred sites to cover the northern portion of Erie County in addition to the City of Buffalo.
- Erie County South: The County has identified a total of sixteen preferred sites to cover the southern portion of Erie County.

The list of preferred sites, in addition to other potential sites, will be provided during the pre-bid meeting with the County.

The Respondent must identify all proposed site locations included in their proposed design.

The use of all proposed sites must be approved by the County prior to contract award.

Each simulcast cell shall preferably support eight (8) frequencies for the initial implementation through the use of two (2) transmit combining systems and antennas and one (1) receive antenna.

Each cell shall have the capability to support up to 12 frequencies (6 per combining system/antenna) to support additional capacity, either at initially deployed or through combiner expansion.

The County anticipates utilizing a collection of currently licensed and to be licensed frequencies in the 420 to 470 MHz frequency range.

The system is envisioned to be a fully trunked system that facilitates automatic roaming throughout the County without user intervention.

A common, redundant system core and simulcast control and voting sub-system shall be used for the entire network.

All cells and sites must be interconnected into a common network such that console equipment from any of the dispatch facilities can access any portion of the network.

End-to-end delay of a radio voice call through the RFRS shall be less than 350 ms.

The RFRS shall utilize P25 Phase 2 trunking.

The RFRS should utilize the TDMA control channel if beneficial for the Respondent's design.

The RFRS shall support end-to-end encryption of radio traffic.

Coverage requirements are detailed in the *Radio Coverage Requirements* section.

5.5.2 Base Station Equipment Performance Specifications

All equipment shall have the capability to operate without degradation within the environmental conditions below:

Temperature: -30^{0}C to 60^{0}C.

Humidity: 95% non-condensing.

All equipment shall be properly shielded to allow operation in high RF environments typical of radio infrastructure facilities.

All active equipment, at the time of delivery, shall be FCC type accepted for the proposed application.

All radio access equipment shall be integrated into and relay Simple Network Management Protocol (SNMP) alarms to the NMS.

All equipment including receivers, transmitters, terminated circulators, filters, watt meters, and any other RF carrying assemblies shall be supplied with the appropriate constant impedance connectors.

Connectors shall be DIN and high PIM rated and selected to operate under the environmental conditions and RF environment typical of high-power radio infrastructure facilities.

No RF adapters shall be utilized with equipment or assemblies, unless approved by the County, to convert from one type of connector to the specified types.

Connectors must be appropriate for the cable-type and mate to the opposite gendered connector.

All IP-based equipment shall support direct connectivity to Ethernet interface cables.

The ECTRN shall not adversely impact any other communications systems co-located at the proposed communications facilities.

Equipment shall include appropriate RF filtering and shielding to mitigate or eliminate potential RF interference to the ECTRN and potential RF interference from the ECTRN to other receivers and transmitters located at the site or at nearby sites.

Contractor shall mitigate, at its own expense, any new interference from the ECTRN to other transmitters and receivers on other entities' systems.

Contractor shall investigate the presence of any interference, through noise measurements or other testing alternatives, that may impact the performance of the ECTRN prior to installation.

5.5.3 Repeater Performance Specifications

RFRS repeaters shall:

Be capable of transmitting continuous duty carrier output at its maximum rated power with less than a 1 dB power variation over the range of output bandwidth.

Have an adjacent channel rejection of at least 60dB and spurious response rejection of 90dB.

Have a frequency response within +1 and -3 dB, 300 to 3000 Hz (1 kHz reference).

Have a hum and noise of a maximum of -55 dBm.

Have audio output adjustable from -20 to +11 dBm, into a 600-ohm load.

Have audio distortion of two percent (2%) or less at rated output.

Be capable of transmitter power rating of 100W continuous.

Have receive sensitivity of <0.25µV (-119dBm).

Capable of 2175 Hz notch filtering to eliminate audible control tones.

5.5.4 Site Routers and Switches

RF site switching and routing equipment shall employ commercial off-the-shelf (COTS) servers, routers and switches, and associated operating system software to the extent possible.

Site routers shall support MPLS and be compatible with microwave and fiber backhaul options.

RF site switching and routing equipment shall have at least two (2) additional ports to support future expansion.

The Contractor shall provide a comprehensive IP address plan for approval by the County as part of their Design Review submittals. The networking layer plan and IP addressing scheme will conform to Internet Engineering Task Force (IETF) best practices.

The Contractor shall coordinate with County networking personnel to align the ECTRN IP addressing plan with existing schema.

5.5.5 Simulcast Solution: Controllers, GPS, Signal Comparators, Audio Distribution

The simulcast solution shall be configurable for connectivity between controller site(s) and remote sites via different backhaul technologies (IP and TDM).

The simulcast solution shall be synchronized using a highly precise GPS reference**.**

The ECTRN shall employ highly reliable time source per Network Time Protocol as its primary timing source which shall be synchronized with existing County systems.

The simulcast solution shall automatically readjust timing to maintain proper simulcast timing in the event a path reroute changes the transport delay from the simulcast prime/control site to a remote simulcast site.

Voting receivers and comparators shall be capable of evaluating the best received signal and audio quality periodically during a transmission.

The optimal location for the primary simulcast controller and audio distribution equipment shall be determined by the Contractor in collaboration with the County.

5.5.6 Antenna Systems

The Contractor shall replace and/or reuse as appropriate, all RFRS passive components including, but not limited to, transmission lines, combiners, wave guides, jumper cables, multi-couplers, tower-top amplifiers, and connectors, unless exceptions are otherwise noted.

Passive component design shall apply to all relevant considerations to avoid single point of failures.

Transmission lines shall be one continuous length with a copper conductor and weatherproof jacket.

All equipment that requires preventive maintenance and is tower mounted, such as tower-top amplifiers, if employed, shall have a test port and line to enable testing purposes from the base of the tower.

All unused ports interfaced with active devices shall be terminated with the appropriate impedance.

Transmit combiners:

Shall provide sufficient margin to support the output power of the proposed number of repeaters.

Shall have a VSWR of 1.25:1 or less.

Shall be designed for equal output power across all channels.

Receive multi-couplers at each site shall have at least one additional port beyond the anticipated expanded capacity of 12-channels for additional capacity expansion and to perform preventative maintenance testing.

5.5.7 Equipment Racks

All proposed remote site equipment shall be mounted on standard 19” two post open-face racks or four post cabinets or existing outdoor cabinets as appropriate. Exceptions are small ancillary equipment such as dehydrators, coaxial surge suppressors, modems or punch blocks.

5.6 Radio Site Equipment Installation

5.6.1 General Installation Requirements

All installation services shall be in strict compliance with approved plans and all local, state and federal (including FCC and FAA requirements) building, electrical, construction and fire codes. In the case where governing codes conflict, the most stringent codes will be applied.

All equipment shall be installed in accordance with the recommendations of the equipment manufacturer.

The Contractor shall provide all tools, equipment, and software required to perform the installation of Contractor provided equipment at its sole expense.

The Contractor shall be responsible for providing its own transportation to and from remote facilities to perform the equipment installation and testing.

Labelling:

> Contractors shall follow a strict and comprehensive labeling scheme to ensure simple identification of all ECTRN physical components, including but not limited to, patch panels, cable bundles, grounding cables, networking equipment, passive and active RF elements.
>
> Cable runs shall be labeled, at minimum, at each end, designating the source and destination, and reasonable intervals for long cable runs.

All Contractor plans for site installation shall be subject to review by the County during the Design Review. Final installation shall be according to the approved plan.

The Contractor shall maintain the equipment shelter free of debris and hazards during the installation period.

All equipment shall be installed in a manner that allows for easy preventive maintenance and servicing based on the most recent revisions of Motorola R-56 Site Installation, Grounding, and Lightning Protection guidelines or equivalent industry site installation and grounding standards.

All sites shall be designed, protected and posted by the Contractor to limit exposure to Electromagnetic Emissions (EME) in accordance with the Federal Communications Commission's (FCC) Bulletin OET-65 (or most recent regulation adopted by the FCC), the Federal Communications Commission's exposure to Radio Frequency Electromagnetic Emissions.

The Contractor shall be responsible for certifying EME compliance for all sites within the ECTRN.

5.6.2 Equipment Installation

The Contractor shall install radio site equipment in specified shelters, equipment rooms, or outdoor cabinets as available, at all proposed sites.

The Contractor shall coordinate with the County's chosen microwave vendor and include rack and/or cabinet space for the necessary microwave equipment at all sites.

At those sites with outdoor cabinets, the Contractor shall specify where additional cabinets are necessary.

All equipment racks and cabinets must be securely mounted to the floor or concrete pad in the case of outdoor cabinets. If necessary, racks or cabinets must be bolted together or braced from the ceiling to prevent swaying or being dislodged. Racks must be isolated from floors and ceilings using suitable insulators, insulating plates, washers, and sleeves.

Equipment shall be installed per all applicable state and local codes.

The proposed equipment shall be sized to accommodate an additional one-half rack (total) of future equipment in the proposed equipment racks.

5.6.3 Transmission Lines and Antennas Installation

The Contractor shall utilize industry best practices for the physical placement and installation of antennas. To the greatest possible extent, the mounting of antennas shall not alter the antennas' radiation pattern.

All power, signal, and transmission line cables shall be routed according to Motorola R-56 Site Installation, Grounding, and Lightning Protection or County approved alternative guidelines.

Cables shall be appropriately separated based on type to prevent interference. The Contractor will be responsible for mitigating and/or correcting any interference between disparate types of transmission cables.

Transmission lines shall be installed to minimize tower face wind loading. The cable support shall be of galvanized steel construction and shall have mounting hardware of stainless steel or galvanized steel construction.

Transmission lines shall be securely fastened to a cable tray or ladder attached to the tower using manufacturer-approved devices and methods.

Transmission line lengths shall be sized to support the selected sites and heights.

No drilling of the tower legs or cross bracing shall be required to install the cable support device.

Transmission lines shall be attached to the transmission line cable support using stainless steel hangers and adapters of the appropriate size for the transmission line supplied. Appropriate snap-in kits shall be used to attach the cable to the transmission line support.

All transmission cable runs shall be mounted in a manner that does not block the tower climbing apparatus.

Transmission lines shall be supported on the tower mount or ice-bridge at intervals of not more than six feet, or as recommended for the wind speed design of the tower with ½" radial ice or as per manufacturer's instructions, whichever is more stringent.

Multiple transmission lines shall be strung and supported adjacent to each other, not bundled together.

The Contractor shall use heavy gauge hanger kits or equivalent for stacking coaxial runs on the tower.

Zip ties are prohibited.

All connectors and adaptors installed exterior to shelters shall be sealed and weather proofed.

Manufacturer-approved wrapping and sealer shall be utilized on all outdoor transmission line in-line and grounding connections to prevent water intrusion.

Each transmission line shall be grounded to the tower or to an approved building ground point using ground kits recommended by the cable manufacturer, and 1/0 bare copper wire where appropriate. Exterior exposed ground wires shall be aluminum coated copper wire.

Grounding conductor lengths shall be kept as short as possible with the minimum number of bends. Conductor bends shall not exceed an 8-inch radius with an included angle of at least 90 degrees. Bends made at connection points shall turn in the direction of earth ground.

The Contractor shall furnish and install tower ground bars per the requirements in this RFP.

At the top of the vertical run near the antenna, the grounding kit conductor shall be connected to a vertical structural member of the tower using the clamp provided with the grounding kit or to a tower ground bar.

All transmission lines shall be grounded within 12 inches of the entrance to the building with a coaxial lightning arrestor surge suppression device.

At the bottom of the vertical run, just above where the transmission line turns from the tower toward the communications building or room, the grounding kit conductor shall be connected to the tower ground bar using an appropriate two-hole lug.

The grounding kit conductor shall be connected to the external bus bar (EGB) using an appropriate two-hole lug.

Additional grounding bonds shall be installed to keep the distance between grounding kits to less than 200 ft along the vertical run.

In the event the tower legs are not accessible for the grounding connection, the Contractor shall implement an equivalent solution approved by the County.

Antenna ground kit tails shall be connected to the bus bar using stainless steel hardware including a star washer under both the bolt head and nut.

5.7 Other Infrastructure Requirements

5.7.1 Electrical Work

The Contractor is responsible for identifying adequate power at each of the proposed sites and to inform the County if it is not sufficient and what upgrades, if any, need to be made.

The Respondent shall provide power requirements (power draw and generated heat (in BTU)) of each rack of equipment, as well as the total power requirements of the site.

5.7.2 Emergency Back-Up Generators and Automatic Transfer Switch (ATS)

The Contractor shall provide an appropriately sized emergency back-up natural gas generator at the Chestnut Ridge site. The new generator will replace an existing generator in the same location.

The supplied generators shall be configured for indoor installation as appropriate and shall be furnished complete with all accessories and equipment needed for the proper operation of the unit. These shall include, but not be limited to, starting batteries, battery racks, battery chargers, battery cables, cooling systems, residential grade exhaust silencers with exhaust pipes and rain caps, automatic load transfer controls, electrical surge protection, automatic frequency regulators, vibration isolators, fuel lines, fuel regulators, conduits, junction boxes, and wiring.

The generator will utilize a County-supplied gas source inside the building. The Contractor shall be responsible for connecting the generator to the gas source.

The Contractor shall be responsible for wiring the supplied generator's alarm indicators to a punch block interface to permit routing of the generator alarms to a monitoring location.

The Contractor shall test and install the complete standby generator in compliance with applicable codes.

The generator shall be sized to support the full existing or proposed load plus an additional 30 % for future growth.

The generator shall be capable of bypass-isolation operation.

The generator shall meet all applicable regulations, zoning requirements and noise ordinance on noise level.

At each site with Contractor-provided generator, Contractor shall supply and install an automatic transfer switch, which provides switching of the equipment shelter electrical load between commercial power and generator power.

The ATS shall be completely factory assembled and shall contain electronic controls designed for surge voltage isolation, with voltage sensors on all phases of input power sources.

Permanently attached manual control handles shall also be installed on the ATS.

The ATS shall be implemented with a bypass isolation configuration for inspection and testing purposes.

The ATS shall support quick-make and quick-break contact mechanisms which shall be provided for manual transfer under load.

The ATS shall be installed in a key locking, UL listed, NEMA cabinet, and mounted within the equipment shelter.

The ATS and accessories shall be U.L. listed and labeled and tested per U.L. Standard 1008.

The ATS shall be fully wired and integrated with the engine generator sets in accordance with local electrical and fire codes.

Switching contacts shall meet or exceed U.L. Standard 1008 standards and comply with local NEC codes, as applicable.

The ATS shall be rated for continuous operation in ambient temperature ranges of -40 to +50 degrees Celsius.

The ATS shall be rated to carry 100% of the rated current in the enclosure.

The ATS control shall be solid state and designed for a high level of immunity to power line surges and transients. The device shall be tested in accordance with IEEE Standard 587-1980 (or latest revision). Controls shall have optically isolated logic inputs, and isolation transformers for AC inputs. Relays shall be installed on all outputs.

Solid-state under voltage sensors shall simultaneously monitor all phases of the standby power source and the commercial utility power source.

Pick up and drop out voltage settings shall be adjustable.

Voltage sensors shall allow for adjustment to sense partial loss of voltage on any phase.

Controls shall be provided with solid-state over-voltage sensors, adjustable from 100-130% of nominal input voltage to monitor the source. An adjustable time delay shall be provided.

Automatic controls shall signal the engine-generator to start upon signal from normal source sensors. A time delay start, variable from at least 0 to 5 seconds, shall be provided to avoid nuisance startups.

The ATS shall transfer when the emergency source reaches the set point voltage and frequency. A time delay shall be provided for transfer, which is variable from 0 to 120 seconds.

The switch shall retransfer the load to commercial power after time delay retransfer. This time delay shall be variable (adjustable) from 0 to 30 minutes to avoid short engine run times. The retransfer time delay shall be immediately bypassed if the emergency generator fails.

A control shall automatically signal the engine generator to stop after a time delay, which shall be adjustable from at least 0 to 10 minutes, the time starting on return to commercial power.

5.8 Console Sub-System Requirements

County agencies currently operate consoles at 15 Dispatch Centers throughout the County. Many currently operate Motorola MCC7500 consoles. The County requests that the Respondent recommend either upgrade or replacement of these consoles to support the new system.

Additionally, some County and local dispatch centers currently operate non-Motorola P25-capable consoles. These consoles are expected to be capable of operating with the ECTRN. Therefore, the Respondent is requested to propose a solution that interfaces to these consoles. The quantities of the existing consoles and their replacement requirements are provided in the table below.

The County notes that a County-provided IP network is available at each dispatch center.

Dispatch Center	Console Type and Quantity	Replace or Interface via CSSI
Erie County Public Safety Campus	26 MCC7500	Please recommend upgrade or replacement
Erie County Backup	18 MCC7500	Please recommend upgrade or replacement
Other Centers	10 MCC7500	Please recommend upgrade or replacement
Other Centers	6 Zetron	Interface to
Other Centers	20 Avtec	Interface to
Other Centers	19 TRBOnet	Replace

5.8.1 Interface to Existing Consoles Via CSSI

When interfacing to existing consoles, Respondent shall provide the necessary hardware, software and services to integrate the ECTRN to the current dispatch console systems.

The interface to the non-Motorola console systems shall be via the P25 Console SubSystem Interface (CSSI) standard. However, the Respondent may propose an alternative interface, provided that the solution meets the performance and reliability criteria prescribed in this RFP, and it is thoroughly described in the proposal, along with a description of the benefits of using the proposed interface.

5.8.2 New/Replacement Consoles

The Contractor shall provide P25 Phase 2 trunking compatible dispatch consoles that fulfill the requirements specified in this solicitation.

If Respondent's dispatch console portfolio includes multiple models, Respondent shall describe how its proposed solution utilizes the most cost-efficient product that satisfies the specifications of this RFP.

All console equipment must meet or exceed all applicable standards, including, but not limited to, Part 90 of the FCC Rules and Regulations, appropriate Electronic Industries Alliance (EIA) and National Institute of Standards and Technology (NIST) standards, all applicable building, electrical and fire codes as well as any Performance Criteria set forth in this document.

The dispatch consoles shall be compatible with the following networks including VHF and UHF paging (Respondent to indicate paging formats supported); conventional VHF and UHF radio, conventional P25 repeaters, P25 Phase 1 and 2 trunking.

All replacement dispatch consoles must be capable of and be interfaced to any existing ancillary County systems, such as paging and Fire Station Alerting systems.

The Respondent shall indicate the total number of resources the dispatch consoles are capable of supporting in their response.

The Contractor shall be fully responsible for the integration of the dispatch consoles to all the subsystems and any existing recorder systems and shall outline any dependencies or non-Contractor responsibilities in its response. The County currently records phone and radio traffic.

The dispatch consoles shall support 4-wire E&M and standardized P25 signaling interfaces.

> Contractor shall be responsible for the integration and/or installation of all required interfaces to their respective radio equipment or networks.

The dispatch consoles and network equipment software configuration shall be sized to accommodate a minimum of 50% expansion for dispatch positions and channels beyond current quantities without the need for major hardware changes (defined as the need to replace any existing consoles) within ten (10) years of final system acceptance.

The Respondent shall identify any and all proprietary technologies employed, if any, as part of the dispatch consoles in their response.

The dispatch consoles shall include the capability of supporting end-to-end AES encryption of channels that are configured for encrypted operation.

The dispatch consoles shall provide “Training Mode” functionality for supervisors and trainers with the capability of monitoring and duplicating a trainee’s console screen at other supervisory consoles.

The conventional radio interface shall be capable of remotely controlling base stations using EIA standard tone remote control and E&M signaling.

The dispatch consoles shall employ a time source for synchronization that shall meet all applicable NENA PSAP standards.

The new dispatch console components and workstations must integrate into the existing console furniture at all locations.

All backroom electronics associated with the dispatch consoles shall be rack-mountable in 19” racks. The Respondent shall indicate the equipment space requirements in their response.

New Dispatch Consoles Functions and User Interface

The dispatch console graphical interface shall provide a user-friendly and flexible to configure graphical interface. Screens customized for each user shall appear upon user logon.

Each function within each channel/talkgroup control representation, and all other functions controlled through the console, shall be color-coded with user definable color choices. These functions shall include but not be limited to audio activity indicators, transmit push-to-talks, volume controls, etc.

Dispatch consoles shall support login and security password to access the system.

- Accounts shall be independent of the specific console enabling a dispatcher to login at any machine and invoke preferred settings.

Dispatch consoles shall employ a suite of audible and visual indicators to alert the dispatcher of the various dispatch occurrences.

All functions and features of the console position shall be accessible from the mouse and/or keyboard as necessary.

Text indicators including, but not limited to, individual radio IDs (or “aliases”), group calls and pre-programmed patch groups shall be displayed by alphanumeric characters chosen by the operator/agency.

Dispatch consoles shall support, at minimum, the following features with corresponding audio, visual or color-coded notifications or individual windows on the GUI:

- Individual and group calls.
- Emergency alerting and voice calls.
- Acknowledging emergency calls.
- Clearing emergency calls.
- Private calls.
- Selective/Individual unit alert.

Tone paging.

Dynamic creation of group calls as specified herein.

Cross-channel/group call patching as specified herein.

Continuous Tone-Coded Squelch System (CTCSS) monitor or disable function of individual base station repeaters.

Auxiliary input/output interfaces.

Talkgroup/Channel busy indicator.

Individual group/channel volume adjust.

Queuing display of at least ten (10) aliases.

Call history of at least the last twenty (20) calls.

Audio muting capabilities.

VU Meter display.

The dispatch consoles shall, at each operator position, include an instant recall recorder function capable of recording, retrieving and replaying at least 30 minutes of all radio traffic.

Simultaneous record and playback shall be possible, with incoming calls taking priority.

The instant recall recorder application shall have an alphanumeric display indicating such information as message length, message ID, radio user ID, number, date and time.

The system shall enable an operator to save a message for future referral or re-recording.

Each dispatch position shall be equipped with:

A high-quality gooseneck microphone or paddle-type desktop microphone.

High quality, noise cancelling, wired (single wire) headsets with single ear audio headphones.

Dual headset jacks with individual amplification or line leveling.

The jacks shall provide TX and RX audio and PTT as well as telephone switching support.

Audio levels for the headset jacks shall be adjustable via physical knobs or buttons and through the console's GUI.

Four speakers (One select/three unselect).

A user-operated footswitch for PTT.

The consoles will be configured with a minimum of a 27" touchscreen flat panel LCD monitor. Resolution of the display monitor will be 1440 X 900/60 Hz or better.

New Dispatch Console Patching Requirements

The dispatch consoles shall provide the console user with the capability of cross channel patching of conventional channels or trunked talkgroups. When activated, all users in the group will be connected and hear all traffic on the selected channels/talkgroups. Respondent shall state the maximum number of patches its solution supports per dispatch position.

> After the selected groups are combined into a virtual single group, it shall require only a single RF channel at each site or cell where a subscriber involved in the call is located.

There shall be no noticeable change in audio levels to the consoles or to the fixed location radio stations regardless of the number of channels patched together.

The console user shall be able to transmit over un-patched channels/talkgroups without interrupting the patch.

A prominent visual indication shall be available at the dispatch console display illustrating all patches in progress. A patch window shall display the patch, which channels/talkgroups are connected, and the console that initiated the patch.

The capability to crosspatch any radio channel to a telephone line or vice versa shall be supported. The Respondent will describe any limitations of this function (e.g., number of patches, etc.).

The console will have the ability to both select in real-time, and to preprogram a list of channels/talkgroups, into a group that can be activated with a single keystroke or mouse click.

New Dispatch Console Availability

The dispatch consoles shall perform self-diagnostics and shall employ high availability and fault-tolerant schemes. The Respondent shall describe their approach to this requirement in their response.

The dispatch console system shall be designed to provide an availability of 99.999%.

The dispatch consoles shall be connected in a configuration such that failure of one console will not affect other consoles.

The dispatch consoles shall maintain the last programming installed when power is interrupted or there is a link failure or hard failure of any console component or sub-system. This includes any user-defined tables, lists, and databases.

The dispatch consoles shall automatically recover to the last operational state without user intervention when power or system connectivity is lost and then restored.

When connected to a radio network and link connectivity is lost, a link failure message shall prominently appear on the console display to notify the operator that the console system is no longer in contact with the radio infrastructure.

Software and/or firmware updates to the dispatch console system and to associated consoles shall not affect configurations.

Outage time for planned maintenance shall not affect more than one console at any one time unless otherwise deemed satisfactory by Dispatch Center managers.

New Dispatch Console Training Requirements

The Respondent shall provide a comprehensive dispatch console training course to instruct personnel in the proper operation, administration, use, and maintenance of the consoles as well as to instruct identified individuals in how to train other personnel in such subjects.

5.8.3 Remote Dispatch Capability

The Respondent shall offer a remote dispatch application/product that will allow the dispatch personnel to perform dispatch functions while operating outside of their primary dispatch location.

The remote dispatch product shall be portable such that it allows dispatch personnel to easily relocate to another facility with only the need for network access.

The remote dispatch product shall provide secure access to the ECTRN.

The remote dispatch product may be offered as either a complete hardware and software solution, or as a software only solution that can be installed on County-owned equipment.

The Respondent shall offer the capability for a minimum of three remote dispatch installations/licenses operating simultaneously.

5.9 Backup Control Stations

The Contractor shall furnish, install and configure a total up to 99 new control stations (up to one per console position) to support interoperability with other systems and to serve as backup in the event of console or link failure, per the performance criteria outlined in this section.

Control stations shall meet the following performance requirements:

Temperature: -30^{0}C to +60^{0}C.

Minimum output power: 50 W (Control Stations).

Transmitter frequency stability: +/- 0.00015% across operating temperature.

Transmitter audio response: +1, -3dB, 6dB pre-emphasis.

Transmitter audio distortion: $\leq$3% at maximum rated output.

Receiver sensitivity: -119 dBm (12dB SINAD), -119 dBm (5% BER).

Min. receiver audio output: 1.5 W.

Receiver audio response: +1, -3 dB, 6dB/octave de-emphasis.

Receiver audio distortion: < 3% at maximum rated output.

Spurious response rejection: > 80 dB.

Intermodulation rejection: > 75 dB.

Control stations shall support the following feature sets:

Analog Voice, P25 Phase 1 conventional and trunking, and Phase 2 trunking.

Operation in all public safety frequency bands (VHF, UHF, 700/800 MHz).

Channel spacing or of 6.25 kHz (or equivalent efficiency) 12.5 kHz, 20 kHz and 25 kHz.

Frequency deviation limits of 2.5 kHz, 4 kHz and 5 kHz.

Frequency generation by an internal synthesizer and/or embedded microprocessor technology.

Individual, group and announcement calls as defined in the APCO P25 TIA 102 suite of standards.

Radio unit inhibit/uninhibit as defined in the APCO P25 TIA 102 suite of standards.

Call alerting (initiated by another radio user or a dispatch console operator) as defined in the APCO P25 TIA 102 suite of standards.

Project 25 Enhanced Full Rate Vocoder (AMBE + 2) and Half-Rate Vocoder.

Scanning across all proposed frequencies.

Emergency call and alerting across all proposed systems including P25 trunked and P25 conventional.

Transmission of a digital unit identification on push to talk across all proposed systems including P25 trunked and P25 conventional systems.

Adjustable transmitter time-out function to limit extended inadvertent PTTs.

Dynamic regrouping by console or network operators.

Talk-around or unit-to-unit capability.

Operation under reduced network redundancy modes.

Control stations shall support standard tone remote control and E&M signaling.

Control stations shall be configurable for use with an internal and external power supply as applicable and as defined by the County.

Control stations shall be rack mounted.

At the Public Safety Campus and Erie County Backup locations, there are anticipated to be a total of 11 new control stations at each location, rack-mounted in a roof/penthouse room with antennas mounted on the roof. Each control station will have an associated desktop remote unit for control/interface placed in the dispatch area at various dispatch positions. The Respondent shall identify and include in its proposal any additional equipment required for the control station installations at the Erie County Public Safety Campus and backup dispatch center.

New control stations at other dispatch centers shall utilize existing feedlines, antennas, and other associated RF equipment where possible. The Respondent shall identify, in general, control station installation requirements for other dispatch centers. The specific requirements and costs for these centers will be assessed at a later date.

5.10 Optional Interfaces

Optionally, the Respondent shall offer a system network interface compliant with the P25 Inter RF SubSystem Interface (ISSI) specifications.

The Respondent shall describe the features and functionality supported with the proposed ISSI.

Optionally, the Respondent shall offer a network interface compliant with the P25 Console SubSystem Interface (CSSI) specifications.

The Respondent shall describe the features and functionality supported with the proposed CSSI.

5.10.1 IP Based Coverage Extension

The Contractor shall provide a ECTRN interface to radios with the feature to transport Push To Talk related communication over IP networks such as wi-fi and LTE. The Contractor shall provide the necessary services and network infrastructure to support such a feature for its own Project 25 subscriber devices as well as a standards-based solution allowing other P25 radio manufacturers to provide the same capability. The Respondent shall describe the proposed methods and services to achieve such multi-vendor capability.

5.10.2 Other Push To Talk Services Interface

The Contractor shall provide a standards-based interface to other Push To Talk services and the ECTRN. This includes carrier-provided 3GPP Mission Critical Push-To-Talk (MCPTT) as well as other PTT services. The Contractor will support connections to as many systems as desired by the County and its user agencies. The Respondent shall provide pricing such that the County is not limited by the number of connections, the number of talkgroups over all or any of the inter-system connections, nor the number of simultaneous talkpaths over any or all of the inter-system connections.

5.10.3 Push To Talk Over Broadband Service

The Respondent shall also identify, if applicable, it's Push-To-Talk over broadband offerings. The solution must interface with the ECTRN. The Respondent shall provide detailed information regarding the proposed solution, including:

- Offered architecture (cloud and/or on premises)
- ECTRN interface solution (proprietary, ISSI, or CSSI)
- Administrative Controls (e.g., provisioning,
- Client software operating system support (Android, Apple)
- PTT features:
    - Compliance with 3GPP MCPTT features and functionality. Identify which MCPTT features Respondent's solution does and does not comply with.
    - The Respondent shall specifically identify its ability to leverage 3GPP MCPTT Quality Control Indicators (QCI/5QI) for 4G and 5G systems. This includes preemption of non-public safety traffic, allocation of guaranteed bitrate bearers (or QoS flows), with tightly controlled jitter, delay, and packet loss. If Respondent's solution is carrier-dependent, please identify the carriers that support Respondent's fully QCI compliant solution.

  - Encrypted talkgroup access and security provisions. Is the solution end-to-end encrypted? If not, identify where decrypt and re-encrypt occurs in Respondent's solution.
  - Emergency activation capabilities
- Other functions: Provide Respondent's capabilities for other services such as multi-media messaging, location/mapping, breadcrumbs, presence/status.

6. Radio Coverage Requirements

6.1 Bounded Area Coverage

Coverage predictions shall be based on the most current version of the Telecommunications Industry Association Telecommunications Systems Bulletin TSB-88 Wireless Telecommunications Systems-Performance in Noise and Interference-Limited Situations-Recommended Methods for Technology-Independent Modeling, Simulation and Verifications (TSB-88).

Coverage specifications prescribed herein shall be construed as the ability to successfully complete "round trip" communications at DAQ 3.4 with a tile reliability of 95% (as defined in TSB-88) at the proposed geographic area percentages.

Coverage predictions shall be based on a 12.5 kHz channel operation.

Coverage predictions must assume full foliage typical of the County.

Coverage predictions shall be based on the latest available USGS information on terrain and land use databases with minimum resolutions of 1 arc-second.

Respondent shall include in its response a detailed description of the radio propagation simulation software employed for its design including all theoretical and empirical assumptions. Descriptions of the application and assumptions shall include, but is not limited to:

Digital voice uplink and downlink budgets including assumed transmit powers, receiver sensitivities, assumed noise levels, and losses (equipment, body, etc.), propagation models, reliability computations, fade margins, time delay, attenuation values per underlying morphology type, and any other assumptions.

For the requirements provided below, the following definitions apply:

Mobile Coverage is defined as a minimum DAQ of 3.4 while using a mobile radio installed in a typical vehicle equipped with an external antenna with unity gain installed on the vehicle rooftop (5-ft. AGL).

Portable On-Hip In-Street Coverage is defined as a minimum DAQ of 3.4 while using a portable radio with a half-wave antenna, outdoors, worn on the hip (approximately 3-ft. AGL), and used with a remote speaker-microphone. The antenna is located on the portable radio, not on the speaker-microphone.

Portable On-Hip In-Building Coverage is defined as a minimum DAQ of 3.4 while using a portable radio with a half-wave antenna, in a building of specified signal attenuation worn on the hip

(approximately 3-ft. AGL) and used with a remote speaker-microphone. The antenna is located on the portable radio, not on the speaker-microphone.

The proposed ECTRN is expected to meet, and the Responder is to guarantee the following minimum coverage requirements:

The County anticipates that the collection of preferred County sites provide greater than 95% on-street portable area coverage with a minimum of 8 dB in-building margin throughout the entire County. In addition, the system is required to provide 20 dB in-building margin area coverage throughout the jurisdictional boundaries of the City of Buffalo.

The Respondent shall confirm in their response that they guarantee the required coverage levels described above. If, for some reason, the Respondent chooses not to guarantee the required coverage, the Respondent shall provide a thorough explanation for their lack of a guarantee and propose an alternative solution.

The coverage area performance shall be verified via the Coverage Acceptance Testing Procedures detailed in this RFP.

Coverage Illustration Maps and Data: The Respondent shall provide the following coverage maps:

Each individual site and composite (all sites) “round-trip” Mobile Coverage (not talk in and out separate).

Each individual site and composite “round-trip” Portable On-Hip In-Street Coverage.

Composite “round-trip” Portable On-Hip In-Building Coverage for 8 dB Buildings.

Composite “round-trip” Portable On-Hip In-Building Coverage for 20-dB Buildings.

Depict areas subject to harmful time domain interference (TDI).

Coverage maps shall be superimposed on suitable geographic layers or images (as available from Microsoft Bing or MapPoint, Google Maps), primary and secondary roads and other necessary information for ease of comprehension.

Coverage maps shall be provided as separate Attachments in the following format:

11” x 17” size for each of the illustrations listed above.

A ESRI or MapInfo Table file with corresponding projection information.

A Google KMZ file.

The Contractor may be requested to provide coverage maps with additional detail during the detailed design review including, but not limited to, individual site uplink and downlink predictions.

Respondents may propose alternative designs. If Respondent elects to do so, Respondent shall provide rationale for its selection and the benefits to the County for the alternative design(s).

7. Backhaul System Requirements

Contractor shall design, furnish, and deploy a highly reliable Backhaul System as part of the ECTRN by leveraging available microwave and fiber connections provided by the County.

The Contractor shall provision and optimize the backhaul network and audio distribution systems for high quality analog audio. Audio received at the simulcast sites shall be equal in quality to the dispatcher audio.

All performance metrics and alarms for the backhaul links shall be integrated into the centralized NMS for remote diagnostics and operation.

All backhaul system equipment shall be installed per all appliable requirements as stated in the *Radio Site Equipment Installation* Section.

7.1 Multi-Protocol Label Switching (MPLS) / Routing

A MPLS backhaul routing network shall be provided that enables the system to maintain reliable high-quality audio that meets the LMR manufacturer's requirements for P25 simulcast system for latency, jitter, and bandwidth. The MPLS system shall leverage Quality of Service (QoS) based priority routing for all voice communication and other essential network signaling (registration, call set up, etc.). In the event that any one link's capacity is exceeded, no priority traffic shall be impacted and non-priority traffic shall be dropped. The MPLS system shall leverage all available microwave and fiber routes made available to the contractor for redundancy and high system availability. The system shall leverage MPLS Fast-Reroute upon a failure. Such reroutes shall maintain high quality audio and shall not affect simulcast system performance. The MPLS design shall use best engineering practices to ensure stability in the primary routes to minimize jitter and delay variability.

The MPLS system shall be integrated with the Niagara County MPLS system to allow for end-to-end secure routing of traffic to the Niagara County core network and to utilize available Niagara County routes in the event of failures at relevant Erie County sites.

The MPLS/Routing system shall provide end-to-end encryption of the LMR system payload (e.g., using IPsec). The mission critical LMR traffic shall be isolated from all other traffic on the MPLS system. All MPLS network management systems shall be hardened (e.g., encrypted, access controlled).

The MPLS performance management shall provide reporting that will provide visibility into path selection, link performance, traffic utilization, QoS behavior, failures and protection events, and underlying transport health, with historical trends sufficient for capacity and reliability planning. This includes:

The active and backup (fast reroute) paths used by each site to the core.

Historical records of re-routes (what changed, when, and why).

Traffic utilization per link and class – including changes to available bandwidth associated with microwave modulation rate changes. Utilization will include busy hour information enabling the determination of trends over several years.

Latency and jitter compliance over time.

Availability of the backhaul system between routers and per site LSP over time.

Traffic Engineering optimization events.

8. Network Management System (NMS)

8.1 General Network Management System Requirements

The ECTRN shall be equipped with a comprehensive and centralized network management and monitoring system with the capability to monitor, diagnose and troubleshoot all aspects of the ECTRN.

The NMS shall have the capability to automatically and manually poll managed devices for status.

The NMS shall be integrated to monitor all Contractor provided ECTRN components, including but not limited to, network controllers, radio access equipment, backhaul connectivity, power and environmental equipment, and other ancillary equipment as required in this RFP.

The NMS shall also be capable of integrating any existing County equipment and sensors currently being monitored, including those described in Section 8.4, such that the resulting system is a single integrated entity.

The Contractor shall provide three stand-alone network terminals, dedicated screens, keyboards and mice to be installed at County facilities, the location of which to be jointly determined by the County and the Contractor.

The NMS shall also support local and secure remote access.

The network management functions shall be accessible via a web-based interface from the County's agency networks or via a VPN outside the County's network.

The NMS shall employ a standardized suite of internet and security protocols including Simple Network Management Protocol (SNMP) and FIPS-14X protocols.

All ECTRN equipment and individual components with IP addresses shall be capable of providing the latest applicable SNMP messages to the NMS.

The NMS shall be configurable to provide multiple tiers of password protected access ranging from full access to read-only access to enable various operator personnel to perform their functions independently.

The NMS shall support the FCAPS (fault, configuration, accounting, performance, security) network management framework by the International Organization for Standards (ISO).

All actions taken on the NMS shall be logged for a period of 365 days and retrievable for transfer to a different archive medium.

The NMS shall store activity logs and generate standard and customized reports detailing the status and performance of the ECTRN and other system related parameters.

The NMS shall be configurable to automatically transfer archived data to other media at pre-determined and user definable intervals (e.g., weekly, monthly, quarterly, annual, etc.).

The network management system shall have the capability to generate detailed statistical and reporting capabilities, including network/component failures, detailed airtime summary reports and system utilization reports.

User intervention of the NMS such as data retrieval, device configuration and report generation shall not impact the capability of the NMS to monitor and log activities or reporting events and alarms in real-time.

The NMS software shall provide a centralized, graphical hierarchical network topology map, showing all managed devices using color coding to represent device status.

> The graphical user interface shall have the capability to point and click the managed object to view the status of the object and modify the parameters as necessary.

The NMS and all its functions shall be web-based; the County shall have a minimum of three (3) licenses to access all NMS functions.

The NMS shall be configurable to label network components with discernible names for easy identification.

All IP-based system components including servers, site controllers, routers, gateways, consoles, PCs shall be capable of receiving any necessary upgrades and patches for software applications, operating systems and anti-virus software from a centralized location while being protected from vulnerabilities.

The NMS shall provide a backup of all network configurations and databases (IP Addresses, equipment configuration, etc.) to restore all functionality in the event of any malfunction.

The Respondent shall describe its network management system, including management and reporting capabilities in its response.

8.2 NMS Voice System Requirements

The NMS shall provide a graphic display of the voting comparator functions.

The NMS shall provide the capability of identifying sites experiencing illegal/foreign carriers. Such data shall be logged and stored for up to one year.

The NMS shall provide the operator with the ability to manually force vote and disable any site.

The NMS shall provide the capability to set automated and operator-configured failover mechanisms including but not limited to:

> Removal of specific sites from voice assignment.
>
> Deactivation of specific base stations from simulcast operation.

8.3 Fault Monitoring, Diagnostics and Alarm Management Requirements

The ECTRN shall have an integrated fault and alarm management system capable of logging and reporting system events and alarms with diagnostic information promptly to designated personnel.

The network management system shall be capable of reporting all major and critical alarms to any e-mail server, cell phone (via SMS), pager, or other handheld device with the capability of relaying

notifications to at least 10 devices/accounts. The message shall include the nature of the alarm, as well as the time, date, and location of the alarm.

The NMS shall permit operator(s) to filter alarms by type and severity.

Alarms shall be classified into at least three (3) levels of severity (Levels 1, 2, and 3) and programmable to promptly relay specific severity levels to relevant operations, management and maintenance personnel.

The NMS shall have the capability to monitor and report alarms for all existing ECTRN and potential future components with IP addresses, relays or contact closures.

Alarms shall appear as flashing colors and transmit audible tones. Colors and tones shall be programmable based on the severity and type of alarm.

The NMS shall autonomously test the microwave system, repeater stations, site controllers, and other critical hardware and software functions.

The NMS shall permit the network operator(s) to manually run remote diagnostics on managed devices to isolate and troubleshoot faults.

The NMS shall automatically or manually (by network operators) run backhaul link communications integrity tests.

The NMS shall perform diagnostics and generate alarms for all radio, environmental, primary and backup electrical power and other physical shelter equipment across the ECTRN as prescribed in various applicable sections of this RFP. Individual thresholds for ECTRN parameters that trigger alarms will be determined during the design phase and shall, at a minimum, include:

Site controllers and associated electronics.

System controllers and NMS applications status.

Voting receiver status.

Servers, switches, routers, gateways.

Dispatch consoles system interface status.

Base station repeater components (receiver sensitivity, output power, transmitter deviation, etc.).

Microwave radios status.

Backhaul link performance (see Backhaul System for details).

Wave guide dehydrator status.

GPS and other timing equipment status.

Transmission cable status and integrity (insertion loss, VSWR, etc.).

Backhaul equipment including microwave link status, fiber optic network, leased lines

Low/High DC power supply, rectifier alarms.

UPS equipment status (battery voltage levels, rectifier alarms, etc.).

Overall service availability per site and in aggregate for the system with root cause identification for each outage, when it occurs, and its duration.

8.4 Contact Closures and SNMP Alarms

The NMS solution shall provide the capability to incorporate site alarms, SNMP traps and relay contact closures from all proposed site facilities.

Monitored equipment is expected to include the following:

HVAC equipment status.

Generator performance status (fuel level, battery voltage, transfer switch, etc.).

Environment and physical shelter status.

Door intrusion.

Shelter high and low temperature alarms.

Fire suppression systems status.

Smoke/Fire alarms.

Tower lighting.

Microwave System.

MPLS and Routing System.

Costs related to extending the Contractor-provided NMS solution to support these additional capabilities shall be provided separately.

9. Other Systems

9.1 Recording

The County currently uses a Nice brand logging recorder system. The County will determine if the existing recorder can be upgraded to support the new trunking system or if replacement is required and shall propose a solution accordingly.

The Respondent shall provide access to the appropriate system interface to enable the following functionality:

- The ECTRN logging recorder system shall be capable of displaying channel and talkgroup information.
- The ECTRN logging recorder system shall provide the operator with the capability to search for a specific call.
- The ECTRN logging recorder system shall be capable of “reconstructing” a conversation based on a given talkgroup.

- The ECTRN logging recorder system shall be capable of multiple user accounts, where each account can be customized to only permit access to specified talkgroups.
- The ECTRN logging recorder system shall permit access from remote locations via a secure network connection.

10. Acceptance Testing

10.1 General System Acceptance Testing

The ECTRN will not be eligible for Final System Acceptance until all acceptance tests have been completed successfully.

The Contractor shall be responsible, at its sole cost, for ensuring the ECTRN attains the contractual and design performance criteria, unless it is otherwise proven that external factors beyond the control of the Contractor are impacting system performance.

The Respondent shall provide a complete description of its testing protocols and procedures (Acceptance Test Plan or ATP) in its response. The proposed ATP will be reviewed and finalized prior to contract execution.

All ECTRN systems, functions, layers, and interfaces obtained through this procurement (and performance across ECTRN interfaces to other non-Contractor subsystems) shall be tested and verified to meet the contractual and design performance criteria.

The County reserves the right to preapprove, witness and to participate in the functional and coverage ATPs.

The Contractor shall outline requirements for County-provided interfaces and equipment necessary to support the execution of Contractor's test plans.

The ECTRN shall be tested for performance compliance in a phased manner at specific milestones including, but not limited to, factory testing, equipment installation/baseline testing, and system acceptance testing.

The ATP shall be designed to identify issues through incremental and phased testing, rather than cumulative testing only at final acceptance testing.

The Contractor shall supply all personnel and equipment necessary to carry out the Acceptance Tests as described in this RFP.

The Contractor shall furnish all final test results and corresponding KPIs as part of the ECTRN documentation.

In the event of a failure of any Acceptance Test, the Contractor shall immediately determine the cause of the failure. The Contractor then shall repair any defective work and replace or repair any defective materials. The Contractor shall document and submit the cause and remediation of the failed test. After remediation by Contractor, the Contractor shall repeat the Acceptance Test.

10.2 Factory Testing and Staging

The Contractor shall include factory staging of the ECTRN to demonstrate the functionality of all major features prior to customer delivery and field installation of the ECTRN.

For the purposes of factory testing, the ECTRN shall be assembled and staged at a Contractor-hosted facility.

Factory testing and staging shall emulate, to the extent possible, the final system or subsystem configuration.

Factory testing shall be performed with subscriber devices and the antenna parameters that have the most prevalent circulation among the ECTRN users.

Staging shall consist of major ECTRN components and features, including, but not limited to:

Simulcast controllers.

Base station repeaters.

Dispatch console subsystem and interfaces.

Network Management System (NMS) applications.

Factory testing shall be designed to enable County representatives to become familiar with the ECTRN features and capabilities.

The Respondent shall include in its response, travel and lodging costs for up to six County representatives to attend and participate in the factory testing.

The County shall be furnished with the results of the successfully completed Factory Test.

10.3 Installation and Baseline Testing

Upon installation of each component or subsystem, Contractor shall perform comprehensive tests based upon manufacturer's recommendations and other KPIs finalized during the Design Review.

The Contractor shall finalize certification and measurement procedures during the Design Review process.

The Contractor shall conduct baseline measurement and test of all parameters agreed upon during the Design Review including, but not limited to, individual and subsystem component RF parameters, equipment installation benchmarks and backhaul networks KPIs.

The Contractor shall submit the baseline measurement and test result documentation.

The Contractor shall develop a complete test list and failure criteria during the Design Review Process for approval and, if necessary, agreed upon modifications by the County.

The Contractor shall conduct intermodulation testing and receiver desensitization on all installed ECTRN components to assure no inter-system and intra-system interference.

At minimum, measured parameters shall include the following:

Receiver sensitivity.

Transmit repeater output power, forward and reflected power.

Combiner insertion loss and VSWR.

Transmission cables and mobile radio antenna cables insertion loss and VSWR.

Multi-coupler gain and noise floor.

Motorola R-56 compliance parameters.

Site grounding impedance, as applicable.

Baseline and installation testing shall include customer physical inspection of all installations to validate proper implementation.

The Contractor shall design the physical inspection check list.

The Contractor shall execute the physical inspection test plan with customer attendance.

10.4 Functional Acceptance Testing

After successful completion of Installation Testing, the Contractor shall perform a comprehensive Functional Acceptance test (FAT) to verify proper functionality of all ECTRN features and modes of operation.

The FAT is a real-world repetition of the Staging and shall consist of all features and functions tested during Staging.

The FAT shall demonstrate that each of the failures mechanism supported by the ECTRN results in system recovery within the maximum failover timeframe.

FAT tests shall be performed with subscriber devices and the antenna parameters that have the most prevalent circulation among the ECTRN users.

FAT shall, in general, cover all functionality and performance specified in this solicitation and, at minimum:

Demonstrate that all equipment meets manufacturer and design specifications.

Verify proper operation of simulcast voice system and supplementary features.

Verify all system redundancy schemes are functioning properly including but not limited to links, controllers, power systems, GPS timing sources, etc.

Verify operational continuity during loss of critical network subsystems.

Verify proper functionality of all NMS features and capabilities.

Validate required performance criteria of the backhaul networks.

Verify all console interfaces are performing properly.

Verify all interfaces with enterprise networks are performing properly.

10.5 Coverage Acceptance Testing

The Contractor shall, at its sole cost and expense, be liable for meeting the coverage performance and bounded area statistics as contracted.

Coverage Acceptance Testing shall demonstrate that the ECTRN meets the guaranteed coverage performance statistics.

Coverage Acceptance Tests (CAT) shall be modelled after and executed in full compliance with the most current version of the TSB standards for reliability assessment. In the case where more stringent performance criteria are provided herein those performance criteria supersede this requirement

The County jurisdictional boundaries shall be gridded to meet the TSB-88 guidelines for reliability at a 99% confidence level. All grids that contain any portion of the County within the grid will be included in the test and scored. The Respondent shall propose a grid size and number of grids, which will be subject to approval by the County.

Coverage Acceptance Tests shall not begin until the system has been fully optimized, and the Functional Test Plan has been successfully completed.

If coverage testing is scheduled to occur during a period of time when foliage on trees is not at its peak, the County reserves the right to alter the Contractor's proposed testing schedule such that CAT is conducted during full foliage.

The Contractor shall conduct the coverage acceptance test—RSSI, and DAQ—within test vehicles using a roof-mounted antenna in order to streamline the testing effort and ensure a repeatable approach. Contractor shall calculate, subject to County approval, and employs the necessary adjustments to simulate the performance of on-street and in-building portable testing as appropriate for the service area under test.

DAQ tests shall be performed with subscriber devices and the antenna parameters that have the most prevalent circulation among the ECTRN users.

The County will provide the test vehicles to be used to perform the Coverage Acceptance Testing.

The Contractor will temporarily install the necessary test equipment in the County vehicles to be used for testing. No permanent modifications will be permitted.

The test team will include the following participants:

Per test vehicle:

One driver provided by the County.

One radio operator provided by the County.

One test equipment operator/navigator provided by the Contractor.

At a dispatch location:

One console operator and voice quality evaluator provided by the County.

One voice quality evaluator provided by the Contractor.

Prior to the CAT, the Contractor and County's test personnel shall mutually agree on DAQ rating and scoring based on DAQ test samples provided by the Contractor.

The Voice DAQ testing shall be performed from the field radio to dispatch (inbound), and dispatch to the field radio (outbound). Test failure in either of these directions shall constitute a failed test location and shall be subject to a retry as per DAQ 3.4 specifications. Successful communications is defined as achieving a minimum of DAQ 3.4 for a round trip: inbound and outbound transmissions.

In the event that the first test call (inbound or outbound) within a grid is unsuccessful, the Contractor shall be allowed to perform one retry while remaining within the same grid as the first test call.

Grids that fail two voice test attempts shall be deemed a failure.

Passes resulting from retries shall be limited to 10% of passing grids.

Relocating within a grid until a successful sample is recorded will not be acceptable as a demonstration of a passed grid.

The CAT shall be deemed a "fail" if the test does not demonstrate the required bounded area coverage statistics.

Voice quality testing shall be performed using random sentences from daily periodicals or other phrases agreed upon by the test participants.

Within each grid, adequate RSSI data shall be collected and aggregated as a single data point representative of the grid.

If failed grids at any given time exceed the allotted coverage statistics, the County reserves the right to suspend the coverage testing until and after the Contractor has implemented a resolution.

All vehicle-accessible grids shall be tested by the Contractor using the test vehicles. The County reserves the right to request testing of vehicle-inaccessible grids on foot, 4WD vehicle, or other means, to the extent possible.

Water testing from the County shore to the international border will be performed using County-supplied watercraft.

Grids that are not tested shall not be counted towards the reliability calculations.

The Contractor shall provide daily progress gridded maps, preferably in soft-GIS format (e.g., Google Earth) depicting progress and identifying failed and passed grids. At the completion of the test, the Contractor will provide a report summarizing the coverage test results.

The County reserves the right to fully execute the DAQ testing with the Contractor playing the role of witness.

10.6 Specific Building Testing

The Contractor shall perform in-building voice quality tests for informational purposes with a hip-mounted portable in up to 20 selected buildings, per the testing specifications within this Section. The list of buildings to be tested will be provided by the County.

Buildings shall be gridded to demonstrate 95% reliability (pass rate of 95% of the tested points).

Therefore, a minimum of 20 uniformly distributed points (with a maximum grid size of 50 ft) shall be tested within each building.

If only 20 points are tested, 19 of 20 points must pass. In the case of a failure, the Contractor shall design and execute a more thorough gridded plan with additional points to demonstrate the prescribed reliability.

Multi-Floor Buildings:

The Contractor shall design and execute a test that includes all floors of the building, including the basement and garage levels, using the grid size requirements herein.

Testing shall demonstrate fulfillment of 95% reliability coverage collectively (i.e., 95% of the points tested have to pass for the building to be considered a pass).

The County reserves the right to require that specific points of interest within a given facility be tested.

The County shall reserve the right to review and approve the CAT developed for each building prior to testing.

10.7 Testing Punch Lists

The Contractor shall provide a punch list of all items that did not meet the performance requirements or that need to be resolved, along with a timeline and steps that Contractor will take to resolve any failures.

11. System Transition and Cutover

The Contractor shall develop and implement an ECTRN Transition and Cutover Plan in a manner that provides for continued, uninterrupted communications to all County public safety agencies throughout the transition process.

The Contractor shall spearhead and coordinate, with all pertinent stakeholders including County staff and third-party vendors, all efforts necessary to transition to the ECTRN.

The Contractor shall furnish the County with a Draft Migration and Cutover plan during the Design Review that complies with the project objectives and specifications in this solicitation.

The draft Cutover Plan shall be refined as necessary until 30 days prior to any planned Contractor action expected to have an impact to the communications capabilities of the end users.

Throughout the network transition and implementation period, the Contractor shall ensure or exercise reasonable effort to maintain existing network performance across the following parameters, including but not limited to:

System coverage.

Network Capacity.

Interoperability across various subsystems and agencies.

The Contractor shall supply, furnish and provision any additional equipment (e.g., audio gateways, duplexers,) required to maintain communications capabilities during the transition plan.

If shelter space is not adequate at any given site, Contractor shall implement a design that reuses currently occupied spaces and relocating equipment in a manner that minimizes outages.

Contractor shall advise the relevant stakeholders about any planned disruptive events attributed to system implementation no later than 30 days prior to the planned event.

Any action with the potential to effect live system(s) must be coordinated with and approved by the County before the action is taken.

Short scheduled outages may be approved at the discretion of the County.

Respondent shall describe its proposed ECTRN transition plan in detail in its proposal.

12. Decommissioning and Removal of Equipment

All current County-owned equipment replaced by this project or no longer to be used shall be identified by the Contractor. The Contractor shall remove all tower and building mounted equipment such as antennas and cabling and leave the removed equipment at the site. Erie County will handle removal from the site, inventory, transportation, and disposal of the unused/replaced equipment.

13. Warranty and On-Going Maintenance Support

13.1 Warranty Period and Support Criteria

The Contractor shall warrant, at its sole cost and responsibility, that all ECTRN components and the installation of such components conform to the requirements and criteria specified in this solicitation and as finalized during the Design Review, or the manufacturer's published specifications, whichever is most stringent for a minimum of one (1) year (System Warranty Period) from the date of Final System Acceptance.

The Contractor shall also offer an optional extended warranty on system components.

Warranty Period shall not begin prior to Final System Acceptance and shall begin only upon the start of Beneficial Use by the County of the ECTRN.

If the manufacturer's warranty period is longer for any individual component or components in the system, the County shall receive the extended warranty beyond the System Warranty Period.

Warranty includes maintenance of the hardware and software to meet the stated coverage, functionality, reliability, and other performance criteria.

All Contractor-furnished equipment shall be software upgraded and be at the equipment manufacturer's latest release at the conclusion of the Warranty period.

During the Warranty Period, in the event the ECTRN or any component fails to meet any of the stated coverage, functionality, reliability and other performance specifications in this solicitation, the Contractor shall take appropriate steps to correct the deficiency so that the ECTRN complies with coverage, functionality, reliability and other performance specifications in this solicitation. Such repairs shall be made at the sole cost of the Contractor for parts, material, and labor.

The Contractor shall make available to the County all mandatory and non-mandatory software and firmware revisions, patches, and/or hotfixes as part of warranty.

> Implementation services for these updates for all subsystems shall be included in the base Warranty period price.

The Contractor shall be responsible for all warranties including warranties obtained from subcontractors, manufacturers and/or suppliers under the System Warranty Period. Copies of all warranties shall be provided to the County upon delivery of the applicable component.

During the warranty period, the Contractor provided hardware and software components of the system shall be fully operational and available at a rate of 99.999 % measured on a monthly basis.

Base Warranty Period pricing shall contain all costs to provide all hardware, equipment, parts, materials, software, firmware, other components, and services necessary to remediate any deficiencies in the ECTRN for the System Warranty Period.

During the Warranty Period, Contractor shall provide a monthly status report, at a minimum, itemizing the following: system availability, list of outages/failures that occurred since last report, and list of outstanding problems that have not been resolved since last report.

The Respondent shall submit annual licensing, support and maintenance costs for the ECTRN for the first five years post the warranty period as provided in the *ECTRN Cost Proposal Sheet*.

13.2 General Maintenance and Support Requirements

Respondents shall be capable of providing ongoing support for up to 10 years following the Warranty period as is necessary to maintain the performance criteria of the ECTRN. Annual and multi-year base costs shall be submitted per the *ECTRN Cost Proposal Sheet*.

The Contractor shall be the single point of contact for all Warranty and Maintenance Period activities.

All test equipment used in the provision or delivery of warranty services provided to the County, shall at all times, be functioning properly and have current equipment calibration certificates.

Technicians shall be properly trained, experienced and certified, if applicable, to utilize the required test equipment. Technicians that are dispatched or assigned to service ECTRN facilities shall be familiar with its configuration.

The County shall be furnished with four (4) licenses of all software necessary to program, administer, and maintain the ECTRN components.

The County reserves the right, at Contractor's expense, to perform warranty repairs, including, but not limited to, engaging another contractor to perform such repairs, if the Contractor is unable to satisfactorily complete such repairs within the timeframes specified herein or in the resultant contract. The Contractor shall reimburse the County for all invoices for labor, materials required, and the shipping/handling costs thereof to perform such repairs, within thirty (30) calendar days from presentation of such invoices.

13.3 Software and Firmware Support

The Contractor shall offer a full suite of maintenance and software support, including, but not limited to, physical components, software, firmware, and security updates.

Such support shall be available for all ECTRN components for a period of not fewer than ten (10) years after the Final System Acceptance. Base annual and multi-year costs shall be submitted per the *ECTRN Cost Proposal Sheet*.

The Contractor shall plan for a replacement of all server equipment in the 5–7-year timeframe to ensure all operating systems remain current and supported.

The Contractor shall provide all mandatory and non-mandatory software and firmware revisions, updates, patches and/or hotfixes, and ECTRN maintenance software, and the required services to perform said updates, ensuring updates are compatible with all ECTRN subsystems.

The Contractor shall provide updates (software, firmware, hardware) for each subsystem, in each of the following situations, and as approved by the County:

To keep current with technology, security, public safety and industry standards.

To keep the operating software compatibility packs and security patches up to date.

To maintain compliance with the performance criteria and other requirements of the resultant Agreement.

To maintain compatibility across various system components.

The Contractor shall be responsible for providing all mandatory revisions to meet the performance specifications prescribed in this solicitation.

Within a reasonable time in advance of the release of each proposed subsystem update, the Contractor shall provide the County with information regarding the update, including but not limited to proposed release date, purpose, functionality, urgency, impact on the other system or subsystem components, and ramifications of accepting or rejecting the proposed update.

Implementation of updates shall receive prior approval of the County.

The Contractor shall test the updates prior to implementation thereof.

The Contractor shall perform all work needed in order to ensure the updates are compatible with the other ECTRN and subsystem components.

The Contractor shall perform scheduled backups of network databases and system configurations prior to and post updates.

13.4 System Monitoring and Dispatch Service

13.4.1 System Monitoring Requirements

During the warranty period, and beyond, if requested by the County, the Contractor shall provide real-time monitoring of the health and diagnostics of the ECTRN and ancillary facilities as per the specifications herein.

The Contractor shall provide monitoring of the ECTRN on a 24 x 7 basis from the Contractor's primary operations facilities and additionally provide the required response to network issues.

During the warranty period, the Contractor shall be responsible for diagnosing service requirements and initiating calls for service to the pertinent party (e.g., Contractor, sub-contractors or other Contractor managed maintenance provider).

The Contractor shall have the capability to troubleshoot and reset system failures.

13.4.2 Technical and On-Call Support Service

The Contractor shall have on-call availability on a 24-hour per day, 7-day per week, 365 day per year basis.

The Contractor shall supply on-call diagnostic and repair service as per the response times and as directed by the County.

The Contractor shall respond to all repair calls and notices and remediate the cause of the system deficiency in accordance with specifications within this section.

The Contractor shall:

Interface and coordinate services with service providers for software and equipment upgrades.

Provide inventory control of all Contractor provided ECTRN network equipment and spares.

Identify, notify and direct the necessary service contractor regarding network issues.

13.4.3 Severity Levels and Response Times

If a Severity One (1) Level problem occurs, the Contractor shall resolve the problem based on the Severity 1 Level timetable.

A Severity 1 Level problem is a major system Deficiency and is defined as one that results in the inability of any portion of the System to operate as normal. This includes, but is not limited to, the following:

Loss of system "core" function.

Loss of one Simulcast Controllers.

Loss of LAN/WAN/Audio Distribution/Comparator Equipment.

Failure resulting in any Simulcast sub-system bypass operation.

Loss of ECTRN interface to any portion of the Dispatch subsystem.

Backhaul link failure.

Loss of a site.

A site power outage where the generator fails to power-up.

Loss of NOC Connection and function.

If a Severity Two (2) Level problem occurs, the Contractor shall resolve the problem based on the Severity 2 Level timetable.

A Severity 2 Level problem is a minor system malfunction and is defined as one in which some system features are inoperative, but ECTRN and its users are able to conduct its business as usual. This includes, but is not limited to:

Loss of a single repeater.

Failure of a backed up backhaul link.

A Severity Three (3) Level is defined as any type of non-emergency, non-user affecting problem, including but not limited to:

Questions or inquiries on system upgrades or intermittent problems.

Questions or inquiries on system problems currently being monitored.

Questions or inquiries regarding parts or work to be performed later.

Any failure of a component of the NMS or other supporting systems, where such failure does not rise to the level of Severity Level 1 or 2.

Scheduled maintenance and/or upgrades.

Response times are defined as follows:

Customer Service and Trouble Ticket Initiation – This is the response from the Contractor to an initial notification of a system problem by the County or through its own monitoring. This includes responding to customer calls, acknowledgement of the problem, assignment and initiating the dispatch of support personnel to the problem and issuance of appropriate problem tracking information.

On-Site Dispatch Support – This is the actual dispatching and arrival of local vendor service personnel to a site or location to resolve the reported problem from the initial notification of the system problem.

Restoration times are defined as the amount of time from notification of a problem to the return of the system to full functionality.

Customer Service and Trouble Ticket Initiation times shall be as follows:

Severity Level 1 – Twenty-four hours (24) a day, Seven (7) days a week, Three Hundred Sixty-Five (365) days a year, within fifteen (15) minutes.

Severity Level 2 – Twenty-four hours (24) a day, Seven (7) days a week, Three Hundred Sixty-Five (365) days a year, within one (1) hour.

Severity Level 3 – Standard business day, eight (8) AM to five (5) PM (CT), Monday through Friday, within twenty-four (24) hours.

On-Site Dispatch Support response times to have shall be as follows:

Severity Level 1 – Twenty-four hours (24) a day, Seven (7) days a week, Three Hundred Sixty-Five (365) days a year, within four (4) hours of initial notification.

Severity Level 2 – Twenty-four hours (24) a day, Seven (7) days a week, Three Hundred Sixty-Five (365) days a year, within eight (8) hours of initial notification.

Severity Level 3 – Standard business day, eight (8) to five (5) (CT), Monday through Friday, within twenty-four (24) hours of initial notification.

Restoration times shall be as follows:

Severity Level 1 – Twenty-four hours (24) a day, Seven (7) days a week, Three Hundred Sixty-Five (365) days a year, within eight (8) hours of initial notification.

Severity Level 2 – Twenty-four hours (24) a day, Seven (7) days a week, Three Hundred Sixty-Five (365) days a year, within twenty-four (24) hours of initial notification.

Severity Level 3 – Standard business day, eight (8) to five (5) (CT), Monday through Friday, within five (5) business days of initial notification.

The County reserves the right to decide whether a system deficiency is classified as Severity Level 1 or Level 2 and to escalate or downgrade a Severity Level of any deficiency if the deficiency meets the definition of the Severity Level as escalated or downgraded, or if the Contractor fails to respond to or resolve a deficiency as required herein.

13.5 System and Field Maintenance Requirements

The Contractor shall provide all services necessary for the maintenance, support, and upkeep of infrastructure facilities as per performance specifications herein, for all Contractor-furnished ECTRN components.

The Contractor shall provide Field Maintenance services per the response times herein, and per manufacturer recommendations.

The Contractor shall provide to the County and maintain a sufficient local supply of new unused ECTRN-dedicated spare parts to allow rapid restoration of operation of the system infrastructure.

In the event that these parts are consumed, they shall be replaced promptly.

Replacement stock will also be available via emergency requests with expedited delivery within twenty-four (24) hours of the component failure.

The Contractor is responsible for all costs to include parts, labor and expedited shipping, if required, due to spares not being available.

The Contractor shall be responsible for providing its own transportation to and from remote facilities to perform the servicing, preventative maintenance, troubleshooting and repair work.

The Contractor will maintain adequate staff and spare parts inventory located in proximity to the ECTRN service area to provide technical support and assure compliance with system availability and response times in this RFP.

After the Contractor has removed the failed component from the system and service is restored, failed parts shall be repaired or replaced and returned to the spare pool within 15 business days.

The Respondent shall detail in its proposal the name, location, and capabilities (qualifications, years in business, experience with Respondent's systems) of the local sub-contractors and service facilities, which will provide any or, all of the installation, service and warranty, both initially and on a continuing basis.

13.6 Spare Equipment

The Contractor shall furnish the County with critical spare components and parts necessary to maintain and operate the ECTRN pursuant to the performance criteria (Grade of Service, system availability and reliability) in this solicitation. Spare equipment shall be determined and sized based on MTBF and other relevant factors.

Spare equipment shall be sufficiently distributed across the County, ECTRN, and Contractor facilities to reduce site response and problem restoration times.

14. Technical Response/Work Plan Description Instructions

In its response to this Section, the Respondent shall demonstrate how its proposed solution and scope of services meet the specifications of this solicitation. Respondents' descriptions shall be thorough and concisely articulated; lengthy descriptions such as product specification sheets and marketing brochures shall be appropriately labeled and included as Attachments to the RFP response.

Prior to responding to this Section, Respondent is responsible for thoroughly reading and understanding the contents of the entire RFP.

Responses shall be provided in the order outlined in this Section. Respondents are not required to provide a point-by-point response to each line item in this section; however, responses shall be ordered and organized by sub-section as identified in this section (e.g., NMS Overview, Training, etc.). All requested pieces of information within a given sub-section shall be sufficiently addressed within that section.

14.1 ECTRN Overview

In its response to this section, the Respondent shall

Provide a functional overview description of its solution for the entire ECTRN including high level architecture illustrating and describing the major systems, subsystems, and components. Such functional descriptions include but are not limited to, core network controllers, gateways,

simulcast control points and simulcast cells, remote base station sites, repeaters, and backhaul systems, interconnections, and other logical interfaces.

Describe how the proposed solution best suits the County's needs, and the requirements specified in this RFP.

Provide an overview of the RFRS functions and features.

Identify the total time delay expected for two-way communications from initial transmitting radio user to receipt by other field users.

Identify all major third-party infrastructure subsystems vendors and state whether and where they have been used in previous or on-going implementations of the Respondent's solutions.

Describe how the RFRS can evolve or be modularly scaled to accommodate additional channels and/or sites in the future.

Describe how the ECTRN supports the P25 CSSI standard as configured.

Respondent shall additionally provide a detailed Bill of Material in spreadsheet format for its entire proposed system(s).

14.2 ECTRN Lifecycle and Sustainability

Describe how the ECTRN will be managed and upgraded (by the Contractor) to meet the 10-year lifecycle requirements.

Discuss the expected and/or published serviceable lifecycle (assuming proper maintenance) of the ECTRN as a whole and all major network components and subsystems of the ECTRN (network controllers, repeaters, RF equipment, etc.).

Describe the process by which these components are maintained or upgraded (e.g., software only, firmware only, hardware replacement).

State published end-of-life dates, projected vendor maintenance and support dates.

Describe any projected product line changes or cancellations and discuss the technical, operational, and financial impact to the ECTRN.

14.3 Radio System Overview

Provide a detailed description of the RFRS describing the subsystems and components. Descriptions shall, at minimum, include the following elements:

Simulcast controllers.

Audio distribution and voting comparators.

Remote site equipment.

Antenna systems (combiners, multi-couplers, transmission lines, VHF antennas, etc.).

Other Contractor-provided components.

Describe how the voting receivers and comparators evaluate the best received signal and audio quality.

Describe the radio access antenna systems including:

- RF equipment implemented at each of the remote radio tower facilities.
- How the channels will be combined or duplexed into the antenna systems.
- Receive-only site equipment and design (if proposed).

Identify/Discuss:

- Antenna types (gain, spectrum, beamwidth, azimuth, antenna patterns, etc.), transmission lines, combiners, multi-coupler, tower top amplifier, mounting hardware (antenna, and cable) and other RF components used at each site.
- Make and model of all passive RF systems.
- Combiner systems: Used and available ports at combiner and multi-couplers; Frequency layout by combiner/duplexer and transmission lines.

Submit:

- Total number of equipment racks by site.
- Equipment rack layout and high-level floor plans.
- Equipment rack layouts shall depict all ECTRN components.

Discuss how the Contractor will manage physical space at the existing shelters and towers to accommodate the Respondent's ECTRN solution during the proposed transition and beyond. Identify the proposed approach to address issues that may arise.

Elaborate on all levels of fallback mode operation. Provide the RFRS redundancy mechanisms, fallback modes of operation, and recovery for the following scenarios:

- Loss of an entire site.
- Loss of multiple sites.
- Simulcast controller failure.
- Bypass mode of operation.
- Voter/comparator failure.
- Transmitter failure.
- Receiver multi-coupler failure.
- Interconnection circuit failure / Link failure.
- GPS timing failure.
- Others as appropriate.

14.4 Console Sub-System

Describe the console sub-system, the individual consoles, including model number, and describe how the proposed consoles will meet the requirements identified in the Console Sub-System Requirements section.

14.5 Reliability and Security

Describe the security mechanisms, protocols, and standards the network employs to ensure the integrity of network components, information, databases and interfaces to other agency enterprise networks and VPNs.

Provide an overview of the anti-virus, firewall and other security packages included in the proposed ECTRN.

Describe how the Contractor will ensure overall ECTRN integrity and security including network configuration backup protocols, security updates, etc.

Describe whether system refresh, software patches and other on-going upgrades cause any system downtime.

Describe the tolerance of remote radio equipment including COTS-network components and repeaters to HVAC failure, including how long the equipment is rated to operate in extreme environmental conditions.

14.6 RFRS Coverage Description

Describe the proposed coverage guarantees.

Populate the following Bounded Area coverage percentage table for your proposed design.

Bounded Area	Type of Coverage	Respondent's Guarantee[1]
Erie County	Mobile	%
Erie County	Portable On-Hip, On-Street	%
Erie County	Portable On-Hip, 8 dB In-Building	%
City of Buffalo	Portable On-Hip, 20 dB In-Building	%

Provide design assumptions and details including:

> Uplink and downlink link budgets including assumed transmit powers, receiver sensitivities and losses (equipment, body, etc.), reliability computations, fade margins, time delay and any other assumptions.

[1] This column to be filled out by the respondent.

Propagation model(s), terrain and clutter resolutions and attenuation values employed.

Simulcast gain and constraints.

Type and dimension of the portable device antenna assumed in the design.

Complete the site list table below identifying all the ECTRN sites and antenna heights/patterns.

Site Name	No. of TX Antennas @ each proposed Height	No. & Height of RX Antennas	Antenna Model and Azimuth as appropriate
Site A	e.g., 1 @ XXX'	e.g., 1 @ XXX'	
Site B	e.g., 1 @ XXX'	e.g., 1 @ XXX'	
Site N	e.g., 1 @ XXX'	e.g., 1 @ XXX'	

Include 11" x 17" coverage maps for:

Composite (all antennas) "round-trip" Mobile Coverage (not talk in and out separate).

Composite "round-trip" Portable On-Hip In-Street Coverage.

Composite "round-trip" Portable On-Hip 8 dB In-Building Coverage.

Composite "round-trip" Portable On-Hip 20 dB In-Building Coverage.

Depict areas subject to harmful time domain interference (TDI) based on the Respondent's design, but not to exceed a time delay of 50 microseconds, or propose a different time delay value if appropriate.

Coverage maps shall be superimposed on suitable geographic layers or images (as available from Microsoft Bing or MapPoint, Google Maps), primary and secondary roads and other necessary information for ease of comprehension.

Submit coverage maps for each itemized map above as ESRI SHP files or Google KMZ files.

Describe any alternative site constellation the Respondent proposes.

14.7 Network Management System (NMS)

Provide a comprehensive description of the proposed NMS, its physical and logical components, the graphical user interfaces, and how it will meet the requirements of this RFP. (See NMS Requirements Section).

Describe all ECTRN components to be managed or monitored by the NMS including, but not limited to, the RFRS, microwave network and power systems.

Describe the number of NMS licenses included in the response.

Detail the system fault and alarm management capabilities as per the specifications in and how the NMS will be configured to monitor the various required parameters.

14.8 Backup Control Stations

Briefly describe your solution for the backup control station including the proposed radio models and other relevant devices and installation plans.

14.9 Factory Testing/Staging and Delivery of the ECTRN

Describe approach for ensuring individual system components and subsystems are fully tested prior to delivery and installation.

Describe the factory acceptance testing and staging process and how all ECTRN solutions/subsystems will be demonstrated and tested.

14.10 Coverage Performance Acceptance Test Plan

Describe the coverage testing process and procedures that will be employed to verify the coverage guarantees and confirm that it is compliance with the CAT described in this specification.

Describe test equipment configuration, measures and procedures, standards employed, test grid size, etc.

Describe the process by which each coverage level: mobile, portable, etc. will be separately validated.

Describe the process Contractor will employ to simulate portable coverage during the prescribed in-vehicle testing.

Identify the proposed vendor and County provided test team members and how many test teams will be deployed.

Estimate the total amount of time required for Coverage Testing.

14.11 Functional and Baseline Acceptance Test Plans

Provide test protocols and procedures the Contractor will employ to validate and verify the overall operation of the ECTRN per the specification.

Describe installation testing and functional acceptance process and the key performance indicators (KPI) that will be used to validate the proper implementation of all aspects of the ECTRN.

Include how the County console functions and interfaces will be tested.

Describe how Contractor will track and resolve test failures.

Estimate the total amount of time the County personnel and contract staff will be expected to dedicate to acceptance testing.

14.12 System Transition and Cutover Methodology

Provide a description of the methodology that will be used to ensure that the impact to users is minimal during the upgrade and transition process.

Identify in detail the impact to field users, dispatchers, and other system users that the proposed transition plan will have, and how the Contractor will ensure mission critical communications is available throughout the transition and cutover.

Describe the proposed sequence of cutover activities and the process of transitioning to the new systems including how each subsystem will be transitioned:

Base repeater equipment.

Site and shelter equipment.

Antenna systems.

Power/DC systems.

Describe how any current frequencies will be transitioned/transferred from the legacy equipment to the Respondent's solution.

Describe how the dispatch console equipment will be transitioned.

Describe the level to which the legacy and the proposed systems will operate in parallel during the transition phase.

Describe how Contractor will manage space at existing shelter facilities and antenna support structures, as applicable.

Estimate the timeline of any impact such as reduced system functionality.

Explain why the proposed approach is optimal.

14.13 Training Program Overview

Provide a brief overview of the proposed training program including specific proposed courses, allotted number of students, schedule, etc.

Respondent shall state whether off-site training is needed to fulfill any of the training requirements.

14.14 Test and Spare Equipment

Describe major proposed spare equipment including the facilities where they will be located locations (e.g., service shop, remote site, etc.).

Describe the recommended test equipment for the County to maintain.

14.15 Project Management and Staffing

Describe your project management approach.

Provide a proposed project plan that includes deliverables and project objectives by project phase.

Identify the staffing plan/resource allocation, including, at minimum, key resources such as:

The Project Manager

Lead Engineer

Field Installation Lead

Describe the work which will be performed by subcontractors and how each sub-contractor will be managed.

Describe communications plan including how the team members (Contractor and County) will communicate during the execution of the project and how issues will be escalated.

Describe the risk management plan.

Discuss potential project risks and possible mitigation strategies.

Describe how Contractor will provide project progress updates: format, frequency and setting.

Describe the kick-off plan and activities.

Describe the Contractor's proposed method for managing, storing and sharing project documentation.

Detail the Change order process.

Describe the Contractor's Quality Control Plan discussing steps that Contractor will employ to monitor system implementation and what performance measures will be used to confirm adherence to the approved Final System Design.

14.16 County and Other Client Agency Responsibilities

Identify the County's responsibilities and duties to fulfill the scope of the project.

Estimate County's level of effort by personnel/functional category over the course of the proposed project.

Identify the role it expects the County's staff to play for the successful delivery of the project.

14.17 Project Schedule

Submit a project schedule in the form of a Gantt chart with detailed deliverables and activities. Schedule must explicitly identify the end dates of the following project phase/milestones.

Project NTP.

Kick Off.

Detailed Design Review.

Site Preparation and Planning.

Factory Testing and Delivery.

Radio System Installation.

Acceptance Testing.

Final System Acceptance.

System Cut-Over.

Project Close Out.

14.18 Detailed Final System Design

Describe the detailed design process.

Describe the objectives and outcomes of the detailed design effort.

Describe the steps that will be used to engage the County and the supporting contractor staff to deliberate, review, approve and finalize the Final System Design.

Describe how project changes (expected and unforeseen) impact the Final System Design and the process by which ensuing iterations are evaluated and formalized.

14.19 Radio System Installation and Implementation

Describe the approach and plan for equipment installation and baseline installation testing plans.

14.20 Warranty and Ongoing Support Services

Provide an overview of the Respondent's warranty and support plans proposed to the County and how it will meet the requirements.

Describe the proposed software or hardware refresh plans to meet the support and lifecycle specifications herein.

Describe the NOC functions and plans the Contractor will implement in order to meet the County's requirements. Include system monitoring and performance diagnostics services included in the Contractor's plans to the County.

Affirm the ability to meet the response and restoration times specified by the County.

Detail the response times of factory support for both repair and engineering.

Describe the Contractor's technical support functions and capabilities and identify, specifically, the capabilities and services included in the County's annual technical support plans.

Briefly describe the types of preventative maintenance plans and frequency of activities the vendor would perform on a time and material basis.

If any portions of the required post acceptance plans are sub-contracted to third party firms, explain how the Contractor, acting as the primary point of contact, will triage, assign, and manage the resolution of system issues.

Describe ongoing factory engineering and service support that the Contractor or manufacturer will provide to the sub-contractor.

Identify services, if any, which are not included in the proposed plan which the Contractor deems necessary to meet the performance and lifecycle requirements of the ECTRN.

Describe whether the 10-year maintenance plan and compliance to the technical sustainability specifications herein require replacement of hardware during that period (servers are to be expected

and taken into account), or whether the system can be kept sustainable, secure and relatively current via software and firmware upgrades.

14.21 Value Add Products and Services

Respondents are invited to provide a brief discussion or portfolio of products and services and estimated costs which they deem are directly complementary to the land mobile radio communications and microwave network prescribed in this solicitation.

15. County Simulcast Cell Capacity Expansion Options

Once the system is operational, the County may introduce additional uses to the County's North and South simulcast cells. Because the County does not know which agencies will eventually join ECTRN, Erie County seeks to secure the scope and pricing associated with increasing the capacities of the North and South simulcast cells. The respondents shall identify the incremental cost required to add an additional channel in each cell, up to 12 channels per cell.

15.1 General Requirements

All proposed municipality projects will integrate with the proposed Erie and Niagara County P25 cores and allow seamless roaming across all sites as well as interoperability among all user agencies. All proposed municipality required network expansion must utilize Project 25 Phase 2 (TDMA) Trunking infrastructure and comply with the relevant infrastructure requirements.

16. Cost Proposal

16.1 Cost Proposal Table

Respondents pricing for the ECTRN shall be submitted in the Appendix B: *ECTRN Cost Proposal Sheet.*

16.2 Milestone Payment Percentages

Respondent shall indicate its proposed payment percentages for each of the predefined milestones below (as described in this RFP). Note that the County will retain the noted percentages of the contract value for the last two project milestones.

- Kick off/Detailed Design Review
- Factory Testing and Delivery.
- Radio System Installation.
- Acceptance Testing/Final System Acceptance.
- Project Close Out.

17. Exhibits and Appendices

- Appendix A: Compliance Matrix.xlsx
- Appendix B: Cost Proposal Sheet.xlsx
- Appendix C: Schedule A: Proposer Certificate
- Appendix D: Schedule B: Standard Insurance Provisions
- Appendix E: Equal Pay Certification
- Appendix F: MBE\WBE Certification