Request for Proposal

Radio Communications System

Town of Middlebury, CT

Issue Date:
August 22, 2008

Walk-Through Date:
September 16, 2008

Response Date:
November 4, 2008

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1 REQUEST FOR PROPOSAL (RFP) OVERVIEW

The Town of Middlebury ("Town") plans to purchase a Very High Frequency ("VHF") conventional land mobile radio system ("Radio System"), which will be deployed in and around the Town of Middlebury. This RFP sets forth terms and conditions, technical requirements, and operational constraints for the implementation of the infrastructure to support the Radio System. The Vendor shall study this RFP and prepare a response that conforms to its requirements.

1.1 Radio System Capabilities

The Radio System is required to support voice, and to operate in the VHF band, 150 – 174 megahertz ("MHz"). The Town preference is for an analog system, however vendors shall supply pricing for both analog and digital systems.

1.2 Mandatory Radio System attributes

Mandatory Radio System infrastructure attributes must include, but are not limited to:

1.2.1 The system shall be conventional and operate in the VHF band, 150 - 174 MHz, at 12.5 kHz bandwidth.

1.2.2 The system shall consist of three (3) high altitude repeated channels (Police, Fire and Town), and three low power simplex tactical channels.

1.2.3 The system shall include a new, two-position PC/LCD based dispatch console including console furniture and radio control subsystems as well as other associated dispatch subsystems.

1.2.4 Any digital system proposed shall be Project 25 Phase 1 capable. Any analog infrastructure proposed shall be upgradeable to Project 25 Standards.

1.2.5 The Radio System design objective shall be to provide balanced, portable (5 watt minimum), in-building (-10 dB) coverage to and from portables worn on the hip, using a swivel mount with a remote microphone, throughout the Town at the 95%-95%-95% level, which is defined as:

- 1.2.5.1 Time Percentage of 95%, the percentage of time the required signal will at least be equaled;
- 1.2.5.2 Location Percentage of 95%, the percentage of locations within an area (defined as the Town limits) where the required signal will be present; and
- 1.2.5.3 Confidence Percentage of 95%, the general reliability of the signal in the presence of factors other than time or location.

1.2.6 The Radio System shall be expandable, with the capability to add additional VHF channel systems to the network, irrespective of the manufacturer of the system or of the added system.

1.2.7 The Vendor shall be responsible for providing a minimum of one (1) year of warranty maintenance and may be asked to provide optional follow-on maintenance for a period of up to ten (10) years from the start of the warranty period. Pricing for the follow on maintenance period shall be provided, including an escalator cap out to ten (10) years.

1.2.8 Equipment proposed for the Radio System shall be commercial-off-the-shelf (COTS) and shall not require additional development to make it compliant with this RFP.

1.2.9 Portable radio equipment proposed for the system shall be FM approved (by FM Global) as "intrinsically safe" and "non-incendive."

1.3 Total Project Scope

Inclusions and exclusions from project scope are listed below:

1.3.1 The Town intends to purchase the infrastructure equipment, with a minimum one (1) year warranty and a post-warranty maintenance agreement. The Vendor is required to provide such equipment and turnkey services as specified in this RFP. The Fire Department has used a FEMA grant to purchase and install new VHF analog infrastructure and subscriber equipment which shall be included in the completed system design.

1.3.2 The RFP includes, but is not limited to, the provision of a conventional radio system, radio control console system, and other ancillary equipment as required. The turnkey services include, but are not limited to, engineering, furnishing, installing, optimizing, testing, integrating, and maintaining the equipment and systems in accordance with the specifications contained in this RFP. In addition, the Vendor is responsible for the provision of all documentation, training, warranty, and other services associated with the equipment supplied, as specified in this RFP.

1.3.3 Along with the functional requirements contained in this RFP, the Vendor shall adhere to referenced communications industry standards and related governmental regulations. The project tasks to be accomplished are detailed in Section 5 STATEMENT OF WORK, of this RFP.

1.3.4 Projects that are not included as part of this document, but that may be concurrent during the term of this procurement, include:

1.3.4.1 Replacement of the Police administrative telephone system
1.3.4.2 Upgrade/replacement of the Computer Aided Dispatch and Records Management Systems (CAD/RMS)

1.4 Time Frame

The project shall be fully implemented in accordance with the time schedule specified in Section 2.3 Schedule of RFP Events. The Vendor is expected to complete each task and milestone detailed in this RFP and as agreed upon in the schedule adopted under any negotiated Contract. This section of the RFP provides the general procedures and instructions the Vendor is expected to follow in completing its response. It also introduces the project timeline.

1.4.1 Time Frame Modifications

If additional sites or modifications to sites are required, as noted in Sections 5.1.2 Modification to Existing Sites and 5.1.3 New Radio Sites, the Town and Vendor will separately negotiate the impact of any delays caused by Town Zoning processes required, frequency coordination required, or FCC licensing delays.

1.5 Copyrighted Material

2 PROPOSAL PROCEDURE AND INSTRUCTIONS

2.1 Site Walk-Through

The Town shall conduct a combination Bidder's Meeting and Site Walk through (the "walk-through), which will commence at the Middlebury Town Hall, Selectman's Conference Room, 1212 Whittemore Road, Middlebury, CT, on Tuesday, September 16, 2008 at 10:00 A.M. Attendance at the walk-through is mandatory. RFP responses submitted by entities not represented or present for the complete duration of the walk-through, shall not be considered by the Town. Vendors shall submit a list of names and titles of those representatives who will attend the walk-through. Vendors shall also include a list of sites they wish to visit, and an estimate of the time needed at each site. The Town will develop a site visit itinerary based on all Vendors' input. The walk-through will be conducted with all respondents as a group; therefore, vendor representatives may be required to visit sites not specifically requested to accommodate transportation logistics.

2.2 Questions

The Vendors may submit initial questions raised by them upon their review of the RFP along with their Response Letter of Intent to Bid; those questions will be answered at the walk-through. Questions raised during walk-through will be answered for the entire group; questions raised after the walk-though must be received in writing by the Town no later than September 30, 2008. All eligible vendors will receive a written record of the answers to all questions, issued with any Final Addendum(s).

2.3 Schedule of RFP Events

Event	***Due Dates***
Issue Date	August 22, 2008
Response Letter of Intent to Bid/No Bid, all questions submitted regarding RFP	September 2, 2008
Mandatory Bidder's meeting/Site walk-through	September 16, 2008 at 10:00 A.M.
Deadline for receipt of RFP Questions	September 30, 2008
Final Addendum(s) to RFP are issued	October 7, 2008
RFP Response/Preliminary Design Due	November 4, 2008
Contract Award/Notice to Proceed (Anticipated)	90 days after RFP Response date
Detailed Design Review	30 days after Contract Award
Installation Commences	120 days after Contract Award
Installation Completed	150 days after Contract Award
Systems Acceptance/Testing Completion	180 days after Contract Award

2.4 Submission of Proposal

The Vendor shall submit one (1) original paper submission, two (2) hard copies, and two (2) electronic copies of its response to this RFP. The electronic copies shall be on CD or DVD disposable media, formatted as one of the following: Adobe Portable Document Format (PDF), Microsoft Word format (Version 6.0 or later), or Rich Text Format (RTF). The Vendor's proposal must be received no later than 11:00 AM Eastern Time on November 4, 2008, at the following address:

Town of Middlebury
Office of the First Selectman
1212 Whittemore Road
Middlebury, CT 06762
ATTN: Radio System RFP

2.5 Bid Bond

Each RFP response shall be accompanied by a bid surety in the form of a Bid Bond payable to the Town of Middlebury in the amount of ten percent (10%) of the sum of the RFP. Surety will be forfeited to the Town of Middlebury if the Vendor fails to execute a contract after notification of the award of contract to the respondent.

2.6 Performance/Payment Bond

The successful respondent shall, at no additional cost to the Town of Middlebury, furnish a Performance/Payment Bond in the amount of 100% of the total contract price.

2.7 Acceptable Security

Acceptable security for bid and performance bonds shall be limited to a bond in a form satisfactory to the Town, written by a surety company authorized to do business in the State of Connecticut.

2.8 Responsibility for Compliance With Legal Requirements

The Vendor's products, services, and facilities shall be in full compliance with all applicable federal, state, and local laws, regulations, codes, standards, and ordinances, regardless of whether or not they are referred to by the Town.

2.9 Vendor Rights

Upon delivery, all materials submitted in response to this RFP become the property of the Town and may be appended to any formal documentation establishing a contractual relationship between the Town and the Vendor. Vendor shall not submit any information that is of a proprietary nature, or mark its proposal as proprietary or confidential.

2.10 Vendor Incurred Costs

The Vendor shall be responsible for all costs incurred in preparing or responding to this RFP. All materials and documents submitted in response to this RFP become the property of the Town and will not be returned.

2.11 Vendor Errors or Omissions

The Town is not responsible for any Vendor errors or omissions concerning the RFP process.

2.12 Modification or Withdrawal of a Proposal

The Vendor agrees in submitting a proposal that the proposal may not be modified, withdrawn or canceled by the Vendor for one hundred eighty (180) calendar days following the submittal date.

Vendor's proposal will be valid for a period of one hundred eighty (180) calendar days following submittal date.

2.13 Covenant Against Contingent Fees

The Vendor warrants that no person or selling agent has been employed or retained to solicit or secure the contract upon agreement or understanding for a commission, percentage, brokerage or contingent fee, except for bona fide employees or bona fide established commercial or selling agencies maintained by the seller for the purpose of securing business. If the Vendor breaches or is found in violation of this warranty, the Town will have the right to annul the contract without liability or in its discretion to deduct the commission, brokerage, or contingent fee from any amounts due the Vendor.

2.14 Reservation of Rights

This RFP does not commit the Town to award a contract, to pay any costs incurred in the preparation of a proposal to this request, or to procure or contract for services or supplies. The Town may require the Vendor to participate in negotiations and to submit such monetary, technical, or other revisions of its proposals that may result from negotiations.

2.15 Rejection of Solicitation Response

The Town reserves the right to reject any or all responses received or any part thereof, to accept any response or any part thereof, or to waive any informalities when it is deemed to be in the Town's best interest.

2.16 Vendor Inquiries

All questions relating to this RFP shall be directed, by e-mail **or** in writing to:

Email: sverbil@oliverassociates.org, with copies to firstselectman@middlebury-ct.org and poliver@oliverassociates.org

In writing:

Oliver Associates
PO Box 1116
Orange, CT 06477
ATTN: Middlebury RFP Questions

All questions and answers will be disseminated to all parties responding to this RFP. All questions concerning or issues related to this RFP shall be presented by e-mail or in writing via receipted delivery.

2.17 Addendum

The Town shall not be responsible for any oral instructions made by any employees, officers of the Town, or their representatives in regard to the proposal instructions, specifications, or contract documents. Changes to the plans and specifications will be in the form of an addendum issued by the Town to all parties receiving the RFP.

2.18 Description of Proposal

Proposals are requested on the material and services specified in this RFP. All responses shall adhere to the terms and conditions set forth in the following contractual sections of this document. Instructions are for descriptive purposes to guide the Vendor in the interpretation of the quality, design, and performance desired. Proposals must address all sections in the RFP by their reference number.

2.19 Proposal Format — Instructions

This section outlines the minimum requirements for the preparation and presentation of a response. The Vendor shall define its capability to design, supply, maintain, and train for a land mobile radio system compliant with the requirements of this RFP. The response should be specific and complete in every detail, and prepared in a simple and straightforward manner.

2.19.1 Response Format and Organization

Proposals should be submitted on the forms and in the format as contained in the RFP. Proposals should be indexed and sectioned in a manner consistent with the RFP. Material presented in response to one section may be referenced, if it is applicable, to the response to another section of the RFP.

The proposal (hard copy) should be submitted in a loose leaf, three-ring binder. The proposal, including all copies, should contain all descriptive literature, specifications, samples, and etcetera. Electronic copies shall be formatted in Microsoft Word, Rich Text Format (RTF), or Adobe Portable Document Format (PDF) as appropriate on CD or DVD media. Responses consisting solely of marketing material will not be accepted.

2.19.2 Letter of Transmittal

The letter of transmittal shall include the Vendor's legal name and business name, if different, address, telephone and fax numbers of the office(s) that will perform the work. The letter shall state the full name of the contact person(s) who will be authorized to represent the company regarding all issues related to this proposal or any contract subsequently awarded to said Vendor. The letter must bear the signature(s) of the person(s) with binding authority for the firm.

2.19.3 Table of Contents

The Table of Contents of the proposal must include a clear definition of the material, identified by sequential page number and by section reference number.

2.19.4 Work Plan and Performance Schedules

Each proposal must be accompanied by an estimated performance schedule detailing each phase. Significant completion intervals for major tasks with itemized deliverables shall be scheduled based upon the milestones listed in Section 2.3 Schedule of RFP Events.

2.19.5 Organizational Chart/Assigned Personnel

The Vendor shall identify its program manager in the response and include the names of all personnel who require site access.

2.19.6 Contractors List

A list of all proposed Contractors and each Contractor's functions, tasks as related to specific sections to the STATEMENT OF WORK, and schedule shall be included in the response to this RFP.

2.19.7 Contract Form and Languages

All documents submitted by the Vendor concerning this RFP shall be written in the English language. Numerical data furnished herein shall use U.S. customary units of measurement (i.e., not metric).

The Vendor shall submit forms of any additional agreements that the Town will be required to enter into because of the Vendor's proposal. Such additional agreements shall include, without limitation, any computer software licensing agreements, leasing agreements, etc. required for the proper operation and maintenance of the system.

2.19.8 Technical Proposal

The Vendor shall respond to the specifications and technical requirements stated in this RFP. Required responses are shown in *underlined Italics* within each section.

2.19.9 Deliverables Checklist

The Vendor's response to this RFP shall comply with the PROPOSAL CHECKLIST shown in Table D-I of APPENDIX D — PROPOSAL CHECKLIST.

2.19.10 Cost Proposal

The Town requires the Vendor to provide detailed, itemized pricing for its proposed design. In addition, a number of deliverables and activities are identified that should be separately priced as options. The Town may or may not elect to purchase these options. The Vendor is instructed to follow the format required in APPENDIX E - PROPOSAL PRICE INFORMATION to provide a price breakdown of the proposed system.

2.19.11 Sales Tax

In accordance with the provisions of Section 12-412(a) of the Connecticut General Statutes, sales of tangible personal property and services to the Town of Middlebury are not subject to Connecticut Sales and Use Tax, and such taxes shall not be included in the RFP response.

2.19.12 Lease/Purchase Proposals

Provide lease/purchase options available to the Town. Include APR, factor, term(s), buy-out, etc. Describe options available and their advantages (such as annual payment vs. monthly payment, including maintenance costs in lease, adding MAC costs to lease, etc.). Also address the issue of when title passes. The Town will not be liable for reimbursing the Lessor for any taxes (personal property, sales, use, etc.) which the Town's tax-exempt status shields them from.

2.19.13 Options — Alternate Proposals

Provide pricing for all additional vendor-proposed options, and/or alternate proposals, as applicable. Alternate proposals must meet the functional and code requirements of the Performance Specifications.

3 PROPOSAL EVALUATION

3.1 Key Personnel

3.1.1 For purposes of this clause, "Key Personnel" is defined as those individuals who are mutually recognized by the Town and Vendor as essential to the successful completion and execution of this Agreement.

3.1.2 Personnel designated as “Key Personnel” shall be assigned to the extent necessary for the timely completion of the task to which they are assigned. Any substitution or reassignment involving Vendor’s Key Personnel assigned to this work shall be made only with persons of equal abilities and qualifications and is subject to prior approval of the Town, in writing.

3.1.3 The Town reserves the right to direct the removal of any individual assigned to this Agreement.

3.1.4 If the Town determines that suitable and timely replacement of Key Personnel who have been reassigned, terminated, or have otherwise become unavailable for the Agreement work is not reasonably forthcoming, or that the resulting reduction of productive effort would be so substantial as to impair the successful completion of the Agreement, the Vendor may be terminated by the Town for default or for the convenience of the Town, as appropriate, or at the discretion of the Town if it finds the Vendor at fault for the condition. The Vendor price or fixed fee may be equitably adjusted downward to compensate the Town for any resultant delay, loss, or damages.

3.1.5 Vendor’s Key Personnel will be identified by the Town and Vendor prior to the certification of the award to the Vendor.

3.2 Evaluation Criteria

The evaluation of responses received will include an initial review and a final detailed review. The initial review will evaluate all submissions for conformance to stated specifications to eliminate all responses that deviate substantially from the basic intent and/or budget of the request, and that fail to satisfy the mandatory requirements. Only those proposals that meet or exceed the intent of the mandatory requirements will be evaluated further.

The requirements stated in this RFP will be used in a weighted evaluation matrix against which each Vendor’s offering will be compared. The degree to which the proposals exceed the mandatory requirements will be assigned a point value, and the total for each offering will be computed as the sum of the products of weight value times point value. Weight values will be assigned in accordance with the perceived importance of each function/capability.

Vendor’s proposal must adhere to the terms and conditions of this RFP. Any exceptions must be noted in Vendor’s response. The evaluation factors for the system, including mandatory requirements, include (without limitation):

- Vendor’s Understanding of Scope of Work
- Organizational Capabilities
- Past Performances
- Implementation
- Radio System Performance
- Contract Logistics Support
- Management Evaluation
- Feature Richness
- Time Schedule
- Total Cost

3.2.1 Vendor's Understanding of Scope of Work

The Vendor shall describe in detail its understanding of the project's scope of work and the Vendor's concept of the methodologies used to achieve the results described. The Vendor's response shall address the specific deliverable items required in the STATEMENT OF WORK. The level of detail described for each item will provide the Town with insights into the Vendor's understanding of the project scope.

3.2.2 Organizational Capabilities

Consideration will be given to the qualifications of the Vendor's project team proposed for assignment to this project. Staff qualifications and specific experience demonstrated on projects of a similar nature will receive primary attention. Consideration will also be given to prior activities such as system engineering, detailed design effort, equipment development, equipment installation, and construction of facilities. The Vendor shall submit the resumes of the Project Manager, Principal Engineer, and other essential personnel who will be assigned to the project.

3.2.3 Past Performance

The Vendor's successful past performance on similar projects will be considered as a significant indicator of the Vendor's technical competency and capability to complete this project. The Vendor shall submit a list of at least three (3) projects of similar size and complexity that demonstrate the firm's qualifications due to past experience with similar projects. The list shall contain details regarding type of system(s), name(s) of customer(s) to whom the services were provided, dates and periods during which the indicated services were provided, the extent and exact nature of services provided, and whether or not the proposed systems were implemented.

3.2.4 Implementation

The Vendor's proposal will be evaluated for the quality, completeness, and realism of the approach to the complete and timely implementation of the system in accordance with the requirements of the SOW. The following evaluation considerations are listed and are equal in order of importance:

A) Plans to coordinate activities, schedules, and resources and ensure availability of required components to ensure timely site implementation.
B) Approach to data gathering and obtaining access to Town information, facilities, and personnel.
C) Availability of qualified personnel resources to complete large scale, implementation within schedule requirements.
D) Approach for coordinating with other service and equipment providers to obtain data, establish schedules, and coordinate activities.
E) Environmental considerations and process for satisfying environmental, land use, zoning and other regulatory requirements.
F) Extent to which implementation plans minimize loss of service and disruption to existing operations.

3.2.5 Radio System Performance

An evaluation will be made of the Vendor's proposed design. The proposed design documents will be evaluated in accordance with the following considerations listed in equal order of importance:

A) Quality of the design and demonstrated ability to meet performance requirements, with particular emphasis on coverage, operational reliability, and recoverability.
B) Extent to which system performance will exceed performance requirements in the performance specification and the richness of features that will be provided.
C) Understanding of the operational and security requirements, and the performance risks and the relative changes associated with meeting the varied service, schedule, feature, and geographic requirements.
D) Extent to which the facilities employ proven, commercial technology and standards and allow connection to the broadest possible range of commercial equipment.

3.2.6 Contract Logistics Support

The Vendor's proposal will be evaluated for the understanding and completeness of the Vendor's plans for meeting Contract Logistics Support requirements of the SOW. The evaluation considerations are listed below and are equal in order of importance:

A) Availability of qualified personnel
B) Plans to ensure timely maintenance and warranty response
C) Plans for receiving, processing, and tracking maintenance and warranty calls
D) Plans for providing spare parts and identifying/obtaining long lead-time materials.

3.2.7 Management Evaluation

Each proposal will be evaluated to assess the Vendor's management ability to plan, schedule and coordinate implementation and operation of the system in accordance with the requirements. The Vendor's proposal must convey to the Town that the Vendor has a suitable approach, the required resources, and possesses sufficient management expertise and experience to manage resources and effectively achieve all requirements.

3.2.8 Feature Richness

Consideration will be given to the degree to which the system being offered by the Vendor exceeds the minimum requirements. Extra weight will be given to proposals that provide state-of-the-art technology, provide useful user-friendly features, conserve radio spectrum, and address the needs of the Public Safety community for wide area multi-agency wireless services, and leverage any data network infrastructure installed for this project to the benefit of all Town agencies.

3.2.9 Total Cost

An important factor in the selection of a Vendor will be the project cost of the proposed solution that meets the goals of the system.

3.3 Contract Award

The award, if any, shall be made by giving written notice to the Vendor.

4 DELIVERY, INSTALLATION, AND TRAINING REQUIREMENTS

This section covers design, delivery, installation, acceptance, and performance requirements for all equipment delivered by the Vendor.

4.1 Responsibility

The Vendor shall be responsible for engineering, furnishing, installing, and testing all elements of the system in accordance with the specifications and requirements of this RFP. The period of performance is expected to be for the design, delivery, and install period plus three (3) years after initial acceptance of the system by the Town. The Vendor shall also be responsible for the work and cost for temporarily moving and/or repositioning existing equipment to facilitate the new installation. After final system acceptance, the Vendor shall be responsible for providing a minimum of one (1) year of warranty maintenance and two (2) years of engineering-level assistance for system operation, management, and development issues. The Vendor may be asked to provide optional follow-on maintenance for a period of ten (10) years. The Vendor shall make necessary provisions to warehouse all maintenance materials and equipment to be installed.

4.2 Delivery/Installation Schedules

The Vendor shall propose a baseline schedule for design, delivery, installation, and testing of all items required for the system. The schedule shall address, as a minimum, the following:

- Site Surveys and Site Selections
- Site Preparation
- Preliminary Design
- Detailed Design/Critical Design
- Equipment Manufacturing
- Acquisition of Other Subsystems
- Equipment Delivery
- Radio System Installation
- Radio System Configuration
- Radio System Testing
- Subsystems Installation
- Subsystems Testing
- Acceptance Test
- User Training
- Radio System and Equipment Warranty
- Radio System Documentation

4.2.1 Time Schedule and Required Milestones

The Vendor shall make every effort to comply with the time frame specified in Section 2.3 Schedule of RFP Events. The Vendor shall propose a detailed implementation schedule and shall identify any tasks that the Town must perform to maintain the schedule. Prior to entering into contract, the Town and the Vendor shall agree on the events Time Frame, with specific times for itemized milestones. Failure by the Vendor to meet the milestones at the times mutually agreed upon could subject the Vendor to penalties, including Liquidated Damages. Notwithstanding the above, the following represents the basic milestone requirements:

A) Commencement of system acceptance testing (which can occur only after completion of mobile radio installation and programming, portable radio delivery and programming, remote control installation and programming and required system training for users) shall occur no more than one hundred and sixty (160) days from the Notice to Proceed.

B) Completion of system acceptance testing shall occur no more than one hundred and eighty (180) days from the Notice to Proceed.

4.3 Cleaning

All work areas shall be cleaned at the end of each workday. The Vendor shall keep all premises clear of all rubbish and debris generated by the work involved and shall leave all premises neat and clean. The Vendor, at the Vendor's expense, shall dispose of all surplus material, rubbish, and debris.

4.4 Security

The Town shall not assume any responsibility, at any time, for the protection of or for loss of materials, from the time the contract operations have commenced until the final acceptance of the work.

4.5 Systems and Equipment Warranty

The following warranties are inclusive and are given in addition to other warranties expressed and implied. The Vendor shall provide multiple warranty options with their associated costs for both the system and subsystem warranty and the software warranty.

4.5.1 Systems and Subsystems Warranty

The Vendor shall warrant that the system and all subsystems, including all components will be fully operational and free from defects for a minimum of one (1) year from date of final acceptance. The Vendor shall provide all parts and labor during warranty period.

4.5.2 Software Warranty

The Vendor shall warrant that software products provided for the system remain free from defects and errors for a minimum of one (1) year from date of final acceptance. The Vendor shall provide all necessary services to promptly correct any defects at no cost to the Town.

The Vendor shall provide any software program upgrades or enhancements developed for any subsystems supplied as part of the system along with any software maintenance needed to keep the system fully functional, for three (3) years from date of final acceptance.

4.5.3 Software Licensing

The Vendor shall comply with software licensing requirements for Vendor's and the Town's (or their designated representatives) use during installation and ongoing use after system implementation.

The Vendor shall provide software license rights to the Town, and shall continue to support the software over that period.

4.6 Training

The Vendor shall provide operational training for Town employees. The operational training shall cover operational capabilities of the system. Such training shall meet the requirements specified in Section 5.8 Training, of this RFP.

5 STATEMENT OF WORK

This Statement of Work (SOW) describes the services, equipment, facilities, software, and subsystems to be provided by the Vendor for engineering, furnishing, installing, integrating, testing, documenting, training, warranting, and maintaining equipment and services for the Radio System to be acquired under this RFP.

The Vendor shall propose a commercial-off-the-shelf (COTS), Very High Frequency (VHF), analog and digital conventional Land Mobile Radio System meeting all requirements of this RFP. The Vendor's response to this RFP shall comply with all mandatory requirements and shall specifically address all italicized requirements specified in this section and in Sections 6, 7, and 8 of this RFP. The technical specifications in Section 6 identify in detail the technical attributes of the equipment and services to be provided.

The Vendor shall perform engineering, design, equipment selection, implementation, optimization, training, system testing, integration, maintenance, and other associated tasks necessary to ensure the installed Radio System is functional and complete, and that it meets the Technical Specifications of this RFP. The Vendor shall provide project management, installation, testing, training, and original equipment manufacturer (OEM) Vendor support services as necessary to implement and maintain a complete and fully operational Radio System in accordance with the specifications and requirements of this RFP. The Vendor shall identify and cost out all necessary site facility additions and modifications and may, at the Town's option, be required to perform the modifications.

The project shall be broken down into discrete tasks. An example is provided in APPENDIX H — TYPICAL TASK LIST. The Vendor's responsibilities include, but are not limited to, the following requirements, which are not necessarily placed in the order of their performance. The Vendor shall refer to appropriate paragraphs of this section for more detail. The vendor shall:

- Conduct site surveys to determine all construction and/or modification of facilities required, including the dispatch center, towers, equipment rooms, power systems, antenna support structures, and buildings. The Vendor shall identify and cost out the modifications and upgrades required for these facilities to support the Radio System, including the provision of backup power generation equipment and Uninterruptible Power Supplies (UPS). Additionally, the Vendor shall prepare all documents and construction specifications for new sites, as required.

- Perform a detailed radio frequency (RF) propagation study and perform test measurements to confirm the validity of the propagation study.

- Perform an interference analysis, including transmitter noise, intermodulation, and receiver desensitization estimates for each site.

- Select the appropriate pairing of the existing licensed frequencies for optimal performance.

- Develop a preliminary design for the Radio System using allocated VHF frequencies. The Vendor shall submit the preliminary design and required studies to the Town for approval. The Vendor shall not commence any further work until approval is received.

- Develop a detailed design for the Radio System. Prepare, in a format agreed upon during contract negotiations, with all documentation, drawings, and implementation plans necessary for Radio System installation, testing, and acceptance. The Vendor shall submit the detailed design to the Town for approval. The Vendor shall not commence any further work until approval is received.

- Develop a preliminary design for the dispatch center improvements, including console electronics, associated subsystems and workstation furniture. The Vendor shall submit the preliminary design to the Town for approval.

- Develop a "cutover" plan which provides for the continuation of services by the communications center while radio system and console system changes are performed. The Vendor shall not commence any work which could impact the dispatch center's ability to provide services until the cutover plan is approved by the Town.

- Install the Radio System as defined in the approved detailed design document. The Vendor shall supply and warehouse all equipment until installation.

- Install the workstation furniture, console electronics and associated subsystems as defined in the approved detailed design document. The Vendor shall supply and warehouse all equipment until installation.

- Prepare and conduct test plans and procedures, including, but not limited to installation tests, final acceptance tests, and field tests.

- Provide project management and scheduling to ensure proper coordination and timely completion of the Radio System.

- Provide training for the Radio System and all subsystems as specified in this RFP, in a "train-the-trainer" format.

- Provide "as-built" documentation, including wiring and cable diagrams, Radio System manuals, equipment manuals, and maintenance manuals.

5.1 Site Selection

All communications sites proposed by the Vendor shall be identified in the Vendor's response to this RFP.

The Vendor shall propose the sites to be used in meeting the requirements of this RFP. Final site selection is subject to Town approval. The sites listed in the Annex B are suggestions only; the only sites licensed for use at the current time are the Police Station and Town Hall sites.

5.1.1 Site Survey

The Vendor shall include in the response to this RFP a complete description of all anticipated site work required to meet the requirements of this RFP.

The Vendor shall be responsible for gathering all data needed and shall conduct site surveys at each site to determine its present condition and suitability for use.

5.1.2 Modification to Existing Sites

The Vendor shall identify all site improvements, including pricing, necessary to meet the Radio System/subsystem performance specifications outlined in this RFP. A list of site deficiencies and/or other circumstances that may present potential problems shall be included in the response to the RFP.

On a site-by-site basis, the Vendor shall determine work required to prepare sites for installation of the Radio and Console systems. The Vendor shall submit all designs and specifications to the Town. The Vendor may be required, at the Town's option, to perform needed site modifications. If the Vendor fails to mention necessary improvements or neglects to specify all facility requirements, the Vendor shall remedy the problems that arise at its own expense.

5.1.3 New Radio Sites

Should the results of site surveys and propagation analyses indicate the requirement for new radio sites, the Vendor shall be responsible for identifying all site construction and/or modification requirements and providing full documentation of the construction/modifications required to establish a fully operational radio site. The Vendor may be required, at the Town's option, to develop, construct, and provide a fully operational site.

The Vendor shall provide a not-to-exceed budgetary estimate for each new site in the response to this RFP. Final prices based on these estimates for site preparation will be negotiated during the design phase.

5.1.4 Site Access Requirements

The Vendor shall provide or obtain permission for site access by and delineate in the response to the RFP any special ingress or egress requirements.

The Vendor shall have final responsibility for arranging for and ensuring site access at proposed sites.

5.1.5 Licenses and Permits, Exceptions

The Vendor shall be responsible for obtaining any and all required approvals, licenses, and permits other than those enumerated below, which are the responsibility of the Town:

A) Federal Communications Commission (FCC) licenses

B) Preparation and submission to the FCC of any environmental review documentation required by 47 CFR §§ 1.1301 – 1.1319

C) Reviewing, preparing, and securing applicable environmental body approval(s), including approvals regarding stream encroachment, flood plains, and wetlands

D) Submitting zoning or planning commission application(s) for the construction or modification of any antenna support structure(s) when required

E) Requesting necessary Federal Aviation Administration (FAA) clearance(s) using Form 7460-1, Notice of Proposed Construction

5.1.6 Site Plans, Elevations and Drawings

Where and when required, the Vendor shall prepare zoning drawings for zoning applications, including site plan, elevations, site boundary survey, antenna specifications, and computer-enhanced photograph(s) with antennas.

5.2 Propagation Analysis

In the response to this RFP, the Vendor shall identify coverage parameters and provide detailed descriptions of the coverage analysis for the Vendor's preliminary design. A list of all assumptions and considerations for proposed sites shall be included.

The Radio System shall be designed to meet the coverage performance requirements specified in Appendix C. The Vendor shall perform in-depth coverage analysis to determine the location and number of sites needed to meet the requirements and objectives of this RFP. The Town will only consider radio sites for which the Vendor has determined that long-term access rights can be obtained.

The coverage simulation output shall provide talk-out and talk-back coverage maps for all individual sites and the composite Radio System for the service areas covered (assume 5 watt portable radios with -17.6 dB relative to a dipole antenna [dBd] gain), and an additional –10 dB of loss inserted to compensate for ordinary construction buildings. The out-of-boundary RF signal level shall comply with any regional regulatory conditions. The Vendor shall provide coverage maps overlaid on a topographic map with 1:60,000 scale or better.

5.3 Interference Analysis

The Vendor shall minimize the effects of interference at each site. The Vendor shall perform RF interference analyses for each radio site. The analyses shall identify on-site and off-site interference problems, including those created by the proposed systems. These analyses shall specify the preventive measures that will be taken at each site to eliminate or reduce interference to an acceptable level. The interference analysis shall be part of the detailed design. In addition, measurements shall be made on the installed Radio System to verify acceptable interference levels during the final acceptance tests. Interference analysis and measurements must include:

- Co-channel and adjacent channel interference
- Intermodulation (IM)
- Transmitter noise
- Receiver desensitization.

If interference occurs to/from others as a result of implementation, the Vendor shall be responsible for making recommendations to the Town for changes needed to resolve inter-System interference.

5.4 Preliminary Designs

5.4.1 Radio System Site Plans, Elevations and Drawings

The Vendor shall describe, in the response to this RFP, their preliminary design proposal for a conventional, three-channel repeater VHF radio system.

The Radio System shall be designed to be expandable and capable of accommodating additional channels. It shall be compatible with, and to the maximum extent possible, capable of sharing equipment with the existing Fire Department VHF radio system.

The preliminary design is defined as those functions performed by the Vendor during preparation of the proposal to satisfy the RFP requirements and to provide substantiated pricing and baseline project schedule for engineering, materials, construction, implementation, testing, and acceptance of the project. The Vendor's preliminary design must include all engineering, coverage, reliability, and interference analyses to ensure that its proposal meets all requirements of this RFP. The preliminary design will serve as a system baseline document to begin contract negotiations.

The preliminary design shall be based on the functional and performance requirements provided in Section 6, in conjunction with the results of the analyses performed. The preliminary design for the overall Radio System and each subsystem shall include, but not be limited to:

- Block diagrams representing the overall Radio System and subsystems
- Descriptions of the Radio System and subsystem functions
- Propagation analysis
- Interface definitions
- Project working schedule
- List of all major hardware and software elements required to substantiate the design
- List of all site modifications, construction, and their associated costs
- List of all site support services and utilities necessary to ensure proper operation of the Radio System.

The Vendor's approach to all Radio System engineering tasks is extremely important. The Vendor's studies and analyses shall include coverage predictions, interference analyses, and other engineering tasks necessary for a complete preliminary design.

5.4.2 Console System Site Plans, Elevations and Drawings

The Vendor shall describe, in the response to this RFP, their preliminary design proposal for a replacement console system in the communications center.

The Console System shall be designed to be expandable and capable of accommodating additional channels. The preliminary design is defined as those functions performed by the Vendor during preparation of the proposal to satisfy the RFP requirements and to provide substantiated pricing and baseline project schedule for engineering, materials, construction, implementation, testing, and acceptance of the project. The Vendor's preliminary design must include any engineering analyses required to ensure that its proposal meets the requirements of this RFP. The preliminary design will serve as a system baseline document to begin contract negotiations.

The preliminary design shall be based on the functional and performance requirements provided in Sections 6.14 and 6.15, in conjunction with the results of the analyses performed. The preliminary design for the Console System and associated subsystems shall include, but not be limited to:

- Block diagrams representing the overall Console System and subsystems
- Descriptions of the Console and subsystem functions
- Project working schedule
- List of all major hardware and software elements required to substantiate the design
- List of all site modifications, construction, and their associated costs

5.5 Detailed Design

Upon approval of the preliminary design, the Vendor shall begin the detailed design of each subsystem, including antenna and transmission lines, power, remote consoles, remote access stations, cabling, wiring, and grounding. The Vendor shall also prepare installation plans, test plans and procedures, and an integration plan. All detailed design data shall be available for final review, comment, modification, and evaluation. The Vendor shall obtain approval from the Town prior to starting any implementation activities.

The Vendor shall provide documentation detailing the design in a Critical Design Review (CDR) Report. This report shall include engineering calculations, interference analysis results, detailed functional descriptions of systems and subsystems, system configurations, interface designs, individual facility floor plans, equipment layout, rack elevations, cabling, wiring, wiring lists, electrical distribution and cable routing information, commercial power connection, emergency generator location, Uninterruptible Power Supply (UPS) location, grounding system designs, main distribution frame (MDF) layout, all necessary drawings for modifications to the existing facilities or for building new sites, drawings of site support systems, towers and antenna structures, antenna space allocation on towers or antenna structure, console furniture, console electronics and associated subsystems, equipment lists, and all other details needed for a complete and successful Radio System implementation. The draft CDR Report shall be submitted according to the schedule in Table E-2 of Appendix E. The Vendor shall incorporate any and all comments received from the Town into the final document.

5.5.1 Radio System Security Requirements

The Vendor shall provide a detailed description of the physical and electronic security features provided with the proposed Radio System.

5.5.2 Leased Lines / Microwave connectivity

The Vendor shall identify and price in its response to this RFP:

a) Microwave/wireless connection technology alternative to the use of leased lines.

b) *Any portions of the municipal-area network (MAN) that could be used to provide the required connectivity.*
c) *Any leased lines required to provide interconnection of all sites*

5.5.3 Interface Designs

The Vendor shall develop an interface control document describing the physical, mechanical, electrical, and functional relationships of equipment being interfaced. The document shall be very detailed so that it can be followed while designing each subsystem. The interface control document shall provide all detailed specifications of each interface point, including physical, mechanical, environmental, and electrical specifications, levels, and protocols.

The interface control document shall be submitted for approval prior to the start of equipment manufacturing.

5.5.4 Radio System Equipment Specifications

The Vendor shall submit the technical specifications on all equipment identified in the detailed Design. Vendor shall certify that the equipment to be provided under this contract shall be supported by the manufacturer for a minimum of ten (10) years after contract award.

5.5.5 Design Approval Process

The Vendor shall conduct a formal CDR, at which time submitted studies, analyses, conceptual designs, and detail designs will be reviewed for completeness in terms of functional capabilities, design performance, and/or other technical issues. Town approval is required for each design document. Approval of the detailed design is required prior to the Vendor commencing any further work.

5.6 Installation

The Vendor shall install the Radio System as defined in the approved detailed design document. Rack-mounted equipment shall be installed in lockable closed racks, using minimal floor space.

Before the installation of any equipment, the Vendor shall provide a Site Preparation Completion Report. The draft Site Preparation Completion Report shall be submitted according to the schedule in Table E-2 of Appendix E. The Vendor shall incorporate any and all comments received from the Town into the final document.

5.6.1 Infrastructure Equipment

The Vendor is responsible for installing all equipment necessary for the operation of the Radio System as described in this RFP, as well as interfacing with the existing Fire VHF system. During the detailed design phase, the Vendor shall develop detailed installation plans and procedures to perform the work in accordance with the schedule, implementation plan, and contract documents. Installation of all equipment shall comply with the requirements of Section 7 GENERAL INSTALLATION SPECIFICATIONS, of this RFP. After equipment installation, the Vendor shall provide an Installation Completion Report. The draft Installation Completion Report shall be submitted according to the schedule in Table E-2 of Appendix E. The Vendor shall incorporate any and all comments received from the Town into the final document. An initial and final walk-through will be conducted to determine operational conditions.

5.6.2 Radio System Documentation

The documents provided as part of the contract must reflect the as-built configuration of the delivered product at the time of Radio System acceptance. All redlined drawings must be revised and delivered in final drawing format within sixty (60) days of Radio System acceptance. It is required that all documentation be provided as bound, printed, and digital media to be determined at contract negotiations.

All drawings, including vendor manuals, must have traceability to allow the technicians to follow signals through the Radio System in a logical sequence during troubleshooting. An equipment manual number and/or title should appear in the block representing that item on the Radio System

block diagram, or a cross-reference list may be provided to allow cross-referencing from a model number on the drawing to an appropriate manual that contains the detailed schematics and parts breakout for that item.

The Vendor shall provide, as part of the Contract, as a minimum, the following types and quantities of Radio System and equipment specific manuals:

- Maintenance Manuals—Two (2) copies for the type of fixed site equipment provided and one (1) set for each applicable site
- Electronic File Copies—Two (2) sets of all applicable manuals on electronic media.

5.6.3 Codes

The installation shall be in complete compliance with all building and fire codes, and good engineering practice, including but not limited to the current editions of:

A) NFPA 37, "*Standard for the Installation and Use of Stationary Combustion Engines and Gas Turbines*"
B) NFPA 70, "*National Electrical Code®*"
C) NFPA 72®, "*National Fire Alarm Code*"
D) NFPA 110, "*Standard for Emergency and Standby Power Systems*"
E) NFPA 111, "*Standard on Stored Electrical Energy Emergency and Standby Power Systems*"
F) NFPA 1221, "*Standard for the Installation, Maintenance and Use of Emergency Service Communications Systems*"
G) Motorola® R56, "*Quality Standards for Fixed Network Installations*"

5.6.4 Cleaning

All work areas shall be cleaned at the end of each workday. The Vendor shall keep all premises clear of all rubbish and debris generated by the work involved and shall leave all premises neat and clean. The Vendor, at the Vendor's expense, shall dispose of all surplus material, rubbish, and debris.

5.6.5 Spare Parts

The Vendor shall include, in the response to this RFP, a list of recommended spare parts with pricing and stocking levels required to sustain operation of the Radio System for one (1) year.

The list shall indicate the Vendor lead-time for delivery of each item.

5.6.6 Test Equipment

The Vendor shall provide, in the response to this RFP, a complete list of any recommended test equipment, including the specific model, manufacturer, and versions required.

5.6.7 Equipment Labeling

The Vendor shall develop a labeling system and shall mark all installed equipment and associated termination hardware using easy-to-read identification labels as agreed upon during contract negotiations. These labels shall describe the equipment details and/or cable termination points in accordance with the final design drawings. All equipment shall be bar-coded. The information to be shown on the label shall be submitted for approval prior to the start of any labeling.

5.7 Acceptance Testing

The Vendor shall inspect, align, optimize, and fully test all facilities, equipment, and subsystems to ensure compliance with the specifications contained in this RFP and any other pertinent contract documents. The Vendor shall provide all personnel and equipment necessary for testing. Acceptance testing shall occur when full foliage is present.

The Vendor shall identify all RF interference problems whether internal or external to the Radio System. The Vendor shall resolve all Radio System-generated RF interference problems and suggest possible solutions to RF interference generated outside the Radio System.

5.8 Training

Prior to the acceptance of the Radio System, the Vendor shall provide the training described in this section to the Town, and/or others as directed by the Town. The Vendor shall provide training at various hours in order to accommodate Town employee shift work.

Two types of training are to be provided:

- Operational training
- Technical training

5.8.1 Training Plan

The Vendor shall provide, in response to this RFP, a condensed training plan describing how the Vendor intends to provide training. This training plan shall include class type, duration, size. and cost. Additionally it shall be compatible with the implementation schedule provided by the Vendor.

The Vendor shall submit to the Town during the detailed design phase, a comprehensive, integrated training plan and schedule of available courses that will enable Town staff, and/or others as directed by the Town to effectively operate the provided Radio System over its life cycle period. The training plan shall include a list of all subjects, including subject descriptions, class material to be provided, number of classes, class duration, class size, training location, and class cost. The training shall be compatible with the system implementation schedule provided by the Vendor. The Town will coordinate the training requirements and class assignments with the Vendor during the design phases. In order to minimize the impact to the ongoing staffing needs of the Town, the training shall be structured as “train the trainer” classes.

Training shall occur in two phases: pre-staging and pre-final acceptance. The Vendor shall provide Radio System concept and design training, upon request, so that management better understands the Radio System design and operational concepts and requirements. Additional training shall be provided on all remaining topics listed above, if requested, during the installation phase but prior to final acceptance.

5.8.2 Instructional Materials

The Vendor shall provide all instructional material, including printed manuals, audio, video, interactive self-paced personal computer programs, and complete equipment operating instructions for all technical and operational training classes. Actual and/or exact model and series of equipment being delivered shall be made available for "hands-on" use and operation during training. All instructional material shall be subject to the approval of the Town.

5.9 Warranty and Maintenance

The Vendor shall identify in the response to this RFP Standard and enhanced (if available) repair response for negotiation prior to contract award.

The Vendor shall be responsible for the maintenance and repair services of all installed equipment during the installation, testing, and first year of the operational phases of this RFP.

The Vendor shall provide, in the response to this RFP, the price for post-warranty maintenance services out to ten (10) years following the warranty period. The Vendor may be asked to provide maintenance service for a ten (10) year period following Radio System acceptance (exclusive of the included warranty coverage), and shall quote the cost for the initial maintenance period for this service in the RFP response. The Vendor shall also specify a guaranteed inflation cap, expressed in percentage of the maintenance agreement, and specify for which period this cap applies. The same repair and restoration response provided during the warranty period is anticipated to be

required during the post-warranty period, subject to negotiation prior to contract award. The Vendor shall recommend all special tools and software, including those considered proprietary, required or necessary for maintaining any installed equipment. All sets of special tools shall include any hardware or software servicing aids not normally used in the day-to-day operations of a radio service facility. Special tools shall include utility software used to change equipment attributes.

The Vendor shall provide any utility software specific to the Vendor's system that is not readily available from a third party.

5.9.1 Service Provider Qualification Requirements

Vendor shall operate a fleet of service vehicles, and shall have a full-time service department employing radio repair technicians who are PCIA or FCC certified, employed on a regular, full-time basis. These radio repair technicians shall have attended and passed manufacturer training classes for installation, modification and maintenance of the proposed equipment. Vendor shall have adequate testing and programming equipment to ensure reliable installation and repair of radio equipment, including the capability of programming mobile and portable radio equipment in the field. Vendor shall be capable of accurately checking operating frequencies, output power and antenna efficiency; and performing minor repairs at Town facilities. *The Vendor shall detail the makeup of its installation and maintenance departments. The detail shall include the following:*

A) Total number of employees
B) Number of Full-time installers
C) Number of Part-time installers
D) Number Full-time repair technicians
E) Number of Part-time repair technicians
F) Number of subcontractors normally used and services performed by those subcontractors (itemized by subcontractor)
G) Location of Service Center(s), both main and branch locations
H) Guaranteed response times, for both routine repair calls and emergency repair calls

5.9.2 Service Provider Location Requirements

Vendor shall provide twenty-four hour emergency service, seven days per week. Emergency service call intake and dispatching shall be provided by a dispatcher; automated call taking and dispatching of emergency service calls is explicitly prohibited.

5.9.3 Service Provider Response Requirements

The vendor shall provide response as follows:

A) For equipment failures which result in a complete failure, defined as the inability to use, whether from the dispatch end or in the field, or both, one or more radio channels: Respond in t**wo (2) hours or less, seven (7) days per week, including holidays.**
B) Vendor shall describe its indemnification to the Town for non-compliance with these time requirements.
C) Vendor shall put forth their best effort to correct any complete failure. In the event that the complete failure is prolonged (defined here as a complete failure which continues more than four hours), the vendor shall consult with the Town's representative(s) regarding alternatives (such as substitute radios) which can be used while repairs continue.
D) For all other failures: Respond in one (1) business day or less.

5.9.4 Service Provider Identity and Subcontracting

The Vendor shall identify the service organization to be used for both routine and emergency maintenance. Subcontracted service is acceptable, provided that:

- the subcontractor is certified and trained by the equipment manufacturer to perform service on the provided equipment,
- the Vendor remains the single point of contact for entry into the service system, and
- the subcontractor meets all other requirements of this section.

6 TECHNICAL SPECIFICATIONS

These specifications define the Radio System, subsystem, and component functionality, and provide performance requirements of the Radio System obtained under this RFP. This section also includes hardware/software specifications for major subsystems, addresses electrical and mechanical attributes, and specifies interfaces to other systems.

6.1 Radio System Functional Requirements

The Radio System to be obtained under this RFP will support the requirements of Police and Fire, as well as non-emergency government users in the Town of Middlebury. The vendor shall provide proposals for both analog and P25 digital systems. The Town will consider the option of digital encryption for the Police Department.

6.1.1 Configuration of Systems

There are six VHF frequencies licensed to the Town which will be integrated into the new system. The Town requires three conventional VHF repeater systems: one for the Fire Department, for which some equipment is currently installed and operational; one for the Police Department; and the third for other Town agencies, including DPW. Equipment required to accomplish simulcast distribution, if required, as well as equipment required for receiver voting, shall be located at Police Headquarters.

6.1.2 Tactical Frequency Infrastructure Requirements

The Fire Department will be utilizing a frequency separate from that for dispatch when operating at multi-unit responses. The Town requires that this frequency be monitored at the PSAP and recorded, and that a receiver for this tactical channel be located at every radio site used by the Town of Clinton radio system.

6.1.3 Radio Identification and Emergency Alarm Requirements

The Town requires portable radios with an "emergency alarm" function to summon emergency assistance. This alarm shall sound and display, at the primary dispatch consoles, the user's unit ID and emergency status, and optionally, the user’s alias or name. The system shall have the capability of identifying every portable, mobile, and control station upon each push-to-talk (PTT) transmission. Subscriber unit ID, and optionally, the user’s alias or name shall display at the primary dispatch consoles. The subscriber unit ID shall also display at consolettes and small control consoles installed as a part of this system.

6.1.4 System Survivability

The system shall be designed so that complete loss of the head-end controlling equipment will not result in a complete loss of the radio system. Vendor shall propose solutions that will allow at least one of the sites (and all of the channels at that site) to operate in an in-cabinet repeater mode. All equipment critical to system survivability shall be protected by both an Uninterruptible Power Supply (UPS) capable of supporting the equipment for a minimum of one hour, and an emergency generator capable of supporting the equipment for a minimum of 24 hours.

6.1.5 Frequency Band/Spectrum

The radio network shall operate in the Very High Frequency (VHF) band (150 - 174 megahertz [MHz]).

6.1.6 Radio System Features

The Vendor shall provide, in response to this RFP, the list of all Radio System features included in the proposal, and a separate list of all other features, with pricing, that could be made available.

6.1.7 Interoperability

The Vendor shall describe, in the response to this RFP, methods that can be used to achieve Radio System interoperability with other networks, from the field user point of view.

The Vendor shall discuss the different methods of interoperability between agencies that will be employed in the proposed network. These methods should include, but not be limited to:

A) Inter-RF subsystem Interface (ISSI) between systems of the same and/or different vendors
B) Console Patching
C) Multi-band mobile radios, or multiple mobile radios.
D) Shared frequencies

6.2 Console Electronics and Furniture systems

Operational control of all radio transceivers and/or receivers, at all radio sites, as well as performance of all Radio System administration functions, shall be performed from the main radio control console positions, located within the Police Department Headquarters. Two (2) radio control console will be required. The consoles and associated equipment shall be installed within the existing communications center.

6.2.1 Basic Console Features

The dispatch radio consoles shall be modern, microprocessor-controlled, and have the ability to control all of the channels of the proposed new system as well as any existing radio system now in use by the Town, with the ability to expand to handle additional channels. The radio consoles shall provide simple, easy to use LCD interface for the users, allowing all radio functions to be performed via mouse/trackball, and/or optional touchscreen. Any keyboard that is a part of the system shall not be needed for routine functioning of the system.

6.2.2 Additional Console Features

Additional features provided by the console system shall include, but are not limited to:

A) Provision of auxiliary functions such as door up, door down, door stop, door unlock, and other functions activated through dry contact closures provided by the console equipment
B) Display of voting receiver information, including provision of individual receive site disable capability
C) Radio paging over the Town's own radio systems
D) Activation of Knox-Box unlocking devices
E) Activation of existing fire station alerting devices
F) Display of radio unit ID on the console LCD flat screen
G) Display and handling of any emergency messages received from Radio System subscriber units
H) Capability of sending alert tones of various types to distinguish emergency traffic from routine traffic
I) Capability of arranging channel appearances into logical groups for ease of use by the dispatcher
J) Provision of an interface device containing speakers with independent volume controls for Select Audio and Unselect audio at each dispatch position, as well as a PTT switch for the selected radio channel(s). The volume control for the select audio speakers shall not be capable of completely silencing the select audio speaker(s).
K) Provision of both a built-in microphone as well as 2 headphone jacks (in 6-wire configuration) at each dispatch position. Plugging in a headset shall disable the radio microphone, mute the select audio speaker and reroute select audio to the headset. PTT shall be possible over the headset jack, as well as via the trackball/mouse, and via a foot switch provided for each position.

L) Provision of a telephone-headset interface, with the ability to react to an "off hook" indication from the customer-provided phone system. The system shall re-route Select audio back to the Select audio speaker when it receives the "off-hook" indication, and route telephone audio to the headset of the dispatcher. Depressing any push-to-talk switch will momentarily re-route microphone audio to the radio system, muting the telephone microphone line for the same period.

6.2.3 Remote Controllers and Consolettes

Additionally, operational control of the Town frequency shall be accomplished using a combination of consolettes (eight) and small control consoles (nine) throughout the Town, at locations to be identified. These units shall have the capability to display subscriber unit ID. The Town will provide a point of contact for exact placement.

6.2.4 Console Furniture

The Vendor shall propose modern, workstation-style furniture designed and purpose-built for 24 x 7 dispatch center use. The equipment shall:

A) Be ergonomically correct and ADA compliant, with adjustable height for the main work surface area and independent height adjustment for the keyboard tray, all motor-controlled.
B) Have adjustable work surface heights, which shall be sufficient to allow a dispatcher to work sitting down or standing, as well as work from a wheelchair.
C) Include storage modules, which shall be movable as necessary and fit underneath the work surface area, and shall be sized to accommodate all of the non-radio equipment to be installed at each dispatcher position, in addition to the radio controls.

6.3 Radio System Performance Specifications

As previously stated, the intent of this RFP is to acquire conventional radio systems, either analog or digital. This section establishes the minimum system performance specifications for the Radio System.

6.3.1 Coverage

Coverage analysis performed by the Vendor shall be based on the following standards and documents:

A) Institute of Electrical and Electronic Engineers (IEEE), Vehicular Technology Society Propagation Committee, Standard Report on Measuring Field Strength in Radio Wave Propagation
B) TIA/EIA TSB-88-B dated September, 2004, Wireless Communications Systems — Performance in Noise and Interference-Limited Situations — Recommended Methods for Technology-Independent Modeling, Simulation, and Verifications

6.3.1.1 Coverage Requirements

Indoor coverage of 95%-95%-95%, as defined in Section 1.2.5, is required for the entire service area. The radio frequency (RF) signal level at the receiver's input for both talk-out and talk-back should be adequate to support CM 4 (delivered audio quality [DAQ]-3.4) voice quality or 2 percent bit error rate (BER) data quality. The coverage shall be based on using portable units on hip, in swivel holster. The Channel Performance Criteria, defined in TSB-88-B, within these areas shall be applied to 95 percent of the Town, in the presence of noise and interference. The Vendor shall provide coverage analyses maps of the proposed Radio System.

6.3.1.2 Specific Building Coverage

"APPENDIX G — LOCATIONS OF PRIMARY CONCERN" lists building locations of primary concern to the Town which, due to location, construction type, size or occupancy, represent a known or anticipated area of difficult radio coverage. The Vendor shall describe the methodology proposed to provide coverage to these buildings.

6.3.1.3 Coverage Conformance Tests

The Vendor shall describe, in the response to this RFP, the methodology proposed to validate the coverage performance.

The Vendor must develop a test plan that is based on statistically valid testing procedures. The voice acceptance test will consist of signal level and BER measurements for the mobile and portable outdoor coverage areas. The Vendor coverage analysis must be complemented with a test plan and procedures to validate the designed coverage reliability over the service area. Conformance testing must be done to validate the required area reliability over the specified service area by measuring statistically significant numbers of test locations in accordance with the TSB-88-B conformance testing methods. The results shall be documented and provided to the Town.

Note: A coverage reliability claim will not be accepted unless empirically verified by averaging measurements over the entire coverage area.

6.3.1.4 Prediction Model Selection

The Vendor shall employ a suitable coverage prediction model using appropriate terrain and land cover data for such an environment.

6.3.1.5 Terrain Elevation Data

The 30 meter U.S. Geologic Survey (USGS), NAD-27 terrain elevation data shall be used for coverage simulations. Alternatively, 3 arc second data may be used where 30 meter data is not available.

6.3.1.6 Land Use and Land Clutter

The Vendor shall include losses due to land use and land clutter obstacles as appropriate.

6.3.1.7 Simulation and Coverage Maps

The coverage simulation output shall provide talk-out and talk-back for individual site and composite coverage maps for mobile and portable radios, including a list of all assumptions and sites used.

7 GENERAL INSTALLATION SPECIFICATIONS

The Vendor shall indicate, in the response to this RFP, the installation standards to be used.

The Vendor shall install all equipment furnished for the Radio System in accordance with good engineering and workmanship practices. The constituent installations shall conform to appropriate installation standards. All equipment installations shall meet all local codes and ordinances. All standards shall be subject to prior approval.

7.1 Installation Plans, Procedures, and Approvals

The Vendor shall prepare, in response to this RFP, an installation plan, which outlines the installation of the infrastructure equipment on a site-by-site basis.

The installation shall be performed in accordance with the overall Radio System project schedule, implementation plan, and contract documents. The installation plan shall also include the installation the dispatch center radio console system and associated equipment, as well as the installation of remote control terminals. The Vendor shall provide detailed installation plans and procedures showing the proposed installations at each site and facility at least fourteen (14) days before the beginning of work at that site. The Vendor shall not perform any installation work until approval of the proposed plans and procedures is received. All work in the dispatch center shall strictly follow the approved cutover plan for that facility. The installation plans shall include the proposed plot plan, floor plan, equipment layout, rack elevations, tower elevations, cabling and wiring diagrams, antenna installation drawings, and seismic bracing details. The equipment layout and space requirements shall be identified at each site and included in the proposed installation plans.

7.2 Installation Coordination

The proposed installations shall be approved prior to commencement of a particular stage of work on a site-by-site basis. Installation at any site or facility shall not commence without written approval. The Vendor shall install the equipment within the designated space as proposed in the installation plan; all changes require prior written approval. Access to all existing Town facilities shall require prior coordination with the Town.

7.3 Equipment Installation Requirements

The Vendor shall provide a copy of its latest installation and quality standards with the response to this RFP.

The Vendor shall be responsible for the installation of all equipment furnished for the Radio System project. The equipment shall be installed in accordance with appropriate installation standards. The installation of this equipment shall conform to the applicable requirements outlined in this section, the Vendor's applicable installation and quality practices, and the Town's requests. The most stringent of these requirements and guidelines shall govern if a conflict arises during the installation. The Town reserves the right to approve or disapprove the use of any portion of the Vendor's standards to which it does not agree.

7.3.1 Electrical Installation, Grounding, Bonding, and Lightning Protection Requirements

The Vendor shall ensure that all equipment is installed, electrically bonded, grounded, and protected in accordance with the latest editions of:

A) NFPA 37, *Standard for the Installation and Use of Stationary Combustion Engines and Gas Turbines*.
B) NFPA 70, *National Electrical Code®*
C) NFPA 72®, *National Fire Alarm Code*
D) NFPA 110, *Standard for Emergency and Standby Power Systems*
E) NFPA 111, *Standard on Stored Electrical Energy Emergency and Standby Power Systems.*
F) NFPA 1221, *Standard for the installation, Maintenance and Use of Emergency Services Communications Systems*
G) Motorola Publication 68P81089E50-A, *Standards and Guidelines for Communication Sites* (R56).

This shall include all metal conduit, trays, racks, cabinets, antennas, transmission lines, electrical service entrance conductors, telephone lines, and other metallic conductors.

Where these standards, and/or those listed in this section conflict, the more stringent requirement shall prevail.

The Vendor shall inspect the grounding systems at all facilities and provide a written report delineating any deficiencies and identifying the required corrective action. The written report shall be submitted to the Town at least sixty (60) days prior to the installation of new equipment. The Town will consider the deficiencies and make disposition in a timely manner. The Town may elect to correct the noted deficiencies or have the deficiencies corrected by the Vendor at additional cost. The Vendor shall furnish and install all grounding and bonding conductors and make connections to existing facilities. The conductors shall be Number 6 American Wire Gauge (AWG) copper wire or larger.

The Vendor shall provide all grounding and lightning protection equipment, including surge arresters, to comply with the requirements of this section for all equipment installed as part of the project. Bonding conductors shall be used to bond the various pieces of equipment, conduit, trays, etcetera, together.

A four-wire soil resistivity test shall be performed and appropriate electrodes installed to meet the ground resistance requirement of less than 10 Ohms. A ground resistance test shall be performed after ground rods and lines are installed to demonstrate compliance with the requirement. The ground resistance readings shall be recorded and provided to the Town prior to site acceptance.

A single point ground system shall be used, whenever possible and approved by the site manager, on all equipment installed as part of the project. The single point ground system installed within equipment shelters or buildings shall be connected to the exterior building/tower ground system. The grounding system installation shall be in accordance with the following guidelines:

H) Each single row of equipment shall have a separate ground bus consisting of an AWG #2 or larger solid or stranded copper conductor. Each bus shall be connected to the single point ground window.
I) A single cabinet, rack, or enclosure and any associated transmission line or circuit protection devices shall have a ground conductor bonding all components to a single point ground near the equipment installation.
J) The antenna support structure/tower must be bonded to the external ground system using an exothermic weld, if permitted by the tower manufacturer.
K) All ground conductors that compose the external ground system shall be connected using exothermic welding.

L) Transmission lines shall be grounded with proper sized ground kits and connected to the tower and entry bus.
M) The external ground system shall be tested for soil impedance in accordance with MIL-HDBK-419A and shall provide a ground resistance of 10 Ohms or less.

The Vendor shall provide lightning surge protection for all metallic cables interfacing with equipment outside the site or facility. This includes alternating current (AC) power, RF cabling to the towers, telephone lines, and other equipment interfaces.

The Vendor shall install surge protection devices for all RF cabling and wiring associated with the Radio System project. The Vendor shall identify surge protection deficiencies at existing facilities, if any exist, and recommend changes to the Town. In the event that the Town does not choose to improve any noted surge protection deficiencies, the Vendor shall take appropriate steps to protect the new equipment associated with the Radio System project, including the inclusion of surge arresters in interfaces between equipment.

All coaxial transmission lines to external antennas shall be protected using suitable flange mount (or bulkhead mount, where necessary) surge protectors equivalent to the PolyPhaser IS-50-NX-CI.

Telephone lines shall be protected using gas tube protectors that comply with Telcordia GR-1361 specifications.

All AC power branch circuits powering equipment outside the site or facility shall use a suitable shunt surge suppressor.

7.3.2 Equipment Racks and Cabinets

All equipment shall be mounted in self-supporting standard closed cabinet racks. If equipment is mounted within secure shelter environment, accessible only to or with the consent of designated Town employees, such equipment may only in that case be rack mounted. Appropriate shielding kits shall be provided where necessary.

The cabinets (or racks) shall be positioned with a minimum spacing of 36 inches between equipment rows provided adequate space is available at the location. The cabinets and equipment racks shall be anchored to the floor using at least four (4) anchor points or as specified by site management.

The racks and equipment shall comply with the appropriate earthquake protection standards. The cabinets and equipment racks shall be braced and/or attached to the overhead superstructure, if required, to prevent equipment from toppling during an earthquake.

7.3.3 Interface Requirements Including the Main Distribution Frame

A distribution frame shall be provided at each site to facilitate the centralized demarcation of data, voice, telephone, alarm, and control wiring between different pieces of equipment at the site and external lines. Distribution frames may be implemented as follows:

A) Type MD110 or equivalent punch blocks attached to a plywood panel mounted on a wall.
B) Type MD110 or equivalent punch blocks mounted in an equipment rack or standalone distribution frame.
C) Type MD110 blocks with bridging clips (or other types) to establish the connection between the equipment and line shall be used at signal demarcations to facilitate fault isolation. The Type MD110 connector block is preferred.
D) All equipment provided for the project shall be wired and tested to the assigned demarcation point.
E) A 36-inch (minimum) aisle shall be provided in front of the main distribution frame (MDF) and/or individual demarcation panels.

7.3.4 Equipment Placement Requirements

The Vendor shall use existing equipment rooms and antenna support structures for the installation of equipment where possible. The use of any alternative locations is subject to the Town's approval. If exterior equipment cabinets are proposed, said cabinets will be designed for the task, equipped with HVAC systems sized for the environment, and subject to the prior approval of the Town. Equipment shall be installed in the equipment room with appropriate spacing to accommodate maintenance and ensure the safety of personnel. Equipment shall be installed in accordance with applicable requirements, including the latest editions of NFPA 70, *National Electrical Code*; NFPA 72®, *National Fire Alarm Code*; NFPA 1221, *Standard for the installation, Maintenance and Use of Emergency Services Communications Systems*; and the current edition of Motorola Publication 68P81089E50-A, *Standards and Guidelines for Communication Sites* (commonly known as the "R56 Standard"), and the applicable American Society of Heating, Refrigerating, and Air Conditioning Engineers (ASHRAE) standards. Finally, the Town's specific requirements shall also be incorporated in the facility layout plans.

The Vendor shall be responsible for both ingress and egress, associated with the installation of antennas on existing antenna support structures. The Vendor shall perform the necessary intermodulation and interference studies prior to installing antenna equipment.

Active radio frequency (RF) equipment should be mounted in the equipment room to facilitate maintenance in inclement weather. Tower-mounted RF equipment, including RF preamplifiers, shall not be proposed.

7.3.5 Antenna and Transmission Line Installation

The antennas and transmission lines for the Radio System must be designed and installed with particular care to ensure proper system performance, reliability, and maintainability. Installation practices, which require particular attention, are presented in this section.

7.3.6.1 RF Coaxial Cable Connectors

The Vendor shall state, in response to this RFP, the method to be used for weatherproofing outdoor connections.

Standard type RF connectors suitable the Ultra High Frequency (UHF) band are required for all Radio System applications. The RF connectors shall remain in the original packaging until installation to prevent oxidation and corrosion of the mating surfaces. The connector installation procedure should be designed to avoid contamination of the connector mating surfaces by the installer, particularly by contact with the installer's fingers. Silicone compounds and other insulating material shall not be used in the assembly of the connector in order to ensure low electrical resistance between mating surfaces.

Connectors shall be tightened to the manufacturer's specifications with a proper torque wrench; hand tightening is not acceptable. All outdoor connections shall be weatherproof.

7.3.6.2 RF Transmission Lines

Transmission lines at the Radio System transmitters and receivers shall use Andrew HELIAX or an equivalent quality coaxial cable with a solid outer shield conductor to minimize signal leakage and interference. Coaxial cables using braided outer conductors shall not be used for the transmission lines. The manufacturer's recommended minimum bend radius for the cable shall not be exceeded in the installation. Where waveguide is required, it shall be installed in accordance with the manufacturer's specifications.

The transmit and receive transmission lines shall be securely fastened to the waveguide bridge and antenna support structure using correctly sized Microflect cushion type cable hangers, or an equivalent alternative. The cable hangers or clamps shall be spaced in accordance with the transmission line manufacturer's recommendations. Particular care shall be exercised to prevent any physical damage or deformation to the line. The line shall be sweep tested, by the Vendor, in the appropriate frequency band to ensure conformance to quality installation standards. The test results shall be provided to the Town.

Terminating connectors shall be installed in accordance with the manufacturer's instructions. The quality of the transmission line, connectors, and hardware shall equal or exceed that available from Andrew or Cablewave systems. Hoisting grips shall be left in place to secure the installed cable. Correctly sized grounding straps supplied by the transmission line manufacturer shall be installed at the top and bottom of each transmission line. The lower grounding strap shall be located at the point of the surge and drip loop. The grounding straps shall be installed in accordance with the manufacturer's instructions and routed by the most direct path to the nearest grounding system conductor. Exothermic welds shall be used, subject to approval by the tower manufacturer, when making direct connections to the antenna support structure.

The ground strap connection with the transmission line shall be weatherproofed according to manufacturer's instructions using the manufacturer's supplied material to preclude corrosion. Non-exothermic ground connections, if used, shall use metals which preclude cathodic or galvanic action.

Transmission lines should use adequate service loops and strain relief at cable interfaces and building entrances to prevent physical damage to the cables during an earthquake.

7.3.6.3 Antennas

The antennas shall be mounted to the tower using either galvanized or stainless steel hardware. All support brackets and other installation hardware shall be hot-dip galvanized to provide a long service life. All support brackets and antennas shall be heavy-duty type and shall be installed vertically or down-tilted using the appropriate down-tilt brackets (Electrical down-tilt is preferred).

The antennas shall be carefully located to minimize interference. The antennas shall be rugged and designed for a service life of at least ten (10) years. The antennas shall be of a high-quality construction commensurate with public safety applications.

7.3.6.4 Receiver Multicouplers

Any multicouplers and associated preamplifiers shall be installed in the receiver cabinet at each site. Neither the preamplifier multicoupler unit nor any other receiver related components shall be placed in the transmitter cabinet or in the transmitter combiner rack, except with the approval of the Town. All RF connectors shall be properly tightened. Tower-mounted RF preamplifiers are not preferred.

All interconnecting coaxial cables shall use Andrew Superflex cable or equivalent solid outer corrugated shield coaxial cable. All joints and fasteners associated with the multicouplers and equipment shall be securely tightened to preclude RF noise generation.

7.3.6.5 Transmitter Combiners

The transmitter combiner components shall be mounted in a floor-mounted rack. The rack shall be anchored to the floor.

All interconnecting coaxial cables shall use Andrew Super-flex HELIAX cable or equivalent solid outer corrugated shield coaxial cable. All joints and fasteners associated with the combiners and equipment shall be securely tightened to preclude RF noise generation. All RF connectors shall be tightened in accordance with the manufacturer's specifications.

7.3.7 Site Internal Cabling

The Vendor shall install all site cabling in a workmanlike manner and in accordance with applicable industry standards. AC and direct current (DC) power cables shall be correctly sized to minimize voltage drop. Control, data, and voice cables shall be shielded and routed separately from AC and DC power cables. RF cabling shall be installed in accordance with the manufacturer's recommended minimum bend radius.

Plenum rated cables shall be used when routed through areas used for air handling and as required to comply with local codes. Cables on cable trays or ladder trays should be separated when secured. Cables that require separation from each other include AC power, DC power, RF, ground, voice, and data cables. These cables can be secured together in "like kind" groups but

must be separate from others. A minimum separation of 2 inches shall be provided between power and signal cables. All cables in cable trays shall be secured at intervals of no more than 36 inches. Cables shall be supported for all runs in excess of 24 inches.

All RF, audio, alarm, and data cables shall be labeled to identify the cable destination or termination. Information printed on each label should be brief but clearly understandable. Labels shall be plastic or Mylar, rather than unprotected paper, and shall stand up to the particular site environment.

Cables and transmission lines shall be installed with an adequate service loop and strain relief to allow movement during an earthquake. Broad service loops should also be used for all cables at building entrances.

7.3.8 Cable Tray Requirements

The Vendor shall provide a cable tray or ladder to appropriately support all RF and power cables. The cable tray system shall be designed using the proper size and type sections used as designed by the manufacturer, including straight sections, elbows, tees, dropouts, and expansion connectors. The cable tray shall be of sufficient width to permit a minimum separation of 2 inches between power and signal cables. The cable tray system must be designed with suitable strength and rigidity to provide adequate support for all contained wiring. Cable ladders or other suitable methods shall be used to interface the cable tray system with cable entrances, the MDF, and equipment. The layout and type of system used will require approval.

Cable trays shall be designed and installed at heights that provide adequate clearances the necessary equipment with provisions for expansion. The cable tray layout and design shall consider factors including ceiling height, light fixture locations, cable entry ports, equipment location, and minimum cable bending radius.

Cable trays shall be installed as designed and shall be securely attached to the ceiling and/or wall such that they are rigid and immovable. Horizontal and vertical tray supports should provide adequate bearing surface and load capacity to meet the requirements of the cable tray system. A support shall be located within 2 feet of each side of an expansion connector. Cable trays shall be positioned such that they are easily accessible with sufficient space to permit access for installation and maintenance of the cables.

The installation shall be in accordance with the cable tray manufacturer's specifications as well as the NEC and any other applicable national, state, and local codes. The cable tray shall be electrically bonded together by an approved method and connected to the grounding system.

7.3.9 Communications Equipment Locations

The centrally-located common equipment shall be installed in accordance with the installation plan and contract documents. The associated equipment racks shall be installed using suitable racks, floor anchoring, and bracing. The Vendor shall furnish and install the interconnecting wiring, grounding, and power connections.

7.3.10 Antenna Support Structures

The Vendor shall perform a structural analysis of existing towers and other antenna support structures, as required, prior to the installation of additional antennas and transmission line. Specific written approval shall be obtained from the owner prior to the installation of equipment on any existing antenna support structures.

The Vendor shall be responsible for the installation of the foundation and/or anchor bolts of any new antenna support structure provided under the contract. A structural analysis of the building or structure shall be performed by the Vendor, if required, prior to installing new antenna support structures. The Vendor is responsible for all remedial facility work required after the installation, including roof repair and painting.

All antenna support structures shall be constructed and installed in accordance with local, state, and national codes. The antenna supporting structures shall meet the requirements of American National Standards Institute (ANSI) EIA/TIA RS-222-E.

Antenna supporting structures and all mounting hardware shall be hot-dip galvanized to provide a service life of at least twenty five (25) years without painting or other maintenance.

The antenna support structures shall be suitably grounded and equipped with a lightning rod, if required.

Transmission lines shall be suitably protected from damage at all points between the antenna and equipment room. The transmission line shall be supported at intervals of no more than 24 inches for horizontal runs. Aerial runs using messenger cable will not be permitted. A cable ladder/ice bridge shall be provided between the equipment shelter/facility and towers. Horizontal transmission runs across rooftops or other areas subject to damage by foot traffic shall be protected using outdoor polyvinyl chloride (PVC) conduit, cable ladder, or other suitable methods.

The penetration of a transmission line into a building or facility requires a weatherproof device. The preferred method of penetration is a commercial cable port assembly composed of an entry plate and boot assembly. The number of ports should accommodate the number of transmission lines plus 50 percent growth. The cable boots shall be correctly sized for the transmission line. No more than a single transmission line shall be installed per port. The Vendor shall ensure that all installations are properly sealed at all times to avoid damage to the existing facility.

7.3.11 Site Restoration

The Vendor shall restore the site and adjacent property to at least the condition prior to the execution of the installation work. The Vendor shall clean up all debris that resulted from the performance of its work. The trash shall be disposed of in accordance with local regulations and the Town's requirements.

7.4 Quality Control Requirements

The Vendor shall include, in the response to this RFP, a Quality Assurance Plan (QAP) for the Radio System project.

The QAP shall include the Vendor's proposed quality assurance/quality control (QA/QC) plans and procedures, which shall ensure that the Radio System is designed, manufactured, and implemented in accordance with these requirements. The QAP shall address all stages of the project, including detailed Radio System design, acquisition, installation, and acceptance testing. The proposed QAP shall address the QA/QC procedures related to the following work steps:

- Design analysis and verification
- RF coverage analysis and verification
- Design review and approval
- Design changes and document control
- Acquisition and Vendor inspection
- Material receiving, storage, and shipping
- Site preparation
- Installation personnel training and certification
- Field installation and inspection
- Radio System testing and validation
- RF coverage validation
- Material and workmanship deficiency reporting and restoration
- Inspection and testing documentation
- Training and certification of Town personnel or their designated representatives.

The Vendor shall develop a detailed QA/QC procedure for each major work step associated with the Radio System project and submit it to the Town at least fourteen (14) calendar days prior to the execution of the work.

8 ACCEPTANCE TESTING

This section addresses the acceptance test and final acceptance requirements of the Radio System.

The Vendor shall perform all tests necessary to demonstrate that the Radio System fully and completely meets the requirements of the RFP. All necessary personnel labor, materials, documentation and test equipment to perform all acceptance tests shall be provided by the Vendor. All test plans are subject to review and approval; it is intended that designated representatives will be at all or part of the testing.

8.1 Acceptance Test Plan

The vendor shall include, in the response to this RFP, a detailed Acceptance Test Plan (ATP) demonstrating compliance with the stated requirements.

The Vendor shall prepare an ATP to demonstrate that all Radio System components, both individually and collectively meet the requirements of the RFP. The ATP shall also demonstrate proper operation of the protective switching and/or fallback modes for all critical Radio System elements. The ATP shall include sections describing field operational tests. The field operational test section shall include equipment level, system level, and coverage testing elements. The test methodology and list of required test equipment shall be included in the ATP. The Town reserves the right to modify the test plan and to add additional test requirements that verify compliance with Radio System requirements.

A major failure during acceptance testing is defined as any failure that reduces the overall system, individual system, or site availability as follows:

- Radio frequency (RF) coverage reliability (on street) of less than 90 percent throughout service area
- Failure of any other critical system.

8.1.1 (Reserved)

8.1.2 Field Acceptance Testing

The Vendor shall include, in response to this RFP, the proposed (or a representative sample) Field Acceptance Test Plan demonstrating compliance with these requirements.

Field acceptance testing includes acceptance testing performed at the equipment and system levels after the Radio System has been installed. Field-testing is divided into three general categories: Functional Tests, Performance Tests, and RF Coverage Tests. The Vendor shall develop a Field Acceptance Test Plan during the detailed design phase that fully and completely tests all components and functions of the Radio System. "Fully and completely" means furnishing all personnel, test equipment, supplies, materials, software, and hardware to conduct the tests, as required, to verify that the radio system complies with the RFP's requirements.

8.1.2.1 Functional Tests

The functional testing shall include the following equipment, individual systems, and system level tests:

- Verification that all equipment is delivered and installed in a professional manner in accordance with the RFP
- Verification that the Radio System incorporates the necessary fallback modes and redundant equipment in accordance with the RFP requirements
- Performance testing of individual sites after they are installed.

8.1.2.2 Performance Tests

The performance testing shall include the following equipment, individual systems, and overall system tests:

- Demonstration that all equipment meets the performance requirements of the RFP by the examination of test data and re-performing specific tests. The Town may request that all tests be re-performed, if deemed appropriate, at the Vendor's expense.
- Verification that all functions perform in accordance with the Radio System specifications.
- Verification that the performance of the Radio System is in accordance with the RFP.
- A successful thirty (30) day Operational Test.

8.1.2.3 RF Coverage Tests

The Vendor shall provide, in response to this RFP, a representative RF Coverage Test Plan that demonstrates compliance with these requirements.

RF coverage tests shall ensure that the coverage is in accordance with the Vendor's proposal and the RFP objectives. The RF coverage test shall be based on the EIA/TIA TSB-88-B document, *Wireless Communications Systems – Performance in Noise and Interference-limited Situations – Recommended Methods for Technology-Independent Modeling, Simulation, and Verifications.*

RF Coverage testing shall be performed when full foliage is in place.

The RF Coverage tests shall verify that the Radio System provides the required signal level necessary to meet the Channel Performance Criteria (CPC), throughout the radio coverage area. The overage test data shall identify the measurement location, absolute signal strength, bit error rate (BER) or Carrier to Interference (C/I) measurement, Circuit Merit measurement, and the CPC. This data shall be collected, processed, and the coverage depicted on suitably scaled maps. Sampled measurements throughout the service area with statistical processing shall be used to expedite the measurement process. At least the minimum number of measurements necessary to produce measurement validity in accordance with the EIA/TIA TSB-88-B document shall be performed during the coverage tests.

8.1.3 Operational Test

The Vendor shall provide, in the response to this RFP, a typical Operational Test Plan that demonstrates compliance with these requirements.

The Vendor shall perform a thirty (30) calendar day Operational Test of the Radio System to ensure that all hardware and software defects have been corrected prior to entering final proof of performance testing The full integrated operation of the Radio System, including all individual subsystems, shall be demonstrated during these tests. The tests shall be designed to demonstrate the reliability, long-term stability, and maintainability of the systems. The Radio System shall operate for thirty (30) consecutive days without a Priority 1 or Priority 2 failure (defined below), or more than twenty-four (24) RF channel-hours of cumulative equipment downtime.

The operational test shall also demonstrate the long-term stability of the operation of the Radio System, including the RF reference sources. Manual optimization, alignment, or adjustment of the Radio System or subsystems, including remote adjustments shall not be permitted during the test. This test shall ensure that the system does not require constant manual adjustment to maintain the level of performance specified in the RFP.

The Vendor shall develop a detailed Operational Test Plan during the detail design phase of the project.

If a major failure occurs during the thirty (30) day test period, that test will be terminated, corrective action will be taken and approved, and the entire thirty (30) calendar day test period will be reinstated. If any minor failure occurs during the thirty (30) day test period, the testing period may resume upon resolution of the problem.

The following priority levels are provided to help the Vendor better understand the systemic effects of major and minor failures. Failure priority levels one (1) and two (2) are considered major failures. Levels three (3) and four (4) are considered minor failures. Nevertheless, the decision regarding whether a problem is major or minor remains with the Town.

PRIORITY LEVEL ONE (1) — Priority level one (1) failures are major system failures that render the Radio System completely unusable and/or inoperable, and are considered unacceptable.

PRIORITY LEVEL TWO (2) — Priority level two (2) failures are major and minor system failures that significantly reduce Radio System operability and usability, and are considered unacceptable.

PRIORITY LEVEL THREE (3) — Priority level three (3) failures are minor system failures that minimally reduce Radio System operability and usability, and are considered acceptable only during the acceptance testing phase.

PRIORITY LEVEL FOUR (4) — Priority level four (4) failures are minor system failures and punch list items that have little or no effect on system operability and usability, and are considered to be operationally acceptable only during the acceptance testing period.

8.1.4 Re-Testing

If the System fails to meet the acceptance criteria, a “re-test” may be rescheduled and reinitiated one time upon request by the Vendor and approval by the Town. Additional acceptance tests required to demonstrate compliance may be reinitiated only upon express written permission from the Town.

8.2 Final Acceptance

The Vendor shall demonstrate that the equipment fulfills all requirements of the RFP. Final acceptance shall require, but not be limited to, the following:

- Completion of all facility work, system, component, hardware and software delivery, installation, testing, optimization, phased integration, documentation, and training.
- Acceptance of Radio System, facilities, individual systems, and equipment by the Town. Correction of any operational, performance, or workmanship defects shall be at the sole expense of the Vendor.
- Written certification by the Vendor of compliance with the RFP requirements, including RF coverage performance and acceptance test results.
- Successful completion of the thirty (30) day Operational Tests.

8.2.1 Failure to Comply

If the Radio System does not satisfy the complete RFP requirements within ninety (90) consecutive calendar days after Installation completion, or any other period specified in the contract, the Vendor may be deemed to be in default.

MIDDLEBURY PUBLIC SAFETY RADIO SYSTEM

APPENDIX A — LIST OF FREQUENCIES

151.1225, 153.9125, 154.7775, 158.8125, 158.9025, 159.2175 MHz.

APPENDIX B — LIST OF POTENTIAL RADIO SITES

Name	Contact Agency	Latitude / Longitude	AGL (meters)
200 Southford Rd	Middlebury Town	41-33-08.8N/073-08-14.4W	45
1212 Whittemore Rd	Middlebury Town	41-31-41.3N/073-07-20.5W	30
Benson Rd Pump Station	Middlebury Town	41-29-46.8N/073-08-51.7W	12
Breakneck Hill	Middlebury Town	41-32-35.3N/073-07-40.8W	15
DPW Garage	T-Mobile	41-32-08.7N/073-05-21.3W	41
Clubhouse@Washington	Middlebury Town	41-29-24.4N/073-07-32.9W	12
I-84 near South Road	CT DPS/CSP	41-30-48.6N/073-07-27.3W	32

APPENDIX C — SERVICE AREA MAP

Figure C-l depicts the area of the state occupied by Middlebury. The Radio System design objective shall be to provide balanced, portable (5-watt), in-building (-10 dB), coverage to and from portables on-hip in 95 percent of the area within Town limits (the “coverage area”), with an area coverage reliability of 95 percent.

APPENDIX D — PROPOSAL CHECKLIST

Table D-l provides the Proposal Checklist. Each item on the checklist must be included in the Vendor's response to this RFP. This list is compiled as an aid to the Vendor only, and it is the Vendor's responsibility to ensure that all mandatory items of this RFP are provided with its proposal.

For each item on the checklist, there shall be a reference included indicating where in the Vendor's proposal the particular item is discussed, unless it is obvious. The Vendor must provide references to documentation and/or detailed explanations outlining the specific way or method each item is accomplished. Comments are to be numbered by the RFP paragraph number.

For items to which the Vendor takes exception to the specifications, a reference must be made on the checklist to a section of the proposal where the Vendor will state the reason for taking the exception, together with any relevant conditions, assumptions, or interpretations, and describe the alternatives, if applicable, being proposed in place of what was specified. If variations from the specifications have not been identified or references are inadequate in the checklist, then the Town is entitled to assume that the Vendor's proposal conforms in all respects with the specification.

Table D-l
Proposal Checklist

___ Accompanied by a bid surety in the form of a Bid Bond
___ Pricing for complete system
___ Lease/Purchase terms and options
___ Pricing for follow-on maintenance services out to ten years
___ All communications sites proposed are identified
___ Complete description of all anticipated site work required
___ All site improvements identified, including pricing
___ Not-to-exceed budgetary estimate for each new site in the response to this RFP
___ List of site deficiencies
___ Identified coverage parameters and detailed coverage analysis for preliminary design
___ Description of the preliminary VHF system design proposed
___ Detailed description of security features
___ Planned locations of leased lines needed, with cost estimates out to five years
___ List of recommended spare parts with pricing and stocking levels
___ List of recommended test equipment
___ Condensed training plan
___ Pricing for the production of training video media.
___ List of standard and enhanced repair response available
___ Description in detail of the makeup of your installation and maintenance departments
___ List the installation standards to be used
___ Provide installation outline for the infrastructure equipment on a site-by-site basis.
___ Provide a copy of its latest installation and quality standards
___ Description of outdoor connection weatherproofing
___ Quality Assurance Plan for the Radio System project
___ Detailed Acceptance Test Plan
___ The proposed or sample Field Acceptance Test Plan
___ Provide a representative RF coverage test plan
___ Provide a typical Operational Test Plan

APPENDIX E — PROPOSAL PRICE INFORMATION

The Vendor shall provide a bill of materials, including manufacturer and part number, for each location reflecting purchase pricing. It is the Vendor's responsibility to ensure that all costs are accurate and included in its proposal.

The Town will decide which quantities of subscriber units it will purchase. For planning purposes, the following anticipated unit counts are provided:

Portable radios: (Minimum 48-channel capable, including speaker microphones, spare batteries, swivel cases, and individual chargers per unit)	44
Multi-Unit Portable battery charger/conditioners (6- slot)	6
Mobile radios, conventional installation:	54
Desktop control station radios:	8
Desktop Controllers:	9
Fire Truck Headset installations:	8
Dispatch Console Positions: (Including furniture, PCs, monitors and printers)	2
Large Uninterruptable Power System for Dispatch Center	1

MIDDLEBURY PUBLIC SAFETY RADIO SYSTEM

APPENDIX F — LIST OF ACRONYMS

AC	Alternating Current
ACR	Area Coverage Reliability
ADA	Americans With Disabilities Act of 1990, Title I
ADP	Automated Data Processing
ANSI	American National Standards Institute
ASHRAE	American Society of Heating, Refrigerating, and Air Conditioning Engineers
ATP	Acceptance Test Plan
AWG	American Wire Gauge
BER	Bit Error Rate
CAD	Computer Aided Dispatch
CAI	Common Air Interface
CDR	Critical Design Report
C/I	Carrier to Interference Ratio
COTS	Commercial-Off-The-Shelf
CPC	Channel Performance Criteria
CTCSS	Continuous tone-controlled subaudible squelch. A system used to limit access and prevent interference to a land mobile radio system.
DAQ	Delivered Audio Quality, using Project 25 numerical identifiers of subjective audio quality.
dB	Decibel
DC	Direct Current
DES	Data Encryption Standard
EIA	Electronic Industries Association
FAA	Federal Aviation Administration
FCC	Federal Communications Commission
FM	Frequency Modulation
FM ***(2)***	Factory Mutual Insurance Company, a/k/a FM Global
HELIAXAndrew	Corporation trademark for hard, corrugated copper shielded coaxial transmission cable
I-CALL	International Calling Channel – 800 MHz NPSPAC Call channel (US & Canada)
IEEE	Institute of Electrical and Electronic Engineers
IRRC	Indian River Recreation Complex (201 Killingworth Tnpk – Route 81, Middlebury)
ISSI	Inter-RF Subsystem Interface
I-TAC	International Tactical Channel – 800 MHz NPSPAC On-Scene (US & Canada)
IM	Intermodulation
KHz	KiloHertz, 1000 cycles per second
LMR	Land Mobile Radio
MDF	Main Distribution Frame
MHz	Megahertz, 1,000,000 cycles per second
NAC	Network Address Code. Used on P25 digital systems, analogous to the use of CTCSS in analog radio systems, it is repeated periodically throughout the transmission to maintain selective access to a receiver.
NEC	National Electrical Code
NFPA	National Fire Protection Association
NMS	Network Management System
NPSPAC	National Public Safety Advisory Planning Committee
ODC	Other Direct Costs
OEM	Original Equipment Manufacturer
P25	The suite of ANSI/EIA/TIA-102 (APCO Project 25) Standards for digital Public Safety radio
PL	*See* CTCSS
PTT	Push-to-talk
PVC	Polyvinyl Chloride
QA	Quality Assurance
QAP	Quality Assurance Plan

QC	Quality Control
RCSS	Radio Control Sub-System
RF	Radio Frequency
RFP	Request for Proposal
RFSS	Radio Frequency Subsystem
SCA	Service Contract
SOW	Statement of Work
TELCORDIA	Telcordia Technologies (formerly Bell Core) family of Communications Standards
TIA	Telecommunications Industry Association
USGS	U.S. Geodetic Survey
VHF	Very High Frequency

APPENDIX G — LOCATIONS OF PRIMARY CONCERN

[TBD]

APPENDIX H — TYPICAL TASK LIST

TASK 1: Detailed Design and Development
This task includes the following deliverables:
- CDR Report

TASK 2: Factory Testing
This task includes the following deliverables:
- Factory Acceptance Testing Report
- Training Materials
- Maintenance and Training Manuals

TASK 3: Installation
This task includes the following deliverables:
- Site Preparation Completion Report
- Installation Completion Report
- As-Built System Description Document

TASK 4: Operational and Acceptance Testing
This task includes the following deliverables:
- Radio System Acceptance Test Report
- Maintenance Procedure Changes

TASK 5: Maintenance Support
This task includes the following deliverables:
- Maintenance Activity Log

APPENDIX I — REFERENCED ORGANIZATIONS

FM Global: The communicative name of the *Factory Mutual Insurance Company* and its affiliates:

FM Global
1301 Atwood Avenue
Johnston, Rhode Island 02919 USA
Phone: 401-275-3000
http://www.fmglobal.com/

Motorola:

Motorola
Network Infrastructure Operations
1301 E. Algonquin Road
Schaumburg, Illinois 60196 USA
Phone: 888-567-7347
http://www.motorola.com/

NFPA International: The communicative name of *National Fire Protection Association International, Incorporated*:

NFPA
1 Batterymarch Park
Quincy, Massachusetts 02269-9101 USA
Phone: 617-770-3000
http://www.nfpa.org/

Telcordia Technologies: Telecommunications Industry research and standards.

Telcordia Technologies
445 South Street
Morristown, NJ 07960-6438
Phone: 973-829-2000
http://www.telcordia.com/