

**BEFORE THE BOARD OF COUNTY COMMISSIONERS
LEWIS COUNTY, WASHINGTON**

IN THE MATTER OF:

RESOLUTION NO. 24-055

ISSUE A REQUEST FOR PROPOSALS (RFP) FOR
MICROWAVE NETWORKING EQUIPMENT FOR
LEWIS COUNTY PUBLIC SAFETY RADIO

WHEREAS, the Lewis County Public Safety radio infrastructure is aging and needs to be updated to improve interoperable communications amongst law enforcement, fire and medical services; and

WHEREAS, Lewis County has received grant funds related to the Department of Justice Community Oriented Policing (COPS) Office of Technology and Equipment Program (TEP); and

WHEREAS, updating the current radio network system to ensure that responders can receive reliable and accurate information, relayed across a robust microwave network is mission critical.

NOW THEREFORE BE IT RESOLVED that the Director of 911 Communications is directed to prepare a request for proposals (RFP) for Microwave Networking Equipment for Lewis County Public Safety Radio and evaluate responses; and

NOW THEREFORE BE IT FURTHER RESOLVED proposals shall be submitted to 911 Communications Director Jennifer Libby-Jones exclusively via the Lewis County OpenGov procurement platform, by 5 p.m. March 25, 2024; and

NOW THEREFORE BE IT FURTHER RESOLVED the Clerk of Board of County Commissioners is instructed to proceed with all appropriate and necessary notifications to advertise for said purpose.

DONE IN OPEN SESSION this 13th day of February, 2024.

APPROVED AS TO FORM:
Jonathan Meyer, Prosecuting Attorney

BOARD OF COUNTY COMMISSIONERS
LEWIS COUNTY, WASHINGTON

David Bailey
By: David Bailey,
Chief Civil Deputy Prosecuting Attorney

Scott J. Brummer
Scott J. Brummer, Chair

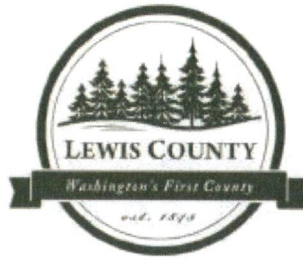
ATTEST:



Lindsey R. Pollock, DVM
Lindsey R. Pollock, DVM, Vice Chair

Rieva Lester, CMC
Rieva Lester, CMC,
Clerk of the Lewis County Board of
County Commissioners

Sean D. Swope
Sean D. Swope, Commissioner



LEWIS COUNTY NOTICE FOR:

Request for Proposals (RFP)

**MICROWAVE NETWORKING EQUIPMENT FOR LEWIS
COUNTY PUBLIC SAFETY RADIO RELATED TO THE
DEPARTMENT OF JUSTICE COMMUNITY ORIENTED
POLICING (COPS) OFFICE TECHNOLOGY AND
EQUIPMENT PROGRAM (TEP) GRANT**

Lewis County is initiating this request for proposals from qualified professional firms to provide all engineering and design, licensing, equipment, labor, and materials to implement a new point to point IP network based back haul system (Microwave Networking Equipment for Lewis County Public Safety Radio) related to the Department of Justice Community Oriented Policing (COPS) Office Technology and Equipment Program (TEP) grant.

Lewis County is accepting electronic submissions exclusively through OpenGov. Those wishing to submit a proposal must create a fee account with OpenGov Procurement by signing up at <https://procurement.opengov.com/signup>.

After completing account registration, proposals can be completed at <https://procurement.opengov.com/portal/lewiscountywa/projects/63225>.

CLOSING DAY AND TIME: Responses will be accepted no later than 5:00 p.m. March 25th, 2024.

For more information about the project and submittal requirements, contact Jennifer Libby-Jones, 911 Director, at 360-740-3394 or email jennifer.libby-jones@lewiscountywa.gov.

All work performed on this project will be subject to the higher of the prevailing state or federal wage rates (if applicable due to other federal funds that are in the project).

The County of Lewis is an Equal Opportunity and Affirmative Action Employer.

Small, Minority- and Women-owned firms are encouraged to submit bids.

The Request for Proposals does not obligate the County to contract for services specified herein. The Board of Lewis County Commissioners reserves the right to reject any and all proposals.

PUBLISH: The Chronicle Thurs 2/15/24; The Seattle Daily Journal of Commerce Thurs 2/15/24; The Portland Daily Journal of Commerce Wed 2/14/24

Lewis County website @www.lewiscountywa.gov



Lewis County

**REQUEST FOR
PROPOSAL**

FOR

**MICROWAVE NETWORKING
EQUIPMENT FOR LEWIS COUNTY
PUBLIC SAFETY RADIO
RELATED TO THE DEPARTMENT OF
JUSTICE COMMUNITY ORIENTED
POLICING (COPS) OFFICE
TECHNOLOGY AND EQUIPMENT
PROGRAM (TEP) GRANT**

[RFP TRACKING NUMBER 2024-RFP-022]

**Issued by:
Lewis County
351 NW North St
Chehalis, WA 98532**

February 13, 2024

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Section 1. RFP Timeline

The Request for Proposal timeline is as follows:

	Date
Request for Proposal Issuance	February 13, 2024
Question Submissions – if allowed Due Date	March 6, 2024 by 5pm Pacific
Question Response Due Date	March 15, 2024 by 5pm Pacific
Request for Proposal Due Date	March 25, 2024 by 5pm Pacific
Review Team’s Selection of Top Proposer	April 3, 2024
Approval by County Commissioners and Award Notification	April 16, 2024
Contract Negotiations Preparation Period and/or Work Commencement Anticipated Dates (dates subject to contract approval)	April 16 – May 1, 2024

Section 2. Introduction and Project Description

Background

Lewis County in Washington proposes to improve community policing and engagement by strengthening and making more current its VHF communications systems. These systems provide critical links amongst responders, both within a single discipline, such as law enforcement, and across disciplines, connecting law enforcement to fire and EMS responders. Critical emergency information is relayed from dispatch to the responders, providing them with a clear vision of what is occurring at the scene. This allows the responders to form a response plan and make informed decisions prior to arriving on scene. This preemptive information, relayed in an accurate and

reliable manner across a robust radio network ensures that responders can better provide service in a manner that is reliable and safe for both them and the public. It also provides for reliable communications across jurisdictions as emergency scenes grow, ensuring reliable regional response to emergencies.

The FY 2023 Department of Justice COPS Office Technology and Equipment Program (TEP) is an invitation-only grant program designed to develop and acquire effective equipment, technologies, and interoperable communications that assist in responding to and preventing crime.

The objective is to provide funding for projects which improve police effectiveness and the flow of information among law enforcement agencies, local government service providers, and the communities they serve.

In 2022, Lewis County applied for the Department of Justice COPS Office Technology and Equipment Program (TEP) through the office of Representative Jamie Herrera Beutler. The County was awarded the grant in October 2023. The term of the grant is December 2022 through December 2024.

Overview

Lewis County Communications is developing a complete replacement of the aging radio communications system. This project is intended to design, install, and complete a new point to point network allowing for IP based connectivity throughout the county in its entirety for use on a replacement VHF radio communications system.

All phases of this project will be required to meet minimum standards that have been identified by the county tech team to meet their requirements. These requirements will include the engineering, design, installation, testing, and completion of a closed network IP based network over microwave back haul. The project proposal shall also include integration with current existing equipment within the county's network.

Sites have been identified per a current RF study completed in November 2023 through Teleate Lewis County, WA Public Safety Radio System Engineering Study Report (Attachment A). These sites were identified as the most effective to provide the necessary paths for optimal performance of a future radio system. There are 15 microwave paths that have been identified for new/replacement paths in the RF study as necessary to create the desired back haul system.

The recommended backhaul network configuration for the East utilizes the following configuration:

Maintaining/upgrade existing links:

- Crego to Dog (replacement of current waveguide and antennas with new 8ft antennas)

Incorporating new links:

- Hopkins to Peterman (site to be used for microwave relay) (spur link)
- Hopkins to Dog

- Peterman to Mineral (spur link)
- Dog to Randle Fire (spur link)
- Dog to Bennett
- Bennett to Packwood

The recommended backhaul network configuration for the West utilizes the following configuration:

Maintaining/upgrade existing links:

- Crego to Courthouse (maintain in current state)

Incorporating new links:

- Crego to Bawfaw
- Bawfaw to Doty (spur link)
- Bawfaw to Toledo
- Toledo to Hopkins
- Hopkins to Democrat (spur link)
- Crego to Mine (spur link)
- Crego to Manners (spur link)
- Seminary to Cooks (spur link)
- Hopkins to Onalaska (spur link)

Additional recommended links (via fiber as microwave is not possible)

- Courthouse to Cooks

The recommended configuration incorporates a loop for redundancy, namely:

- Loop 1: Crego, Bawfaw, Toledo, Hopkins, Dog

Since the spur links are not part of either loop, the microwave spur links are recommended to be implemented in a “hot-standby” configuration to maximize reliability. Maps and further information can be found in Attachment A.

Section 3. RFP Submittal and Closing Date

Vendors shall submit the following in response to the RFP:

Cover Letter

A cover letter addressed to Jennifer Libby-Jones, Director 911 Communications. The cover letter must:

- State the company’s ability to comply with all the stipulations of this solicitation.
 - Point out the company’s particular strengths.
 - Provide a reason as to why they should be chosen to provide the service needed.
 - Specify any areas that the company cannot or may not be able to comply and explain why.
 - Be signed by a person legally able to commit the company.
-

- Include the submitter's mailing address and telephone number.

Key Proposal Information

Proposal submittals must include:

- System proposal including all specifications as outlined in Section 6 of this RFP.
- History of company showing familiarity with public safety radio systems.
- Engineer and other involved staff qualifications.
- Qualification to complete a turnkey project (or ability to do so with qualified subcontractor services).
- Customer references.
- Training and software support.

Fee Schedule

The proposed fee to accomplish the work shall be submitted in a separate, sealed envelope marked Fee Schedule.

Insurance – The selected vendor shall be required to provide a current copy of the Certificate of Liability Insurance naming Lewis County as an additional insured and shall be considered as primary and shall waive all rights of subrogation. The County insurance shall be noncontributory.

Submission Instructions – Lewis County exclusively utilizes OpenGov for online proposal submissions. Bidders shall create a FREE account with OpenGov Procurement by signing up at <https://procurement.opengov.com/signup>.

Once you have completed the registration, please visit the Lewis County OpenGov Procurement website at: <https://procurement.opengov.com/portal/lewiscountywa> and browse to the “Microwave Networking Equipment for Lewis County Public Safety Radio RFP,” click on “Submit Response” and follow the instructions to submit the electronic proposal.

All questions and responses shall be submitted through the OpenGov Procurement website. All responses will be public.

Lewis County is not responsible for communication errors. Applicants are advised to call the Lewis County 911 Communications department at 360-740-3394 to confirm that a submittal has been received.

Lewis County Rights

Lewis County reserves the right to reject any or all proposals, make counter proposals and/or engage in negotiations with any or all firms or individuals, waive any requirements or otherwise amend this RFP, or cancel the RFP in order to achieve the County's goals and objectives for this project. Any changes in the status of the RFP will be brought to the attention of all parties that provide contact information for updates. The information contained in this RFP represent the County's best information at the time of the release of the RFP and the County reserves the right to modify any term or condition contained herein.

Responsibility for Proposal Preparation

Except as otherwise specifically agreed to in writing by the County, each consulting individual or team submitting proposals shall provide and pay for all materials, labor, transportation, charges, levies, taxes, fees or expenses incurred, including all costs to prepare a response to this RFP, travel and presentation costs, and all other services and facilities of every nature whatsoever necessary for the preparation of the RFP.

It is neither the County's responsibility nor practice to acknowledge receipt of any proposal as a result of the RFP process. It is the proposer's responsibility to assure that a proposal is delivered and received in a timely manner.

No Conflict of Interest

No member of the Board of COUNTY Commissioners, member of the evaluation committee for this RFP, and any other officer, employee or agent of the Lewis County who exercises any functions or responsibilities in the selection of a proposal, shall have any personal interest, direct or indirect, in the project.

Section 4. Inquiries and Addenda

Questions that are received prior to the RFP deadline identified in Section 1 for questions shall be addressed via the County's procurement platform, Open Gov.

Questions and answers will be posted to the Lewis County procurement website at <https://procurement.opengov.com/portal/lewiscountywa>.

Addenda to this solicitation, if needed, will be posted to the Lewis County procurement website at <https://procurement.opengov.com/portal/lewiscountywa>. The County, at its sole judgment, may require clarification of information submitted in any Proposal.

Section 5. Mandatory Requirements

The following submission guidelines and requirements apply to this Request for Proposal:

1. Only qualified firms with the capacity to provide ALL services and components included in the scope of work (allowed with subcontractors) should submit proposals in response to this Request for Proposal.
2. Proposers must provide a minimum of 4 projects of relative size and equivalency to the Lewis County project. Project info should include references and contact info.
3. Proposals must include a technical proposal that provides an overview of the proposed approach as well as a list of qualifications for all key personnel performing the work. In addition, the technical proposal should provide a proposed schedule and milestones, as applicable; including the hours estimated for completion of each phase of the project.
4. Proposals must include a description of method of approach, strategy, and/or ability to

understand, facilitate, and complete the tasks listed under Section 6; Project Scope below

5. A price proposal must be provide a per link/site price breakdown. This shall include a per component price and any included service (ie frequency coordination or licensing). Services should be listed by type (ie tower services, networking, programming etc)
6. Proposals must be signed by a representative that is authorized to commit proposer's company.
7. Proposals must include any suggested changes to the proposed terms and conditions for this procurement. Any changes to the proposed terms and conditions will be made at Lewis County's sole discretion.
8. A copy of your current certificate of insurance for professional liability.
9. Statement of Conflicts of Interest (if any) the service provider or key employees may have regarding these services, and a plan for mitigating the conflict(s). Note that the County may in its sole discretion determine whether or not a conflict disqualifies a firm, and/or whether or not a conflict mitigation plan is acceptable.
10. System for Award Management. Service Providers shall have a current registration in the System for Award Management (<https://www.sam.gov/SAM/>). Service provider and its Principals may not be debarred or suspended nor otherwise on the Excluded Parties List System (EPLS) in the System for Award Management (SAM). Include verification that the service provider as well as its principals are not listed (are not debarred) through the System for Award Management (www.SAM.gov). Enclose a printout of the search results that includes the record date. This clearance information should be included in the service provider's Proposal. The clearance in the Service Provider's proposal must be re-verified prior to award. Federal awarding agencies may relax the timing of the requirement for active SAM registration at time of allocation in order to expeditiously issue funding. At the time of award, the requirements of 2 CFR § 200.206, Federal awarding agency review of risk posed by recipients, continue to apply.
11. Required Contract Provisions. Applicable provisions (enclosed) must be included in all contracts executed as a result of this RFP.
12. Proposals must remain valid for a period of 90 days.
13. Submissions must meet the Pass/Fail Criteria listed under Section 7.2, below.

Open Records/Proprietary Information

Lewis County recognizes that in responding to this RFP, the proposer may desire to provide proprietary information in order to clarify and enhance their response. To the extent permitted by law, Lewis County will keep confidential such information provided that:

1. The information submitted is arguably proprietary, and
2. The proprietary information is submitted in a separate file or section that is clearly identified as containing proprietary information, according to the submittal instructions of this RFP. Only information that is credibly proprietary may be included. Inclusion of non-proprietary significant information in the sealed portions may render a submittal ineligible.

Responders should note that Lewis County is a county in Washington State, and as such its files are available for public review pursuant all applicable public disclosure laws, the Washington State Open Public Meetings Act, and the Freedom of Information Act.

Section 6. Project Scope

Proposal Submission Requirements

Lewis County ("County") is initiating this request for proposals ("RFP") from qualified professional firms ("Contractor") to provide all engineering and design, licensing, equipment, labor, and materials to implement a new point to point IP network based back haul system (Microwave Networking Equipment for Lewis County Public Safety Radio) related to the Department of Justice Community Oriented Policing (COPS) Office Technology and Equipment Program (TEP) grant.

The objective of this Request for Proposal is to contract with a service provider that will provide the best overall value to Lewis County. While price is a significant factor, other criteria will also form the basis of our award decision, as more fully described in the Proposal Evaluation and Contractor Selection section of this Request for Proposal below.

Lewis County is seeking to contract with vendor for a fixed-price contract. Throughout this project there will be a need to maintain quality control and management of cost and expenses. The selected service provider will be expected to ensure that all applicable federal, state and local laws and regulations are followed. The project will require the selected service provider to work closely with Lewis County and other relevant partners staff and the general public throughout the project.

Scope of Services and Specifications

While the scope described presumes the direct performance by the chosen consultant or firm, work may also be performed by a subcontractor to the firm. In such case, the proposal should state so, along with the subcontractor(s)' supporting qualifications to provide such services. In the event the work is performed by a subcontractor to the firm, then the firm shall be responsible for subcontracting with them, as well as for reviewing the work product of such subcontractor(s) for quality and completeness. All services must comply with local law and permit conditions as well as applicable federal, state, and local statutory, regulatory, recording, reporting, and other requirements.

- I. The County will accept only turnkey solution proposals addressing all project systems, subsystems, and components.
- II. All Contractors providing proposals must acknowledge a requirement and obligation to coordinate planning and implementation activities with other vendors and or county tech teams when required. All work to be performed shall be scheduled with the county tech team and any outages are to be planned in advance.
- III. Proposals will not be accepted that include technology from any vendor that is within 5 years of end of life or any technology that has already been cancelled.
- IV. Proposals shall not be accepted that include systems or equipment that will no longer be supported for software, spare parts, and repair by the manufacturer within no less than 10 years of system acceptance. Equipment support timeline must be provided by the equipment vendor.
- V. Proposals shall include the coordination of licensing through the FCC for all proposed link and any modifications to existing licenses.
- VI. Warranty shall be honored if county employees provide maintenance and repairs. No proposal will be accepted if ANY warranty is void in the event that a properly trained employee provides any service or maintenance per provided training requirement listed in scope of work section.
- VII. All proposals shall include manufacturer and model information of each component. Vague descriptions of equipment and components will not be accepted and will be cause for disqualification.

Scope of Work

The following criteria must be met and included in the scope of work of any submitted proposal and must comply with any and all project specifications provided herein.

- I. Contractor will be expected to provide ALL services in house or through qualified subcontractors and submit a turnkey proposal. These services will include but not limited to: Microwave radio equipment, alignment, FCC licensing and coordination, network and switch programming, antenna installation, tower work, integration with existing network, testing and system qualification.
- II. Path description and calculations based on height, distance, estimated height of path relative to ground to ensure longevity of the path integrity.
- III. Proposed equipment vendor information and equipment specific model numbers.
- IV. ALL equipment must be of like and kind. Multiple vendors per type of equipment will not be accepted (i.e. microwave radio equipment shall be of all one vendor or specific manufacturer).
- V. All equipment shall meet or exceed the minimum standards provided by the County technical staff. Technical requirements as listed in Attachment B. See also Attachment C and D for additional microwave path information.

- VI. Labor to be performed shall be compliant with prevailing wage requirements and contractor shall be in compliance of prevailing wage standards.
- VII. Proposals shall be broken down by link and specify equipment proposed at a per link cost (to include equipment, licensing, and labor).
- VIII. Proposals shall include a closed loop IP based network system based on accessibility provided by county tech team. All equipment will be required to meet mission critical criteria for 99.999% reliability.
- IX. Proposals shall include public safety grade microwave equipment. All equipment will be required to meet mission critical criteria for 99.999% reliability.
- X. Provide the County with testing and documentation of links and network equipment and meet the county's tech team standard before final sign off.
- XI. Provide training to county employees for any new equipment as well as necessary software for programming and monitoring. Any cost for training and software is to be included in proposal.

Minimum Equipment Standards

The county tech team has compiled minimum standards for equipment to be included in any proposal. If these basic requirements contained herein are not met the county has the right to reject any proposal not meeting the standards.

Microwave Radio Equipment

- All equipment must be of 6 ghz or 11ghz bandwidth.
- All microwave radio equipment must provide a T1 and IP capability. A minimum of 8 T1 circuits are required.
- All equipment must meet mission critical standards for public safety grade equipment of 99.999% reliability.
- All equipment must pass at minimum of 8mb per second bandwidth capacity.
- All equipment must be 48v DC compatible.
- All primary backhaul links shall be rack mounted radio configurations. No antenna mounted radio option will be accepted for primary backhaul and must meet the 6ghz or 11Ghz frequency criteria.
- Spare equipment for all components included in the proposal. This is to include 1 of each type and frequency of each radio, power supply, and network switch.

- All ethernet switches must be of layer 3 compatibility with remote programming capability and no less than 48 port POE. If possible include a 48v DC power option.

Section 7. Proposal Evaluation and Contractor Selection

7.1 Evaluation Process

Proposals submitted on time will be reviewed against the Pass/Fail criteria (Section 7.2). RFPs meeting those criteria will be forwarded to an evaluation committee for scoring against the Evaluation Criteria (listed in Section 7.3 below) and ranking. The outcome of the evaluations may, at Lewis County's sole discretion, result in (A) notice to a Proposer(s) of selection for tentative contract negotiation and possible award; or (B) further steps to gather more information for further evaluation. The selection process may be canceled if Lewis County determines it is in the public interest to do so.

7.2 Pass/Fail Criteria

- 7.2.1 Submission Deadline Date and Time met.
- 7.2.2 Proposal is complete and addresses all Submission Guidelines and Requirements listed in Section 4.
- 7.2.3 Correct number of Proposals included (if relevant)
- 7.2.4 All training for county tech staff shall be included in proposal. Any proposal that does not include training for county tech staff will be eliminated from consideration.

7.3 Evaluation Criteria

Evaluation factors and maximum points will be as follows:

Criteria	Maximum Score
1. Fee Schedule	20
2. Qualifications,	25
3. Experience, Work Samples, References	25
4. Method of Approach	20
5. Timeline and Milestones	10
Total Maximum Score	100

Lewis County reserves the right to award to the proposer that presents the best value to Lewis County as determined solely by Lewis County in its absolute discretion.

Section 8. General Information; Terms and Conditions

1. Lewis County may require any clarification or change it needs to understand the selected contractor's project approach.
2. The successful contractor must have Worker's Compensation Insurance covering work in Lewis County's Location. The successful contractor must also submit documents addressing insurance, non-collusion, tax law, debarment, and conflict of interest as part of the personal services contract.
3. The selected vendor shall be required to provide a current copy of the Certificate of Liability Insurance naming Lewis County as an additional insured and shall be considered as primary and shall waive all rights of subrogation. The County insurance shall be noncontributory.
4. Lewis County reserves the right to reject any or all proposals and is not liable for any costs the contractor incurs while preparing or presenting the proposal.
5. Lewis County reserves the right to cancel this RFP upon a good cause finding.
6. Lewis County may award a contract to the contractor whose proposal, in the opinion of Lewis County, would be most advantageous to Lewis County.
7. The selected contractor will be required to assume responsibility for all services outlined in the RFP, whether the contractor produces them.
8. This RFP does not commit Lewis County to award a contract, nor to pay any costs incurred in the preparation of the response to the RFP. Lewis County reserves the right to accept or reject any or all responses received as a result of this request or to cancel this RFP in part or in its entirety. Lewis County may request additional information from responders.
9. Failure of the Contractor to perform the scope of work identified or to meet the performance standards established by the resulting Contract include, may result in the following:
 - a. Lewis County's reduction or withholding of payment under the Contract,
 - b. Lewis County's right to require the Contractor to perform, at the Contractor's expense, any additional work necessary to perform the scope of work or to meet the performance standards established by the resulting Contract; and
 - c. Lewis County's rights, which Lewis County may assert individually or in combination, to declare a default of the resulting Contract, to terminate the resulting Contract, and to seek damages and other relief available under the resulting Contract or applicable law.

Section 9. System for Award Management (SAM)

Vendors must register with the System for Award Management (SAM) and receive a Unique Entity Identifier and must not be debarred from receiving federal funds to qualify for this award. It is recommended vendor register as soon as responding to the RFP as the SAM process may take several weeks to complete and must be in place prior to any contract process.

Section 10. Contract Provisions

The non-Federal entity's contracts should contain applicable provisions described in Appendix II to Part 200—Contract Provisions for non-Federal Entity Contracts Under Federal Awards.

Terms Required for all Lewis County Contracts Funded with Federal Grant Funds Subject to the Uniform Guidance

In the event of a conflict between these Terms Required for all Lewis County Contracts Funded with Federal funds Subject to the Uniform Guidance (“Federally Required Contract Terms”) and the terms of the main body of the Contract or any exhibit or appendix, these Federally Required Contract Terms shall govern.

1. **2 CFR 200 APPENDIX II (A).** Contracts for more than the simplified acquisition threshold, which is the inflation adjusted amount determined by the Civilian Agency Acquisition Council and the Defense Acquisition Regulations Council (Councils) as authorized by 41 U.S.C. 1908, must address administrative, contractual, or legal remedies in instances where contractors violate or breach contract terms, and provide for such sanctions and penalties as appropriate.
2. **2 CFR 200 APPENDIX II (B).** All contracts in excess of \$10,000 must address termination for cause and for convenience by the non-Federal entity including the manner by which it will be effected and the basis for settlement.
3. **Debarment and Suspension.** Contractor represents and warrants that, as of the execution of this Contract, neither Contractor nor any subcontractor or sub-consultant performing work under this Contract (at any tier) is included on the federally debarred bidder’s list listed on the government-wide exclusions in the System for Award Management (SAM), in accordance with the OMB guidelines at 2 CFR 180 that implement Executive Orders 12549 (3 CFR part 1986 Comp., p. 189) and 12689 (3 CFR part 1989 Comp., p. 235), “Debarment and Suspension.” If at any point during Contract’s term Contractor or any subcontractor or sub-consultant performing work at any tier is included on the federally debarred bidder’s list, Contractor shall notify the County immediately. Contractor’s completed Vendor Debarment Certification is attached hereto and incorporated herein.
4. **Amendment Permitted.** This list of Federally Required Contract terms may be amended by the County in the event that the applicable federal grant providing funding for this Agreement contains additional required terms.
5. **Public Records.** The Contractor shall assist the County in fulfilling all obligations of the County under the Washington Public Records Act (chapter 42.56 of the Revised Code of Washington). In the event that the Contractor fails to fulfill its obligations pursuant to this section and due in whole

or in part to such failure a court of competent jurisdiction imposes a penalty upon the County for violation of the Public Records Act, Contractor shall indemnify the County for that penalty, as well as for all costs and attorney fees incurred by the County in the litigation giving rise to such a penalty. The obligations created by this section shall survive the termination of this contract.

6. **Record Retention.** The Contractor shall maintain all books, records, documents, data and other evidence relating to this contract and performance of the services described herein, including but not limited to, accounting procedures and practices which sufficiently and properly reflect all direct and indirect costs of any nature expended in the performance of this contract. Contractor shall retain such records for a period of seven (7) years following the date of final payment.

If any litigation, claim or audit is started before the expiration of the seven- (7) year period, the records shall be retained for a period of seven (7) years after all litigation, claims, or audit findings involving the records have been finally resolved.

7. **Procurement of Recovered Materials.** A non-Federal entity that is a state agency or agency of a political subdivision of a state and its contractors must comply with section 6002 of the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act. The requirements of Section 6002 include procuring only items designated in guidelines of the Environmental Protection Agency (EPA) at 40 CFR part 247 that contain the highest percentage of recovered materials practicable, consistent with maintaining a satisfactory level of competition, where the purchase price of the item exceeds \$10,000 or the value of the quantity acquired during the preceding fiscal year exceeded \$10,000; procuring solid waste management services in a manner that maximizes energy and resource recovery; and establishing an affirmative procurement program for procurement of recovered materials identified in the EPA guidelines.
8. **Clean Air Act (42 U.S.C. 7401-7671q.) and the Federal Water Pollution Control Act (33 U.S.C. 1251-1387), as amended**—If this is a contract or sub-grant in excess of \$150,000, Contractor must comply with all applicable standards, orders or regulations issued pursuant to the Clean Air Act (42 U.S.C. 7401-7671q) and the Federal Water Pollution Control Act as amended (33 U.S.C. 1251-1387). Violations must be reported to the Federal awarding agency and the Regional Office of the Environmental Protection Agency (EPA).
9. **Byrd Anti-Lobbying Amendment (31 U.S.C. 1352).** Contractor certifies that:
 - 9.1 No federal appropriated funds have been paid or will be paid, by or on behalf of Contractor, to any person for influencing or attempting to influence an officer or employee of an agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal Loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of and Federal contract, grant, loan, or cooperative agreement.
 - 9.2 If any funds other than federal appropriated funds have been paid or will be paid to any person for making lobbying contacts to an officer or employee of an agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this federal contract, grant, loan, or cooperative agreement, Contractor shall request and provide, completed, the "Disclosure Form to Report Lobbying," in accordance with its instructions as amended by "Government wide Guidance for New Restrictions on Lobbying," 61 Fed. Reg. 1413 (1/19/96).
 - 9.3 Contractor shall require that the language of this certification be included in the award documents for all sub-awards at all tiers (including subcontracts, sub-grants, and contracts under

grants, loans, and cooperative agreements) and that all sub-recipients shall certify and disclose accordingly.

- 9.4 Contractor's completed Byrd Anti-Lobbying Certification is attached hereto and incorporated herein.
10. **Contract Work Hours and Safety Standards Act (40 U.S.C. 3701-3708).** If this Contract is for an amount in excess of \$100,000 and involves the employment of mechanics or laborers, Contractor must comply with 40 U.S.C. 3702 and 3704, as supplemented by Department of Labor regulations (29 CFR Part 5). Under 40 U.S.C. 3702 of the Act, Contractor must compute the wages of every mechanic and laborer on the basis of a standard work week of 40 hours. Work in excess of the standard work week is permissible provided that the worker is compensated at a rate of not less than one and a half times the basic rate of pay for all hours worked in excess of 40 hours in the work week. The requirements of 40 U.S.C. 3704 are applicable to construction work and provide that no laborer or mechanic must be required to work in surroundings or under working conditions which are unsanitary, hazardous, or dangerous. These requirements do not apply to the purchases of supplies or materials or articles ordinarily available on the open market, or contracts for transportation or transmission of intelligence.
11. **Right to Inventions.** If the federal award is a "funding agreement" under 37 CFR 401.2 and this is an agreement between the County or a sub-recipient and a small business firm or nonprofit organization regarding the substitution of parties, assignment of performance or experimental, developmental or research work thereunder, the County or sub-recipient will comply with 37 CFR Part 401, "Rights to Inventions Made by Nonprofit Organizations and Small Business Firms Under Government Grants, Contracts and Cooperative Agreements," and any implementing regulations issued by the awarding agency.
12. **Davis-Bacon Act, as amended (40 U.S.C. 3141-3148).** If this is a "prime construction contract," in its performance under the Contract, Contractor shall comply with the Davis-Bacon Act (40 Page 13 of 38 U.S.C. 3141-3144, and 3146-3148) as supplemented by Department of Labor regulations (29 CFR Part 5, "Labor Standards Provisions Applicable to Contracts Covering Federally Financed and Assisted Construction"). In accordance with the statute, Contractor is required to pay wages to laborers and mechanics at a rate not less than the prevailing wages specified in a wage determination made by the Secretary of Labor. In addition, Contractor is required to pay wages not less than once a week.
13. **Prevailing Wage.** Contractor shall pay the prevailing rate of wages to all workers, laborers, or mechanics employed in the performance of any part of the Work in accordance with RCW 39.12 and the rules and regulations of the Department of Labor and Industries. The schedule of prevailing wage rates for the locality or localities of the Work, is determined by the Industrial Statistician of the Department of Labor and Industries. It is the Contractor's responsibility to verify the applicable prevailing wage rate.

Each Application for Payment submitted by Contractor shall state that prevailing wages have been paid in accordance with the pre-filed statement(s) of intent, as approved. Copies of the approved intent statement(s) shall be posted on the job site with the address and telephone number of the Industrial Statistician of the Department of Labor and Industries where a complaint or inquiry concerning prevailing wages may be made.

In compliance with chapter 296-127 WAC, Contractor shall pay to the Department of Labor and Industries the currently established fee(s) for each statement of intent and/or affidavit of wages paid submitted to the Department of Labor and Industries for certification.

14. **Equal Employment Opportunity.** If this is a “federally assisted construction contract,” as defined by 41 CFP Part 60- 1.3, except as otherwise provided in 41 CFR Part 60, in its performance under the contract, the 41 CFP Part 60-1.3 shall comply with the equal opportunity clause provided under 41 CFR 60-1.4(b), in accordance with Executive Order 11246, “Equal Employment Opportunity” (30 FR 12319, 12935, 3 CFR Part, 1964-1965 Comp., p. 339), as amended by Executive Order 11375, “Amending Executive Order 11246 Relating to Equal Employment Opportunity,” and implementing regulations at 41 CFR part 60, “Office of Federal Contract Compliance Programs, Equal Employment Opportunity, Department of Labor.” The text of 41 CFR 60-1.4(b) is available upon request.
15. **Domestic preferences for procurements.** Pursuant to 2 CFR §200.322, as appropriate, and to the extent consistent with law, contractor should, to the greatest extent practicable under this Contract, provide a preference for the purchase, acquisition, or use of goods, products, or materials produced in the United States (including but not limited to iron, aluminum, steel, cement, and other manufactured products). The requirements of this section must be included in all subcontracts and purchase orders for work or products under this Contract.
16. **Prohibition on Certain Telecommunications and Video Surveillance Services or Equipment.** Contractor shall not use funds under this Contract to purchase, or enter into subcontracts to purchase, any equipment, services, or systems that use telecommunications equipment or services as a substantial or essential component of a system that is subject to 2 CFR § 200.216 (generally, video surveillance or telecommunications equipment produced by Huawei Technologies Company, ZTE Corporation, Hytera Communications Corporation, Hangzhou Hikvision Digital Technology Company, or Dahua Technology Company, their subsidiaries or affiliates, or any entity that the Secretary of Defense reasonably believes to be an entity owned or controlled by the government of a foreign country). In the event Contractor identifies covered telecommunications equipment or services that constitute a substantial or essential component of any system, or as critical technology as part of any system that is subject to 2 CFR § 200.216, during Contract performance, Contractor shall alert the County as soon as possible and shall provide information on any measures taken to prevent recurrence.

Section 11. BYRD Anti-Lobbying Certification

(To be submitted with each bid or offer exceeding \$100,000)

(a) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of an agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

(b) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

(c) The undersigned shall require that the language paragraph 1 and 2 of this anti-lobbying certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all recipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by 31, U.S.C. § 1352 (as amended by the Lobbying Disclosure Act of 1995).

The Contractor, _____, certifies or affirms the truthfulness and accuracy of each statement of its certification and disclosure, if any. In addition, the Contractor understands and agrees that the provisions of 31 U.S.C. § 3801 et seq., apply to this certification and disclosure, if any.

Signature of Contractor's Authorized Official

Printed Name and Title of Contractor's Authorized Official

Date

Section 12. Certifications Regarding Debarment, Suspension and other Responsibility Matters

The bidder, proposer, contractor, or subcontractor, as appropriate, certifies to the best of its knowledge and belief that neither it nor any of its officers, directors, or managers who will be working under the Contract, or persons or entities holding a greater than 10% equity interest in it (collectively "Principals"):

1. Are presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any federal or state department or agency in the United States;
2. Have within a three-year period preceding this proposal, bid, or agreement been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (federal, state or local) transaction or contract under a public transaction; violation of federal or state anti-trust or procurement statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;
3. Are presently indicted for or otherwise criminally or civilly charged by a government entity, (federal, state or local) with commission of any of the offenses enumerated in paragraph 2 of this certification; and
4. Have within a three-year period preceding this application/proposal had one or more public transactions (federal, state or local) terminated for cause or default.

I understand that a false statement on this certification may be grounds for rejection of this proposal or bid, or termination of the award or, in some instances, criminal prosecution.

I hereby certify as stated above:

Signature

Date

Print Title and Name of authorized representative

I am unable to certify to one or more the above statements. Attached is my explanation.

Signature

Date

Print Title and Name of authorized representative

RADIO SERVICES INVOICE

CUSTOMER	REMIT PAYMENT TO

DEPARTMENT:	LCFD 15	LEWIS COUNTY RADIO SERVICES
CONTACT:	Rich Underdahl	351 NW NORTH ST
VEHICLE:	LADDER 15-1	CHEHALIS, WA 98532
WORK ORDER:	WO686	360-740-1292

DEPARTMENT:	LCFD 15	LEWIS COUNTY RADIO SERVICES
CONTACT:	Rich Underdahl	351 NW NORTH ST
VEHICLE:	LADDER 15-1	CHEHALIS, WA 98532
WORK ORDER:	WO686	360-740-1292

WORK DESCRIPTION

INSTALL RADIO AND SIGTRONICS SYSTEM IN LADDER TRUCK AT STATION 15-1

PARTS/SUPPLIES USED

QTY	ACCT #	DESCRIPTION	PRICE	TOTAL
				\$0.00
				\$0.00
				\$0.00
				\$0.00
				\$0.00
				\$0.00
				\$0.00
				\$0.00
				\$0.00
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				\$0.00
				\$0.00
				\$0.00
28		TRAVEL	\$0.66	\$18.48
4		LABOR	\$66.89	\$267.56
		SHIPPING		
		SUBTOTAL		\$286.04
		TAX (8.2%)		\$0.00
		TOTAL		\$286.04

THANK YOU FOR YOUR CONTINUED SUPPORT



Lewis County, WA Public Safety Radio System Engineering Study Report

Televate, LLC
1934 Old Gallows Road
Suite 350
Vienna, VA 22182

November 2023
P: 703-639-4200
www.televate.com

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EXECUTIVE SUMMARY

Introduction

Lewis County, WA ("the County") engaged Televate to identify gaps in current public safety radio system coverage and provide recommendations to improve radio site coverage, compatibility, and interoperability. Specifically, the County requested that Televate:

1. Develop a plan for and make recommendations for replacement of existing radio infrastructure equipment as a county-wide simulcast system
2. Develop a plan for and make recommendations for replacement of existing microwave infrastructure
3. Develop a plan for and make recommendations for replacement of existing DC power plants
4. Perform an analysis of existing sites and provide recommendations of additional/alternate sites for improved coverage, and
5. Provide coverage maps of existing and proposed sites.

To accomplish these objectives for the County, Televate sought to define a comprehensive public safety radio system upgrade, which will prepare the County for an effective procurement and smooth execution of the upgrade implementation process. Televate proceeded to work in partnership with Lewis County project leadership and stakeholders to document their unique requirements and to help prepare for the next phase of the system procurement cycle that will establish a mutually agreeable contract with a qualified radio system vendor resulting in a sustainable, interoperable, standards-based and cost-effective radio system that addresses the public safety community's needs throughout the County. This report documents and details the findings and recommendations for the County.

Key Findings

During the needs analysis and through discussions with County stakeholders, Televate identified multiple systems supporting public safety and public works communications within the County. These systems include:

- Fire System East
- Fire System West
- RFA City System
- RFA District 12 System
- Fire Paging
- City PD System
- LCSO System East
- LCSO System West
- Public Works
- Microwave/Backhaul System

Televate also identified the following key items affecting County system users:

System Item/Feature	Findings
Coverage	<ul style="list-style-type: none">• Fire coverage is limited in many areas• The use of a simplex channel for fire hampers the ability of field users to communicate directly with each other and they must relay messages through dispatch in many situations• Coverage within the cities and along Route 12 is a priority

	<ul style="list-style-type: none"> • FD14 has coverage issues in the southern portion of the district – repeater was moved from Watch Mountain due to site access problems • FD1 has coverage issues along Route 508 • Lewis County Sheriff's Office (LCSO) experiences coverage issues along Route 12 east of Packwood, in the Mineral area, in the northwest portion of the County, in addition to other areas • Western fire districts including FD11, FD13, FD16 have many coverage issues – can usually hear dispatch but can't reliably talk back • Fire Paging generally has adequate coverage • PD coverage in the cities of Chehalis and Centralia is generally good – has improved since the main site was moved – some in-building issues exist in buildings such as the hospital, Walmart and Home Depot • Coverage for the separate Riverside Fire Authority (FD12 and Centralia) system is generally good, except for in-building coverage in large commercial facilities • Public Works operates with a single repeater in the east and a single repeater in the west
Interference	<ul style="list-style-type: none"> • The County frequently receives substantial interference on the primary fire frequency (Fire 1) from transmitters in Mason and Pacific Counties – this should be addressed as soon as possible • Some fire districts in the eastern portion of the County use a different channel to avoid the interference
Site Connectivity	<ul style="list-style-type: none"> • Microwave connectivity is limited • Connectivity to many sites is done through aged Telco T1 channels over partner's microwave, or via analog circuit connections
Capacity	<ul style="list-style-type: none"> • Capacity for the most part is adequate, however, additional repeated Tactical channels should be considered for both fire and law enforcement, if available, to offload the dispatch channels • Newly acquired simplex Tactical channels (5) will provide additional opportunity to offload traffic from the main dispatch channels – these tactical channels, along with other potential frequency changes, need to be programming into all radios
System Reliability	<ul style="list-style-type: none"> • System reliability has generally been acceptable, although it was noted that one microwave link becomes unreliable when temperatures are over 95 degrees • Regular site checks are performed by the Radio Services personnel which helps to maintain consistent operation

Dispatch Operations	<ul style="list-style-type: none"> • Dispatch spends time repeating communications between units in the field since they can't hear each other – a repeated frequency pair will significantly reduce this need • Dispatch contends with users in the east and west portion of the County since they can't hear each other • The dispatch workload suggests 24 dispatch operators are needed, yet the center currently has only nine • Users in the field would like more consistent dispatch related to training/procedures, voice volume and clarity
Interoperability	<ul style="list-style-type: none"> • County fire and law enforcement can talk to each other • No interoperability with the State Patrol, although it is seldom needed • Fire districts require interoperability with the state Division of Natural Resources (DNR) • FD11 also needs to talk with Pacific County to the west
Site Infrastructure	<ul style="list-style-type: none"> • The conditions of the sites vary – an assessment was performed • The Democrat site is currently located at a residence and needs to be upgraded • Additional recommendations will be provided as part of the enhanced system concept
Features	<ul style="list-style-type: none"> • The Lewis County Sheriff's Office (LCSO) and the local police departments need encryption capability and would also like radio location capability, emergency button use, and individual call capability
Operational	<ul style="list-style-type: none"> • New Radio Services personnel have been very helpful and have made substantial improvements • The radio committee meetings should be continued • The fire chief's meetings should be continued

Table 1: Study Key Findings

Following a complete analysis of the existing systems and considerations of the key findings and needs, Televate provided specific actionable recommendations for each of the systems listed above to provide significant improvements in public safety communications for the County's first responders. Please see the Recommendations for Improved Public Safety Communications section of this report.

Televate additionally provided capital cost estimates for the recommended site facilities upgrades, as well as estimated ongoing operating and maintenance costs. Please see Cost Estimate of Proposed Recommendations. A complete estimated project budget was also provided under separate cover.

Finally, to facilitate an efficient project to implement the recommended enhancements, a set of next steps for the County to pursue were provided, including:

- Achieving consensus on the recommended direction and performing coordination with its partners

- Developing a comprehensive frequency plan as soon as possible, which entails:
 - Performing coordination on potential new frequencies and identifying frequency pairs
 - Evaluating available frequencies from a combining/multicoupler perspective for the following groups:
 - East simulcast cell group:
 - Fire East repeater pair
 - LCSO East repeater pair, and
 - Public Works East repeater pair.
 - West simulcast cell group:
 - Fire West repeater pair
 - LCSO West repeater pair, and
 - Public Works West repeater pair.
 - Identifying a new Fire West frequency and begin using ASAP
- Identifying and allocating sufficient funding for the project
- Developing a long-term Public Safety Communications strategy
- Establishing a procurement strategy and developing a procurement specification, and
- Considering dispatch improvements.

EXISTING SYSTEM BACKGROUND

County Systems

In order to develop firsthand familiarity with the County's system and to subsequently outline viable paths for system enhancement options, an exhaustive data collection, review and analysis effort was conducted. System data was collected through a review of available electronic records from the County's operational personnel, publicly available information from FCC records and other sources, as well as through targeted onsite physical surveys. Additionally, a series of discussions were held with the radio services and dispatch personnel to better understand the system's history, strengths and gaps, desired outcomes, and overall vision.

Data collected to support the assessment included:

- Overall radio and microwave network architecture and system design
- VHF radio and microwave equipment types, models, quantities, and years in operations
- RF site coordinates
- Operational frequencies
- Dispatch center equipment and interfaces, and
- Site equipment inventory.

Current Systems Overview

The County currently operates VHF analog conventional systems for both their law enforcement and fire operations. These systems support the following County and partner agencies:

- Law Enforcement:
 - Lewis County Sheriff
 - Centralia PD
 - Chehalis PD
 - Napavine PD
 - Winlock PD
 - Toledo PD
 - Morton PD
 - LCFD #18-Glenoma
 - Cowlitz-Lewis #20
 - Riverside Fire Auth.
 - Chehalis FD
- Fire Agencies:
 - LCFD #1-Onalaska
 - LCFD #2-Toledo
 - LCFD #3-Mossyrock
 - LCFD #4-Morton
 - LCFD #5-Napavine
 - LCFD #6-Chehalis
 - LCFD #8-Salkum
 - LCFD #9-Mineral
 - LCFD #10-Packwood
 - LCFD #11-PeEll
 - LCFD #13-Curtis
 - LCFD #14-Randle
 - LCFD #15-Winlock
 - LCFD #16-Doty
 - Other Agencies:
 - American Medical Response
 - Coroner's Office
 - Public Works/DEM
 - US Forest Service

Telestate analyzed the different systems in order to establish a complete picture of communications throughout the County. These systems include:

- Fire System East
- Fire System West
- RFA City System
- RFA District 12 System
- Fire Paging
- City PD System
- LCSO System East
- LCSO System West
- Public Works
- Backhaul System

A description of each of these systems is provided below and estimated coverage performance based on a propagation simulation is provided in Appendix B: Current System Predicted Coverage.

Fire System East:

The fire system in the eastern portion of the County operates with Tx/Rx sites at Storm King (154.19 MHz for the Mineral area – FD9), Dog (154.19 & 156.105), Randle Fire (155.805), and Packwood (155.805). The Storm King and Dog sites use the Fire 1 channel of 154.19, while the Randle Fire and Packwood sites utilize the Fire 3/4 repeated channel (155.805/156.105) which support fire districts 10 and 14. The Hopkins site is used as a relay site for Storm King (via 159.315). A diagram of this configuration is shown in Figure 1.

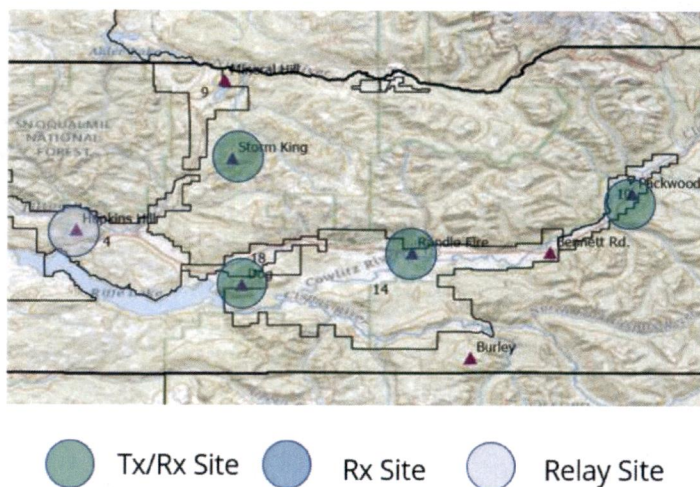


Figure 1: Lewis County Fire System East Sites

Fire System West:

The fire system in the western portion of the County operates with Tx/Rx sites at Crego and Democrat, with receive only sites at Cooks, Onalaska, Toledo, and at the Fire District 11 Station (receives one frequency then transmits on 154.19). All of these sites utilize the Fire 1 channel of 154.19, except for the alternate receive frequency used at the Fire District 11 Station. A diagram of this configuration is shown in Figure 2.

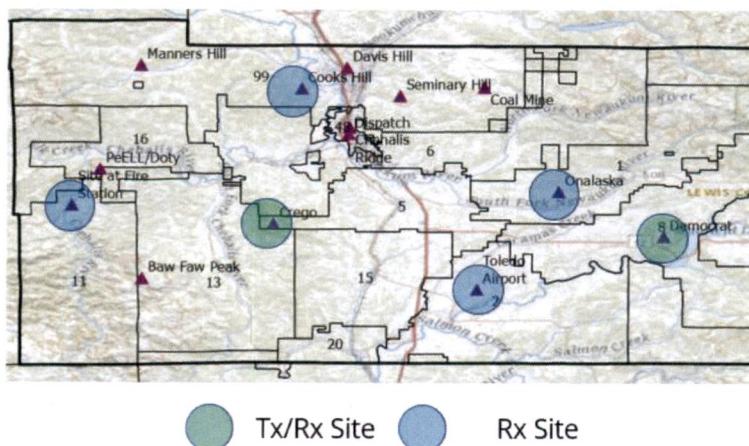
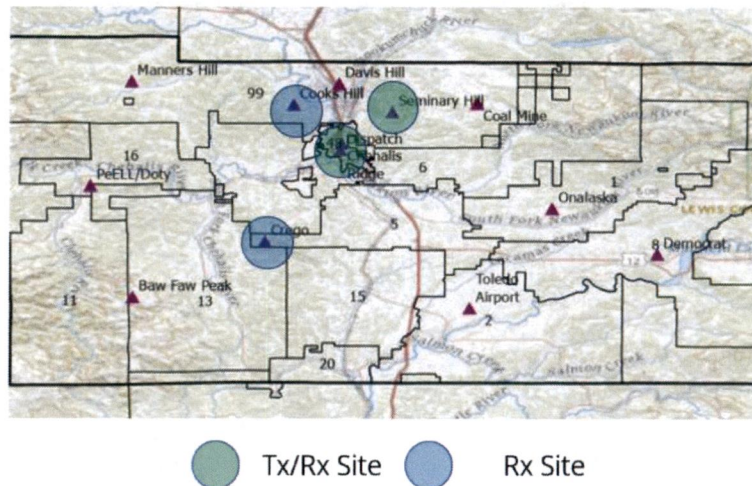
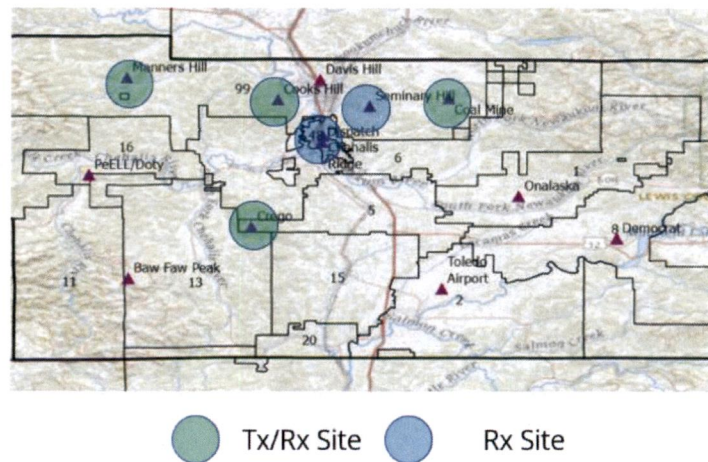


Figure 2: Lewis County Fire System West Sites*RFA City System:*

The RFA system that supports the fire departments for Chehalis and Centralia uses Tx/Rx sites at the Courthouse and Seminary Hill, with receive only sites at Cooks and Crego. This system is configured as simulcast transmit and voted receive and uses the repeater pair of 154.145/158.760 MHz, which is also referred to as the Fire 6 channel. A diagram of this configuration is shown in Figure 3.

**Figure 3: RFA City Fire System***RFA District 12 System:*

The Riverside Fire Authority (RFA) District 12 system supports the fire district in the northwest portion of Lewis County and utilizes Tx/Rx sites at Crego, Cooks, Coal Mine, Manners and receive only sites at the Courthouse and Seminary Hill. This system is configured as simulcast transmit and voted receive and uses the repeater pair of 154.9725/159.0975 MHz, which is also referred to as the Fire 2 channel. A diagram of this configuration is shown in Figure 4.

**Figure 4: RFA District 12 System**

Fire Paging System:

The paging system that supports all fire agencies within the County utilizes two sites in the east (Dog and Packwood) using the mobile receive side of the voice channel in that area (155.8050 MHz) instead of a dedicated paging channel. The paging system in the western portion of the County uses a total of four sites at Cooks, Crego, Manners, and Toledo using a dedicated paging frequency 155.7150 MHz. A diagram of this configuration is shown in Figure 5.

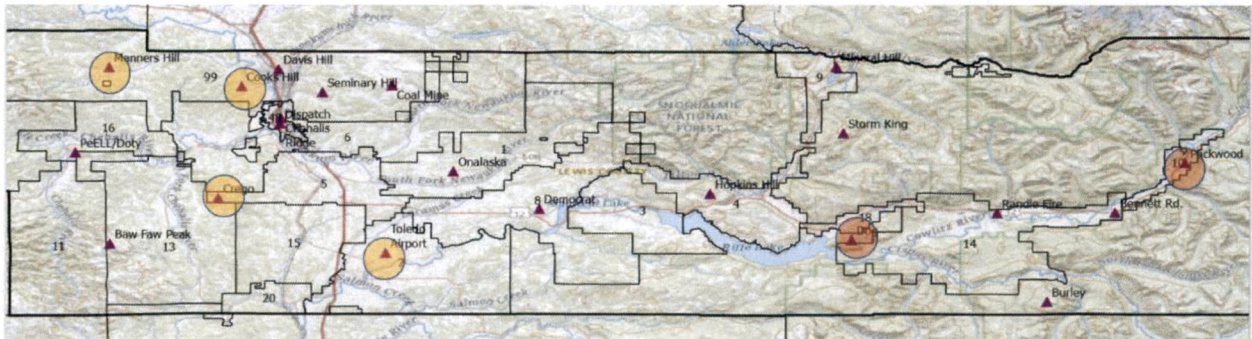


Figure 5: Fire Paging System

City Police Departments (PDs) System:

The system that supports the police departments for Chehalis and Centralia uses one Tx/Rx site at Chehalis Ridge and a receive only site at Seminary Hill. An additional receive site at Davis Hill has been disabled as it was not found to provide any additional benefit. This system uses the repeater pair of 156.1800/159.0000 MHz. A diagram of this configuration is shown in Figure 6.

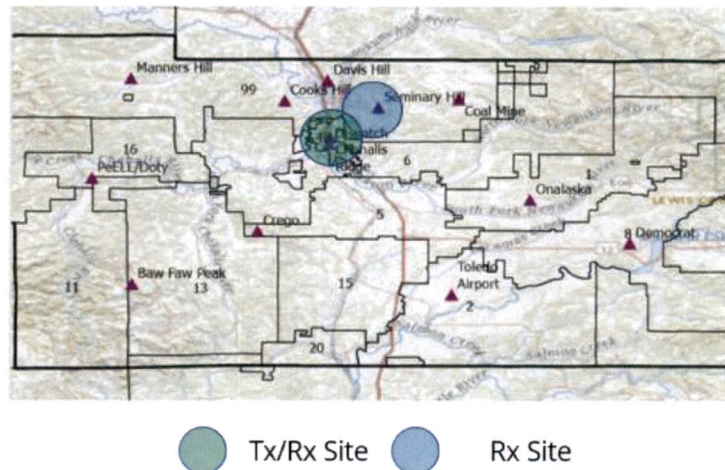


Figure 6: City PD System

LCSO System East:

The system that supports LCSO in the eastern portion of the County uses the Burley and Storm King remote sites as Tx/Rx, which are linked via a transmitter at Crego. This system also uses receive only

sites at Bennett, Dog, Hopkins, and Packwood. The frequency pair used for this system is 155.6250/156.0300 MHz. A diagram of this configuration is shown in Figure 7.

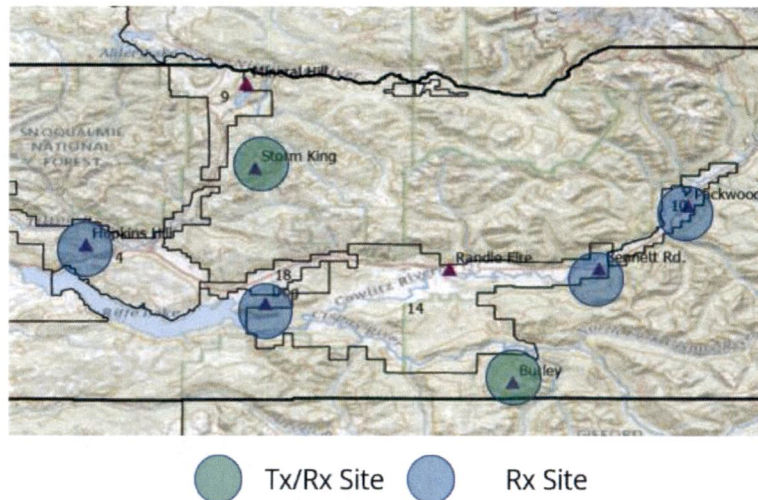


Figure 7: LCSO System East

LCSO System West:

The system that supports LCSO in the western portion of the County uses a single Tx/Rx site at BawFaw and receive only sites at Crego, Davis Hill, Hopkins, and Toledo. The frequency pair used for this system is also 155.6250/156.0300 MHz. A diagram of this configuration is shown in Figure 8.

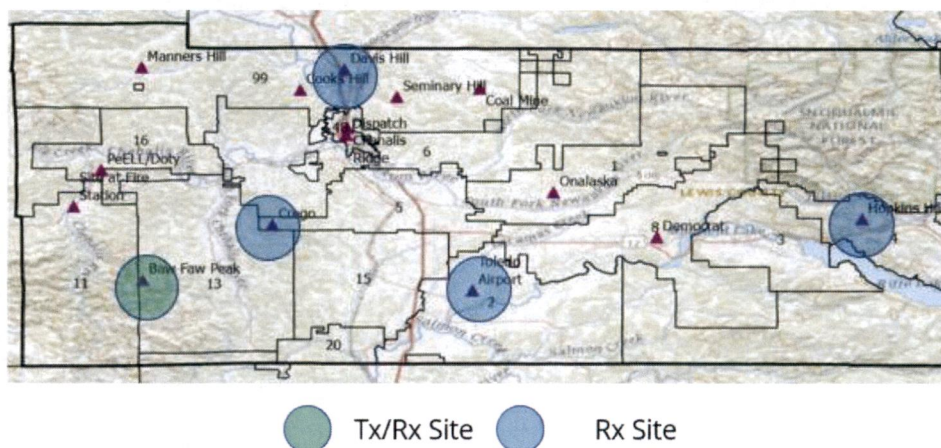


Figure 8: LCSO System West

Public Works:

The public works system operates from a single repeater site at Hopkins for the east side of the County, and single repeater site at Crego for the west side of the County. A diagram of this configuration is shown in Figure 9. Both repeaters use the frequency pair 155.1000/155.7450 MHz for their operations.

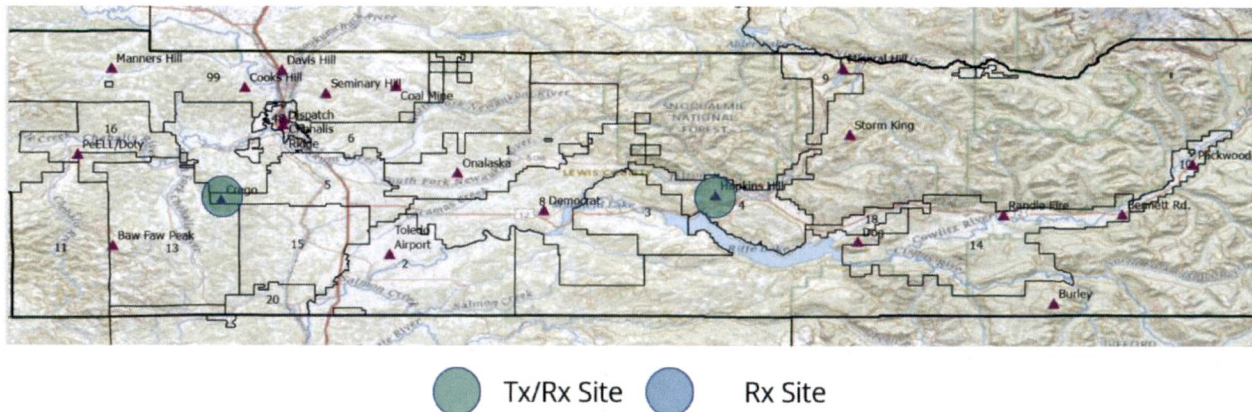


Figure 9: County Public Works System

County Microwave Backhaul Network:

The County currently uses microwave links to provide radio site backhaul connectivity to some of the communications sites in use throughout the County. Some microwave links are owned by the County and other connections provide a T1 connection configured over a County partner's microwave. These existing connections are shown in Figure 10.

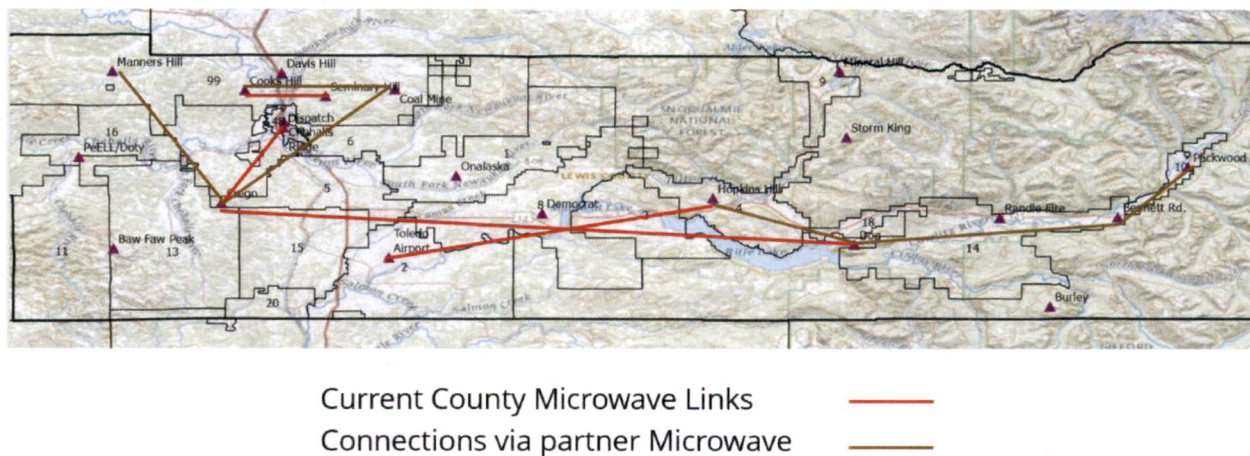


Figure 10: Lewis County Microwave Backhaul Network

Physical Infrastructure

The County maintains approximately twenty communications sites to support the operations described above. These sites contain substantial physical infrastructure which includes radio towers or other support structure, equipment shelters with environmental support systems, DC power plants and backup generators. These facilities are essential for maintaining a robust radio network. Basic descriptions of the sites currently in use today in Lewis County appear below in Table 2.

Site Name	Structure	Equipment Location	Backup Power
BawFaw Peak	Self-support tower	Custom block building	Batteries and generator

Bennett Rd.	Self-support tower	Concrete prefab building	Batteries and generator
Burley	Tower	Custom building	None – Solar power only
Chehalis Ridge	Monopole tower	Custom block building	Generator
Coal Mine	Self-support tower	Custom building	Batteries and generator
Cooks Hill	Self-support tower	Room inside fire station	Batteries and generator
Crego	Self-support tower	Portion of custom block building	Batteries and generator
Davis Hill	Pole attached to building	Custom brick building	None
Democrat	Pole attached to house	Garage	None
Dog	Self-support tower	Custom building	Batteries and generator
Historic Courthouse	Building rooftop	Building equipment room	UPS and generator
Hopkins Hill	Self-support tower	Custom building	UPS and generator
Manners Hill	Self-support tower	Custom block building	Batteries and generator
Onalaska	Pole attached to building	Room inside fire station	Batteries
Packwood	Ladder structure of water tower	Custom building	Batteries
Seminary Hill	Wooden pole	Outdoor cabinets	Batteries and generator
Storm King	Tower	Custom building	None – Solar power only
Toledo Airport	Self-support tower	Custom building	Batteries
Randle Fire	Tower attached to building	Room inside fire station	Batteries

Table 2: Current Lewis County Infrastructure Sites

FCC Licenses

Another key ingredient for maintaining a public safety radio system is the access to licensed frequency spectrum. Voice communications is achieved via the use of frequencies licensed by the Federal Communications Commission (FCC). The primary frequencies in use by Lewis County, as well as some additional licensed frequencies, are listed in Table 3.

Frequency (MHz)	Current Usage
154.1900	Primary fire dispatch and voice channel - simplex
154.1450/158.7600	Used by RFA for fire voice for Chehalis and Centralis fire
154.9725/159.0975	Used by RFA for fire voice for fire district 12
155.8050/156.1050	Repeated pair for fire paging and voice for fire districts 10 and 14

155.7150	Fire paging for County and RFA fire districts
155.6250/156.0300	Law enforcement voice channel for Lewis County Sheriff's Office
156.1800/159.0000	Law enforcement voice channel for Chehalis and Centralia PD
155.4150/159.0300	Jail voice channel
155.1000/155.7450	Voice communications for County public works
154.3400	Hospital Emergency Administrative Radio (HEAR) - Primarily used by ambulance services for administrative communications with hospitals
155.7675	SW WA public department (fairgrounds voice communications)
155.9550	Used by fire district 14
154.4300	Licensed by Lewis County and RFA
154.9800	Licensed by Lewis County
154.9950	Licensed by Lewis County
155.0100	Licensed by Centralia, Chehalis, and Lewis County
158.9250	Licensed by Lewis County

Table 3: Lewis County Licensed Frequencies

FCC license changes are likely to be required when the County chooses to implement system enhancements.

Subscriber Devices and Vehicular Repeaters

The public safety agencies within Lewis County operate a variety of mobile and portable radios as part of their communications systems. Based on on-site interviews and responses to a user survey, it is estimated that the County agencies operate approximately 300 mobile radios and 500 portable radios. These radios come from various manufacturers, including Bendix King, Icom, Kenwood, and Motorola. The majority of these radios support analog voice only, although a small percentage would be capable of supporting digital voice. Some agencies also utilize in-band vehicular repeaters as a means to extend the usable range of portable radios in areas of limited coverage.

Dispatch Centers and Equipment

Radio dispatch consoles are critical tools used by telecommunicators or dispatch staff to communicate with, support, and coordinate the first responder field response and operations. Dispatch equipment is situated at call-taking/dispatch operator positions and is typically connected via wired or wireless links to central switching controllers or to base station radio sites. Lewis County dispatches from the historic courthouse location and maintains eight dispatch positions utilizing Motorola MCC7500 consoles. The County also uses a Motorola (formerly Spillman) Computer Aided Dispatch (CAD) system.

Current Systems Signal Measurements

LMR network signal level measurements were taken to confirm existing system performance, as well as to provide input into the radio propagation tool to improve the accuracy of the RF coverage simulations. During Televate's on-site visit in August 2023, a signal measurement device was used to gather existing system signal measurements. A Berkeley Varitronics Systems Coyote™ (shown in Figure 11) unit was used to measure the signal level and correlate it to GPS location.

The unit was programmed to receive and measure frequency 155.1000 MHz for testing purposes. The testing was performed in a County vehicle while driving throughout the County with the unit held inside in the passenger seat. Since the Lewis County systems are conventional, the channels are normally only active when a call is in process. However, to record data throughout the drive route, the channel was placed into a periodic transmit mode, which would cycle the transmitter on and off for 30 seconds each. The data was then filtered to eliminate the data when the transmitter was off.

Over a two-day period, measurements were recorded from a total of four sites: BawFaw, Crego, Hopkins and Packwood. Data from each of these measurements are shown in the figures below. In each case, the following legend applies to illustrate the measure radio signal strength:



Figure 11: Measurement Device

> -78 dBm	■
-78 to -88	■
-88 to -98	■
-98 to -107	■

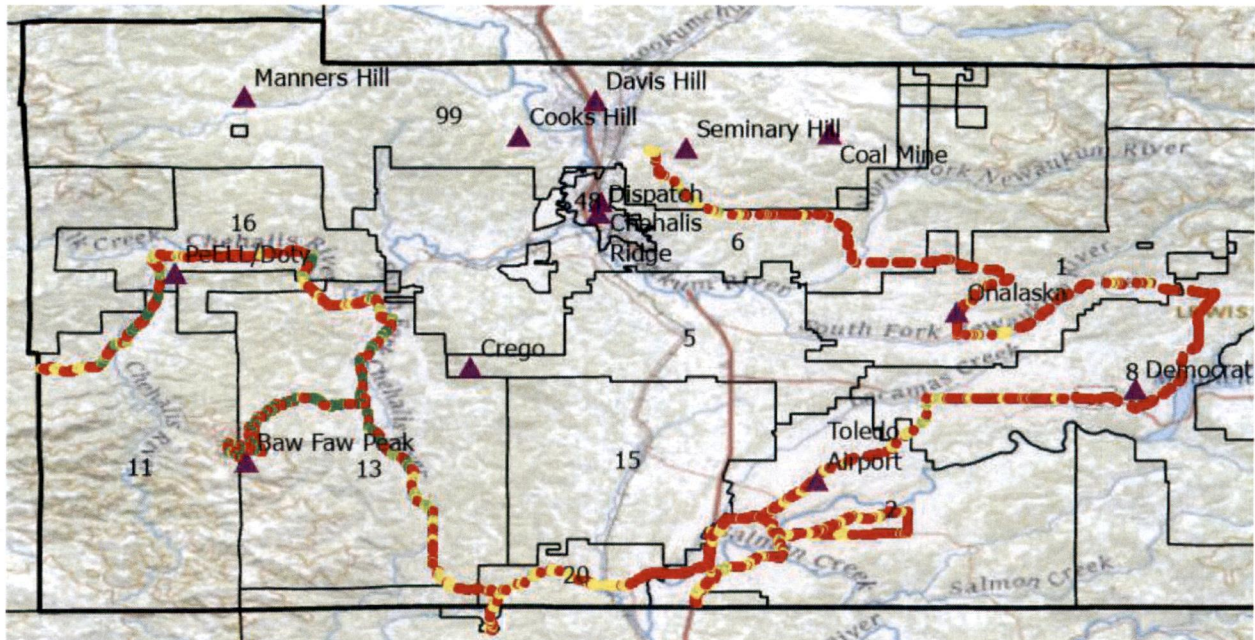


Figure 12: Recorded Signal Level Data from BawFaw

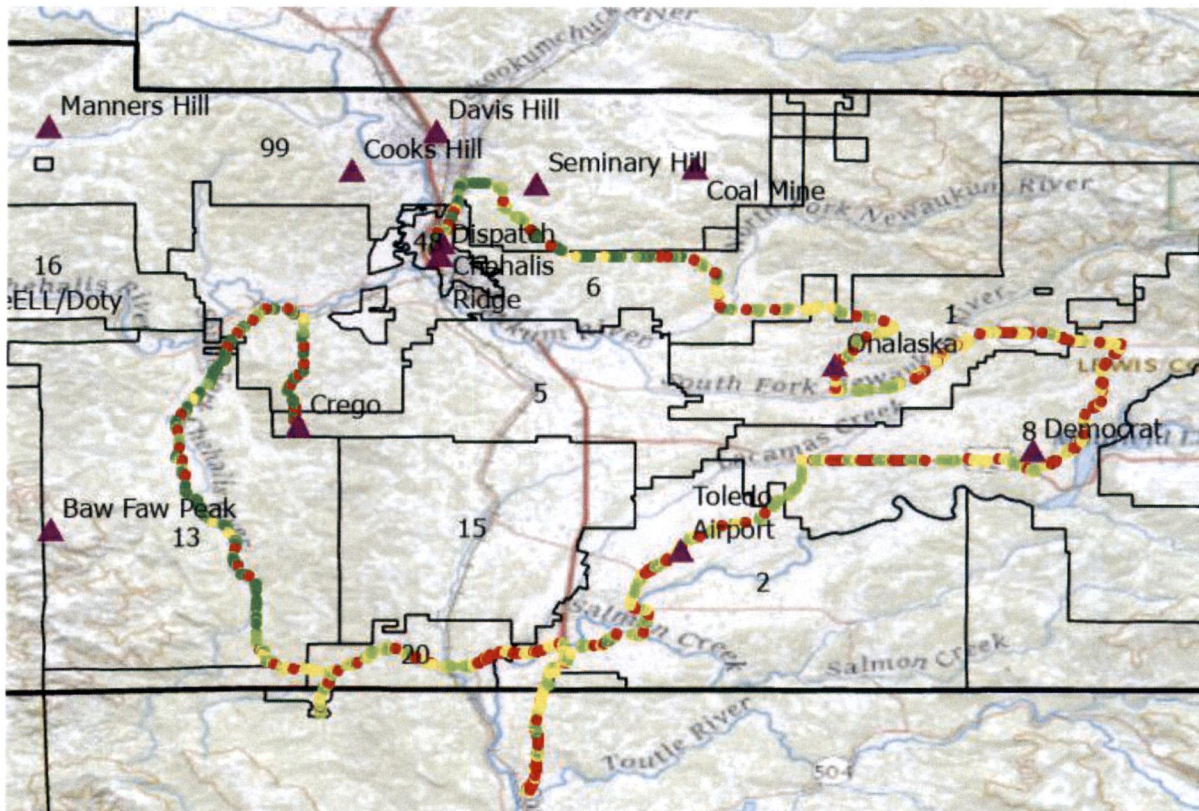


Figure 13: Recorded Signal Level Data from Crego

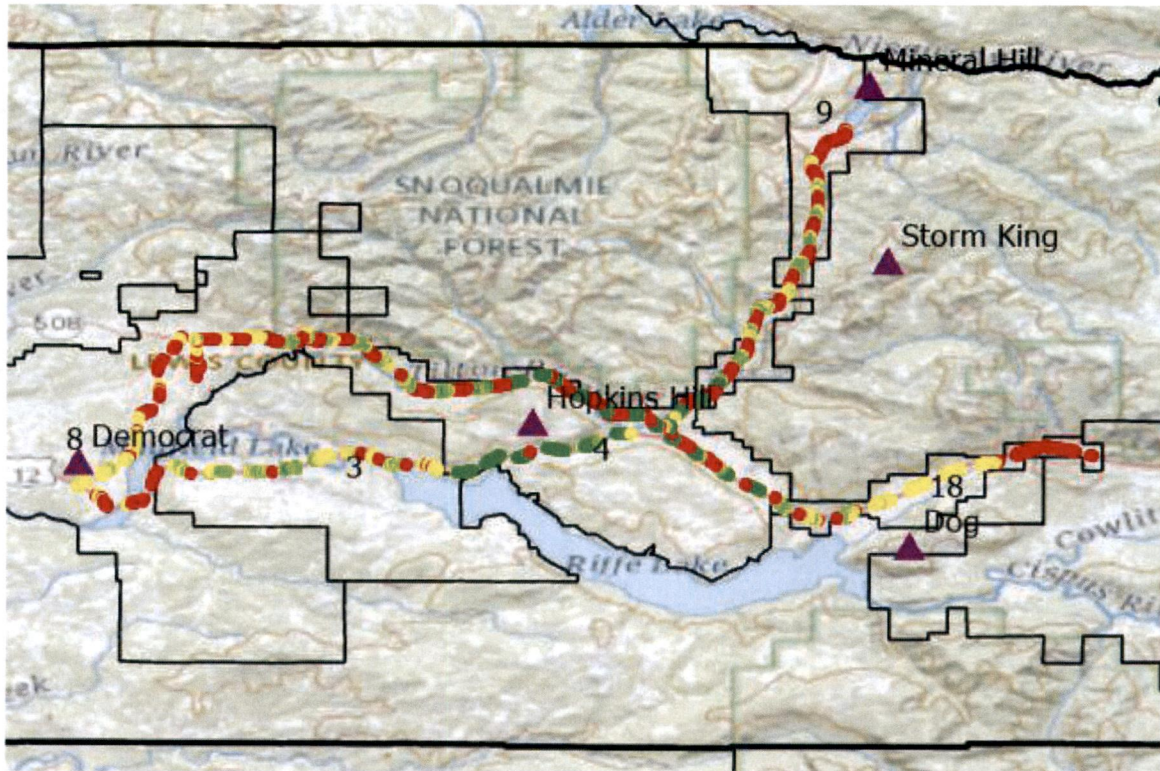


Figure 14: Recorded Signal Level Data from Hopkins

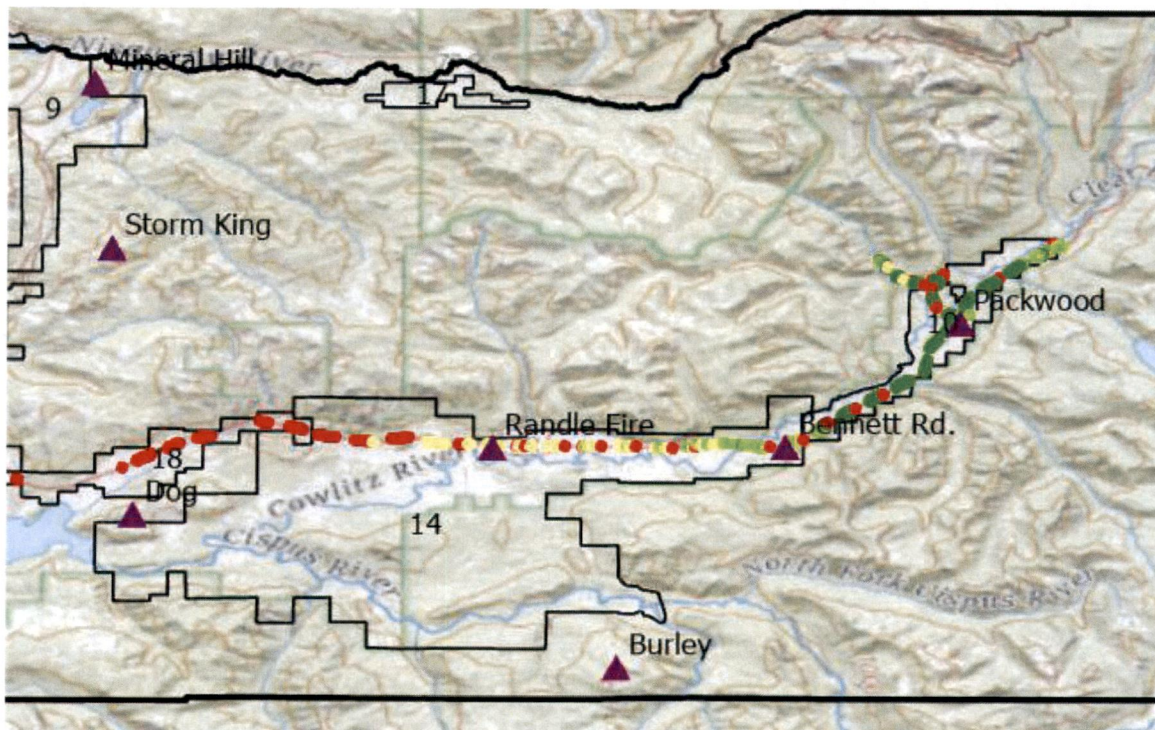


Figure 15: Recorded Signal Level Data from Packwood

SYSTEM FEEDBACK FROM USERS

Identifying the objectives and needs of the public safety communications system stakeholders is key to establishing requirements for radio system enhancement solutions. Technology selections and investments are best driven by the user community to ensure that the next generation radio network satisfies their unique communications needs, and likewise considers fundamental financial and governance objectives. During the on-site visit to Lewis County, the Televate team conducted interviews and informal discussions with technical, end user, management and systems operations staff regarding the system's operation and performance. Discussions focused on a range of topics including current systems capabilities and gaps, interoperability requirements, and the condition of existing and new infrastructure assets. A radio user survey form was also made available for those stakeholders that did not have the opportunity to attend in person interviews.

Detailed notes from the on-site interviews are included in *Recommended Next Steps*

Televate recommends Lewis County proceed in the following manner to implement the recommendations provided in this report.

Consider Recommendations and Direction and Coordination

The County should review the recommendations provided in this report, provide feedback and update plans as necessary. Additionally, the County should engage additional stakeholders from the County's first responder community to solicit input on the recommended direction and achieve consensus on the approach. Once consensus on the preferred approach is achieved, Televate recommends that the County begin the coordination activities with its communications partners, including RFA, WSDOT, and others as necessary to implement the recommended improvements.

Develop a Comprehensive Frequency Plan As Soon As Possible

Co-channel interference on the main fire frequency is one of the most critical issues currently faced by County first responders. It is essential that the County address this issue as soon as possible. To do so, Televate recommends the following short-term actions:

Perform coordination on potential new frequencies

A number of potential alternative and additional frequencies suggestions are provided in this report. Televate recommends the County work with a licensed frequency coordinator to perform coordination services on selected frequencies to determine what frequencies can be licensed by the County and to move forward with the licensing process. The usable frequencies should then be combined as candidate frequency pairs to create repeated channels.

Evaluate available frequencies from a combining/multicoupler perspective

Once the collection of new frequencies is identified and candidate repeater pairs are created, it is suggested that the County identify groups of frequency pairs that can be easily combined at a common site. The groups that the County should consider include:

- East simulcast cell group:
 - Fire East repeater pair
 - LCSO East repeater pair, and
 - Public Works East repeater pair.
- West simulcast cell group:
 - Fire West repeater pair

- LCSO West repeater pair, and
- Public Works West repeater pair.

Identify new Fire West frequency and begin using ASAP

The process described above will identify a candidate repeated frequency pair for the Fire West system. Televate believes that the County should begin using this frequency as soon as possible, even if the other recommended enhancements are not addressed until a later time. Elimination of the interference currently experienced on the 154.1900 frequency may be worth the additional effort of reprogramming radios with this new frequency, even if radios will need to be programmed again at a later date.

Allocate Funding for the Project

It is Televate's understanding that the County intends to utilize identified ARPA funding in addition to a source of grant funding in support of this project. It is recommended that the County confirm these allocations in the amounts available to support this project. In order to implement all enhancements, the currently identified ARPA and grant funding may not be sufficient to support the entire project. Therefore, since additional funding, above and beyond the currently identified allocations may be required for this project, it is recommended that the County develop a plan to address the potential for additional costs. Potential options for addressing this may include:

- Identifying additional funding to cover potential additional costs
- Scaling back or phasing in the improvements over several years, or
- Working with partner agencies to identify additional funding.

Additionally, since the timing for the funding may vary by source, it is recommended that the earliest available funds be allocated toward the portions of the project that are likely to have the longest lead time for implementation, including the facilities updates and the extensive microwave connectivity.

Develop a Long-Term Public Safety Communications Strategy

In addition to these near-term improvements, Televate recommends the County also consider additional improvements to further enhance the public safety communications within the County. Considerations may include:

- Upgrading law enforcement user radios for P25 capability to support encryption and location services
- Adding additional site infrastructure to further improve coverage in key areas
- Upgrading additional site infrastructure to support digital communications for improved coverage with existing sites, and
- Considering a regional consortium with neighboring counties to share resources and improve regional communications.

Establish a Procurement Strategy and Develop a Procurement Specification

Once the final project direction has been established and the funding strategy is in place, Televate recommends that the County develop a procurement strategy for the project, and as required, a procurement specification to define the project and solicit proposals. Televate would be happy to assist the County further with establishing this strategy and documentation.

Consider Dispatch Improvements

In addition to the radio enhancements recommended in this report, Televate recommends that the County perform an internal dispatch assessment to consider potential improvements to dispatch operations and to address comments received from stakeholders. Some areas that could be investigated include:

- A staffing analysis to determine the optimal number of dispatch operators required for the current call volume and a means to achieve this level
- A review of and potential update to the current dispatch processes regarding call handling and interaction with the first responders – this should include communications with the first responder agencies to solicit their input as well as inform them on the dispatch processes and challenges that exist
- Consideration of a patching policy to facilitate communications between the east and west systems/channels when necessary
- A review of and potential update to the current dispatch training processes to better enable consistent call handling and response, and
- An evaluation of an Automated Voice Dispatching (AVD) system to ensure consistent volume and voice quality.

Appendix A: On-Site Interview Notes. A summary of the key findings from the in-site interviews and survey results has been provided in Table 1 in the executive summary portion of this report.

The primary issues that surfaced during interviews and also in the survey results was the need for better coverage and problems due to disruptive radio channel interference. Coverage issues plagued most of the agencies, except for those that work primarily in the Cities of Chehalis and Centralia. However, even for these agencies, larger buildings such as the big “box” stores (Walmart, Home Depot, etc.) still cause problems.

Interference is a major concern with most of the County fire agencies. All agencies that still utilize Fire 1 (154.1900) commented on the interference from outside the County, mostly from Mason County. Televate was able to confirm the assertion that Mason County is operating a site on 154.1900 at high power. Our research of FCC records did reveal a City of Shelton call sign KNFF591 in Mason County which is licensed at an Effective Radiated Power (ERP) of 350W. Televate performed a contour analysis of that license to determine its potential impact. Figure 16 below shows the location of the City of Shelton site and the predicted service (Blue) and interference (Red) contours based on the license information. It can be seen that the predicted interference contour intersects a very large portion of Lewis County and confirms the reason behind the significant interference problems experienced on Fire 1.

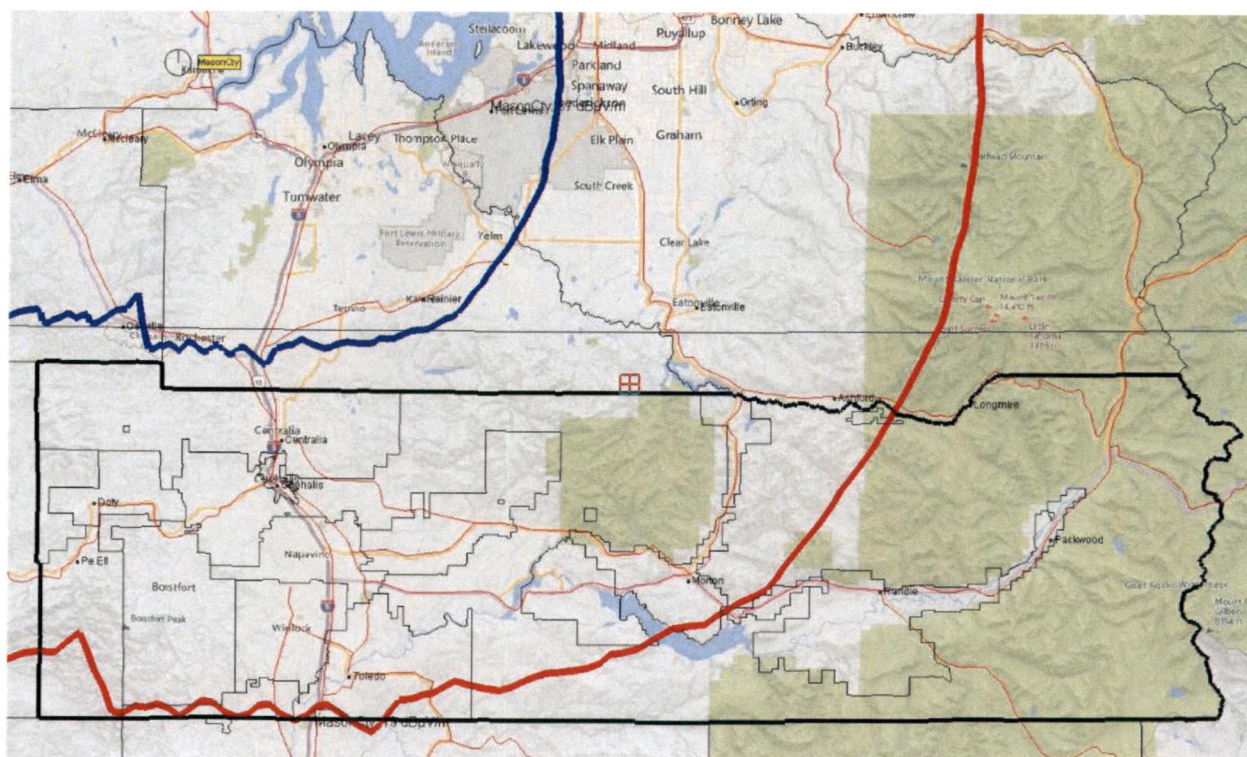


Figure 16: City of Shelton License KNFF591 Service (—) and Interference (—) Contours

In addition to documenting significant findings from the system research and stakeholder meetings, Televate developed a list of key requirements that should be addressed by the system enhancements. These key system requirements are summarized in Table 4.

Category	Key System Requirements
Overall Functionality and Coverage	<ul style="list-style-type: none"> • An alternative to the main fire frequency (154.1900) must be identified and implemented to resolve the interference issues • Fire system coverage must be improved in key areas in both the eastern and western portions of the County <ul style="list-style-type: none"> ○ Additional vehicular repeaters can provide a short-term improvement • Law Enforcement system coverage must be improved in key areas in both the eastern and western portions of the County
Site Connectivity	<ul style="list-style-type: none"> • It is critical to implement a modern microwave system to support digital signaling and robust connectivity between sites
Dispatch Operations	<ul style="list-style-type: none"> • Implementing a repeater pair for the primary fire channel to facilitate direct communications between field users and eliminate the need for dispatch to repeat traffic would be a significant improvement

Radio Programming, TAC channels and Interoperability	<ul style="list-style-type: none"> • Additional TAC channels should be incorporated into a common radio template • Additional repeated channels should be incorporated if available • Key interoperability channels (such as DNR) should be incorporated into the radio templates • Fire radio templates should be programmed to a common standard
Features	<ul style="list-style-type: none"> • A key enhancement would include the capability for future support of digital communications to support encryption and location tracking of radios for law enforcement
Operations and Maintenance	<ul style="list-style-type: none"> • Ensure a sustainable, fault-tolerant network, including redundant power at the sites and redundant backhaul • Implement a full suite of remote monitoring, alarm/fault management capabilities • Implement consistent system service and maintenance procedures • Fire radio batteries are very old and should be replaced
General	<ul style="list-style-type: none"> • Implement the most cost-effective, yet beneficial system upgrade • Plan for a system that is financially sustainable

Table 4: Key Requirements

RECOMMENDATIONS FOR IMPROVED PUBLIC SAFETY COMMUNICATIONS

Based on the needs assessment, survey results, and detailed discussions with stakeholders, Televate developed a number of recommendations for the County to consider which will provide improved communications. For the recommended improvements, Televate approached the process by considering the east and west portions of the County. This approach was taken due to several considerations, primarily:

- The geography of the County lends itself to an east/west approach as it extends more than 90 miles east to west, while being approximately 25 miles north to south
- The Lewis County Sheriff's Office using an east and west approach
- A single County simulcast cell would be impractical to deploy due to the extended site separation that would occur between east and west sites. A large site separation significantly increases the chance of internal system interference known as Time Delay Interference (TDI), which occurs when areas within the coverage boundary receive signals from multiple sites, but at noticeably different times. An example of potential interference areas from a simulcast cell utilizing sites in both the east and west portions of the County is shown in Figure 17, where the red areas indicate areas of likely TDI interference. These issues can largely be avoided by utilizing separate simulcast cells in the east and west.

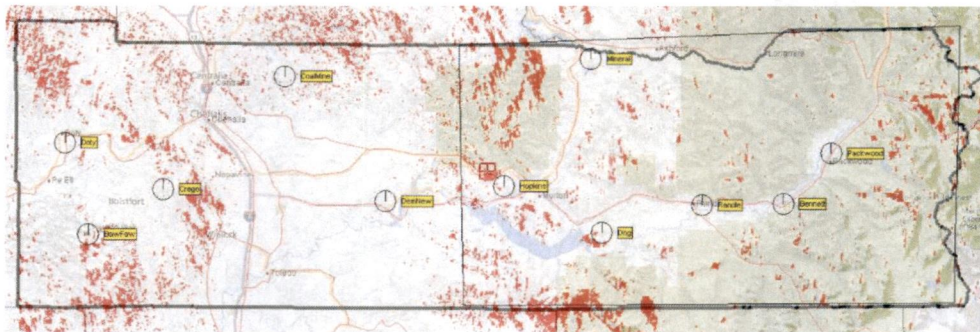


Figure 17: Potential TDI Interference from sites in both East and West

With the East/West approach, the recommendation is for the fire districts to be broken down in this manner:

- East: Fire Districts 4, 9, 10, 14, 17, 18
- West: Fire Districts 1, 2, 3, 5, 6, 8, 11, 13, 15, 16, 20.

Geographically, this grouping is shown in Figure 18, where the East districts are shown in red, and the West districts are shown in green. In addition to these groupings, it is assumed that the RFA communications system remains separate.

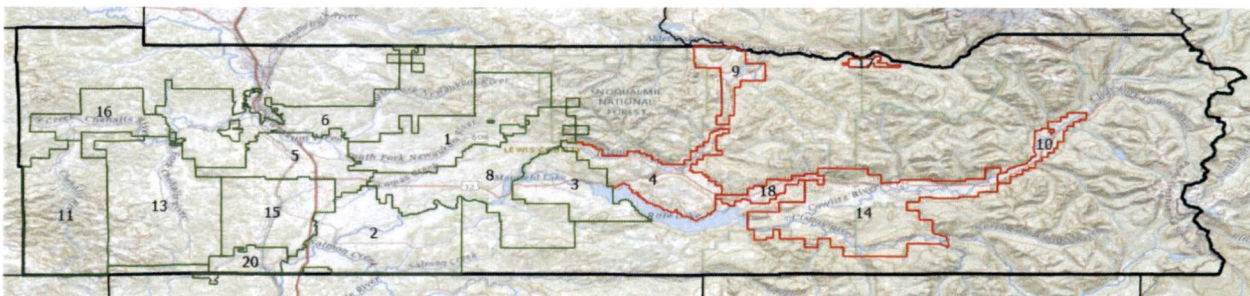


Figure 18: Fire District Recommended East/West Grouping

Neighboring districts that work together regularly, such as Fire Districts 3 and 4 that fall in different regions may raise some concern with the east/west approach. However, these concerns can be addressed through appropriate operational procedures such as ensuring that these districts have the East and West primary channels and they enable scanning of both channels, and also that they use the same TAC channel.

In general, Televate recommends Lewis County maintain operations in the VHF frequency band and continue to operate analog conventional radio systems. This approach will permit the County to maintain interoperability with neighbors and partners, as well as utilize much of their existing equipment while implementing targeted enhancements designed to improve coverage and enhance operations. Additionally, Televate recommends that the infrastructure improvements proposed (including microwave, RF repeaters and receivers) be capable of supporting migration to digital P25 operation at a later date to enable further operational improvements such as encryption for law enforcement and location services. Specific recommended improvements for each of the existing systems are provided below.

System Enhancement Recommendations

Fire System East:

The goals for the enhanced Fire System in the east is to improve coverage and reliability without using the solar-powered sites as the primary assets. To achieve these goals, the following changes/additions are recommended:

- Implement transmit/receive sites at Hopkins, Mineral Hill, Dog, Randle Fire, Bennett, and Packwood in a simulcast cell
- Convert Storm King to a receive only site and add Burley as receive only as well
- Utilize the current repeated frequency pair used in the east (155.8050/156.1050), or a suitable replacement based on additional frequency analysis, and
- Ensure all new infrastructure is digital (P25) capable.

A graphical view of the recommended new configuration is shown in Figure 19.

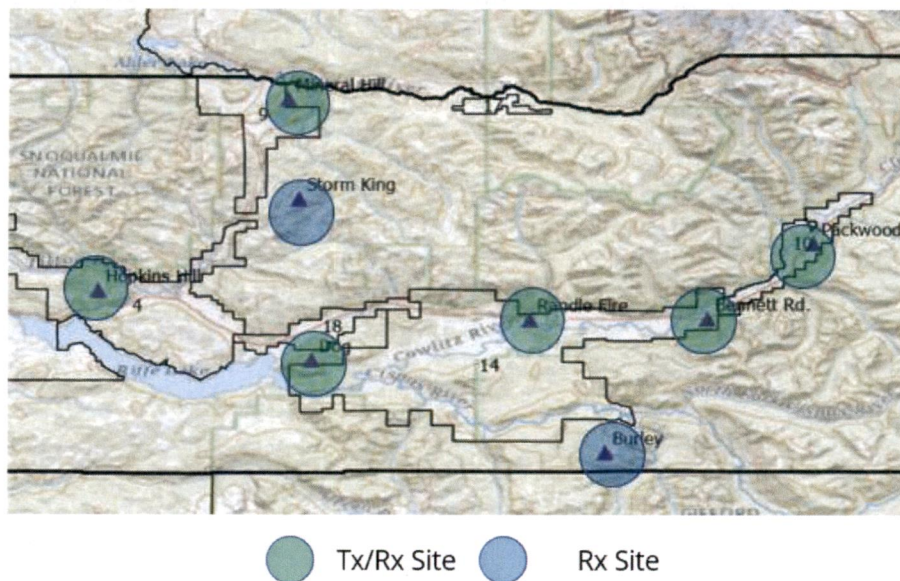


Figure 19: Lewis County Fire System East Recommended Configuration

Fire System West:

To improve communications performance for the fire system in the west, the following changes/additions are recommended:

- Implement transmit/receive sites at BawFaw, Crego, Doty, Coal Mine, and Democrat (new tower) in a simulcast cell
- Maintain receive sites at Cooks, Onalaska (new tower), and Toledo
- Eliminate the relay/receive site at the Fire District 11 station (The Doty site covers this area)
- Utilize a new repeated frequency pair based on the frequency analysis provided in this report, and
- Ensure all new infrastructure is digital (P25) capable.

A graphical view of the recommended new configuration is shown in Figure 20.

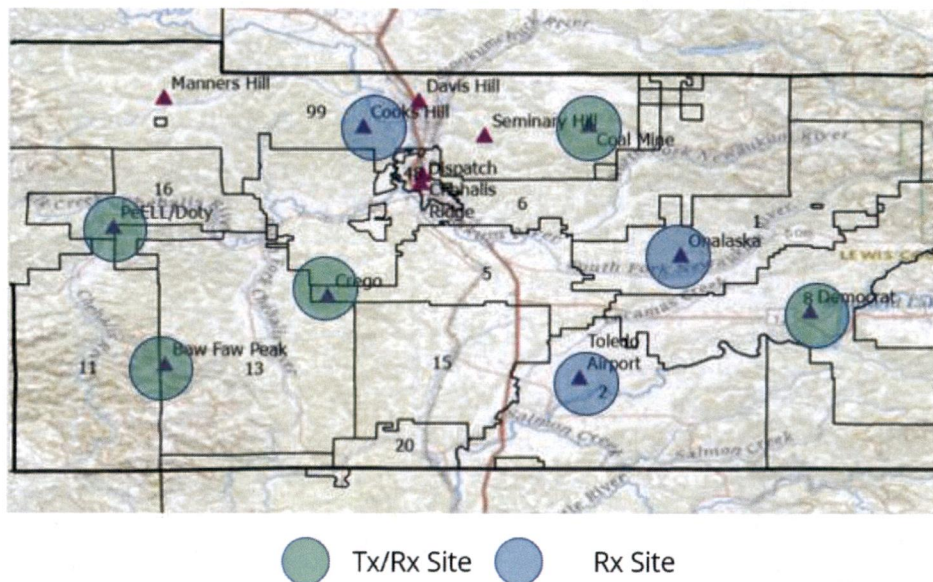


Figure 20: Lewis County Fire System West Recommended Configuration

RFA City System:

The RFA system that supports the fire departments for Chehalis and Centralia appears to be working well and no configuration changes are recommended at this time. However, if needed, additional vehicular repeaters can be purchased to address current coverage problems within buildings.

A diagram of the existing configuration was provided earlier in Figure 3.

RFA District 12 System:

Similarly, the RFA District 12 System appears to be working well and no configuration changes are recommended at this time. However, if needed, additional vehicular repeaters can be purchased to address current coverage problems within buildings.

A diagram of the existing configuration was provided earlier in Figure 4.

Fire Paging System:

The paging system that supports all fire agencies within the County appears to be working well at this time. However, given that the fire agencies in the east currently utilize the base transmit/mobile receive

voice frequency 155.8050 MHz for paging and additional sites are recommended for the east voice system, utilizing this same method and frequency will improve the paging performance in the east.

In the west, the paging system currently uses different sites than the recommended updated voice system, as it supports paging for RFA as well as other County fire districts. Therefore, in order to not disrupt the current paging system in the west, it is recommended that this system remain unchanged at this time. However, it is noted that an additional site (Coal Mine) is currently being added to the paging system in the west, which will improve paging performance in that area.

City Police Departments (PDs) System:

The City PDs System that supports the police departments for Chehalis and Centralia appears to be working well and no configuration changes are recommended at this time. However, it is recommended that all infrastructure (repeaters, receivers, comparators, microwave equipment) be upgraded to current manufacturer equipment and enabled to support digital (P25) operation. Additionally, if needed, additional vehicular repeaters can be purchased to address current coverage problems within buildings.

A diagram of the existing configuration was provided earlier in Figure 6.

LCSO System East:

The recommendation for the LCSO System in the east mirrors that for the Fire System as this recommendation provides the best coverage using existing sites and it is preferable to maintain equivalent coverage for first responder agencies. The following changes/additions are recommended:

- Implement transmit/receive sites at Hopkins, Mineral Hill, Dog, Randle Fire, Bennett, and Packwood in a simulcast cell
- Convert Burley and Storm King to receive only sites
- Utilize a new repeated frequency pair based on the frequency analysis provided in this report, and
- Ensure all infrastructure is digital (P25) capable.

A graphical view of the recommended new configuration is shown in Figure 21.

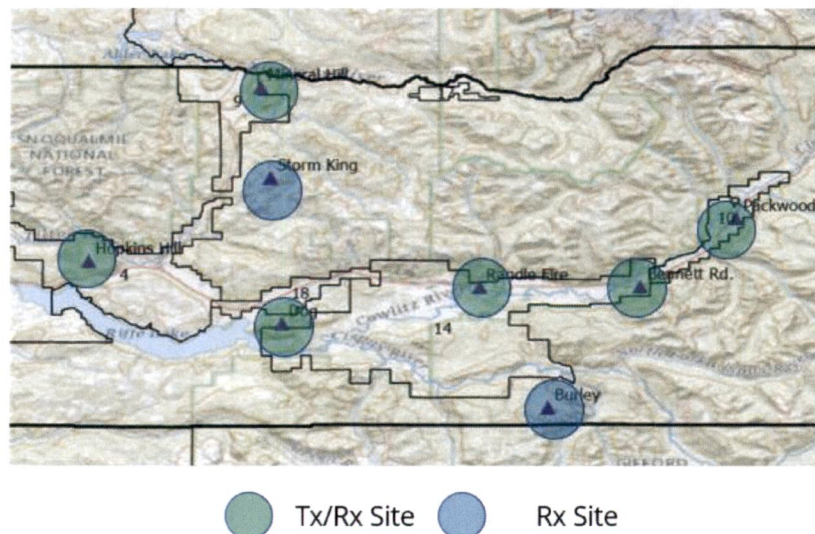


Figure 21: LCSO System East Recommended Configuration

LCSO System West:

Similar to the east systems, it is recommended that for the most part, the LCSO System West mirror the configuration of the Fire System in the west. However, in addition to the previously proposed west simulcast cell, an additional repeater for LCSO is recommended at Manners Hill. For clarification, this site is not recommended for the Fire agencies in the west since this area is currently covered and supported by the RFA system. The following changes/additions for the LCSO System West are recommended:

- Implement transmit/receive sites at BawFaw, Crego, Doty, Coal Mine, Democrat (new tower), and Manners Hill in a simulcast cell
- Maintain receive sites at Toledo and implement new receive sites at Cooks and Onalaska (new tower)
- Eliminate the receive site at Davis Hill (Cooks Hill covers this area)
- Utilize the current LCSO repeated frequency pair (155.6250/156.0300), or a suitable replacement based on additional frequency analysis, and
- Ensure all infrastructure is digital (P25) capable.

A graphical view of the recommended new configuration is shown in Figure 22.

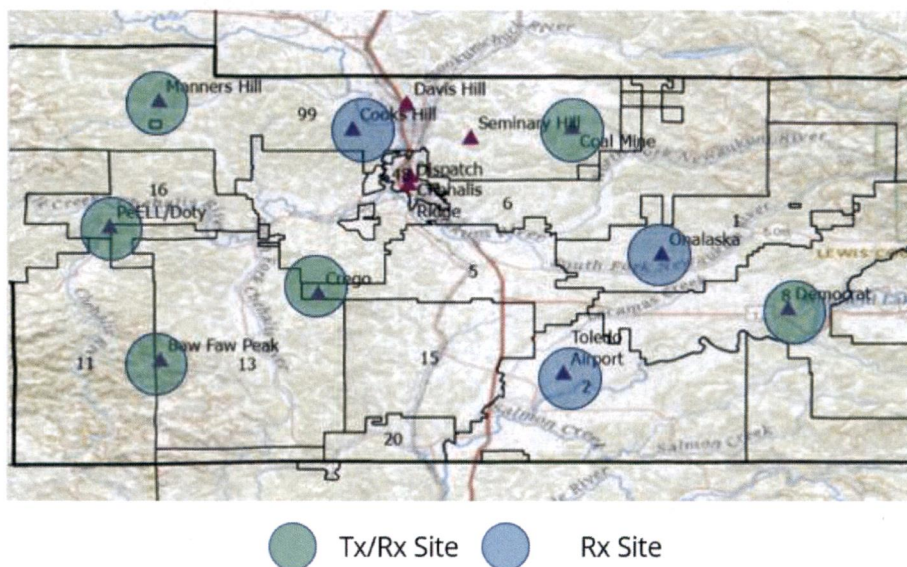


Figure 22: LCSO System West Recommended Configuration

Public Works:

In order to maintain equivalent coverage for the fire, law enforcement and public works personnel, it is recommended that the public works system also be expanded in the east and west utilizing the same east and west simulcast cells as proposed above in Figure 21 and Figure 22. This will equate to adding an additional channel to each of these simulcast cells to support public works.

Predicted coverage for each of the revised system configuration recommendations are provided in Appendix C: Proposed System Predicted Coverage.

Site Usage Summary

A summary of the proposed site usage based on the recommended system configurations described above is provided in Table 5.

Site	Fire System East	Fire System West	RFA City System	RFA District 12 System	Fire Paging	City PD System	LCSO System East	LCSO System West	Public Works
BawFaw		T/R						T/R	T/R
Bennett	T/R						T/R		T/R
Burley	R						R		R
Chehalis Ridge						T/R			
Coal Mine		T/R		T/R	In process			T/R	T/R
Cooks		R	R	T/R	T			R	R
Crego		T/R	R	T/R	T			T/R	T/R
Davis									
Democrat		T/R						T/R	T/R
Dispatch			T/R	R					
Dog	T/R				T		T/R		T/R
Doty		T/R						T/R	T/R
Hopkins	T/R						T/R		T/R
Manners				T/R	T			T/R	T/R
Mineral	T/R						T/R		T/R
Onalaska		R						R	R
Packwood	T/R				T		T/R		T/R
Peterman									
Randle Fire		T/R					T/R		T/R
Seminary Hill			T/R	R		R			
Storm King	R						R		R
Toledo		R			T			R	R

Table 5: Recommended Site Utilization

County Microwave and Backhaul Network:

A major portion of the Countywide system upgrade is expected to be the microwave network. The current system utilizes some existing County-owned links, in addition to T1 connections over partner links. A simulcast-based system will require robust inter-site connections and precise timing.

Additionally, the new microwave system must be capable of supporting both native Time Division Multiplex (TDM) and native Ethernet/IP traffic to support modern digital communications. For existing links that utilize partner microwave, Televate recommends the County work with their partners to ensure that the existing links can support the new system requirements, and/or provide upgrades to the equipment as necessary.

The recommended backhaul network configuration for the east utilizes the following configuration:

- Maintaining/upgrade existing links:
 - Crego to Dog
 - Dog to Bennett
 - Bennett to Packwood
- Incorporating new links:
 - Democrat to Hopkins
 - Hopkins to Peterman (site to be used for microwave relay)
 - Peterman to Dog
 - Peterman to Mineral, and
 - Dog to Randle Fire.

A diagram of the configuration is shown in Figure 23. It is important to note that the recommended microwave network is not proposed in a loop configuration. While a loop is generally preferred, the rugged terrain of this region makes a loop configuration extremely difficult and costly. However, the recommended configuration does include two separate paths to connect to the Dog site, which provides redundancy for links to the other east sites. Also, the microwave spur links are recommended to be implemented in a “hot-standby” configuration to maximize reliability.

It is also important to note that all proposed microwave links have been verified via an electronic terrain path profile. These path profiles are included in Appendix D: Proposed Microwave Link Path Profiles (From Terrain Database). All planned links must ultimately be verified by a physical path survey prior to implementation.

Connections to Storm King and Burley are recommended to remain as RF connections (via control stations), as these sites are solar powered only and cannot support a microwave connection. However, due to the recommended use of these sites as receive only, this type of connection should be adequate.

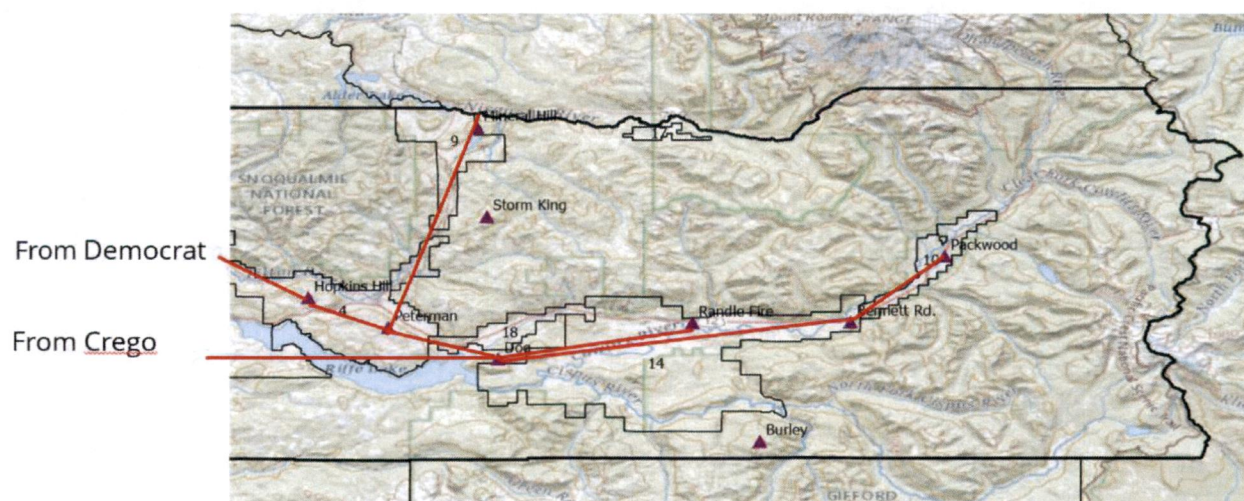


Figure 23: Lewis County Recommended East Backhaul Network

The recommended backhaul network configuration for the west utilizes the following configuration:

- Maintaining/upgrade existing links:
 - Crego to Courthouse
 - Crego to Coal Mine
 - Crego to Manners
 - Cooks to Coal Mine
 - Seminary Hill to Cooks
- Incorporating new links:
 - Manners to Doty
 - Manners to BawFaw
 - BawFaw to Toledo
 - Toledo to Democrat
 - Crego to Democrat
 - Democrat to Onalaska
- Additional recommended links (via fiber as microwave is not possible)
 - Courthouse to Cooks.

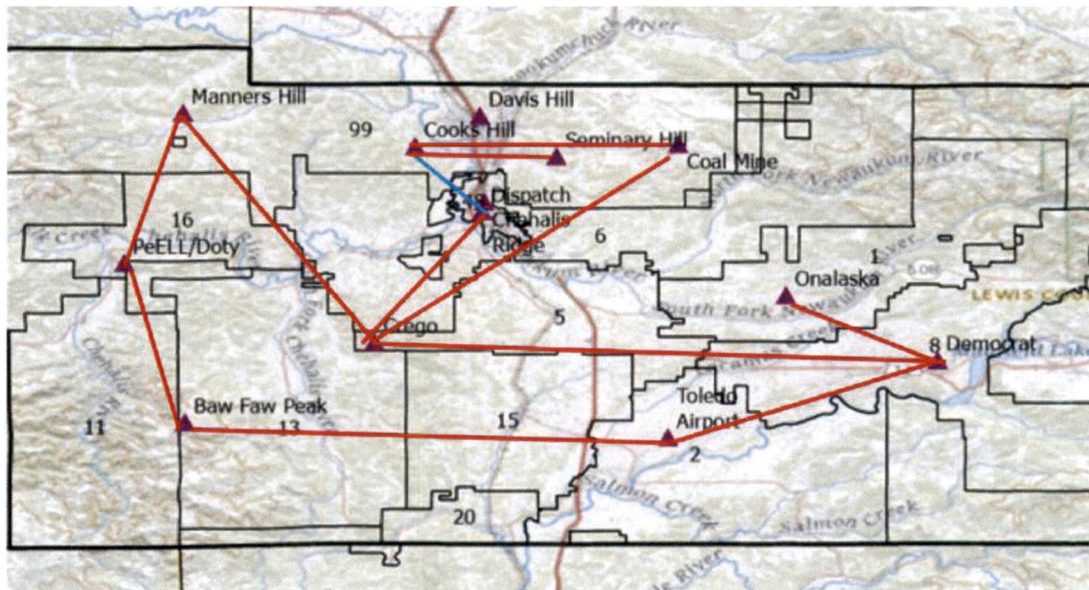
A diagram of the configuration is shown in Figure 24. The recommended configuration incorporates two loops for redundancy, namely:

- Loop 1: Manners, Crego, Democrat, Toledo, BawFaw, Doty
- Loop 2: Crego, Coal Mine, Cooks, Courthouse

In addition to those loops, the following spur links are part of the recommended configuration:

- Cooks to Seminary Hill, and
- Democrat to Onalaska.

Since the spur links are not part of either loop, the microwave spur links are recommended to be implemented in a “hot-standby” configuration to maximize reliability.



Current or future Microwave Links ———

Other Necessary Links ———

Figure 24: Lewis County Recommended West Backhaul Network

Televate notes that the proposed link between Manners Hill and Doty is indicated as questionable using the electronic path profile analysis, and previous experience by the County indicates it may not be reliable. If this path is not feasible, Doty can be alternatively accessed through a spur link from BawFaw, and a variation of Loop 1 can be implemented by closing the loop via a link from BawFaw to Crego. A diagram of this alternate configuration is shown in Figure 25.

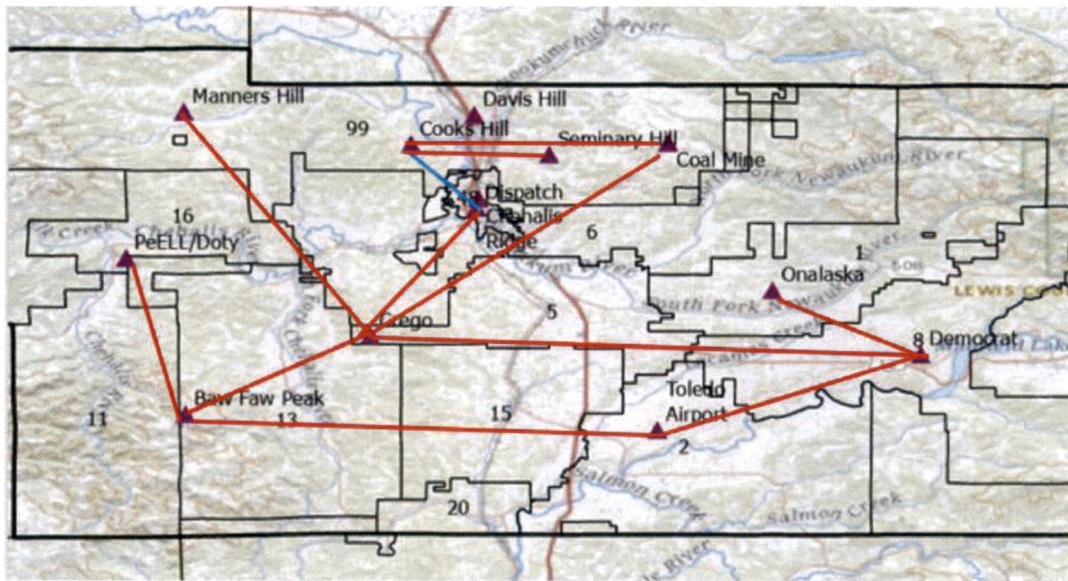


Figure 25: Lewis County Recommended West Backhaul Network (Alternate)

Site Facility Requirements

In order to support the system recommendations developed in this report, some new site development and facility upgrades will be required. The recommendations presented in this report will require the site development shown in Table 6.

Site Name	Area	Recommended Development	Purpose/Improvement
Democrat	Fire District 8 area	Either a new tower and site are to be developed to support the County's needs, or space must be leased on one of the existing towers (3 potentials)	Improved coverage in the central/western positions of the County, including Fire District 8. While a current site exists in this area, it is only a temporary site with an antenna attached to a house.
Doty	Pe Ell	Either a new tower and site are to be developed	Improved fire system coverage in the western portion of the County and to

		(potentially use abandoned tower) to support the County's needs, or space must be leased on the existing tower	replace the Fire District 11 station receive/repeater site
Mineral	Mineral	Lease/share space on the existing WSDOT tower and in the existing equipment shelter	Improved coverage in the Mineral area and the replacement of Storm King as a primary site
Onalaska	Onalaska (Fire District 1)	Construct a new tower of at least 100'	A taller tower will provide better coverage in this area and the capability for a microwave connection to Democrat
Peterman	Central County south or Morton	Lease/share space on the existing tower and in the existing equipment shelter	To facilitate microwave connectivity to Mineral
Randle Fire	East part of County, Fire District 14	Tower enhancement	A tower extension or new tower may be required to support a microwave connection

Table 6: Potential Additional Site Development

In addition to the new site development, additional site facility upgrades will be required to support the enhanced systems. These upgrades are anticipated to include the new towers or site colocations described above, as well as potential tower strengthening/remediation to support additional loads, new equipment shelters, new equipment power systems (DC Plant), and new generators. The anticipated needs for each site, based on on-site surveys and feedback from County personnel, are included in Table 7.

Site	New Tower	Tower Remediation	New Shelter	New DC Plant	New Generator	Microwave End Points
BawFaw		1	1	1		2
Bennett				1		2
Burley				Battery Upgrade		
Chehalis Ridge				1		1
Coal Mine		1		1		2
Cooks				1		2

Crego		1		1		5
Davis						
Democrat	1		1	1	1	4
Dispatch						2
Dog		1		1		4
Doty		1	1	1	1	2
Hopkins		1		1		2
Manners		1		1		2
Mineral		1				1
Onalaska	1			1	1	1
Packwood				1		1
Peterman		1		1		3
Randle Fire		1		1		1
Seminary Hill						1
Storm King				Battery Upgrade		
Toledo				1		2

Table 7: Recommended Site Facility Enhancements

Frequency Analysis

New and/or different frequencies will also be necessary to effectively implement the recommendations presented in this report. A number of potential new frequencies that may be useful for the County were identified either by the County or others from previous work. These frequencies are listed in Table 8.

Frequency (MHz)	Current Usage
151.1075	No current site license in Lewis County – planned for one of five new simplex TAC channels
153.9275	No current license in Lewis County - Only current WA license in Spokane
153.9950	No current license in Lewis County - Only current WA licenses in Spokane and Chelan County – planned for one of five new simplex TAC channels

154.2875	No current site license in Lewis County – planned for one of five new simplex TAC channels
154.8600	No current license in Lewis County - Licenses in Benton and King Counties
154.9875	No current license in Lewis County
155.0625	No current license in Lewis County
155.3925	No current site license in Lewis County – planned for one of five new simplex TAC channels
155.4000	No current license in Lewis County
155.4900	No current site license in Lewis County – planned for one of five new simplex TAC channels
155.9325	No current license in Lewis County
155.9925	No current license in Lewis County
156.0000	No current license in Lewis County - Licenses in Columbia, Pend Oreille, Island, King, Kittitas, Okanogan, Yakima County
156.2250	No current license in Lewis County - Licenses in Skagit, Mason
159.3150	No current license in Lewis County - Licensed by WA Dept. of Natural Resources in several places – Mason County is closest

Table 8: Potential New Frequencies

These candidate frequencies were evaluated further to determine their applicability for use with the County's recommended new system configurations. The recommended configuration will require the following new or reused frequency pairs, at minimum:

- Fire East repeater pair (Currently 155.8050/156.1050)
- Fire West repeater pair
- LCSO East repeater pair
- LCSO West repeater pair (Currently 155.6250/156.0300)
- Public Works East repeater pair (Currently 155.1000/155.7450)
- Public Works West repeater pair
- Paging West (Currently 155.7150)
- RF receive link from Storm King and BawFaw for Fire, and
- RF receive link from Storm King and BawFaw for LCSO.

The frequencies currently used for the RFA systems and City PDs system are not anticipated to change.

The three channels in the east and the three in the west (and potentially other frequencies based on site) will each be combined using an RF combiner/multicoupler for support by a single transmit and single receive antennas. Therefore, it is preferable that the chosen frequencies for these channels have sufficient separation to allow efficient combining, without significant combiner loss.

In order to determine applicability for the recommended configurations, an FCC license search was performed for the candidate frequencies where a co-channel search was performed within 70 miles of the site locations to be licensed. In general, if there are no co-channel licensees within 70 miles of the proposed sites, the frequency can be licensed at that site. If co-channel licensees are present within 70 miles, the frequency may still be able to be licensed, but an engineering study and contour analysis will be required to ensure acceptable performance without the risk of interference. Table 9 shows the results of the co-channel studies for the candidate frequencies that were evaluated.

Candidate Frequency (MHz)	East System Co-Channels within 70 Miles (Hopkins, Mineral, Packwood)	West System Co-Channels within 70 Miles (BawFaw, Coal Mine, Democrat)
151.1075	None	None
153.9275	None	None
153.9950	WPMG928	WPMG928
154.2875	None	None
154.8600	KOH888, WPIT540, WPQF424, WQTD257	KOH888, WNZN460, WQTD257
154.9875	None	WRBY483 (70.5 mi.)
155.0625	WPYT650	WPYT650
155.3925	WQUR851	WQUR851
155.4000	11 Active Licenses	Did not search
155.4900	KTS776, WPBV445, WQCE971, WXY382	KTS776, WPBV445, WQCE971, WXY382
155.9325	WQWX932	None
155.9925	None	None
156.0000	KCJ932, KDP304, KXV380, WPYL588, WQWP397	KCJ932, KDP304, KXV380, WPYL588
156.2250	KNCY702, WNDZ708, WNIG952, WPAF993, WPAF745	KNCY702, WNDZ708, WNIG952, WPAF993
159.3150	WNUS280	WNUS280

Table 9: Co-Channels of Candidate Frequencies

Due to the mountainous terrain environment in and around Lewis County, it is Televate's opinion that many of the above frequencies can be used by Lewis County without causing or experiencing significant interference, even though some show co-channel licensees within 70 miles. Also, the best frequency selection may require repurposing some of the frequencies currently utilized or planned in the County. The decision as to what specific frequencies are best to use will require further analysis and frequency coordination activities, which is recommended as a next step and should be performed prior to proceeding with the system enhancement in this report.

COST ESTIMATE OF PROPOSED RECOMMENDATIONS

Telestate developed a detailed cost model to estimate the capital and recurring costs anticipated to develop and maintain the recommended system configurations. All cost estimates are based on the specific components and upgrades required at each site within the system, as well as Telestate's previous experience with equipment and site construction costs.

Capital Costs

A significant portion of the project costs will include the site facilities upgrades, as well as development of the redundant microwave connectivity between the sites, which may include:

- Site development, civil services and tower construction for new radio sites
- Upgrade costs for existing sites including any required tower remediation to accommodate additional antenna loads
- Equipment shelters as necessary
- Redundant power sources, including UPS/batteries and generator, and
- Primary and redundant site backhaul/interconnection.

These estimated costs for these activities are provided below on a site-by-site basis.

Radio Site Facility	Facility Upgrade and Connectivity Cost Estimate
BawFaw	\$242,000
Bennett	\$132,000
Burley	\$9,600
Chehalis Ridge	\$72,000
Coal Mine	\$182,000
Cooks Hill	\$132,000
Crego	\$362,000
Democrat	\$677,000
Dog	\$302,000
Doty	\$257,000
Hopkins	\$182,000
Manners	\$182,000
Mineral	\$110,000
Onalaska	\$437,000
Packwood	\$72,000
Peterman	\$242,000
Randle Fire	\$122,000

Seminary Hill	\$60,000
Storm King	\$9,600
Toledo	\$132,000

Table 10: Facilities Cost Estimate by Site

In addition to the site development costs, the County will incur additional project costs for the radio site equipment and installation costs for the enhancements described in this report. The cost estimate for this portion of the project includes:

- Manufacturer's costs for all infrastructure and core equipment for all system enhancements
- Design and engineering services and FCC licensing
- Construction and installation services
- Project management services, and
- Vendor oversight and quality assurance services.

The capital cost estimate to complete the full project implementation of the specific system enhancements included in this report was provided to County emergency personnel under separate cover.

Operating Costs

The annual operating cost estimate for the recommendations described in this report (not including County labor) are based on typical recurring costs associated with maintaining public safety radio systems, and are expected to include equipment maintenance costs, site maintenance costs, network monitoring, etc. An estimate for these costs is provided in Table 11.

System Component	Annual Cost Estimate
Annual Lease/Site Maintenance	\$185,000
Annual Software and Licensing (Core and RF)	\$180,000
Annual Software and Licensing (Microwave)	\$45,000
Proactive Spares/Preventive Maintenance	\$44,000
Network Monitoring	\$20,000
Project Total	\$474,000

Table 11: Cost Estimate of Annual Maintenance

RECOMMENDED NEXT STEPS

Televate recommends Lewis County proceed in the following manner to implement the recommendations provided in this report.

Consider Recommendations and Direction and Coordination

The County should review the recommendations provided in this report, provide feedback and update plans as necessary. Additionally, the County should engage additional stakeholders from the County's first responder community to solicit input on the recommended direction and achieve consensus on the approach. Once consensus on the preferred approach is achieved, Televate recommends that the County begin the coordination activities with its communications partners, including RFA, WSDOT, and others as necessary to implement the recommended improvements.

Develop a Comprehensive Frequency Plan As Soon As Possible

Co-channel interference on the main fire frequency is one of the most critical issues currently faced by County first responders. It is essential that the County address this issue as soon as possible. To do so, Televate recommends the following short-term actions:

Perform coordination on potential new frequencies

A number of potential alternative and additional frequencies suggestions are provided in this report. Televate recommends the County work with a licensed frequency coordinator to perform coordination services on selected frequencies to determine what frequencies can be licensed by the County and to move forward with the licensing process. The usable frequencies should then be combined as candidate frequency pairs to create repeated channels.

Evaluate available frequencies from a combining/multicoupler perspective

Once the collection of new frequencies is identified and candidate repeater pairs are created, it is suggested that the County identify groups of frequency pairs that can be easily combined at a common site. The groups that the County should consider include:

- East simulcast cell group:
 - Fire East repeater pair
 - LCSO East repeater pair, and
 - Public Works East repeater pair.
- West simulcast cell group:
 - Fire West repeater pair
 - LCSO West repeater pair, and
 - Public Works West repeater pair.

Identify new Fire West frequency and begin using ASAP

The process described above will identify a candidate repeated frequency pair for the Fire West system. Televate believes that the County should begin using this frequency as soon as possible, even if the other recommended enhancements are not addressed until a later time. Elimination of the interference currently experienced on the 154.1900 frequency may be worth the additional effort of reprogramming radios with this new frequency, even if radios will need to be programmed again at a later date.

Allocate Funding for the Project

It is Televate's understanding that the County intends to utilize identified ARPA funding in addition to a source of grant funding in support of this project. It is recommended that the County confirm these allocations in the amounts available to support this project. In order to implement all enhancements, the currently identified ARPA and grant funding may not be sufficient to support the entire project. Therefore, since additional funding, above and beyond the currently identified allocations may be required for this project, it is recommended that the County develop a plan to address the potential for additional costs. Potential options for addressing this may include:

- Identifying additional funding to cover potential additional costs
- Scaling back or phasing in the improvements over several years, or
- Working with partner agencies to identify additional funding.

Additionally, since the timing for the funding may vary by source, it is recommended that the earliest available funds be allocated toward the portions of the project that are likely to have the longest lead time for implementation, including the facilities updates and the extensive microwave connectivity.

Develop a Long-Term Public Safety Communications Strategy

In addition to these near-term improvements, Televate recommends the County also consider additional improvements to further enhance the public safety communications within the County. Considerations may include:

- Upgrading law enforcement user radios for P25 capability to support encryption and location services
- Adding additional site infrastructure to further improve coverage in key areas
- Upgrading additional site infrastructure to support digital communications for improved coverage with existing sites, and
- Considering a regional consortium with neighboring counties to share resources and improve regional communications.

Establish a Procurement Strategy and Develop a Procurement Specification

Once the final project direction has been established and the funding strategy is in place, Televate recommends that the County develop a procurement strategy for the project, and as required, a procurement specification to define the project and solicit proposals. Televate would be happy to assist the County further with establishing this strategy and documentation.

Consider Dispatch Improvements

In addition to the radio enhancements recommended in this report, Televate recommends that the County perform an internal dispatch assessment to consider potential improvements to dispatch operations and to address comments received from stakeholders. Some areas that could be investigated include:

- A staffing analysis to determine the optimal number of dispatch operators required for the current call volume and a means to achieve this level
- A review of and potential update to the current dispatch processes regarding call handling and interaction with the first responders – this should include communications with the first

responder agencies to solicit their input as well as inform them on the dispatch processes and challenges that exist

- Consideration of a patching policy to facilitate communications between the east and west systems/channels when necessary
- A review of and potential update to the current dispatch training processes to better enable consistent call handling and response, and
- An evaluation of an Automated Voice Dispatching (AVD) system to ensure consistent volume and voice quality.

APPENDIX A: ON-SITE INTERVIEW NOTES

The interview schedule followed during the on-site visits is shown in Figure 26.

LEWIS COUNTY RADIO		TELEVATE RADIO INTERVIEW SCHEDULE	
MONDAY 8/21		TUESDAY 8/22	
900		800	
1000	LEWIS 8	900	
1100	LEWIS 14	1000	LEWIS 2/15
1200	LUNCH	1100	LEWIS 1
1300	LEWIS SO	1200	LUNCH
1400	LEWIS 11/13/16	1300	
1500	CHEHALIS PD	1400	CENTRALIA PD
1600		1500	RFA/CHEH FIRE
		1600	
BOCC CONF ROOM (BASEMENT)		911 CONF ROOM (3RD FLOOR)	

Figure 26: Stakeholder Interview Schedule

Jennifer Libby-Jones and Justin Stennick

- Fire Departments
 - Lewis County, Chehalis, Centralis and Riverside (RFA)
- Mike Kytta is the fire chief of RFA (Riverside Fire Authority). Have their own trunked radio system – Fire Two dispatch
 - 155.715 paging channel to alert
 - 4-site simulcast
 - Could their network become part of the countywide network?
 - We now have 5 simplex channels – all not yet programmed into county radios
 - 3 dedicated to fire
 - 1 designated for law
 - 1 designated for all other agencies
 - Fire believes that all in-building fire radio comms need to be recorded
 - OSHA requirement to be on tac channel interior during a fire
 - 154.190 is the fire dispatch channel – however, this channel is co-channel with two nearby counties

- Mason County has a tall site using this frequency and it is highly interference prone
- The FDs use Zone A which is common for all FDs
- XTS/XTL 5000 radios purchased for FDs in 2007 via a grant
 - Old fire radio batteries – many need to be replaced – possible use of grant funding? Purchase new radio batteries?
- Countywide radio network improvements need to be implemented
 - What new radio technologies to consider?
 - Need a near, mid-, and long-term plan for radio network/equipment
 - \$7.3M in funding available now – assessing the introduction of a 0.2% sales tax to increase the available radio network budget
 - \$2.8M spent by the end of 2024
 - \$4.5M spent by 2026, designated for spending by the end by 2023
 - Backhaul network is at risk, a new plan is required
 - Designate for Phase 1 allocation?
 - New GTR radios required
 - The Burley site is 18 miles off of the road and is running on solar power
 - Hwy 12 coverage is essential
- Primary needs – Justin and Jen
 - Radio technology upgrades
 - Sufficient funding in Phase 1 to design a conventional simulcast radio network – leverage the RFA network and expand where possible?
 - Microwave network upgrades – network connectivity is essential
 - Radio spectrum upgrade – eliminate fire dispatch channel interference - no backup channel for the law
 - Phase 1 replacement of the fire dispatch channel
 - Identify law backup channel
 - We can always buy new radios later
 - We're familiar with Simulcast but do we have sufficient budget and frequencies?
 - Jenn
 - Plan focused on near term, mid-term, or long-term radio plan

Fire Districts 3 and 8

- Attendees
 - Chiefs McDaniel (FD 8)
 - Chief Doug Fosburg (FD 03)
- When visiting the sites, you will learn about their condition
- When leaving Morton and hitting the lakes, you are in FD3 and FD8
- The Democrat site sits in my districts commissioner's garage
 - Update the Democrat radio site in Phase 1?
- What are your thoughts on transitioning to a digital communications channel?
 - State patrol has migrated to digital, and we cannot talk with them
 - My education on digital is limited (FD3)
- Narrowbanding created radio comm issues
- On a major incident scene – we typically monitor 3-frequencies
 - RedNet

- RedNet appears to be a tac channel at 153.830 MHz
- Countywide dispatch
- Working frequency channels are those owned by the district
- Fire channels are being recorded
 - Fire 1
 - Fire 2
 - VTAC 11 – used to communicate with helicopters
 - RedNet also being recorded – in certain areas
- The Democrat site needs a complete redo
- Mason County interference is common on FD Channel 1
 - Similar call signs in play as well
- Relaying through dispatch is common occurrence
- Getting away from 154.190 is critical
 - County radio dept
- Very happy with the new radios
- Key needs
 - Need to be able to communicate on scene from our portable radios back to dispatch
 - Limited vehicular repeaters, Pyramid's that do not facilitate auto shut off to manage interference
 - Phase 1 purchase of vehicular repeaters?
 - Old radios are being used
 - Phase 1 purchase of new radios?
 - Operating budget is very limited
- Interoperability with DNR is required
 - Further investigation required to determine how to fix – could be simple radio programing
 - DNR operates multiple VHF sites and frequencies throughout the state – need to identify the required sites and freqs.
- Dispatchers would benefit if there were additional dispatch channels
- Using "I Spy Fire" ([iSpyFire, Inc.](#)) and "BRYX" ([Station Alerting System & Software for First Responders | Bryx](#)) as smartphone app fire comms
- Need to talkaround on occasions due to inability for dispatch channel to be free
- Not using MDC's due to cellular coverage issues
- Adventure medics are providing back ambulance service and using the FD3 radios
- FD3
 - 30 portables
 - CDM50 mobile radio
 - XTL-1500 portables
 - HT 1250 portables
 - Two Icom radios
 - One Pyramid repeater
- County needs to support comms
 - Two repeated channels
 - Eliminate the 154.190 freq.

- East, west and central channels
 - Channels need to be recorded
- Perhaps 25% down on their respective volunteers

Fire District 14

- Chief Jeff Jacques
- Eastern side of the county
- Respond into the federal forest area, clear into the adjacent county
- Coverage issue in the southern sections of the county
- Cispus (town and river) areas in the forest not well covered
- Using the Pyramid VRS which is working well
- Difficulty in talking back to a new repeater site
 - Phase 1 remote receive radio site requirement
- Added several new repeater sites
- Radio
 - APX7500 radios
 - Bendix King
 - XTL2500
- Friends in Pierce County who have donated radios
- Interop primarily with FD 10 and FD 18, WA-DNR (RedNet) and the Fire Service (freqs. programmed in radios)
- Hope that we never go digital – WASP use digital – listening in on WASP and their comms are poor
- Assistance from the County radio shops
 - Plenty of support from the county radio shops
 - County committee was meeting every two months, now not meeting as frequently – need to get this group back together and add in radio comms agenda
 - Requirement to reignite these meetings
- The 5-new radio tac channels are not well coordinated and not programmed into law enforcement radios – can be beneficial if programmed and support an SOP
 - Develop common fire radio fleetmap and program all radios
- Use of cell phone to communicate with law enforcement
 - T-Mobile and US Cellular service is limited – US Cellular has some backup power
- County Public Works has a radio site as well that needs to be updated
 - Could not identify this radio license?
- Top requirements
 - Complete buildout of countywide dispatch channel, just not possible
 - Getting off of 154.190 beneficial but not necessary since they have licensed a new dispatch channel
 - Have licensed 156.105 – main dispatch in FD14 area
 - [FCC Callsign WPIU343 \(LEWIS COUNTY FIRE PROTECTION DISTRICT NO 14\) \(radioreference.com\)](#)
 - Multiple sites and VHF freqs. licensed – need to determine ability to integrate into countywide radio network

- At Packwood and the FD 14 fire station
- FD14 need to be higher
 - Wondering why the county has not moved off of 154.190
- More towers to expand coverage of the 156.105
 - Is this frequency licensable for an East site dispatch channel?
- Radio users are qualified at using their radios

County Sheriff Meeting

- Wes Rethwill, Rick Van Wyck, Captain Ben White, Chief Englebertson
- Radio issue has been in play for years, and is finally being addressed
- 42 sworn officers
- Using federal funds to update the radio network
- Long term concerns also need to be defined
- 100% lack of support of infrastructure - no capital investments being made in the infrastructure
- No stakeholder money available to invest in infrastructure – now that we have federal money, we can invest to update
- Trying to set the law rate for LE and Fire, currently at 70/30%. Recommendations to change to 75/25
- Suggest we meet with County Sheriff's operations guild and sergeants – Televate to schedule meeting with these gentlemen
 - Deputy Dan Reardon – Operations Guild
 - Sgt. Jeff Godbey (Spoke via phone on 10/5/23)
- Coverage
 - Anywhere near power lines is a comms issue
 - East End
 - Packwood
 - Along the pass for portable and mobile
 - Mineral area (P/M)
 - NW portion of the county
 - State agency also uses the county radio network in some geographic areas
 - 1-deputy on duty per 12 hours shift – Mossyrock bridge to pass on the East End
 - West end, Mossyrock Bridge to County end
 - No available repeated tac channels except of the LEARN channel
 - New tac channels have been licensed – has the sheriff programmed them into radios?
 - There is also a DES channel – Channel 8 that is recorded
 - VTAC11 is also usable for incidents
- Familiar with digital radio – can we afford it?
- Radio encryption is required – no coverage impact over a P25 digital network

Fire Departments 11 and 13 representing 16

- Gwen Turner and Miles Burmeister
- The biggest issue is that the radio network is old, expensive to upgrade
- Lots of “blind spots” – no portable coverage where needed

- Inability to communicate back – uplink limitations
- Justin is top notch
- Interference from 154.190 – needs to be replaced – issue with Mason County
- District 11 has a private radio tower and frequency
- Greg Peterson programmed the radio repeater for FD11
- Paging
 - Most of the time the paging is good
 - Occasionally there is a “ghost” page, could be an operator error?
 - Minitor 5 and 6 Moto pagers
 - No pager issues that we have experienced
- Hwy 5 in the canyon is a coverage issue
- FD 11 also needs to talk with Pacific County to the west
- Rider Wood is in Cowlitz County but part of FD 20
- Interop with the sheriff and DNR and public works
- Have to use the cell phone when radio coverage is unavailable – US Cellular – recently changed towers and the coverage declined
- Ambulance Consortium Group – have an agreement with AMR for emergency medical
 - Does AMR use the county’s radio network? What impacts if county institutes changes (freqs, sites, simulcast)
- Challenges with outbound radio comms from the fire station
- Coverage issue in the Weyerhaeuser forest area in the SE portion of FD 11 = Weyerhaeuser may have radio sites – Miles Burmester offers to talk with Weyerhaeuser to find out more about their towers in this area
- Radios
 - XTS1500
 - HT
 - Kenwood
 - No budget for new radios
 - HT is a better radio
- Top requirements
 - Highly reliable radio coverage – 100%
 - New Fire dispatch channel
 - Get the word out when necessary – no coverage in the white area
 - Systems need to work better
 - Similar county access within and with neighbors
 - Common radio templates and frequencies for all radios
- Radio committee has not met in over one year
- Need uniformity in how we talk with one another and with dispatch

Chehalis PD: Randy Kaut

- New radio tower now providing better coverage
- Recently installed new tower
- In-building coverage may still be an issue at Walmart, Home Depot, all of the big box stores

- Secondary channel on a tower that we are leasing and since they are not needed, should be abandoned
- Mobile and portable radios working fine
- Total of 12 vehicles and 18 sworn
- City may be expanding into Napavine
- Shared freq with Centralia – can be an issue with chatter over the main dispatch channel
 - New repeated tac channels for PD?
- Have secondary repeated channel, however not sufficient dispatchers to cover
- Wish list
 - Go to digital which adds capabilities
 - Encryption
 - Location
 - Individual officer radio comms
- We generally do not talk with the sheriff
- We generally do not talk with city fire, have capabilities but do not use it
- Political side of the issue is that the city is paying for only one site and not the countywide radio network – why should they pay for the coverage for all
- Radios
 - XTS-1500
- Radio committee should be reinstated and the chief or deputy chief will participate
- Primary goals
 - Cost of fulfilling the wish list
 - System is functional
- Dispatchers are understaffed and doing the best they can with what they have

FDs 2, 5, 13, and 15

- Chief Underdahl FD15 (Winlock), Chief Dorothy of FD2 (Toledo), Greg of FD5 (Napavine)
- Greg: 25 years in Lewis County – new radio, narrowbanding funding and experience,
- HT1250 is my favorite radio
- Frequently our radio transmission cannot be heard
- Issues with 154.190 – first change to be made
- Building coverage issues
- 20 minutes status check when we are on scene
- Use RedNet when necessary
- VTAC11 is also used for air to ground comms
- Have TAC channels now that have not been implemented – plan in development - will use in place of VTAC11
- Countywide use of fire manual – Greg to provide to Dom
- Wish list
 - New dispatch channel – Mason County interference needs to go
 - Repeated channel configuration
 - Second repeated tactical channel countywide
 - Program in new talkaround TAC channel

- What is Cowlitz system doing?
 - They can talk over their portable radio throughout the network
- Toledo site not providing expected coverage improvements
 - Toledo site includes Fire 1 and RedNet receive
- Expand portable radio coverage

Fire District 1

- Chief Brad Flexhaug – 32 years working in the county
- Portable radio is XPR-3500
- General impressions of the radio network
 - Having been here 30+ years, his expectations have been set
 - Dispatchers need better training
 - Some are too quiet
 - Dispatcher protocols not being followed
 - Not using the correct radio sites – talks about toning out of the Democrat site
 - Use I SPY FIRE
 - East end of district not served by the Crego site
 - What challenges do the dispatchers have? Would like to know so that the district fire fighters adjust their comms accordingly
 - Route 508 is the main road through the district
 - Cannot directly communicate with state patrol
 - Rarely need to speak with neighboring counties
 - Go to RedNet when on scene
 - Poor coverage in the fire stations
 - Poor paging in fire stations – main in Onalaska
 - The school might also be a poor coverage building – not responding there often
- Wish list
 - Transition away from 154.190 – reality is that we could migrate to a freq. that is still probably interference prone
 - New base station in the eastern portion of the district
 - This is our challenge, may be able to convert the Onalaska site
 - New site on Hurricane Ridge where the windmills are located
 - Review a few calls with dispatch to assess quality and areas for improvement
 - Have 13 apparatus and would prefer to have a VRS on at least two vehicles

Lewis County PSAP Manager - Liz

- 25 years of dispatching and now as Ops Supervisor
- Can hear Mason County, which is 100 miles away
- Fire 1 is a major problem – interference related
- RFA is the busiest fire station
 - Not sufficient staff to cover RFA
- Good if the East End could hear the West End, or have the ability to listen and communicate
- FIRE 2 includes RFA, AMR and Station 48 (Chehalis fire)
- 8-positions, minimum of 3-positions working, but we also do 2-positions

- Recommendations that 24 telecommunicators are required, we have 9 positions filled, and a budget for 20 – difficult to hire staff
 - Working 4 10-hour shifts, often 4 12s, we pay OT for all hours worked when only 2-telecommunicators are on site
 - Phase 1: Expand efforts/create incentives/pay raise, whatever to hire and retain additional dispatch staff – can the grant be leveraged to hire new staff if there is insufficient budget?
- We do relay radio messages, but not frequently – did not know that we relay this often
 - Reconsiders and agrees that dispatch relays info for fire depts
- Fire fighters always call in the know what's going on with events – we have no time to talk with them when we are on an incident
 - Suggest that fire depts have CAD access to view events and to stop from calling into dispatch
- I love ISPY, however, the chiefs call in and wants to know why I Spy informed them of an event that was not the event? Well, the original entry that I SPY relayed was modified.
- More pagers, do not rely on I SPY
- Rules for recording
 - We use Equature for recording and it works well
 - Hold recordings for 6-months
 - VTAC11 is recorded
- We can hear RedNet, not being recorded, but better check
- If responders say Mayday, we are listening and responsive,
- Reviewing options to use Metal Myrtle voice automated dispatching assistance – I SPY offers one, however Motorola will over charge to integrate it into their Spillman CAD product
- Wish list
 - Auto dispatch
 - Phase 1 implementation?
 - Like the idea of an East and West dispatch dispatching zones and will likely have to maintain RFA
 - Phase 1: Can we do an East and West dispatch channel and combine RFA into the West dispatch zone?
 - Repeated dispatch
 - Mason County interference eliminated
 - Taking care of Mason will result in more free time for the dispatchers, it will reduce the number of calls from fire chiefs

Centralia PD

- Chief Tracey Denham
- 32 years of LE, 5 as PD chief
- Share a dispatch channel with Chehalis
 - Backup car-to-car backup freq.
- New site working much better
- Davis Hill and Cooks Hill RX sites need to be upgraded
 - Phase 1 activity? What is required to upgrade these RX sites?

- Thinking that the city is charging us \$250,000 annually, which we think is too hard
 - Calls for service, keystrokes data entry into RMS
 - Other PDs were cheating to pay less (MDT searches)
 - Requested that any increase equal across the board
 - 45% calls for service, # of officers, population
 - The Deltaworx model was not good
 - Recommendations to split 75/25% (PD to FD)
 - All PDs are paying
 - Policy for the PSAP
 - Huge distrust for the Lewis County
- The hospital is poorly covered
 - Delivery
 - ER
 - ICU
- Walmart may be still not covered since the new site was installed
- PD is not covered well, but it could be related to a new cell site located
- Typically, we do not talk with FD, we would communicate with them through dispatch
- Thurston just upgraded their radio network and donated their radios to the PD
- 29 officers with 35 vehicles (all have radios) 40 portables
- Features
 - Location of the officers (on push to talk)
 - Encryption
 - We use DEA radios
- The LERN statewide LE network radio network is not performing ([WA Mutual Aid \(Washington\) Scanner Frequencies and Radio Frequency Reference \(radioreference.com\)\)](#)
 - Need to investigate if the LERN network is still functional – 155.370 MHz – appears to be talkaround? [WA CEMP ESF2 Appendix 1 10.25.2019](#)
 - State patrol is supposed to monitor LERN

Chehalis Fire Dept and RFA

- Kevin Anderson Deputy Fire Chief, Mike Kytta (RFA), Captain Casey McCarthy, Adam Albright (Chehalis)
- 20 years doing our own thing
- More sites were required to deliver needed coverage
- 4 RX/TX and 6 RX sites in RFA, separate system for the cities with 2 TX/RX and 2 RX
- Topography is extremely challenging to serve
- Auxiliary back up network: 2 radio sites
- One repeated pair on each site
- Coverage
 - In building coverage poor in most Chehalis buildings into box stores not reliable
 - Use Pyramid in most vehicles (have lights on the dashboard that lights up when the VRS in in operations – use voice paging and I SPY)
- Replaced all mobiles and portables in the last year
 - New radios and batteries have improved marginal coverage areas





- APX-6000XE portable radios
 - APX-1500 mobile radios
- Funding the radio network is a priority for fire district funding
- Provide letters of operations to neighboring jurisdictions to use the RFA network
- Chehalis Ridge site should be considered for the RFA system
- Accounts for 55% of the call volume
- Boat load of licenses that we are protecting – might be able to share a frequency
 - Phase 1: What freqs. might be available for countywide use?
- Keep the communications open with all chiefs – they should be engaged
- Chiefs need to have skin in the game
- Dispatch fees do not cover the radio network – the people need to know the facts
- Chief Lonny Gobel of FD 10 – need to visit with him to get him involved
- **Dispatch needs to speak more directly**
 - One male dispatcher is very clear
 - Thurston is now using Medal Myrtle – should talk with them
- Kluge of MW out there, some licensed and unlicensed
 - All 4.9 GHz for RFA sites
 - MLC are used
 - Wind and ice storms occur to the MW dish
- What about dispatch back up operations?
- What about the back-up fire radio paging at BawFaw
 - Ross McDowell

APPENDIX B: CURRENT SYSTEM PREDICTED COVERAGE

A detailed propagation simulation was developed to further analyze coverage and to predict performance from various site constellations for an enhanced system. The simulations utilize the EDX SignalPro™ application, which is a standard propagation tool employed by Public Safety to model the system elements and to predict coverage by incorporating industry standard propagation algorithms in addition to terrain and land use databases. Once the initial simulation was developed, the recorded data from the signal testing was factored into the SignalPro™ application to calibrate the model and improve its accuracy.

The propagation simulation was further developed to predict where the system would provide a voice quality (Delivered Audio Quality (DAQ)) of at least 3.4 per typical public safety standards. The minimum Channel Performance Criteria (CPC) required for a DAQ level of 3.4 for an analog narrowband (12.5 kHz) voice system was derived using the information from Table A-1 of TSB-88¹. The TSB-88 report serves as the public safety LMR network design industry standard.

The propagation model predicts coverage for a mobile radio, as well as a portable radio worn on the hip on street (outdoors) and within buildings up to a specific dB signal loss value for both outbound (dispatch to field) and inbound (field to dispatch). The results for the simulation at this level of voice quality for the following conditions, for each of the analyzed county systems are provided in the figures on the following pages.

- > Medium Building 
- > Light Building 
- > Portable 
- > Mobile 

¹ TIA Telecommunications System Bulletin TSB-88.1-C: Wireless Communications Systems Performance in Noise and Interference Limited Situations - Part1: Recommended Methods for Technology Independent Performance Modeling; February 2008.

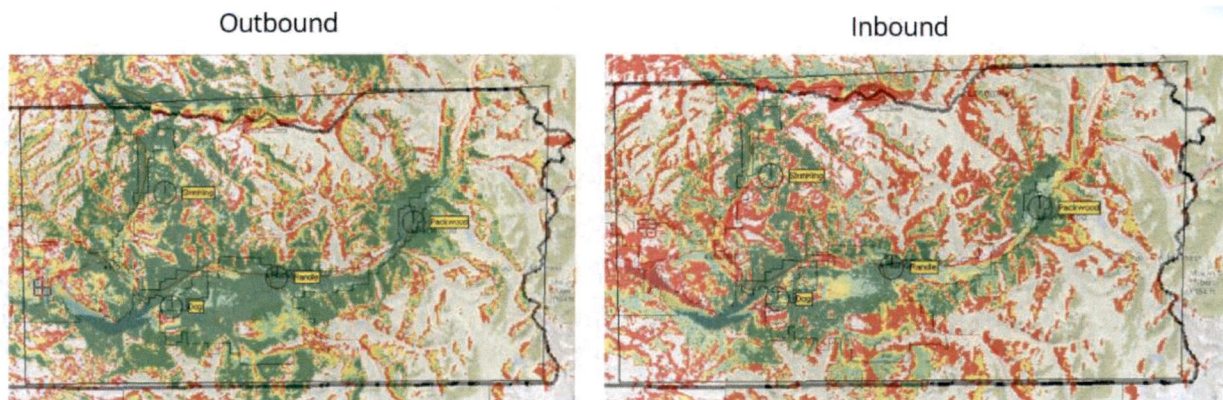


Figure 27: Fire System East Current Coverage (Simulated)

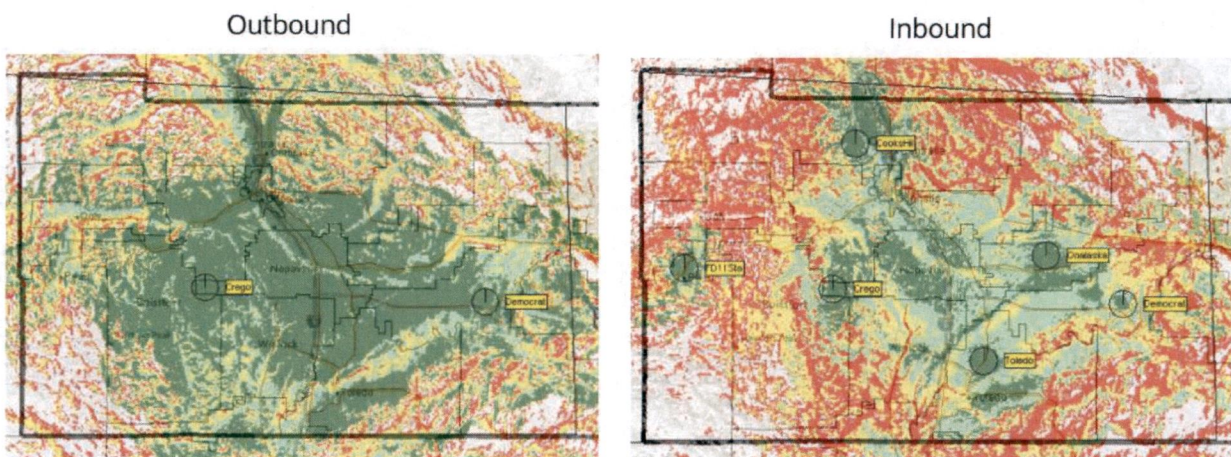


Figure 28: Fire System West Current Coverage (Simulated)

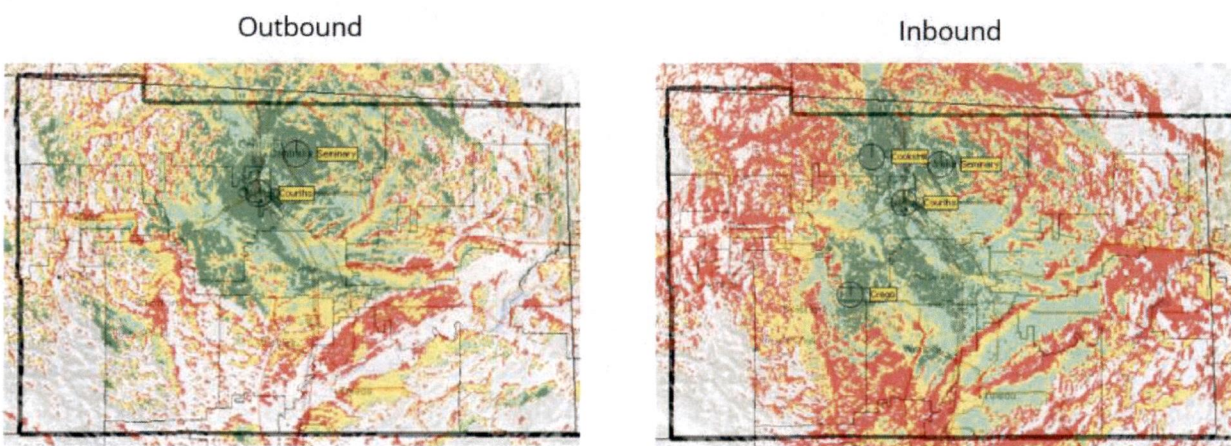


Figure 29: RFA City System Current Coverage (Simulated)

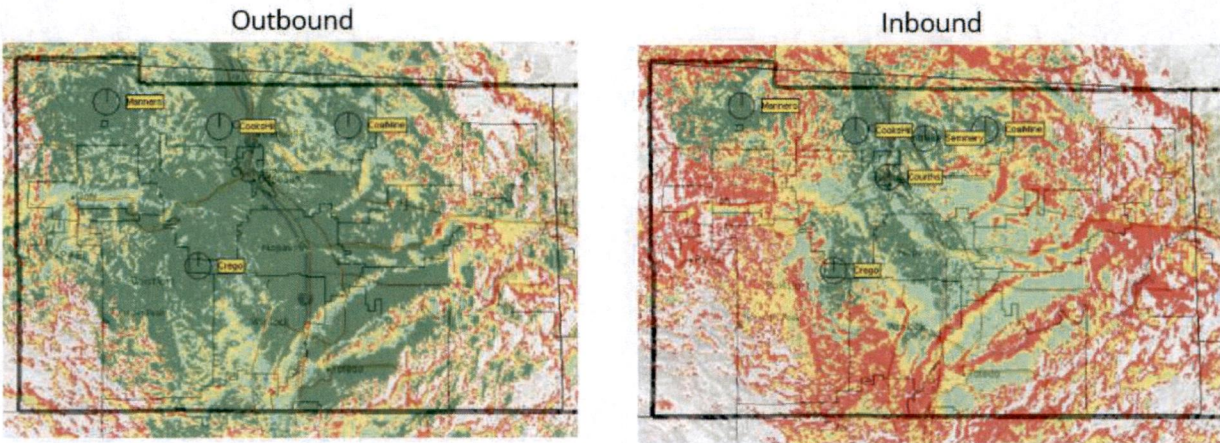


Figure 30: RFA District 12 System Current Coverage (Simulated)

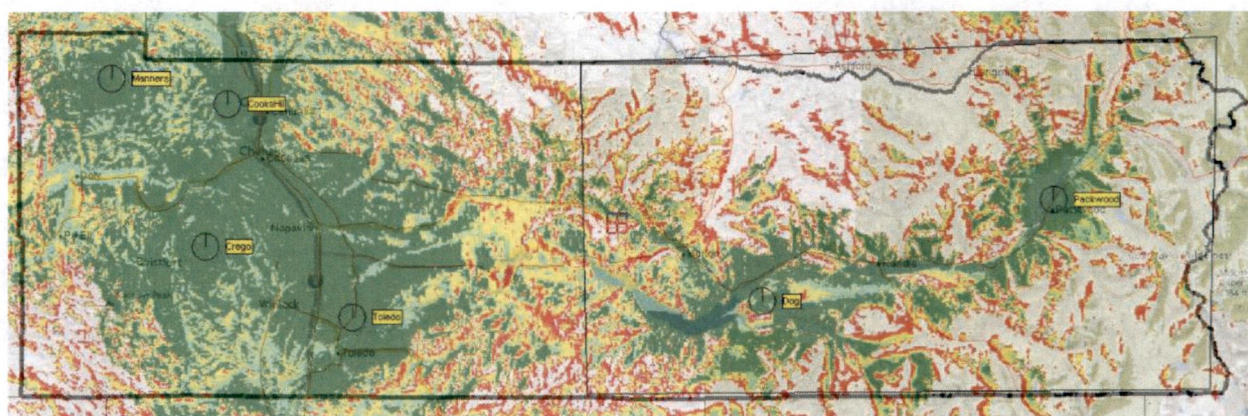


Figure 31: Paging System Current Composite Coverage (Simulated)

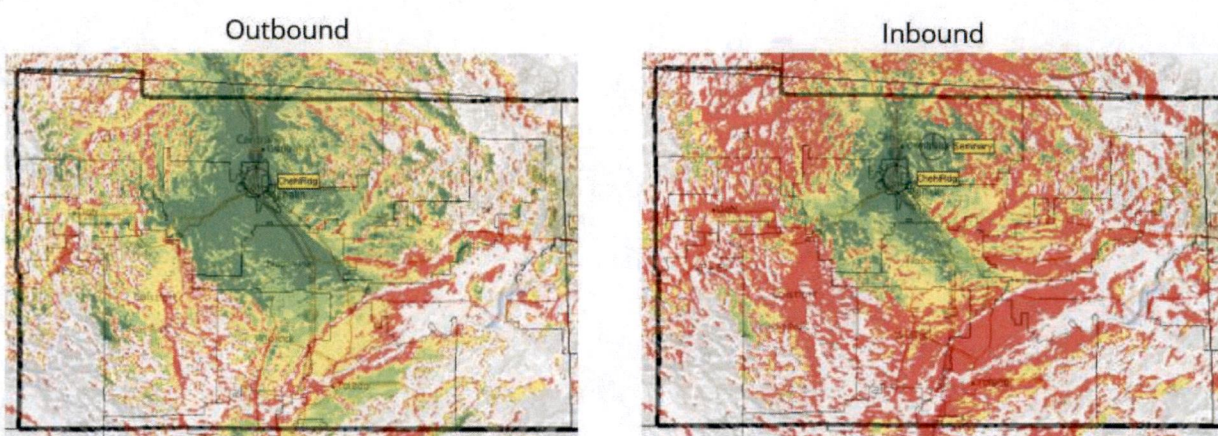


Figure 32: City PD System Current Coverage (Simulated)

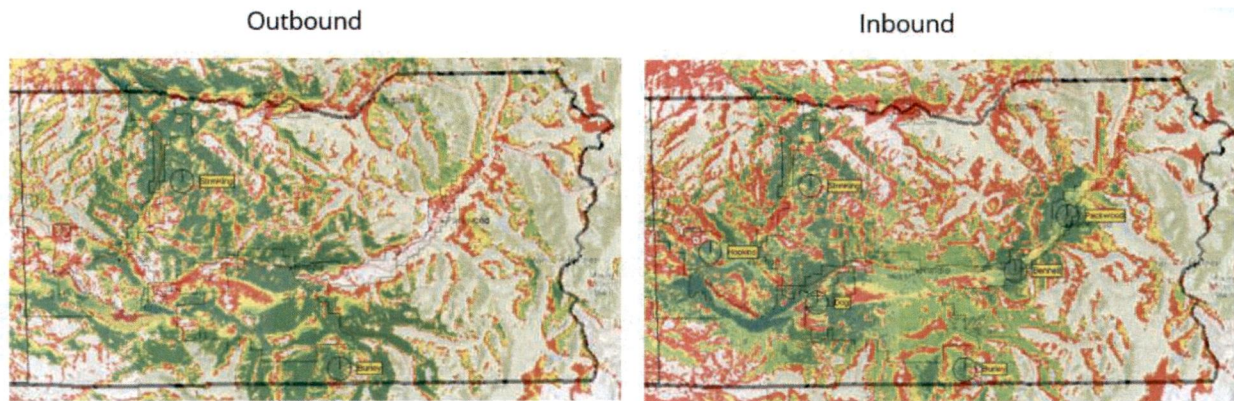


Figure 33: LCSO East System Current Coverage (Simulated)

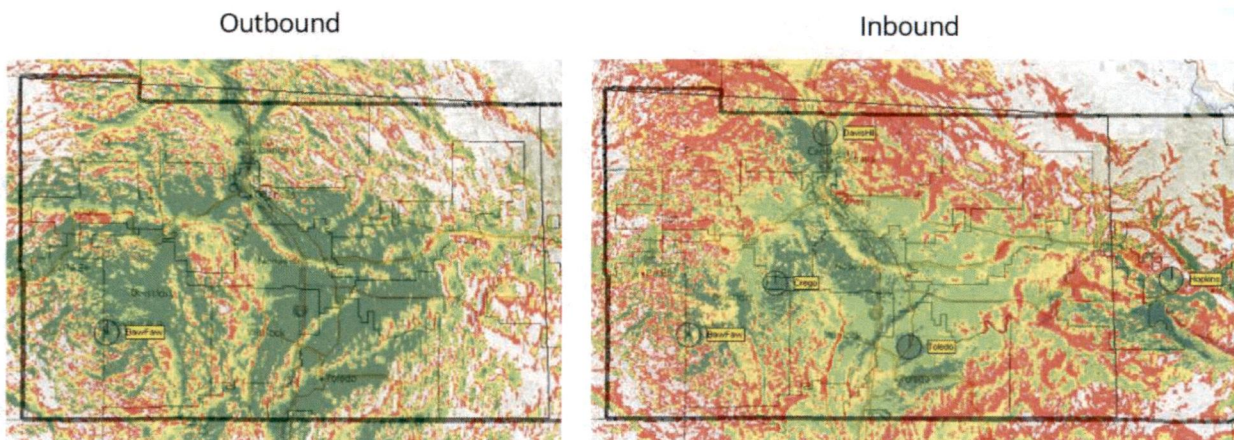


Figure 34: LCSO West System Current Coverage (Simulated)

APPENDIX C: PROPOSED SYSTEM PREDICTED COVERAGE

A detailed propagation simulation was developed to further analyze coverage and to predict performance from various site constellations for an enhanced system. The simulations utilize the EDX SignalPro™ application, which is a standard propagation tool employed by Public Safety to model the system elements and to predict coverage by incorporating industry standard propagation algorithms in addition to terrain and land use databases. Once the initial simulation was developed, the recorded data from the signal testing was factored into the SignalPro™ application to calibrate the model and improve its accuracy.

The propagation simulation was further developed to predict where the system would provide a voice quality (Delivered Audio Quality (DAQ)) of at least 3.4 per typical public safety standards. The minimum Channel Performance Criteria (CPC) required for a DAQ level of 3.4 for an analog narrowband (12.5 kHz) voice system was derived using the information from Table A-1 of TSB-88². The TSB-88 report serves as the public safety LMR network design industry standard.

The propagation model predicts coverage for a mobile radio, as well as a portable radio worn on the hip on street (outdoors) and within buildings up to a specific dB signal loss value for both outbound (dispatch to field) and inbound (field to dispatch). The results for the simulation at this level of voice quality for the following conditions, for each of the analyzed county systems are provided in the figures on the following pages.

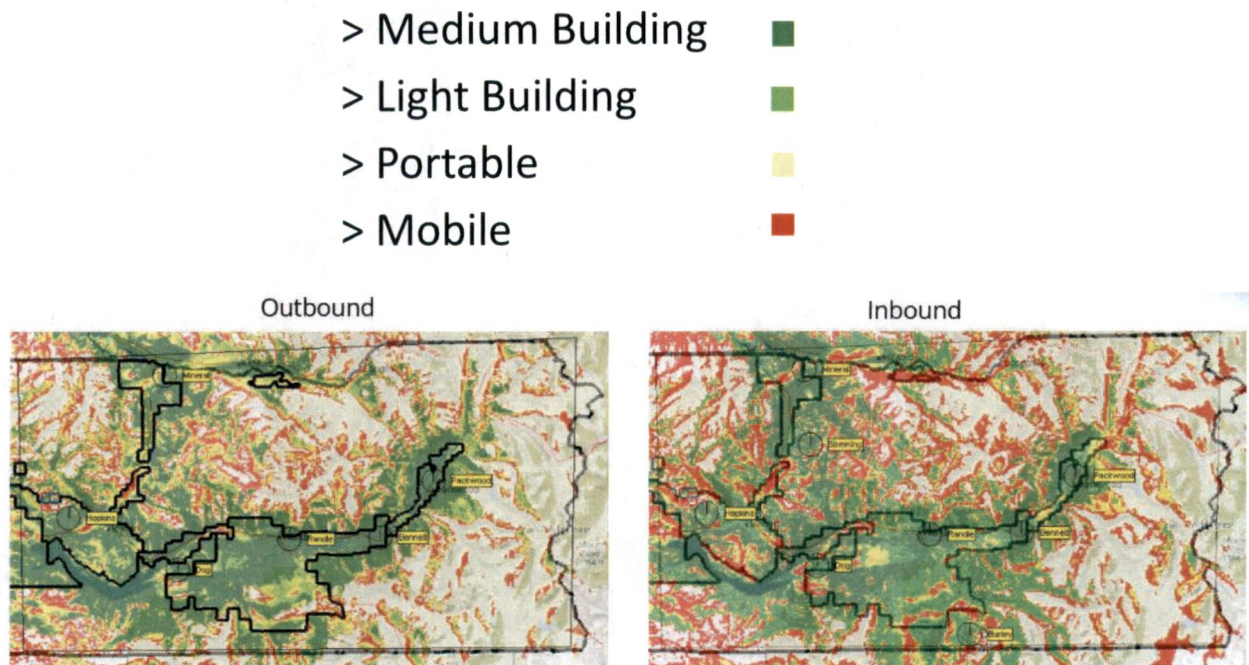


Figure 35: Proposed Fire System East Coverage (Simulated)

² TIA Telecommunications System Bulletin TSB-88.1-C: Wireless Communications Systems Performance in Noise and Interference Limited Situations - Part1: Recommended Methods for Technology Independent Performance Modeling; February 2008.

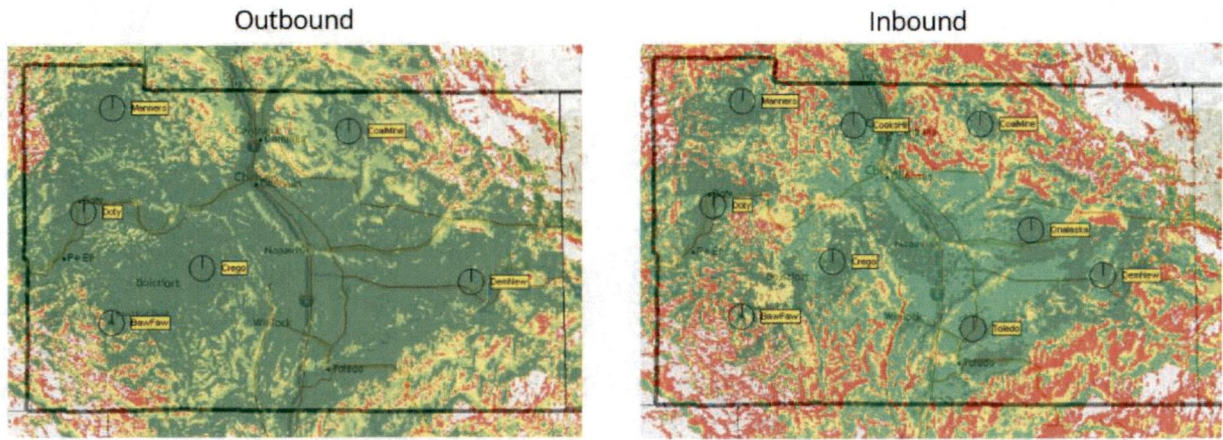


Figure 39: Proposed LCSD West System Coverage (Simulated)

APPENDIX D: PROPOSED MICROWAVE LINK PATH PROFILES (FROM TERRAIN DATABASE)

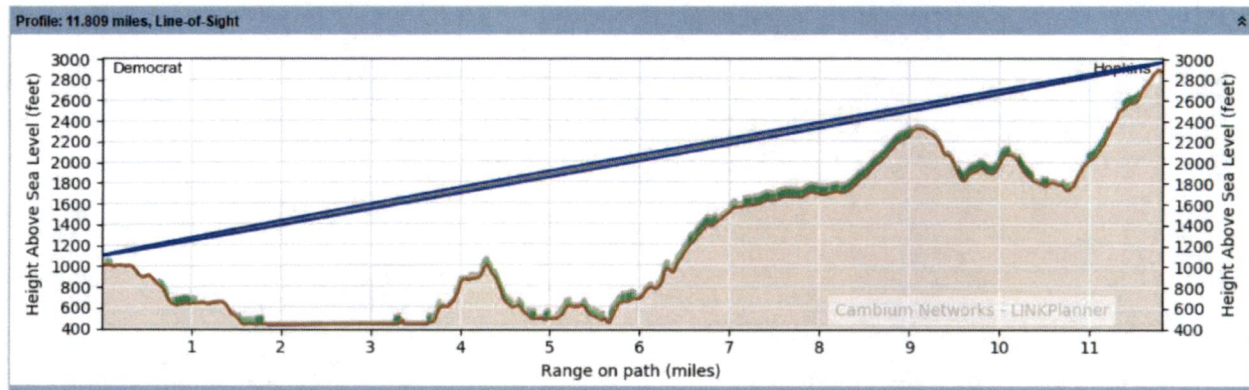


Figure 40: Democrat (90 ft.) to Hopkins (90 ft.) Path Profile

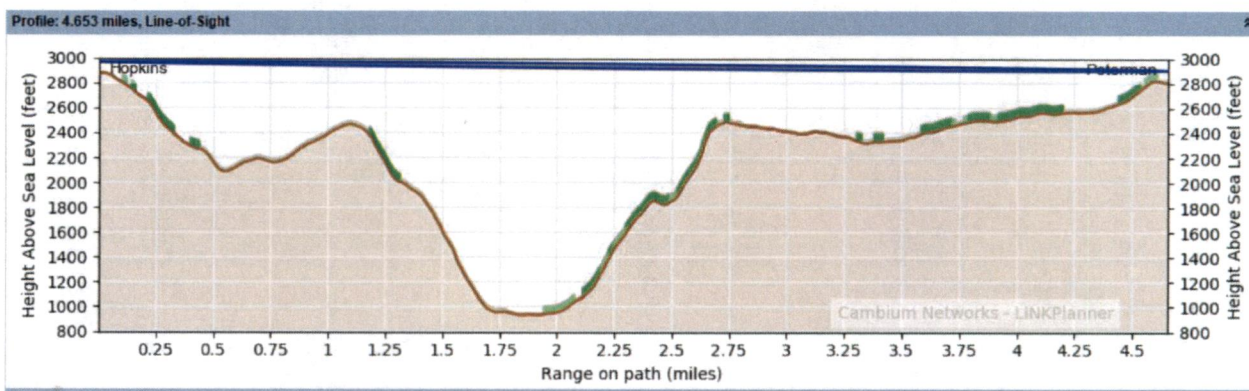


Figure 41: Hopkins (90 ft.) to Peterman (100 ft.) Path Profile

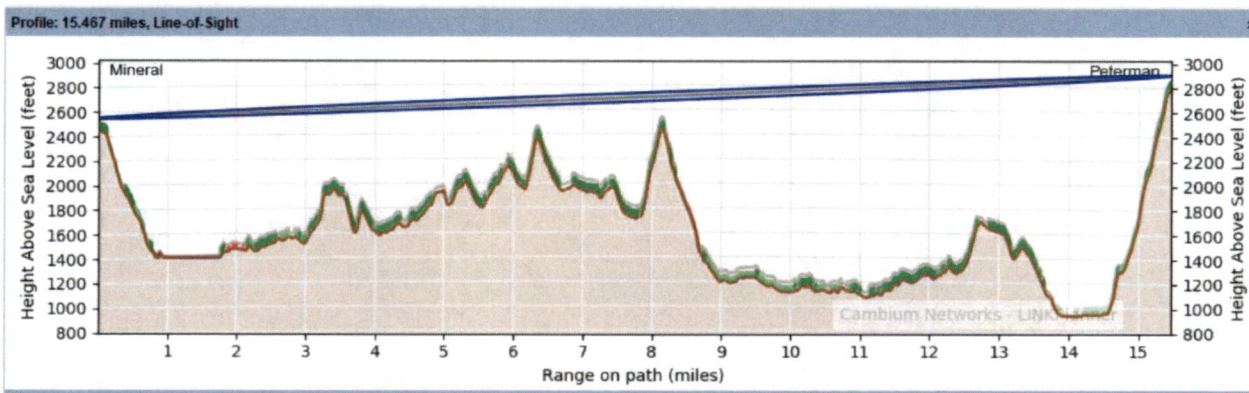


Figure 42: Mineral (90 ft.) to Peterman (100 ft.) Path Profile

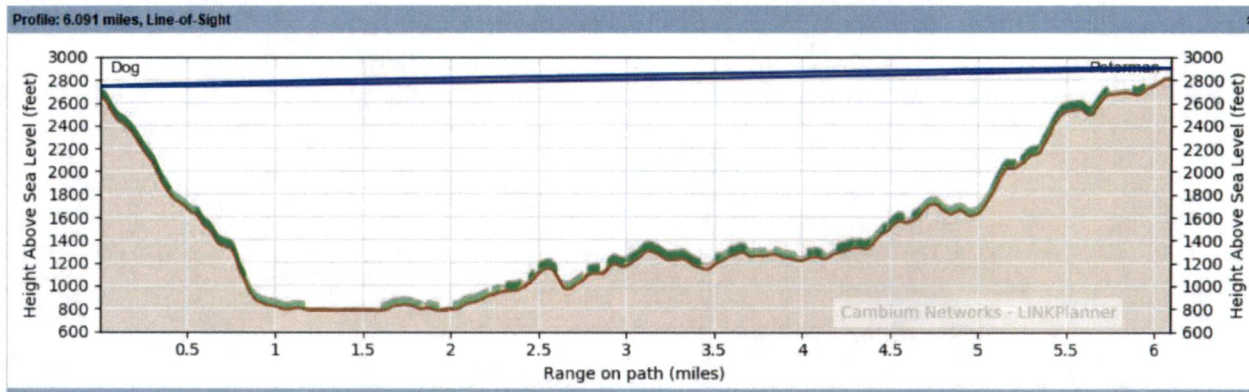


Figure 43: Dog (90 ft.) to Peterman (100 ft.) Path Profile

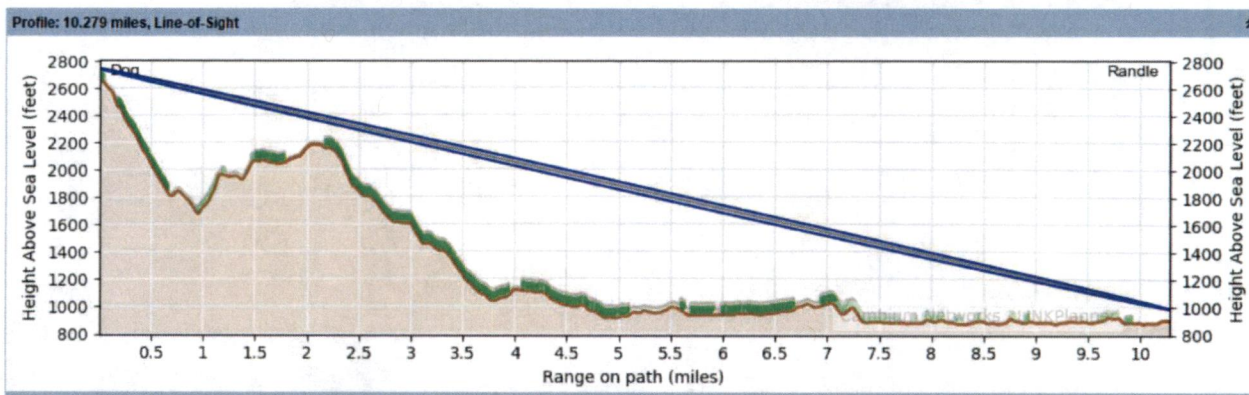


Figure 44: Dog (90 ft.) to Randle (90 ft.) Path Profile

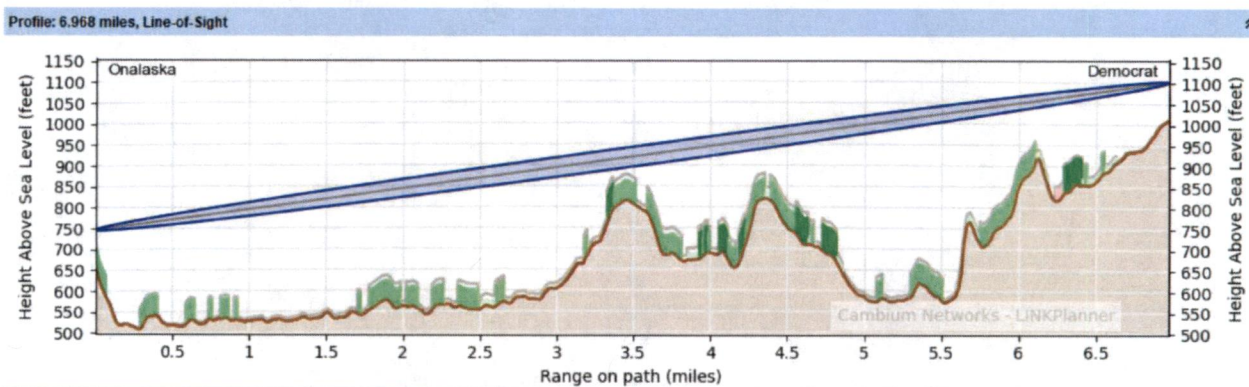


Figure 45: Onalaska (90 ft.) to Democrat (90 ft.) Path Profile

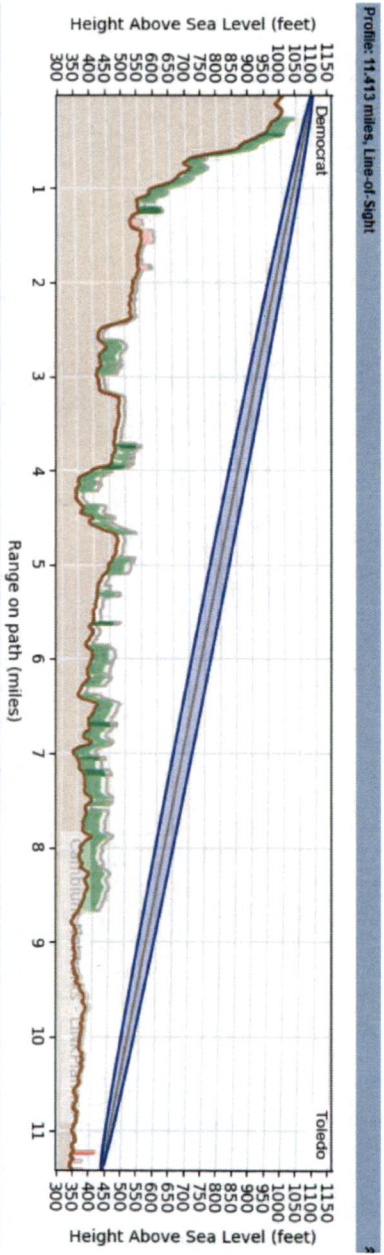


Figure 46: Democrat (90 ft.) to Toledo (90 ft.) Path Profile

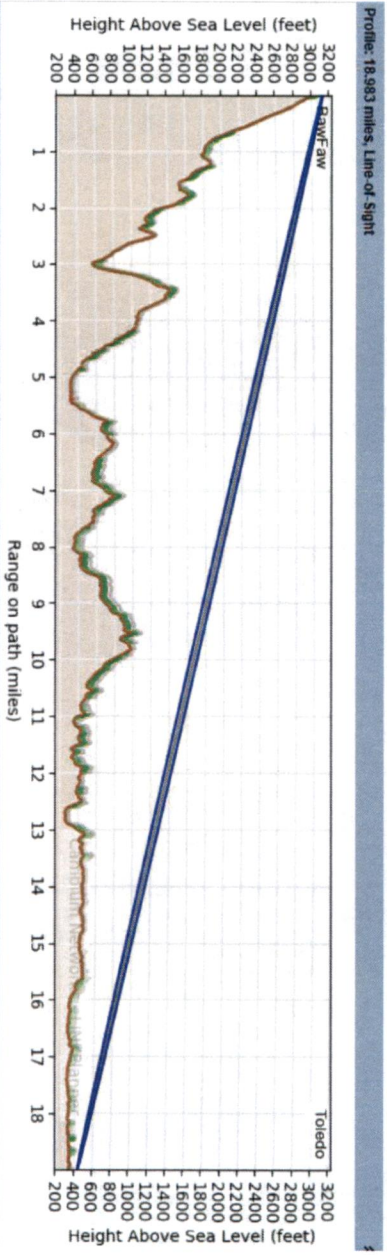


Figure 47: BawFaw (90 ft.) to Toledo (90 ft.) Path Profile

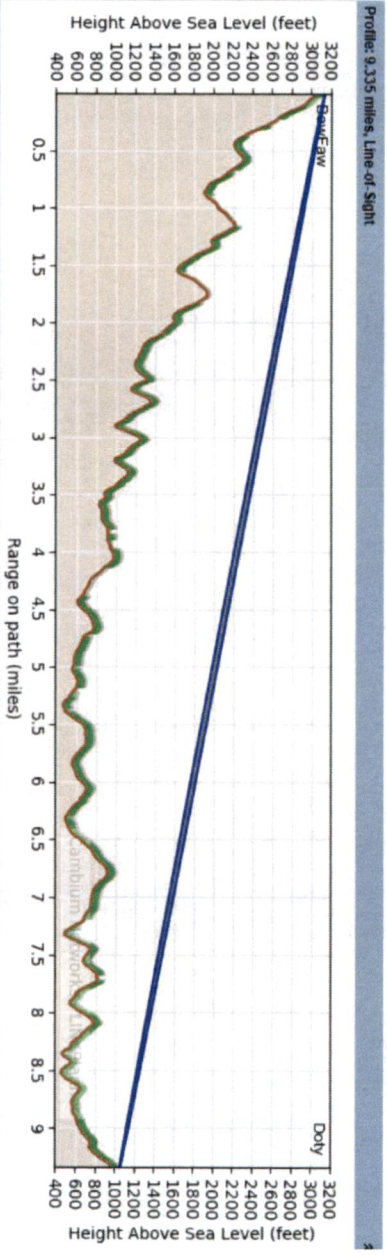


Figure 48: BawFaw (90 ft.) to Doty (100 ft.) Path Profile

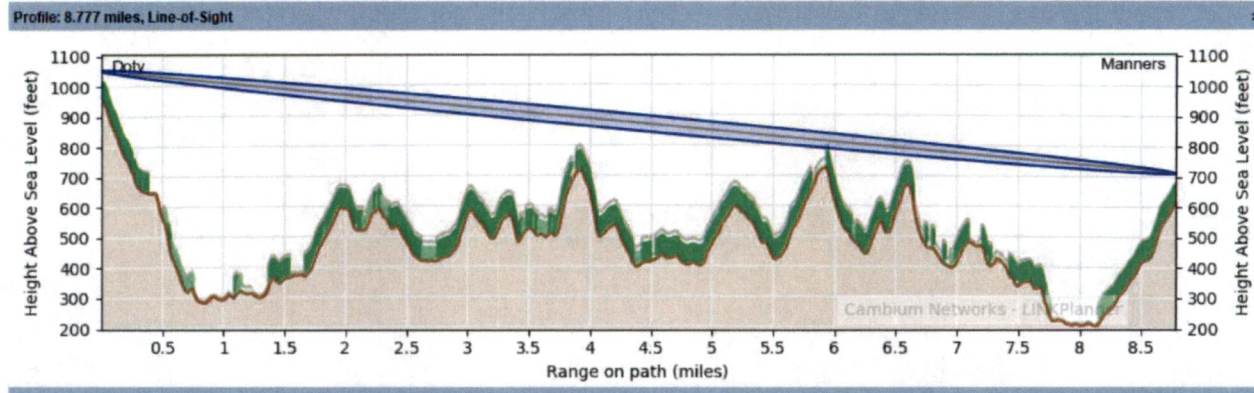


Figure 49: Doty (100 ft.) to Manners (100 ft.) Path Profile

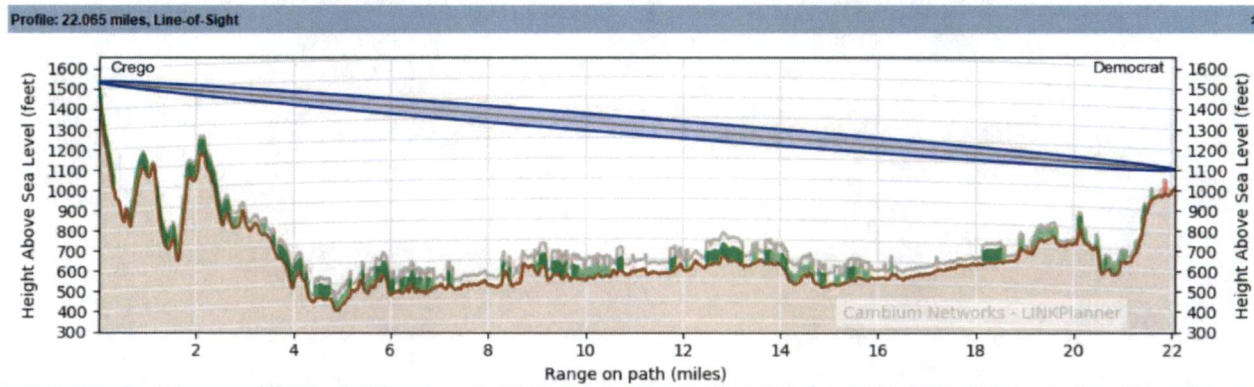


Figure 50: Crego (90 ft.) to Democrat (90 ft.) Path Profile



Lewis County

**REQUEST FOR
PROPOSAL**

FOR

**MICROWAVE NETWORKING EQUIPMENT
FOR LEWIS COUNTY PUBLIC SAFETY RADIO
RELATED TO THE DEPARTMENT OF
JUSTICE COMMUNITY ORIENTED
POLICING (COPS) OFFICE TECHNOLOGY
AND EQUIPMENT PROGRAM (TEP) GRANT**

Attachment B

SECTION 1

TECHNICAL REQUIREMENTS

1. Project Description

Lewis County Communications is located in Chehalis, WA. Lewis County encompasses roughly 2400 square miles. The county consists of varying terrain from low land farm area to mountainous hilly terrain ranging from sea level to 5300 feet. The county spans approximately 90 miles stretching from west to east and 25 miles north to south. Lewis County is bordered by Thurston County to the north, Yakima County to the east, Cowlitz County to the south, and Pacific County to the west.

Most of the Lewis County Communication sites are served by a mix of 6 and 11 Ghz and 4.9 and 5.8 Ghz microwaves systems ranging from Alcatel MDR8000 to Motorola Cambium microwave links configured with the topologies depicted in Attachment C of this RFP. The sites are serviced partially by county owned equipment as well as shared microwave with other agencies. The existing microwave network is used to interconnect Lewis's Land Mobile Radio (LMR) sites to the Lewis County Communications center at 351 NW North Street in Chehalis.

The current system carries a range of T1 connections and Attachments only 2 primary links to carry IP based traffic on county owned platforms.

With this RFP, Lewis County will procure a mixed TDM and IP (Internet Protocol) and scalable traffic payloads system. The successful bidder will design, furnish, and install the system. The county radio services department will be responsible for removing old, antiquated equipment in the future after additional system components have been replaced.

Payload scaling and bandwidth allocation, within the limits of the purchased software, hardware, and FCC licenses, shall be completed by the customer locally, or via the manufacturer's factory or support organization through remote access, on a dynamic basis by properly trained technical personnel.

The existing system utilizes both non-protected (NP) and monitored hot standby (MHSB) repeaters/terminals in the layout shown in the attached Attachments. In the future, as Lewis County migrates its LMR infrastructure to fully IP enabled systems, the existing T1 traffic is expected to be reduced on the microwave network at which time the new microwave system would carry IP traffic after the additional system improvements are completed. In this RFP the complete program of work and equipment is referred to as the "Furnished System" for convenience.

1.1 Reliability

The Furnished System shall be designed by the vendor, based upon their unique equipment capabilities, to reliably meet or exceed 99.999% two-way availability measured on an annualized basis on a per-link basis. Replacement of existing antenna and waveguide systems shall be assumed by the vendor.

1.2. Minimum Traffic Payload

Lewis County contemplates that the minimum traffic payload on any single hop will be ≥ 100 Mbps for its new LMR system. The Furnished System shall be configured as a Layer 3 network.

To facilitate transition of the existing traffic to the Furnished System, it shall support the existing capacity DS-1 circuit requirements as described in the Attachments and ≥ 45 Mbps for the new LMR system.

Traffic grooming and the transition plan to migrate Lewis County's traffic payload from the existing microwave radio system onto the new Furnished System shall be the responsibility of the successful Contractor. Planning and close coordination with Lewis County is required to prevent service outages. Traffic not groomed into DS1 circuits shall be carried and presented as Ethernet traffic organized into four (4) separate VLANs. The VLANs shall be:

- LMR Radio (≥ 10 Mbps)
- Site Management (≥ 5 Mbps)
- Video (≥ 60 Mbps)
- Spare (≥ 10 Mbps)

Each VLAN for each link shall be presented on an individual electrical Ethernet port at each site. The sites shall be configured with modulation modes and protection schemes which the Contractor shall design and present to Lewis County for approval. The Contractor shall include its proposed design configuration with its response to this RFP.

The Contractor shall describe its automatic ring and hot/standby service solution in its proposal.

2. General Requirements

The Furnished System shall include, but is not limited to, digital microwave radios, switches/traffic protection equipment, order wire for each site, alarm and control technology and interfaces, and any other equipment required for a complete and operational system.

Vendor solutions shall be provided which minimize or eliminate the risk of failure from any single point outage of a specific component or assembly that impairs the reliability objectives of this Section under normal operating conditions.

2.1 Network Reliability and Qualification Services

The successful Contractor shall be responsible for the total system turnkey design and implementation, which shall include services such as, but not limited to:

- Field based path surveys, if required by the Vendor, to finalize new antenna centerlines and warrant reliability of the paths and the overall network consistent with the requirements of this specification.
- Design of the network topology to achieve the performance requirements.
- If required by the vendor to validate the design, field path surveys shall be performed.
- Frequency search, interference analysis, Prior Coordination Notices (PCNs) and/or other public notices and frequency coordination including re-coordination/modification of Lewis County's existing FCC Part 101 license authorizations to re-purpose the existing FCC licenses authorizations for use with the new system; and,
- Compliance with the latest FCC Rules, Part 101 and related requirements; and,
- Preparation of FCC Form 601 microwave license applications; and,
- Factory testing of the assembled microwave hardware in staged configuration and demonstration of readiness for field deployment.

Following Contract award, the successful Contractor shall schedule their work to be ready to submit, for FCC licensing, all license applications within 45 business days after notice to proceed with the path survey work. The Contractor shall pay any required frequency coordination fees directly to the coordination body. The Vendor shall identify a frequency coordination agent based on master contracts or other bulk coordination arrangements which will minimize Lewis County Communications' cost

3. Microwave Antenna Systems and Waveguide

Given that the existing microwave system is carrying Lewis County's public safety traffic, after award of the contract, the Contractor shall develop and submit to Lewis County a plan for each site of how the antenna / waveguide system will be installed and the impact on reliability and performance of the existing system.

3.1 Antenna System Performance

The vendor's proposal shall indicate the antenna make, model, and centerline used in the feasibility path studies which form the basis of the proposal. All antennas shall include radomes.

Class "A" parabolic antennas are assumed to be the minimum acceptable design. Vendors proposing high performance antennas for any link shall narratively explain the rationale for that selection as part of their proposal.

3.2 Waveguide and Connectors

The new waveguide systems needed to achieve the required performance and reliability shall indicate the make, model, and length of waveguide and connectors which form the basis of the proposal.

3.3 Tower Structural Analysis

As part of its proposal, if the quantity, size or location of antennas on the towers will change, the Contractor shall utilize Northwest Tower Engineering <http://www.nwtower.net/> to determine whether the tower will accommodate the load.

The cost of the analysis shall be included in the proposal.

The cost to modify towers will be determined after the contract is awarded.

4. Dehydrator, Manifolds, and Pressure Gauges

The vendor shall furnish, install, and test waveguide system dehydrators, manifolds, and pressure gauges at each site of the work. The dehydrators shall maintain sufficient pressure and volume to achieve the waveguide supplier's design requirements.

5. Furnished System Equipment Input Power Source

All equipment shall be designed and proposed to support A/B (dual) power input sources. Equipment furnished in response to this specification shall be powered from the Owner's existing 48 VDC power plant.

Any equipment proposed by the vendor which is not capable of operating from 48 VDC in its native state (i.e. power inversion or voltage change required), shall be specifically identified in the proposal response.

The radio equipment shall be rack-mounted inside each building. Outdoor radios mounted on the tower or antenna are not allowed.

At the top of each microwave rack the vendor shall provide a DC distribution panel which shall become the point of demarcation between the DC power feeds and vendor's Furnished System equipment. This distribution panel shall be equipped with sufficient resettable DC circuit breakers (plus two spares of each size for each site) to power equipment contained within the rack.

Two 20 Amp 48VDC circuit breakers to supply the Furnished System to supply the equipment will be available at each site. If 20 Amp is not sufficient, the required circuit breaker size shall be specified in the proposal.

Each proposal shall include an Exhibit, identifying the proposed microwave equipment complement, by site, and shall identify the proposed thermal contribution and current consumption (in Amps) for each rack or cabinet. Current consumption shall identify both inrush current (e.g. radio boot -up) as well as static current loads in tabular form along with the vendor's requested circuit breaker rating for both the A and B power legs at Lewis County's existing DC distribution panel.

6. General Digital Microwave Equipment Requirements

This paragraph describes the non-frequency specific requirements of the microwave radio equipment specifications. All microwave radios shall be fully synthesized. Access to frequencies within a specific band (lower/upper 6 GHz) and 11 GHz shall be possible within a particular manufacturer's radio band family.

6.1 Electromagnetic Susceptibility and Spurious Radiation

The Furnished System equipment shall be designed to operate in a radio communications equipment environment installed in or near the vicinity of other types of equipment which may include but is not limited to:

- 100-watt VHF (150 MHz), 380-470 MHz, 700 MHz and 800 MHz transmitters and receivers.
- Microwave transmitters with up to 39 dBm output power.
- A portable radio transmitter operating at 6 watts or less in the 140 to 165 and 440 to 470 MHz band, and 4 watts or less in the 805 to 861 MHz bands, within 12" of the Furnished Equipment.

The Furnished System shall not emit spurious or unwanted Radio Frequency Interface (RFI) to any of the co-located equipment at any level and/or frequency which causes measurable performance degradation.

6.2 Physical Requirements

The Furnished System equipment described in these specifications shall be factory staged and capable of being mounted in a standard 7'-0" high 19-inch aluminum unpainted equipment rack (e.g. Chatsworth Products 4635 3-503 or equal) for each site.

All indoor equipment shall operate and meet specifications over the temperature range of 0 to +50 degrees C and at elevations above sea level at the sites where installed.

6.3 Multiplex Equipment

All terminal and repeater equipment shall be designed with multiplex equipment to convert the signaling speeds and formats internal to the microwave equipment to the DS1 level and/or mixed traffic of NxDS1 and data from 10/100BaseT port(s).

7. Path Reliability and Outages

The vendor's proposal shall identify and include information in its proposal response describing the parameters used to design the Furnished System.

The following and other parameters used by the vendor shall be included.

- Vigants Barnett model
- Digital, 64 QAM Minimum Modulation Mode Assumed
- $K=4/3$
- First Fresnel Zone 0.6
- An inspection of Google Earth for foliage and other obstructions
- Field based path observations
- Assumed minimum transmitter power, receiver sensitivity, antenna sizes/gains, insertion losses as shown in the individual path calculation sheets.

8. Traffic Protection

The Furnished System shall incorporate a method of traffic protection which shall be described in the vendor's proposal. Lewis County prefers that the traffic protection methods are internal to the manufacturer's hardware and not require separate external loop switches (in the case of TDM traffic) or external third-party routers (in the case of IP traffic).

The proposal shall describe how alternative transport technologies (e.g. fiber into the overall transport architecture), shall be integrated into the Furnished System utilization, traffic protection, and monitoring. The traffic protection shall utilize field-proven techniques to eliminate 'broadcast storms' or other outages which impair Lewis County's access to and use of the other connected systems. A description of the convergence time to effect traffic protection switching shall be included with the proposal.

9. Guaranteed Minimum Performance Specs

- System gain
- Transmitter power (measured at antenna flange)
- Receiver threshold sensitivity (measured at antenna flange)
- Bit Error Rate (BER) performance at various modulation modes
- Percent availability

10. Alarm Interface Demarcation

At each site where Furnished System equipment is installed the alarm interface demarcation shall be on a standard 66 block.

At minimum, the Furnished System shall be capable of providing minor and major alarms generated by each of the technology elements . Minor and major alarm configuration shall be coordinated with Lewis County radio services and adjusted by county tech team.

11. Service Channel

Each hop of the Furnished System shall include at least two (2) digital service channels. Each proposal shall stipulate the maximum payload and protocols supported by the service channel(s).

12. Jack Fields and Circuit Presentation

Each communication or data circuit shall be presented on 24 port (minimum) RJ-45/RJ-48 jack fields mounted in the microwave equipment rack and tested at the factory.

13. Special Considerations for Monitored Hot Standby (MHSB) Links

Hitless/errorless receiver switching is desired for MHSB links. Transmitter switching time of ≤ 50 ms is required. The proposed MHSB solution shall be designed to minimize branching loss and the proposal shall describe all design assumptions for MHSB switching and branching losses.

14. Factory Testing Requirements and Documentation

Equipment for every site shall be staged, assembled, and tested in the manufacturer's factory. Testing shall verify that every system assembly meets its design objectives which shall be so certified by a signed test report from the manufacturer's representative performing the test. A printed and electronic packet of "birth certificate" information shall be generated which shows, at minimum:

- Transmitter power output
- Receiver sensitivity
- AGC curves
- Modulation mode
- Protection performance
- Software and hardware revision versions
- Options and parameter settings

The Owner (Lewis County) may elect to witness factory testing for some or all links of the furnished system. Suitable advance notice shall be provided to permit scheduling and observation of factory testing. Any module or assembly which fails factory testing shall be subjected to re -testing until required performance is achieved.

15. Field Testing and Documentation

Field documentation shall include all the documentation requirements of Section 5 of this RFP. With the proposal, the vendor shall describe their typical recommended practices, as well as a documentation example, for field testing and commissioning the Furnished System

16. Furnished System Management and Control

16.1 Craft Interface

The Furnished System shall include a craft interface that permits connection of a browser equipped computer to access and set parameters of both the local network element hardware and software and, using the communications pathways provided by the Furnished System, shall allow access to any remote network element. The craft interface shall operate using the most current version of Microsoft Windows which is available when the Furnished System ships from the factory.

The craft interface shall be password protected and offer layered access for security. IP and serial connections for connecting the local computer to the craft interface is desirable. Any limitations associated with the craft interface shall be identified in the proposal. Such limitations may include, but are not limited to: specific version of Microsoft Windows operating system, specific required browser supplier and version, serial communication speed/parity, pre-provisioning control, diagnostic tools, alarm observation, performance observation on a per-radio and link basis, software upload/download, etc.

If the vendor offers a simple local tool (e.g. keypad or other display screen) that allows quick viewing of network craft features without connecting a computer, one such tool shall be included for each site where Furnished System equipment is located.

Describe any limitations to remote (off-site) access by interfacing the craft interface to a suitably protected IP connection (e.g. Internet) to allow remote maintenance and surveillance.

16.2 Network Element Manager (NEM) Option

As an option to the base proposal, the vendor may quote a NEM tool. The proposal shall describe how this tool will interface with, remotely control, and accept traps from, both Furnished System hardware as well as downstream systems connected to the Furnished System.

The required hardware and software needed to support the NEM functionality shall be included in the option cost. A description associated with this option shall be provided by the vendor or which includes any sizing considerations (e.g. total number of NEM devices supported), limitations, or pre-requisites to implementing the NEM solution with the Owner's current and future systems.

Ideally, if selected by the Owner, the NEM option will be capable of end-to-end network surveillance, including non -Furnished System technologies (e.g. Owner's owned/leased fiber) to observe, measure, and isolate characteristics such as jitter, latency, packet loss, BER, consistent with industry standards.

The proposal shall describe if the NEM option is a manufacturer integrated/branded solution, or a separate stand-alone application acquired from others and offered for this project.

The proposal shall describe any limitations to remote (off-site) access by interfacing the NEM interface to a suitably protected IP connection (e.g. Internet) to allow remote maintenance and system surveillance

17. Grounding

Grounding should be completed to existing system at each site.

18. Other Proposal Information Required

Vendor's proposals shall provide answers to the following with their response:

- 1) What is the City, State, and Country of equipment manufacture for the Furnished System?
- 2) What is the City, State, and Country where field and factory product engineering and field support people are located who support the Furnished System?
- 3) What are the specific locations of the two geographically closest (to Lewis County) factory-trained or manufacturer-certified technical support resource organizations for the Furnished System ?
- 4) Specify any external or independent testing certifications previously performed on the proposed equipment and the manufacturing processes.
- 5) Specify the number of individual microwave radios sold of the type proposed to address this RFP and total number of complete microwave systems implemented over the life of the company.
- 6) Encryption: Although not required as part of the current procurement, the Furnished System shall support FIPS 140-2 encryption. The proposal shall include a brief description of how encryption is accomplished in a post-sale, previously deployed configuration.

19. Decommission, Dismantle & Remove Old Equipment

Each vendor's proposal shall identify the cost to safely dismantle and carefully remove any identified existing equipment (include loop switching equipment). Such dismantled equipment shall remain as the property of Lewis County and be delivered, by the Contractor, to a designated storage location within Lewis County. The Contractor shall maintain a simple inventory of all such equipment removed and so tendered to Lewis County. The inventory shall be updated and provided to Lewis County daily.

20. Equipment Spares

A complement of spares as identified in the RFP in the scope of work section shall be included in the response. This equipment should include:

- (1) of each microwave radio type/frequency
- (1) of each microwave power supply
- (1) of each network switch

21. Special Pre-Cutover Testing

Where any cut-over to new system is required, the vendor's proposal shall describe a suitable field testing method of each T1 and IP circuit at each location.

Tests shall conform to applicable industry standards.

All pre-cutover plans shall be coordinated and approved by county tech teams with ample notice given to ensure communication shall be made to users and dispatch staff.

Required, calibrated test equipment to complete and document the pre-commissioning tests shall be provided by the contractor.

Spot check witnessing of pre-cutover testing may be performed by Lewis County tech team at its discretion.

All test results shall be electronically captured and included as part of the documentation requirements identified in Section 5 of this RFP.

END OF SECTION 1 TECHNICAL REQUIREMENTS

SECTION 2 EXISTING SYSTEM

1. Overview

Lewis County's existing microwave radio system is a single path no ring configuration consisting of a total of 5 county owned paths and utilization of 6 additional outside agency paths. Currently only 3 county owned links have IP capacity. All other links are utilizing T1 traffic only. This current configuration is listed below.

COUNTY OWNED MICROWAVE

- Crego to Dog 6 Ghz MDR8000 T1 microwave
- Crego to Courthouse 6 Ghz Nokia T1/IP microwave
- Courthouse to Chehalis Ridge 11 Ghz Motorola Cambium IP microwave
- Hopkins to Toledo 4.9 Ghz Motorola IP microwave
- Cooks to Seminary 4.9 Ghz Motorola IP microwave

SHARED MICROWAVE

- Crego to Coal Mine 5.8 Ghz Motorola IP microwave (RFA Owned)
- Coal Mine to Cooks 5.8 Ghz Motorola IP microwave (RFA Owned)
- Crego to Manners 5.8 Ghz Motorola IP microwave (RFA owned)
- Dog to Hopkins T1 circuit on WSDOT microwave
- Dog to Bennett T1 circuit on WSDOT microwave
- Bennett to Packwood T1 circuit on WSDOT microwave

Attachment C provides current microwave configuration.

Attachment D provides proposed new network path configuration.

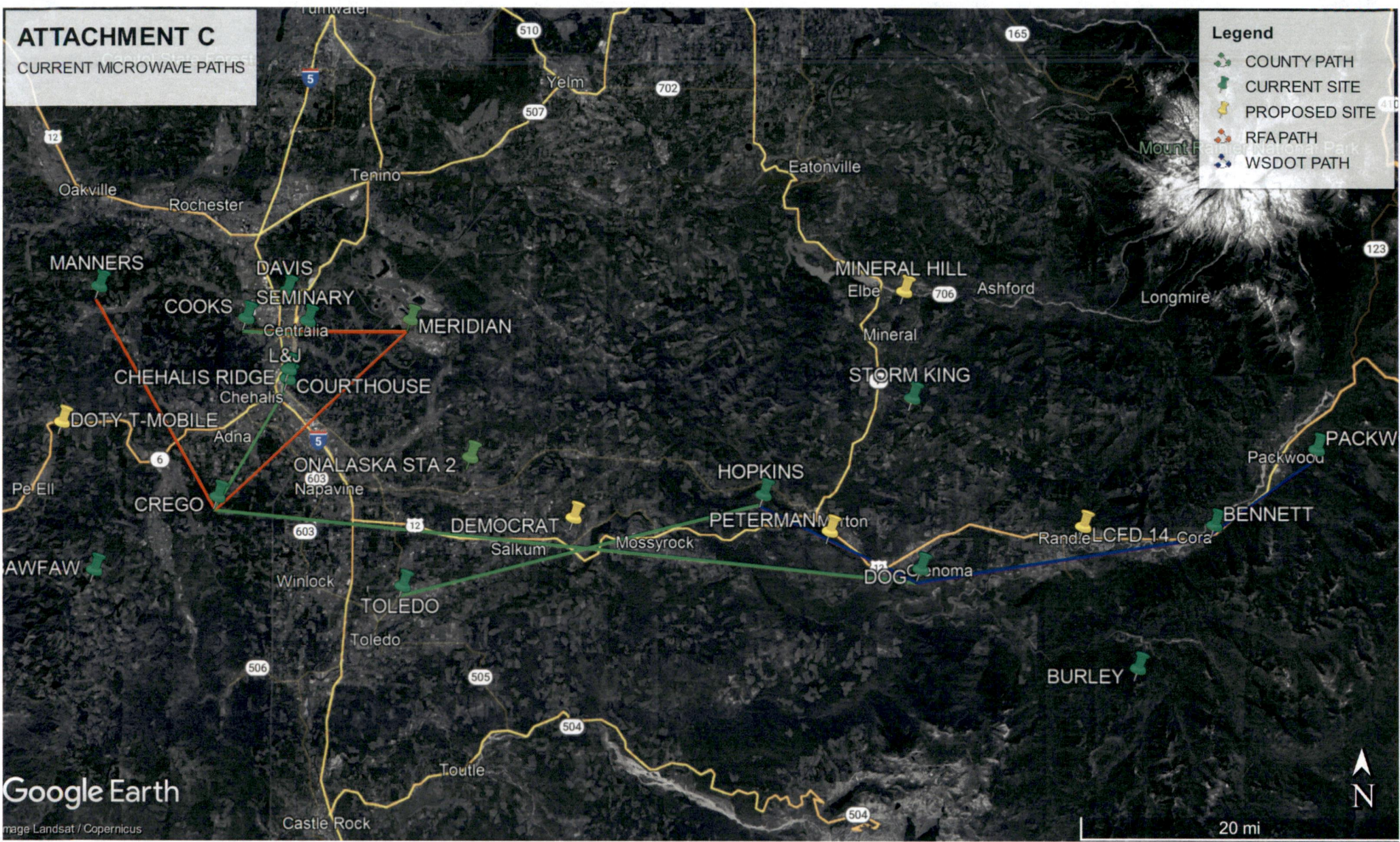
END OF SECTION 2

ATTACHMENT C

CURRENT MICROWAVE PATHS

Legend

- COUNTY PATH
- CURRENT SITE
- PROPOSED SITE
- RFA PATH
- WSDOT PATH

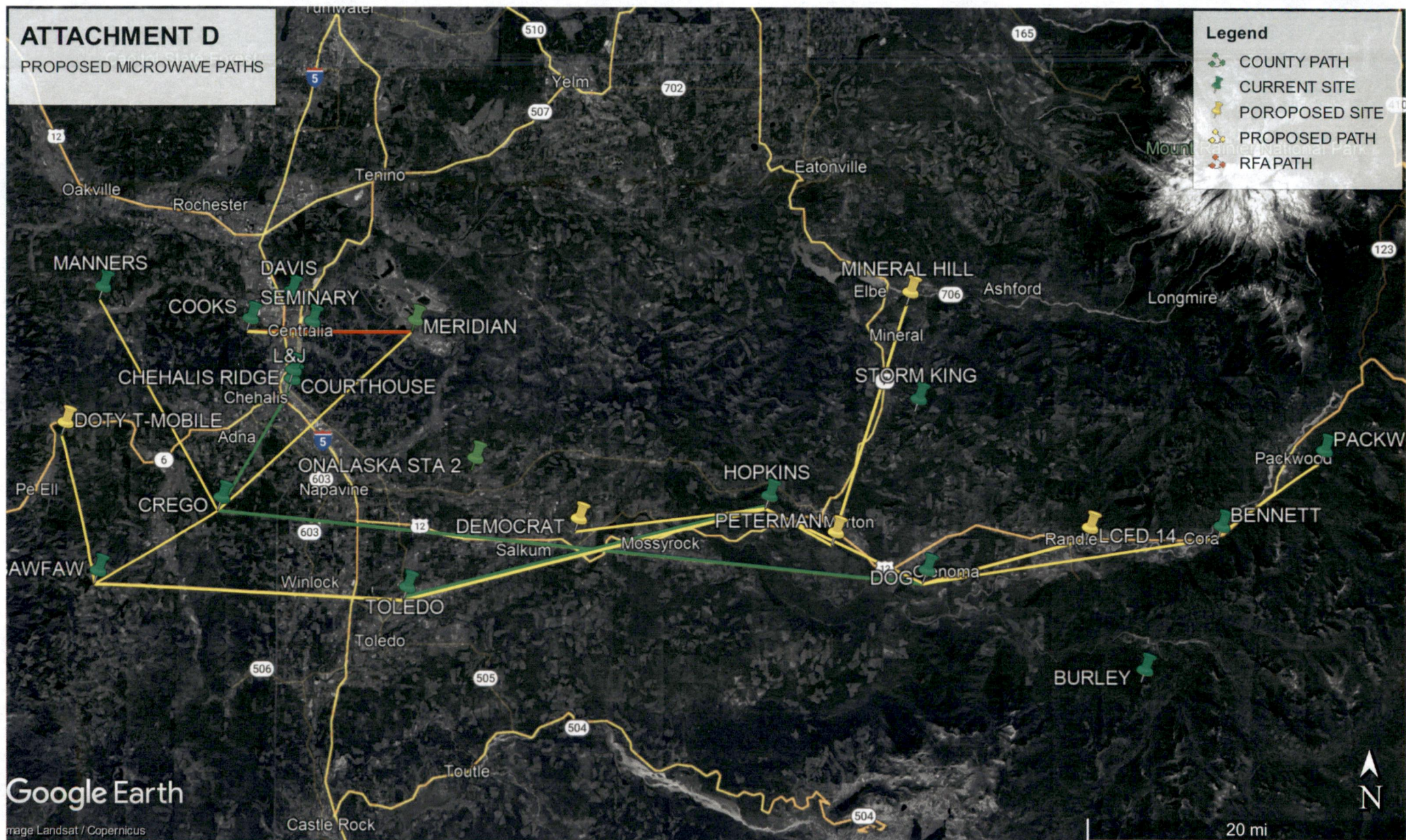


ATTACHMENT D

PROPOSED MICROWAVE PATHS

Legend

- COUNTY PATH
- CURRENT SITE
- PROPOSED SITE
- PROPOSED PATH
- RFA PATH



BOCC AGENDA ITEM SUMMARY

Resolution: 24-055

BOCC Meeting Date: Feb. 13, 2024

Suggested Wording for Agenda Item:

Agenda Type: Legal Notice

Issue a Request for Proposals (RFP) for Microwave Networking Equipment for Lewis County Public Safety Radio

Contact: Jennifer Libby-Jones

Phone: 360-740-3394

Department: COMM - 911

Description:

Issue a Request for Proposals for Microwave Networking Equipment for Lewis County Public Safety Radio

Approvals:

User	Status
PA's Office	Approved

Publication Requirements:

Publications:

The Chronicle Thurs 2/15/24; The Seattle Daily Journal of Commerce Thurs 2/15/24; The Portland Daily Journal of Commerce Wed 2/14/24

Additional Copies:

Cover Letter To: