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# STATEWIDE EMERGENCY COMMUNICATIONS BOARD

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June 25, 2015

12:30 P.M.

Chair: Mark Dunaski

MnDOT Arden Hills Training Center  
1900 West County Road I Shoreview, MN 55126

*Call in Number: 1-888-742-5095*

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## MEETING AGENDA

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### Call to Order

### Approval of Today's Agenda

### Approval of Previous Meeting's Minutes

### Announcements

### Reports of Standing Committees:

#### *Operations and Technical Committee (Glaccum)*

- **Lake of the Woods County Participation Plan** *ACTION ITEM*
- **Roseau County Participation Plan** *ACTION ITEM*
- **Lac qui Parle County Outdoor BDA** *ACTION ITEM*
- **Isanti County Console Upgrade and Addition** *ACTION ITEM*
- **Rice and Steele County JPB Participation Plan Amendment** *ACTION ITEM*
- **Stevens and Kandiyohi County Local Repeater Coverage Request** *ACTION ITEM*

#### *Interoperability Committee (Thomson)*

#### *Legislative & Government Affairs Committee (Workman)*

- **Letter to Federal Legislators Regarding Minnesota Response to FirstNet's Public Notices** *DISCUSSION ITEM*

#### *Steering Committee (Hartog)*

- **Recommended Changes to the By-Laws** *ACTION ITEM*

#### *IPAWS Committee (Seal)*

#### *NG911 (Pankonie)*

*Interoperable Data Committee (Risvold)*

*Finance Committee (Gerlicher)*

## **Reports – Other**

*Status Board Report (MnIT)*

- *ARMER Project Status Report (MnDOT OSRC)*
- *ECN Update (Mines, DPS ECN)*

**Old Business**

**New Business**

**Adjourn**

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# STATEWIDE EMERGENCY COMMUNICATIONS BOARD

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## MEETING MINUTES

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May 28, 2015

### Attendance

#### Members:

<u>PRESENT</u>	<u>MEMBER/ALTERNATE</u>	<u>REPRESENTING</u>
X	Mark Dunaski (Chair)/Jackie Mines	DPS
X	Mukhtar Thakur/Tim Lee/Jim Mohn	MnDOT
X	Dave Van Thiel/vacant	MNIT
X	Rodmen Smith/Dan Kuntz	DNR
	Rochelle Schrofer/Tim Boyer	MN State Patrol
X	Vince Pellegrin/Thomas Humphrey	METC
X	Bill Droste/ Vacant	League of MN Cities, Metro
X	Eric Anderson/Pat Novacek	League of MN Cities, Greater MN
X	Liz Workman/vacant	Assoc. of MN Counties, Metro
X	Jim McMahon/Tom Kaase	Assoc. of MN Counties, Greater MN
X	Kathy Hughes/Darlene Pankonie	MSA, Metro
X	Dan Hartog/Scott Turner	MSA, Greater MN
	/Jeff Marquart	
X	Mike Gamache/Ted Bearth	MESB
X	Mike Risvold/vacant	MN Chiefs of Police Assoc., Metro
X	Cari Gerlicher/Dave Thomson	MN Chiefs of Police Assoc., Greater MN
X	Ulie Seal/Vacant	MN Fire Chiefs Assoc., Metro
X	T. John Cunningham	MN Fire Chiefs Assoc., Greater MN
X	Joe Glaccum/vacant	MN Ambulance Assoc., Metro
X	Brad Hanson/Paul McIntyre	MN Ambulance Assoc., Greater MN
X	Scott Camps/	NE MN Emergency Communications Board

#### Also in attendance:

Cathy Anderson DPS-ECN  
Carol-Linnea Salmon, DPS-ECN  
Rubin Walker, DPS-ECN  
Rick Juth, DPS-ECN  
Jill Rohret, MESB  
Bruce Hegrenes  
Thomas Baden, MnIT

Mike Fink, Motorola  
Dave Eischen, Motorola  
Scott Wosje, Northland Business Systems

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### CALL TO ORDER

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Commissioner Dunaski calls the meeting to order at 12:35 p.m.

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### APPROVAL OF AGENDA

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*Mike Risvold moves to approve the agenda.  
Cari Gerlicher seconds the motion.  
Motion carries to approve the agenda.*

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### APPROVAL OF PREVIOUS MEETING MINUTES

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*Liz Workman moves to approve the meeting's minutes.  
Risvold seconds the motion.  
Motion carries to approve the minutes.*

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### REPORTS OF STANDING COMMITTEES

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#### Finance Committee (Gerlicher)

- **FY2014/15 SECB Grant Allocation**

*ACTION ITEM*

Chair Gerlicher introduces the FY 14/15 Grant allocation. This was recommended by the grant workgroup and approved by the Finance Committee.

*Gerlicher moves approval of the recommended SECB grant allocation for FY2014/2015 as submitted in the meeting materials.*

*Jim McMahon seconds.*

No discussion.

*Motion carries.*

- **Marshall County Request for Participation Plan Grant**

Chair Gerlicher introduces a request from Marshall County for \$19,500 in financial support to complete its ARMER Participation Plan. This has been approved by the Finance Committee.

*Gerlicher moves to approve the request from Marshal County for financial support for its ARMER Participation Plan.*

*Mike Risvold seconds.*

No discussion.

*Motion carries.*

Jackie Mines reports that a notice of grant opportunities for ARMER integration migration funds has gone out. Counties and tribal governments that are not currently on the ARMER system and have not previously received an ARMER Integration Grant may apply. Applications will be submitted to the Finance Committee for approval.

## **Operations and Technical Committee Report (Thomson)**

- **St. Louis Park Participation Plan Amendment**

***ACTION ITEM***

Vice Chair Thomson introduce a Participation Plan amendment from St. Louis County. The county will be upgrading three Gold Elite consoles to three primary MCC 7500 console positions and one patched position. The request is for two 4-port CCGWs and all eight CCGWs will be used. There will be two separate data routes expected to be in service in the fall. Logging will be done over the air. The county will turn back 212 radio I.D.s.

***Thomson moves approve the St. Louis County Participation Plan amendment.***

***Thomas Humphrey seconds.***

No discussion.

***Motion carries.***

- **Minneapolis Participation Plan Amendment**

***ACTION ITEM***

Vice Chair Thomson introduces the City of Minneapolis' request to replace sixteen Gold Elite consoles with sixteen MCC 7500s plus a patch. Two 8-port CCGWs are requested.

***Thomson moves to approve the Minneapolis Participation Plan amendment.***

***Bill Droste seconds.***

No discussion.

***Motion carries.***

- **Limited Interoperability Participation Plan, City of La Crosse**

***ACTION ITEM***

Vice Chair Thomson reports that the City of La Crosse currently has an 800 MHz analog trunked radio system and will be upgrading to a system that is similar to the ARMER system. The city is requesting a limited participation plan on the ARMER system to allow for interoperability and is requesting 300 radio I.D.s. It will not be used for day-to-day operations. The OTC approved it contingent on a successful MnDot contract and the Southeast Emergency Communications Board approval at its meeting on June 8.

***Thomson moves to approve the City of La Crosse's Limited Interoperability plan contingent on approval by the Southeast Emergency Communications Board and MnDOT satisfaction over the contract.***

***Humphrey seconds.***

No discussion.

***Motion carries.***

- **Lake County Participation Plan Addendum**

***ACTION ITEM***

Vice Chair Thomson introduces the Lake County Participation Plan addendum. Lake County would like to replace its existing consoles with two MCC 7500s. The request is for three CCGWs with 12 ports. One additional channel is requested at the Silver Cliff site. Sixty radio I.D.s will be returned.

*Thomson moves to approve the Lake County Participation Plan addendum.*

*Droste seconds.*

No discussion.

*Motion carries.*

- **Variance Request for St. Louis County**

***ACTION ITEM***

Vice Chair Thomson introduces a request from St. Louis County for a variance of the final implementation for all agencies covered in the St. Louis County ARMER participation plan from the naming requirements in ARMER Standards 3.15.0, 3.16.0, and 3.19.0 until August 31, 2015.

*Thomson moves to approve the St. Louis County variance request.*

*Uli Seal seconds.*

No discussion.

*Motion carries.*

### **Standard 1.11.1 - Training System Administrators**

***INFORMATION/DISCUSSION***

Vice Chair Thomson reports that after much discussion, the committee decided to move the Standard to back to the workgroup and then to the System Managers Group (SMG) for revision. The workgroup has had one meeting on it already. The direction the workgroup is moving is to separate system administrators into four categories with different levels of training required depending on level of authority on the system.

### **Interoperability Committee Report (Thomson)**

- **Approval of ISSI on the ARMER system but not to provide state funding for implementation or ongoing maintenance**

Chair Thomson gives a brief description of InterSubSystem Interface (ISSI). ISSI is a solution that allows seamless integration between ARMER and other P25 systems. He gives additional technical details, as reported in the meeting materials. To use the system for interoperability, it requires that both parties have purchased ISSI. There are some constraints, as described in the meeting materials.

Areas where it potentially could be used would be between Douglas County, Wisconsin and St. Louis County, Minnesota; Red Wing and Wisconsin because of the Prairie Island nuclear plant; Monticello; and South Dakota, though South Dakota has not purchased ISSI. It could also benefit ambulance services who service areas in both Minnesota and Wisconsin.

North Dakota, Iowa and Canada currently don't have statewide or nationwide trunking radio

systems but may in the future.

ISSI would cost Minnesota \$300,000 which would include ten talkgroups. Additional talkgroups would cost \$50,000 for ten.

Thomson reports that the Interoperability Committee decided to approve ISSI on the ARMER system for interoperability but not to recommend it for funding as a statewide system because of the limitations of its usefulness as a statewide resource.

Bruce Hegrenes reports that Superior and Douglas County are on the WISCOM System. The State of Wisconsin is currently using ISSI. Iowa is about to purchase a P25 Motorola system. St. Louis County has \$130,000, including a \$30k grant that could be used for this project and a microwave connection has been installed. It looks like the reductions in the contract pricing would purchase the hardware.

Thomson says the hardware was half the cost and the system integration was the other half.

Chair Dunaski says we have had this conversation before. The concern was that it applies to certain border areas but that it was not a statewide asset because it was not useful everywhere on the system. He asks who has talked to the power plants. Nate Timm has discussed it with them. They haven't put any funding into it. Thomson says the nuclear power plants have been reluctant to connect directly with anything because of their security concerns.

It is suggested to talk to the Radio Emergency Preparedness program (REP) and HSECM for funding options. Chair Dunaski will check with HSEM to find out if there are any funding possibilities there.

Rodmen Smith said even though there would be a free upgrade, it still costs money for state radio upgrades. Thomson says the cost for upgrading all the radios in the state is substantial.

### **Legislative & Government Affairs Committee (Workman)**

Chair Dunaski announces that Commissioner Workman has agreed to chair this committee. He reiterates that it is very helpful to have others working down at the legislature when it is in session.

Jackie Mines reports that the membership of the Legislative Committee has been expanded by the Steering Committee to include regional representatives to help offset the trouble the committee has had in the past in getting enough participation.

Discussion about committee membership. Chair Workman asks about the Metropolitan Council's participation. Committee chairs can remove from their rosters members who do not attend a percentage of meetings or omit them from the count for a quorum. Mines says she would like to see the associations represented but their representation could come from the regions.

Dunaski adds that the statutes outlining membership were established at the beginning of the ARMER system and maybe the board should look at that now and recommended changes.

### **Steering Committee (Hartog)**

Chair Hartog reports that the Steering Committee has suggested some changes to the bylaws and sent them to the Legislative Committee for review. The recommended changes included adding regional representation to the membership of the Legislative Committee, as discussed previously.

The committee also reviewed the Governance Assessment report written by Televate. The report included some possible perception issues. The committee, minus Director Mines, discussed the issues and how to address them. A decision was made to work with Judy Plante, who was the facilitator of the Strategic Planning Session, to have her help the committee develop a plan.

### **IPAWS Committee (Seal)**

No report from the committee.

Chair Dunaski says that rail and pipeline safety is a big topic of discussion at the capital. One of the concerns is the difficulty in getting information to people, especially concerning evacuating people, and the gaps in communications. IPAWS adds another helpful layer to the communications systems in place.

Chair Seal responds that there are only about 11 or 12 counties in the state who are not a COG or a member of a COG. There are still some knowledge gaps with people not knowing if their county is a member and also there are gaps regarding how an alerting the polygon is drawn and gaps with the carriers. Probably the best way to be alerted is to be signed up with the county to get an alert.

Chair Seals says he would be happy to give the board a presentation on IPAWS.

### **NG911 (Pankonie)**

No report.

### **Interoperable Data Committee (Risvold)**

- **MN Request for Information (RFI)**

Chair Risvold reports that the state would like to release an RFI for information pertaining to public-private partnerships relative to the development of a nationwide public safety broadband network in Minnesota. This would be an outreach to private partners and as a formal RFI could include information that may be proprietary but would be protected under Minnesota statute.

Three purposes are to:

- 1) Prepare the state in describing to FirstNet if and what potential private partnerships exist;
- 2) Educate the state and its stakeholders regarding potential private partnership opportunities;
- 3) Evaluate potential partnership opportunities for preparation of the state's public safety broadband strategic plan, which will help guide the ultimate outcome of the FirstNet consultation process.

Mines reminds the committee that an abbreviated informal RFI was completed in August of 2014. This RFI was not required by FirstNet. This is over and above any SLIGP grant money so ECN will fund this if it meets with the board's approval today.

***Chair Risvold moves to approve the MN Request for Information.  
Workman seconds.***

## **Discussion**

Chair Dunaski says he thinks it is very important to collect this data. The more information we have the better informed decision we can make.

Discussion about FirstNet's approach and if it will be the best one for Minnesota. FirstNet is looking at 50 states and three territories and most are not as prepared as Minnesota. In Minnesota, we have the ARMER system in place, which gives us an advantage. FirstNet may make it difficult to opt out. Minnesota's response is that we have concerns about the proposed approach. The best outcome would be if FirstNet could produce a solution that we could all be happy with. Through the consultation process, we are providing FirstNet with information about what would work best for Minnesota. It would also be best to have fully explored what are our options and the RFI will help with this.

***Motion carries.***

## **Reports – Other**

- ***ARMER Project Status Report (MnDOT OEC)***

Mukhtar Thakur reports that 97% of the ARMER backbone is complete, as outlined in the report presented in the meeting materials. Land acquisition will continue to impact completion of some sites. No new sites are on the air on this month but a few are imminent. The ARMER backbone is 324 sites, with about 10 sites with tower acquisition in progress, for a total of 314 sites completed. The Island Lake land acquisition has been completed. The environmental reviews are completed for the Devil Fish site and the Sawbill site. The budget is looking good and stable.

- ***ECN Update***

Jackie Mines reports that FirstNet's third Public Notice was released. It has to be submitted before the next SECB meeting but has been submitted to the Interoperable Data Committee for review and response.

The Phase II build out will be discussed with a workgroup. There will be a meeting next week with representatives from each region and other entities. This Phase II build out will be the most important feedback—they are asking for a response on what we envision to be the best methodology for building out in Minnesota. We will bring that forward to each region over the summer to identify what we think would be the best approach for each region then give another opportunity for feedback.

Our budget request at the Legislature has been passed with no changes to our funding request. The governor approved the Public Safety budget. We will move forward on the system upgrade. We will have a meeting in June with the subsystem owners to get feedback about in which fiscal quarters the money will be spent so we can plan for that.

She thanks the MSA, Jim Franklin, MESB, Margaret Vessel, the AMC and the Dakota County lobbyist for support at the Legislature. She said it was helpful to have the fire chiefs there in their uniforms. She thanks MnDot for their continued support.

Text-to-911 was trialed in St. Louis County. The NextGen GIS Regional kick off meetings have been happening. They have been successful and well attended by GIS people and PSAP people. The next major task is collecting and reviewing the request for information to see who has what resources available so we can identify where we need to support the regions.

**Old Business**

None.

**New Business**

None.

**Other Business/discussion**

None.

**Meeting Adjourns at 1:38 p.m.**



## Lake of the Woods County, Minnesota

# ARMER Radio System Participation Plan

May 2015

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# ARMER Participation Plan

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## I. Introduction

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### A. ARMER System Application – Lake of the Woods County

Lake of the Woods County, Minnesota, and the city and county agencies within the county, request approval for participation in and use of the State of Minnesota Allied Radio Matrix for Emergency Response (ARMER) radio system. The county and its agencies plan to be “Full Participants” in the ARMER system, and will eventually migrate primary voice communications services to the network, once fully implemented.

The county requests that this application and plan be reviewed and approved by the following agencies:

- Northwest Minnesota Regional Advisory Committee (NW RAC)
- Northwest Minnesota Regional Radio Board (NW RRB)
- State of Minnesota Radio Board Operations and Technical Committee (OTC)

***Lake of the Woods County law enforcement agencies (Sheriff and Police) have been using the ARMER system on a trial basis for operational communications for about one year, and are now ready to move ahead with a full ARMER participation plan. The law agencies are now fully equipped with ARMER-capable mobile and portable radios, and the EMS agencies within the county are planning the same. Fire agencies will consider a move to ARMER when funding allows for the purchase of mobile and portable radios.***

Lake of the Woods County’s plan has been developed based on the requirements and operational standards established for participation in and use of the ARMER radio system.<sup>1</sup> The county desires to contract as required with the Northwest Regional Radio Board and the State of Minnesota Department of Transportation (Mn/DOT) for use of the ARMER system once approved.

A list of the local city and county agencies within the county that plan to be included in the use of this system is provided in Section I.D of this planning document.

### B. Project Summary

Lake of the Woods County, Minnesota, and the public safety entities within Lake of the Woods County have developed a plan for the migration from existing VHF public safety radio systems currently used by those agencies to the ARMER network. A comprehensive radio system analysis was conducted in 2009,

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<sup>1</sup> All endnotes are attached at the end of the report (Attachment 2) under the heading of “References.”

which presented options for either continued VHF radio operations, or a migration to the 800 MHz ARMER system.

The primary goals of a new radio communications system are:

- Provide improved radio system reliability, coverage, and capacity
- Provide expanded county and region wide interoperability between public safety agencies, whether utilizing VHF or 800 MHz radio systems
- Replacement of the existing aging VHF radio system equipment (as needed)

After a thorough review of the options available, the county has determined that a migration to the 800 MHz ARMER radio system, utilizing the system's multi-site, digital, and Trunking technologies would best meet the county agencies radio communications goals, and will provide the required level of interoperability between public safety agencies in the region.

The primary points of contact for this project are:

Sheriff Gary Fish  
Lake of the Woods County Sheriff's Office  
206 – 8<sup>th</sup> Ave. SE.  
Baudette, MN 56623  
218-634-1143 Phone  
[gary\\_f@co.Lake-of-the-Woods.mn.us](mailto:gary_f@co.Lake-of-the-Woods.mn.us)

Rey Freeman  
RFCC  
13517 Larkin Drive  
Minnetonka, MN 55305  
952-541-0747 Phone  
[rfreeman@isd.net](mailto:rfreeman@isd.net)

### **C. Jurisdictional Coverage of System**

The radio system is intended to provide radio communications throughout the geographic area of Lake of the Woods County, Minnesota. Lake of the Woods County is located in the far northern area of Minnesota, covering 1,298 square miles, with a population of 4,045 people; the county seat is located in Baudette. The terrain of Lake of the Woods County is relatively flat, with ground elevations ranging from 1,050 feet in the northern areas to 1,250 feet in the southwestern area. The county is bordered by Koochiching County (east), Roseau County (west), Beltrami (south) and Ontario, Canada to the north.

### **D. Entities and Users Participating in the Planned System**

It is the intent of Lake of the Woods County and the agencies within to implement a shared radio system that will incorporate both public safety and additional governmental agencies. The list contains all of the agencies planning to participate in the system at this time.

<b>Participating Public Safety Agencies (7)</b>	
Lake of the Woods County Sheriff's Office	Williams Fire Department
Baudette Police Department	Roosevelt 1 <sup>st</sup> Responders
Baudette Fire Department	Lakewood Health Center
Lake of the Woods Ambulance	
<b>Participating Public Works and School Departments (2)</b>	
Lake of the Woods County Highway Department	Lake of the Woods School District

### E. Existing VHF System Configuration

The existing Lake of the Woods County voice radio systems operate on VHF (150-160 MHz) frequencies, providing radio channels for law enforcement, fire, and Emergency Medical Service (EMS)/ambulance operations. The dispatch center is physically located at the Lake of the Woods County Sheriff's Office in Baudette, Minnesota.

The existing Lake of the Woods County radio system consists of multiple VHF base and repeater stations located at tower sites around the county. The following primary tower site(s) are used for the Lake of the Woods County system.

- Lake of the Woods County Sheriff's Office
- Williams tower

All radio equipment located at the tower or other remote sites is controlled from the dispatch center via in-house telephone circuits or VHF radio links. The primary VHF radio system infrastructure equipment used by the county is a variety of Harris base and repeater stations. Most stations are in good operating condition, and are operating on narrowband (12.5 kHz) radio frequencies. A single-position Zetron 4010 radio control console is used in the Lake of the Woods dispatch center.

The radio system consists of separate VHF channels and base/repeater stations for Sheriff/law, and fire/EMS operations, which are located at the tower site(s) noted above, as well as at various fire halls throughout the county. The Sheriff/law radio network consists of multiple law repeater channels and sites, along with local Minnesota Statewide Emergency Frequency (MNSEF/VLaw31) and point-to-point stations. The fire/EMS radio networks consist of multiple independent stand-alone base stations located at various tower sites around the county, which also provides tone-and-voice paging capabilities. The radio users and dispatchers manually select the proper tower site based on the radio or service location.

## 2. ARMER System Technical Review

### A. System Design

During the local ARMER system implementation planning process, work was done to determine what type of configuration would be appropriate for the Lake of the Woods County radio system. Since the basic structure of the ARMER system as a multicast digital trunked radio system will meet the needs of Lake of the Woods County agencies, they plan to utilize the system in this planned multicast configuration.

Primary planning factors:

- System infrastructure and equipment plans
- Tower site planning
- Tower site and Public Safety Answering Point (PSAP) connectivity
- 800 MHz channel requirements
- 800 MHz talk group requirements
- Quantity of end user radios

Specific details of how these system parameters will be addressed are provided in this section of the document.

#### i) System Infrastructure and Tower Site Planning

The ARMER system plan that exists for the Lake of the Woods County area includes five tower sites within the county borders, as well as additional sites outside the county borders that will provide some level of coverage within the county. The following sites are planned for within Lake of the Woods County:

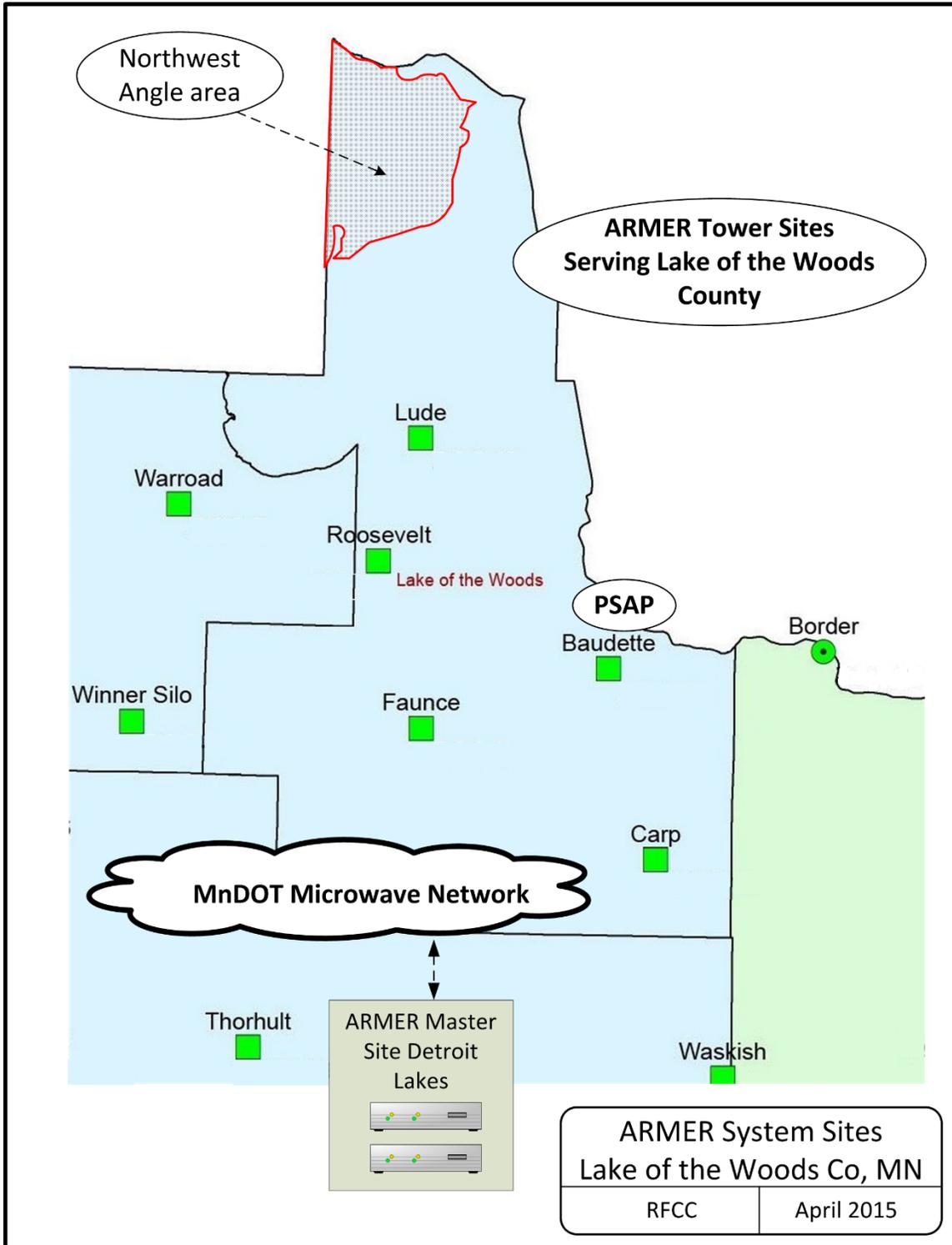
Baudette	Faunce	Roosevelt
Lude	Carp	

The following sites are located outside of but on or near the county border and will provide coverage within Lake of the Woods County:

Border	Thorhult
Warroad	Winner Silo

Refer to the diagram below for a high-level overview of the ARMER tower site details for the proposed system implementation for Lake of the Woods County.

### Lake of the Woods County ARMER System Tower Site Architecture



## ii) Local Equipment Additions and Enhancements

The ARMER planning study conducted for Lake of the Woods County determined that no additional local enhancement, tower sites (coverage), or channel capacity are required or planned. The ARMER tower sites in Lake of the Woods County and surrounding areas have demonstrated a high level of reliable coverage for the county's agencies, based on use over the past year, and no additional tower sites are planned. Refer to Section B of this plan for a review of 800 MHz coverage.

***The only area of concern for Lake of the Woods County is the far northern area of the county, known as the "Northwest Angle", which is a land area of 473 square miles, bordered mostly by Canada, located across Lake of the Woods (water body), north of the county proper. Most of the land is property of the Red Lake Tribal Nation. Access to the Northwest Angle from the U.S. is possible only by boat, or via road by crossing the border into Canada. The official population of the Angle is approximately 152 (year 2000 census).***

Radio usage in this area includes Lake of the Woods law enforcement, Fire/EMS, and US Border Patrol. The closest tower site to this area is Lude, located on the south shore of the lake. The distance from the Lude tower to the south shore of the Angle is 17 miles, directly across the lake. As shown in the coverage maps in this plan, the signal levels from the Lude tower site drop off significantly once the signals hit the shoreline. Radio testing in the Angle has shown very poor coverage in most situations.

Potential solutions for the area would be either the addition of an ASR trunked site, or a standalone non-networked 800 MHz repeater "Booster" site, setup to repeat one or more local talk groups. However, there is no current plan on a local level to address the coverage problems at this time.

A review of the number of radios planned for use in Lake of the Woods County, along with the number of talk groups, in conjunction with current and expected radio traffic levels was conducted to determine if any additional 800 MHz channel capacity will be needed at the local ARMER tower sites. Considering these factors, and the resulting traffic loading calculations included in this ARMER Plan, no channel expansion should be needed at the ARMER sites serving the county. Refer to Section A. vii) of this plan for a review of calculated 800 MHz channel traffic loading.

## iii) PSAP/Dispatch Center Equipment and Logging/Recording

The Lake of the Woods County dispatch center currently utilizes a one-position Zetron 4010 radio console. This console system is now connected to the county's existing VHF system equipment, as well as two (2) 800 MHz RF control stations, for use on local Lake of the Woods County talk groups, NW Region talk groups, as well as selected statewide talk groups.

Lake of the Woods County is considering a replacement of this older console with a newer Zetron product, but will be retaining control station operation. They have no plan to implement an MCC7500 console system or direct network connectivity.

Their current configuration of two 800 MHz RF control stations will be expanded with up to eight 800 MHz RF control stations for access to the local, regional and statewide talk groups available to Lake of the Woods County.

A high-level system connectivity diagram is provided on the following page.

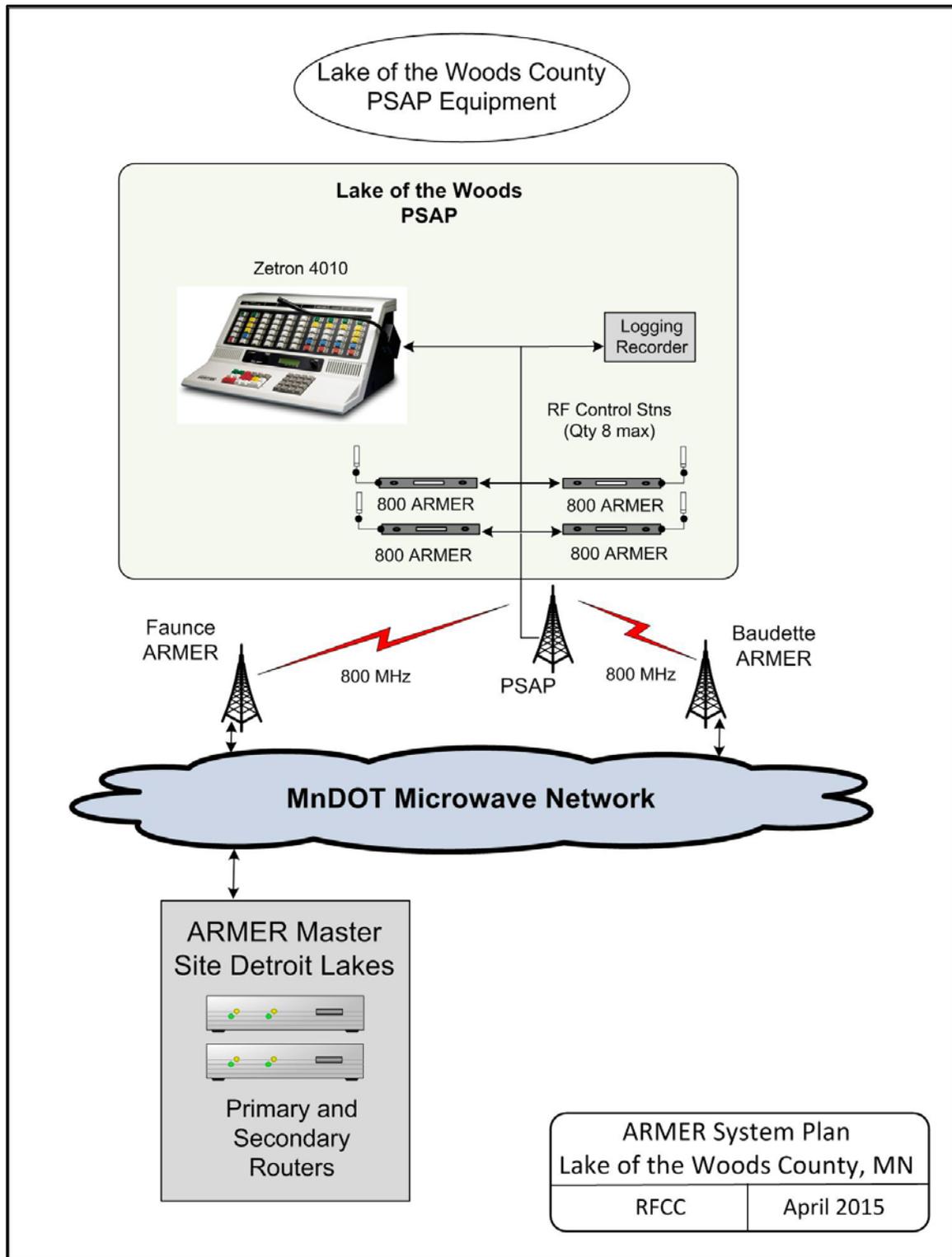
**Voice Logging:** The dispatch center will continue to use its existing local voice logging recorder for the recording of ARMER and conventional channel radio traffic. A limited number of local ARMER talk groups will be recorded at the PSAP, and will be handled through the local 800 MHz RF control stations.

#### **iv) PSAP Connectivity**

Connectivity between the Lake of the Woods County dispatch center and the ARMER system is required for operation of the system talk groups, as well other non-trunked conventional channel resources.

The existing Zetron console, or replacement consoles, are connected to 800 MHz RF control stations located at the county's PSAP. These stations communicate on-channel with the Baudette and other ARMER tower sites.

### Lake of the Woods County PSAP ARMER Architecture



**v) Subscriber Radios**

The 800 MHz subscriber (mobile and portable) radio inventory planning work conducted with Lake of the Woods County agencies has identified the following maximum estimated quantities of radios to be utilized on the system:

<b>Agency Type</b>	<b>Mobile</b>	<b>Portable</b>	<b>Base</b>
Law Enforcement	8	9	9
Fire/EMS	9	18	3
Public Works	4	4	0
Schools/Other	2	2	0
<b>Totals</b>	<b>23</b>	<b>33</b>	<b>12</b>

A total of 68 mobile, portable and control base radios would be implemented in the system, if all agencies purchase or obtain the radios identified within this plan. This includes the total potential for three year growth for the agencies within the county. The county agencies currently have a total of 12 radios on hand, which are now being used on the ARMER system. A detailed breakdown of Lake of the Woods County’s mobile, portable, and VHF radio pager inventory requirements and cost estimates is provided on the next page. Agencies throughout the county will be able to use this opportunity to purchase and implement standard radio types for use within the system, which will promote user commonality and interoperability between the various agencies.

**Lake of the Woods County MN  
800 MHz Radio Inventory and Cost Data**

Total of 800 MHz Mobile and Portable Radio Equipment Required for System Implementation											Totals
Agency	Dual Band Mobile @ \$6,000	Mid-Tier Mobile Radios w/DES @ \$4,000	Mid-Tier Mobile Radios no DES @ \$3200	Mid-Tier Mob Radios Dual Control @ \$3800	Dual Band Portable @ \$6,000	Mid-Tier Port Radios w/DES @ \$3,300	Mid-Tier Port Radios no DES @ \$2500	Low-Tier Mobile Radios @ \$2,150	Low-Tier Portable Radios @ \$1,550	800 Mhz RF Control Stations @ \$6,000	Total Agency Radio Equipment Costs (Maximum)
LoW Co Sheriff (on hand)	5						6				NA
Baudette Police (on hand)							1				NA
Baudette Police (future)			3				2			1	\$ 20,600
Low County 911 Dispatch (on hand)										2	NA
Low County 911 Dispatch (future)										6	\$ 36,000
<b>Law Agency Totals</b>	<b>5</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>9</b>	<b>0</b>	<b>0</b>	<b>9</b>	<b>\$ 56,600</b>
Baudette Fire (future)			3						12	1	\$ 34,200
Williams Fire (future)			4							1	\$ 18,800
Lake of the Woods Ambulance (future)				2							\$ 7,600
Roosevelt 1st Responders (future)								6			\$ 9,300
Lakewood Health Center (future)										1	\$ 6,000
<b>Fire/EMS Agency Totals</b>	<b>0</b>	<b>0</b>	<b>7</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>18</b>	<b>3</b>	<b>\$ 75,900</b>
LoW County Highway Dept								2	2		\$ 7,400
LoW Public Works (future)								2	2		\$ 7,400
LoW School District (future)								2	2		\$ 7,400
<b>Public Works Agency Totals</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>6</b>	<b>6</b>	<b>0</b>	<b>\$ 22,200</b>
<b>GRAND TOTALS</b>	<b>5</b>	<b>0</b>	<b>10</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>9</b>	<b>6</b>	<b>24</b>	<b>12</b>	<b>\$ 154,700</b>
<b>Total Quantity of Radios:</b>	<b>68</b>										

## vi) System Talk Group Planning and ID Requirements

The Fleetmap for Lake of the Woods County has a total of 32 talk groups, which was developed based on the needs of the county agencies.

In addressing the talk group needs for the county agencies, the following basic outline will be used:

- Primary and secondary dispatch talk groups for law enforcement
- Primary and secondary dispatch talk groups for fire service
- Primary and secondary dispatch talk groups for EMS service
- Individual dispatch talk groups for non-traditional public safety agencies
- Countywide talk groups for special events
- Countywide talk groups for interoperability
- Individual talk group(s) for each participating agency

Refer to Attachment I for a copy of the preliminary Lake of the Woods County fleet map.

A total of 68 ARMER system IDs are expected for the Lake of the Woods County implementation, which includes three year estimated totals:

- 60 for mobile and portable subscriber units total expected on the system for all agencies
- 8 for PSAP operations

## vii) 800 MHz Traffic Loading and Frequency Planning

The ARMER system sites within Lake of the Woods County will operate in a trunked multicast mode of operation. The state has planned for a group of five 800 MHz frequency pairs to be implemented at each site, and these channels will be shared by all users of the system/sites in the area. These users will include:

- Lake of the Woods County agency users
- Neighboring county agency users
- State of Minnesota and Federal agency users

The county recognizes that in a trunked radio system it is important that the tower sites be established with a sufficient number of 800 MHz channels to ensure that all radio users are able to access the system when needed for both routine and emergency radio communications traffic. However, a balance must be established between providing a sufficient number of channels and the cost of implementing those channels, as well as the increasingly limited number of 800 MHz frequencies available for the channels.

With a maximum radio inventory of 68 local radio units planned for this system, it is expected that the planned five channels will be sufficient at the Lake of the Woods County ARMER sites.

When neighboring county and state radios are added to this total, it is possible that a greater number of channels would be needed at the sites. To better calculate the expected traffic loading the Lake of the Woods County radio would have on the local tower sites, the industry-standard Erlang-C process has been used in this plan to determine the expected voice traffic on the ARMER system. This process can be used for both telephone and radio networks, where a shared and limited number of communications paths (trunks) are used to handle the voice traffic.

A full discussion of how this process works is beyond the scope of this plan; however, several critical factors are used to determine the expected radio traffic usage of the tower sites:

- Number of local (Lake of the Woods County) radios
- Number of neighboring county agency radios that are likely to use any given tower site
- Number of State of Minnesota agency radios that are likely to use the sites
- Number of 800 MHz radio channels available at the site(s)
- Estimation of how many radios are in use/service at a point in time
- Average radio transmission length of time (in seconds)
- Average expected number of transmissions from the radios (per hour)

When these radio inventory and usage parameters are entered into the Erlang calculation formula, a resulting Grade of Service (GOS) parameter is generated, indicating the calculated or expected availability of the radio system channels for the radio users. This GOS number could also be viewed as a “likelihood of getting a busy signal” when pressing the transmit button on a radio. The lower the number, the better GOS.

Public Safety Wireless Network (PSWN), the governmental agency which establishes operational standards and recommendations for public safety radio communications, has established a minimum GOS for these radio systems at “equal or less than two percent.”

In other words, there should be less than a two percent chance that a radio user’s transmission would be blocked by the system due to radio traffic levels. This could also be viewed as “greater than 98 percent” chance of a radio user’s transmission being properly handled by the system when needed. This two percent GOS is considered a “Standard Busy Hour” level of usage. It should be noted that many agencies have elected to move beyond the PSWN recommendation and a common goal in Public Safety today is a GOS of 1 or better.

The parameters used for the Lake of the Woods County radio traffic calculations are as follows:

- Quantity 68 Lake of the Woods County radios (three year maximum)
- Quantity 80 neighboring county radios (interoperability use in Lake of the Woods County)
- Quantity 100 State of Minnesota and Federal agency radios
- 33 percent estimate percentage of how many radios are in use/service at one time
- 8 seconds average radio transmission length of time (in seconds)
- .51 average expected number of transmissions from the radios (per hour)
- 1.5 seconds average busy time (in seconds)

The GOS is then calculated for each site, based on the number of radio channels planned for the sites, to show the impact of the differing number of channels that would be implemented at the sites.

This formula does not necessarily incorporate any parameter for the number of talk groups being planned for use by the local county agencies. The number of talk groups can have a dramatic effect on system loading, as the larger the number of talk groups, the greater potential for spreading the traffic among the RF channels. Nonetheless, it remains the most reliable method for calculating radio traffic levels.

The table shown below contains the predicted 800 MHz radio channel and tower site traffic loading for typical operational radio activity for the sites that are located within Lake of the Woods County, based on the parameters in the previous data table:

**Predicted 800 MHz Standard Voice Channel Traffic Loading for Lake of the Woods County**

Site and GOS	Number of Voice Channels Normal Conditions			
	1	2	3	4
Baudette	18.6%	1.5%	0.1%	0.0%
Faunce	15.6%	1.1%	0.1%	0.0%
Carp	15.6%	1.1%	0.1%	0.0%
Lude	11.7%	0.6%	0.1%	0.0%
Roosevelt	23.3%	2.3%	0.2%	0.0%

One channel at each site is allocated as the Control Channel, which is not used for voice and not reflected in the table above. As shown, a GOS of better than one percent is achieved with two or three channels per site (highlighted in yellow), less than the total quantity being installed by the state at each of the county sites. This would indicate that no additional channels should be needed at the county sites.

The above calculations are again based on the PSWN “Standard Busy Hour” calculations, and do not account for the increased traffic loads that would be expected during emergency periods (tornado, large fire, multiple events). PSWN has established a recommendation of an additional 20 percent capacity for

these events. Refer to the following table for the predicted ARMER system traffic loading and GOS for the Lake of the Woods County sites when the PSWN 20 percent additional emergency operations data is incorporated into the usage calculations.

**Predicted 800 MHz Voice Channel Traffic Emergency Loading for Lake of the Woods County**

Site and GOS	Number of Voice Channels Emergency Conditions			
	1	2	3	4
Baudette	36.2%	5.2%	0.5%	0.0%
Faunce	35.4%	5.0%	0.5%	0.0%
Carp	35.4%	5.0%	0.5%	0.0%
Lude	28.8%	3.4%	0.3%	0.0%
Roosevelt	46.6%	8.2%	1.1%	0.1%

As shown, three voice channels are adequate to maintain the minimum recommended GOS during emergency traffic periods at all sites. The State of Minnesota will be implementing four voice channels at all sites, so no additional channels should be needed at the ARMER sites. Based on the limited number of radios and talk groups planned by Lake of the Woods County agencies, it appears that Lake of the Woods County’s implementation will have not a significant impact on the system loading at the system sites, and should not be a factor requiring additional RF channel capacity. This also includes additional future capacity for the local sites in the event that other governmental agencies (schools, transportation) elect to join the system in the future.

The State of Minnesota has obtained the 800 MHz frequency assignments for the basic five channel configuration needed for the five tower sites within Lake of the Woods County. The table on the following page is the current available 800 MHz frequency data for the Lake of the Woods County ARMER tower sites. The channels listed as “Lake of the Woods Co.” have been assigned to Lake of the Woods County via the state’s 800 MHz NPSPAC channel plan, and while they have not yet been assigned to a specific site, they could be used for the system at some point.

### 800 MHz Frequency Assignments for ARMER Sites in Lake of the Woods County

Site	Chan 1	Chan 2	Chan 3	Chan 4	Chan 5
Lake of the Woods County	55	120	199	219	NA
Baudette	24	34	64	185	PS
Faunce	60	128	148	167	221
Lude	4	80	182	224	PS
Carp	132	146	172	183	223
Roosevelt	14	145	189	201	PS

**(PS = Public Safety/Non-NPSPAC channels)**

#### viii) Legacy VHF Equipment

The county will continue to operate and control a number of existing or updated VHF radio system channels, for local paging and interoperability. Emergency paging for fire and EMS operations is currently conducted via county-owned VHF system(s). These existing systems will be retained and modified or expanded as needed for improved paging coverage. This expansion could include the installation of some equipment at ARMER tower sites for improved coverage and reliability.

In addition, the existing law enforcement VHF repeater channels may be utilized for local interoperability between VHF and 800 MHz radio system users.

## B. Coverage Review

### i) Design Parameters

The overall system design and resulting communications coverage of the ARMER system can be affected by the following goals and concerns:

- Desire to obtain in-building coverage as best as possible in more densely populated areas of the county
- Need to cover the geographic area with a reasonable number of tower sites
- Cost of developing new tower sites, including structures, land acquisition, Federal Aviation Administration (FAA)/FCC/National Environmental Policy Act (NEPA) considerations, as well as local zoning
- Availability of and costs associated with existing and planned tower sites

The existing and planned tower sites planned for this project are being provided by the State's ARMER network. The coverage goal for Lake of the Woods County is 95 percent "on-the-street/outdoor" reliability to a portable radio with a standard antenna held at a height of five feet above ground level.

## ii) Coverage Propagation Mapping

In the planning for this project, coverage modeling and propagation analysis was done to determine if the basic tower site planning assumptions were valid and could be expected to result in a system that would meet Lake of the Woods County’s coverage needs.

These coverage maps were generated with the RadioSoft© ComStudy2© software program. The modeling for the coverage analysis was done with both the Okumura and Longley-Rice propagation models. The coverage maps were done for portable talk-in and talk-out usage, as this is the most difficult coverage scenario. If the basic system design shows the portable goals are attainable, then mobile coverage should not be a concern.

Provided below are the parameters used for the coverage modeling:

Site Parameters	Value
Transmit Antenna Gain	9 db, omnidirectional
Transmit Output Power (into main line)	35 watts
Transmission Line Size (tower over 300 feet)	1.25 inch Heliax®
Transmission Line Size (tower under 300 feet)	7/8 inch Heliax®
Transmission Line Length	Based on tower height
Receive Antenna Gain	9db, omnidirectional
Receive Tower Top Amplifier Gain	5db
Receive Transmission Line Size	7/8 inch Heliax®
Receive Transmission Length	Based on tower height
Field Unit Parameters	Value
Type of Unit	Portable radio
Environment	Outdoors, on-street
Antenna Height	5 feet
Transmit Power	3 watts

Preliminary coverage maps for portable radio talk-in and talk-out are shown on the following pages. The color coding for these maps is:

- Light Green: Reliable signal coverage 40 dBu or greater
- Yellow: Reliable signal coverage 33 dBu or greater
- Red: Marginal signal coverage 19 dBu or greater
- White: No useable coverage expected 10 dBu or less

Five predicted-coverage maps are provided in this plan; all maps utilize all tower sites within and outside of the county that provide coverage in the target service area:

1. State of Minnesota prepared coverage map for Lake of the Woods County (from 2008).
2. Mobile (vehicle-mounted) radio coverage
3. On-Street portable radio coverage
4. In-building countywide coverage
5. In-building coverage in the Baudette area

As shown in the predicted coverage maps on the following pages, the potential coverage for the system, using the selected sites and parameters is very good and is expected to meet the project coverage goals.

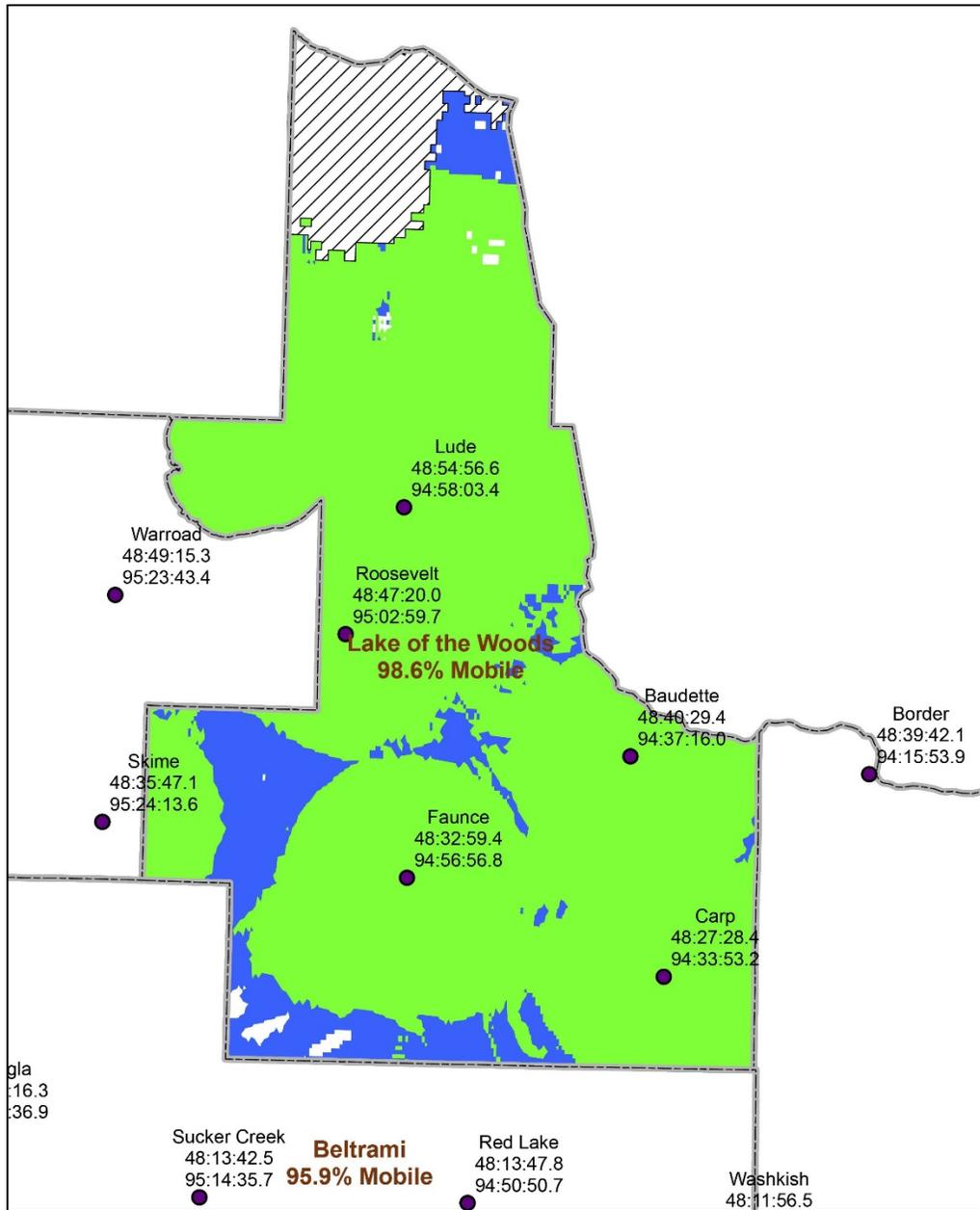
The first map presented in this plan is the original predicted coverage map provided by the State of Minnesota for the Lake of the Woods County geographical area.

All maps were created using RadioSoft© ComStudy2© software program, and the modeling for the coverage analysis was done with the Longley-Rice and Okumura propagation models. The modeling parameters used by the State and RFCC are similar, however a somewhat different color-coding scheme is used. The State's maps use green areas represent a 40 dBu level of radio signal, which can generally be translated into a level where reliable portable and mobile radio coverage can be expected. The areas shaded in blue represent a 33 dBu level of radio signal, which typically reflects mobile (vehicle-mounted) radio coverage.

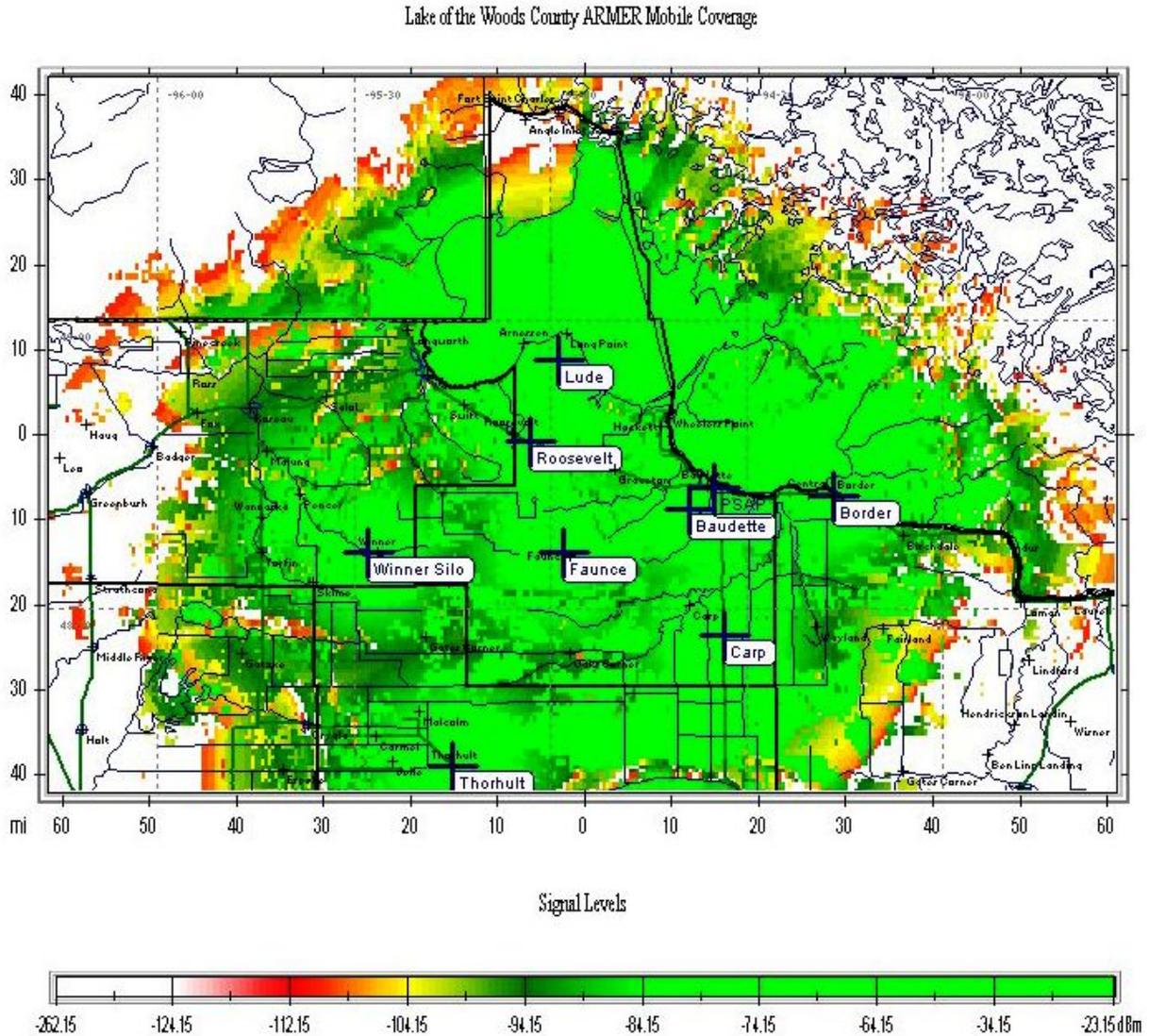
The areas shaded in white reflect a lower level of signal where coverage cannot be predicted, and can be interpreted to represent very weak areas of coverage. The only areas of the county where this is predicted to exist are in the far west and east corner of the county, and are not expected to be problematic.

**Map I: Lake of the Woods County Predicted ARMER Coverage**

(Originally provided by the State of Minnesota in 2008; this map is provided for reference only, and is considered outdated due the changes in tower site locations that have been established since the time of original publication).

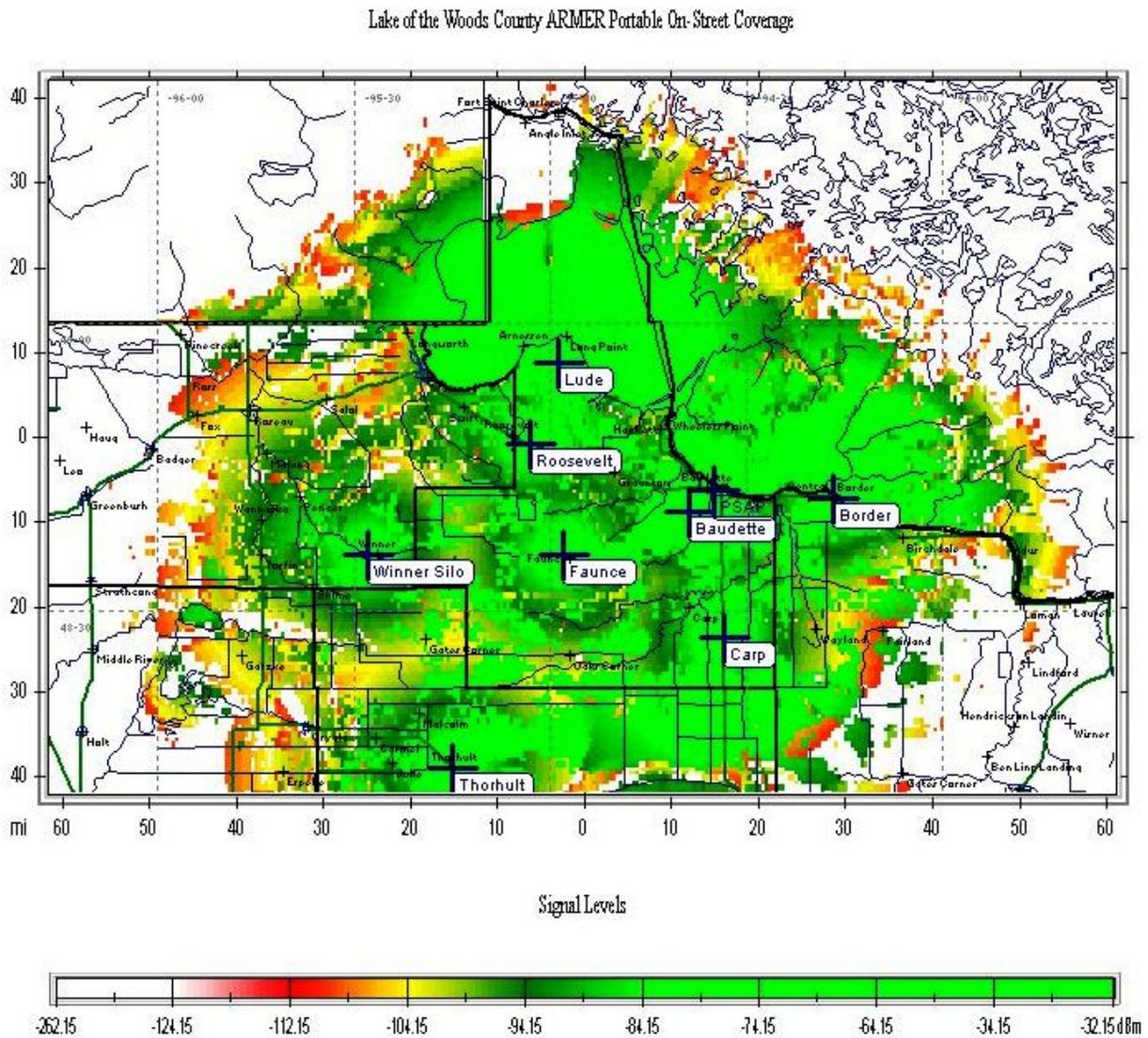


**Map 2:** The map shown below, prepared by RFCC for the county’s ARMER planning process, demonstrates the predicted coverage to be expected for Mobile (vehicle-mounted) radios from the ARMER tower sites to be located within Lake of the Woods County, including the first-tier sites outside the county borders.



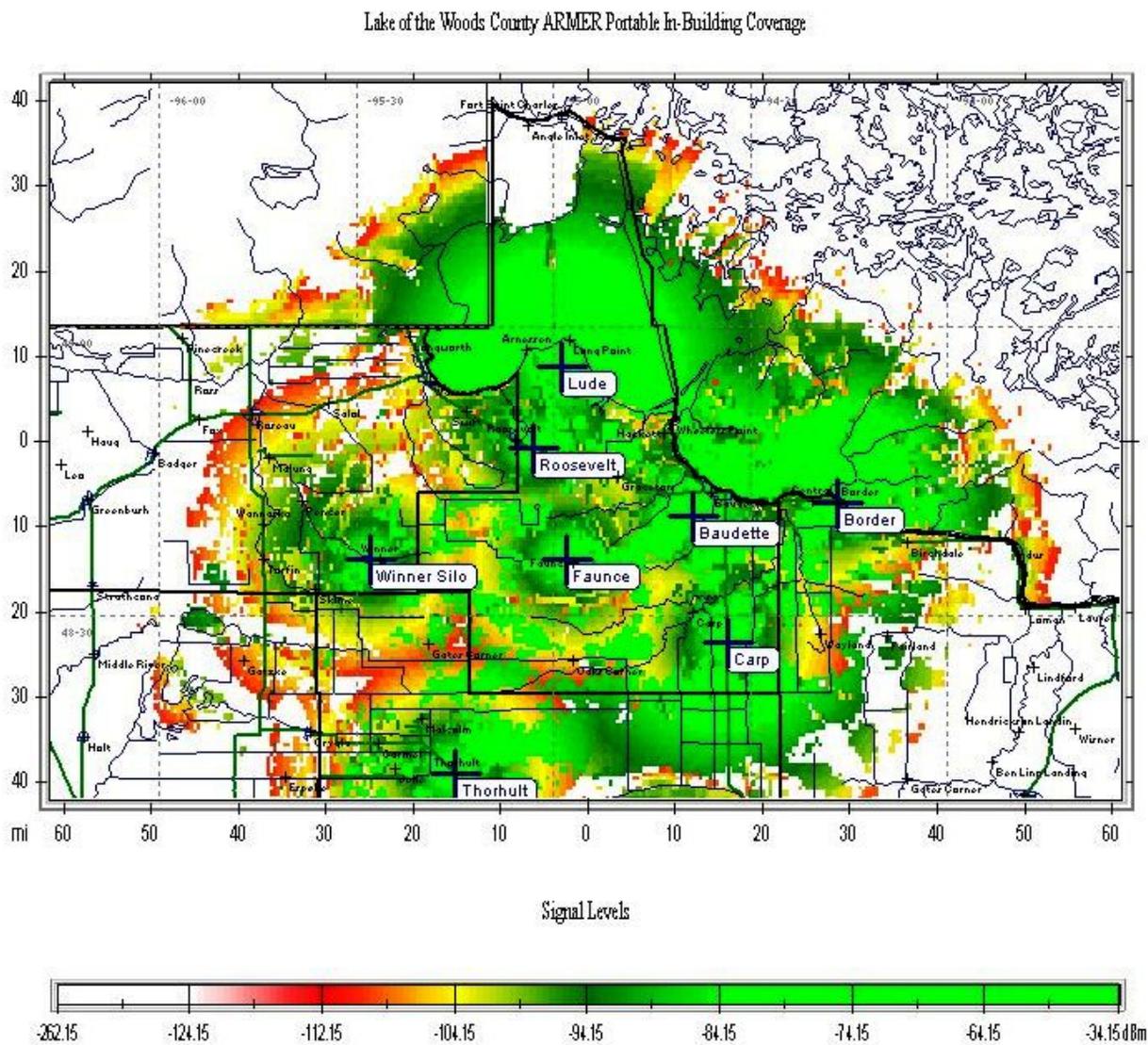
The predicted mobile radio coverage throughout the county is excellent with the planned tower sites, and coverage within the county is enhanced by tower sites outside of the county borders. The only area of concern is up in the far northern area (“Northwest Angle”) of the county.

**Map 3:** The map shown below demonstrates the predicted coverage to be expected for portable (handheld) radios “On Street/Outdoors” from the ARMER tower sites to be located within Lake of the Woods County, including the first-tier sites outside the county borders.



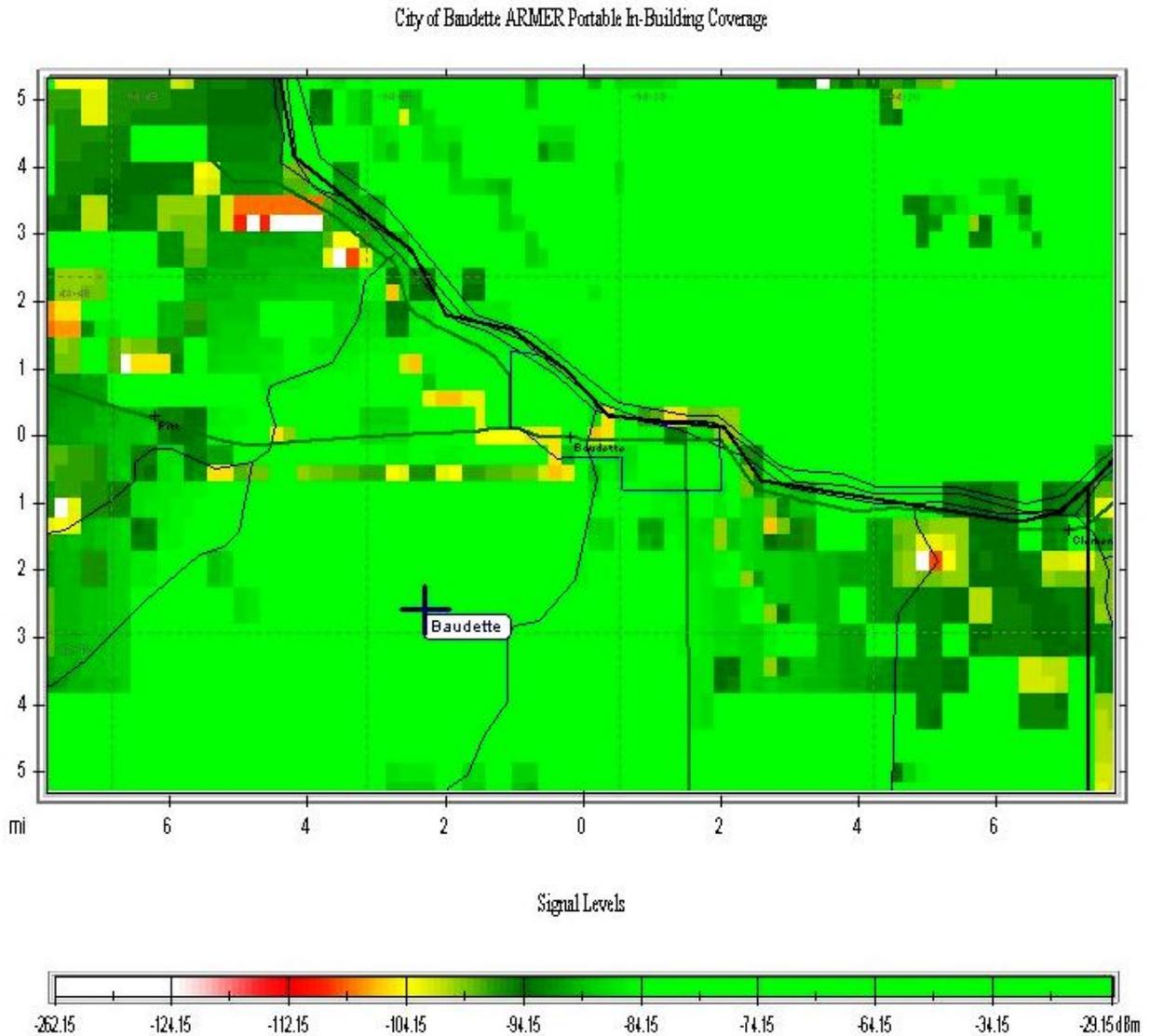
The predicted portable radio coverage throughout most of the county is very good with the planned tower sites, and coverage within the county is enhanced by tower sites outside of the county borders. The primary area of concern again is the Northwest Angle; testing has been conducted with portable radios, with the results confirming the poor coverage as predicted on the map.

**Map 4:** The map shown below demonstrates the predicted in-building (6db loss) coverage to be expected for portable/hand held radios in Lake of the Woods County from the ARMER system when all tower area sites in the region are included in the calculations.



The predicted 6db in-building coverage for Lake of the Woods County is good in many areas, including the city of Baudette. Refer to the map on the next page for more detail of the predicted coverage in the Baudette area. County deputies have observed good in-building coverage in some areas, and poor coverage in others. No coverage is provided in the Northwest Angle.

**Map 5:** This map demonstrates the predicted in-building (6db loss) portable radio coverage to be expected in the Baudette area from the ARMER system when all tower area sites in the region are included in the calculations.



The blue lines on the map indicate the city limits of Baudette, and the dark blue lines indicate highways and main roads. The predicted in-building coverage should be good within the city, although this will depend on the type of building involved. Recent coverage testing has shown good results in wood-framed residential structures, but weaker signal conditions and coverage in higher-density buildings such as the high school.

## C. Contingency Planning

In planning for ARMER system migration and connecting to the ARMER system the following failure modes are being addressed:

1. Loss of connectivity between the dispatch center and the ARMER system.
2. Loss of microwave network (to ARMER tower sites), which will result in the system reverting to site trunking mode.

The primary method of redundancy for Lake of the Woods County operations will be the implementation of multiple 800 MHz RF control stations at the main PSAP location. This would typically include one control station for each primary public safety discipline, such as:

- Law operations
- Fire operations
- EMS operations

Scenario 1 would only occur if multiple RF control stations failed at the PSAP, or the console controlling the stations failed. A separate stand-alone RF control station in the PSAP would be used for dispatch operations if this situation occurred.

If scenario 2 occurs, (local ARMER sites lose connectivity to the master site in Detroit Lakes, or the master site experiences a failure), the sites will revert to a Site Trunking mode, which results the sites operating independently from each other. The effect on field units is that they can only communicate with each other if they are in range of the same tower site. If they are not, communication is not possible. This is due to the local sites and network operating in a multicast mode of operation (rather than simulcast).

The resulting effect on the dispatch center is the same; however, the County will program one or more RF control stations for backup "Site Trunking" operation, which will allow access to at least some of the local tower sites in the county. It is unlikely that the dispatch center would be able to access the Roosevelt or Lude tower sites, due to the dispatch from the dispatch center, but Baudette, Faunce and Carp should not be a problem.

## D. Training

ARMER system implementation and associated operational standards require that all personnel who will be using the system receive proper training on the use, capabilities, and features of the system. Trunked radio systems, including the ARMER system, have operational requirements that differ from traditional conventional repeater systems, and it is necessary that dispatchers and end users be trained on the capabilities and proper operation of the system.

Lake of the Woods County agencies recognize this need, and have conducted initial in-house training for the current radio system users. Additional training is planned through the services of independent contractors recognized by the state as proficient in the operation of the ARMER radio system. The program will include training for the following workgroups and functions:

- Radio end user training
- PSAP dispatchers
- Local system administrator
- Interoperability

Funding for the end user and dispatcher training has been included in the project budget.

## E. Interoperability

The need for interoperability exists on multiple levels within public safety radio operations. Establishing or enhancing interoperability at each of these levels has been a primary consideration in Lake of the Woods County's decision to migrate to the ARMER system. The areas specifically addressed are:

**Internal:** Between the many agencies within the general jurisdictional area of Lake of the Woods County (i.e. law enforcement, fire service, and EMS agencies). The implementation of a common 800 MHz trunked radio system for all public safety agencies, as well as other units of local government, should resolve most interoperability communications issues that may currently exist. To make the ARMER system work effectively will require careful fleet map planning and the proper training of all radio system users.

**External:** Between the county agencies and other public safety (law, fire, and EMS) and government agencies operating both within and sharing borders with Lake of the Woods County, to include the following:

- Roseau agencies
- Beltrami County agencies
- Koochiching County agencies
- Minnesota State Patrol, Mn/DOT, Department of Natural Resources (DNR) enforcement, and fire agencies
- Border Patrol and other Federal law enforcement and fire agencies
- Canadian public safety agencies

Many agencies within the Northwest Region of Minnesota have been moving forward with the ARMER participation planning and implementation process, which will improve communications interoperability for those agencies. Lake of the Woods County is currently bordered by county agencies operating both on 800/ARMER and VHF systems, which will require a combination of solutions to ensure reliable communications between all agencies in the region, regardless of radio system type. Lake of the Woods County will have neighboring agencies operating on both types of systems for the foreseeable future.

To accommodate communications between agencies that may operate with Lake of the Woods County that are not on the ARMER system in the short-term using legacy system technology, access to the ARMER radio system, a variety of interconnectivity options will be needed:

- The most basic requirement will be for Lake of the Woods County to continue operation of their VLaw31 155.4750 MHz base station. This can be patched to an 800 MHz talk group via the PSAP console system when required.
- All Lake of the Woods County Law Enforcement agencies use dual-band radios, capable of both VHF and ARMER/800 MHz operations.
- Lake of the Woods County Fire and EMS agencies will maintain the use of VHF radios in their vehicles, in conjunction with the eventual use of ARMER/800 MHz radios.
- Lake of the Woods County repeater channels will be retained, and will become local “interoperability” channel resources, capable of being patched to the ARMER system, to allow local VHF radio users a simple and effective link to county agencies operating on the ARMER system.

## F. Standards

The primary technology standard applied to this project is that of the Project 25 (P25) ARMER system. The P25 standard is specifically for digital radios systems for public safety. In this case, the Phase I Frequency Division Multiple Access (FDMA) standard is currently in use.

Lake of the Woods County will adopt and comply with the standards published by both the State Radio Board and the Northwest Minnesota Regional Radio Board. Use of these standards will ensure that users in Lake of the Woods County will adopt the same naming conventions, talk group usage, and other operational and technical standards that are in use throughout the state.

## G. Alarms and Monitoring

Mn/DOT – ARMER will have the primary tower site alarm monitoring for sites in the county.

## **H. Maintenance**

Maintenance of the primary ARMER tower sites within Lake of the Woods County will be handled by the Mn/DOT staff. Lake of the Woods County currently contracts with a local authorized service facility for maintenance of any additional 800 MHz system equipment planned for the Lake of the Woods County implementation, including the PSAP equipment.

## **I. System Administration**

Local system administration for Lake of the Woods County will be the responsibility of the Lake of the Woods County Sheriff's Office.

## **J. Other Local Enhancements**

The primary local enhancements to the planned system implementation are:

- VHF interoperability systems

No other tower site or 800 MHz channel expansion local enhancements are planned for the system.

### 3. Project Costs and Budget

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Funding for the purchase of the ARMER system equipment for Lake of the Woods County is being considered from three different sources:

- Local bonding
- Local levy
- Grant opportunities

Grant funding has been received for the purchase of the existing 800 MHz mobile and portable radios for law enforcement agencies in the county. Funding for the remaining system infrastructure equipment has not yet been finalized, but is being reviewed by the county and considered for year 2015 or beyond.

#### Project Cost Estimates:

Item/Category	Estimated Costs
Zetron Console Modifications	\$ 15,000
800 RF Control Stations (Dispatch)	\$ 36,000
800 MHz Subscriber Radios (Law Enforcement)	\$ 20,600
800 MHz Subscriber Radios (Fire agencies)	\$ 75,900
<b>Total Estimated Costs</b>	<b>\$ 147,500</b>
Optional: Public Works/School Radios	\$ 22,200

## 4. Project Implementation

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### A. Schedule

Implementation of the ARMER radio network for an organizational group the size of Lake of the Woods County, with the number of agencies, quantity of radios being planned and dispatch equipment would typically be expected to require 6 to 12 months to complete.

However, Lake of the Woods County law enforcement has migrated to ARMER system use over the past year, and the Law agency radio operations are now conducted via the ARMER system. The county agencies will continue to seek the funding needed to obtain the remaining ARMER-capable mobile and portable radios needed for Fire agencies. The County is also considering replacement of the existing Zetron radio dispatch console with a newer product, but will continue the use of 800 MHz RF control stations.

The County will continue to utilize their existing VHF radio systems over the next few years, and will retain such equipment as needed for Interoperability purposes. The PSAP console equipment is configured to operate both systems (legacy VHF and ARMER).

**Attachment I: Lake of the Woods County Fleet Map**

	<b>Law Enforcement Operations</b>	<b>TG Alias</b>
1	Lake of the Woods County Law 1 (main)	LW Law 1
2	Lake of the Woods County Law 2	LW Law 2
3	Lake of the Woods County Law 3 Encrypted	LW Law 3E
4	Lake of the Woods County Law Car-Car	LW L C2C
5	Lake of the Woods County Law Admin	LW L ADM
6	Baudette Police Department	LW BPD
7	Lake of the Woods County Emergency Mgmt/EOC	LW EM/EOC
	<b>Fire and EMS Operations</b>	<b>TG Alias</b>
8	Lake of the Woods County Fire 1 (main)	LW Fire 1
9	Lake of the Woods County Fire 2	LW Fire 2
10	Lake of the Woods County EMS (main)	LW EMS
11	Lake of the Woods County Baudette Fire TAC	LW BFD TAC
12	Lake of the Woods County Williams Fire TAC	LW WFD TAC
13	Lake of the Woods County Ambulance/EMS TAC	LW EMS TAC
14	Lake of the Woods County Fire/EMS Admin	LW F/E ADM
15	Lake of the Woods County SRU/Rescue	LW SRU
	<b>Local Interoperability</b>	<b>TG Alias</b>
16	Lake of the Woods County Announcement Group	LW ANN ALL
17	Lake of the Woods County Emergency Button	LW EMER
18	Lake of the Woods County 911	LW 911
19	Lake of the Woods County Statewide Roam	LW SW ROAM
20	Lake of the Woods County Public Safety Common 1	LW COM 1
21	Lake of the Woods County Public Safety Common 2	LW COM 2
22	Lake of the Woods County Public Safety Common 3	LW COM 3
	<b>Public Works and Schools</b>	<b>TG Alias</b>
23	Lake of the Woods County Highway Operations 1	LW HWY 1
24	Lake of the Woods County Highway Operations 2	LW HWY 2
25	Future Public Works 1	LW PW 1
26	Future Public Works 2	LW PW 2
28	Lake of the Woods School Security	LW SCH SEC
29	Lake of the Woods County School Transportation 1	LW School 1
30	Lake of the Woods County School Transportation 2	LW School 2
31	Lake of the Woods County Future Use 1	LW Future 1
32	Lake of the Woods County Future Use 2	LW Future 2

All regional and statewide interoperability talk groups will be incorporated into Lake of the Woods County radios as defined by ARMER standards.

## **Attachment 2: References**

1. State of Minnesota “Local Agency and Regional Planning and Contracting for ARMER Participation” (sic) dated September 8, 2008, as published at [www.srb.state.mn.us](http://www.srb.state.mn.us)
2. Federal Engineering “Radio System Needs Assessment and Alternatives Report for Lake of the Woods County” October, 2009
3. RadioSoft™ ComStudy2™ Terrain Database
4. ARMER Status Map, as posted at <http://www.srb.state.mn.us/> dated March 2015
5. Region 22 (Geographic State of Minnesota) 800 MHz Regional Planning Committee “Regional Band Plan” as filed with the FCC, General Docket 87-112; 800 MHz NPSPAC Plan Amendment WT Docket No. 20-55; NPSPAC PR Docket No 93.130 dated June 2009

**REQUEST FOR SPECIAL  
WIDE AREA SITE ACCESS  
FOR AN ARMER TALKGROUP**

**Talkgroup/ Announcement Group Name(s):** Lake of the Woods County Statewide Roam  
(LW SW Roam)

If Announcement Group List all Contained Talkgroups: \_\_\_\_\_

**Sites Requested:**

- Statewide (Requires Statewide Radio Board Approval)
- Other (Specify Sites or Regions):

**Talkgroup Owner Agency (Include Point of Contact Information):**

Agency Name: Lake of the Woods County Sheriff's Office  
Contact Name: Sheriff, Lake of the Woods County (Gary Fish)  
Address: 206 - 8<sup>th</sup> Ave SE  
Baudette, MN 56623  
Phone: 218-634-1143  
Email: Gary\_f@co.lake-of-the-woods.mn.us

**Talkgroup or Announcement Group Type (Check all that Apply):**

- Shared
- Private
- Special Roaming Only Talkgroup - Occasional Use.
- Special Operations Tactical Talkgroup - Occasional Use. **If yes**, describe or list the counties or regions covered by a mutual aid agreement, memorandum of understanding, joint powers agreement, incident response plan or other relevant agreements here: \_\_\_\_\_
- Main Dispatch or Tactical Talkgroup - Day to Day Use. **If yes**, applicant must demonstrate that the users of this talkgroup conduct their "Normal Day to Day Business Operations" throughout the requested coverage area. Describe or list the counties or regions where the users of this talkgroup conduct their "Normal Day to Day Business Operations" here: \_\_\_\_\_

**Describe the users, entities or agencies that will operate on this talkgroup:**

*The "LW SW Roam" talk group is intended to allow Lake of the Woods County public safety agency personnel the ability to contact Lake of the Woods County dispatch when outside of the Lake of the Woods County geographical service area. It may also be used for two Lake of the Woods County public safety personnel to communicate with each other when operating outside of the county geographical area (and outside the operational range of an SOA channel).*

**Describe the type of operations that will occur on this talkgroup:**

*The two most common uses of this talk group are 1) Prisoner transports, and 2) Communications between two Lake of the Woods County field units when outside of the county geographical operating area.*

**Describe the anticipated frequency, duration and extent of use of this talkgroup:**

*The use of this talk group will be very minimal, perhaps twice a week, primarily for prisoner transport. There will NOT be any routine dispatch or operational traffic on this talk group.*

**Describe why the Statewide Shared Incident Response talkgroups or other shared roaming talkgroups are not suitable to meet these operational requirements:**

*It is unlikely that the Lake of the Woods County PSAP would be monitoring the various Statewide Shared Incident Response or Roaming talk groups, and the purpose for which Lake of the Woods County units would need to communicate would not necessarily appear to fit the intended use of those talk groups.*

 Jill Hasbungen Olson  
Talkgroup Owner Agency Authorized Official - Signature & Date 5/26/2015

Gary Fish, Sheriff – Lake of the Woods County MN  
Printed Name and Title



# **Roseau County, Minnesota**

## **ARMER Radio System Participation Plan**

May 2015

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# ARMER Participation Plan

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## I. Introduction

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### A. ARMER System Application – Roseau County

Roseau County, Minnesota, and the city and county agencies within the county, request approval for participation in and use of the State of Minnesota Allied Radio Matrix for Emergency Response (ARMER) radio system. The county and its agencies plan to be “Full Participants” in the ARMER system, and will migrate all primary voice communications services to the network, once fully implemented.

The county requests that this application and plan be reviewed and approved by the following agencies:

- Northwest Minnesota Regional Advisory Committee (NW RAC)
- Northwest Minnesota Regional Radio Board (NW RRB)
- State of Minnesota Radio Board Operations and Technical Committee (OTC)

In 2011 Roseau County had submitted a “Limited ARMER Interoperability Plan” which outlined the county’s intent to use both ARMER and VHF radio system resources for the next several years, while updates were being made to their radio networks. Decisions were also being made regarding what level of ARMER system use and involvement were desired by the county. Since that time, all law enforcement operations have migrated to the ARMER system and no longer use VHF, other than for interoperability with neighboring agencies. The fire and EMS agencies within the county now also have some number of ARMER radios, and are slowly migrating to ARMER use.

The plan now being presented replaces the previous plan, and reflects the county’s increased and continued use of the ARMER system. VHF resources will continue to be used for interoperability and voice paging services.

Roseau County’s plan has been developed based on the requirements and operational standards established for participation in and use of the ARMER radio system.<sup>1</sup> The county desires to contract as required with the Northwest Regional Radio Board and the State of Minnesota Department of Transportation (Mn/DOT) for use of the ARMER system once approved.

A list of the local city and county agencies within the county that plan to be included in the use of this system is provided in Section I.D of this planning document.

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<sup>1</sup> All endnotes are attached at the end of the report (Attachment 2) under the heading of “References.”

## B. Project Summary

Roseau County, Minnesota, and the public safety entities within Roseau County have developed a plan for the migration from existing VHF public safety radio systems currently used by those agencies to the ARMER network. A comprehensive radio system analysis was conducted in 2009, which presented options for either continued VHF radio operations, or a migration to the 800 MHz ARMER system.

The primary goals of a new radio communications system are:

- Provide improved radio system reliability, coverage, and capacity
- Replacement of the existing aging VHF radio system equipment
- Provide expanded county and region wide interoperability between public safety agencies, whether utilizing VHF or 800 MHz radio systems

After a thorough review of the options available, the county has determined that a migration to the 800 MHz ARMER radio system, utilizing the system's multi-site, digital, and Trunking technologies would best meet the county agencies radio communications goals, and will provide the required level of interoperability between public safety agencies in the region.

The primary points of contact for this project are:

Sheriff Steve Gust  
Roseau County Sheriff's Office  
605 – 5<sup>th</sup> Ave SW  
Roseau, MN 56751  
218-463-1421 Phone  
[steve.gust@co.roseau.mn.us](mailto:steve.gust@co.roseau.mn.us)

Rey Freeman  
RFCC  
13517 Larkin Drive  
Minnetonka, MN 55305  
952-541-0747 Phone  
[rfreeman@isd.net](mailto:rfreeman@isd.net)

## C. Jurisdictional Coverage of System

The radio system is intended to provide radio communications throughout the geographic area of Roseau County, Minnesota. Roseau County is located in the northwest area of Minnesota, covering 1,672 square miles, with a population of 15,629 people. The terrain of Roseau County is relatively flat, with ground elevations ranging from 984 feet in the north western areas to 1,250 feet in the southeastern area.

## D. Entities and Users Participating in the Planned System

It is the intent of Roseau County and the agencies within to implement a shared radio system that will incorporate both public safety and additional governmental agencies. The list contains all of the agencies planning to participate in the system at this time.

<b>Participating Public Safety Agencies (11)</b>	
Roseau County Sheriff's Office	Greenbush Fire Department
City of Roseau Police Department	Greenbush EMS
Warroad Police Department	Roosevelt First Responders
City of Roseau Fire Department	Warroad Fire Department
Roseau EMS	Wannaska First Responders
Badger Fire Department	
<b>Participating Public Works and School Departments (2)</b>	
Roseau County Highway Department	Roseau School District

### E. Existing VHF System Configuration

The existing Roseau County voice radio systems operate on VHF (150-160 MHz) frequencies, providing radio channels for law enforcement, fire, and Emergency Medical Service (EMS)/ambulance operations. The dispatch center is physically located at the Roseau County Sheriff's Office in the city of Roseau, Minnesota.

The existing Roseau County radio system consists of multiple VHF base and repeater stations located at tower sites around the county. The following primary tower site(s) are used for the Roseau County system.

- Roseau County Sheriff's Office

All radio equipment located at the tower or other remote sites is controlled from the dispatch center via in-house telephone circuits or VHF radio links. The primary VHF radio system infrastructure equipment used by the county is a variety of newer Harris base and repeater stations. Most stations are in good operating condition, and are operating on narrowband (12.5 kHz) radio frequencies. A 2-position Zetron 4048 PC-based radio control console is used in the Roseau dispatch center.

The radio system consists of separate VHF channels and base/repeater stations for Sheriff/law, and fire/EMS operations, which are located at the tower site(s) noted above, as well as at various fire halls throughout the county. The Sheriff/law radio network consists of multiple law repeater channels and sites, along with local Minnesota Statewide Emergency Frequency (MNSEF/VLaw31) and point-to-point stations. The fire/EMS radio networks consist of multiple independent stand-alone base stations located at various tower sites around the county, which also provides tone-and-voice paging capabilities. The radio users and dispatchers manually select the proper tower site based on the radio or service location.

## 2. ARMER System Technical Review

### A. System Design

During the local ARMER system implementation planning process, work was done to determine what type of configuration would be appropriate for the Roseau County radio system. Since the basic structure of the ARMER system as a multicast digital trunked radio system will meet the needs of Roseau County agencies, they plan to utilize the system in this planned multicast configuration.

Primary planning factors:

- System infrastructure and equipment plans
- Tower site planning
- Tower site and Public Safety Answering Point (PSAP) connectivity
- 800 MHz channel requirements
- 800 MHz talk group requirements
- Quantity of end user radios

Specific details of how these system parameters will be addressed are provided in this section of the document.

#### i) System Infrastructure and Tower Site Planning

The ARMER system plan that exists for the Roseau County area includes four tower sites within the county borders, as well as additional sites outside the county borders that will provide some level of coverage within the county. The following sites are planned for within Roseau County:

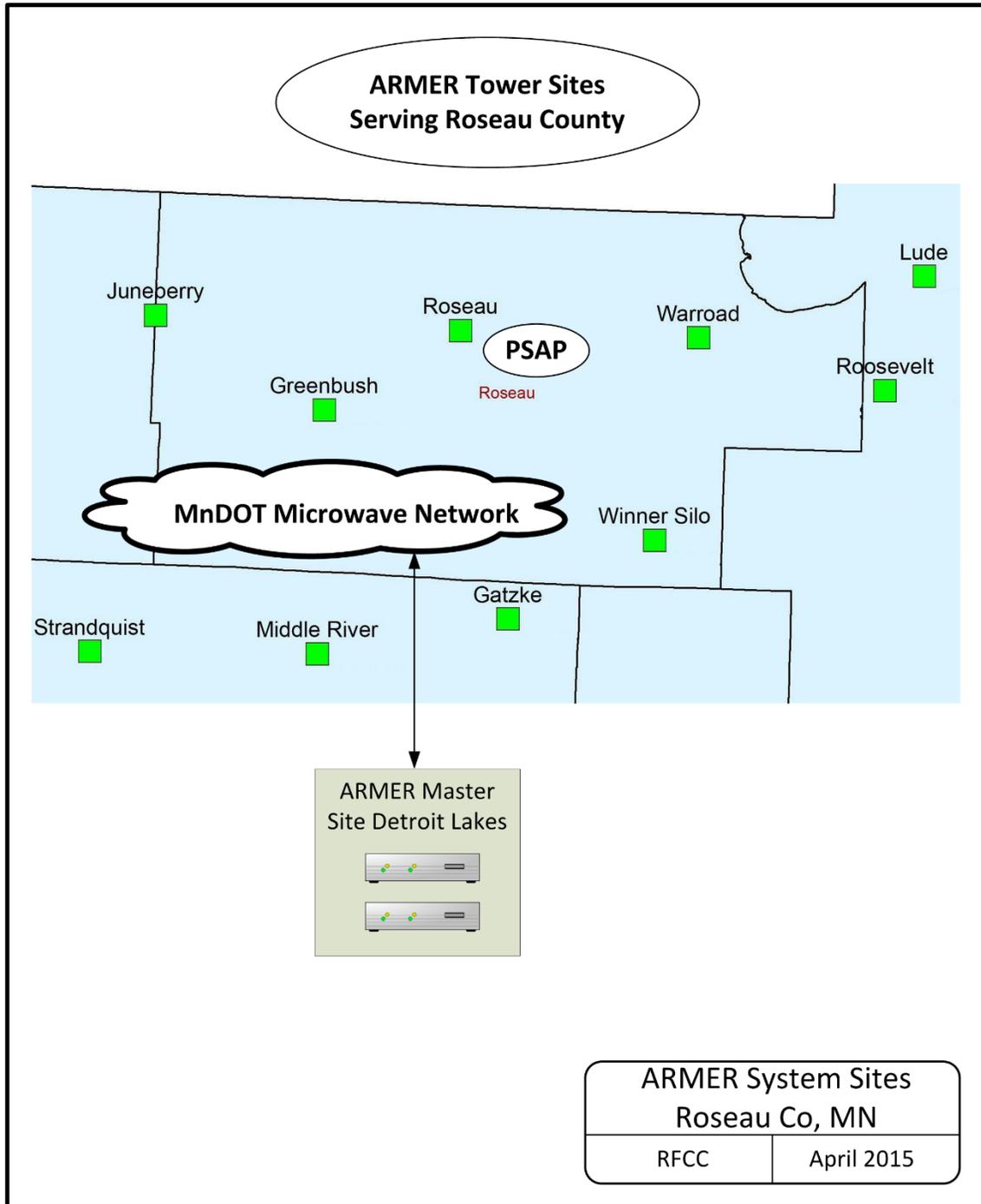
Roseau	Greenbush	Warroad	Winner Silo
--------	-----------	---------	-------------

The following sites are located outside of but on or near the county border and will provide coverage within Roseau County:

Juneberry	Middle River	Gatzke
Roosevelt	Lude	Strandquist

Refer to the diagram below for a high-level overview of the ARMER tower site details for the proposed system implementation for Roseau County.

### Roseau County ARMER System Tower Site Architecture



## ii) Local Equipment Additions and Enhancements

The ARMER planning study conducted for Roseau County determined that no additional local enhancement, tower sites (coverage), or channel capacity are required or planned. The ARMER tower sites in Roseau County and surrounding areas have demonstrated a high level of reliable coverage for the county's agencies, based on use over the past year, and no additional tower sites are planned. Refer to Section B of this plan for a review of 800 MHz coverage.

A review of the number of radios planned for use in Roseau County, along with the number of talk groups, in conjunction with current and expected radio traffic levels was conducted to determine if any additional 800 MHz channel capacity will be needed at the local ARMER tower sites. Considering these factors, and the resulting traffic loading calculations included in this ARMER Plan, no channel expansion should be needed at the ARMER sites serving the county. Refer to Section A. vii) of this plan for a review of calculated 800 MHz channel traffic loading.

## iii) PSAP/Dispatch Center Equipment and Logging/Recording

The Roseau County dispatch center currently utilizes a two-position Zetron 4048 PC-based radio console control system. This console system is now connected to the county's existing VHF system equipment, as well as eight (8) 800 MHz RF control stations, for use on local Roseau County, NW Region talk groups, as well as selected statewide talk groups.

Roseau County is including a two-phased approach for PSAP console equipment in this ARMER participation plan:

Phase 1 of the implementation plan, which is their current configuration, will retain the existing Zetron 4048 console equipment and eight 800 MHz RF control stations for access to the local, regional and statewide talk groups available to Roseau County. It is expected that this configuration will be used for the next two to three years.

Phase 2 of the implementation plan, which is being considered as a long-term option (dependent on funding), will replace the existing Zetron consoles with a new Motorola MCC7500 3-position console system for use with the ARMER system. The county would notify the Region, State and OTC at the time the Phase 2 transition was being planned.

*A total of 20 Conventional Channel Gateway (CCGWs) ports are being planned for the Phase 2 (MCC7500) implementation.*

High-level system connectivity diagrams are provided on the following pages.

**Voice Logging:** The dispatch center will continue to use its existing local voice logging recorder for the recording of ARMER and conventional channel radio traffic. A limited number of local ARMER talk groups will be recorded at the PSAP, and will be handled via local 800 MHz RF control stations.

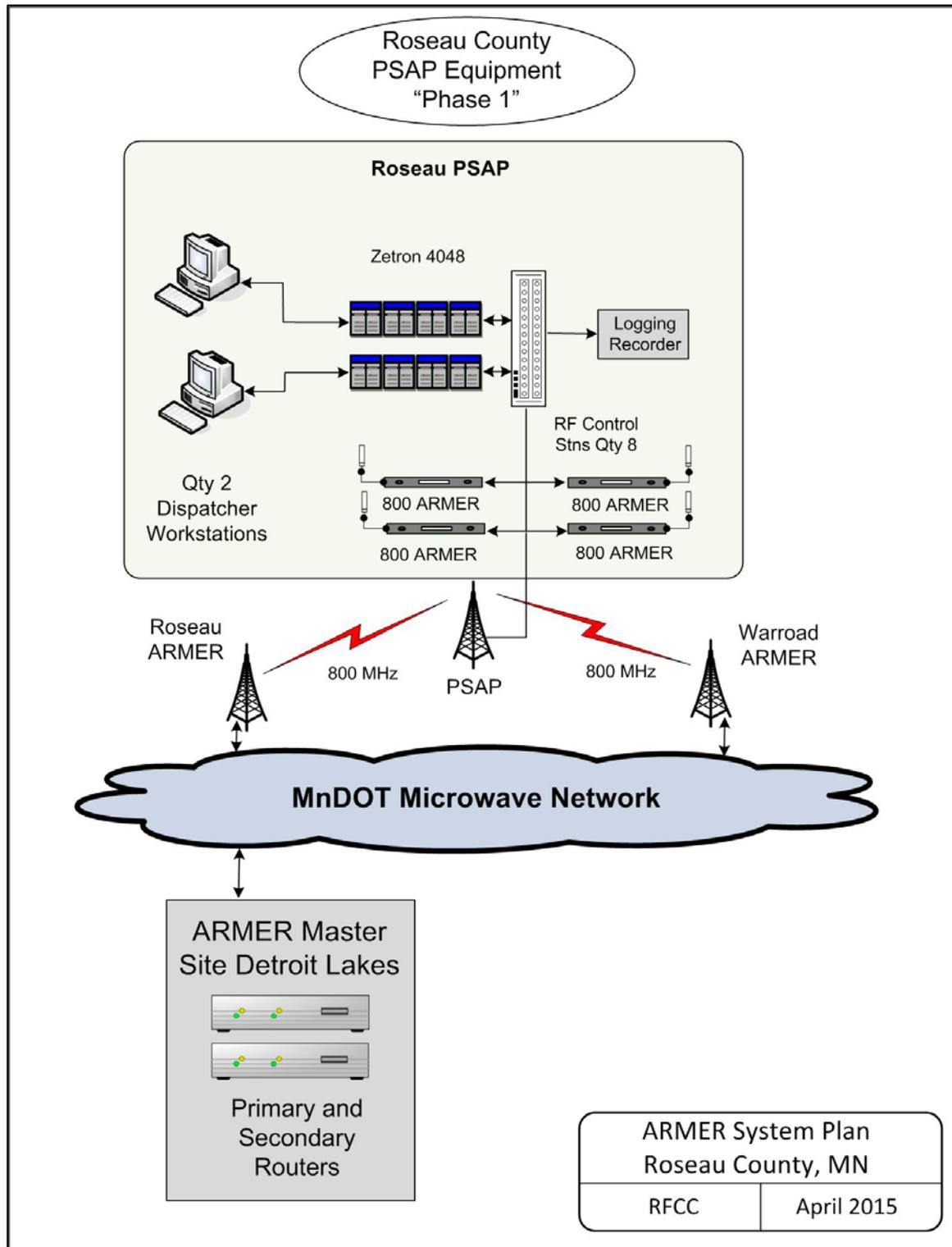
#### **iv) PSAP Connectivity**

Connectivity between the Roseau County dispatch center and the ARMER system is required for operation of the system talk groups, as well other non-trunked conventional channel resources.

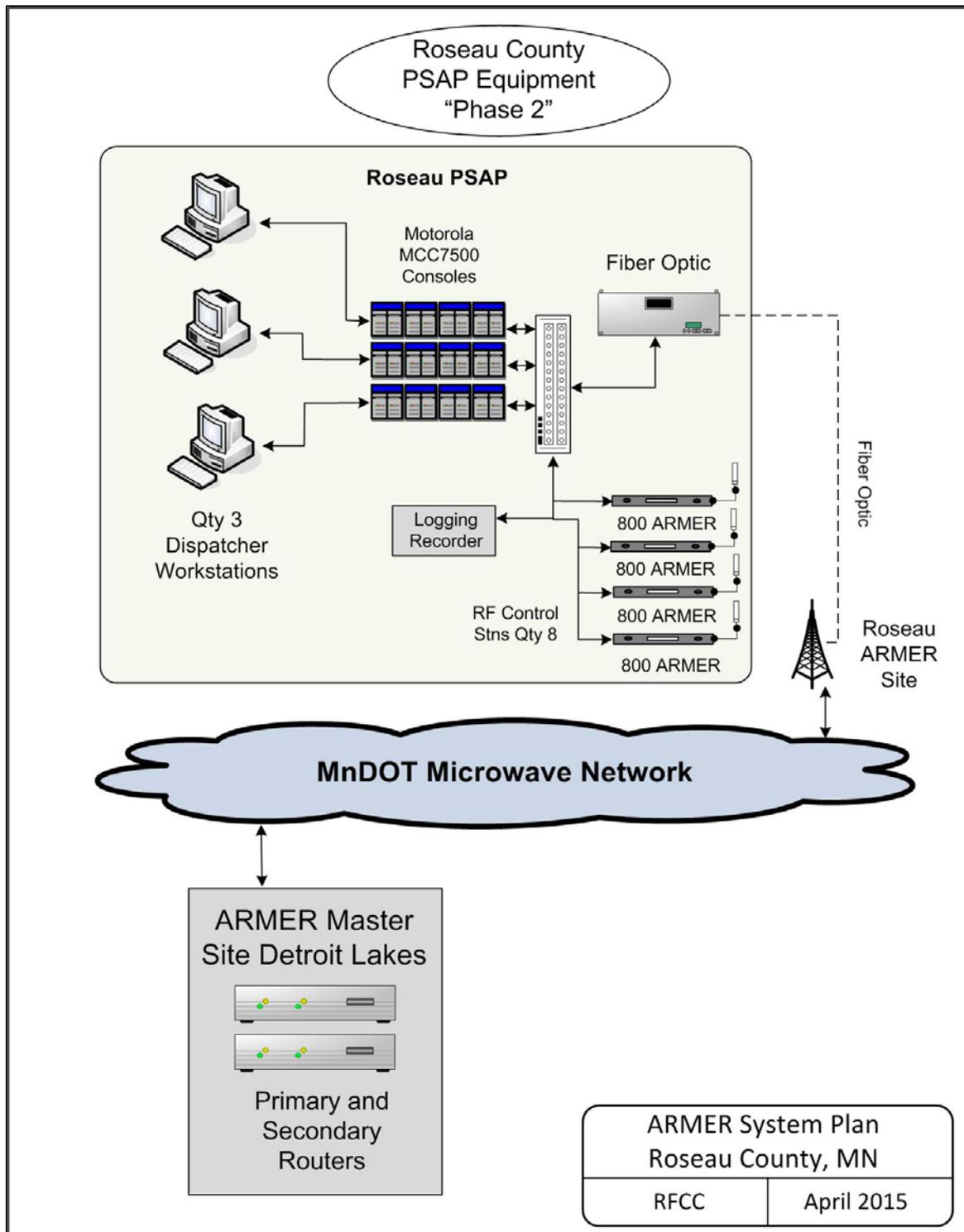
**Phase 1:** The Zetron consoles currently being used by the county are connected to a group of eight (8) 800 MHz RF control stations located at the county's PSAP. These stations communicate on-channel with the Roseau and other ARMER tower sites.

**Phase 2:** Roseau County has an existing fiber optic link between the PSAP in Roseau to the Roseau ARMER tower site, which is located approximately three miles west of the PSAP. The county will utilize this fiber optic link if/when new MCC7500 consoles are implemented at the PSAP.

### Roseau County PSAP ARMER Architecture (Phase I)



### Roseau County PSAP ARMER Architecture (Phase 2)



### v) Subscriber Radios

The 800 MHz subscriber (mobile and portable) radio inventory planning work conducted with Roseau County agencies has identified the following maximum estimated quantities of radios to be utilized on the system:

<b>Agency Type</b>	<b>Mobile</b>	<b>Portable</b>	<b>Base</b>
Law Enforcement	14	29	8
Fire/EMS	27	127	3
Public Works	2	2	0
Schools/Other	0	14	0
<b>Totals</b>	<b>45</b>	<b>174</b>	<b>11</b>

A total of 230 mobile, portable and control base radios would be implemented in the system, if all agencies purchase or obtain the radios identified within this plan. This includes the total potential for three year growth for the agencies within the county. The county agencies currently have a total of 61 radios on hand, which are now being used on the ARMER system. A detailed breakdown of Roseau County's mobile, portable, and VHF radio pager inventory requirements and cost estimates is provided on the next page. Agencies throughout the county will be able to use this opportunity to purchase and implement standard radio types for use within the system, which will promote user commonality and interoperability between the various agencies. As noted previously, the Sheriff's Office has purchased all mobile and portable radios required for law enforcement operations on the ARMER system.

**Roseau County MN  
 800 MHz Radio Inventory and Cost Data**

Total of 800 MHz Mobile and Portable Radio Equipment Required for System Implementation											Totals
Agency	Dual Band Mobile @ \$6,000	Mid-Tier Mobile Radios w/DES @ \$4,000	Mid-Tier Mobile Radios no DES @ \$3200	Mid-Tier Mob Radios Dual Control @ \$3800	Dual Band Portable @ \$6,000	Mid-Tier Port Radios w/DES @ \$3,300	Mid-Tier Port Radios no DES @ \$2500	Low-Tier Mobile Radios @ \$2,200	Low-Tier Portable Radios @ \$1,900	800 Mhz RF Control Stations @ \$6,000	Total Agency Radio Equipment Costs (Maximum)
Roseau Co Sheriff (on hand)	10					14					NA
Roseau Police (on hand)	2					8					NA
Warroad Police (on hand)	2					7					NA
RS County 911 Dispatch (on hand)										8	NA
<b>Law Agency Totals</b>	<b>14</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>29</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>8</b>	<b>\$ -</b>
Badger Fire (on hand)							2				NA
Badger Fire (near term)			8							1	\$ 31,600
Badger Fire (long term)									26		\$ 49,400
Greenbush Fire (on hand)							2				NA
Greenbush Fire (near term)			5							1	\$ 22,000
Greenbush Fire (long term)									26		\$ 49,400
Roseau Fire (on hand)							4			1	NA
Roseau Fire (near term)			5								\$ 16,000
Roseau Fire (long term)									24		\$ 45,600
Warroad Fire (on hand)							2				NA
Warroad Fire (near term)			6								\$ 19,200
Warroad Fire (long term)									24		\$ 45,600
Greenbush EMS (on hand)				1			2				NA
Roseau EMS (on hand)				2			3				NA
Warroad EMS (on hand)				2			2				NA
Wannaska First Responders									6		\$ 11,400
Roosevelt First Responders									6		\$ 11,400
<b>Fire/EMS Agency Totals</b>	<b>0</b>	<b>0</b>	<b>24</b>	<b>5</b>	<b>0</b>	<b>0</b>	<b>17</b>	<b>0</b>	<b>112</b>	<b>3</b>	<b>\$ 301,600</b>
Roseau County Highway Dept								2	2		\$ 8,200
Roseau Public Works								2	2		\$ 8,200
Roseau School District									10		\$ 19,000
<b>Public Works Agency Totals</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>14</b>	<b>0</b>	<b>\$ 35,400</b>
<b>GRAND TOTALS</b>	<b>14</b>	<b>0</b>	<b>24</b>	<b>5</b>	<b>0</b>	<b>29</b>	<b>17</b>	<b>4</b>	<b>126</b>	<b>11</b>	<b>\$ 337,000</b>

**Total Quantity of Radios: 230**

## vi) System Talk Group Planning and ID Requirements

The original Roseau County Limited/Interoperability ARMER plan submitted in 2011 included 83 talk groups for use by the agencies within the county. A recent check of the ARMER system database indicates that there are 59 talk groups currently affiliated with Roseau County, with eight (8) of these talk groups showing system traffic (March 2015).

The Fleetmap for Roseau County has been updated based on the revised needs of Roseau County agencies, and will have a total of 59 talk groups, using the same talk group ID's currently active in the ARMER system database. Some revision of the talk group names in the database will be needed once the new plan is completed.

In addressing the talk group needs for the county agencies, the following basic outline will be used:

- Primary and secondary dispatch talk groups for law enforcement
- Primary and secondary dispatch talk groups for fire service
- Primary and secondary dispatch talk groups for EMS service
- Individual dispatch talk groups for non-traditional public safety agencies
- Countywide talk groups for special events
- Countywide talk groups for interoperability
- Individual talk group(s) for each participating agency
- Non-trunked tactical talk groups for "Scene of Action" use

Refer to Attachment I for a copy of the preliminary Roseau County fleet map.

A total of 230 ARMER system IDs are expected for the Roseau County implementation, which includes three year estimated totals:

- 220 for mobile and portable subscriber units total expected on the system for all agencies
- 10 for PSAP operations

## vii) 800 MHz Traffic Loading and Frequency Planning

The ARMER system sites within Roseau County will operate in a trunked multicast mode of operation. The state has planned for a group of five 800 MHz frequency pairs to be implemented at each site, and these channels will be shared by all users of the system/sites in the area. These users will include:

- Roseau County agency users
- Neighboring county agency users
- State of Minnesota and Federal agency users

The county recognizes that in a trunked radio system it is important that the tower sites be established with a sufficient number of 800 MHz channels to ensure that all radio users are able to access the system when needed for both routine and emergency radio communications traffic. However, a balance must be

established between providing a sufficient number of channels and the cost of implementing those channels, as well as the increasingly limited number of 800 MHz frequencies available for the channels.

With a maximum radio inventory of approximately 226 local radio units planned for this system, it is expected that the planned five channels will be sufficient at the Roseau County ARMER sites.

When neighboring county and state radios are added to this total, it is possible that a greater number of channels would be needed at the sites. To better calculate the expected traffic loading the Roseau County radio would have on the local tower sites, the industry-standard Erlang-C process has been used in this plan to determine the expected voice traffic on the ARMER system. This process can be used for both telephone and radio networks, where a shared and limited number of communications paths (trunks) are used to handle the voice traffic.

A full discussion of how this process works is beyond the scope of this plan; however, several critical factors are used to determine the expected radio traffic usage of the tower sites:

- Number of local (Roseau County) radios
- Number of neighboring county agency radios that are likely to use any given tower site
- Number of State of Minnesota agency radios that are likely to use the sites
- Number of 800 MHz radio channels available at the site(s)
- Estimation of how many radios are in use/service at a point in time
- Average radio transmission length of time (in seconds)
- Average expected number of transmissions from the radios (per hour)

When these radio inventory and usage parameters are entered into the Erlang calculation formula, a resulting Grade of Service (GOS) parameter is generated, indicating the calculated or expected availability of the radio system channels for the radio users. This GOS number could also be viewed as a “likelihood of getting a busy signal” when pressing the transmit button on a radio. The lower the number, the better GOS.

Public Safety Wireless Network (PSWN), the governmental agency which establishes operational standards and recommendations for public safety radio communications, has established a minimum GOS for these radio systems at “equal or less than two percent.”

In other words, there should be less than a two percent chance that a radio user’s transmission would be blocked by the system due to radio traffic levels. This could also be viewed as “greater than 98 percent” chance of a radio user’s transmission being properly handled by the system when needed. This two percent GOS is considered a “Standard Busy Hour” level of usage. It should be noted that many agencies have elected to move beyond the PSWN recommendation and a common goal in Public Safety today is a GOS of 1 or better.

The parameters used for the Roseau County radio traffic calculations are as follows:

- Quantity 230 Roseau County radios (three year maximum)
- Quantity 150 neighboring county radios (interoperability use in Roseau County)
- Quantity 150 State of Minnesota agency radios
- 33 percent estimate percentage of how many radios are in use/service at one time
- 8 seconds average radio transmission length of time (in seconds)
- .51 average expected number of transmissions from the radios (per hour)
- 1.5 seconds average busy time (in seconds)

The GOS is then calculated for each site, based on the number of radio channels planned for the sites, to show the impact of the differing number of channels that would be implemented at the sites.

This formula does not necessarily incorporate any parameter for the number of talk groups being planned for use by the local county agencies. The number of talk groups can have a dramatic effect on system loading, as the larger the number of talk groups, the greater potential for spreading the traffic among the RF channels. Nonetheless, it remains the most reliable method for calculating radio traffic levels.

The table shown below contains the predicted 800 MHz radio channel and tower site traffic loading for typical operational radio activity for the sites that are located within Roseau County, based on the parameters in the previous data table:

**Predicted 800 MHz Standard Voice Channel Traffic Loading for Roseau County**

Site and GOS	Number of Voice Channels Normal Conditions				
	1	2	3	4	5
Roseau	30.5%	3.7%	0.3%	0.0%	0.0%
Greenbush	26.5%	2.9%	0.2%	0.0%	0.0%
Juneberry	19.7%	1.6%	0.1%	0.0%	0.0%
Roosevelt	26.5%	2.9%	0.2%	0.0%	0.0%
Warroad	25.7%	2.7%	0.2%	0.0%	0.0%
Winner Silo	19.7%	1.6%	0.1%	0.0%	0.0%

One channel at each site is allocated as the Control Channel, which is not used for voice and not reflected in the table above. As shown, a GOS of better than one percent is achieved with three channels per site (highlighted in yellow), less that the total quantity being installed by the state at each of the county sites. This would indicate that no additional channels should be needed at the county sites.

The above calculations are again based on the PSWN “Standard Busy Hour” calculations, and do not account for the increased traffic loads that would be expected during emergency periods (tornado, large fire, multiple events). PSWN has established a recommendation of an additional 20 percent capacity for

these events. Refer to the following table for the predicted ARMER system traffic loading and GOS for the Roseau County sites when the PSWN 20 percent additional emergency operations data is incorporated into the usage calculations.

**Predicted 800 MHz Voice Channel Traffic Emergency Loading for Roseau County**

Site and GOS	Number of Voice Channels Emergency Conditions				
	1	2	3	4	5
Roseau	67.8%	15.3%	2.7%	0.4%	0.0%
Greenbush	58.7%	12.2%	2.0%	2.0%	0.0%
Juneberry	26.9%	2.9%	0.2%	0.0%	0.0%
Roosevelt	58.7%	12.2%	2.0%	2.0%	0.0%
Warroad	61.1%	12.8%	2.1%	0.3%	0.0%
Winner Silo	26.9%	2.9%	0.2%	0.0%	0.0%

As shown, three voice channels are adequate to maintain the minimum recommended GOS during emergency traffic periods at all sites other than Roseau and Warroad, where 4 channels are needed. The State of Minnesota will be implementing four voice channels at all sites, so no additional channels should be needed at the ARMER sites. Because of the reasonable number of talk groups planned by Roseau County agencies (59), we do not believe that Roseau County’s implementation will have a significant impact on the system loading at the remaining sites, and should not be a factor requiring additional RF channel capacity. This also includes additional future capacity for the local sites in the event that other governmental agencies (schools, transportation) elect to join the system in the future.

The State of Minnesota has obtained the 800 MHz frequency assignments for the basic five channel configuration needed for the five tower sites within Roseau County. The table on the following page is the current available 800 MHz frequency data for the Roseau County ARMER tower sites. The channels listed as “Roseau Co.” have been assigned to Roseau County via the state’s 800 MHz NPSPAC channel plan, and while they have not yet been assigned to a specific site, they could be used for the system at some point. Channels and sites with a “?” listed may have been assigned a non-NPSPAC 800 MHz channel, but this information is not readily available at this time.

### 800 MHz Frequency Assignments for ARMER Sites in Roseau County

Site	Chan 1	Chan 2	Chan 3	Chan 4	Chan 5
Roseau County	91	118	138	197	217
Roseau	22	38	58	157	174
Greenbush	16	132	146	172	PS
Juneberry	2	70	88	183	PS
Warroad	7	66	126	151	191
Winner Silo	36	78	143	160	PS

**(PS = Public Safety/Non-NPSPAC channels)**

#### viii) Legacy VHF Equipment

The county will continue to operate and control a number of existing or updated VHF radio system channels, for local paging and interoperability. Emergency paging for fire and EMS operations is currently conducted via county-owned VHF system(s). These existing systems will be retained and modified or expanded as needed for improved paging coverage. This expansion will include the installation of some equipment at ARMER tower sites for improved coverage and reliability.

In addition, the existing law enforcement VHF repeater channels may be utilized for local interoperability between VHF and 800 MHz radio system users.

## B. Coverage Review

### i) Design Parameters

The overall system design and resulting communications coverage of the ARMER system can be affected by the following goals and concerns:

- Desire to obtain in-building coverage as best as possible in more densely populated areas of the county
- Need to cover the geographic area with a reasonable number of tower sites
- Cost of developing new tower sites, including structures, land acquisition, Federal Aviation Administration (FAA)/FCC/National Environmental Policy Act (NEPA) considerations, as well as local zoning
- Availability of and costs associated with existing and planned tower sites

The existing and planned tower sites planned for this project are being provided by the State's ARMER network. The coverage goal for Roseau County is 95 percent "on-the-street/outdoor" reliability to a portable radio with a standard antenna held at a height of five feet above ground level.

## ii) Coverage Propagation Mapping

In the planning for this project, coverage modeling and propagation analysis was done to determine if the basic tower site planning assumptions were valid and could be expected to result in a system that would meet Roseau County's coverage needs.

These coverage maps were generated with the RadioSoft® ComStudy2® software program. The modeling for the coverage analysis was done with both the Okumura and Longley-Rice propagation models. The coverage maps were done for portable talk-in and talk-out usage, as this is the most difficult coverage scenario. If the basic system design shows the portable goals are attainable, then mobile coverage should not be a concern.

Provided below are the parameters used for the coverage modeling:

Site Parameters	Value
Transmit Antenna Gain	9 db, omnidirectional
Transmit Output Power (into main line)	35 watts
Transmission Line Size (tower over 300 feet)	1.25 inch Heliac®
Transmission Line Size (tower under 300 feet)	7/8 inch Heliac®
Transmission Line Length	Based on tower height
Receive Antenna Gain	9db, omnidirectional
Receive Tower Top Amplifier Gain	5db
Receive Transmission Line Size	7/8 inch Heliac®
Receive Transmission Length	Based on tower height
Field Unit Parameters	Value
Type of Unit	Portable radio
Environment	Outdoors, on-street
Antenna Height	5 feet
Transmit Power	3 watts

Preliminary coverage maps for portable radio talk-in and talk-out are shown on the following pages. The color coding for these maps is:

- Light Green: Reliable signal coverage 40 dBu or greater
- Yellow: Reliable signal coverage 33 dBu or greater
- Red: Marginal signal coverage 19 dBu or greater
- White: No useable coverage expected 10 dBu or less

Six predicted-coverage maps are provided in this plan; all maps utilize all tower sites within and outside of the county that provide coverage in the target service area:

1. State of Minnesota prepared coverage map for Roseau County (from 2008).
2. Mobile (vehicle-mounted) radio coverage
3. On-Street portable radio coverage
4. In-building countywide coverage
5. In-building coverage in the City of Roseau area
6. In-building coverage in the City of Warroad area

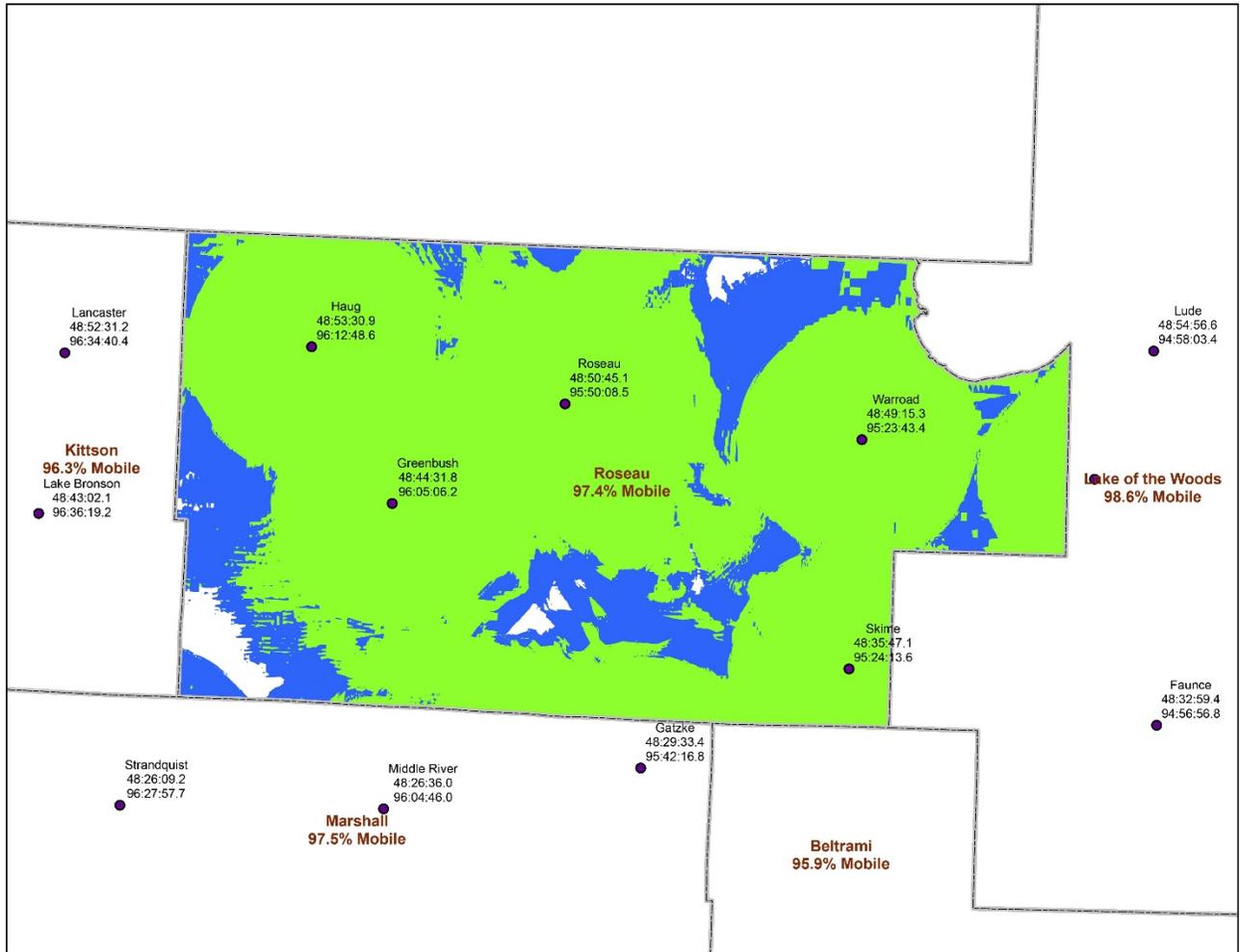
As shown in the predicted coverage maps on the following pages, the potential coverage for the system, using the selected sites and parameters is very good and is expected to meet the project coverage goals. The first map presented in this plan is the predicted coverage map provided by the State of Minnesota for the Roseau County geographical area.

All maps were created using RadioSoft© ComStudy2© software program, and the modeling for the coverage analysis was done with the Longley-Rice and Okumura propagation models. The modeling parameters used by the State and RFCC are similar, however a somewhat different color-coding scheme is used. The State's maps use green areas represent a 40 dBu level of radio signal, which can generally be translated into a level where reliable portable and mobile radio coverage can be expected. The areas shaded in blue represent a 33 dBu level of radio signal, which typically reflects mobile (vehicle-mounted) radio coverage.

The areas shaded in white reflect a lower level of signal where coverage cannot be predicted, and can be interpreted to represent very weak areas of coverage. The only areas of the county where this is predicted to exist are in the far west and east corner of the county, and are not expected to be problematic.

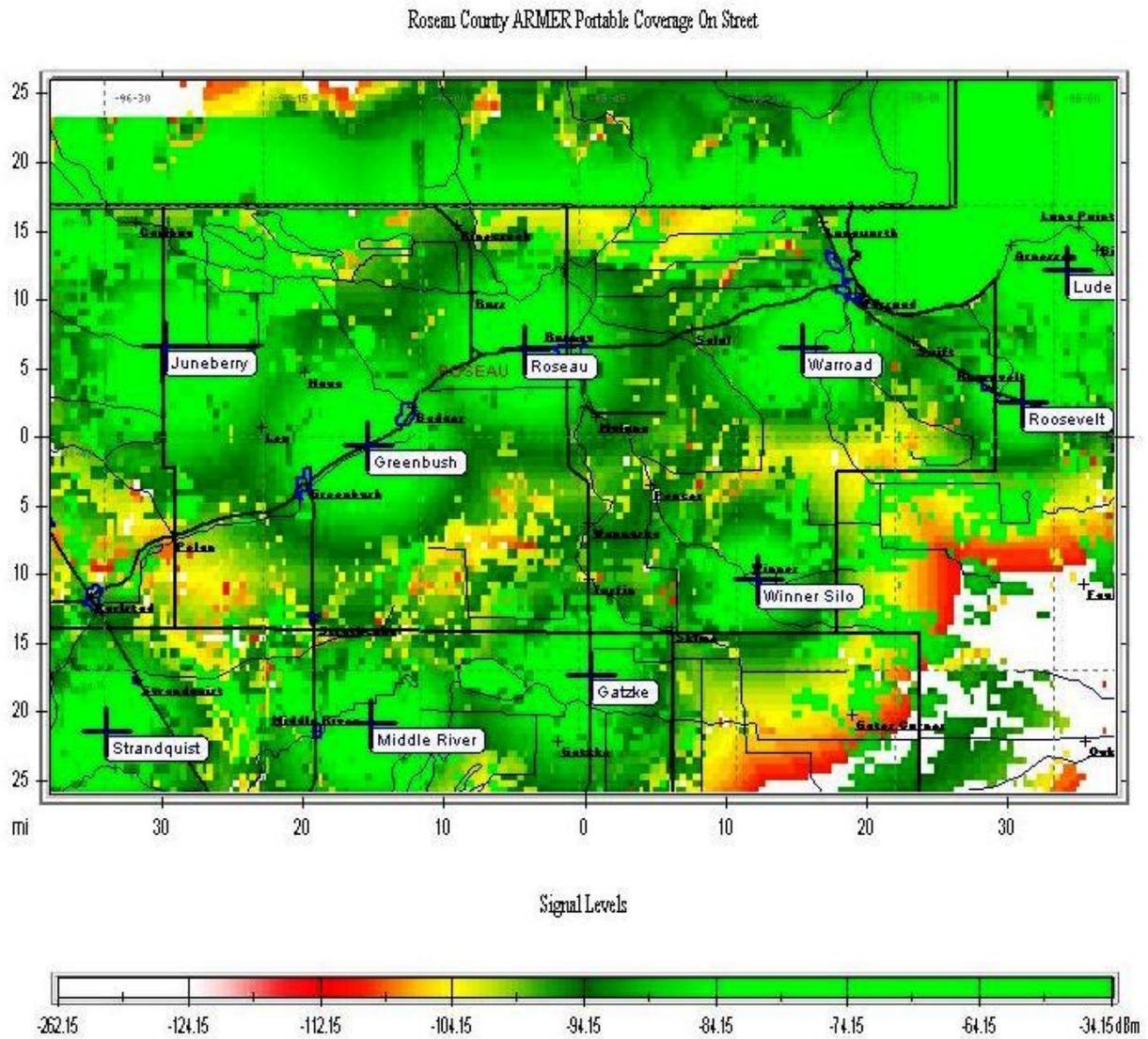
**Map I: Roseau County Predicted ARMER Coverage**

(Originally provided by the State of Minnesota in 2008; this map is provided for reference only, and is considered outdated due the changes in tower site locations that have been established since the time of original publication).



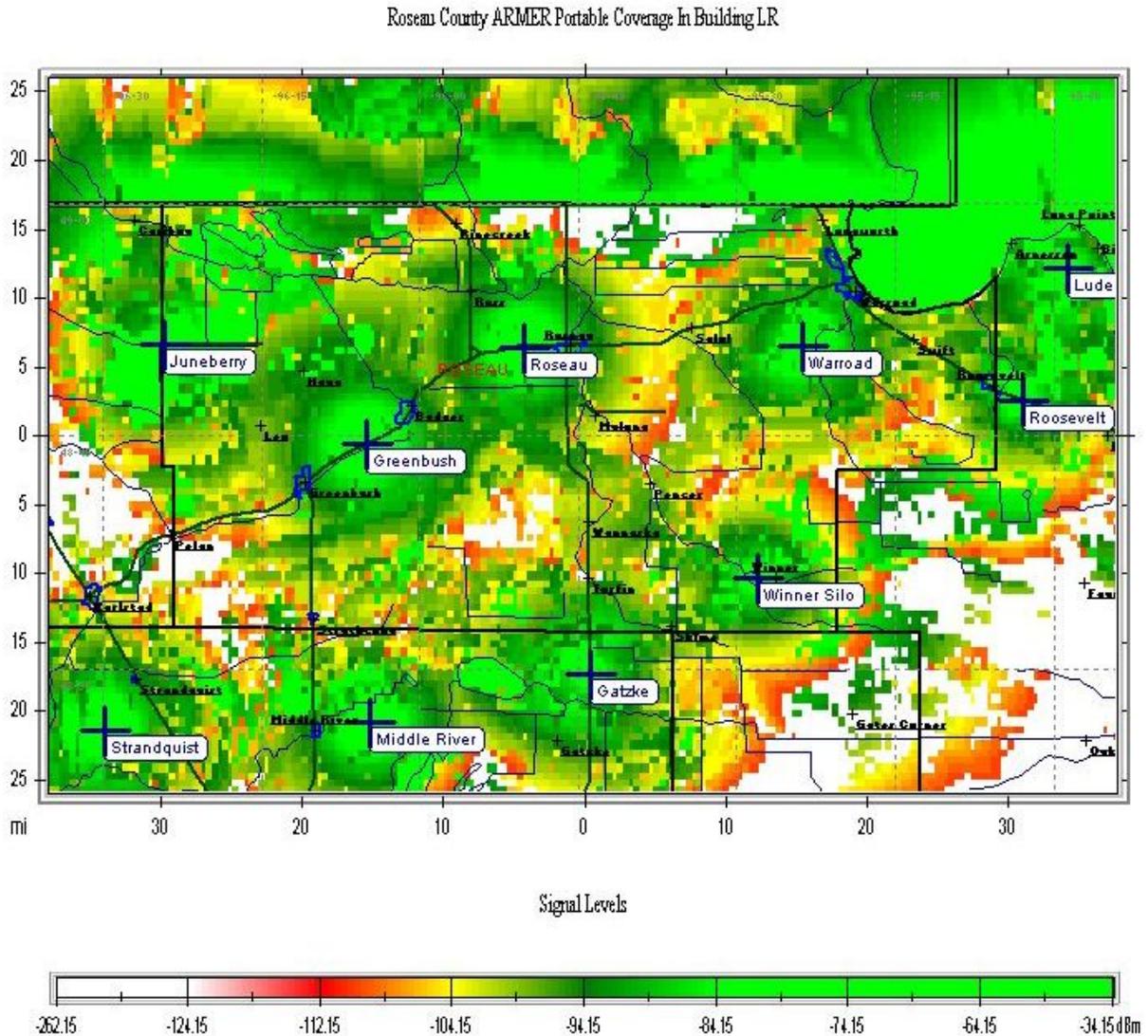


**Map 3:** The map shown below demonstrates the predicted coverage to be expected for portable (handheld) radios “On Street/Outdoors” from the ARMER tower sites to be located within Roseau County, including the first-tier sites outside the county borders.



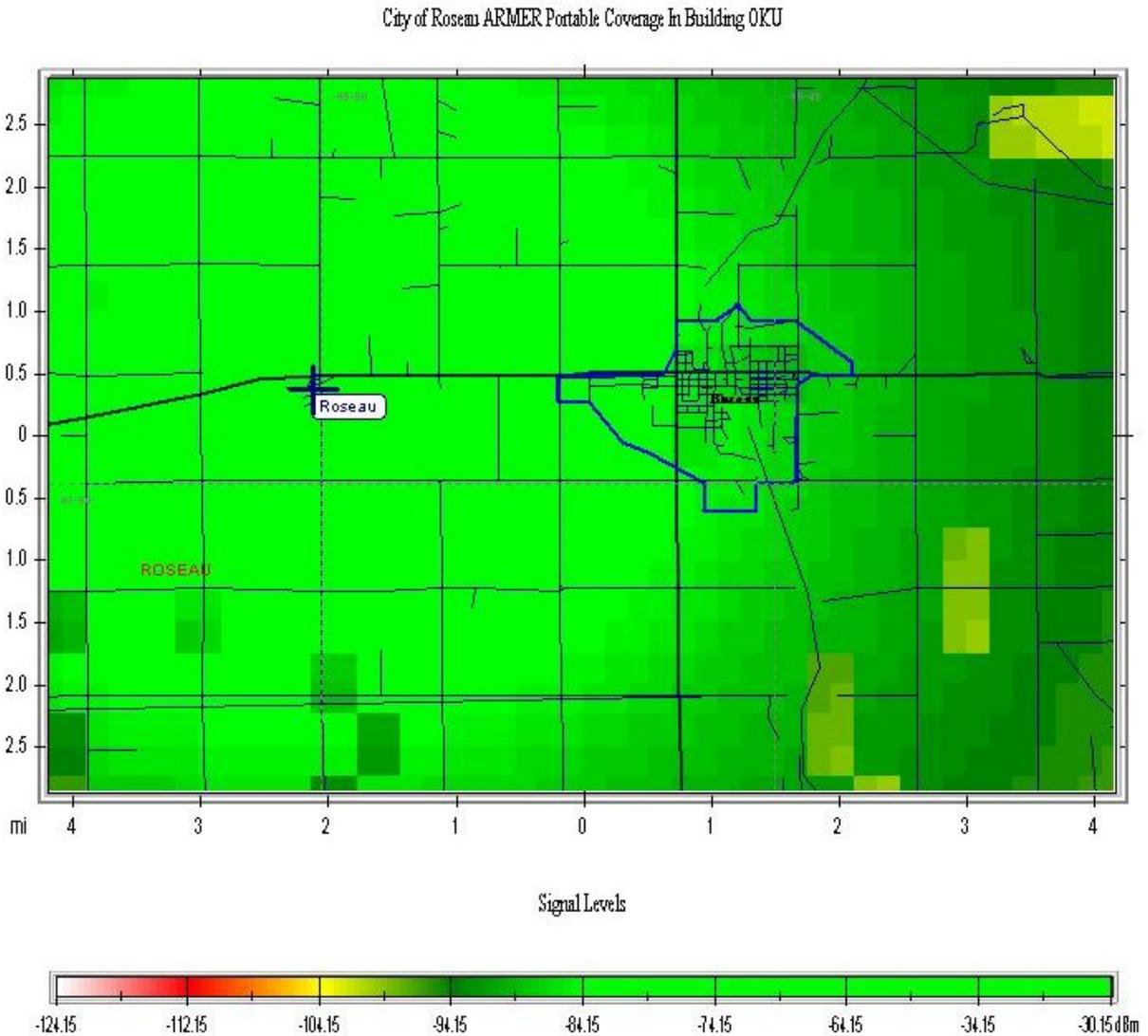
The predicted portable radio coverage throughout most of the county is very good with the planned tower sites, and coverage within the county is enhanced by tower sites outside of the county borders. The only areas of potentially weak coverage would be southeast of Greenbush, and in the far southwest corner of the county.

**Map 4:** The map shown below demonstrates the predicted in-building (6db loss) coverage to be expected for portable/hand held radios in Roseau County from the ARMER system when all tower area sites in the region are included in the calculations.



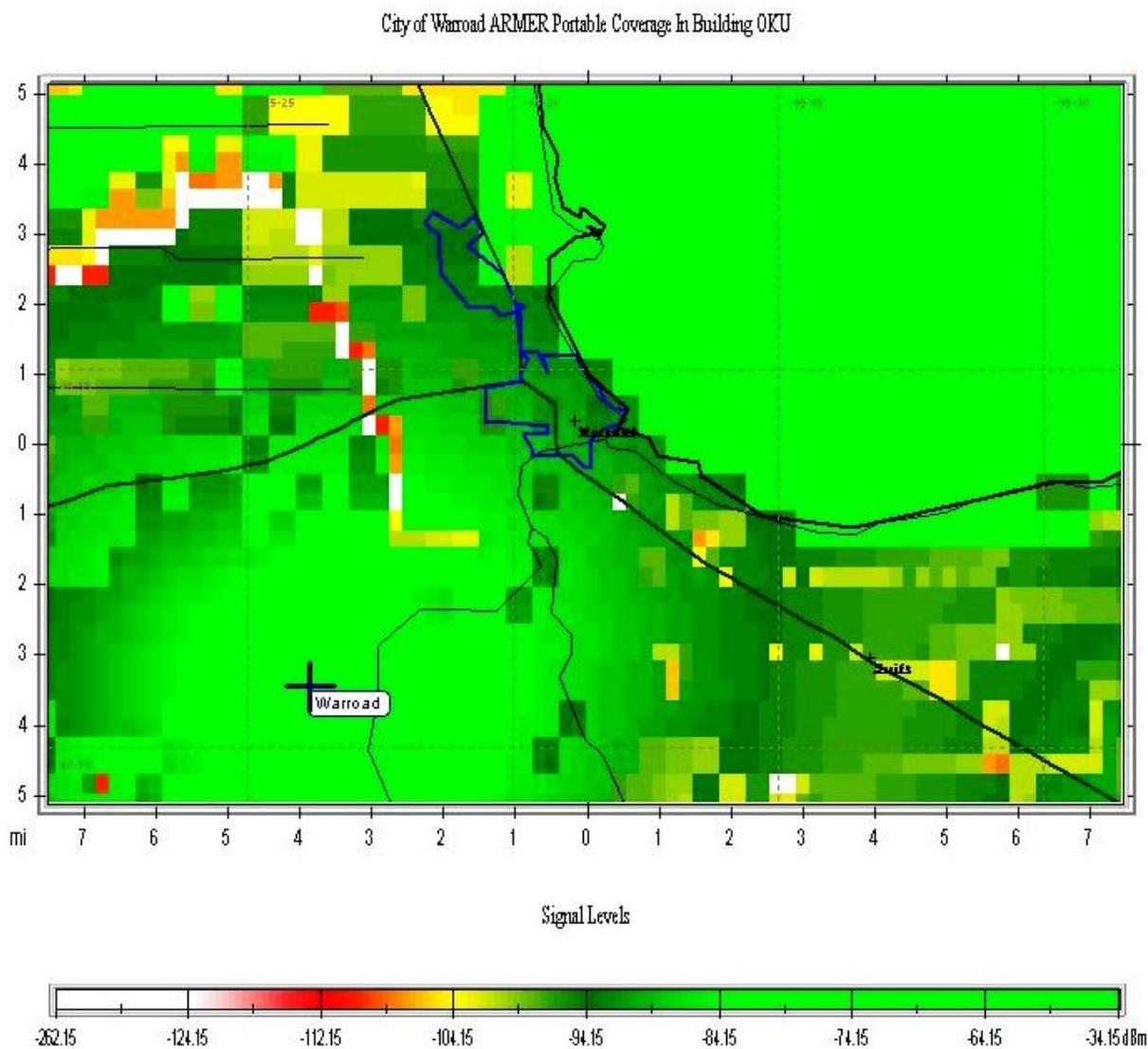
The predicted 6db in-building coverage for Roseau County is good in many areas, including the cities of Roseau and Warroad. Refer to the maps on the next pages for more detail of the predicted coverage in these two areas. Roseau County is fortunate that the ARMER sites exist in close proximity to the more populated cities in the county.

**Map 5:** This map demonstrates the predicted in-building (6db loss) portable radio coverage to be expected in the City of Roseau area from the ARMER system when all tower area sites in the region are included in the calculations.



The blue lines on the map indicate the city limits of Roseau, and the dark blue lines indicate highways and main roads. The predicted in-building coverage should be good within the city, although this will depend on the type of building involved. As an example, testing has been conducted in the high school, located in east central area of town; it has been determined that an in-building booster (BDA) will be needed for reliable coverage. Other facilities will be tested as well.

**Map 6:** This map demonstrates the predicted in-building (6db loss) coverage to be expected for portable radios in the City of Warroad area from the ARMER system when all tower area sites in the region are included in the calculations.



The blue lines on the map indicate the city limits of Warroad, and the dark blue lines indicate highways and main roads. The predicted in-building coverage should be good within the city, although this will depend on the type of building involved. The Warroad tower site is located 5.8 miles southwest of the city. Coverage testing within the Marvin Windows facilities has shown good results, primarily due to existing BDA's installed for cellular telephone coverage. Coverage within schools is not good, and will require additional equipment be installed.

## C. Contingency Planning

In planning for ARMER system migration and connecting to the ARMER system the following failure modes are being addressed:

1. Loss of connectivity between the dispatch center and the ARMER system.
2. Loss of microwave network (to ARMER tower sites), which will result in the system reverting to Site Trunking mode.

The primary method of redundancy for Roseau County operations will be the implementation of multiple 800 MHz RF control stations at the main PSAP location. This would typically include one control station for each primary public safety discipline, such as:

- Law operations
- Fire operations
- EMS operations

If scenario 1 occurs, the PSAP loses direct connectivity with the ARMER network, and talk group access and control is lost. The control stations will allow the PSAP staff to access the county-specific and system interoperability talk groups over the air and function much like a mobile or portable radio.

If scenario 2 occurs, (local ARMER sites lose connectivity to the master site in Detroit Lakes, or the master site experiences a failure), the sites will revert to a site trunking mode, which results the sites operating independently from each other. The effect on field units is that they can only communicate with each other if they are in range of the same tower site. If they are not, communication is not possible. This is due to the local sites and network operating in a multicast mode of operation (rather than simulcast).

The resulting effect on the dispatch center is the same; however, it is possible to implement multiple RF control stations at the dispatch center, with access to all of the tower sites within the county. The challenge with this approach is that the number of stations could be cumbersome and difficult to manage, depending on the number of talk groups incorporated in the backup station plan.

No final determination has been made for Roseau County as to the specific number of 800 MHz RF control stations that will be implemented at the PSAP, but a plan will be based on the county's final dispatch console implementation decisions.

## D. Training

ARMER system implementation and associated operational standards require that all personnel who will be using the system receive proper training on the use, capabilities, and features of the system. Trunked radio systems, including the ARMER system, have operational requirements that differ from traditional conventional repeater systems, and it is necessary that dispatchers and end users be trained on the capabilities and proper operation of the system.

Roseau County agencies recognize this need, and have conducted initial in-house training for the current radio system users. Additional training is planned through the services of independent contractors recognized by the state as proficient in the operation of the ARMER radio system. The program will include training for the following workgroups and functions:

- Radio end user training
- PSAP dispatchers
- Local system administrator
- Interoperability

Funding for the end user and dispatcher training has been included in the project budget.

## E. Interoperability

The need for interoperability exists on multiple levels within public safety radio operations. Establishing or enhancing interoperability at each of these levels has been a primary consideration in Roseau County's decision to migrate to the ARMER system. The areas specifically addressed are:

**Internal:** Between the many agencies within the general jurisdictional area of Roseau County (i.e. law enforcement, fire service, and EMS agencies). The implementation of a common 800 MHz trunked radio system for all public safety agencies, as well as other units of local government, should resolve most interoperability communications issues that may currently exist. To make the ARMER system work effectively will require careful fleet map planning and the proper training of all radio system users.

**External:** Between the county agencies and other public safety (law, fire, and EMS) and government agencies operating both within and sharing borders with Roseau County, to include the following:

- Lake of the Woods County agencies
- Beltrami County agencies
- Kittson County agencies
- Marshall County agencies
- Minnesota State Patrol, Mn/DOT, Department of Natural Resources (DNR) enforcement, and fire agencies
- Border Patrol and other Federal law enforcement and fire agencies
- Canadian public safety agencies

Many agencies within the Northwest Region of Minnesota have been moving forward with the ARMER participation planning and implementation process, which will improve communications interoperability for those agencies. Roseau County is currently bordered by county agencies operating both on 800/ARMER and VHF systems, which will require a combination of solutions to ensure reliable communications between all agencies in the region, regardless of radio system type. Roseau County will have neighboring agencies operating on both types of systems for the foreseeable future.

To accommodate communications between agencies that may operate with Roseau County that are not on the ARMER system in the short-term using legacy system technology, access to the ARMER radio system, a variety of interconnectivity options will be needed:

- The most basic requirement will be for Roseau County to continue operation of their VLaw3 I 155.4750 MHz base station. This can be patched to an 800 MHz talk group via the PSAP console system when required.
- All Roseau County Law Enforcement agencies use dual-band radios, capable of both VHF and ARMER/800 MHz operations.
- Roseau County Fire and EMS agencies will maintain the use of VHF radios in their vehicles, in conjunction with new ARMER/800 MHz radios.
- Roseau County repeater channels will be retained, and will become local “interoperability” channel resources, capable of being patched to the ARMER system, to allow local VHF radio users a simple and effective link to county agencies operating on the ARMER system.

## F. Standards

The primary technology standard applied to this project is that of the Project 25 (P25) ARMER system. The P25 standard is specifically for digital radios systems for public safety. In this case, the Phase I Frequency Division Multiple Access (FDMA) standard is currently in use.

Roseau County will adopt and comply with the standards published by both the State Radio Board and the Northwest Minnesota Regional Radio Board. Use of these standards will ensure that users in Roseau County will adopt the same naming conventions, talk group usage, and other operational and technical standards that are in use throughout the state.

## **G. Alarms and Monitoring**

Mn/DOT – ARMER will have the primary tower site alarm monitoring for sites in the county.

## **H. Maintenance**

Maintenance of the primary ARMER tower sites within Roseau County will be handled by the Mn/DOT staff. Roseau County currently contracts with a local authorized service facility for maintenance of any additional 800 MHz system equipment planned for the Roseau County implementation, including the PSAP equipment.

## **I. System Administration**

Local system administration for Roseau County will be the responsibility of the Roseau County Sheriff's Office.

## **J. Other Local Enhancements**

The primary local enhancements to the planned system implementation are:

- VHF interoperability systems

No other tower site or 800 MHz channel expansion local enhancements are planned for the system.

### 3. Project Costs and Budget

Funding for implementation of the ARMER system within Roseau County is being considered from three different sources:

- Local bonding
- Local levy
- Grant opportunities

Grant funding has been received for the purchase of a many of the existing 800 MHz mobile and portable radios for public safety agencies in the county. Funding for the remaining system infrastructure equipment has not yet been finalized, but is being reviewed by the county and considered for year 2015 or beyond.

#### Project Cost Estimates – Phase 1:

Item/Category	Estimated Costs
Zetron Console Modifications	\$ NA
800 RF Control Stations	\$ NA
800 MHz Subscriber Radios (Law Enforcement)	\$ NA
800 MHz Subscriber Radios (Fire agencies)	\$ 88,000
<b>Grand Total Estimated Costs</b>	<b>\$ 88,000</b>

#### Project Cost Estimates – Phase 2:

Item/Category	Estimated Costs
MCC7500 ARMER Console Equipment	\$350,000
Other System Equipment	\$ 50,000
800 MHz Subscriber Radios (Fire and EMS)	\$212,800
800 MHz Radios (Public Works and Schools)	\$ 35,400
Other Services	\$ 25,000
<b>Grand Total Estimated Costs</b>	<b>\$637,800</b>

## 4. Project Implementation

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### A. Schedule

Implementation of the ARMER radio network for an organizational group the size of Roseau County, with the number of agencies, tower sites, and quantity of radios being planned, would typically be expected to require a 12-month period to complete.

However, Roseau County has slowly migrated to ARMER system use over the past two years, and all Law agency radio operations are now conducted via the ARMER system. Local EMS agencies have also obtained ARMER radios, and are using the system. The county agencies will continue to seek the funding needed to obtain the remaining ARMER-capable mobile and portable radios needed for Fire agencies. The County is also planning and budgeting for the long-term replacement of its existing Zetron radio dispatch console with a new Motorola console, and direct connectivity into the ARMER network, although no specific time frame has been established for this work. Roseau County will notify the regional and state technical committees at such time that this change is being planned.

The County will continue to utilize their existing VHF radio systems over the next few years, and will retain such equipment as needed for Interoperability purposes. The PSAP console equipment is configured to operate both systems (legacy VHF and ARMER).

**Attachment I: Roseau County Fleet Map**

	<b>Law Enforcement Operations</b>	<b>TG Alias</b>
1	Roseau County Law 1 (main)	RS Law 1
2	Roseau County Law E1 Encrypted	RS Law E1
3	Roseau County Law 2	RS Law 2
4	Roseau County Law E2 Encrypted	RS Law E2
5	Roseau County Law Car-Car	RS C2C
6	Roseau Sheriff's Office Ops 1	RS RSO Ops 1
7	Roseau Sheriff's Office Ops 1 Encrypted	RS RSO Ops E1
8	Roseau Sheriff's Office Admin	RS RSO Adm
9	Roseau Police Dept. Ops 1	RS RPD Ops 1
10	Roseau Police Dept. Ops 1 Encrypted	RS RPD Ops 1E
11	Roseau Police Dept. Admin	RS RPD Adm
12	Warroad Police Dept. Ops 1	RS WPD Ops 1
13	Warroad Police Dept. Ops 1 Encrypted	RS WPD Ops 1E
14	Warroad Police Dept. Admin	RS WPD Adm
15	Roseau County Emergency Management/EOC	RS EOC 1
16	Roseau County EOC Ops 1	RS EOC Ops 1
	<b>Fire and EMS Operations</b>	<b>TG Alias</b>
17	Roseau County Fire 1 (main)	RS Fire 1
18	Roseau County Fire 2	RS Fire 2
19	Badger Fire Dept. Ops	RS BFD Ops
20	Badger Fire Dept. Admin	RS BFD Adm
21	Badger First Responders Ops	RS B1st Ops
22	Greenbush Fire Dept. Ops	RS GFD Ops
23	Greenbush Fire Dept. Admin	RS GFD Adm
24	Roosevelt First Responders Ops	RS R1st Ops
25	Roseau Fire Dept. Ops 1	RS RFD Ops 1
26	Roseau Fire Dept. Ops 2	RS RFD Ops 2
27	Roseau Fire Dept. Admin	RS RFD Adm
28	Wannaska First Responders Ops	RS W1st Ops
29	Warroad Fire Dept. Ops 1	RS WFD Ops 1
30	Warroad Fire Dept. Ops 2	RS WFD Ops 2
31	Warroad Fire Dept. Admin	RS WFD Adm
32	Roseau County EMS 1 (main)	RS EMS 1
33	Roseau County EMS 2	RS EMS 2
34	Roseau County EMS 3	RS EMS 3

**Attachment I: Roseau County Fleet Map (continued)**

	<b>Fire/EMS Operations (cont.)</b>	<b>TG Alias</b>
35	Roseau County EMS Admin	RS REMS Adm
36	Greenbush EMS Admin	RS GEMS Adm
37	Roseau County EMH 1	RS EMH 1
38	Roseau County EMH 2	RS EMH 2
	<b>Local Interoperability</b>	<b>TG Alias</b>
39	Roseau County Announcement Group	RS ANNC ALL
40	Roseau County Call	RS Call
41	Roseau County Emergency Button	RS EMER
42	Roseau County Emergency 911	RS 911
43	Roseau County Public Safety Statewide Roam	RS Roam
44	Roseau County Public Safety Common 1	RS Com 1
45	Roseau County Public Safety Common 2	RS Com 2
46	Roseau County Public Safety Common 3	RS Com 3
47	Roseau County Public Safety Common 4	RS Com 4
48	Roseau County Public Safety Common 5	RS Com 5
	<b>Public Works and Schools</b>	<b>TG Alias</b>
49	Roseau County Highway Operations 1	RS Hwy 1
50	Roseau County Highway Operations 2	RS Hwy 2
51	Roseau County Transit	RD TRNST
52	Future Public Works 1	RS PW 1
53	Future Public Works 2	RS PW 2
54	Future Public Works 3	RS PW 3
55	Roseau County School Security	RS SCH SEC
56	Roseau County School Transportation 1	RS School 1
57	Roseau County School Transportation 2	RS School 2
58	Roseau County Future Use 1	RS Future 1
59	Roseau County Future Use 2	RS Future 2

All regional and statewide interoperability talk groups will be incorporated into Roseau County radios as defined by ARMER standards.

## Attachment 2: References

1. State of Minnesota “Local Agency and Regional Planning and Contracting for ARMER Participation” (sic) dated September 8, 2008, as published at [www.srb.state.mn.us](http://www.srb.state.mn.us)
2. Federal Engineering “Radio System Needs Assessment and Alternatives Report for Roseau County” December, 2009
3. RadioSoft™ ComStudy2™ Terrain Database
4. ARMER Status Map, as posted at <http://www.srb.state.mn.us/> dated March 2015
5. Region 22 (Geographic State of Minnesota) 800 MHz Regional Planning Committee “Regional Band Plan” as filed with the FCC, General Docket 87-112; 800 MHz NPSPAC Plan Amendment WT Docket No. 20-55; NPSPAC PR Docket No 93.130 dated June 2009

**REQUEST FOR SPECIAL  
WIDE AREA SITE ACCESS  
FOR AN ARMER TALKGROUP**

**Talkgroup/ Announcement Group Name(s):** Roseau County Statewide Roam (RS Roam)

If Announcement Group List all Contained Talkgroups: \_\_\_\_\_

**Sites Requested:**

- Statewide (Requires Statewide Radio Board Approval)
- Other (Specify Sites or Regions):

**Talkgroup Owner Agency (Include Point of Contact Information):**

Agency Name: Roseau County Sheriff's Office  
Contact Name: Sheriff, Roseau County (Steve Gust)  
Address: 605 - 5<sup>th</sup> Ave SW  
Roseau, MN 56751  
Phone: 218-463-1451  
Email: Steve.Gust@co.roseau.mn.us

**Talkgroup or Announcement Group Type (Check all that Apply):**

- Shared
- Private
- Special Roaming Only Talkgroup - Occasional Use.
- Special Operations Tactical Talkgroup - Occasional Use. **If yes**, describe or list the counties or regions covered by a mutual aid agreement, memorandum of understanding, joint powers agreement, incident response plan or other relevant agreements here: \_\_\_\_\_
- Main Dispatch or Tactical Talkgroup - Day to Day Use. **If yes**, applicant must demonstrate that the users of this talkgroup conduct their "Normal Day to Day Business Operations" throughout the requested coverage area. Describe or list the counties or regions where the users of this talkgroup conduct their "Normal Day to Day Business Operations" here: \_\_\_\_\_

**Describe the users, entities or agencies that will operate on this talkgroup:**

*The "RS Roam" talk group is intended to allow Roseau County public safety agency personnel the ability to contact Roseau County dispatch when outside of the Roseau County geographical service area. It may also be used for two Roseau County public safety personnel to communicate with each other when operating outside of the county geographical area (and outside the operational range of an SOA channel).*

**Describe the type of operations that will occur on this talkgroup:**

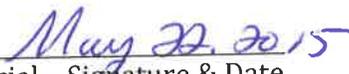
*The two most common uses of this talk group are 1) Prisoner transports, and 2) Communications between two Roseau County field units when outside of the county geographical operating area.*

**Describe the anticipated frequency, duration and extent of use of this talkgroup:**

*The use of this talk group will be very minimal, perhaps twice a week, primarily for prisoner transport. There will NOT be any routine dispatch or operational traffic on this talk group.*

**Describe why the Statewide Shared Incident Response talkgroups or other shared roaming talkgroups are not suitable to meet these operational requirements:**

*It is unlikely that the Roseau County PSAP would be monitoring the various Statewide Shared Incident Response or Roaming talk groups, and the purpose for which Roseau County units would need to communicate would not necessarily appear to fit the intended use of those talk groups.*

   
\_\_\_\_\_  
Talkgroup Owner Agency Authorized Official - Signature & Date

Steve Gust, Sheriff - Roseau County MN  
\_\_\_\_\_  
Printed Name and Title

## **Lac qui Parle County – City of Dawson BDA Proposal**

The Lac qui Parle County Sheriff's Office presents the following proposal to install a bi-directional amplifier (BDA) to enhance ARMER coverage in the City of Dawson and requests consideration for grant funding.

### Background

Dawson is located in Lac qui Parle County, approximately 6 miles east of the US Highway 212 and US Highway 75 intersection. The population is approximately 1,500 people. The City is approximately 1.5 square miles. The west branch of the Lac qui Parle River flows through Dawson, and Dawson is the only densely populated area in Lac qui Parle County that has river flooding concerns. The racial makeup of the city is 97.4% White, 0.4% African American, 0.4% Native American, 0.1% Pacific Islander, 0.6% from other races, and 1.1% from two or more races. Hispanic or Latino of any race is 2.3% of the population.

### Risk

The City of Dawson has deficient ARMER signal coverage. The City is surrounded by ARMER towers, but at great distances. While in the City of Dawson, a radio can receive signal from the following tower sites: Madison, Canby, Clarkfield, Montevideo, and Milan – however all signals are relatively weak. Indoor coverage is a bigger issue in the City. Officers are often unable to receive calls via radio due to the poor signal. Due to the size of the community, officers work alone almost all the time, and radio contact is there only back-up. This leads to great risk for officers, firefighters, and ambulance personnel.

### Solution

The Lac qui Parle Sheriff's Office has investigated several solutions to this issue. MNDOT has performed studies, and finds Dawson to be in compliance with its outdoor requirements for ARMER (there are no MNDOT guarantees for indoor coverage). Therefore MNDOT will not place a State-owned tower in Dawson. The placement of a locally-owned ARMER tower has proven cost-prohibitive in this case. Mobile radios have been placed in the Dawson City Office (which houses the Dawson Police Department) to allow for radio coverage while officers are in the office, however, this only solves the coverage issue for that building. The cost-effective solution appears to be the installation of an outdoor BDA.

The Lac qui Parle Sheriff's Office requested bids for this project from the following vendors:

- Fiplex – \$107,370.87
- Milbank Communications – no bid submitted
- RACOM - \$35,345.57

- West Central Communications – no bid submitted

Proposal

The Lac qui Parle Sheriff's Office respectfully requests consideration for funding to complete this project. AGP has tentatively agreed to allow the installation of the equipment, pending a review by the corporate office and lawyers. The City and several community organizations are looking into their ability to support the on-going electrical and maintenance costs of the BDA. If these groups are unable to pay the on-going costs, the Lac qui Parle County Sheriff's Office will fund the costs.

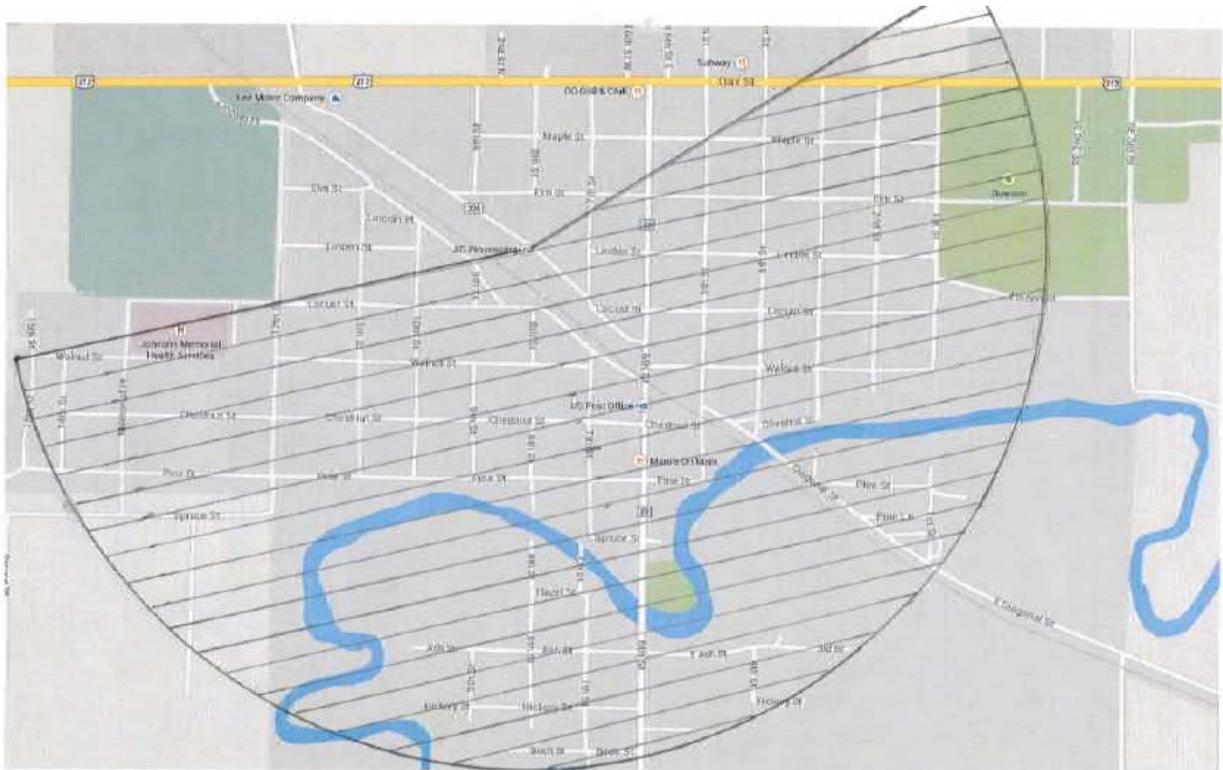
Respectfully submitted,

John Maatz

# Lac qui Parle County – Dawson External BDA Proposal

**RACOM Bid - \$35,345.57**

The goal of the project is to improve in-town Public Safety radio coverage. To do this at a reasonable cost it was necessary to find an existing structure to mount the system on. The location picked seems to have the least tradeoffs between coverage area and improved signal strength. The edges of the community is low density housing which we found during our survey had a common signal of -100 dBm to -90 dBm. In the downtown business district and school area the signal strength was considerably lower, which is where we focused our attention.



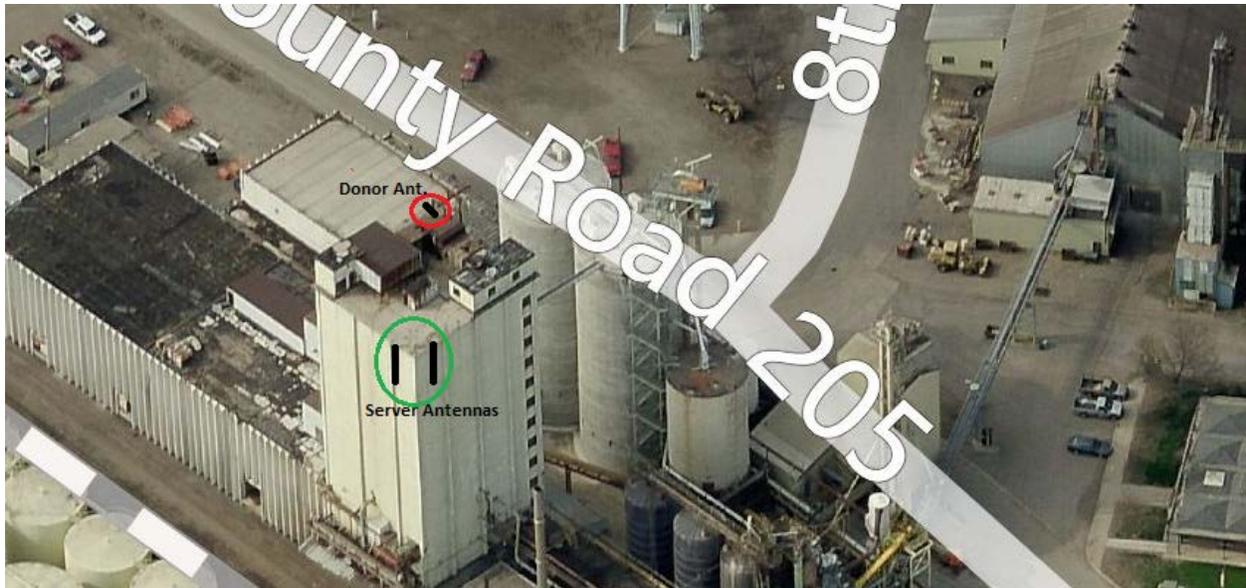
We would put a BDA on top of the AGP building, donor antenna pointed at Madison, and two server antennas pointed southeast and southwest. We expect a 20 dBm signal improvement in the shaded area.



Donor antenna.



Server antennas.



All antennas would be mounted to the side of the building with custom brackets. The reasons for mounting to the side of the building are; provide isolation between donor and server antennas, be out of the way of maintenance workers, and future building changes.



The BDA would be mounted inside the penthouse. The RF coax cables will have in-line lightning protectors attached to a ground bar.

The total cost for this project is \$35,345.57. This quote will be honored for 60 days. No major price changes are anticipated beyond that time. Please do note that this project will require Regional and State Radio Board approval also.

Thank you.

Marv Kuipers

RACOM 1521 Oxford ST, Worthington MN 56187

[marv.kuipers@racom.net](mailto:marv.kuipers@racom.net)

Office 507-376-4250 Cell 507-370-4752



**ISANTI COUNTY  
SHERIFF'S  
OFFICE**

---

May 7, 2015

Metro Emergency Services Board

Isanti County is requesting a resolution authorizing Isanti County to replace the existing Motorola Gold Elite with a four position Motorola MCC7500 console system. There will be three dispatch positions and a patch position. Eleven existing conventional resources will be connected to CCGW ports; the existing remote position at the Emergency Operations Center will not be replaced.

Isanti County will also acquire one MCC 7100 remote capable radio console configured in a laptop. This laptop will access the ARMER system through a proxy server that will be placed at the Isanti County dispatch site. Connection will be done using a VPN connection to the Isanti County firewall and then to the Motorola firewall to gain access to the Zone Controller.

The current Gold Elite Console IDs will of 144 will be replaced with 5 MCC7500 IDs. There are no additional talkgroups being requested so the existing number of authorized talkgroups will remain at 31.

Respectfully Submitted,

A handwritten signature in black ink, appearing to read 'Caulk', written over a horizontal line.

Sheriff Christopher L. Caulk

**Sheriff Chris Caulk • Chief Deputy Lisa Lovering**  
Isanti County Law Enforcement Center  
509 - 18th Avenue SW • Cambridge, MN 55008-9386  
(763) 689-2141 DL: (763) 691-2408 Fax: (763) 689-3691

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**From:** Michael Kahl [<mailto:MikeK@GraniteElectronics.com>]

**Sent:** Thursday, May 28, 2015 12:46 PM

**To:** Chris Caulk

**Cc:** Ron Jansen

**Subject:** Additional Info on Console Upgrade

Chris, here is the information you requested in regards to the MCC7500 console upgrade:

**Conventional Channel Gateway:** The MCC7500 will be installed with two 8 port GGM8000 conventional gateways, of which only 11 ports of the 16 will be activated. These CCGWs will also provide analog audio for the logging recorder on the County's primary talkgroups and VHF channels.

**T1 Connections:** Current connection of the Motorola Gold Elite is utilizing three T1 links over the MNDOT microwave, after the MCC7500 console is in operation, one of these T1 connections will no longer be needed and will be disconnected at the Cambridge tower. Each of the remaining two T1s will be connected to a dedicated Site Gateway that will be placed in service to give a redundant link if possible on the MNDOT microwave.

**Gold Elite Centracom Decommission:** Once the MCC7500 console is in operation the Gold Elite Console will be shut down and removed from operation. Console IDs will be de-activated.

I would be happy to answer any other questions in regard to this upgrade, please feel free to contact me via any of the following methods.

Michael Kahl

Office 320-252-1887

Mobile 320-980-1948

[MikeK@GraniteElectronics.com](mailto:MikeK@GraniteElectronics.com)

**Rice & Steele County  
Consolidated Joint Powers Board  
Technical Plan**

For

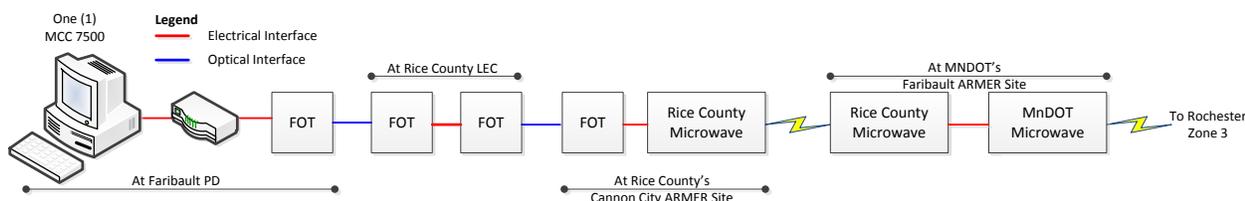
**PSAP Participation Plan Amendment on the ARMER Radio System**

## 1. Introduction & Background

In 2010 the Southeast Region and Statewide Radio Board approved the participation of the Rice-Steele Consolidated Joint Powers Board (PSAP) on the ARMER system with four (4) fully equipped MCC 7500 radio positions plus a patching position. This equipment was installed at the primary PSAP location in Owatonna.

Now the PSAP requests approval to add a fifth (5<sup>th</sup>) MCC 7500 position at a backup location inside the Faribault Police Department. This fifth position would be connected to the Zone 3 master site in Rochester, MN. Proposed connectivity would be established as described in the block diagram below. One (1) T1 is requested on the MnDOT microwave to Zone 3. There will be no local CCGWs associated with the 5<sup>th</sup> console position. There will be no changes to the previously approved recording mechanisms used at the primary PSAP. No other changes to the previously approved plan for the PSAP are requested. The targeted in-service date for the new, 5<sup>th</sup> backup console position would be not later than July 30, 2015. The first year's warranty maintenance for the 5<sup>th</sup> position addition would be via Motorola. The 5<sup>th</sup> position equipment would be installed in a secure location at the Faribault Police Department to control access to the system. Intended use of the equipment is via the PSAP's previously trained dispatch staff who are already familiar with ARMER system operation and policies.

## 2. Connectivity Block Diagram



## 3. Questions & Contact Information

Questions concerning this Plan may be directed to:

For the Consolidated PSAP  
Jill Bondhus, Interim Administrator  
Rice & Steele County Consolidated PSAP  
204 E. Pearl Street  
Owatonna, MN 55060  
Voice (507) 444-0341  
e-mail: [jbondus@rsc-psap.org](mailto:jbondus@rsc-psap.org)

PSAP's Consultant  
Jeff Nelson  
PSC Alliance Inc.  
7900 International Drive – Suite 300  
Bloomington, MN 55425  
Voice (612) 216-1502  
e-mail: [jeff.nelson@pscalliance.com](mailto:jeff.nelson@pscalliance.com)

Notes:

- 1) Blue font reflects modifications to originally adopted ARMER participation plan.



May 29 2015

## *Local Repeater Coverage to ARMER. (LRCA)*

The purpose of the LRCA is to provide portable indoor coverage in areas where the ARMER signal does not penetrate structures, where the outdoor coverage from ARMER is adequate for portable and mobiles.

### *ARMER Coverage limitations:*

Atwater in Kandiyohi county and Hancock in Stevens county both have the same coverage issues. ARMER signal to a mobile covers the city. ARMER signal coverage in some buildings and outside in town for portables is useable. ARMER signal coverage within brick and metal structures does not work. In this case both towns have Schools with no in building coverage.

### *System Tested:*

We have used a Quantar 800Mhz repeater with an antenna system low enough to give us town coverage, yet contain the signal to the areas that need indoor coverage and a small radius around the town, for our test we used 8TAC94.

A gateway system, consisting of two mobile radios, one on the 8TAC94 and the other on a County ARMER talk group as the interface.

### *Test Results:*

In both cases (Atwater and Hancock) we found no internal buildings that we could not penetrate using the 8TAC94 repeater. The Dispatch centers choose to use a lower County interop talk group which dispatch would monitor, and patch when required. All users inside and outside of the structures understand what channels and "talk groups" to use.

### *Audio Delays and bonk tones:*

A concern of ours was if the audio delays in our system design would cause users on the 8TAC94, ARMER subscriber radios and dispatchers too much delay and make the system unusable. We did not find this to be the case, technically there is a slight delay, but not much more than what users experienced on a VHF repeater system. One drawback we did find is that if an ARMER talk group would be denied, the 8TAC94 user would not know this, as well as the ARMER subscriber or dispatcher not knowing if the 8TAC94 users did hear the talk group traffic.

LRCA/ASR/BDA:

In both of our cases we found the coverage is not bad enough for the Counties to justify an ASR site and use valuable 800 channels. There are too many buildings with poor coverage to implement indoor BDA's. An outdoor BDA system would not guarantee in building penetration.

Frequency to be used and interoperability.

For our test we used 8TAC94 channel which all subscribers have which is good for interoperability even if it is an analog channel. The use of a 8TAC channel makes a strong case for increased coverage within the communities, and would support agencies from across the nation access to dispatch centers. If permitted on nationwide basis it could fill a nationwide access to whatever system each state or territory might. However understanding Region 22 NPSPAC plan, the use of the 8TAC is controlled at the national level and meant only "for interop between agencies not sharing any other compatible communication system, and not meant to be used for routine, daily operations".

Each County was assigned 800Mhz NPSPAC channels that could be used, however some counties have used up their channels. A new licensed channel for each community could be issued at the expense of the 800Mhz spectrum. However in both cases we would forfeit interoperability between agencies.

Therefore we are asking for a Statewide repeater channel to be assigned for the use of the LRCA which could be used by multiple agencies across the state and maintain interoperability, in time through programming of radios.

If there are no state wide repeater channels available, could a 8SOA-R repeater channel be implemented for this purpose across the state, it would again maintain interoperability, in time through programming of radios.

We feel that the use of the LCRA repeater channel will be used infrequently on a daily basis, however provide significant assurance to emergency responders when entering these no coverage areas.

David Sisser, West Central Communications on behalf of Sheriff Dan Hartog of Kandiyohi County and Sheriff Jason Dingman of Stevens County.

Month, Day, 2015

**VIA ELECTRONIC MAIL**

Senator Amy Klobuchar  
302 Hart Senate Office Building  
Washington, DC 20510

Dear Senator Klobuchar:

As you know, the Middle Class Tax Relief and Job Creation Act of 2012 (the Act) created FirstNet as an independent authority within the U.S. Department of Commerce's National Telecommunications and Information Administration (NTIA). FirstNet's charter is to build, deploy and operate the first nationwide public safety broadband network, called the National Public Safety Broadband Network (NPSBN).

Minnesota has been diligent in responding to FirstNet's Public Notices regarding interpretations of the Act. The Statewide Emergency Communications Board's (SECB) Interoperable Data Committee, which is a standing committee of the board, has been active in providing feedback from all disciplines of public safety and all regions of the state regarding broadband data needs, requirements and desires. This feedback is used in Minnesota's responses to FirstNet's Public Notices.

As a federal representative from the State of Minnesota, the Statewide Emergency Services Board felt it was vital that you be aware of its responses to these notices. Below are links to Minnesota's responses to FirstNet's Public Notices to date:

- <https://dps.mn.gov/divisions/ecn/Documents/mn-response-to-firstnet-public-notice.pdf>
- <https://dps.mn.gov/divisions/ecn/Documents/mn-response-to-firstnet-request-for-information.pdf>
- <https://dps.mn.gov/divisions/ecn/programs/wireless-broadband/Documents/state-of-minnesota-reply-to-the-firstnet-second-public-notice.pdf>
- <https://dps.mn.gov/divisions/ecn/programs/wireless-broadband/Documents/minnesota-comments-on-third-notice.pdf>

The Statewide Emergency Communications Board feel strongly that this network is being built for public safety, and its operational needs and concerns are especially important to consider as decisions are being made on its behalf by FirstNet. While FirstNet has issued four Public Notices, it does state that it can proceed with rule-making and other decisions without any additional input from its potential users and subscribers. We strongly advocate that FirstNet continue to build this network with input from public safety responders across the country.

Letter to Senator Klobuchar, Page 2  
Month, Day 2015

Please contact us with questions regarding Minnesota's stances on FirstNet at [mark.dunaski@state.mn.us](mailto:mark.dunaski@state.mn.us) or (651) 201-7160 or [liz.workman@co.dakota.mn.us](mailto:liz.workman@co.dakota.mn.us) or (651) 438-4431.

Thank you for your time and consideration.

Sincerely,

Mark Dunaski  
Assistant Commissioner, Department of Public Safety  
Chair, Statewide Emergency Communications Board

Liz Workman  
Commissioner, Dakota County  
Chair, SECB Legislative Committee

cc: Jackie Mines  
Rich Stanek

## **PROPOSED REVISED BYLAWS JUNE 2015**

### **BYLAWS of the Statewide Emergency Communications Board Established October 2005**

#### **ARTICLE I: Name**

In accordance with Minn. Stat. §403.36 this board shall be herein named the Statewide Emergency Communications Board (SECB) as a successor to the Statewide Radio Board (SRB).

#### **ARTICLE II: Purpose**

1. In accordance with Minn. Stat. §403.36 1(e) The Statewide Emergency Communications Board exists to develop a project plan for a statewide, shared, trunked public safety radio communication system in Minnesota, to develop and apply statewide standards and guidelines for interoperability and to initiate an education plan to stakeholders.
2. The statewide radio system may be referred to as Allied Radio Matrix for Emergency Response or ARMER.
3. Pursuant to Minn. Stat. §403.36 Subd. 1g: The Statewide Emergency Communications Board shall act as Minnesota's Statewide Interoperability Executive Committee (SIEC).
4. Pursuant to Minn.Stat.403.382 Subd. 1b: As a Statewide Emergency Communication Board, the board shall be responsible for the statewide coordination of 911 service in addition to existing responsibilities for the ARMER system provided for in sections 403.21 to 403.37.

#### **ARTICLE III: Members**

##### 1. Membership

In accordance with Minn. Stat. §403.36 Subd. 1, the membership of the Statewide Emergency Communications Board shall consist of the following members or their designees:

- (a) The commissioner of public safety
- (b) The commissioner of transportation
- (c) The state chief information officer
- (d) The commissioner of natural resources
- (e) The chief of the Minnesota State Patrol
- (f) The chair of the Metropolitan Council
- (g) Two elected city officials, one from the nine-county metropolitan area and one from greater Minnesota, appointed by the governing body of the League of Minnesota Cities
- (h) Two elected county officials, one from the nine-county metropolitan area and one from greater Minnesota appointed by the governing body of the Association of Minnesota Counties
- (i) Two sheriffs, one from the nine-county metropolitan area and one from greater Minnesota, appointed by the governing body of the Minnesota Sheriffs' Association
- (j) Two chiefs of police, one from the nine-county metropolitan area and one from greater Minnesota, appointed by the governor after considering recommendations made by the Minnesota Chiefs of Police Association
- (k) Two fire chiefs, one from the nine-county metropolitan area and one from greater Minnesota, appointed by the governor after considering recommendations made by the Minnesota State Fire Chiefs Association
- (l) Two representatives of emergency medical service providers, one from the nine-county metropolitan area and one from greater Minnesota, appointed by the governor after considering recommendations made by the Minnesota Ambulance Association
- (m) The chair of the regional emergency services board for the metropolitan area
- (n) A representative of greater Minnesota elected by those units of government in phase three and any subsequent phase of development as defined in the statewide, shared radio and

communication plan, who have submitted a plan to the Statewide Emergency Communications Board and where development has been initiated.

The Statewide Emergency Communications Board shall coordinate the appointment of board members representing greater Minnesota with the appointing authorities and may designate the geographic region or regions from which an appointed board member is selected where necessary to provide representation from throughout the state in accordance with ARMER Standard 8.1.0 adopted on January 24, 2011.

Each member or designee shall be allowed to choose an alternate and all members shall annually identify in writing to the chair of the Statewide Emergency Communications Board the name and contact information of members and alternates.

## 2. Attendance

The membership of the SECB and any standing committees shall maintain an attendance record of either the designee or the alternate of 75% of all official meetings across a twelve month rolling calendar. If a member or the alternate fails to meet the attendance requirement, the chair of the committee shall notify the member's organization in writing of the attendance record and request a replacement designee. At the discretion of the chair of the committee, the member's appointment may be omitted in determining the presence of a quorum until the attendance record is in compliance as outlined in the article. A member that is not in compliance of the attendance requirement will not be able to vote on any action items until the attendance record is in compliance as outlined in this article.

## **ARTICLE IV: Officers**

Per Minn. Stat. §403.36 Subdivision 1(a), the commissioner of public safety shall convene and chair the Statewide Emergency Communications Board.

1. The officers of the board shall consist of the vice chair and the executive secretary.
2. The vice-chair and executive secretary must be members of the board.
3. The vice-chair and executive secretary shall be elected annually.
4. Officers shall serve a one-year term or until their successors are chosen. The term of office shall be effective at the close of the meeting at which the officers are installed. No member may hold more than one office at a time. In the event of a vacancy in one of the officer positions, the chair may appoint a member to serve the remaining portion of the term.
5. The chair's duties and responsibilities include representing the board as its principal spokesperson; presiding at board meetings; directing the preparation of the agenda for all board meetings; and appointing members to standing and special committees.
6. The vice-chair shall exercise the duties and responsibilities of the chair whenever the chair is unable to serve.
7. The executive secretary shall exercise the duties and responsibilities of the chair whenever both the chair and vice chair are unable to serve.
8. The vice-chair and executive secretary must equally represent the state of Minnesota metro area and greater Minnesota.

## **ARTICLE V: Board Meetings**

1. Regular meetings of the full Statewide Emergency Communications Board shall be held at the call of the chair but not less than quarterly. Regular meetings may be cancelled by the chair upon agreement by a majority of the members. Notice of such cancellation shall be provided as far in advance of the scheduled meeting as possible.
2. A simple majority of the membership shall constitute a quorum.
3. The agenda for each board meeting shall be established and published by the chair and be sent to the board members five business days prior to the meeting. At the beginning of a regular meeting any member may move to amend the published meeting agenda.
4. Regular meetings of the board will be conducted in the following order:

- (a) Call to order;
  - (b) Motions, if any, by members to amend the published agenda;
  - (c) Approval of the minutes of prior meeting(s);
  - (d) Reports by standing committees;
  - (e) Special reports;
  - (f) Old business;
  - (g) New business;
  - (h) Other business;
  - (i) Motion to adjourn.
5. Upon the request of any board member, immediately preceding a vote by the board, the recording secretary shall repeat the motion, name of the person making the motion and the name of the person who has seconded the motion. Any board member may request to have their vote entered in the minutes.
  6. Special meetings of the board may be called by the chair or as indicated by Minn. Statute 403.36, Subd. 1d providing that any six members may call a meeting. Notice of special meetings shall include the date, time, place and agenda and be sent to board members at least three calendar days prior to the meeting. Business at special meetings shall be limited to the subjects listed in the published agenda.
  7. When a member/designee and their alternate are present at a regular meeting or committee meeting, only the member may cast votes and be recorded in proceedings.

#### **ARTICLE VI: Committees**

The Statewide Emergency Communications Board chair may recommend to the board for its approval the establishment of special or standing committees to assist the board in performing its duties and responsibilities. The chair's recommendation shall include the duties and responsibilities of the special committee, task force or work group, its chair and members, and any other matters necessary for the efficient operation of the committee. Committees operate under the same by-laws as the Statewide Emergency Communications Board.

#### **Standing Committees**

The following standing committees and memberships are established. At the discretion of the SECB additional membership may be added to the committees by the chair.

#### **Finance:**

- To advise the Statewide Emergency Communications Board upon all matters which have a financial impact upon the Statewide Emergency Communications Board and its members.
- Membership is comprised of one primary and one alternate from each of the following: Minnesota Department of Transportation, Minnesota Indian Affairs Council or Tribal Government, the regional emergency services board for the metropolitan area, and one regional emergency communications or emergency services board from greater Minnesota.

#### **Legislative/Government Affairs:**

- To advise the Statewide Emergency Communications Board upon all matters related to legislation and government affairs that have the potential to impact the Statewide Emergency Communications Board and its members.
- Membership is comprised of one primary and alternate from each of the following: Minnesota Department of Transportation, Minnesota Sheriffs' Association, Minnesota Chiefs of Police Association, Minnesota State Fire Chiefs Association, League of Minnesota Cities, Association of Minnesota Counties, Minnesota Ambulance Association, Minnesota Indian Affairs Council or Tribal Government, and each regional emergency communications or emergency services board.

#### **Operations and Technical:**

- As directed by Minn. Statute 403.40.

- To advise the Statewide Emergency Communications Board upon all matters operational and technical as they pertain to use of the ARMER system.
- Membership is comprised of one primary and one alternate from each of the following: Minnesota Department of Transportation, Minnesota State Patrol, Minnesota Sheriffs' Association, Minnesota Chiefs of Police Association, Minnesota State Fire Chiefs Association, Minnesota Ambulance Association, Minnesota Indian Affairs Council or Tribal Government, and each regional emergency communications or emergency services board.

**Steering:**

- To advise the Statewide Emergency Communications Board upon all policy decisions.
- Membership is comprised of one primary and alternate from each of the following: Minnesota Department of Transportation, Office of Enterprise Technology (MN.IT Services), Minnesota Sheriffs' Association, Minnesota Chiefs of Police Association, Minnesota State Fire Chiefs Association, Minnesota Ambulance Association, Minnesota Indian Affairs Council or Tribal Government, and each regional emergency communications or emergency services board.

**Interoperability:**

Shall seek to represent regions within the state whose membership includes federal, local, and tribal public safety officials, including emergency management officials from all regions of the state.

The responsibilities of the Interoperability Committee shall be:

- To advise the Statewide Emergency Communications Board upon all matters related to public safety communications interoperability. To address the responsibilities provided for in Minn. Stat. 403.36 Sub. 1e.
- To coordinate and establish standards and protocols as needed for the use of the Statewide Interoperable Frequencies, such as, but not limited to:
  - VLAW 31 (155.475 MHz) (Formerly MINSEF)
  - VFIRE23 (154.295 MHz) (Formerly SWFIREMA)
  - VMED28 (155.340 MHz) (Formerly EMS HEAR)
  - MNCOMM (155.370 MHz) (formerly MIMS)
  - Any other identified state interoperable in VHF, UHF, and/or 700-800 MHz bands.
- Membership is comprised of one primary and one alternate from each of the following: Minnesota Department of Transportation, Minnesota Department of Natural Resources, Minnesota State Patrol, two Minnesota sheriffs appointed by the Minnesota Sheriffs' Association—one from the metropolitan area and one from greater Minnesota, two chiefs of police appointed by the Minnesota Chiefs of Police Association—one from the metropolitan area and one from greater Minnesota, two fire chiefs appointed by the Minnesota State Fire Chiefs Association—one from the metropolitan area and one from greater Minnesota, two members of Minnesota Ambulance Association—one member from the metropolitan area and one from greater Minnesota, Minnesota Indian Affairs Council or Tribal Government, Department of Corrections, Minnesota Homeland Security and Emergency Management, Emergency Management District VI (metropolitan area), one seat from District I, II, III, IV or V (greater Minnesota), Bureau of Criminal Apprehension, Minnesota National Guard, the United States Federal Government, and Twin Cities Urban Area Security Initiative, and a representative from each regional emergency communications or emergency services board.

**Integrated Public Alert and Warning System (IPAWS):**

- To advise the Statewide Emergency Communications Board on matters related to the Integrated Public Alert and Warning System and to coordinate and establish policy, procedure, and protocols for the expansion of IPAWS through private/public partnership.

- Membership is comprised of one primary and one alternate from each of the following: Department of Public Safety Office of Communications, Emergency Communication Networks, Office of Enterprise Technology (MN.IT Services), Minnesota State Patrol, Minnesota Sheriffs' Association, Minnesota Chiefs of Police Association, Minnesota State Fire Chiefs Association, Minnesota Indian Affairs Council or Tribal Government, Minnesota Cable Communications Association, Homeland Security and Emergency Management, Bureau of Criminal Apprehension, National Weather Service, Minnesota Department of Health, Minnesota Broadcasters Association, Minnesota Telecom Alliance, Association of Minnesota Emergency Managers, Association of Public Safety Communications Officials, International, National Emergency Number Association, Utilities Telecom Council, Electronic Signage Providers, and each regional emergency communications or emergency services board or equivalent.

**Interoperable Data:**

- To advise the Statewide Emergency Communications Board on all matters relating to wireless broadband for public safety and to represent Minnesota on a national level.
- Membership is comprised of one primary and one alternate from each of the following: Minnesota Department of Public Safety, Office of Enterprise Technology (MN.IT Services), Minnesota Department of Transportation, Minnesota Department of Natural Resources, Minnesota State Patrol, League of Minnesota Cities, Association of Minnesota Counties, Minnesota Sheriffs' Association, Minnesota Chiefs of Police Association, Minnesota State Fire Chiefs Association, Minnesota Ambulance Association, Minnesota Indian Affairs Council or Tribal Government, and each regional emergency communications or emergency services board or equivalent.  
Membership may also include non-voting seats representing non-government and private industry partners at the discretion of the committee.

**Next Generation 911 (NG911):**

- To advise the Statewide Emergency Communications Board on all matters relating to NG911. The committee will recommend to the Statewide Emergency Communications Board uniform 911 network design characteristics, policies, and procedures based on best practices and industry standards to ensure Public Safety Answering Point (PSAP) interoperability across the state through the use of open architecture and the implementation of a coordinated statewide NG911 plan. The NG911 Committee will plan the migration to, utilization of, and the continued operation and maintenance for the statewide, interoperable next generation 911 system.
- Membership is comprised of one primary and one alternate from each of the following: Emergency Communication Networks Division, Minnesota State Patrol, Minnesota Sheriffs' Association, Minnesota Chiefs of Police Association, Minnesota State Fire Chiefs Association, Minnesota Ambulance Association, Minnesota Indian Affairs Council or Tribal Government, Tribal PSAP, County Geographical Information System (GIS) and each regional emergency services board or regional emergency communications board.
- Membership may also include non-voting seats representing non-government and private industry partners at the discretion of the committee and the Statewide Emergency Communications Board.

**1. Chair and Members.**

The board chair shall recommend to the board for approval at its first regular meeting in January, or as soon thereafter as possible, the chair, the members, and responsibility of each standing committee.

Additional representatives may be added to any committee upon recommendation of the chair and majority voting approval by the Statewide Emergency Communications Board.

## **2. Committee Meetings.**

The time and place for standing committee meetings shall be determined by the committee chair.

The procedures for notice, cancellation and the conduction of business at standing committee meetings shall be the same as those for meetings of the full board.

A simple majority of committee members shall constitute a quorum per the attendance requirements listed in Article 2.

Board members other than those serving on the committee may attend and participate in committee debate but may not cast votes or be counted for the purpose of making a quorum.

## **ARTICLE VII: Robert's Rules**

Unless otherwise specified, Robert's Rules of Order will prevail in board or committee proceedings.

## **ARTICLE VIII: Amendment of Bylaws**

These Bylaws may be amended at any regular meeting of the board by a two-thirds vote of the members present representing a quorum, after a 10-day notice to board members setting forth in detail the contents of the proposed amendment(s).

### **Revised:**

June 2013  
September 2012  
January 22, 2009  
October 25, 2007

# ***BYLAWS of the Statewide Emergency Communications Board***

## ***Established October 2005***

### **ARTICLE I: Name**

In accordance with Minn. Stat. §403.36 this board shall be herein named the Statewide Emergency Communications Board (ECB) as a successor to the Statewide Radio Board (SRB).

### **ARTICLE II: Purpose**

1. In accordance with Minn. Stat. §403.36 1(e) The Statewide Emergency Communications Board exists to develop a project plan for a statewide, shared, trunked public safety radio communication system in Minnesota, to develop and apply statewide standards and guidelines for interoperability and to initiate an education plan to stakeholders.
- 2.
2. The statewide radio system may be referred to as Allied Radio Matrix for Emergency Response or ARMER.
3. Pursuant to Minn. Stat. §403.36 Subd. 1g: The Statewide Emergency Communications Board shall act as Minnesota's Statewide Interoperability Executive Committee (SIEC).
4. Pursuant to Minn.Stat.403.382 Subd. 1b: As a Statewide Emergency Communication Board, the board shall be responsible for the statewide coordination of 911 service in addition to existing responsibilities for the ARMER system provided for in sections 403.21 to 403.37

### **ARTICLE III: Members**

#### **1. Membership**

In accordance with Minn. Stat. §403.36 Subd. 1, the membership of the Statewide Emergency Communications Board shall consist of the following members or their designees:

- (a) The commissioner of public safety
- (b) The commissioner of transportation
- (c) The state chief information officer
- (d) The commissioner of natural resources
- (e) The chief of the Minnesota State Patrol
- (f) The commissioner of management and budget
- (g) The chair of the Metropolitan Council
- (h) Two elected city officials, one from the nine-county metropolitan area and one from Greater Minnesota, appointed by the governing body of the League of Minnesota Cities
- (i) Two elected county officials, one from the nine-county metropolitan area and one from Greater Minnesota appointed by the governing body of the Association of Minnesota Counties
- (j) Two sheriffs, one from the nine-county metropolitan area and one from Greater Minnesota, appointed by the governing body of the Minnesota Sheriff's Association
- (k) Two chiefs of police, one from the nine-county metropolitan area and one from Greater Minnesota, appointed by the governor after considering recommendations made by the Minnesota Police Chief's Association
- (l) Two fire chiefs, one from the nine-county metropolitan area and one from Greater Minnesota, appointed by the governor after considering recommendations made by the Minnesota Fire Chiefs' Association
- (m) Two representatives of emergency medical service providers, one from the nine-county metropolitan area and one from Greater Minnesota, appointed by the governor after considering recommendations made by the Minnesota Ambulance Association
- (n) The chair of the regional radio board for the metropolitan area
- (o) A representative of Greater Minnesota regional radio boards selected in accordance with ARMER Standard 8.1.0 adopted on January 24, 2011

Each member or designee shall be allowed to choose an alternate and all members shall annually identify in writing to the Chair of the Statewide Emergency Communications Board the name and contact information of members and alternates.

## 2. Attendance

The membership of the SRB and any standing committees shall maintain an attendance record of either the designee or the alternate of 75% of all official meetings across a twelve month rolling calendar. If a member or the alternate fails to meet the attendance requirement, the Chair of the committee shall notify the member's organization in writing of the attendance record and request a replacement designee. At the discretion of the Chair of the committee, the member's appointment may be omitted in determining the presence of a quorum until the attendance record is in compliance as outlined in the article. A member that is not in compliance of the attendance requirement will not be able to vote on any action items until the attendance record is in compliance as outlined in this article.

## **ARTICLE IV: Officers**

Per Minn. Stat. §403.36 Subdivision 1(a), the commissioner of public safety shall convene and chair the Statewide Emergency Communications Board.

1. The officers of the Board shall consist of the Vice Chair and the Executive Secretary.
2. The Vice-Chair and Executive Secretary must be members of the Board.
3. The Vice-Chair and Executive Secretary shall be elected annually.
4. Officers shall serve a one-year term or until their successors are chosen. The term of office shall be effective at the close of the meeting at which the officers are installed. No member may hold more than one office at a time. In the event of a vacancy in one of the officer positions, the Chair may appoint a member to serve the remaining portion of the term.
5. The Chair's duties and responsibilities include representing the Board as its principal spokesperson; presiding at Board meetings; directing the preparation of the agenda for all Board meetings; and appointing members to standing and special committees.
6. The Vice-Chair shall exercise the duties and responsibilities of the Chair whenever the Chair is unable to serve.
7. The Executive Secretary shall exercise the duties and responsibilities of the Chair whenever both the Chair and Vice Chair are unable to serve.
8. The Vice-Chair and Executive Secretary must equally represent the State of Minnesota Metro Area and Greater Minnesota.

## **ARTICLE V: Board Meetings**

1. Regular meetings of the full Statewide Emergency Communications Board shall be held at the call of the Chair but not less than quarterly. Regular meetings may be cancelled by the Chair upon agreement by a majority of the members. Notice of such cancellation shall be provided as far in advance of the scheduled meeting as possible.
2. A simple majority of the membership shall constitute a quorum.
3. The agenda for each Board meeting shall be established and published by the Chair and be sent to the Board members five business days prior to the meeting. At the beginning of a regular meeting any member may move to amend the published meeting agenda.
4. Regular meetings of the Board will be conducted in the following order:
  - (a) Call to order
  - (b) Motions, if any, by members to amend the published agenda;
  - (c) Approval of the minutes of prior meeting(s);
  - (d) Reports by standing committees;
  - (e) Special reports;
  - (f) Old business;
  - (g) New business;
  - (h) Other business;

- (i) Motion to adjourn.
5. Upon the request of any Board member, immediately preceding a vote by the Board, the Recording Secretary shall repeat the motion, name of the person making the motion and the name of the person who has seconded the motion. Any Board member may request to have their vote entered in the minutes.
  6. Special meetings of the Board may be called by the Chair or as indicated by Minn. Statute 403.36, Subd. 1d providing that any six members may call a meeting. Notice of special meetings shall include the date, time, place and agenda and be sent to Board members at least three calendar days prior to the meeting. Business at special meetings shall be limited to the subjects listed in the published agenda.
  7. When a member/designee and their alternate are present at a regular meeting or committee meeting, only the member may cast votes and be recorded in proceedings.

#### **ARTICLE VI: Committees**

The Statewide Emergency Communications Board Chair may recommend to the Board for its approval the establishment of special or standing committees to assist the Board in performing its duties and responsibilities. The Chair's recommendation shall include the duties and responsibilities of the special committee, task force or work group, its chair and members, and any other matters necessary for the efficient operation of the committee. Committees operate under the same by-laws as Statewide Emergency Communications Board.

#### **Standing Committees**

The following standing committees are established:

##### **Finance:**

- To advise the Statewide Emergency Communications Board upon all matters that have a financial impact upon the Statewide Emergency Communications Board and its members.
- Membership is comprised of one primary and alternate from each of the following: Minnesota Department of Finance, Minnesota Department of Transportation, the regional radio board for the metropolitan area, and one regional radio board from Greater Minnesota.

##### **Legislative/Government Affairs:**

- To advise the Statewide Emergency Communications Board upon all matters related to legislation and government affairs that have the potential to impact the Statewide Emergency Communications Board and its members.
- Membership is comprised of one primary and alternate from each of the following: regional radio board from Greater Minnesota, the regional radio board for the metropolitan area, Minnesota Department of Transportation, Minnesota Ambulance Association, Minnesota Sheriff's Association, Minnesota Fire Chiefs Association, and Minnesota Chiefs of Police Association.

##### **Operations and Technical:**

- As directed by Minn. Statute 403.40.
- To advise the Statewide Emergency Communications Board upon all matters operational and technical as they pertain to use of the ARMER system.
- Membership is comprised of one primary and one alternate from each of the following: Minnesota Ambulance Association, Minnesota Chiefs of Police Association, Minnesota Fire Chief's Association, Minnesota Sheriff's Association, Minnesota Department of Transportation, Minnesota State Patrol, and each regional radio board.

##### **Steering:**

- To advise the Statewide Emergency Communications Board upon all policy decisions.
- Membership is comprised of one primary and alternate from each of the following: regional radio board from Greater Minnesota, the regional radio board for the metropolitan area,

Minnesota Department of Transportation; Minnesota Ambulance Association; Minnesota Sheriff's Association, Fire Chiefs Association; Minnesota Chiefs of Police Association, and Office of Enterprise Technology (MN.IT Services).

**Interoperability:**

Shall seek to represent regions within the state whose membership includes federal, local, and tribal public safety officials, including emergency management officials from all regions of the state.

The responsibilities of the Interoperability Committee shall be:

- To advise the Statewide Emergency Communications Board upon all matters related to public safety communications interoperability. To address the responsibilities provided for in Minn. Stat. 403.36 Sub. 1e.
- To coordinate and establish standards and protocols as needed for the use of the Statewide Interoperable Frequencies, such as, but not limited to:
  - VLAW 31 (155.475 MHz) (Formerly MINSEF)
  - VFIRE23 (154.295 MHz) (Formerly SWFIREMA)
  - VMED28 (155.340 MHz) (Formerly EMS HEAR)
  - MNCOMM (155.370 MHz) (formerly MIMS)
  - Any other identified state interoperable in VHF, UHF, and/or 700-800 MHz bands.

Membership is comprised of one primary and one alternate from each of the following: two members of Minnesota Ambulance Association—one member from the metropolitan area and one from Greater Minnesota, Minnesota Department of Natural Resources, Minnesota Department of Transportation, a representative from each regional radio board, Minnesota State Patrol, two Minnesota Sheriffs appointed by the Sheriff's Association—one from the Metropolitan area and one from Greater Minnesota, two chiefs of police—one from the metropolitan area and one from Greater Minnesota from the Police Chief's Association, two fire chiefs—one from the metropolitan area and one from Greater Minnesota appointed by the Fire Chief's Association, Department of Corrections, Minnesota Homeland Security and Emergency Management, Emergency Management District VI (metropolitan area), one seat from District I, II, III, IV or V (Greater Minnesota), Bureau of Criminal Apprehension, Minnesota National Guard, the United States Federal Government, and Twin Cities Urban Area Security Initiative.

**Integrated Public Alert and Warning System (IPAWS):**

- To coordinate and establish policy, procedure, and protocols for the expansion of the Integrated Public alert and Warning System through private/public partnership.
- Membership is comprised of one primary and one alternate from each of the following: Minnesota Fire Chiefs Association, Minnesota Cable Communications Association, Homeland Security and Emergency Management, Bureau of Criminal Apprehension, Emergency Communication Networks, Minnesota State Patrol, Department of Public Safety Office of Communications, National Weather Service, Office of Enterprise Technology (MN.IT Services), Minnesota Department of Health, Tribal Government, Minnesota Broadcasters Association, Minnesota Telecom Alliance, Association of Minnesota Emergency Managers, Minnesota Sheriff's Association, Minnesota Chiefs of Police, Association of Public Safety Communicatons Officials, International, National Emergency Number Association, Utilities Telecom Council, Electronic Signage Providers, Metropolitan Emergency Services Board, and each regional radio board or equivalent.

**Interoperable Data:**

- To advise the Statewide Emergency Communications Board on all matters relating to wireless broadband for public safety and to represent Minnesota on a national level.
- Membership is comprised of one Primary and one Alternate from each of the following: Minnesota Department of Public Safety, Office of Enterprise Technology (MN.IT Services), Minnesota Management and Budget, Minnesota Department of Transportation, Minnesota Department of Natural Resources, Minnesota State Patrol, Minnesota Sheriff's Association, Minnesota Fire Chief's Association, Minnesota Police Chief's Association, Minnesota Ambulance Association, League of Minnesota Cities, Association of Minnesota Counties, Minnesota Indian Affairs Council, and each regional radio board or equivalent.
- Membership may also include non-voting seats representing non-government and private industry partners at the discretion of the committee. Statewide Emergency Communications Board
- **Next Generation 911 (NG911):**
- **The NG911 Committee will recommend to the Statewide Emergency Communications Board uniform 911 network design characteristics, policies, and procedures based on best practices and industry standards to ensure Public Safety Answering Point (PSAP) interoperability across the state through the use of open architecture and the implementation of a coordinated statewide NG911 plan. The NG911 Committee will plan the migration to, utilization of, and the continued operation and maintenance for the statewide, interoperable next generation 911 system.**
- **Membership is comprised of one Primary and one Alternate from each of the following: each regional radio board or regional emergency communications board, Minnesota Ambulance Association, Minnesota Fire Chiefs' Association, Minnesota State Patrol, Minnesota Sheriff's Association, Minnesota Chiefs of Police Association, Emergency Communication Networks Division, , Tribal PSAP, County Geographical Information System (GIS)**
- Membership may also include non-voting seats representing non-government and private industry partners at the discretion of the committee and the Statewide Emergency Communications Board.

### **1. Chair and Members.**

The Board Chair shall recommend to the Board for approval at its first regular meeting in January, or as soon thereafter as possible, the chair, the members, and responsibility of each standing committee.

Additional representatives may be added to any committee upon recommendation of the chair and majority voting approval by the Statewide Emergency Communications Board.

### **2. Committee Meetings.**

The time and place for standing committee meetings shall be determined by the committee chair.

The procedures for notice, cancellation and the conduction of business at standing committee meetings shall be the same as those for meetings of the full Board.

A simple majority of committee members shall constitute a quorum per the attendance requirements listed in Article 2.

Board members other than those serving on the committee may attend and participate in committee debate but may not cast votes or be counted for the purpose of making a quorum.

### **ARTICLE VII: Robert's Rules**

Unless otherwise specified, Robert's Rules of Order will prevail in Board or Committee proceedings.

### **ARTICLE VIII: Amendment of Bylaws**

These Bylaws may be amended at any regular meeting of the Board by a two-thirds vote of the members present representing a quorum, after a 10-day notice to Board members setting forth in detail the contents of the proposed amendment(s).

**Revised:**

June 2013  
September 2012  
January 22, 2009  
October 25, 2007



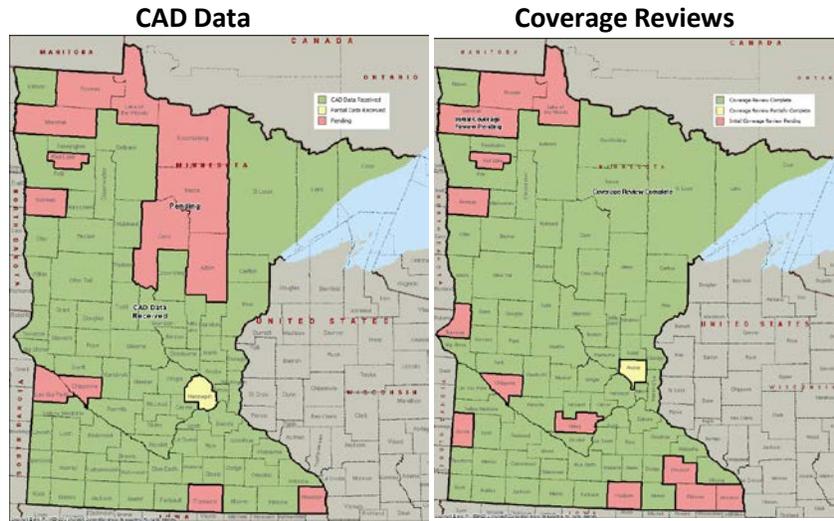
Minnesota Public Safety Wireless Data Network Requirements Project

Status on 26 May 2015	Prior Status	Green	Current Status	Green
Green	The project is within 20% variance of the currently approved baseline for budget and schedule, and is expected to substantially meet all of the business objectives established in the startup report.			
Yellow	The project has exceeded 20% variance of the currently approved baseline for budget and/or schedule and is expected to substantially meet all of the business objectives established in the startup report.			
Red	The project is at risk of termination, or at risk of not substantially meeting the business objectives established in the startup report.			
<ul style="list-style-type: none"> <li>● <b>Task 18.01 – Response to 3<sup>rd</sup> Public Notice:</b> <ul style="list-style-type: none"> <li>○ Outline of proposed comments to FirstNet Third (3<sup>rd</sup>) Public Notice has been circulated to the Team. The Third Notice focuses on the definition of "public safety entity," which determines the extend of FirstNet's legal authority to serve an entity as a primary network subscriber (as opposed to a secondary user under a "covered leasing agreement").</li> </ul> </li> <li>● <b>Task 20 – Minnesota State Plan Decision Process</b> <ul style="list-style-type: none"> <li>○ Review of Ken’s outline and comment relevant to the scope of work</li> </ul> </li> <li>● <b>Task 6 – MOA, Standardize Templates:</b> <ul style="list-style-type: none"> <li>○ Legal Document Report is in process and shall provide a rationale for the MOAs. It will also describe any legal/policy barriers or concerns raised by the MOAs.</li> <li>○ Team would like to coordinate a small group from OAG, MnIT, and MnDOT to further progress on the report                             <ul style="list-style-type: none"> <li>▪ MnDOT: Tim Lee? Shane?</li> <li>▪ MNIT: Jim Johnson?</li> <li>▪ OAG:</li> </ul> </li> </ul> </li> <li>● <b>Task 4 – Education and Outreach:</b> <ul style="list-style-type: none"> <li>○ Q6 Newsletter: Strategic Build-Out Strategy and introduction into the regional consultation process has been released.</li> <li>○ Publication: CAD data &amp; Coverage Review document shall be drafted and will be submitted to the counties upon completion of the Coverage Reviews.</li> <li>○ Pending Items:                             <ul style="list-style-type: none"> <li>▪ <i>Public Safety Broadband for the PSAP</i> – to be delivered to Alex Tech</li> <li>▪ Network Requirements (just before Phase 2) – Pending</li> </ul> </li> <li>○ Delivered Items:                             <ul style="list-style-type: none"> <li>▪ Training Modules:                                     <ul style="list-style-type: none"> <li>● <i>What is Wireless Broadband</i> – Delivered &amp; Posted</li> <li>● <i>LTE Technical Review (Deep Dive)</i> – Delivered and additional edits provided</li> </ul> </li> </ul> </li> </ul> </li> <li>● <b>Task 5 – Stakeholder Entities</b> <ul style="list-style-type: none"> <li>○ MnFCP Team to coordinate with Regional Interoperability Coordinators to improve User Population Survey response rates in top key counties                             <ul style="list-style-type: none"> <li>▪ “The Metro 9” (Twin Cities Metro area)                                     <ul style="list-style-type: none"> <li>● Coordinated outreach with MESB (Jill Rohret)</li> </ul> </li> <li>▪ “The Top 10” (top 10 counties by population that are outside of Metro 9)                                     <ul style="list-style-type: none"> <li>● RICs have been provided a list of the Top 10.</li> </ul> </li> </ul> </li> </ul> </li> <li>● <b>Task 5 – Public-Private Partner (RFI)</b> <ul style="list-style-type: none"> <li>○ Formal RFI text has been finalized</li> <li>○ RFI to be posted sometime between June 15 - 30</li> </ul> </li> <li>● <b>Task 8 – Coverage Reviews</b> <ul style="list-style-type: none"> <li>○ Upcoming Reviews: Pending</li> </ul> </li> </ul>				

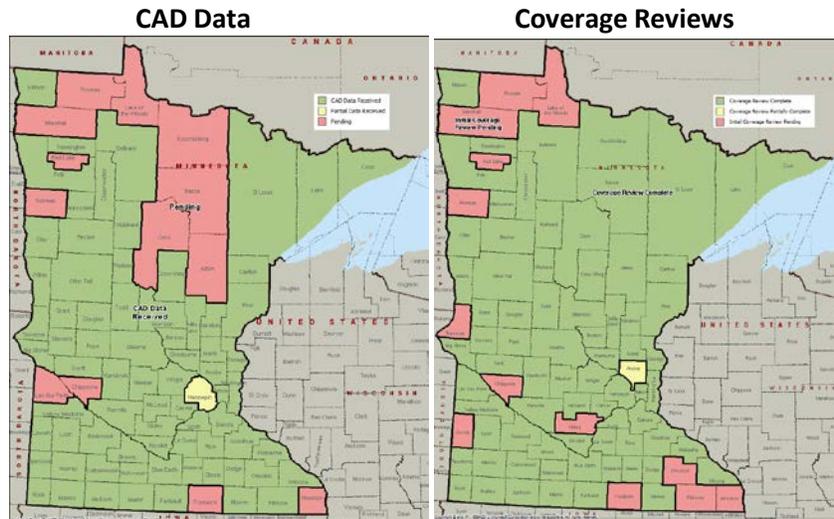
# Minnesota Public Safety Wireless Data Network Requirements Project

<b>Status on 26 May 2015</b>	<b>Prior Status</b>	<b>Green</b>	<b>Current Status</b>	<b>Green</b>
<b>Green</b>	The project is within 20% variance of the currently approved baseline for budget and schedule, and is expected to substantially meet all of the business objectives established in the startup report.			
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**Status MAPS as of this week:**



**Status MAPS as of LAST week:**



**Coverage Review Participation**

Quarter	Beginning Date	End Date	# Agencies	# Individuals	Meetings
3 <sup>rd</sup> Quarter, 2014	7/1/2014	9/30/2014	61	85	13
4 <sup>th</sup> Quarter, 2014	10/1/2014	12/31/2014	85	128	36
1 <sup>st</sup> Quarter, 2015	1/1/2015	3/31/2015	66	99	23
2 <sup>nd</sup> Quarter, 2015	4/1/2015	6/30/2015	19	23	11

## Minnesota Public Safety Wireless Data Network Requirements Project

<b>Status on 26 May 2015</b>	<b>Prior Status</b>	<b>Green</b>	<b>Current Status</b>	<b>Green</b>
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### This Week's Tally

Task	Sub-Tasks & Status							
	POC Data Received	CAD Data Received	User POP Survey Sent	Utilization Survey	CAD Geocoded	KML Created	Coverage Review Completed	
							County	Tribe
Rick Juth	92%	95%	97%	0%	92%	87%	96%	0%
Marcus Bruning	59%	69%	94%	0%	63%	63%	80%	57%
Randy Donahue	65%	80%	95%	0%	75%	70%	79%	67%
<b>Count Totals:</b>	81	91	106	0	86	82	74	6

### Previous Week's Tally

Task	Sub-Tasks & Status							
	POC Data Received	CAD Data Received	User POP Survey Sent	Utilization Survey	CAD Geocoded	KML Created	Coverage Review Completed	
							County	Tribe
Rick Juth	92%	95%	97%	0%	92%	87%	96%	0%
Marcus Bruning	59%	69%	94%	0%	63%	63%	80%	57%
Randy Donahue	65%	80%	95%	0%	75%	70%	79%	67%
<b>Count Totals:</b>	81	91	106	0	86	82	74	6

- **Task 8 – Subcommittees (Work Group)**
  - Released recommendations from working groups for review
  - System & Security Work Group activities to continue until 22 May. Their final recommendations to be included in the report.
- **Task 13 – FirstNet Baseline Review**
  - Data has been uploaded and is ready to proceed.
- **Task 14 – Phased Build-Out Strategy**
  - Workgroup volunteers are being defined at this time
  - First workgroup session to be held in Arden Hill Training Center, June 2, 10:30am to 2:30pm
  - Process has been defined. We are seeking participants for the workgroup to define the build-out strategy and objectives per phase.
    - Presentations, to the Regional RAC, to be held in July-August; estimated dates:
      - Metro:
      - Central:
      - Northeast:
      - Northwest:
      - Southeast:
      - South Central:
      - Southwest:
- **Task 15 – Utilization Survey**
  - First draft of the survey to be released to the Team for review.

## Minnesota Public Safety Wireless Data Network Requirements Project

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Red	The project is at risk of termination, or at risk of not substantially meeting the business objectives established in the startup report.			
<ul style="list-style-type: none"> <li>○ FirstNet to provide a portal to upload responses in bulk</li> <li>○ Utilization survey to be published in June</li> <li>● <b>Task 16 – Public Safety Entity Operational Areas</b> <ul style="list-style-type: none"> <li>○ Data format has been defined; and to be sent for review to FirstNet (Brian Hobson)</li> <li>○ Geocomm: Team to send format to Geocomm</li> <li>○ Need to follow up with the two other GIS services companies:                             <ul style="list-style-type: none"> <li>▪ Pro-West (we have contacts) &amp; BullBerry (no direct contacts yet)</li> </ul> </li> </ul> </li> <li>● <b>Task 17 – Data Usage/Traffic Profiles – CAD Data Manipulation</b> <ul style="list-style-type: none"> <li>○ Methodology is pending</li> </ul> </li> <li>● <b>Task 18.02 – FirstNet Draft RFP Evaluation:</b> <ul style="list-style-type: none"> <li>○ First overview of the RFP has been completed. Televate has send a draft of questions for comment by the team</li> </ul> </li> <li>● <b>Task 19 – MnFCP Commercial Carrier Coverage &amp; Throughput Measurements</b> <ul style="list-style-type: none"> <li>○ <b>On Hold</b></li> </ul> </li> <li>● Televate IG to provide <b>Invoices and Deliverables</b> <ul style="list-style-type: none"> <li>○ No new milestone completions to report</li> </ul> </li> <li>● <b>Upcoming Events, Travel, New Business:</b> <ul style="list-style-type: none"> <li>○ No events pending</li> </ul> </li> </ul>				

## 1 Notes

- Wireless Contracts:
  - State Contract – check back with Dale Stevens concerning the number of subscribers on each contract
  - GSA Contract – Mark to check in with contract administrator; no luck yet
    - Add questions on PSAP applications to the NG911 Survey; (from working group)
- PSAP coordination with Dana Wahlberg;
  - Add questions on PSAP applications to the NG911 Survey; (from working group)
- Legislative Activities are potentially coming.
  - Met with legislator, not likely to be capital costs
  - Legislature is not necessarily involved in the program
- Website: <https://dps.mn.gov/divisions/ecn/Pages/broadband.aspx>;
- Additional Newsletter Topics:
  - Coverage & Radio Propagation Basics
  - Differences between NPSBN LTE, Commercial Services & P25
  - Capacity Basics
  - Quality of Service Basics

- Coverage Augmentation Strategies & Advantages/Disadvantages
- Public Safety Broadband Devices
- **GIS Data**
  - Will need to coordinate with Danna Mackenzie, [Danna.Mackenzie@state.mn.us](mailto:Danna.Mackenzie@state.mn.us), with regard to the phase 2 infrastructure assessment; however, the data will likely come from NTIA as GIS has restriction its release
- **Task 3 – Tribal**
  - Continue updates to “Tribal Consultation Recommendations”; to include output from Governance
  - Governance Efforts:
    - Effort to develop plan for better engaging tribes on governance:
      - Call held with Anna Marie Hill, MN Indian Affairs Council 5/20;
      - Monte Fronk called on 6/4, he proposes that we organize a meeting with the Emergency Manager at Ripley at a date to be determined
      - Also interviewed Greg Hayes 6/18 (Shakopee Mdewakanton Sioux)
      - Also reach out to Mike Keyport (Grand Portage Ojibwe)
- **Fire Chief Association:** Summary of key data points:
  - Bruce: has agreed to distribute the letter to every fire departments throughout the state
  - 780 fire departments throughout the state ~20,700 fire fighters
  - Some money available from old grants for travel expenses; volunteer only
  - Bruce: can send us a link that contains the name and address for every fire department throughout the state of Minnesota
- **Bureau of Criminal Apprehension;** keep on the horizon when it comes time to assess applications
- **NTIA Officer:** Caroline Dunn
- **Task 3 – Tribal**
  - Need to keep a running list of coordination activities with the tribes as proof of our outreach efforts.
  - In the context of the Governance and MOA/MOU tasks, FirstNet does not expect the State to resolve all issues with regard to the tribes. FirstNet does expect:
    - The States to summarize what exists and to “characterize” the relationship with each Tribe
    - Indicate the level of tribal participation in the State’s governance structures
    - Highlight the issues that would impact the implementation of the network on tribal lands
    - We are expected to collate the points of contact at each tribe
    - We are expected to quantify the number of potential users at each tribe
  - Background Materials on tribes that were suggested for review:
    - Review of the United States Code, Title 16, Supremacy Clause
    - Review of the State’s Constitution wrt tribes
  - Keep running list of outreach efforts for the Tribes (Mark)
    - Summarize attendance from tribal areas; Outline gaps
    - Keep informed Cassandra O’Hearn

**Allied Radio Matrix for Emergency Response**



# ARMER

## Project Status Report

Reporting Period May 1, 2015 through June 1, 2015

**Executive Summary**

**Overall Status:**

	Green (Controlled)	Yellow (Caution)	Red (Critical)	Reason for Deviation
<b>Budget</b>	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/>	
<b>Schedule</b>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input checked="" type="checkbox"/>	<input type="checkbox"/>	Land acquisition delays will impact completion of some sites
<b>Scope</b>	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/>	

ARMER  
Backbone  
**97%**  
On-the-air

**Controls**

**Issue Status:**

**Change Status:**

- No pending plan changes

**Accomplishments**

**Accomplishments during this Reporting Period:**

- The following sites went on the air:
  
- The land acquisition has been completed for the following sites:
  -

**Budget**

**Construction Budget Status as of June 1, 2015**

Project Funding	Original Budget	Spent to Date	Unspent Balance Remaining	Encumbered	Available Balance
Phase 3	\$45,000,000	\$44,952,397.19	\$47,602.82	\$0.00	<b>*COMPLETE</b>
SRB Funds (FY 09)	\$1,902,831.00	\$1,902,831.00	\$0	\$0	<b>COMPLETE</b>
Phase 456 (FY 09)	61,996,957.89	\$61,981,069.99	\$15,887.90	\$15,887.90	\$ 0.00
Phase 456 (FY 10)	\$62,015,407.77	\$61,887,353.03	\$128,054.74	\$128,054.74	\$ 0.00
Phase 456 (FY 11, 12, 13)	\$61,987,634.34	\$46,870,673.32	\$15,116,958.02	\$3,840,787.64	\$ 11,276,173.38
<b>Total Phase 456</b>	<b>\$186,000,000.00</b>	<b>\$170,739,096.34</b>	<b>\$15,260,900.66</b>	<b>\$3,984,730.28</b>	<b>\$ 11,276,173.38</b>
<b>Projected Contingency as of June 1, 2015</b>					<b>\$86,173.38</b>

**Comments:**

-

**Scheduled Milestones / Deliverables**

Status updated May 1, 2015

Milestone	Total Sites	Sites Not Started	Sites in Progress	Sites Complete
ARMER Backbone Construction	324 Sites			
Tower Site Acquisition	324	0	10	314
Tower Construction & Site Development Work	324	8	10	307
Microwave Connectivity & RF Deployment	324	9	0	317 On the Air

Some Sites are on the air, but on the old towers or temporary towers. They are counted as on the air, but still require construction and/or installation at the new tower sites before they are complete:

- Finland
- Beaver Bay (New site under construction)
- Argo Lake (New site under construction)
- Duluth South

Of the 317, 4 are on temporary sites; sites construct and move still in the works.

- SE – all sites completed
- SR – all sites done, but working on leased site replacement.
- SW – all sites completed
- CM – all sites completed, but working on leased site replacement.
- Metro – all sites completed
- NW – 2 land acquisitions remaining.
- NE – 9 site under construction, 7 land acquisitions remaining.

Completion Targets

ARMER all Phases:

10 sites will be delayed due to delays in land acquisition.

**Ongoing ARMER System Work****Motorola System Upgrade**

- Upgrade to Motorola system version 7.13 punch list is completed. Any issues with system should have a case opened with Motorola.
- 7.15 upgrade scheduled to begin May 2016. Lock down for any system changes prior to the 7.15 upgrade will be around the beginning of April 2016.

**Site improvements**

- We also have 2 sites that need shelter upgrades to get air handlers and generators upgraded. One of these sites currently under construction.
- Still working on the addition of card key reader to the equipment shelters. Parts are in. Working on installs, 75% of the sites completed.
- We are also still working on replacing a number of towers that are on the air, but are not structurally up to standards and need to be replaced. This has limited some of the county requests for other antenna system and microwave additions.
- We are also reviewing some of our leased sites. Plans had always been to build towers in these areas, but to get the project moving we leased site to get on the air. In review of some of the land and lease cost it would make sense to find land in these areas and build towers. Also looking at long term land lease from private parties, would prefer to have towers on state, County or City owned land.

**Microwave improvements**

- We have developed a process for microwave path review and are working on a number of improvements to the microwave system. For high capacity routes we have taken the target of 20 miles for space diversity down to 17 miles. We are reviewing outage records for the paths and working improvements, space diversity, realignment, etc.
- At this point we have identified one bad path where an intermediate microwave site is needed. So we are looking to add a microwave site somewhere in the Cromwell area to split the Lawler – Moose Lake link. Working with the County it appears a site has been identified. Need to work through the acquisition and easements.
- Working to reroute the Oakland Woods – Alden path through Albert Lea to improve path performance. Path completed.
- We are also working to get the DC power systems updated at all sites to improve system reliability. Battery system contract completed, ordering parts and working on installs.
- Still reviewing microwave performance, ongoing.

**VHF interop layer**

- 109 outstate VHF sites have VLAW31 installed. VLAW31 is connected to CCGW so it is available to any MCC7500 console in the system and any Gold Elite within the zone. With the 7.13 upgrade zone boundaries for 7500 consoles have gone away, you just need to program the resource into the MCC7500.
- 109 sites have the VHF VFS installed and connected to MotoBridge.
- VPN access is being worked on for access to MotoBridge network.
- Working on plans in the metro area to simplify the VHF interop layer as we move from Gold Elites to 7500s.

**System improvements**

- Add redundant router and sink links to all ASR sites. This will help improve the instances of site trunking. Working on install of redundant routers, all areas complete. Still need to deal with County local enhancement sites, waiting on action by counties.
- Replace Lake Crystal leased site with 2 new sites. This adds a new site to the area.

**Old towers that need replacement**

- We have a number of towers that are on the air for ARMER that are old towers constructed in the 50's. These towers did not pass structural when we added the new ARMER equipment. But the level of structural deficiency was not a risk that required immediate replacement. So we have held off on replacement of these towers to see where we were in the ARMER budget to build what we had planned. We are still holding off on these until we are a little further along with ARMER. We are looking a moving a few of these up due to County co-location request that we have had to turn down and a couple that need to may have to have space diversity dished added.

## ARMER Construction Budget (Remaining Work)

Unencumbered Fund Balance ( As of May 2015)					<b>\$11,276,173.38</b>
Site Name <small>(Green - site on air)</small>	County	Description	Land/ Construction	Estimate to Complete	Balance
Lutsen	Cook	Replace Shelter	Ready	\$175,000.00	\$11,101,173.38
Tower	St Louis	Add Shelter/site work	Ready	\$150,000.00	\$10,951,173.38
Berner	Clearwater	New tower	Ready - On Hold	\$505,000.00	\$10,446,173.38
Island Lake	Beltrami	New tower	Ready	\$505,000.00	\$9,941,173.38
Cromwell	Carlton	New tower	Purc	\$655,000.00	\$9,286,173.38
Duluth South	St Louis	New tower	Lease	\$280,000.00	\$9,006,173.38
Finland	Lake	Replace Tower	DNR/Envir	\$590,000.00	\$8,416,173.38
Cascade River	Cook	New tower	DNR/Envir	\$1,060,000.00	\$7,356,173.38
NE Lake County	Lake	New tower	DNR/Envir	\$760,000.00	\$6,596,173.38
Lima Mt	Cook	New tower	DNR/Envir	\$1,260,000.00	\$5,336,173.38
Sawbill	Cook	New tower	Envir/Lease	\$1,310,000.00	\$4,026,173.38
Devil Fish	Cook	New tower	Envir/Lease	\$810,000.00	\$3,216,173.38
Red Lake	Beltrami	New tower	Indent Land	\$530,000.00	\$2,686,173.38
Eden Valley	Meecker	New tower	Envir/Lease	\$500,000.00	\$2,186,173.38
Lake Crystal	Blue Earth	New tower	Indent Land	\$625,000.00	\$1,561,173.38
Madelia	Watonwan	New tower	DOT/Envir	\$530,000.00	\$1,031,173.38
Molde	St Louis	Replace fire tower	DNR/Envir	\$320,000.00	\$711,173.38
<b>PENDING WORK</b>					
Card Key				\$100,000.00	\$611,173.38
Site clean up, shelter and tower removals				\$375,000.00	\$236,173.38
MSO - Backup equipment				\$50,000.00	\$186,173.38
Microwave DC power - Upgrades to meet run time required				\$100,000.00	\$86,173.38
<b>TOWER REPLACEMENTS (This work being held until above projects completed)</b>					
Russell	Replace tower			\$600,000.00	-\$513,826.62
Hawley	Replace tower			\$600,000.00	
Freedhem	Replace tower			\$600,000.00	
Middle River	Replace tower			\$600,000.00	
Theif River Falls	Replace tower			\$600,000.00	
Windom	Replace tower			\$600,000.00	
Virginia	Replace tower			\$600,000.00	
Cass Lake	Replace tower			\$600,000.00	
Viola	Replace tower			\$600,000.00	
Kimball	Replace tower			\$600,000.00	
Hoffman	Replace tower			\$600,000.00	
New London	Replace tower			\$600,000.00	
Woodland	Replace tower			\$600,000.00	
Littlefork	Replace tower			\$600,000.00	
Roosevelt	Replace tower			\$600,000.00	
Hewit: Land Purchase, replace tower.				\$500,000.00	
Scandia: Need to look at land purchase.				\$100,000.00	
Geneva: Need to look at land purchase, new tower ?				\$500,000.00	
Mapleton: Find land and build new tower				\$500,000.00	
Red Wing: Land purchase				\$100,000.00	