April 12, 2017
Steering Committee
Minutes
STATEWIDE EMERGENCY COMMUNICATIONS BOARD

STEERING COMMITTEE

WEDNESDAY, APRIL 12, 2017

1 P.M.

CHER: DAN HARTOG

NORTH MEMORIAL AMBULANCE SERVICE
4501 68TH AVE N
BROOKLYN CENTER, MN  55429

MEETING MINUTES

Attendance

Members:

Present  Member/Alternate  Representing
Joe Glaccum, Vice Chair
Mukhtar Thakur/Tim Lee
Troy Tretter
Tina Lindquist
Steve VanKekerix
Neil Ellis
Stacy Tufto

Minnesota Ambulance Association
MnDOT OSRC
Metropolitan Emergency Services Board
Central MN ESB
Northeast ECB
Northwest ECB
Southwest ECB

Guests:
Rick Juth, DPS-ECN
Jim Stromberg, DPS-ECN
Dustin Leslie, DPS-ECN

CALL TO ORDER

Chair Hartog is unable to attend the meeting, Vice Chair Joe Glaccum calls the meeting to order at 1pm.

APPROVAL OF AGENDA

Jim Stromberg would like to talk about the membership roster. Amend the agenda to add it. It will be added to new business.

Troy Tretter makes a motion to approve the agenda.
Tina Lindquist seconds the motion.

The motion carries.

APPROVAL OF PREVIOUS MEETING’S MINUTES

No additions or corrections to the meeting minutes.
Steve VanKekerix makes a motion to approve the March minutes. Neil Ellis seconds the motion.

The motion carries.

ANNOUNCEMENTS

Jim Stromberg makes announcement that agenda should be out five days in advance. This means meeting materials should be sent out 4 days in advance of that. So a total of 9 business days in advance of the meeting.

Glaccum comments that this is something that all committees are trying to accomplish.

ACTION ITEMS

METROPOLITAN COUNCIL – ARMER PARTICIPATION TYPE (STROMBERG)

At the March OTC meeting, the group approved the Metro Mobility requested permission to add 213 additional radio IDs. During the process, Stromberg could not find a participation plan for them. Historical documents showed that they were underneath the umbrella of the Metropolitan Council. At the OTC Stromberg suggested that the Metropolitan Council be identified as full participants because that was never fully identified. The OTC requested that this be sent to the Steering Committee for review. Stromberg recommends that the Metropolitan Council should be full ARMER participants.

Glaccum asks the question: is there any contract between the metro and the state for the Metropolitan Council?

Troy Tretter comments that the contract with the Metropolitan Council was signed by the Metropolitan Radio Board in June of 1997. So it predates the existence of ARMER and the SECB being formed. It also pre-dating the existence of participation plans. The Metropolitan Council was a part of the original buildout of the ARMER system. Troy Tretter clarifies that Metro Mobility is under the Met Council’s Participation Plan. The Metropolitan Council did contribute 3 Million toward the initial cost of the backbone so they have been around for a while. There should be a contract saying that they are on the ARMER system already in place. There should be a contract with MNDOT. The original agreement was established in June of 1997 before the MESB was established and were grandfathered in.

Jim Stromberg says there is no agreement between the Metropolitan Council and MNDOT.

Tim Lee they do not have an agreement on file. Tim recalled that they had an agreement with the metro radio board. Glaccum agrees with this. If they would join today, they would contract with the metro and become full participants. What is the will of the group?

Jim Stromberg is recommending that the Metropolitan Council be on a full Participation Plan.

Tretter has no objection from the metro. No need to change any contract language.

Tim Lee from MNDOT does not have an issue with the contract as it is. Did say that some contracts may have to be reviewed and updated. Lee says leave the language sit for now.

Tretter – a lot of the contracts need to be taken a look at, not just the Metropolitan Council. Existing contracts in place are grand fathered in. Perhaps we can redo some of the language of the contracts.
Tina Lindquist from Central region asks for a clarification: is this setting a precedent for other contracts to be reviewed and considered for full participation? Glaccum says that is correct. If there is any significant changes within any of the contracts, that would be the time to look at the status of their participation.

Tina Lindquist asks if the Metropolitan Council actually built their own backbone infrastructure or if they are just users of the system. Glaccum says that is correct.

Tretter says that rather than adding infrastructure, they made a monetary contribution of 3 million dollars. All of the metro standards transferred over and became state standards.

No other objections. Glaccum looks for a formal motion

Troy Tretter makes the motion

VanKekerix seconds

The motion carries

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**METROPOLITAN COUNCIL – FEDERAL RESERVE BANK OF MINNEAPOLIS ARMER PARTICIPATION TYPE (STROMBERG)**

Jim Stromberg comments that at the March OTC meeting, the Federal Reserve Bank (FRB) asked for 10 more radio IDs and this was approved by the group. Stromberg reports that there no participation plan on file. Stromberg asked the OTC to consider what type of participant the FRB is as their day-to-day operations are not on ARMER. It was recommended that they become an Interoperability Participant.

The three-way subscriber agreement from 2005 between the FRB, the MESB, and MNDOT had three statues of note: Section 2.4 reads that their participation would be solely for interoperability purposes. There would be no communications within the user’s agency. Section 3.3 explains that the MESB will provide the user with access to training materials and train-the-trainer. Section 3.4 states that the MESB will manage and administer the system database including radio IDs.

In addition to requesting additional IDs, this letter pointed out that:

- The FRB is an occasional user
- They use ARMER for their own off-site use
- The System Administrator is ANCOM
- They will provide their own training
- They will have their own talkgroup

The Subscriber Agreement can be updated but that is up to the signatories.

Stromberg feels that the OTC should clarify that the FRB is an Interoperability Participant. This issue was sent to the Steering Committee. Stromberg does not support Interoperability Participants having their own talkgroups. Stromberg does not support the FRB using ARMER just among themselves for cash destruction runs or their own dignitary protection details.

Stromberg supports the FRB as an Interoperability Participant having an ARMER radio tuned to MSP call or a regional call to hail help while out of reach of their home radio system.

Stromberg also supports the FRB using interoperability talkgroups to coordinate with law, fire, and EMS when they are at the Federal Reserve property or when their officers are working with other entities.
Glaccum asks if Troy Tretter would like to add anything.

Tretter states that when they came on in 2005, they had their own VHF system. This is the Federal Reserve Bank division of the Metropolitan Council. They fit in as an Interoperability Participant because they do not use the ARMER system as a primary means of communication.

MNDOT does not have any issues

Tretter makes the motion

Thakur seconds

The motion is carried

NEW BUSINESS

MEMBERSHIP ROSTERS

Stromberg states that his office has been working on their membership rosters, their email lists, and their meeting minutes in order to make sure they are working off of the same lists. Stromberg has a copy of the most updated membership roster and posted on line. Will go down the list to make sure everyone is in agreement.

- MSA- Dan Hartog with no alternate
- Minnesota Ambulance Association – Joe Glaccum with no alternate
- MNDOT – Mukhtar Thakur, Tim Lee, Jim Mohn
- MNIT – Vacant
- Minnesota Chiefs of Police - Vacant
- Fire Chiefs – Vacant
- MN Indian or Tribal Community- vacant
- Northeast – Steve VanKekerix, Steve Olson
- Northwest – Neil Illies, Jack Swanson
- Central – Tina Lindquist, Kristen Lahr
- MESB – First is Vacant, Tom Wolf, Troy Tretter
- Southwest – Stacy Tufto, Mike Hammon
- South Central – Vacant
- Southeast – Vacant

All of these were found on the SECB bylaws which are posted on the SECB website. That is the list as we know it at this time.

Glaccum – the bottom does say Operations and Technical Committee, it should be changed. Stromberg notes that it was a mistake and will be changed. Was a cut and paste from another form and forgot to change from OTC from Steering.

Glaccum states that something needs to be done about the vacancies. More info to come. MNDOT says all of the vacancies are not acceptable.

Tretter says they will bring up the vacancies at the next radio board meeting.

This issue will be brought up at the SECB meeting at the Interop conference.
OLD BUSINESS

ARMER PARTICIPATION BY FEDERAL ENTITIES

Stromberg states that there are no new requests for Federal or non-911 response participation on ARMER. Over the last few meetings, I have been sharing numbers of Federal participation on ARMER and those numbers have basically stayed flat from last month. There are conversations along the border about eliminating some in order to reduce numbers.

Glaccum – who is taking the lead on that?

Stromberg – It has been a local initiative. Marcus Brunning and Steve VanKekerix have been working with border patrol.

Glaccum – what kind of decrease have we seen since this has started?

Stromberg – Last month it has stayed flat but it has been as high as 209 hours with an average of 119.2 hours.

Glaccum – Doesn't seem like enough. May have to do a formal ask of the regions up there and of our RIC to get these numbers to come down.

VanKekerix – Marcus Brunning is planning on meeting with their radio manager in Grand Forks. Have not talked with him this month so I do not know if he’s done that yet. We have met with local border patrol supervisors in the Northeast.

Glaccum – Would it be helpful to have more formal direction from committee and board?

VanKekrix – It wouldn't hurt.

Glaccum – We have two options on how we can handle this.

1) Formally ask for a significant decrease

2) Making it clear what the discussion was from Marcus to the Sheriff before we formalize anything

Marcus's plan is to talk to them about taking down their patch and seeing how that helps which should reduce the numbers significantly.

Stromberg – Have not received any complaints from the northern counties about loading being an issue. They like being able to have communication with the border patrols in the northern regions. Asking them to come down at this point is premature and we should focus on the bigger issue of if they're a full participant or an Interoperable Participant.

Glaccum – sounds like the group is looking to take the patch down and bringing the numbers down significantly

VanKekrix - In the Northeast, the border patrol is an integral partner. In some cases they are helping officers with 911 calls. Their normal radios are not able to monitor dispatch traffic from our regions.

Tretter – I agree with all that is said. If they can find a way to change the way the patch is used, it could also help. I think we should leave it up to the northern regions to decide.

Lindquist – How about an option 3 about a proactive letter of support of their plan to include border patrol in their discussions. Be more proactive and thank them and use that figure out how to decide if they're a full participant or interoperable partner.
Glaccum – we should look at this from an operational perspective: do they need to be on the system, yes or no? We need to figure out how to accommodate that. Let’s just give Marcus what he needs to be successful and maybe he can get that patch down. A formal letter can be helpful or it can be a hindrance. It could draw attention to him trying to break down that patch.

Illes – I have a lot of faith in Marcus and I think we should give him a chance to talk with them.

Glaccum – We can put off sending out a letter and let Marcus do his job. (Lindquist agrees)

REQUEST FOR A STUDY

Stromberg states that there is a financial limitation of $5,000 without going out to RFP for the services. We have identified Rey Freeman as interested in the work. We drafted a proposal which is attached in the materials for the meeting. My next step would be to solicit feedback from the group and send the request off to the finance committee. This will fund a study to further investigate use of ARMER by Federal participation and non-911 entities. Talk about historical information and current usage or ARMER. Talk about 2011 participation standard where it talks about full, limited, and interoperable participants. We talk about VHF overlay and cache radios with the ARMER system as a user. We have talked about the FBI, IRS, and the Railroads request to ARMER and we want to know how to handle a request for access by completing a comprehensive study. Should a user fee be established? Other questions will also be answered by this study. This could also be used to look toward the future of FirstNet and other changes to the system. We put together this request and I think we did a good job of bulleting out our request to Mr. Freeman. I am asking for additional guidance from the group.

Tretter – topics have been a gray area for some time and this study could really help.

Committee agrees with the request for a study and it will be moved on to the finance committee.

PARTICIPATION PLAN AMENDMENT GUIDELINES

Last month the committee discussed having a form creating participation plan amendment guidelines. In the last meeting it was brought to my attention that perhaps the form was too formal and that we should allow more flexibility when making any changes. In response to that feedback, we decided to eliminate the form and instead created a checklist that says here are the types of things we would expect in a participation plan amendment. It states the following should be included on a participation plan amendment:

- Date of document
- Summary statement
- Technical, operation, and financial impacts
- Points of contact

Tretter – Should I send it to ECN first for review?

Stromberg – used the ECN inbox as a generic address in case someone is out of the office and makes it easier for it to be seen.

Glaccum – One add could be regional approval and feedback given.

Recommendation is to send the checklist to the OTC. Group agrees with the form being forwarded to OTC.

EDUCATION AND OUTREACH WORKGROUP

The workgroup has not met since the last SECB meeting. There is little time for follow up. We have feelers out for an SECB logo. Two companies we are working with are CivicPlus and GovDelivery.
March 8, 2017
Steering Committee
Minutes
STATEWIDE EMERGENCY COMMUNICATIONS BOARD

STEERING COMMITTEE

WEDNESDAY, MARCH 8, 2017

1 P.M.

CHAIR: DAN HARTOG

NORTH MEMORIAL AMBULANCE SERVICE
4501 68TH AVE N
BROOKLYN CENTER, MN  55429

MEETING MINUTES

Attendance

Members Present  Member/Alternate  Representing
 Dan Hartog, CHAIR  Minnesota Sheriff's Assn.
 Joe Glaccum, Vice Chair  Minnesota Ambulance Association
 Mukhtar Thakur  MnDOT OSRC
 Troy Tretter  Metropolitan Emergency Services Board
 Tina Lindquist  Central MN ESB
 Steve VanKekerix  Northeast ECB
 Neil Ellis  Northwest ECB
 South Central ECB
 Southeast ECB
 Southwest ECB
 MN State Patrol
 MN.IT
 Chiefs of Police
 Fire Chiefs
 Indian Affairs Council

Guests:
 Rick Juth, DPS-ECN
 Marcus Bruning, DPS-ECN
 Randy Donahue, DPS-ECN
 Jim Stromberg, DPS-ECN
 Jill Rohret, MESB

CALL TO ORDER

Chair Hartog calls the meeting to order at 1:11 p.m.
APPROVAL OF AGENDA

Troy Tretter makes a motion to approve the agenda.
Joe Glaccum seconds the motion.
The motion carries.

APPROVAL OF PREVIOUS MEETING’S MINUTES

Glaccum makes a motion to approve the January minutes.
Tretter seconds the motion.
Stromberg advises that “border patrol” should be capitalized throughout the minutes.
The motion carries.

ACTION ITEMS

None.

DISCUSSION ITEMS

None.

OLD BUSINESS

ARMER PARTICIPATION BY FEDERAL ENTITIES (STROMBERG)

Stromberg reported that the Steering Committee was asked to consider how the SECB should handle requests from federal entities and other non-911 response agencies that may request Full ARMER Participation.

Usage data indicates that some federal users are major users of ARMER and some are minimal users.

A search of Participation Plan files revealed that some non-911 response entities have limited Participation plans, some have Interop Participation plans, and some are sponsored by other entities.

Research shows that some non-911 response entities are using their own radio systems for day-to-day use and, at least one, is dispatching on ARMER.

Since we last met, Stromberg was approached by another non-911 response entity and asked about becoming a full participant. This time it was by CP Rail Police, an entity whose hazmat response team is already sponsored by the City of Bloomington. This request came from an officer in Canada assigned to an interoperability project. He was researching his options for interop between the RR and provinces as well as states. CP’s request came with an offer to pay for access. CP was very understanding of our position and seemed more interested in waiting us out than jumping on an interop plan right now.

Generally 12-month averages are unchanged. Maybe slightly less but the month was 10% shorter than January. Our focus should not be on airtime numbers but should be on the larger question of who should be permitted to use ARMER as a primary tool.

As part of his continuing research Stromberg reviewed the ARMER Plan and noted:
• Many references to state, local, and “private public safety” entities. This suggested to me that our “forefathers” intended this system for state and local government public safety such as police and fire but also that they intended it to include private public safety entities such as private ambulance services. I would submit that a private public safety entity would also include railroad police.

• [Page 8] The Plan prioritizes state agencies, specifically State Patrol, MnDOT, and DNR. Secondary are other state agencies (BCA & DOC examples), fire departments (almost always “local”), colleges and universities (no reference to public safety), and finally “other institutions and agencies.”

• [Page 12] The Plan mentions cooperation between metro, local, and regions.

• [Page 27] Only federal mention is regarding interoperability between ARMER and federal agencies

• No tribal mention

Glaccum and Rohret pointed out that the 2002 Plan in the meeting materials was not the last ARMER plan. Other, larger documents were created in the 2004 & 2005 time periods. Stromberg reported that was the closest he could find in ECN files. MnDOT should have copies. Rohret will check MESB files.

Glaccum asked the value of having the original plan. Stromberg responded that, although the plan may have changed over time, knowing the original intent is a good starting point. Hartog supported “starting at the base and working up.”

Glaccum recommended that the study consider laws related to these issues.

At February meeting Committee there was discussion about a requesting a study to help the Steering Committee identify and answer questions related to allowing federal and non-911 response entities on ARMER as full participants. ECN was asked to collect information about what a study would look like and approximate costs. Research has commenced.

ECN Findings:

• ECN believed it could find a vendor for under $5,000 we are allowed to spend without going out for bid.
• The study should look at the ARMER plan, standards, and other resources that may dictate how we should respond to a federal request.
• The study should examine current participation options and assess how well federal and other non-911 response entities fit those participation plan types.
• The study should offer insight into how federal and other non-911 response entities currently operate in other states.
• The study should offer insight into how other states and large radio systems address the issue of federal and other non-911 response entities.

Tretter recommended that the study include recommendations of how to measure ARMER use and how to assign a value and cost to that usage.

Thakur recommended that we define geographic boundaries when considering participation. He used the example of five or ten miles into another state. The group agreed that the boundary should be the state boundary and the more relevant point was to consider the type of business the entity had in the state.

The committee believed that a timeline should be established for a study. It was recommended that one month be afforded to line up a vendor and three months for vendor to provide a report. The committee was willing to be flexible, as necessary.

Stromberg advised that at the February 8th meeting it was suggested that he should work on a participation plan amendment guidelines template for participants to use when amending their plans. He provided a sample template that he developed from Saint Louis County plan amendment. It has been shared with Marcus Bruning and he has used it to help Lake of the Woods County and Allina with participation plan PP updates. Stromberg
recommended that each time the OTC or a Committee receives a participation plan Amendment that the committee take that opportunity to label the unlabeled or mislabeled participation plan types.

Rohret and Tretter supported the draft Amendment provided in the packet but cautioned that there would be resistance from OTC members, especially for minor changes such as adding Radio IDs. Agreement that there was value in updating Agency and System Admin contacts for every request, including minor ones. Glaccum suggested a bullet approach where we create a document bulleted required and optional information but allowing options regarding the format. In addition to items on the form, recommended bullets to include: Approved by MNDOT? Approved by RAC? Approved by ECN? If all bulleted items are satisfied the ECN should be able to put it on the agenda without asking the committee chair. Agreement that as entities ask to amend their Participation plans, this is a good time for the ECN to clean up the entities participation type.

THE EDUCATION AND OUTREACH WORKGROUP REQUESTS GUIDANCE ON SECB LOGO (STROMBERG)

Stromberg reported that at its January 2017 meeting, the Steering Committee gave the Education and Outreach Workgroup two directives:

• The Steering Committee supported the creation of a logo for the SECB and that the Education and Outreach Workgroup should work on the process of acquiring a logo to be created by an outside vendor.
• The workgroup should work on materials and messaging for communications to legislators, the public, and system administrators.

The workgroup met yesterday and brainstormed a strategy for creating a logo for the SECB. There was agreement that we should start fresh and not feel obligated to incorporate the existing yellow swoosh. It was agreed that the workgroup should define key points from which the vendor should draw inspiration.

• Logo should represent the key programs of the SECB: 911, ARMER, FirstNet, IPAWS, & Interoperability
• SECB Mission Statement
• We should extract key words from the SECB Mission and Vision Statements: Emergency Responders, Critical, Robust, Citizens, Safety, State-of-the-Art

The workgroup should ask the DPS Office of Communications for guidance in identifying a vendor to help design a logo.

The Workgroup discussed the Steering Committee’s second directive to work on materials and messaging for communications to legislators, the public, and system administrators.

The workgroup was in agreement that we should not be focusing on paper materials nor should we get too hung up on the look and feel. The focus for communicating with the public should be in getting the ECN website updated. The focus for communicating with system administrators and other public safety constituents should be in developing a special tool for them such as the DPS Connect tool. A plan for how to communicate with legislators could be developed as requested.

The Committee advised that the workgroup should contact a few vendors to get an idea about prices. Initial thought was that we should keep the price under $5,000.00 so that this does not have to go out for RFP. Workgroup should come up with a preliminary price range and then bring to Finance for approval. After approval the workgroup should come back to Steering.
Regarding providing education materials, group agreed that web communication was good for general info but that we still need to be prepared to produce single page fact sheets for specific audiences such as legislators. Stromberg advised that the workgroup was willing to take on specific projects for SECB and Committees as needed.

Glaccum moves to adjourn
Tretter seconds.
Motion carries
Cass County/Fargo, North Dakota Participation Plan
Cass County - City of Fargo, North Dakota

ARMER Radio System
800 MHz Participation Plan

April 2017
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ARMER Participation Plan

1. Introduction

Cass County, North Dakota and the public safety entities within Cass County including the cities of Fargo, West Fargo, and all others within the county have developed a plan for the implementation of a new 800 MHz P25 Trunked Radio System to serve the public safety and public service agencies within the Cass County jurisdictional areas. All agencies currently use VHF P25 systems, which were purchased new and installed back in 2006-2007. These VHF systems have been linked together as best possible for local Interoperability between agencies, along with the typical radio channel sharing and cross-programming. This existing VHF system is now becoming dated and reaching the end of the equipment’s service life, and the operational needs of the ever-growing Fargo and West Fargo metropolitan areas are now exceeding the VHF system’s capabilities. A final critical factor are the plans for Clay County/Moorhead, Minnesota for conversion from VHF to the 800 MHz ARMER system.

Cass County operations are unique in that the county is located on the state border with Minnesota, and all 911 dispatch operations are handled by the Red River Regional Dispatch Center (RRRDC). The RRRDC is an independent local government agency that provides 911 call answering and dispatching services for Minnesota agencies (Clay County, City of Moorhead, and other cities in the county) and North Dakota agencies (Cass County, City of Fargo, and other cities in the county). The RRRDC facility is located in the city of Fargo, and operates under contract to both the Minnesota and North Dakota agencies. This ARMER plan is being presented by and for Cass County, but the RRRDC is currently an ARMER user through Clay County’s plan.

A detailed implementation plan has been developed for Cass County, and the details of that plan are incorporated into this ARMER system application. A copy of the Cass County/Fargo 800 MHz Phase 2 plan is also attached to this document for reference purposes.

The key factor for consideration within this project is whether the State of Minnesota ARMER organization would consider allowing Cass County to connect to and utilize the ARMER Zone 6 Master Site (MSO) in Detroit Lakes for the operation of a new Cass County 800 MHz P25 subnetwork. It is the purpose of this document to present the technical, operational and financial parameters and factors associated with this concept. Note that this proposal would not use any ARMER 800 MHz tower site RF channels, as Cass County/Fargo would be providing a separate 800 MHz subnetwork with RF tower sites and associated infrastructure.
2. Client and Project Overview

Cass County, and the cities within the county plan to implement a 9-site 800 MHz P25 Trunked Radio System, to serve all public safety and public service operations within the Cass County, Fargo, West Fargo, and associated metropolitan and rural areas of the county.

Cass County is located in the southwest area of North Dakota, and borders Minnesota. The county has a total land area of 1,768 square miles, with a population of approximately 150,000 (2010 census data). The county seat is located in Fargo. The county is generally considered “rural”, with the exception of the Fargo and West Fargo metropolitan areas. The population of the Fargo and West Fargo areas was 145,000 per 2010 census data, with continued significant growth in recent years, estimated to be 172,000 at the end of 2016. Fargo and West Fargo are the most populated area in North Dakota, with continued growth expected due to a strong economy in the region.

Cass County is bordered by seven other counties: Clay and Norman, Minnesota (east); Traill and Steele (north and northwest); Barnes (west); and Ranson and Richland (southwest and south). The heavily-traveled Interstate 94 highway corridor runs through the entire east-west length of the county, and Interstate 29 runs the entire north-south distance of the county. These two highways intersect in Fargo, with significant traffic implications.

A. Agency Summary and Jurisdictional Coverage of New System

The new 800 MHz P25 Trunked System is intended to provide integrated radio service for all public safety and public service entities within Cass County, North Dakota. Those agencies include:

<table>
<thead>
<tr>
<th>Law Agencies (4)</th>
<th>Fire/EMS Agencies (17)</th>
<th>Fire/EMS Agencies</th>
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<tbody>
<tr>
<td>Cass County Sheriff</td>
<td>Argusville Fire Prot. District</td>
<td>Harwood Area Fire &amp; Rescue</td>
</tr>
<tr>
<td>Fargo Police Department</td>
<td>Arthur Volunteer Fire Dept.</td>
<td>Hunter Fire Prot. District</td>
</tr>
<tr>
<td>NDSU Police Department</td>
<td>Casselton Fire Dept.</td>
<td>Leonard Fire Prot. District</td>
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<td></td>
<td>Davenport Fire Dept.</td>
<td>Mapleton Fire Dept.</td>
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<td></td>
<td>Erie Rural Fire Dept.</td>
<td>Page Fire Dept.</td>
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<td></td>
<td>Fargo Fire Dept.</td>
<td>Tower City Rural Fire Dept.</td>
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<tr>
<td>Fargo Moorhead Ambulance</td>
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<td>West Fargo Fire Dept.</td>
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<td></td>
<td>Grandin Fire Dept.</td>
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Public Works and School Agencies (4)

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<tr>
<th>Fargo Public Works</th>
<th>West Fargo Public Works</th>
<th>Fargo Area Schools</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fargo Utilities</td>
<td>Cass County Highway Dept.</td>
<td>West Fargo Schools</td>
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</tbody>
</table>

All agencies are dispatched by the RRRDC in Fargo. There exists a high level of interoperability between all agencies within Cass County, as well as “across the river” with Clay County, Moorhead, Norman County and other agencies in Minnesota. The southwest area of Cass County also borders the northwest area of the Central ARMER Region of Minnesota. The new
800 MHz Trunked Radio System will be utilized by all agencies listed above. Shown below is a map of the Cass County and Fargo area:

The primary points of contact for this project and plan are:

**Sheriff Paul Laney**  
Cass County Sheriff’s Office  
211 – 9th Street So.  
Fargo, ND 58103  
701-241-5800 Phone  
[laneyP@Casscountynd.gov](mailto:laneyP@Casscountynd.gov)

**Rey Freeman**  
RFCC  
13517 Larkin Drive  
Minnetonka, MN 55305  
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[rfreeman@isd.net](mailto:rfreeman@isd.net)

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B. Existing VHF Radio Systems in Cass County/Fargo

Within Cass County, Fargo and West Fargo the existing VHF radio system utilizes numerous P25 repeater systems for the individual agencies:

- 2 repeaters for Fargo Police
- 2 repeaters for Fargo Fire
- 1 repeater for Fargo Metro Ops
  - (the above are a multi-site Simulcast network in Fargo)
- 2 repeaters for Fargo Public Works
- 1 repeater for West Fargo Police
- 1 repeater for West Fargo Fire
- 2 repeaters for Cass County Sheriff
- 1 repeater for Cass County Fire and Local Government
- 1 repeater for Cass County Highway
- ...along with other analog repeaters for local operations

These repeaters, voting receivers and base stations are located at 14 different site locations throughout the operating area. The sites are connected through a combination of microwave radio, city-owned fiber optic cabling, and leased telco circuits.

The existing systems are fairly complex, some using Simulcast technology, Voting receivers, Multicast, and other technologies. Most of the repeater and base stations are Motorola Quantar. The majority of the system equipment was purchased and installed in 2006-2007, and is now approaching the end of its service life, and/or support from the manufacturer as the products have been discontinued for several years. A large number of VHF radio frequencies and FCC licenses are also needed for the operation of these systems.

All public safety agencies are receive primary dispatch services through the RRRDC 911 center in Fargo. The RRRDC has recently installed new Motorola MCC7500 radio dispatch consoles, and is connected to ARMER via microwave link through the Moorhead ARMER tower site.

C. 800 MHz Radio System Summary – Cass County, North Dakota

The implementation of an 800 MHz Trunked Radio System has been determined to be the best technology solution to meet the operational needs of the agencies within Cass County. As outlined in the previous section, numerous VHF systems are now used to provide radio communications for the many agencies in the area. The growing operational needs of the county and city agencies are no longer met by the existing VHF systems. The key performance factors to be addressed within the radio system are:

- **Coverage**: The system needs to have enough tower sites, designed and/or tall enough, to provide the required level of coverage for the local agencies service area. Statewide systems
are often designed with a basic level of coverage, and additional sites can be added by local agencies if more coverage is needed.

An important use of the tower sites in the system is the ability of radio users to “roam” automatically between tower sites as needed. The system uses the measured signal strength of the radios to direct the radios to the best tower site. The mobile and portable radios are constantly measuring the signal strength from the tower site, and will automatically switch to a different tower site with a better signal. This includes other tower sites that may be outside the county boundaries.

- **Capacity**: The system should provide enough “channel” capacity to support all agencies using the system and tower sites. In a Trunked System, capacity is greatly expanded over conventional systems through the dynamic assignment of frequencies for use as talk paths (Talk Groups or Channels) for agencies using the system. The system also needs to provide easy to use Interoperability between neighboring agencies.

- **Reliability**: A system should utilize a high level of equipment and technology to minimize the possibility of equipment or system failure, in conjunction with meeting user coverage requirements. This includes multiple tower sites, connectivity paths, backup AC power and generators at tower sites, alarm systems, lightning and grounding protection, and other critical elements.

- **Redundancy**: The system should be designed with enough overlap between sites, along with backup systems, to ensure that the failure of any one site, repeater, or link results in a loss of system access for user agencies.

A properly designed 800 MHz P25 Trunked Radio System will meet the operational performance needs of the Cass County, Fargo, West Fargo and associated agencies identified in this plan.

Another critical factor in this decision are the plans for Clay County and Moorhead, Minnesota agencies to convert from VHF radio systems to the Minnesota ARMER system later in 2017. Clay County completed and approved an ARMER Plan in 2015, and is moving forward with the implementation of 800 MHz ARMER. As noted previously, the Cass County ND and Clay County MN agencies work seamlessly together on a daily basis for public safety operations, and having a common radio system in place for all agencies is key to the success of operations.

1. **800 MHz System Design**: A new 800 MHz system design has been developed utilizing 9 tower and water tower sites throughout the Cass County and Fargo/West Fargo area. This system will also use a combination of Simulcast and Multicast/ASR sites for effective coverage, capacity and cost:

   - **Fargo area: 4-site, 10 channel Simulcast system**
     1. Downtown water tower (new Prime site)
     2. 45th Street water tower
3. 32nd Avenue water tower (new site)
4. 64th Avenue water tower

☐ Cass County area: 5-site, 5-channel Multicast/ASR system
   1. Amenia tower
   2. US Customs and Border Patrol tower
   3. Buffalo tower (new)
   4. Kindred tower
   5. Alice tower (new)

The proposed radio system will reuse several existing tower and water tower sites where possible to reduce the cost of new sites. Maps of the site locations are provided in Section 2 of this ARMER plan.

Connectivity between the sites will use a combination of microwave radio, city-owned fiber optic cabling, and leased circuits as needed.

A budgetary proposal has been received from Motorola for the new radio system.

**A key factor in the overall design of the new 800 MHz network is the decision whether a Master Site/Zone Controller will need to be purchased by Cass County for operation of the new system, or whether ARMER will allow this new system to operate as a subnetwork on the ARMER network through the Zone 6 Master Site located in Detroit Lakes, MN.**

2. 800 MHz Frequencies/Channels: The proposed system will require a total of 35 new 800 MHz channels for operation of the network.
   - 10 for Fargo/West Fargo Simulcast
   - 25 for Cass County ASR sites (5 sites x 5 channels each)

A group of 14 existing 800 MHz channels are available to Cass County for use with the proposed network. Additional 800 MHz channels are available from the Public Safety and NPSPAC pools for the project.

3. Talk Groups and Fleetmap: The planning work conducted for a new 800 MHz radio system has established a Fleetmap with a total of 82 Talk Groups for use within the system. Refer to Section 2.B. of this ARMER plan for more details about the proposed Fleetmap.

4. Mobile and Portable Subscriber Radios: The radio system user agencies within Cass County are planning for a total of approximately 1,650 radios for use within the network. A detailed breakout of these radios is provided in Section 2.

More detailed technical radio system information is provided in Section 2. of this ARMER plan.
D. ARMER System Application – Cass County, North Dakota

Cass County North Dakota, the City of Fargo, and the municipal governmental agencies within the county are presenting this ARMER Participation Plan and Radio System Plan for consideration by the various committees and governing agencies of the ARMER radio system network. The county and its agencies desire to be “Full Participants” in the ARMER system, and will migrate all primary voice communications services to the network, once fully implemented.

Cass County, Fargo, West Fargo and associated agencies recognize that as entities located outside of the geographical borders of Minnesota, it may be outside the scope or charter of the ARMER system to be utilized in this manner. However, we propose that the Cass County/Fargo operations, in conjunction with Clay County/Moorhead, Minnesota and the RRRDC 911 dispatch center all functioning as a cohesive and interoperable group, it is the best interest of all agencies to communicate through a common radio system platform.

The request by Cass County/Fargo is for access to and use of the ARMER Zone 6 Master Site in Detroit Lakes, MN. Please note that this request for ARMER system access is only for use of the core ARMER network, and not for access to or use of the 800 MHz tower sites or radio channels, as Cass County/Fargo plans to implement a fully independent 800 MHz P25 subnetwork with 9 sites in the Cass County/Fargo geographical area.

Cass County/Fargo requests that this application and plan be reviewed and approved by the following agencies:

- Northwest Minnesota Regional Advisory Committee (NW RAC)
- Central Minnesota Regional Advisory Committee (CM RAC)
- Northwest Minnesota Regional Radio Board (NW RRB)
- State of Minnesota Radio Board Operations and Technical Committee (OTC)
- State of Minnesota Emergency Communications Board (SECB)

Cass County’s plan – though an independent 800 MHz subnetwork – has been developed based on the requirements and operational standards established for participation in and use of the ARMER radio system. The county desires to contract as required with ARMER, the Northwest Regional Radio Board and the State of Minnesota Department of Transportation (Mn/DOT) for use of the ARMER system if approved.

The specific justifications and technical considerations for use of the Zone 6 Master Site by Cass County/Fargo are presented in the next Section (1.E.) of this plan.
E. Operational and Technical Review, and Justification for Use of the ARMER Backbone by Cass County North Dakota

The new 800 MHz 9-site Trunked Radio System being planned for Cass County requires the implementation of a Master Site/Zone Controller for operation and management of the new system. There are two primary options to accomplish this for Cass County:

- Purchase and install a new Master Site from Motorola, which would be housed in Fargo at a new site to be developed for the project
- Connect the new subnetwork to the State of Minnesota ARMER Zone 6 Master Site in Detroit Lakes

Cass County North Dakota, along with the city of Fargo, West Fargo, and all other public safety entities within the county are requesting and proposing the use of the existing ARMER Zone 6 Master Site for use with their planned 800 MHz 9-site subnetwork.

When considering this option, there are operational, technical and financial issues and parameters to be reviewed. We believe there is a strong case for ARMER to consider allowing Cass County access to and use of the Zone 6 Master Site.

1. **Operational Considerations:** We believe it is in this area that significant benefits are to be realized for all entities involved in public safety operations in the area.

- Clay County Minnesota, the city of Moorhead and all other public safety agencies in Clay County will be converting from VHF radio operations to the 800 MHz ARMER system in the near future, potentially in later 2017. This transition will cause some amount of disruption to the radio interoperability that now exists with all local agencies operating on VHF systems and channels. To address this issue on a short-term basis, cross-band patch capabilities have been implemented within the RRRDC to allow interoperability between the agencies and VHF/800 MHz radio spectrum.

  But ultimately, it is highly beneficial for all agencies to be operating within the same radio frequency spectrum and common radio network when possible.

- The RRRDC 911 dispatch center in Fargo, which provides 911 and radio dispatching services for all agencies in both Cass and Clay counties, has recently installed new Motorola MCC7500 radio consoles, which replaced older Centracom equipment. These new consoles are now connected into the ARMER system Zone 6 Master Site via microwave radio link into the Moorhead ARMER tower site. Once Clay County and Moorhead operations convert to ARMER, the console system will be operating on both the existing Cass County VHF system (via CCGW’s) and the ARMER system for Clay County (via network link into ARMER).
- **It is not possible to directly connect (network level) an MCC7500 console system to more than one Trunked radio system. As such, if Cass County/Fargo is required to purchase and implement an independent Master Site for their new 800 MHz Trunked system, there cannot be direct connectivity from the RRRDC into both systems. A choice will need to be made which of the two networks would be accessed via RF control stations.**

- ISSI: If Cass County/Fargo is required to purchase and implement an independent Master Site for their new 800 MHz Trunked system, it may be possible to implement an ISSI connection between the new system and ARMER. This has been done for connectivity and interoperability in other areas of Minnesota, including access into the State of Wisconsin WISCOM network for agencies and operations in the Duluth area. However, there is a cost to implement this option (~$50k to $100k), and ISSI does not necessarily provide full functionality and seamless operation. There are limits to the number of talk groups (10) that are allowed between the systems, along with radio ID’s. Additional talk groups are $50K per group of 10.

- Allowing the Cass County/Fargo 800 MHz subnetwork to operate from the ARMER Zone 6 Master Site will promote communications interoperability with other Minnesota agencies as well, including State Patrol, Norman County MN, and potentially others. Minnesota-based radio users would be allowed to roam into the Cass County/Fargo subnetwork for interoperability with local users, and other use as would be established through operational agreements.

  The proposed Cass County 800 MHz system would also provide good coverage in the far western area of Norman County, where ARMER coverage is somewhat limited. It may be possible to establish radio site roaming permissions to allow Norman County radios to use the Cass County site(s) if ARMER coverage is not available in certain areas.

  The proposed Cass County 800 MHz system is expected to provide a good coverage footprint well into the Clay County area of Minnesota. Cass County/Fargo units roaming into Minnesota would be programmed to remain affiliated with the Cass County network and not require access to or use of the local ARMER tower site RF channel resources.

  Ultimately, it is of great benefit to all agencies on both sides of the river if the Cass County/Fargo 800 MHz radio system were to be allowed to operate from the ARMER Zone 6 Master Site, and on a common radio system platform.
2. **Technical Factors:** The factors that determine whether or not the Cass County/Fargo 800 MHz subnetwork can effectively operate from the ARMER Zone 6 Master Site, and the potential impact to the system, are rather straightforward and easy to accomplish.

- **Availability:** The Zone 6 Master Site in Detroit Lakes is the least-utilized of the six Master Sites now implemented within the ARMER network (based on input from MnDOT operations), as discussed in the next topic points. See also the data table provided below.

- **Site Capacity:** Each Master Site within the ARMER network is capable of supporting a total of 100 tower sites. The Zone 6 Master Site is currently supporting 59 tower sites in the Northwest Region of Minnesota. The proposed Cass County/Fargo subnetwork would add a total of 6 sites to the Zone 6 controller (1 Simulcast group, and 5 ASR’s). This reflects a 10% increase of site usage for Zone 6. The addition of the Cass County sites would function exactly the same as any other group of sites connected to an ARMER Master Site.

  Based on the information obtained for this plan, there are currently no plans for the addition of any new tower sites in the Northwest Region of the state.

- **Console connections and CCGW’s:** Each Master Site is capable of supporting a maximum of 50 MCC7500 console connections. There are currently a total of six consoles connected to the Zone 6 Master Site:
  - Becker County
  - Beltrami County
  - Clay County (RRRDC)
  - Hubbard County
  - Polk County
  - Pennington County

  Because Clay County/RRRDC is already connected to Zone 6, no additional console ports or resources would be needed for the Cass County system.

- **ARMER System ID’s:** The ARMER system (overall) currently has the capability of supporting 128,000 radio user IDs, with current usage estimated at 92,000. The proposed Cass County system is estimated to add 1,650 radio IDs, and a long-term total of 2,000 included in this ARMER plan. This calculates to a 2% increase system-wide. Motorola advises that the system-wide ID capacity will be increased to 256,000 through a future system software release.

- **Talk Groups:** The ARMER system (overall) has the capacity for 8,000 Talk Groups, with current usage estimated at 4,000. The proposed Cass County system would add 85 talk groups to the ARMER system, for a calculated increase of 2% over current use.
Call Count/PTT’s and Airtime: An important metric within the ARMER system is the number of calls or PTTs (Push-To-Talk) events generated by the radio users of the ARMER system, along with the total amount of airtime from these call events. This is used to track the level of traffic within a specific tower site or group of sites by all users, within a Zone or Region, or from a specific user agency. While the maximum number of calls or airtime for a Master Site is not known, the limiting factor is usually the number of 800 MHz RF channels at the tower sites associated with the Zone.

This becomes an easy tool to use for tracking the amount of traffic that a Cass County/Fargo subnetwork would generate within Zone 6.

Shown below is a table which summarizes the above data for the Zone 6 Master Site or ARMER system overall:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Capacity</th>
<th>Current Use (est or avg)</th>
<th>Est. Cass Co. Use</th>
<th>Est. Cass Co. Use %</th>
<th>Remaining Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>System ID’s (Note 1)</td>
<td>128,000</td>
<td>92,000</td>
<td>2,000</td>
<td>2%</td>
<td>34,000</td>
</tr>
<tr>
<td>Zone 6 Tower Sites</td>
<td>100</td>
<td>59</td>
<td>6</td>
<td>10%</td>
<td>35</td>
</tr>
<tr>
<td>Talk Groups (Note 2)</td>
<td>8,000</td>
<td>4,000</td>
<td>82</td>
<td>2%</td>
<td>3,920</td>
</tr>
<tr>
<td>Z6 Call Count/PTTs (3)</td>
<td>NA</td>
<td>2.4M</td>
<td>265K</td>
<td>11%</td>
<td>NA</td>
</tr>
<tr>
<td>Z6 User Airtime (hours)</td>
<td>NA</td>
<td>5,500</td>
<td>725</td>
<td>13%</td>
<td>NA</td>
</tr>
<tr>
<td>Z6 Console ID’s (4)</td>
<td>50</td>
<td>6</td>
<td>Included</td>
<td>Included</td>
<td>44</td>
</tr>
</tbody>
</table>

(Note 1): The System ID capacity is planned for expansion to 256,000 through a future software upgrade via Motorola’s SUA II program. The numbers shown are system wide, not just for Zone 6.

(Note 2): The Talk Group Capacity is system wide, not just for Zone 6.

(Note 3): The numbers shown are per month. The Cass County/Fargo estimates are based on existing traffic levels from similar subnetworks such as Duluth, St. Cloud and Olmsted.

(Note 4): The RRRDC consoles are already connected to the Zone 6/DL site. No further port use or expansion would be needed.

As shown, there exists significant available capacity within the Zone 6 Detroit Lakes Master Site and the ARMER system for future use and expansion. At this time, there are no additional tower sites planned in the Northwest/Zone 6 Region, but significant capacity remains available for future expansion within the Region.

Connectivity: It would be very easy to establish connectivity between a new 800 MHz subnetwork in the Cass County area and the Zone 6 Master Site. This same type of connectivity was installed between the RRRDC in Fargo and the Moorhead ARMER tower site using microwave radio. The Moorhead site has dual routing microwave paths to Detroit Lakes for reliability. A new microwave radio link would be
implemented from the new Prime Site in Fargo to the Moorhead site. Additional capacity between Moorhead and Detroit Lakes would be funded by Cass County if necessary to ensure the required system transport capacity.

3. **Financial Considerations:** A Master Site/Zone Controller is an expensive piece of equipment to purchase and maintain. The cost to purchase and install an M1 Master Site for the proposed Cass County/Fargo 800 MHz is estimated at $1.5 million, along with an estimated annual maintenance cost of $83,000 per year. Based on data obtained for this plan, the State of Minnesota spends an estimated $233,000 per year to maintain the Zone 6 Master Site in Detroit Lakes. The difference in cost between the two is that ARMER system uses a larger M3 Master Site, vs. an M1 Master Site proposed for Cass County.

We believe it could be beneficial to all parties involved for some type of cost sharing plan to be implemented in conjunction with this ARMER plan.

- **Cass County/Fargo:** The obvious benefit to Cass County/Fargo and associated agencies if ARMER Zone 6 connectivity were allowed is the elimination of the need to purchase a Master Site for their new system (~ $1.5 million). Also eliminated would be the need for $83,000 in annual maintenance fees.

- **ARMER:** It could be argued that there is potentially no direct incremental cost to ARMER for the proposed Cass County 800 MHz subnetwork’s use of the Zone 6 Master Site, as no new hardware or software expansion would be needed to accommodate the Cass County/Fargo 800 MHz subnetwork. Any fees paid to ARMER by Cass County/Fargo could be used to offset existing maintenance costs.

**Cass County is proposing and prepared to pay ARMER a fee for the use of the Zone 6 Master Site.** But how should a usage fee be determined? The suggested approach might be calculate the percentage of the overall use of the Zone 6 Master Site by the Cass County/Fargo subnetwork, and apply this percentage to the annual costs associated with the Zone 6 Master Site. An example of that model might be as follows:

<table>
<thead>
<tr>
<th></th>
<th>Annual Operating and Maintenance Costs for Zone 6 Master Site (Motorola SUA-II Service Contract)</th>
<th>$156,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Motorola ST Technical Services (% of system total)</td>
<td>$ 27,200</td>
</tr>
<tr>
<td>3</td>
<td>Other MnDOT Zone 6 Maintenance and Operating Costs (est.)</td>
<td>$ 50,000</td>
</tr>
<tr>
<td>4</td>
<td>Total Estimated Yearly ARMER Zone 6 Maintenance Costs</td>
<td>$233,200</td>
</tr>
<tr>
<td>5</td>
<td>Cass County/Fargo Zone 6 Site Usage (estimated, from previous table)</td>
<td>13%</td>
</tr>
<tr>
<td>6</td>
<td>$233,200 x 13% = (Cass County/Fargo Annual Usage Fee)</td>
<td>$ 30,316</td>
</tr>
</tbody>
</table>

In the above example, Cass County/Fargo uses 10% of the overall Zone 6 tower site capacity (based on 6 sites of a total of 65 being used). However, as shown in the table on the
previous page, the Cass County/Fargo subnetwork is projected to use 13% of the traffic capacity in Zone 6, so this higher number would be used to calculate the resulting cost sharing. This usage can easily be tracked, and adjustments made if the traffic levels are significantly higher or lower than the estimated numbers.

_Cass County/Fargo also proposes to pay a one-time “Connection Fee” of $195,000 for use of the Zone 6 Master Site. This number is based on a Master Site cost of $1.5M x 13% (usage) = $195,000._

_Cass County/Fargo is open to a discussion regarding other operational usage parameters or criteria that could be used to calculate their use of the Zone 6 Master Site, and establish an equitable fee to be paid to ARMER for the use of this valuable resource._

Another important element to these calculations, usage considerations and cost determination is to establish an understanding and written agreement that if – at some point in the future – the Zone 6 Master Site approaches operational capacity, and requires expansion (with associated costs), Cass County/Fargo will be responsible for funding whatever changes are needed to that element of the system.

Further, Cass County/Fargo would be required (by written agreement) to do the following:

- Maintain their 800 MHz Trunked Radio subnetwork at the same software levels being used by the ARMER system
- Provide funding for future maintenance and software upgrades associated with Zone 6 Master Site operations, based on whatever usage formula is established with ARMER

There are numerous other technical considerations to be addressed, such as Tower Site permissions for Cass County/Fargo radios, which would be set to keep Cass County/Fargo agency radios affiliated with their home network, unless roaming into Clay County, when working with other agencies in that service area. However, the proposed Cass County/Fargo 800 MHz system would provide a significant coverage footprint into Clay County and Moorhead areas, and as a result Cass County/Fargo radios could remain on the Cass/Fargo system without using ARMER 800 MHz RF tower site capacity.

4. **Other Options and Considerations**: The reader might be questioning whether there has been any discussion about or consideration for the proposed Cass County 800 MHz system being connected to a future State of North Dakota (SIRN 20/20) radio network. A significant effort has been underway for the past few years within the state, trying to move forward with the funding and implementation of a new public safety radio system in North Dakota. A full radio assessment and planning effort was conducted in 2016 (Televate consultants), whereby a full technical plan and cost analysis was established for the new system.
The planned system is to implement a P25 Trunked System, using VHF frequencies in the rural areas of the state, and 800 MHz operation in the metropolitan areas (Bismarck, Fargo, Grand Forks, etc.). However, at this time the current funding sources for SIRN 20/20 are uncertain, with no defined sources identified or established. Any possible funding sources currently being debated by the 2017 North Dakota legislature are not directed toward local RF infrastructure or subscriber needs within SIRN 20/20. With the uncertainty and lack of project timelines, this option cannot currently be effectively reviewed or considered.

It should be noted that IF the SIRN 20/20 system were to become available, connectivity to the ARMER system would still provide significant operational benefits to Cass County/Fargo agencies, because of the high level of interoperability needed between Cass County and Clay County agencies.

**Summary:** The Cass County and Fargo project team appreciate the collective ARMER administration’s willingness to consider the option of allowing connectivity and operation of a new Cass County/Fargo 800 MHz subnetwork from the ARMER Zone 6 Master Site. We believe there are significant operational and financial benefits to be provided to all participants with the implementation of this system configuration. The county again recognizes that this is a somewhat unusual request, but believes that the unique operational situation of the Cass County, Clay County and RRRDC entities open the door to such an opportunity.

In preparation for the presentation of this plan to the user groups and committees who will review and consider this request, there have been some prior discussions and presentations of the concept to various groups within the ARMER administration, allowing for consideration of the plan and seeking feedback on the concept. This includes the following groups:

- ARMER Executive Steering Committee
- ARMER SECB Finance Committee
- State of Minnesota ECN staff
- MnDOT
- Northwest Minnesota RAC and ECB

In general, the responses received from these groups was overwhelmingly positive and supportive, with an understanding that Cass County/Fargo be willing to fund any and all costs associated with the technical needs, as well as establish specific requirements for future upgrades and operational requirements needed for proper and effective shared system usage.
3. 800 MHz System and ARMER Technical Plans

A. System Design

A detailed and complete radio system implementation plan was developed for the proposed Cass County/Fargo 800 MHz subnetwork, which incorporated the following primary factors:

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

Specific details of how these system parameters have been addressed are provided in this section of the document. Refer also to the attached Cass County/Fargo Phase 2 Radio System planning document for more detail.

1. System Infrastructure and Tower Site Planning

The 800 MHz subnetwork being planned by Cass County/Fargo includes a total of nine (9) tower sites, as follows:

- 4-site Simulcast system for the Fargo and West Fargo areas, with 10 RF channels
- 5-site ASR system for the Cass County areas, with 5 RF channels per site

The 4-site Simulcast system will provide improved in-building portable radio coverage within the urban and suburban Fargo and West Fargo city areas; the 5-site ASR will provide wide-area coverage throughout Cass County. The following tower sites are planned for the new network:

- **Fargo area: 4-site, 10 channel Simulcast system**
  1. Downtown water tower (new Prime site)
  2. 45th Street water tower
  3. 32nd Avenue water tower (new site)
  4. 64th Avenue water tower

- **Cass County area: 5-site, 5-channel ASR system**
  5. Amenia tower
  6. US Customs and Border Patrol tower (USCBP)
  7. Buffalo tower (new)
  8. Kindred tower
  9. Alice tower (new)
The proposed radio system will reuse several existing tower and water tower sites where possible to reduce the cost of new sites. Maps of the proposed site locations for the Fargo/West Fargo and Cass County areas are shown below and on the next page.
Section 2.A.4. provides technical information about the network connectivity planned for the new 800 MHz subnetwork.

2. **Local Equipment Additions and Enhancements**

This section of the ARMER plan would normally provide specific details about new tower sites, 800 MHz RF channels being added to existing tower sites, and other system equipment being added to the ARMER network by the sponsoring agency. Because this plan is presenting a completely independent 800 MHz RF network from existing ARMER tower sites, the entire plan can be considered a “local enhancement”.
3. 800 MHz Frequency Planning and Traffic Loading

The proposed 800 MHz tower sites within Cass County will operate as either trunked Simulcast or Multicast (ASR) mode of operation:

- Fargo/West Fargo: 4 sites, 10 RF channels, Simulcast
- Cass County: 5 sites, 5 RF channels, Multicast/ASR

Cass County/Fargo recognizes that trunked radio system sites need be established with a sufficient number of 800 MHz RF channels to ensure that all radio users are able to access the system when needed for both routine and emergency radio communications traffic. The number of RF channels planned for the tower sites as noted above is based on practical experience with Trunked radio systems, in conjunction with standard Erlang traffic calculations. More information regarding the calculations is provided in later paragraphs of this section of the plan.

The proposed 800 MHz Trunked Radio system for Cass County/Fargo will require a total of 35 new 800 MHz channels/frequencies for operation of the system and sites:

- Fargo/West Fargo: 10 RF channels (Simulcast)
- Cass County: 25 RF channels (5 x 5 sites) (Multicast/ASR)

The State of North Dakota (Region 32) NPSPAC Plan has a group of 14 – 800 MHz frequency assignments allocated to Cass County/Fargo, shown in the table below.

Table of 800 MHz NPSPAC Region 32 (North Dakota) Channel Assignments to Cass County ND

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>610</td>
<td>Dedicated</td>
<td>8</td>
</tr>
<tr>
<td>2</td>
<td>630</td>
<td>Dedicated</td>
<td>9</td>
</tr>
<tr>
<td>3</td>
<td>648</td>
<td>Shared</td>
<td>10</td>
</tr>
<tr>
<td>4</td>
<td>685</td>
<td>Shared</td>
<td>11</td>
</tr>
<tr>
<td>5</td>
<td>698</td>
<td>Shared</td>
<td>12</td>
</tr>
<tr>
<td>6</td>
<td>705</td>
<td>Shared</td>
<td>13</td>
</tr>
<tr>
<td>7</td>
<td>723</td>
<td>Shared</td>
<td>14</td>
</tr>
</tbody>
</table>

As noted above, some channels have been dedicated or assigned for exclusive use by the agency, while some may be shared with others. The new system is planned for use of the channels shown in the above table, along with other Public Safety (non-NPSPAC) channels. 800 MHz channel availability in North Dakota is very good, due to the limited use of 800 MHz systems.
**800 MHz RF Channel Loading Review**

To better calculate the expected traffic loading the Cass County radios would have on the system’s tower sites, the industry-standard Erlang-C process is used in this plan to determine the expected voice traffic on the ARMER system. This process is used when a shared and limited number of communications paths (trunks) are used to handle the voice traffic in a radio network. Neighboring county and state estimated radio totals are added to the Cass County radios in these calculations.

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 (Cass County/Fargo) agency radios
- Number of neighboring county agency radios that are likely to use any given tower site
- Number 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 Cass County radio traffic calculations are as follows:

- Quantity 932 Fargo and West Fargo agency radios
- Quantity of 706 Cass County agency radios
- Quantity 150 neighboring county radios (interoperability use in Cass County)
- Quantity 175 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 time for normal use
- 12 seconds average radio transmission time for busy use
- .51 average expected number of transmissions from the radios (per hour)
- 1.25 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 Fargo and Cass County, based on the parameters in the previous data table:

**Predicted 800 MHz Standard Voice Channel Traffic Loading for Fargo/West Fargo/Cass County Tower Sites**

<table>
<thead>
<tr>
<th>Site and GOS</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fargo Simulcast</td>
<td>129.5%</td>
<td>42.0%</td>
<td>11.5%</td>
<td>2.6%</td>
<td>0.5%</td>
<td>0.1%</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Amenia (ASR)</td>
<td>49.8%</td>
<td>8.9%</td>
<td>1.2%</td>
<td>0.1%</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>USCBP (ASR)</td>
<td>38.6%</td>
<td>5.7%</td>
<td>0.6%</td>
<td>0.1%</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Buffalo (ASR)</td>
<td>38.6%</td>
<td>5.7%</td>
<td>0.6%</td>
<td>0.1%</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Kindred (ASR)</td>
<td>38.6%</td>
<td>5.7%</td>
<td>0.6%</td>
<td>0.1%</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Alice (ASR)</td>
<td>33.2%</td>
<td>4.4%</td>
<td>0.4%</td>
<td>0.0%</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
</tbody>
</table>

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 two percent is achieved with 5 voice channels for the Fargo/West Fargo Simulcast group, and 3 channels for the Cass County ASR sites (highlighted in yellow).
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. The table below shows the predicted ARMER system traffic loading and GOS for the Cass 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 Fargo/West Fargo/Cass County Tower Sites**

<table>
<thead>
<tr>
<th>Site and GOS</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fargo Simulcast</td>
<td>232.3%</td>
<td>103.5%</td>
<td>41.1%</td>
<td>14.4%</td>
<td>4.4%</td>
<td>1.2%</td>
<td>0.3%</td>
<td>0.1%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Amenia (ASR)</td>
<td>92.6%</td>
<td>25.4%</td>
<td>5.6%</td>
<td>1.0%</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>USCBP (ASR)</td>
<td>83.4%</td>
<td>22.0%</td>
<td>4.6%</td>
<td>0.8%</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Buffalo (ASR)</td>
<td>83.4%</td>
<td>22.0%</td>
<td>4.6%</td>
<td>0.8%</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Kindred (ASR)</td>
<td>83.4%</td>
<td>22.0%</td>
<td>4.6%</td>
<td>0.8%</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Alice (ASR)</td>
<td>74.3%</td>
<td>18.1%</td>
<td>3.5%</td>
<td>0.5%</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
</tbody>
</table>

As shown, 6 voice channels are now required to maintain the minimum recommended GOS during emergency traffic periods for the Fargo/West Fargo Simulcast sites, and 4 voice channels for the Cass County ASR sites.

Overall, the planned number of voice channels for all sites within the system should be capable of handling the traffic levels expected from local user agencies.
4. PSAP, Tower Site and Network Connectivity

Connectivity between the proposed Cass County/Fargo 800 MHz subnetwork and the ARMER Zone 6 Master Site in Detroit Lakes is required for operation of the system, if approved for ARMER use. The new MCC7500 consoles at the RRRDC in Fargo are now connected into the ARMER network through both a local fiber optic link and microwave radio link to the Moorhead ARMER tower site.

A new combined microwave radio and fiber optic link is planned between the new Cass County/Fargo system Prime site, to be located in downtown Fargo, and the Moorhead ARMER tower site.

The new radio system will require connectivity between the many tower sites, as well as the new system Prime site in downtown Fargo. Multiple connection technologies will be used to meet this need:

- Microwave radio links (licensed)
- Fiber Optic cable
- Leased circuits from local telephone companies

Microwave radio links are the preferred solution for connectivity to sites located in rural areas, due the high cost of installing fiber optic cabling over great distances to rural tower sites. Fiber optic is a preferred solution within the larger city and metropolitan areas, where the sites are closer together, and the local city governments often own a dedicated fiber network (vs. paying a local communications provider). This is the case with the City of Fargo, as they have been expanding their fiber network over the past several years, with reliable connectivity throughout much of the city. As such, fiber optic will be the primary method of connectivity to the Fargo tower sites, with diverse routing (multiple circuits for backup in case of failure) to all locations.

The new system plan will continue to use this combination of technologies, with some expansion and replacements:

- Microwave radio: This technology will continue to be used for connectivity to the rural tower sites. As noted above, the existing microwave radio now being used is a combination of licensed and unlicensed equipment, varying in age from 10 years old to less than 4 years old.

  All existing unlicensed radio equipment will be replaced with new licensed microwave equipment, and licensed as required. This includes the links from Buffalo to Alice, and from downtown Fargo to Kindred.

  Much of the existing licensed equipment is in excellent condition, and may be reused for the new system. Further research is required on this issue, but funding has been placed in the overall project budget for the replacement of the unlicensed links.
- **Fiber Optic**: This is currently used to the 45th St and 32nd Ave. water tower sites. New fiber circuits will be planned to all four of the water tower sites planned for the 4-site Fargo/West Fargo Simulcast system. The system will require new fiber optic installations to all sites, including 45th St., because of the need for dual circuit paths from downtown to this site.

- **Leased Circuits**: These circuits are only minimally used within the existing VHF system, connecting the RRRDC facility in Fargo to the 315 Main tower site in downtown Fargo, where most of the system’s backup stations are located. These circuits may be retained for future radio use.

A group of ten (10) 800 MHz RF control stations will be located at the RRRDC PSAP, and used as another level of backup in the event of other system failures. These stations communicate on-channel with the Fargo and Cass County tower sites, and can be used for Site Trunking as well.

Refer to the Fargo and Cass County system connectivity diagrams on the next two pages.
City of Fargo ND Proposed Radio System Connectivity

City of Fargo
Proposed Radio Network Connectivity

New Downtown Fargo Water Tower

Fiber Optic Dual Path Ethernet

MW Link to Amenia Tower (refer to Cass Co diagram)

45th St. Water Tower

32nd Ave. Water Tower

RRRDC Fargo

Leased Telco

64th St. Water Tower

ARMER Moorhead

MW Link to Detroit Lakes

City of Fargo, ND Radio System Connectivity

| RFCC    | 2-9-2017 |
5. PSAP/Dispatch Center Equipment and Logging/Recording

The RRRDC (Red River Regional Dispatch Center) located in Fargo provides all 911 and dispatch related services for Cass County/Fargo, North Dakota and Clay County/Moorhead, Minnesota public safety agencies. The RRRDC has recently implemented a new Motorola MCC7500 radio console control system, with a total of 9 operator positions.

This console system is now connected to the ARMER network (for use with Clay County/Moorhead ARMER operations), along with multiple VHF law, fire and EMS systems, including:
- Clay County and City of Moorhead, MN (VHF legacy systems)
- Cass County North Dakota
- City of Fargo North Dakota
- 800 MHz RF control stations for interoperability with ARMER system users

Additional RRRDC MCC7500 console technical details:
- **CCGW Ports:** The new MCC7500 console system is connected to forty (40) conventional channel resources, and is now configured with 40 CCGW ports (the maximum allowed). As Clay County operations migrate from VHF to the ARMER network, fewer VHF channel resources will be required; however several 800 MHz RF control stations will be needed for ARMER backup operations. Assuming Cass County/Fargo migrate from VHF to an 800 MHz system,

- One existing workstation has been established with a CAD/Paging system interface, to allow direct access to the County’s VHF tone-and-voice paging system.
- A total of six (6) 800 MHz RF Control Stations will be implemented at the RRRDC
- System Administration: The RRRDC has implemented an ARMER System Management workstation to allow access to the ARMER database, for management of the Clay County radios and technical parameters.

A high-level system connectivity diagram is provided on the following page (from the original Clay County/RRRDC ARMER Plan document).

- In addition to the RRRDC 911 PSAP, a backup PSAP has been established at the West Fargo Police Department. This location currently uses 4 older Motorola Gold Elite consoles, which will be retained and connected to six (6) 800 MHz RF control stations.

Voice Logging: The dispatch center will continue to use its existing local voice logging recorder for the recording of 800 MHz, ARMER and conventional channel radio traffic, through the local ARMER 800 MHz RF control stations planned for the PSAP. A “Trunked” logging system is not included in the plan at this time.
RRRDC Cass County/Clay County PSAP ARMER Architecture

RRRDC Cass Co ND/Clay Co MN PSAP Equipment

RRRDC PSAP
Motorola MCC7500 Consoles

Microwave
Fiber Optic

RRRDC Microwave

MnDOT Microwave Network

ARMER Master Site Detroit Lakes

800 MHz + ARMER System Plan
RRRDC Fargo ND
RFCC March 2017
6. Legacy VHF Equipment

Cass County/Fargo 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 may 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. System Talk Group Planning and ID Requirements

A new Fleetmap has been developed for Cass County/Fargo based on the needs of participating agencies, and will have a total of 82 talk groups. 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 1 for a copy of the preliminary Cass County/Fargo agency fleet map.

A total of 2,000 ARMER system IDs are being requested for the Cass County/Fargo system implementation, which includes three year estimated totals:

- 932 for Fargo and West Fargo mobile and portable subscriber units
- 706 for Cass County and rural agency mobile and portable subscriber units
- 342 for future expansion
- 20 for PSAP operations
C. 800 MHz Radio System Coverage Review

Radio system range or coverage is considered the most critical function of any radio system, especially in public safety operations. While there are other important elements to a good system (equipment reliability, channel capacity), the ultimate factor by which a system’s measure of success or failure is usually measured is how reliably it covers the intended service area.

Radio system coverage is a function of several key elements:

- The radio frequency being used (VHF, UHF, 700/800 MHz)
- The transmitter power of the radios (base units, portable units, etc.)
- The height of the antennas of the base stations and repeaters
- The distance from the field units needing to communicate and the base station or repeater they are trying to reach

These parameters are incorporated into the design of a radio system.

1. Design Parameters

The overall system design and resulting communications coverage of the 800 MHz system can be affected by the following goals and concerns:

- The need and 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
- Minimize the 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 proposed 800 MHz system will be using a combination of existing and new tower sites, with a focus on reusing existing sites when possible.

- The coverage goal for Cass 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.
- The same 95% is desired within “6db loss” building structures within the Fargo and West Fargo metropolitan areas.

2. 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 Cass County’s coverage needs.

The coverage maps presented in this plan were prepared by Motorola for the Cass County/Fargo project, utilizing Motorola’s standard computer-based Hydra program.
Multiple coverage maps were done for portable talk-in and talk-out usage, as this is the most difficult coverage scenario. Provided below are the parameters used for the coverage modeling:

<table>
<thead>
<tr>
<th>Site Parameters</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transmit Antenna Gain</td>
<td>9 db, omnidirectional</td>
</tr>
<tr>
<td>Transmit Output Power (into main line)</td>
<td>35 watts</td>
</tr>
<tr>
<td>Transmission Line Size (tower over 300 feet)</td>
<td>1.25 inch Heliax®</td>
</tr>
<tr>
<td>Transmission Line Size (tower under 300 feet)</td>
<td>7/8 inch Heliax®</td>
</tr>
<tr>
<td>Transmission Line Length</td>
<td>Based on tower height</td>
</tr>
<tr>
<td>Receive Antenna Gain</td>
<td>9db, omnidirectional</td>
</tr>
<tr>
<td>Receive Tower Top Amplifier Gain</td>
<td>5db</td>
</tr>
<tr>
<td>Receive Transmission Line Size</td>
<td>7/8 inch Heliax®</td>
</tr>
<tr>
<td>Receive Transmission Length</td>
<td>Based on tower height</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Field Unit Parameters</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type of Unit</td>
<td>Portable radio</td>
</tr>
<tr>
<td>Environment 1</td>
<td>Outdoors, On-street</td>
</tr>
<tr>
<td>Environment 2</td>
<td>In-Building, 6dB loss</td>
</tr>
<tr>
<td>Environment 3</td>
<td>In-Building, 12dB loss</td>
</tr>
<tr>
<td>Antenna Height</td>
<td>5 feet</td>
</tr>
<tr>
<td>Transmit Power</td>
<td>3 watts</td>
</tr>
</tbody>
</table>

Preliminary coverage maps for portable radio talk-in and talk-out are shown on the following pages. The color coding for these maps is:
- **Green**: Reliable signal coverage, 95% or greater reliability
- **White**: Weaker signal coverage, less than 95% reliability

Ten predicted-coverage maps are provided in this plan, showing the calculated coverage for the 800 MHz system. The maps are divided into two groups:
- **Fargo and West Fargo city areas (5 maps)**
- **Cass County areas (5 maps)**; note also that the Cass County maps include the radio signal coverage provided by the Fargo area Simulcast tower sites.

The maps show the predicted coverage from radios used outdoors, as well as inside “6dB loss” and “12dB loss” buildings. There are many different types of building structures, which have differing levels of signal loss for radio systems. The 6dB and 12dB loss factors are an attempt to categorize the different types of buildings for the purpose of calculating radio system coverage. In general, these building categories are:
6dB loss: Wood-framed residential homes and similar structures, and commercial “strip mall” buildings which have numerous windows and few deep interior rooms

12dB loss: These are typically larger structures such as government buildings, hospitals, schools, large stores and shopping malls, etc. These structures often include brick and steel construction, limited windows, and other factors which greatly affect the radio signal penetration into the building.

It is expected that there are also many buildings with greater than 12dB loss in the Fargo and West Fargo areas. Several of the “Critical” buildings identified in the Phase 1 report are in this category. It is extremely difficult to predict the coverage levels in these buildings, and will require field testing once a new system is completed. Some locations will undoubtedly require “In Building Amplifiers” (BDAs) to obtain the required level of radio system coverage. These will be dealt with on a case-by-case basis.

Fargo/West Fargo area maps:
1. Talk-In coverage from Portable radios, On-Street (outdoors)
2. Talk-In coverage from Portable radios, inside 6dB loss buildings
3. Talk-Out coverage to Portable radios, inside 6dB loss buildings
4. Talk-In coverage from Portable radios, inside 12dB loss buildings
5. Talk-Out coverage to Portable radios, inside of 12dB loss buildings

Cass County area maps:
6. Talk-In coverage from Portable radios, On-Street (outdoors)
7. Talk-In coverage from Portable radios, inside 6dB loss buildings
8. Talk-Out coverage to Portable radios, inside 6dB loss buildings
9. Talk-In coverage from Portable radios, inside 12dB loss buildings
10. Talk-Out coverage to Portable radios, inside 12dB loss buildings

Note that separate “Talk-In” and “Talk-Out” maps are shown for most of the various coverage levels. This is due to the differing transmit power levels between the field radios and the repeaters at the tower sites. The 800 MHz trunked system include technology that works to balance these differing signal levels; this is done through the installation of “Tower Top Amplifiers” (TTA’s) at each tower site. These amplifiers receive in the lower-powered signals from portable radios and boost the signal levels before sending the signals down the coax cables to the repeater receivers. This greatly improves the “balance” of the system. The predicted coverage maps are shown on the following pages.
The proposed system’s predicted Talk In coverage from portable radios On Street, when all tower sites are included, is very good. The Fargo/West Fargo Simulcast tower sites are shown as the blue circles on the map, and the black line indicates the general city border of the combined Fargo and West Fargo areas.
The proposed system’s predicted Talk In coverage from portable radios when all tower sites are included, is also good in most areas of the Fargo/West Fargo area, with the same “95%” observations made from the previous map.
The proposed system’s Talk Out coverage to portable radios – inside “6db loss” buildings – appears to be very good throughout the Fargo and West Fargo areas.
Map 4: 800 MHz Talk In from Portable Radios
12dB Loss In-Building Fargo/West Fargo

The proposed system’s Talk In coverage from portable radios – inside “12db loss” buildings – appears very good in most areas of the Fargo and West Fargo area. Some areas of “white” (<95% predicted reliability) can be seen in the northwest and southwest areas of the target coverage area. However, this only matters if there are “12dB loss” buildings in these specific areas.
The proposed system’s Talk Out coverage to portable radios – inside “12db loss” buildings – is good in most areas of the Fargo/West Fargo service area, other than a few spotty areas in the far north.
The proposed system’s Talk-In coverage from portable radios when used outdoors looks very good throughout most of Cass County, with the exception of the far northwest corner. This issue is discussed in the summary of this section of the plan document. The coverage provided by the Fargo Simulcast sites is included in the Cass County maps.
Map 7: 800 MHz Talk In from Portable Radios
6dB Loss In-Building Cass County

The proposed system’s Talk-In coverage from portable radios when used inside 6dB loss buildings looks good throughout most of Cass County, with the exception of the far northwest corner, along with some other pockets north of Fargo, and the south central area of the county.
The proposed system’s Talk-Out coverage to portable radios when used inside 6dB loss buildings looks good throughout most of Cass County, with the exception of the far northwest corner of the county.
Map 9: 800 MHz Talk In from Portable Radios
12dB Loss In-Building Cass County

The 12dB loss building Talk-In coverage from portable radios is where the “circles of coverage” drastically shrink, and because highly dependent on the radio’s distance from the tower sites. Additional sites could be added to improve this coverage, but many of the areas shown in white do not necessarily have “12dB buildings” requiring radio coverage.
Map 10: 800 MHz Talk Out to Portable Radios
12dB Loss In-Building Cass County

The 12dB loss building Talk-Out coverage to portable radios is better than the “Talk In” coverage shown on Map 9, but again is dependent on the radio’s distance from the tower sites.
Summary of coverage and maps: The Motorola computer-based maps for the proposed system indicate excellent On-Street portable radio coverage in most areas of the Fargo, West Fargo, and Cass County. The predicted 6dB and 12dB In-Building coverage for the Fargo/West Fargo areas is excellent. The 6dB In-Building coverage throughout Cass County is also very good in most areas. The 12dB In-Building coverage in Cass County is somewhat limited to a 5 to 8 mile radius of the tower site.

- It is important to keep in mind that 6db and 12db coverage only matters if there are building structures in these areas. In other words, if no building exists in an area shown with “less than 95% coverage”, then there is not necessarily a problem.

- There are building structures in Fargo, West Fargo and Cass County that most certainly have greater than 12db loss factors. Typical examples of this are hospitals, schools, and steel buildings, especially those with no windows. The radio coverage in these locations will need to be tested once a new system is operational, and BDA’s (in-building amplifiers) added as necessary.

It is understood that no radio system, public safety or otherwise, can be expected to provide 100% radio coverage. There exist too many variables in providing reliable radio signals to every area and building within the targeted coverage area. Developing a radio system to provide reliable coverage on a day-to-day basis can be an expensive process. The goal is to have a radio system that meets most daily communications needs, again with a typical target of 95% or greater reliability.

For those buildings that exceed 12db loss, and require solid in-building coverage, either the building owner, or the county, should consider the addition of in-building amplifier/boosters, also know as “BDA’s” (Bi Directional Amplifiers). These devices should be considered on a case-by-case basis depending on the coverage needs for the location.

Coverage testing is included in the Motorola proposal; this is a process whereby they will assemble a testing team with radio coverage measurement equipment, and “drive the county” measuring the signal levels and digital Bit Error Rate (BER) in 1-mile grids throughout the county. BER testing is much more structured than the typical “Can you hear me now” process that has been used with previous testing. Motorola will provide a full report on the results of this testing process.

A final note is that Motorola (or any vendor) does not “guarantee” coverage for the whole county; what they will stand behind is the system coverage shown in these maps. If there is an area showing less than 95% and field testing shows no coverage, which is to be accepted by the customer.
D. Subscriber Radios

The conversion from VHF to a new 800 MHz Trunked Radio system will require the purchase, programming and installation of new mobile and portable radios for all Cass County, Fargo and West Fargo agencies. The following estimated quantities of new 800 MHz radios will be needed for the various user groups:

<table>
<thead>
<tr>
<th>Agency</th>
<th>Mobiles</th>
<th>Portables</th>
<th>Ctrl Stns</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fargo Police</td>
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<td>Fargo Fire</td>
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<td>Fargo Utilities</td>
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<td>Cass County Highway</td>
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<td>Cass Co. Rural Fire/EMS</td>
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<td>18</td>
</tr>
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</table>

**Totals**  
684 | 931 | 31

An estimated total of 1,646 radios will be needed to equip all Cass County, Fargo and West Fargo agencies with the new radios needed for the 800 MHz system. The above quantities include a variety of different models of radios, with various features, options, and associated pricing.

*Cass County/Fargo recognizes and agrees that any radios implemented on this system will meet the criteria and requirements established by ARMER and MnDOT for 800 MHz mobile and portable radios to be used on the ARMER system.*
E. 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 800 MHz and/or ARMER system.
2. Loss of network connectivity to the 800 MHz tower sites, which will result in the system reverting to Site Trunking mode.

The primary method of redundancy for Cass County operations will be the implementation of redundant links between the Cass County/Fargo Prime Site in Fargo and the Moorhead ARMER tower site, including fiber optic connectivity and microwave radio. In addition, multiple 800 MHz RF control stations will be implemented at the 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, the county plans 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. A total of ten (10) 800 MHz RF control stations have been implemented at the RRRDC PSAP.
F. Training

Implementation of a new 800 MHz Trunked Radio system for Cass County/Fargo will follow the ARMER system requirement and associated operational standards which requires 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.

The Cass County/Fargo administration recognizes this need, and will conducted in-house training for the all 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.

G. Interoperability

The need for interoperability is a primary, driving factor in the Cass County/Fargo plan to adopt an 800 MHz radio system, due to Clay County/Moorhead’s plan for a conversion from VHF to 800 MHz ARMER. Radio interoperability can exist at multiple levels within public safety radio operations. However, having all local public safety operations using a common radio system platform is the preferred and easiest method to establish good interoperability. The areas specifically addressed are:

**Internal:** Between the many agencies within the general jurisdictional area of Cass County and Fargo/West Fargo (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.

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

- Clay County/City of Moorhead MN agencies
- Neighboring North Dakota agencies remaining on VHF radio systems and channels
- Norman County MN agencies
Minnesota State Patrol, Mn/DOT, Department of Natural Resources (DNR) enforcement, and fire agencies operating on 800 MHz ARMER

North Dakota State Patrol, DOT, DNR and other agencies operating on VHF system and channels

Border Patrol and other Federal law enforcement and fire agencies

The Minnesota county agencies bordering Cass County are now ARMER system users (Becker, Wilkin, and Otter Tail), which improves and simplifies communications interoperability for those agencies if Cass County/Fargo converts to 800 MHz operation. However, interoperability with North Dakota agencies will continue to be a high priority, and these agencies will continue to operate on VHF systems for the foreseeable future. Cass County and the RRRDC intend to establish permanent patches between selected 800 MHz talk groups and local VHF channels, either through console or “hard” patches. These talk groups are incorporated into the master Fleet map included in this plan.

To accommodate other communications between agencies that may operate with Cass 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 Cass 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.
- Cass County Fire and EMS agencies will maintain the use of VHF radios in their vehicles, in conjunction with new 800 MHz radios.
- Cass County repeater channels will be retained, and will become local “interoperability” channel resources, capable of being patched to the 800 MHz system, to allow local VHF radio users a simple and effective link to agencies operating on the 800 MHz system.

**H. 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 1 Frequency Division Multiple Access (FDMA) standard is currently in use.

Cass County will adopt and comply with the standards published by ARMER, the State Emergency Communications Board (MN SECB) and the Northwest Minnesota Regional Radio Board. Use of these standards will ensure that users of the Cass County/Fargo system will adopt the appropriate naming conventions, talk group usage, and other operational and technical standards that are in use throughout the ARMER system.
I. Alarms and Monitoring
The new system when purchased from Motorola would include Network Monitoring services through Motorola’s NOC in Schaumburg. Cass County/Fargo will also be implementing an alarm and monitoring system for sites in the new system.

J. Maintenance
Cass County/Fargo plans to enter into a Maintenance Agreement with Motorola for service and maintenance of the primary 800 MHz tower site and system network equipment implemented for the new 800 MHz Trunked system.

If this application for ARMER system connectivity is approved, Cass County/Fargo agrees to maintain the system at the same required level of software version as is being used by the ARMER system.

K. System Administration
Local system administration for the proposed Cass County/Fargo system will be the responsibility of the Cass County Sheriff’s Office, in conjunction with the RRRDC administration.
4. Project Costs and Budget

Funding for proposed 800 MHz Trunked Radio System for Cass County/Fargo agencies is being considered from three different sources:

- Local bonding
- Local levy
- Grant opportunities

Cass County and the City of Fargo have established a “line item” within the respective county and city budgets for the purchase and implementation of the new radio system, although the specific funding mechanism has not been finalized. Grant funding will be considered for the purchase and implementation of the other system equipment, and 800 MHz mobile and portable radios needed for public safety agencies.

Motorola will be the selected vendor for the 800 MHz radio system equipment needed for this project. They have provided Cass County/Fargo with a “Budgetary Proposal” for the equipment and services needed for the purchase and installation of a new radio system. A “Budgetary” proposal is a detailed proposal that addresses all of the technical and equipment requirements of the desired system, with the pricing based on nominal State Contract equipment and service rates. Once the final technical details are established for the new system, a final and formal proposal will be obtained and negotiated with the vendor for final pricing and options.

**Project Cost Estimates:**

<table>
<thead>
<tr>
<th>Project Element</th>
<th>Est. Cost</th>
</tr>
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<tbody>
<tr>
<td>1A 800 MHz system equipment (repeaters, antennas, network technology, software, installation services, etc.) for Fargo/West Fargo Simulcast network</td>
<td>$2,536,052</td>
</tr>
<tr>
<td>1B 800 MHz system equipment (repeaters, antennas, network technology, software, installation services, etc.) for Cass County ASR network</td>
<td>$1,316,113</td>
</tr>
<tr>
<td>1C Master/Zone Controller (Optional, may not be needed)</td>
<td>$1,665,391</td>
</tr>
<tr>
<td>1st Year Maintenance Services (Included)</td>
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<tr>
<td><strong>Subtotal for 800 MHz System</strong></td>
<td><strong>$5,517,556</strong></td>
</tr>
</tbody>
</table>

Additional project equipment and services are shown on the next page.
In addition to the primary project items and costs shown above, other items will be needed for completion of the project:

<table>
<thead>
<tr>
<th>Project Item</th>
<th>Est. Cost</th>
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<tbody>
<tr>
<td>1D Microwave Radio Equipment</td>
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<tr>
<td>1E Fiber Optic Equipment</td>
<td>$299,870</td>
</tr>
<tr>
<td>1F System Coverage Testing (Motorola)</td>
<td>$35,000</td>
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<tr>
<td>2A Buffalo Site Tower, Shelter and Civil Work</td>
<td>$150,000</td>
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<td>2B Fargo Prime Site Shelter and Civil Work</td>
<td>$205,000</td>
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<tr>
<td>2C 32(^{nd}) Ave Water Tower Shelter and Civil Work</td>
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<td>2D 64(^{th}) Ave Water Tower Shelter and Civil Work</td>
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<td>2E US CBP Tower, Shelter and Civil Work</td>
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<tr>
<td>2F Alice Tower, Shelter and Civil Work</td>
<td>$167,500</td>
</tr>
<tr>
<td>2G Kindred Tower Structural Review</td>
<td>$2,500</td>
</tr>
<tr>
<td>3 800 MHz Mobile and Portable Radios</td>
<td>$6,158,442</td>
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<tr>
<td>4A Training for Dispatchers and Radio Users</td>
<td>$20,000</td>
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<tr>
<td>4B FCC Licensing</td>
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<tr>
<td>4C Consulting &amp; Project Management</td>
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<tr>
<td>Project Contingency</td>
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<td><strong>Subtotal for Other Project Items</strong></td>
<td><strong>$9,035,812</strong></td>
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<td><strong>Subtotal for Motorola (from prev. page)</strong></td>
<td><strong>$5,517,556</strong></td>
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<tr>
<td><strong>Grand Total for Project</strong></td>
<td><strong>$14,554,000</strong></td>
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5. Project Implementation

A. Schedule

The implementation of an 800 MHz radio network for an organizational group the size of Cass County and Fargo, with the number of agencies, tower sites, and quantity of radios being planned, would typically be expected to require a 12 to 24 month period to complete. There are several tower and water tower sites needing development and modification, in conjunction with the implementation of the new radio system equipment. Some existing microwave radio equipment may be reused, but new equipment will be needed for some locations.

Cass County, Fargo and associated agencies will continue to seek the funding needed to obtain the 800 MHz mobile and portable radios needed for public safety agencies. The RRRDC has recently completed the replacement of its Centracom Gold Elite radio dispatch console with a new Motorola MCC7500 console, and direct connectivity into the ARMER network.

The County will continue to use their existing VHF radio systems into the future until a new 800 MHz system is ready for use, and will retain such equipment as needed for Interoperability purposes.

As outlined in Section 3.0 Project Costs and Budget, the Cass County/Fargo administrations are prepared to move forward with establishing the funding for the new system, possibly later in 2017. Development of a new radio system could begin in 2018, with implementation completed in 2019.
## Attachment 1: Cass County/Fargo 800 MHz Trunked System Fleet Map

<table>
<thead>
<tr>
<th>Law Enforcement Operations</th>
<th>TG Alias</th>
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<tr>
<td>1 Cass County LE Announcement TG</td>
<td>CS LAW ANNCE</td>
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<tr>
<td>2 Cass County Sheriff Primary</td>
<td>CS SO MAIN</td>
</tr>
<tr>
<td>3 Cass County Sheriff Alternate Encrypted</td>
<td>CS SO2E</td>
</tr>
<tr>
<td>4 Cass County Sheriff Alternate</td>
<td>CS SO3</td>
</tr>
<tr>
<td>5 Cass County Sheriff Alternate Car to Car</td>
<td>CS SO C2C</td>
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<tr>
<td>6 Cass County Sheriff Investigations</td>
<td>CS INV1E</td>
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<tr>
<td>7 Cass County Sheriff Investigations</td>
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<tr>
<td>8 Cass County Jail</td>
<td>CS JAIL1</td>
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<tr>
<td>9 Cass County Public Safety Roam</td>
<td>CS PS ROAM</td>
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<tr>
<td>10 Cass County Law Emergency Button</td>
<td>CS EMER LAW</td>
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<tr>
<td>11 Fargo PD Primary</td>
<td>CS FGO PD1</td>
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<tr>
<td>12 Fargo PD Alternate</td>
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<td>13 Fargo PD Alternate</td>
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<td>15 Fargo PD Alternate- Car to Car</td>
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<td>16 Fargo PD Investigations Encrypted</td>
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<td>25 NDSU PD Alternate Encrypted</td>
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### Attachment 1: Cass County/Fargo 800 MHz System Fleet Map (continued)

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<th>Fire and EMS</th>
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<td>Cass Co Fire Truck to Truck</td>
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<td>West Fargo Fire Truck to Truck</td>
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<td>Cass County Fire Emergency Button</td>
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<td>Cass County FM Ambulance Dispatch</td>
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<td>Cass County FM Ambulance Alternate E</td>
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<td>Cass County Public Health</td>
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<td>Cass Emergency Mangement</td>
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<td>Fargo Emergency Mangement</td>
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<td>Cass County Announce TG</td>
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<td>49</td>
<td>Cass County Calling/Hailing TG</td>
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<td>50</td>
<td>Cass County Operational TG</td>
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<td>Cass County Operational TG</td>
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<td>Cass County Operational TG</td>
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<table>
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<td>Fargo Street</td>
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<td>Fargo Street</td>
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<td>Fargo Water/Wastewater</td>
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<td>Fargo Solid Waste</td>
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<td>Fargo Schools-Emergency</td>
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<td>Cass County PW 1 Future</td>
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<td>81</td>
<td>Cass County PW 2 Future</td>
</tr>
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<td>Matbus-Metro Transit</td>
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</table>

All regional and statewide interoperability talk groups will be incorporated into Cass County radios as defined by ARMER standards.
Steering Committee Roster (April 12, 2017)
<table>
<thead>
<tr>
<th>MEMBER</th>
<th>REPRESENTING</th>
<th>ALTERNATE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Committee Chair:</strong>  &lt;br&gt; Dan Hartog  &lt;br&gt;Kandiyohi County Sheriff's Office  &lt;br&gt;2201 NE 23rd St., Suite 101  &lt;br&gt;Willmar, MN 56201  &lt;br&gt;320-235-1260  &lt;br&gt;<a href="mailto:3301@co.kandiyohi.mn.us">3301@co.kandiyohi.mn.us</a></td>
<td>Minnesota Sheriffs’ Association  &lt;br&gt;100 Empire Drive Ste. 222  &lt;br&gt;St. Paul, MN 55125  &lt;br&gt;651-451-7216</td>
<td>Vacant</td>
</tr>
<tr>
<td><strong>Committee Vice Chair:</strong>  &lt;br&gt; Joe Glaccum  &lt;br&gt;North Memorial Ambulance  &lt;br&gt;4501 68th Avenue North  &lt;br&gt;Brooklyn Center, MN 55429  &lt;br&gt;763-581-9905  &lt;br&gt;<a href="mailto:joe.glaccum@northmemorial.com">joe.glaccum@northmemorial.com</a>  &lt;br&gt;<a href="mailto:nancy.sundberg@northmemorial.com">nancy.sundberg@northmemorial.com</a></td>
<td>Minnesota Ambulance Association  &lt;br&gt;2800 North 7th Street, PO Box 823  &lt;br&gt;St. Cloud, MN 56302  &lt;br&gt;320-654-1767 / 800-852-2776</td>
<td>Vacant</td>
</tr>
<tr>
<td>Mukhtar Thakur  &lt;br&gt;Minnesota Department of Transportation  &lt;br&gt;1500 W. County Road B-2  &lt;br&gt;Roseville, MN 55113  &lt;br&gt;651-234-7962  &lt;br&gt;<a href="mailto:mukhtar.thakur@state.mn">mukhtar.thakur@state.mn</a></td>
<td>Minnesota Department of Transportation  &lt;br&gt;1500 W. County Road B-2  &lt;br&gt;Roseville, MN 55113</td>
<td>Tim Lee  &lt;br&gt;Minnesota Department of Transportation  &lt;br&gt;1500 W. County Road B-2  &lt;br&gt;Roseville, MN 55113  &lt;br&gt;651-234-7963  &lt;br&gt;<a href="mailto:tim.lee@state.mn.us">tim.lee@state.mn.us</a>  &lt;br&gt;Jim Mohn  &lt;br&gt;Minnesota Department of Transportation  &lt;br&gt;1500 W. County Road B-2  &lt;br&gt;Roseville, MN 55113  &lt;br&gt;651-234-7969  &lt;br&gt;<a href="mailto:jim.mohn@state.mn.us">jim.mohn@state.mn.us</a></td>
</tr>
<tr>
<td>Vacant</td>
<td>Minnesota Office of Enterprise Technology (MN.IT)  &lt;br&gt;658 Cedar St, St Paul, MN 55155  &lt;br&gt;651-296-8888</td>
<td>Vacant</td>
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<tr>
<td>Vacant</td>
<td>Minnesota Chiefs of Police Association  &lt;br&gt;1951 Woodlane Drive  &lt;br&gt;Woodbury, MN 55125  &lt;br&gt;651-457-0677 / 800-377-4058</td>
<td>Vacant</td>
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<tr>
<td>Vacant</td>
<td>Minnesota State Fire Chiefs Association  &lt;br&gt;2704 County Highway 10  &lt;br&gt;Mounds View, MN 55112</td>
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<tr>
<td>MEMBER</td>
<td>REPRESENTING</td>
<td>ALTERNATE</td>
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<tr>
<td>Vacant</td>
<td>Minnesota Indian Affairs Council or Tribal Government Seat</td>
<td>Vacant</td>
</tr>
<tr>
<td>Steve VanKekerix</td>
<td>Lake County Sheriff’s Office 613 3rd Ave. Two Harbors, MN 55616 218-834-8387 <a href="mailto:Steve.VanKekerix@co.lake.mn.us">Steve.VanKekerix@co.lake.mn.us</a></td>
<td>Steve Olson</td>
</tr>
<tr>
<td>Neal Illies</td>
<td>Clearwater County 36744 Lomond Dr. Bagley, MN 56621 218-368-5947 / 218-785-2801 <a href="mailto:neal.illies@co.clearwater.mn.us">neal.illies@co.clearwater.mn.us</a></td>
<td>Jack Swanson</td>
</tr>
<tr>
<td>Tina Lindquist</td>
<td>Grant County 10 1st St. NW Elbow Lake, MN 56531 218-685-8224 <a href="mailto:tina.lindquist@co.grant.mn.us">tina.lindquist@co.grant.mn.us</a></td>
<td>Kristen Lahr</td>
</tr>
<tr>
<td>Vacant</td>
<td>Metropolitan Emergency Services Board 2099 University Ave. W. St. Paul, MN 55104 651-643-8395</td>
<td>Tom Wolf</td>
</tr>
<tr>
<td>Stacy Tufto</td>
<td>Chippewa County Sheriff’s Office 629 N. 11th St., #14 Montevideo, MN 56265 320-269-2627 <a href="mailto:stufto@co.chippewa.mn.us">stufto@co.chippewa.mn.us</a></td>
<td>Troy Tretter</td>
</tr>
<tr>
<td>Minnesota Indian Affairs Council 161 Saint Anthony Ave. Suite 919 Saint Paul, MN 55103</td>
<td>Northeast Minnesota Emergency Communications Board</td>
<td>Mike Hamann</td>
</tr>
</tbody>
</table>
The Bylaws of the Statewide Emergency Communications Board prescribes the membership of its Steering Committee as follows:

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.

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