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# STATEWIDE EMERGENCY COMMUNICATIONS BOARD

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July 23, 2015

12:30 P.M.

Chair: Mark Dunaski

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

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

*Call in code: 2786437892#*

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## MEETING AGENDA

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### Call to Order

### Approval of Today's Agenda

### Approval of Previous Meeting's Minutes

### Announcements

### Reports of Standing Committees:

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

- Ramsey County Participation Plan Amendment *ACTION ITEM*
- Olmsted County Simulcast Channel Expansion *ACTION ITEM*
- Dodge Console Upgrade Participation Plan Amendment *ACTION ITEM*
- Clay County ARMER Participation Plan *ACTION ITEM*
- BIA Drug Enforcement Limited Interoperability Participation Plan *ACTION ITEM*
- BIA Forestry Interoperability Participation Plan *ACTION ITEM*
- Standard 3.31.0 StatusBoard *ACTION ITEM*

#### *Interoperability Committee (Thomson)*

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

#### *Steering Committee (Hartog)*

#### *IPAWS Committee (Seal)*

#### *NG911 (Pankonie)*

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

*ACTION ITEM*

- MN Draft Response to NPSBN (FirstNet) RPF

#### *Finance Committee (Gerlicher)*

## **Reports - Other**

- *ARMER Project Status Report (MnDOT OSRC)*
- *ECN Update (Mines, DPS ECN)*
  - *Status of SECB Initiatives*
    - *GIS Project*
    - *Text-to-911*
    - *7.19 Upgrade*
    - *FirstNet*

## **Old Business**

## **New Business**

## **Adjourn**

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# STATEWIDE EMERGENCY COMMUNICATIONS BOARD

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## MEETING MINUTES

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June 23, 2015

### Attendance

#### Members:

##### MEMBER/ALTERNATE

Mark Dunaski (Chair)/Jackie Mines

Mukhtar Thakur/Tim Lee/Jim Mohn

Dave Van Thiel/Thomas Baden

Rodmen Smith/Dan Kuntz

Rochelle Schrofer/Tim Boyer

Vince Pellegrin/Thomas Humphrey

Bill Droste/ Vacant

Eric Anderson/Pat Novacek

Liz Workman/vacant

Jim McMahon/vacant

Kathy Hughes/Darlene Pankonie

Dan Hartog/Scott Turner

/Jeff Marquart

Mike Gamache/Ted Bearth

Mike Risvold/vacant

Cari Gerlicher/Dave Thomson

Ulie Seal/Vacant

T. John Cunningham

Joe Glaccum/vacant

Brad Hanson/Paul McIntyre

Scott Camps/vacant

##### REPRESENTING

DPS

MnDOT

MNIT

DNR

MN State Patrol

METC

League of MN Cities, Metro

League of MN Cities, Greater MN

Assoc. of MN Counties, Metro

Assoc. of MN Counties, Greater MN

MSA, Metro

MSA, Greater MN

MESB

MN Chiefs of Police Assoc., Metro

MN Chiefs of Police Assoc., Greater MN

MN Fire Chiefs Assoc., Metro

MN Fire Chiefs Assoc., Greater MN

MN Ambulance Assoc., Metro

MN Ambulance Assoc., Greater MN

NE MN Emergency Communications Board

#### Also in attendance:

Chris Caulk, Isanti County Sheriff

Cathy Anderson DPS-ECN

Carol-Linnea Salmon, DPS-ECN

Rubin Walker, DPS-ECN

Rick Juth, DPS-ECN

Jill Rohret, MESB

Victor Wanchena, DOC

Rey Freeman, RFCC

Chris Maier, Motorola

Dave Eischens, Motorola

Mike Fink, Motorola  
Scott Wosje, Northland Business Systems  
Ace Bonnema, Central MN ESB

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### CALL TO ORDER

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Commissioner Dunaski calls the meeting to order at 12:32 p.m.

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### APPROVAL OF AGENDA

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*Thomas Humphrey moves to approve the agenda.  
Dave Van Thiel seconds the motion.  
Motion carries to approve the agenda.*

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### APPROVAL OF PREVIOUS MEETING MINUTES

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Chair Dunaski notes an error in the May minutes. The paragraph describing the St. Louis Park Participation Plan Amendment should be corrected to read St. Louis Park rather than St. Louis County.

*Jim McMahon moves to approve the meeting's minutes as amended.  
Liz Workman seconds the motion.  
Motion carries to approve the minutes.*

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### ANNOUNCEMENTS

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Chair Dunaski announces that this is Dave Van Thiel's last meeting as he will be retiring. Dunaski thanks Van Thiel for his participation.

Van Thiel says it was an honor and an interesting learning experience.

Chair Dunaski introduces Sheriff Chris Caulk and welcomes him.

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### REPORTS OF STANDING COMMITTEES

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

- Lake of the Woods Participation Plan

Chair Glaccum introduces the Lake of the Woods Participation Plan. It is a full plan with 68 radios on the system and 32 talkgroups. They will connect to the system via control stations rather than through consoles. They will not be adding any sites or channel capacity.

*On behalf of the OTC, Chair Glaccum moves to approve the Lake of the Woods Participation*

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**Plan.**

**Scott Camps seconds.**

No discussion.

**Motion carries.**

- **Roseau County Participation Plan**

**ACTION ITEM**

Chair Glaccum gives details of the Roseau County Participation Plan. They will add 230 radios to the system and 59 talkgroups. They will also connect via control stations. No site additions or channels.

**On behalf of the OTC, Chair Glaccum moves to approve the Roseau County Participation Plan.**

**Humphrey seconds.**

No discussion.

**Motion carries.**

- **Lac qui Parle County Outdoor BDA**

**ACTION ITEM**

Chair Glaccum introduces the Lac qui Parle County request for an Outdoor Bi-Directional Amplifier (BDA). The county needs additional coverage in the city of Dawson which is located a long distance from ARMER towers. The equipment that will be used is similar to the BDA equipment that has already been approved for the system.

**On behalf of the OTC, Chair Glaccum moves to approve the Lac qui Parle County Outdoor BDA.**

**Dan Hartog seconds.**

McMahon asks about funding because the proposal as submitted asks for funding.

Glaccum responds that the OTC approved the technical aspect not funding. That would be a separate proposal.

No discussion.

**Motion carries.**

- **Isanti County Participation Plan Amendment**

**ACTION ITEM**

Chair Glaccum presents the Isanti County Participation Plan Amendment. The county plans to upgrade three Gold Elites consoles to MCC7500s plus one patching console. The county will also put an MCC7100 console in their EOCs. Eleven CCGW ports are required. About 140 I.D.s will be turned back. The county has had some connectivity through a T-1 that we had approved but will no longer need that after the upgrade.

**On behalf of the OTC, Chair Glaccum moves to approve the Isanti County Participation Plan Amendment.**

**McMahon seconds.**

No discussion.

**Motion carries.**

- **Rice and Steele County JPB Participation Plan Amendment**

**ACTION ITEM**

Chair Glaccum introduces a request from Rice and Steele Counties to add fifth MCC7500 position.

***On behalf of the OTC, Chair Glaccum moves to approve the Rice and Steele County JPB Participation Plan Amendment.***

***Mike Risvold seconds.***

No discussion.

***Motion carries.***

- **Stevens and Kandiyohi County Local Repeater Coverage**

***ACTION ITEM***

Chair Glaccum introduces a request from Stevens and Kandiyohi County to use a Local Repeater Coverage to ARMER (LRCA). The counties propose using conventional 800 MHz frequencies to connect into the system to provide some in-building coverage that they don't have. A BDA system is not a cost-effective solution in this case. It is being presented before the SECB today partially because it may present a solution to other areas that have similar coverage issues. The OTC approved the concept but not the re-allocation of frequencies. It was determined that that would require going through the change management process.

***On behalf of the OTC, Chair Glaccum moves to approve the concept of the local repeater coverage but not to allocate frequencies.***

***Humphrey seconds.***

#### **Discussion**

Glaccum explains that the request is to put some equipment on the system but use it in a different way. The user is going to have to work through a conventional interface that is then going to hook into the trunk system. This is done with mobile repeaters in squad cars. To his knowledge, this is the first time it will be used for building coverage or a coverage of an area. Any first responder that will be called in to work in that area would have to be aware of this and how it's being used.

Dunaski asks if the board should ask for a report back to see if it worked. He asks if this will impact the whole system or only locally. Glaccum responds that the opinion of the OTC is that any issues would be local and would not have an impact on the overall system.

***Motion carries.***

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

No report.

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

Chair Workman reports the committee met with three members attending. She invoked Article III, Number 2 of the SECB bylaws to determine that there was a quorum for the meeting. She reads the paragraph to the board:

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

Chair Workman reports that the committee requested staff to send the appropriate letters to the association members asking that the associations recommend members who are able to actively participate. The preference is that those representatives not be lobbyists. The committee accepted the addition of “and Outreach” to its name based on feedback regarding recommendations from the Steering Committee but would like to know what the expectations of the Steering Committee are for that outreach.

The committee also discussed sending a letter to Minnesota’s federal legislative delegation calling attention to Minnesota’s responses to FirstNet’s public notices. The letter is presented in the meeting materials today for approval by the board.

Chair Dunaski responds that the letter succinctly states the concerns that have been raised.

***On behalf of the Legislative Committee, Chair Workman moves that the Department of Public Safety/ECN is given authority to send this letter, as presented in the meeting materials, after hearing the latest from FirstNet and after the governor has been briefed. Humphrey seconds.***

Mines adds that FirstNet is not required to respond to our comments to the public notice. She thinks the next time we will get an indication that FirstNet has taken those comments under consideration is when they send out the formal RFP but probably more specific to Minnesota will be when they present the state plan. That is currently scheduled to happen in December. That is probably when we would know for sure if they are taking our concerns under consideration.

***Motion carries.***

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

Chair Hartog reviews changes to the SECB bylaws as proposed by the Steering Committee and as presented in the meeting materials. The changes included adding a representative from each regional Emergency Communications Board or Emergency Services Board to the Legislative Committee; adding the Minnesota Indian Affairs Council or Tribal Government to each committee; removing the Commission of Management and Budget from the SECB (which was done by statute); making the language consistent with the language in the statute; and some clean-up edits.

***On behalf of the Steering Committee, Chair Hartog moves to approve the recommended changes to the SECB bylaws. Glaccum seconds.***

Mines clarifies that the Steering Committee did not add Outreach to the Legislative Committee title because there was discussion at the Steering Committee about creating a subcommittee to do outreach.

***Motion carries.***

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

No report.

#### **NG911 (Pankonie)**

No report.

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

Chair Risvold says that the committee met but he was not able to attend and defers to Director Mines and Rubin Walker to report on the meeting.

Mines reports that the meeting reviewed the status of the Phase 2 data collection, planning for the phased build-out and an update on the LCE project in Elk River.

Rubin Walker reports on the public-private partnership project with Great River Energy. They have been planning to hold an exercise in August but there were challenges in finding an exercise coordinator. The Office of Emergency Communications will provide a planner and so now the exercise is being considered for September. Motorola and other vendors have given input and equipment to help give a bigger picture of how various devices will respond and interact. With this project are hoping to gain insight into how the public-private partnership works but also how things will work in different areas and with different equipment. We are hoping to come up with a platform with multi-level solutions that will provide insight into how FirstNet can best operate in Minnesota.

On the phased build-out strategy the workgroup is coming up with a list of priorities to help the regions develop the most effective strategies and to give FirstNet information about the best way to buildout in Minnesota. The workgroup meetings will happen in July and August and we will report to FirstNet in September.

### **Finance Committee (Gerlicher)**

No report.

### **Reports – Other**

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

Mukhtar Thakur distributes a status report to the committee members. This will be sent out on the ARMER listserv by ECN after the meeting. Thakur reports that there are 317 sites on the air and 17 sites remaining to construct. There are five sites currently under construction. Currently there is only one contractor bidding on the work. They are waiting on Cook County to approve the land lease for both the Sawbill and Devil Fish sites. All of the environmental reviews have been completed for the Cascade River site.

He reports that in the last three days there were at least three sites that we down because of external interference. In a couple of the sites they have found the problem and should be able to reduce most of the interference.

The redundant routers have significantly reduced outages.

Chair Dunaski adds that with the addition of Lake of the Woods and Roseau Counties that puts us at about 85 counties that are on the ARMER system. It is exciting to see the system near completion.

## ***ECN Update***

Jackie Mines refers to a NextGen911 GIS report that was submitted in the meeting materials. The outreach kick-off has been completed in all of the regions and now we are on to a request for information. You will see in the materials the number of counties that have responded. We are getting information back on the type of GIS that most counties have, the current status of the data collection, if they have a GIS representative in the county. This will give us an indication of how we need to work with each county as we collect GIS data. The next step will be to analyze the data. This team is also working on collection of some of the data that is needed for the FirstNet project. After this, then team will go on to working on standards and a communication plan. The team has been working very closely with two regions in particular – the Northeast and Metro. This project has gotten off to a really strong start.

The Text-to-911 initiative is in the final stages of reviewing RFP responses.

We are also working on the 7.19 upgrade. Jackie Mines and Tim Lee will meet on July 6 with the subsystem owners to discuss the project rollout with recent information that we received from Motorola and will also gather the final budget numbers.

### **Old Business**

None.

### **New Business**

None.

### **Other Business/discussion**

None.

**Meeting Adjourns at 1:19 p.m.**

Jill Rohert  
Metropolitan Emergency Services Board  
2099 University Ave W  
St. Paul, MN 55104

Dear Jill,

Ramsey County needs to receive approval from the MESBTOC and SECB OTC to update our Participation Plan that was dated 14-10-2004. We are in the process of replacing our nineteen (19) Motorola Gold Elite consoles with twenty (20) Motorola MCC7500 in our PSAP dispatch center. Once we have switched over to the new MCC7500, we will be able to free up approximately 1507 radio IDs that are currently assigned to our consoles. Three (3) CCGW's will be utilized with twenty one (21) ports, and we will have three (3) spare ports for future needs. We will be returning 1507ID's. We will use our current two (2) diverse path T1's between the Master site in Zone 2 and Ramsey County Dispatch center. Equipment is set to be arriving the first part of July. We will be holding onto 1 CEB for a temporary logging solution.

I would like the approval to increase our "Approved Radio Quantity" from 6900 to 7000 for future growth. I would also like to increase our "Approved Talkgroup Quantity" from 256 to 286 to cover the 10 we are over today and give room for future growth.

If you have any questions or concerns, please feel free to contact me.

Sincerely,

Ramsey County  
Dave Pikal, Technology Manager  
388 13<sup>th</sup> St. Paul, MN 55101  
651-266-7733

**Scott Williams, Director**  
388 13th Street  
Saint Paul, MN 55101  
Phone: (651) 266-7700  
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# OLMSTED COUNTY SIMULCAST ENHANCEMENT PROJECT



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Control No. PS-000059002

Motorola Solutions, Inc.  
9855 W 78<sup>th</sup> Street  
Eden Prairie, MN 55344

July 2015

Olmsted County  
Law Enforcement Center  
101 Forth St SE  
Rochester, MN 55904

Subject: Simulcast Channel Expansion Project

Dear Olmsted County Administration:

Motorola Solutions, Inc. (Motorola) is pleased to have the opportunity to provide Olmsted County with quality communications equipment and services. The Motorola project team has taken great care to propose a solution to address your needs and provide exceptional value.

Motorola's solution includes a combination of hardware, software and services. Specifically, this solution is for a 5 site simulcast single channel expansion and provides:

- Five (5) GTR8000 simulcast base station radios to expand the 5 site simulcast system to 12 channels total.

This proposal is subject to the terms and conditions of the Customer System Agreement (CSA) together with its Exhibits. This proposal shall remain valid until Oct 15th 2015. Olmsted County may accept the proposal by delivering to Motorola the CSA signed by an authorized County representative. Alternatively, Motorola will be pleased to address any concerns Olmsted County may have regarding the proposal. Any questions can be directed to Chris Meier, Sr. Account Manager, at 612-581-7308.

We thank you for the opportunity to furnish Olmsted County with our communications solutions and we hope to strengthen our relationship by implementing this project. Our goal is to provide you with the best products and services available in the communications industry.

Sincerely,

Motorola Solutions, Inc.



Bill Burton  
Area Sales Manager  
North America Government Markets

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# SYSTEM DESCRIPTION

## 1.1 OVERVIEW

Motorola Solutions Inc. (Motorola) offers Olmsted County, Minnesota (Olmsted County) a proposal for the addition of a single channel to the Olmsted County Trunked Simulcast network. Olmsted County is a member of Zone 2 and contains five Simulcast sites. The five (5) sites are Viola (Subsite 1), Mayo (Subsite 2), New Haven (Subsite 3), Pleasant Grove (Subsite 4), and Rock Dell (Subsite 5). Each of the sites will receive one (1) GTR 8000 base radio that will be integrated into the existing radio network with the necessary hardware and software.

Olmsted County is responsible for verifying key components for backhaul network bandwidth capacity to provide adequate performance for the channel addition. Olmsted must verify the existing channel banks at each site are able to support the addition of a V.24 circuit (SRU ports available) and that the backhaul (microwave) can support the addition of a DS0 timeslot. It is Olmsted County's responsibility to work with Mn/DOT for DS0 timeslot allocation/approval.

Olmsted County is also responsible for acquiring a Transmit/Receive RF channel pair to be assigned to the new GTR 8000 base radio. The new channel pair must satisfy the RF combiner specification of at least 150kHz separation from existing channels in Olmsted County's system.

This proposal includes the necessary hardware, software, and services to implement a single channel add to the five existing Olmsted simulcast sites. Motorola has included its design assumptions to aid in planning your RF site construction/modification.

The details required to expand the ARMER regional 800 MHz Project 25 radio system are described in the following sections.

## 1.2 SYSTEM COMPONENTS

### 1.2.1 Single Channel Addition Components

Motorola has refined its RF site design through its latest ASTRO releases and is pleased to offer our latest GTR 8000 base radio.

The GTR 8000 base radio offers many features not found in other radios including:

- Designed to integrate with STR3000 base radios for seamless hardware refresh upgrades in the future.
- Versatile power source, capable of either 120V AC or -48V DC power.
- Supports P25 FDMA trunking (ARMER requirement) and TDMA trunking.
- Supports both V.24 circuit-based architectures as well as state-of-the-art IP-based system designs.

This channel addition is designed for the 800 MHz band. In addition, Motorola has included the necessary networking equipment and software licenses for integrating this base radio into the ARMER ASTRO 25 network.



Our proposed single channel addition solution includes the following equipment Olmsted County. The list below will be replicated to all of the five (5) sites:

- One (1) Motorola GTR 8000 Base Radio:
  - Backwards compatible with STR3000 radio systems.
  - Adapter kit to mount the GTR 8000 into STR rack.
  - DC Power cable adapter for STR power supply.
  - License for circuit based Simulcast Trunking Operation.

The list below will be at the Prime Site:

- ASTRO-TAC 9600 Comparator.
  - Trunking operation license.
  - 6 I/O ports.

## 1.3 BACKHAUL CONNECTIVITY REQUIREMENTS

Olmsted County and Mn/DOT are responsible for providing and managing backhaul connectivity to the radio sites. Each expansion radio will require a DS0 time slot from the existing channel bank and an available v.24 port to interface to the Prime Site via the existing ARMER backhaul network. Olmsted County must work with Mn/DOT to determine the DS0 assignment for each of the five (5) sites.

## 1.4 ANTENNA/FEEDLINE AND POWER REQUIREMENTS

The GTR 8000 will connect to an available port on the existing STR3000 combiner at each site.

## 1.5 SUMMARY

This integrated system solution provides Olmsted County, MN with an additional channel on the P25 ARMER network. In addition, the GTR 8000 is our latest radio and will integrate with the next system refresh coming in 2016 for the IP-based ARMER 800 MHz P25 trunked radio system.



# STATEMENT OF WORK

Motorola is proposing to Olmsted County the installation and configuration of the following equipment at the specified locations.

Site Name	Major Equipment
Viola (Subsite1/Prime) Site	1 Channel GTR 8000, 1 ASTRO-TAC 9600 (6 port) Comparator
Mayo (Subsite 2)	1 channel GTR 8000
New Haven (Subsite 3)	1 channel GTR 8000
Pleasant Grove (Subsite 4)	1 channel GTR 8000
Rock Dell (Subsite 5)	1 channel GTR 8000

The document delineates the general responsibilities between Motorola and Olmsted County as agreed to by contract.

## 2.1 OVERVIEW

This Statement of Work (SOW) describes the deliverables to be furnished to Olmsted County. The tasks described herein will be performed to implement the solution described in the System Description. It describes the actual work involved in installation, identifies the installation standards to be followed, and clarifies the responsibilities for both Motorola and Customer during the project implementation.

This SOW was developed to improve capacity by adding a single channel using our latest GTR 8000 radio. The GTR 8000 equipment is further described in the System Description. This SOW provides the understanding of the work required by both parties to ensure a successful project implementation. In particular, Motorola has made assumptions regarding the project. Should any of the information change, a revision to the SOW and associated pricing will be required. This SOW is a working document, and it will be revised as needed to incorporate any changes associated with contract negotiations, Detailed Design Review (DDR), and any other change orders that may occur during the execution of the project.



## 2.2 ASSUMPTIONS

Motorola has based the Olmsted County equipment list for a single channel addition on information provided by Olmsted County. All assumptions have been listed below for review. Should Motorola's assumptions be deemed incorrect or not agreeable to Olmsted County, a revised proposal with the necessary changes and adjusted costs may be required. Changes to the equipment or scope of the project after contract may require a change order.

- Each site will have a V.24 interface on the existing channel bank and an assigned DS0 time slot to reach the Prime Site, with sufficient V.24 interfaces at the prime site.
- The Prime site will have an available ports on the TRAK GPS timing device (open 5Mhz and 1PPS ports), the Subsites will leverage the existing composite GPS TRAK Timing interface in the STR3000 rack.
- There is sufficient rack space in the STR3000 rack to include the addition of a new GTR 8000 base radio (included is the STR3000 retrofit kit).
- DC power connection is available on the STR3000 power supply.
- All backup power at each site is sufficient and capable of supporting the additional GTR 8000 and Comparator at Viola Site, and is the responsibility of Olmsted County.
- The new Transmit/Receive frequencies chosen by Olmsted County must have a minimum separation of 150 kHz from existing channels to function properly in the transmit combiner.
- The existing combiner has an available port and is the responsibility of Olmsted County.
- Any conflicting upgrades or modifications to the existing equipment are the responsibility of Olmsted County.
- Approved FCC Licensing of Transmit/Receive frequencies are the responsibility of Olmsted County.
- Prime site (Viola) has available rack space and power to accommodate the ASTRO-TAC 9600 Comparator.
- No Furniture has been included.
- No transport, storage or disposal of old equipment is included in this quote. The Customer is responsible for the removal and/or relocation of existing equipment.
- The existing sites or equipment locations will provide sufficient space for the equipment installation referencing the R56 standards. The customer will make necessary site improvements to follow the R56 guidelines. Reasonable attempts should be make for worker safety, proper spacing, and good grounding practices.
- All existing sites or equipment locations will have adequate electrical power in the proper phase and voltage and site grounding to support the requirements of the system described.
- Any site/location upgrades or modifications are the responsibility of the Customer.
- Approved Local, State, or Federal permits as may be required for the installation and operation of the proposed equipment are the responsibility of the Customer.
- Where necessary, the Customer will provide a dedicated delivery point, such as a warehouse, for receipt, inventory, and storage of equipment prior to delivery to the sites.



- If, for any reason, any of the proposed sites cannot be utilized due to reasons beyond Motorola's control, the costs associated with site changes or delays including, but not limited to, re-engineering, frequency re-licensing, site zoning, site permitting, schedule delays, site abnormalities, re-mobilization, etc., will be paid for by the Customer and documented through the change order process.
- All work is to be performed during normal work hours, Monday through Friday.
- Any required system interconnections not specifically outlined here will be provided by the Customer. These may include dedicated phone circuits, microwave links, or other types of connectivity.

## 2.3 MOTOROLA RESPONSIBILITIES

Motorola's general responsibilities include the following:

- Conduct project kickoff meeting with Olmsted County to review project design and finalize requirements.
- Inventory the Motorola supplied equipment described in the system description and the equipment list.
- Deliver and perform the installation of the Motorola supplied equipment described in the system description and the equipment list.
- Connect the appropriate equipment to Olmsted County-supplied ground system in accordance with Motorola's R56 Site Installation Standards.
- Program the GTR 8000 station and network interface device and enter that information into the appropriate ARMER Zone database.
- Coordinate the activities of all Motorola subcontractors under this contract.
- Administer safe work procedures for installation.
- Test operation and functionality to ensure they are in accordance with manufacturers' specifications.
- Check forward and reflected power for all radio equipment, after connection to the antenna systems, to verify that power is within tolerances.
- Integration of system into the ARMER system.
- Optimization and testing with customer to confirm operation using existing configurations.
- If any major task as contractually described fails, repeat that particular task after Motorola determines that corrective action has been taken.
- Document all issues that arise during testing.
- Document the results of any acceptance tests and present to Olmsted County for review.
- Resolve any punchlist items before project completion.



## 2.4 OLMSTED COUNTY RESPONSIBILITIES

Olmsted County will assume responsibility for the installation and performance of all other equipment and work necessary for completion of this project that is not provided by Motorola. Olmsted County's general responsibilities include the following:

- Assign a Project Manager, as the single point of contact responsible for Customer signed approvals.
- Assign other resources necessary to ensure completion of project tasks for which the Customer is responsible. Coordinate the activities of all Olmsted County's vendors or other contractors.
- Attend and participate in project meetings and reviews.
- Provide ongoing communication, as applicable; with ARMER regarding the channel addition project and schedule.
- Coordinate with MnDOT to ensure that the assigned DS0 slot and required bandwidth are available linking the new GTR 8000 base radio at each of the five (5) sites to the ARMER Prime site.
- Ensure rack space for GTR 8000 at each site and comparator equipment at the Prime site.
- Ensure sites meet space, grounding, power, and connectivity requirements for the installation of all equipment.
- Obtain all licensing, site access, or permitting required for project implementation.
- Customer is responsible for coordinating with the appropriate resources to provide training for the equipment provided in this proposal.
- Customer is responsible for the removal, transport, storage or disposal of any old equipment.
- Customer will provide a dedicated delivery point, such as a warehouse, for receipt, inventory and storage of equipment prior to delivery to the site(s).
- Supply adequately sized electrical service, backup power (UPS, generator, batteries, etc.) including the installation of conduit, circuit breakers, outlets, etc., at each equipment location. Provide AC power (dedicated 20 Amp AC outlets—simplex with ground) for each major piece of equipment within six (6) feet of the location of the Motorola-supplied equipment, including the associated electrical service and wiring (conduit, circuit breakers, etc.).
- Provide adequate HVAC, grounding, lighting, cable routing, and surge protection (also, among existing and Motorola-provided equipment) based upon Motorola's "Standards and Guidelines for Communication Sites" (R56). Ceiling (minimum 9 feet) and cable tray heights [minimum eight (8) feet] in the equipment rooms in order to accommodate the equipment racks.
- Bring grounding system up to Motorola's "Standards and Guidelines for Communication Sites" (R56) and supply a single point system ground, of five (5) ohms or less, to be used on all FNE supplied under the Contract. Supply grounding tie point within 10 feet from the Motorola-supplied equipment.



- Provide free and open access to all owned or leased sites of work. This includes but is not limited to, the following:
  - Provide escort at no charge, if escorts are required at any particular site. The availability of such escort shall not be unreasonably withheld.
  - Arrange site permission; provide keys to all the locks at sites and/or temporary identification cards should be issued to Motorola personnel if required for access to the sites.
  - Provide site access to all sites for Motorola personnel and Motorola's subcontractors for the purpose of installing, and optimizing Motorola provided equipment, and for testing of the equipment and system operation.
  - Provide any required parking permits to Motorola personnel for restricted access entry and/or parking.



# PERFORMANCE SCHEDULE

This preliminary schedule is included for informational purposes only and assumes that all Customer responsibilities as defined in the Statement of Work are completed, as required. A final project schedule will be developed based upon mutual agreement between Motorola and Olmsted County at the Detailed Design Review (DDR).

The dates for the installation and activation of the Olmsted County system are highly dependent on the actual completion dates of the Olmsted County, or their subcontractors, tasks associated with R56 upgrades, installation, cabling and providing unobstructed cable routes.

Some of the tasks listed below can be run concurrently. Motorola's preliminary schedule indicates total project implementation to be approximately 4–5 months. The specific and detailed scheduled will be determined during the DDR.

Preliminary Project Schedule	Task Responsibility	Task Duration Days
<b>Contract</b>		
Contract Award	Olmsted County	0
Contract Administration	Motorola	10
Project Kick-Off	Motorola	8
<b>Customer Design Review</b>		
Review Customer Design and Approval	Motorola and Olmsted County	10
<b>Order Processing and Equipment Manufacturing</b>	Motorola	65
<b>Equipment Staging</b>	Motorola	5
<b>Link Installation and Testing</b>	Olmsted County	15
<b>Equipment Installation</b>	Motorola	23
<b>MN/DOT Integration Approval</b>	Olmsted County	30
<b>System Optimization and Testing</b>	Motorola	25
<b>Perform R-56 Audit</b>	Motorola	2
<b>Cutover</b>	Motorola and Olmsted County	5
<b>Finalize</b>		
Resolve Punchlist	Motorola	9
Finalize Documentation	Motorola	9
Final Acceptance	Motorola and Olmsted County	0



# WARRANTY

## 4.1 WARRANTY, SERVICE AND MAINTENANCE

### 4.1.1 System Life Cycle Support

Motorola's comprehensive warranty and maintenance services address all of Olmsted County, Minnesota's day-to-day and emergency communication needs for seamless System Operations. The Motorola approach provides a low risk, high value support solution that keeps Olmsted County, Minnesota's Radio System at optimum availability and ready to serve mission critical communications needs.

### 4.1.2 Customer Support Plan

Motorola is the largest and most experienced provider of public safety communications systems. We have extensive familiarity with the processes, procedures and functionality required to operate a wide area public safety system. With this level of experience, Motorola will customize a detailed Customer Support Plan for Olmsted County, Minnesota that will allow us to maintain this Public Safety System through its life-cycle.

Working with Olmsted County, Minnesota personnel, Motorola will complete a detailed Customer Support Plan by the start of Final Acceptance Testing. This Customer Support Plan document will provide specific procedures and methods for effective service delivery and system restoral. The information supplied in this response will be incorporated into the Customer Support Plan. This document will also outline the escalation procedures to be used in maintaining the system. Key contact names, telephone numbers and pager numbers will all reside in the Customer Support Plan.

The Customer Support Plan will be the reference document for use by Olmsted County, Minnesota, Motorola, and Motorola's Authorized Servicers. This document will be reviewed and updated on a regular basis and as needed.

The Customer Support Plan will contain everything you need to know to take advantage of the services provided in your contract. This support plan is designed to help transition you from the pre-sales, staging, and installation phases to the delivery of life cycle support services for your system. Motorola supports your communication system with several expert service groups, each performing a specific function and working together to provide you with fast response and quick closure to issues.

### 4.1.3 The Motorola Service Delivery Team

#### 4.1.3.1 Customer Support Manager

Your Motorola Customer Support Manager provides coordination of support resources to enhance the quality of service delivery and to ensure your satisfaction. The Customer Support Manager (CSM) is responsible to oversee the execution of the Warranty and Service Agreement and ensure that Motorola meets its response and restoration cycle time commitments. The CSM will supervise and manage the Motorola Authorized Servicer's functions.

### 4.1.3.2 Motorola System Technologists

The Motorola System Technologists (ST) are available to assist Motorola's Authorized Servicers when needed for network health and operations.

### 4.1.3.3 Motorola System Support Center

Located in Schaumburg, Illinois, the System Support Center (SSC) is a key component to the overall management and maintenance of Olmsted County, Minnesota's system. As detailed in this Customer Support Plan, the following services are provided by the System Support Center:

- Sub-System Network Monitoring Operations.
- Technician Dispatch Service.
- Infrastructure Repair with Advanced Replacement.
- Technical Support.

## 4.2 WARRANTY PERIOD SERVICES

The Motorola Standard Commercial Warranty (Warranty), which is in effect for one year from the date of system acceptance, or a maximum of eighteen months from shipment of equipment from the factory, covers on-site repair during normal business hours (8:00am to 5:00pm, Monday to Friday) and replacement of defective hardware components. In addition, during the warranty period, Motorola will also deliver a "best-in-class" set of system services that has been tailored to meet the unique requirements of your addition to the Minnesota Metro/ARMER ASTRO® 25 SmartZone Radio System. Motorola system services are designed to optimize your system equipment availability and performance.

This combination of service products is Motorola's Custom Warranty package. In addition to the Standard Commercial Warranty, the service products that comprise the Custom Warranty package are listed below along with a brief description.

### 4.2.1 Overview of Services Provided During the Custom Warranty Period

Motorola Custom Warranty is comprised of the following service products for Olmsted County, Minnesota.

- On-Site Infrastructure Response.
- Infrastructure Repair with Advanced Replacement.
- Annual Network Preventative Maintenance.

A detailed Statement of Work describing each of these service products can be found as an Exhibit of the Communications Service Agreement (CSA).

The following services will be provided by Motorola during the warranty. Specific support services required for subsequent contracted Service Agreement years will be mutually determined by Olmsted County, Minnesota's and Motorola during the Warranty Period.



## 4.2.2 On-Site Infrastructure Response Service

On-Site Infrastructure Response provides for Motorola's Authorized Servicer to respond on site when dispatched by Motorola. Motorola will respond to issues as determined by predefined severity and response times. Severity 1 or Major Failures are dispatched 24 hours a day, 365 days a year including holidays. On-site response will be within four (4) hours of the Dispatch call. If a second technician is required, the technician will arrive on-site within four (4) hours of notification from the first technician or SSC. On-site service for Minor Failures will be provided on business days within 24 hours of a call placed to the SSC.

## 4.2.3 Infrastructure Repair Service with Advanced Replacement

Infrastructure Repair provides repair services to Motorola and select third party infrastructure equipment. The Motorola Authorized Service provider will remove and ship the malfunctioning equipment to the Motorola Infrastructure Depot Operations (IDO) for repair.

## 4.2.4 Network Preventative Maintenance Service

During the Warranty Period, one operational test and alignment will be performed on the dispatch equipment as well as the transmit site base station paging equipment to ensure that the equipment meets original manufacturer's specifications. This service will occur on a business day during normal business hours.

## 4.3 POST-WARRANTY SERVICE AND MAINTENANCE

Motorola has provided an "estimated" or "budgetary" price for the first, five years of maintenance following expiration of the warranty period based on our experience of ARMER System Owner's previous decisions as well as the known criteria. It is extremely difficult to be more specific for the following reasons:

- The support offered during the Warranty period is a "bundled" package of services. Olmsted County, Minnesota may or may not require or desire the same service product combination during Post-Warranty maintenance.
- Certain service product pricing quoted in this response is established by the annually renewed State of Minnesota master support contract. At this time it is premature to predict how long the State will maintain this contract, what service products will be included and what the pricing will be on an annual basis.
- Pricing contained in the aforementioned contract cannot be divulged with any agency until the actual contract is in force by the State of Minnesota, Department of Administration.

For the purposes of this exercise, it is assumed the same suite of services will be desired by the Customer during the post-warranty period as those received during warranty and that no State of Minnesota master support contract would exist at the time post-warranty support would commence.

We will be happy to work with Olmsted County, Minnesota to ensure that a suitable level of service is attained along with the associated budgetary pricing that will meet your requirements for services that are not covered by the State of Minnesota master support agreement. Again, we would be pleased to discuss these options at the request of Olmsted County, Minnesota given the content of the master contract at the time of warranty expiration.



This budgetary quotation is predicated on a master support contract between the State of Minnesota and Motorola that will be agreed to for the entire Minnesota Metro/ARMER Radio System for the 2011 calendar year and beyond. Some services that we would normally recommend for your equipment are assumed to be covered under that agreement. This would include: Technical Support and Software Subscription Agreement.

The following “estimated” or “budgetary” prices for year one through four of post-warranty maintenance for the proposed Olmsted County, Minnesota equipment is based on the following equipment packages and quantities:

## 4.3.1 Main Offering

### Primary System Equipment Quantities

- 1 Channel addition to five (5) existing sites.

### Services Included (See Notes Below)

- On-Site Infrastructure Response.
- Infrastructure Repair with Advanced Replacement.
- Annual Preventative Maintenance Check.

### Total Annual Budgetary Prices

- Year 1 post-warranty—\$5,140.00.
- Year 2 post-warranty—\$5,280.00.
- Year 3 post-warranty—\$5,440.00.
- Year 4 post-warranty—\$5,600.00.

### Notes

1. Currently, the following support products are included with the State of Minnesota Master Support Contract:

- Technical Support.
- System Upgrade Agreement.
- Security Update Service.
- One (1) Dedicated Motorola Field Technician for OnSite Infrastructure Response of the Master Sites (customer is responsible for remote sites).

MNDOT annually assesses (based on individual agency equipment quantities and is not included in the budgetary estimates provided) the individual agency cost allocation for this contract.

2. Software Installation has not been included because this service pricing can vary widely based on the type of upgrade required and historically, the software installation costs have been included in the overall upgrade price on a system-wide level.

3. The information provided in this quote is provided for informational (or budgetary) purposes only and does not constitute an offer to sell or license any Motorola product. This quote is not binding on Motorola and Motorola is making no representations, warranties, or commitments with respect to pricing, products, or terms and conditions which would require more information and further detailed analysis of the requirements for which this quote is requested.



# EQUIPMENT LIST

Total Qty	Nomenclature	Description
1	T6507	ASTRO-TAC 9600 COMPARATOR
1	CA00091AA	ENH: ASTRO 25 SIMULCAST TRUNKING OPERATION
1	X225AL	ADD: 6 I/O PORTS
1	X87	DEL: CABINET
1	X153	ADD: HARDWARE, RACKMOUNT
1	T7039	GTR 8000 BASE RADIO
1	CA00855AA	ADD: 700/800 MHz
1	CA00025AF	ADD: CIRCUIT BASED MULTISITE BASE RADIO SOFTWARE
1	CA00951AA	ADD: STR 3000 RETROFIT HARDWARE
1	X153AW	ADD: RACK MOUNT HARDWARE
1	CA01400AA	ADD: POWER CABLE, DC
1	T7039	GTR 8000 BASE RADIO
1	CA00025AF	ADD: CIRCUIT BASED MULTISITE BASE RADIO SOFTWARE
1	CA00855AA	ADD: 700/800 MHz
1	CA00951AA	ADD: STR 3000 RETROFIT HARDWARE
1	X153AW	ADD: RACK MOUNT HARDWARE
1	CA01400AA	ADD: POWER CABLE, DC
1	T7039	GTR 8000 BASE RADIO
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1	CA00855AA	ADD: 700/800 MHz
1	CA00951AA	ADD: STR 3000 RETROFIT HARDWARE
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1	T7039	GTR 8000 BASE RADIO
1	CA00025AF	ADD: CIRCUIT BASED MULTISITE BASE RADIO SOFTWARE
1	CA00855AA	ADD: 700/800 MHz
1	CA00951AA	ADD: STR 3000 RETROFIT HARDWARE
1	X153AW	ADD: RACK MOUNT HARDWARE



Total Qty	Nomenclature	Description
1	CA01400AA	ADD: POWER CABLE, DC
1	T7039	GTR 8000 BASE RADIO
1	CA00025AF	ADD: CIRCUIT BASED MULTISITE BASE RADIO SOFTWARE
1	CA00855AA	ADD: 700/800 MHz
1	CA00951AA	ADD: STR 3000 RETROFIT HARDWARE
1	X153AW	ADD: RACK MOUNT HARDWARE
1	CA01400AA	ADD: POWER CABLE, DC



# PRICING

Exhibit B: Pricing Summary	
Equipment Description	Sale Price
<b>Total Equipment Price</b>	<b>\$120,498.00</b>
Project Services	
Project Management/Post Sale Engineering/Installation/System Integration and 1st year 24/7 Response and Warranty	<b>\$71,778.00</b>
Performance Bond	<b>\$1,442.00</b>
<b>System Discount on Services for Sign Off Prior to October 15th</b>	<b>(\$5,812.00)</b>
<b>Grand Total</b>	<b>\$187,906.00</b>
*Note 1: The Grand Total shown above does not include MN Sales Tax or any other applicable local, state or federal taxes.	
*Note 2: If a Performance Bond is not required, the price of the Performance Bond shown above may be deducted from the Grand Total shown above.	



SECTION 7

# CONTRACT

Please see the following pages for the Communications System Agreement (CSA).



## Communications System Agreement

Motorola Solutions, Inc. ("Motorola") and Olmsted County, Minnesota ("Customer") enter into this "Agreement," pursuant to which Customer will purchase and Motorola will sell the System, as described below. Motorola and Customer may be referred to individually as a "Party" and collectively as the "Parties." For good and valuable consideration, the Parties agree as follows:

### Section 1 EXHIBITS

The exhibits listed below are incorporated into and made a part of this Agreement. In interpreting this Agreement and resolving any ambiguities, the main body of this Agreement takes precedence over the exhibits and any inconsistency between Exhibits A through E will be resolved in their listed order.

Exhibit A	Motorola "Software License Agreement"
Exhibit B	"Payment Schedule"
Exhibit C	"Technical and Implementation Documents"
C-1	"System Description" dated July 2015.
C-2	"Equipment List" dated July 2015.
C-3	"Statement of Work" dated July 2015.
C-4	"Acceptance Test Plan" or "ATP" dated
C-5	"Performance Schedule" dated July 2015.
Exhibit D	Service Statement(s) of Work and "Service Terms and Conditions" (if applicable)
Exhibit E	"System Acceptance Certificate"

### Section 2 DEFINITIONS

Capitalized terms used in this Agreement have the following meanings:

- 2.1. "Acceptance Tests" means those tests described in the Acceptance Test Plan.
- 2.2. "Administrative User Credentials" means an account that has total access over the operating system, files, end user accounts and passwords at either the System level or box level. Customer's personnel with access to the Administrative User Credentials may be referred to as the Administrative User.
- 2.3. "Beneficial Use" means when Customer first uses the System or a Subsystem for operational purposes (excluding training or testing).
- 2.4. "Confidential Information" means any information that is disclosed in written, graphic, verbal, or machine-recognizable form, and is marked, designated, or identified at the time of disclosure as being confidential or its equivalent; or if the information is in verbal form, it is identified as confidential at the time of disclosure and is confirmed in writing within thirty (30) days of the disclosure. Confidential Information does not include any information that: is or becomes publicly known through no wrongful act of the receiving Party; is already known to the receiving Party without restriction when it is disclosed; is or becomes, rightfully and without breach of this Agreement, in the receiving Party's possession without any obligation restricting disclosure; is independently developed by the receiving Party without breach of this Agreement; or is explicitly approved for release by written authorization of the disclosing Party.
- 2.5. "Contract Price" means the price for the System, excluding applicable sales or similar taxes and freight charges.
- 2.6. "Effective Date" means that date upon which the last Party executes this Agreement.
- 2.7. "Equipment" means the equipment that Customer purchases from Motorola under this Agreement. Equipment that is part of the System is described in the Equipment List.



- 2.8. "Force Majeure" means an event, circumstance, or act of a third party that is beyond a Party's reasonable control (e.g., an act of God, an act of the public enemy, an act of a government entity, strikes or other labor disturbances, hurricanes, earthquakes, fires, floods, epidemics, embargoes, war, and riots).
- 2.9. "Infringement Claim" means a third party claim alleging that the Equipment manufactured by Motorola or the Motorola Software directly infringes a United States patent or copyright.
- 2.10. "Motorola Software" means Software that Motorola or its affiliated company owns.
- 2.11. "Non-Motorola Software" means Software that another party owns.
- 2.12. "Open Source Software" (also called "freeware" or "shareware") means software with either freely obtainable source code, license for modification, or permission for free distribution.
- 2.13. "Proprietary Rights" means the patents, patent applications, inventions, copyrights, trade secrets, trademarks, trade names, mask works, know-how, and other intellectual property rights in and to the Equipment and Software, including those created or produced by Motorola under this Agreement and any corrections, bug fixes, enhancements, updates or modifications to or derivative works from the Software whether made by Motorola or another party.
- 2.14. "Software" means the Motorola Software and Non-Motorola Software, in object code format that is furnished with the System or Equipment.
- 2.15. "Specifications" means the functionality and performance requirements that are described in the Technical and Implementation Documents.
- 2.16. "Subsystem" means a major part of the System that performs specific functions or operations. Subsystems are described in the Technical and Implementation Documents.
- 2.17. "System" means the Equipment, Software, and incidental hardware and materials that are combined together into an integrated system; the System is described in the Technical and Implementation Documents.
- 2.18. "System Acceptance" means the Acceptance Tests have been successfully completed.
- 2.19. "Warranty Period" means one (1) year from the date of System Acceptance or Beneficial Use, whichever occurs first.

### **Section 3 SCOPE OF AGREEMENT AND TERM**

- 3.1. **SCOPE OF WORK.** Motorola will provide, install and test the System, and perform its other contractual responsibilities, all in accordance with this Agreement. Customer will perform its contractual responsibilities in accordance with this Agreement.
- 3.2. **CHANGE ORDERS.** Either Party may request changes within the general scope of this Agreement. If a requested change causes an increase or decrease in the cost or time required to perform this Agreement, the Parties will agree to an equitable adjustment of the Contract Price, Performance Schedule, or both, and will reflect the adjustment in a change order. Neither Party is obligated to perform requested changes unless both Parties execute a written change order.
- 3.3. **TERM.** Unless terminated in accordance with other provisions of this Agreement or extended by mutual agreement of the Parties, the term of this Agreement begins on the Effective Date and continues until the date of Final Project Acceptance or expiration of the Warranty Period, whichever occurs last.
- 3.4. **ADDITIONAL EQUIPMENT OR SOFTWARE.** For three (3) years after the Effective Date, Customer may order additional Equipment or Software if it is then available. Each order must refer to this Agreement and must specify the pricing and delivery terms. Notwithstanding any additional or contrary terms in the order, the applicable provisions of this Agreement (except for pricing, delivery, passage of title and risk of loss to Equipment,



warranty commencement, and payment terms) will govern the purchase and sale of the additional Equipment or Software. Title and risk of loss to additional Equipment will pass at shipment, warranty will commence upon delivery, and payment is due within twenty (20) days after the invoice date. Motorola will send Customer an invoice as the additional Equipment is shipped or Software is licensed. Alternatively, Customer may register with and place orders through Motorola Online (“MOL”), and this Agreement will be the “Underlying Agreement” for those MOL transactions rather than the MOL On-Line Terms and Conditions of Sale. MOL registration and other information may be found at <http://www.motorola.com/businessandgovernment/> and the MOL telephone number is (800) 814-0601.

3.5. **MAINTENANCE SERVICE.** During the Warranty Period, in addition to warranty services, Motorola will provide maintenance services for the Equipment and support for the Motorola Software pursuant to the Statement of Work set forth in Exhibit D. Those services and support are included in the Contract Price. If Customer wishes to purchase additional maintenance and support services for the Equipment during the Warranty Period, or any maintenance and support services for the Equipment either during the Warranty Period or after the Warranty Period, the description of and pricing for the services will be set forth in a separate document. If Customer wishes to purchase extended support for the Motorola Software after the Warranty Period, it may do so by ordering software subscription services. Unless otherwise agreed by the parties in writing, the terms and conditions applicable to those maintenance, support or software subscription services will be Motorola’s standard Service Terms and Conditions, together with the appropriate statements of work.

3.6. **MOTOROLA SOFTWARE.** Any Motorola Software, including subsequent releases, is licensed to Customer solely in accordance with the Software License Agreement. Customer hereby accepts and agrees to abide by all of the terms and restrictions of the Software License Agreement.

3.7. **NON-MOTOROLA SOFTWARE.** Any Non-Motorola Software is licensed to Customer in accordance with the standard license, terms, and restrictions of the copyright owner on the Effective Date unless the copyright owner has granted to Motorola the right to sublicense the Non-Motorola Software pursuant to the Software License Agreement, in which case it applies and the copyright owner will have all of Licensor’s rights and protections under the Software License Agreement. Motorola makes no representations or warranties of any kind regarding Non-Motorola Software. Non-Motorola Software may include Open Source Software. All Open Source Software is licensed to Customer in accordance with, and Customer agrees to abide by, the provisions of the standard license of the copyright owner and not the Software License Agreement. Upon request by Customer, Motorola will use commercially reasonable efforts to determine whether any Open Source Software will be provided under this Agreement; and if so, identify the Open Source Software and provide to Customer a copy of the applicable standard license (or specify where that license may be found); and provide to Customer a copy of the Open Source Software source code if it is publicly available without charge (although a distribution fee or a charge for related services may be applicable).

3.8. **SUBSTITUTIONS.** At no additional cost to Customer, Motorola may substitute any Equipment, Software, or services to be provided by Motorola, if the substitute meets or exceeds the Specifications and is of equivalent or better quality to the Customer. Any substitution will be reflected in a change order.

3.9. **OPTIONAL EQUIPMENT OR SOFTWARE.** This paragraph applies only if a “Priced Options” exhibit is shown in Section 1, or if the parties amend this Agreement to add a Priced Options exhibit. During the term of the option as stated in the Priced Options exhibit (or if no term is stated, then for one (1) year after the Effective Date), Customer has the right and option to purchase the equipment, software, and related services that are described in the Priced Options exhibit. Customer may exercise this option by giving written notice to Seller which must designate what equipment, software, and related services Customer is selecting (including quantities, if applicable). To the extent they apply, the terms and conditions of this Agreement will govern the transaction; however, the parties acknowledge that certain provisions must be agreed upon, and they agree to negotiate those in good faith promptly after Customer delivers the option exercise notice. Examples of provisions that may need to be negotiated are: specific lists of deliverables, statements of work, acceptance test plans, delivery and implementation schedules, payment terms, maintenance and support provisions, additions to or modifications of the Software License Agreement, hosting terms, and modifications to the acceptance and warranty provisions.



**Section 4 PERFORMANCE SCHEDULE**

The Parties will perform their respective responsibilities in accordance with the Performance Schedule. By executing this Agreement, Customer authorizes Motorola to proceed with contract performance.

**Section 5 CONTRACT PRICE, PAYMENT AND INVOICING**

5.1. CONTRACT PRICE. The Contract Price in U.S. dollars is \$\_\_\_\_\_. If applicable, a pricing summary is included with the Payment Schedule. Motorola has priced the services, Software, and Equipment as an integrated system. A reduction in Software or Equipment quantities, or services, may affect the overall Contract Price, including discounts if applicable.

5.2. INVOICING AND PAYMENT. Motorola will submit invoices to Customer according to the Payment Schedule. Except for a payment that is due on the Effective Date, Customer will make payments to Motorola within twenty (20) days after the date of each invoice. Customer will make payments when due in the form of a wire transfer, check, or cashier’s check from a U.S. financial institution. Overdue invoices will bear simple interest at the maximum allowable rate. For reference, the Federal Tax Identification Number for Motorola Solutions, Inc. is 36-1115800.

FREIGHT, TITLE, AND RISK OF LOSS. Motorola will pre-pay and add all freight charges to the invoices. Title to the Equipment will pass to Customer upon shipment. Title to Software will not pass to Customer at any time. Risk of loss will pass to Customer upon delivery of the Equipment to the Customer. Motorola will pack and ship all Equipment in accordance with good commercial practices.

INVOICING AND SHIPPING ADDRESSES. Invoices will be sent to the Customer at the following address:

\_\_\_\_\_

The address which is the ultimate destination where the Equipment will be delivered to Customer is:

\_\_\_\_\_

The Equipment will be shipped to the Customer at the following address (insert if this information is known):

\_\_\_\_\_

Customer may change this information by giving written notice to Motorola.

**Section 6 SITES AND SITE CONDITIONS**

6.1. ACCESS TO SITES. In addition to its responsibilities described elsewhere in this Agreement, Customer will provide a designated project manager; all necessary construction and building permits, zoning variances, licenses, and any other approvals that are necessary to develop or use the sites and mounting locations; and access to the work sites or vehicles identified in the Technical and Implementation Documents as reasonably requested by Motorola so that it may perform its duties in accordance with the Performance Schedule and Statement of Work. If the Statement of Work so indicates, Motorola may assist Customer in the local building permit process.

6.2. SITE CONDITIONS. Customer will ensure that all work sites it provides will be safe, secure, and in compliance with all applicable industry and OSHA standards. To the extent applicable and unless the Statement of Work states to the contrary, Customer will ensure that these work sites have adequate: physical space; air conditioning and other environmental conditions; adequate and appropriate electrical power outlets, distribution, equipment and connections; and adequate telephone or other communication lines (including modem access and adequate interfacing networking capabilities), all for the installation, use and maintenance of the System. Before installing the Equipment or Software at a work site, Motorola may inspect the work site and advise Customer of any apparent deficiencies or non-conformities with the requirements of this Section. This Agreement is

predicated upon normal soil conditions as defined by the version of E.I.A. standard RS-222 in effect on the Effective Date.

6.3. **SITE ISSUES.** If a Party determines that the sites identified in the Technical and Implementation Documents are no longer available or desired, or if subsurface, structural, adverse environmental or latent conditions at any site differ from those indicated in the Technical and Implementation Documents, the Parties will promptly investigate the conditions and will select replacement sites or adjust the installation plans and specifications as necessary. If change in sites or adjustment to the installation plans and specifications causes a change in the cost or time to perform, the Parties will equitably amend the Contract Price, Performance Schedule, or both, by a change order.

## **Section 7 TRAINING**

Any training to be provided by Motorola to Customer will be described in the Statement of Work. Customer will notify Motorola immediately if a date change for a scheduled training program is required. If Motorola incurs additional costs because Customer reschedules a training program less than thirty (30) days before its scheduled start date, Motorola may recover these additional costs.

## **Section 8 SYSTEM ACCEPTANCE**

8.1. **COMMENCEMENT OF ACCEPTANCE TESTING.** Motorola will provide to Customer at least ten (10) days notice before the Acceptance Tests commence. System testing will occur only in accordance with the Acceptance Test Plan.

8.2. **SYSTEM ACCEPTANCE.** System Acceptance will occur upon successful completion of the Acceptance Tests. Upon System Acceptance, the Parties will memorialize this event by promptly executing a System Acceptance Certificate. If the Acceptance Test Plan includes separate tests for individual Subsystems or phases of the System, acceptance of the individual Subsystem or phase will occur upon the successful completion of the Acceptance Tests for the Subsystem or phase, and the Parties will promptly execute an acceptance certificate for the Subsystem or phase. If Customer believes the System has failed the completed Acceptance Tests, Customer will provide to Motorola a written notice that includes the specific details of the failure. If Customer does not provide to Motorola a failure notice within thirty (30) days after completion of the Acceptance Tests, System Acceptance will be deemed to have occurred as of the completion of the Acceptance Tests. Minor omissions or variances in the System that do not materially impair the operation of the System as a whole will not postpone System Acceptance or Subsystem acceptance, but will be corrected according to a mutually agreed schedule.

8.3. **BENEFICIAL USE.** Customer acknowledges that Motorola's ability to perform its implementation and testing responsibilities may be impeded if Customer begins using the System before System Acceptance. Therefore, Customer will not commence Beneficial Use before System Acceptance without Motorola's prior written authorization, which will not be unreasonably withheld. Motorola is not responsible for System performance deficiencies that occur during unauthorized Beneficial Use. Upon commencement of Beneficial Use, Customer assumes responsibility for the use and operation of the System.

8.4 **FINAL PROJECT ACCEPTANCE.** Final Project Acceptance will occur after System Acceptance when all deliverables and other work have been completed. When Final Project Acceptance occurs, the parties will promptly memorialize this final event by so indicating on the System Acceptance Certificate.

## **Section 9 REPRESENTATIONS AND WARRANTIES**

9.1. **SYSTEM FUNCTIONALITY.** Motorola represents that the System will perform in accordance with the Specifications in all material respects. Upon System Acceptance or Beneficial Use, whichever occurs first, this System functionality representation is fulfilled. Motorola is not responsible for System performance deficiencies that are caused by ancillary equipment not furnished by Motorola which is attached to or used in connection with the System or for reasons or parties beyond Motorola's control, such as natural causes; the construction of a building that adversely affects the microwave path reliability or radio frequency (RF) coverage; the addition of



frequencies at System sites that cause RF interference or intermodulation; or Customer changes to load usage or configuration outside the Specifications.

9.2. **EQUIPMENT WARRANTY.** During the Warranty Period, Motorola warrants that the Equipment under normal use and service will be free from material defects in materials and workmanship. If System Acceptance is delayed beyond six (6) months after shipment of the Equipment by events or causes within Customer's control, this warranty expires eighteen (18) months after the shipment of the Equipment.

9.3. **Motorola Software Warranty.** Unless otherwise stated in the Software License Agreement, during the Warranty Period, Motorola warrants the Motorola Software in accordance with the terms of the Software License Agreement and the provisions of this Section 9 that are applicable to the Motorola Software. If System Acceptance is delayed beyond six (6) months after shipment of the Motorola Software by events or causes within Customer's control, this warranty expires eighteen (18) months after the shipment of the Motorola Software. **TO THE EXTENT, IF ANY, THAT THERE IS A SEPARATE LICENSE AGREEMENT PACKAGED WITH, OR PROVIDED ELECTRONICALLY WITH, A PARTICULAR PRODUCT THAT BECOMES EFFECTIVE ON AN ACT OF ACCEPTANCE BY THE END USER, THEN THAT AGREEMENT SUPERCEDES THIS SOFTWARE LICENSE AGREEMENT AS TO THE END USER OF EACH SUCH PRODUCT.**

9.4. **EXCLUSIONS TO EQUIPMENT AND MOTOROLA SOFTWARE WARRANTIES.** These warranties do not apply to: (i) defects or damage resulting from: use of the Equipment or Motorola Software in other than its normal, customary, and authorized manner; accident, liquids, neglect, or acts of God; testing, maintenance, disassembly, repair, installation, alteration, modification, or adjustment not provided or authorized in writing by Motorola; Customer's failure to comply with all applicable industry and OSHA standards; (ii) breakage of or damage to antennas unless caused directly by defects in material or workmanship; (iii) Equipment that has had the serial number removed or made illegible; (iv) batteries (because they carry their own separate limited warranty) or consumables; (v) freight costs to ship Equipment to the repair depot; (vi) scratches or other cosmetic damage to Equipment surfaces that does not affect the operation of the Equipment; and (vii) normal or customary wear and tear.

9.5. **WARRANTY CLAIMS.** To assert a warranty claim, Customer must notify Motorola in writing of the claim before the expiration of the Warranty Period. Upon receipt of this notice, Motorola will investigate the warranty claim. If this investigation confirms a valid warranty claim, Motorola will (at its option and at no additional charge to Customer) repair the defective Equipment or Motorola Software, replace it with the same or equivalent product, or refund the price of the defective Equipment or Motorola Software. That action will be the full extent of Motorola's liability for the warranty claim. If this investigation indicates the warranty claim is not valid, then Motorola may invoice Customer for responding to the claim on a time and materials basis using Motorola's then current labor rates. Repaired or replaced product is warranted for the balance of the original applicable warranty period. All replaced products or parts will become the property of Motorola.

9.6. **ORIGINAL END USER IS COVERED.** These express limited warranties are extended by Motorola to the original user purchasing the System for commercial, industrial, or governmental use only, and are not assignable or transferable.

9.7. **DISCLAIMER OF OTHER WARRANTIES.** THESE WARRANTIES ARE THE COMPLETE WARRANTIES FOR THE EQUIPMENT AND MOTOROLA SOFTWARE PROVIDED UNDER THIS AGREEMENT AND ARE GIVEN IN LIEU OF ALL OTHER WARRANTIES. MOTOROLA DISCLAIMS ALL OTHER WARRANTIES OR CONDITIONS, EXPRESS OR IMPLIED, INCLUDING THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

## Section 10 DELAYS

10.1. **FORCE MAJEURE.** Neither Party will be liable for its non-performance or delayed performance if caused by a Force Majeure. A Party that becomes aware of a Force Majeure that will significantly delay performance will notify the other Party promptly (but in no event later than fifteen days) after it discovers the Force Majeure. If a Force Majeure occurs, the Parties will execute a change order to extend the Performance Schedule for a time period that is reasonable under the circumstances.



10.2. PERFORMANCE SCHEDULE DELAYS CAUSED BY CUSTOMER. If Customer (including its other contractors) delays the Performance Schedule, it will make the promised payments according to the Payment Schedule as if no delay occurred; and the Parties will execute a change order to extend the Performance Schedule and, if requested, compensate Motorola for all reasonable charges incurred because of the delay. Delay charges may include costs incurred by Motorola or its subcontractors for additional freight, warehousing and handling of Equipment; extension of the warranties; travel; suspending and re-mobilizing the work; additional engineering, project management, and standby time calculated at then current rates; and preparing and implementing an alternative implementation plan.

## **Section 11 DISPUTES**

The Parties will use the following procedure to address any dispute arising under this Agreement (a "Dispute").

11.1. GOVERNING LAW. This Agreement will be governed by and construed in accordance with the laws of the State in which the System is installed.

11.2. NEGOTIATION. Either Party may initiate the Dispute resolution procedures by sending a notice of Dispute ("Notice of Dispute"). The Parties will attempt to resolve the Dispute promptly through good faith negotiations including 1) timely escalation of the Dispute to executives who have authority to settle the Dispute and who are at a higher level of management than the persons with direct responsibility for the matter and 2) direct communication between the executives. If the Dispute has not been resolved within ten (10) days from the Notice of Dispute, the Parties will proceed to mediation.

11.3. MEDIATION. The Parties will choose an independent mediator within thirty (30) days of a notice to mediate from either Party ("Notice of Mediation"). Neither Party may unreasonably withhold consent to the selection of a mediator. If the Parties are unable to agree upon a mediator, either Party may request that American Arbitration Association nominate a mediator. Each Party will bear its own costs of mediation, but the Parties will share the cost of the mediator equally. Each Party will participate in the mediation in good faith and will be represented at the mediation by a business executive with authority to settle the Dispute.

11.4. LITIGATION, VENUE and JURISDICTION. If a Dispute remains unresolved for sixty (60) days after receipt of the Notice of Mediation, either Party may then submit the Dispute to a court of competent jurisdiction in the state in which the System is installed. Each Party irrevocably agrees to submit to the exclusive jurisdiction of the courts in such state over any claim or matter arising under or in connection with this Agreement.

11.5. CONFIDENTIALITY. All communications pursuant to subsections 11.2 and 11.3 will be treated as compromise and settlement negotiations for purposes of applicable rules of evidence and any additional confidentiality protections provided by applicable law. The use of these Dispute resolution procedures will not be construed under the doctrines of laches, waiver or estoppel to affect adversely the rights of either Party.

## **Section 12 DEFAULT AND TERMINATION**

12.1. DEFAULT BY A PARTY. If either Party fails to perform a material obligation under this Agreement, the other Party may consider the non-performing Party to be in default (unless a Force Majeure causes the failure) and may assert a default claim by giving the non-performing Party a written and detailed notice of default. Except for a default by Customer for failing to pay any amount when due under this Agreement which must be cured immediately, the defaulting Party will have thirty (30) days after receipt of the notice of default to either cure the default or, if the default is not curable within thirty (30) days, provide a written cure plan. The defaulting Party will begin implementing the cure plan immediately after receipt of notice by the other Party that it approves the plan. If Customer is the defaulting Party, Motorola may stop work on the project until it approves the Customer's cure plan.

12.2. FAILURE TO CURE. If a defaulting Party fails to cure the default as provided above in Section 12.1, unless otherwise agreed in writing, the non-defaulting Party may terminate any unfulfilled portion of this Agreement. In the event of termination for default, the defaulting Party will promptly return to the non-defaulting Party any of its Confidential Information. If Customer is the non-defaulting Party, terminates this Agreement as permitted by this Section, and completes the System through a third Party, Customer may as its exclusive remedy



recover from Motorola reasonable costs incurred to complete the System to a capability not exceeding that specified in this Agreement less the unpaid portion of the Contract Price. Customer will mitigate damages and provide Motorola with detailed invoices substantiating the charges.

## **Section 13 INDEMNIFICATION**

13.1. **GENERAL INDEMNITY BY MOTOROLA.** Motorola will indemnify and hold Customer harmless from any and all liability, expense, judgment, suit, cause of action, or demand for personal injury, death, or direct damage to tangible property which may accrue against Customer to the extent it is caused by the negligence of Motorola, its subcontractors, or their employees or agents, while performing their duties under this Agreement, if Customer gives Motorola prompt, written notice of any the claim or suit. Customer will cooperate with Motorola in its defense or settlement of the claim or suit. This section sets forth the full extent of Motorola's general indemnification of Customer from liabilities that are in any way related to Motorola's performance under this Agreement.

13.2. **GENERAL INDEMNITY BY CUSTOMER.** Customer will indemnify and hold Motorola harmless from any and all liability, expense, judgment, suit, cause of action, or demand for personal injury, death, or direct damage to tangible property which may accrue against Motorola to the extent it is caused by the negligence of Customer, its other contractors, or their employees or agents, while performing their duties under this Agreement, if Motorola gives Customer prompt, written notice of any the claim or suit. Motorola will cooperate with Customer in its defense or settlement of the claim or suit. This section sets forth the full extent of Customer's general indemnification of Motorola from liabilities that are in any way related to Customer's performance under this Agreement.

### **13.3. PATENT AND COPYRIGHT INFRINGEMENT.**

13.3.1. Motorola will defend at its expense any suit brought against Customer to the extent it is based on a third-party claim alleging that the Equipment manufactured by Motorola or the Motorola Software ("Motorola Product") directly infringes a United States patent or copyright ("Infringement Claim"). Motorola's duties to defend and indemnify are conditioned upon: Customer promptly notifying Motorola in writing of the Infringement Claim; Motorola having sole control of the defense of the suit and all negotiations for its settlement or compromise; and Customer providing to Motorola cooperation and, if requested by Motorola, reasonable assistance in the defense of the Infringement Claim. In addition to Motorola's obligation to defend, and subject to the same conditions, Motorola will pay all damages finally awarded against Customer by a court of competent jurisdiction for an Infringement Claim or agreed to, in writing, by Motorola in settlement of an Infringement Claim.

13.3.2. If an Infringement Claim occurs, or in Motorola's opinion is likely to occur, Motorola may at its option and expense: (a) procure for Customer the right to continue using the Motorola Product; (b) replace or modify the Motorola Product so that it becomes non-infringing while providing functionally equivalent performance; or (c) accept the return of the Motorola Product and grant Customer a credit for the Motorola Product, less a reasonable charge for depreciation. The depreciation amount will be calculated based upon generally accepted accounting standards.

13.3.3. Motorola will have no duty to defend or indemnify for any Infringement Claim that is based upon: (a) the combination of the Motorola Product with any software, apparatus or device not furnished by Motorola; (b) the use of ancillary equipment or software not furnished by Motorola and that is attached to or used in connection with the Motorola Product; (c) Motorola Product designed or manufactured in accordance with Customer's designs, specifications, guidelines or instructions, if the alleged infringement would not have occurred without such designs, specifications, guidelines or instructions; (d) a modification of the Motorola Product by a party other than Motorola; (e) use of the Motorola Product in a manner for which the Motorola Product was not designed or that is inconsistent with the terms of this Agreement; or (f) the failure by Customer to install an enhancement release to the Motorola Software that is intended to correct the claimed infringement. In no event will Motorola's liability resulting from its indemnity obligation to Customer extend in any way to royalties payable on a per use basis or the Customer's revenues, or any royalty basis other than a reasonable royalty based upon revenue derived by Motorola from Customer from sales or license of the infringing Motorola Product.



13.3.4. This Section 13 provides Customer's sole and exclusive remedies and Motorola's entire liability in the event of an Infringement Claim. Customer has no right to recover and Motorola has no obligation to provide any other or further remedies, whether under another provision of this Agreement or any other legal theory or principle, in connection with an Infringement Claim. In addition, the rights and remedies provided in this Section 13 are subject to and limited by the restrictions set forth in Section 14.

## **Section 14      LIMITATION OF LIABILITY**

Except for personal injury or death, Motorola's total liability, whether for breach of contract, warranty, negligence, strict liability in tort, indemnification, or otherwise, will be limited to the direct damages recoverable under law, but not to exceed the price of the Equipment, Software, or services with respect to which losses or damages are claimed. **ALTHOUGH THE PARTIES ACKNOWLEDGE THE POSSIBILITY OF SUCH LOSSES OR DAMAGES, THEY AGREE THAT MOTOROLA WILL NOT be liable for any commercial loss; inconvenience; loss of use, Time, DATA, GOOD WILL, REVENUEs, profits or savings; or other SPECIAL, incidental, INDIRECT, OR consequential damages IN ANY WAY RELATED TO OR ARISING FROM THIS AGREEMENT, THE SALE OR USE OF THE EQUIPMENT OR SOFTWARE, OR THE PERFORMANCE OF SERVICES BY MOTOROLA PURSUANT TO THIS AGREEMENT.** This limitation of liability provision survives the expiration or termination of the Agreement and applies notwithstanding any contrary provision. No action for contract breach or otherwise relating to the transactions contemplated by this Agreement may be brought more than one (1) year after the accrual of the cause of action, except for money due upon an open account.

## **Section 15      CONFIDENTIALITY AND PROPRIETARY RIGHTS**

15.1. **CONFIDENTIAL INFORMATION.** During the term of this Agreement, the parties may provide each other with Confidential Information. Each Party will: maintain the confidentiality of the other Party's Confidential Information and not disclose it to any third party, except as authorized by the disclosing Party in writing or as required by a court of competent jurisdiction; restrict disclosure of the Confidential Information to its employees who have a "need to know" and not copy or reproduce the Confidential Information; take necessary and appropriate precautions to guard the confidentiality of the Confidential Information, including informing its employees who handle the Confidential Information that it is confidential and is not to be disclosed to others, but these precautions will be at least the same degree of care that the receiving Party applies to its own confidential information and will not be less than reasonable care; and use the Confidential Information only in furtherance of the performance of this Agreement. Confidential Information is and will at all times remain the property of the disclosing Party, and no grant of any proprietary rights in the Confidential Information is given or intended, including any express or implied license, other than the limited right of the recipient to use the Confidential Information in the manner and to the extent permitted by this Agreement.

15.2. **PRESERVATION OF MOTOROLA'S PROPRIETARY RIGHTS.** Motorola, the third party manufacturer of any Equipment, and the copyright owner of any Non-Motorola Software own and retain all of their respective Proprietary Rights in the Equipment and Software, and nothing in this Agreement is intended to restrict their Proprietary Rights. All intellectual property developed, originated, or prepared by Motorola in connection with providing to Customer the Equipment, Software, or related services remain vested exclusively in Motorola, and this Agreement does not grant to Customer any shared development rights of intellectual property. Except as explicitly provided in the Software License Agreement, Motorola does not grant to Customer, either directly or by implication, estoppel, or otherwise, any right, title or interest in Motorola's Proprietary Rights. Customer will not modify, disassemble, peel components, decompile, otherwise reverse engineer or attempt to reverse engineer, derive source code or create derivative works from, adapt, translate, merge with other software, reproduce, distribute, sublicense, sell or export the Software, or permit or encourage any third party to do so. The preceding sentence does not apply to Open Source Software which is governed by the standard license of the copyright owner.

## **Section 16      GENERAL**

16.1. **TAXES.** The Contract Price does not include any excise, sales, lease, use, property, or other taxes, assessments or duties, all of which will be paid by Customer except as exempt by law. If Motorola is required to pay any of these taxes, Motorola will send an invoice to Customer and Customer will pay to Motorola the amount of the taxes (including any interest and penalties) within twenty (20) days after the date of the invoice. Customer



will be solely responsible for reporting the Equipment for personal property tax purposes, and Motorola will be solely responsible for reporting taxes on its income or net worth.

16.2. **ASSIGNABILITY AND SUBCONTRACTING.** Except as provided herein, neither Party may assign this Agreement or any of its rights or obligations hereunder without the prior written consent of the other Party, which consent will not be unreasonably withheld. Any attempted assignment, delegation, or transfer without the necessary consent will be void. Notwithstanding the foregoing, Motorola may assign this Agreement to any of its affiliates or its right to receive payment without the prior consent of Customer. In addition, in the event Motorola separates one or more of its businesses (each a "Separated Business"), whether by way of a sale, establishment of a joint venture, spin-off or otherwise (each a "Separation Event"), Motorola may, without the prior written consent of the other Party and at no additional cost to Motorola, assign this Agreement such that it will continue to benefit the Separated Business and its affiliates (and Motorola and its affiliates, to the extent applicable) following the Separation Event. Motorola may subcontract any of the work, but subcontracting will not relieve Motorola of its duties under this Agreement.

16.3 **WAIVER.** Failure or delay by either Party to exercise a right or power under this Agreement will not be a waiver of the right or power. For a waiver of a right or power to be effective, it must be in a writing signed by the waiving Party. An effective waiver of a right or power will not be construed as either a future or continuing waiver of that same right or power, or the waiver of any other right or power.

16.4. **SEVERABILITY.** If a court of competent jurisdiction renders any part of this Agreement invalid or unenforceable, that part will be severed and the remainder of this Agreement will continue in full force and effect.

16.5. **INDEPENDENT CONTRACTORS.** Each Party will perform its duties under this Agreement as an independent contractor. The Parties and their personnel will not be considered to be employees or agents of the other Party. Nothing in this Agreement will be interpreted as granting either Party the right or authority to make commitments of any kind for the other. This Agreement will not constitute, create, or be interpreted as a joint venture, partnership or formal business organization of any kind.

16.6. **HEADINGS AND SECTION REFERENCES.** The section headings in this Agreement are inserted only for convenience and are not to be construed as part of this Agreement or as a limitation of the scope of the particular section to which the heading refers. This Agreement will be fairly interpreted in accordance with its terms and conditions and not for or against either Party.

16.7. **ENTIRE AGREEMENT.** This Agreement, including all Exhibits, constitutes the entire agreement of the Parties regarding the subject matter of the Agreement and supersedes all previous agreements, proposals, and understandings, whether written or oral, relating to this subject matter. This Agreement may be executed in multiple counterparts, each of which shall be an original and all of which shall constitute one and the same instrument. A facsimile copy or computer image, such as a PDF or tiff image, or a signature shall be treated as and shall have the same effect as an original signature. In addition, a true and correct facsimile copy or computer image of this Agreement shall be treated as and shall have the same effect as an original signed copy of this document. This Agreement may be amended or modified only by a written instrument signed by authorized representatives of both Parties. The preprinted terms and conditions found on any Customer purchase order, acknowledgment or other form will not be considered an amendment or modification of this Agreement, even if a representative of each Party signs that document.

16.8. **NOTICES.** Notices required under this Agreement to be given by one Party to the other must be in writing and either personally delivered or sent to the address shown below by certified mail, return receipt requested and postage prepaid (or by a recognized courier service, such as Federal Express, UPS, or DHL), or by facsimile with correct answerback received, and will be effective upon receipt:

Motorola Solutions, Inc.	Customer
Attn: _____	Attn: _____
_____	_____
fax: _____	fax: _____

16.9. COMPLIANCE WITH APPLICABLE LAWS. Each Party will comply with all applicable federal, state, and local laws, regulations and rules concerning the performance of this Agreement or use of the System. Customer will obtain and comply with all Federal Communications Commission ("FCC") licenses and authorizations required for the installation, operation and use of the System before the scheduled installation of the Equipment. Although Motorola might assist Customer in the preparation of its FCC license applications, neither Motorola nor any of its employees is an agent or representative of Customer in FCC or other matters.

16.10. AUTHORITY TO EXECUTE AGREEMENT. Each Party represents that it has obtained all necessary approvals, consents and authorizations to enter into this Agreement and to perform its duties under this Agreement; the person executing this Agreement on its behalf has the authority to do so; upon execution and delivery of this Agreement by the Parties, it is a valid and binding contract, enforceable in accordance with its terms; and the execution, delivery, and performance of this Agreement does not violate any bylaw, charter, regulation, law or any other governing authority of the Party.

16.11. ADMINISTRATOR LEVEL ACCOUNT ACCESS. Motorola will provide Customer with Administrative User Credentials. Customer agrees to only grant Administrative User Credentials to those personnel with the training or experience to correctly use the access. Customer is responsible for protecting Administrative User Credentials from disclosure and maintaining Credential validity by, among other things, updating passwords when required. Customer may be asked to provide valid Administrative User Credentials when in contact with Motorola System support. Customer understands that changes made as the Administrative User can significantly impact the performance of the System. Customer agrees that it will be solely responsible for any negative impact on the System or its users by any such changes. System issues occurring as a result of changes made by an Administrative User may impact Motorola's ability to perform its obligations under the Agreement or its Maintenance and Support Agreement. In such cases, a revision to the appropriate provisions of the Agreement, including the Statement of Work, may be necessary. To the extent Motorola provides assistance to correct any issues caused by or arising out of the use of or failure to maintain Administrative User Credentials, Motorola will be entitled to bill Customer and Customer will pay Motorola on a time and materials basis for resolving the issue.

16.12. SURVIVAL OF TERMS. The following provisions will survive the expiration or termination of this Agreement for any reason: Section 3.6 (Motorola Software); Section 3.7 (Non-Motorola Software); if any payment obligations exist, Sections 5.1 and 5.2 (Contract Price and Invoicing and Payment); Subsection 9.7 (Disclaimer of Implied Warranties); Section 11 (Disputes); Section 14 (Limitation of Liability); and Section 15 (Confidentiality and Proprietary Rights); and all of the General provisions in Section 16.

The Parties hereby enter into this Agreement as of the Effective Date.

**Motorola Solutions, Inc.**

**Customer**

By: \_\_\_\_\_

By: \_\_\_\_\_

Name: \_\_\_\_\_

Name: \_\_\_\_\_

Title: \_\_\_\_\_

Title: \_\_\_\_\_

Date: \_\_\_\_\_

Date: \_\_\_\_\_



## Exhibit A

### SOFTWARE LICENSE AGREEMENT

This Exhibit A Software License Agreement ("Agreement") is between Motorola Solutions, Inc., ("Motorola"), and \_\_\_\_\_ ("Licensee").

For good and valuable consideration, the parties agree as follows:

#### Section 1 DEFINITIONS

1.1 "Designated Products" means products provided by Motorola to Licensee with which or for which the Software and Documentation is licensed for use.

1.2 "Documentation" means product and software documentation that specifies technical and performance features and capabilities, and the user, operation and training manuals for the Software (including all physical or electronic media upon which such information is provided).

1.3 "Open Source Software" means software with either freely obtainable source code, license for modification, or permission for free distribution.

1.4 "Open Source Software License" means the terms or conditions under which the Open Source Software is licensed.

1.5 "Primary Agreement" means the agreement to which this exhibit is attached.

1.6 "Security Vulnerability" means a flaw or weakness in system security procedures, design, implementation, or internal controls that could be exercised (accidentally triggered or intentionally exploited) and result in a security breach such that data is compromised, manipulated or stolen or the system damaged.

1.7 "Software" (i) means proprietary software in object code format, and adaptations, translations, de-compilations, disassemblies, emulations, or derivative works of such software; (ii) means any modifications, enhancements, new versions and new releases of the software provided by Motorola; and (iii) may contain one or more items of software owned by a third party supplier. The term "Software" does not include any third party software provided under separate license or third party software not licensable under the terms of this Agreement.

#### Section 2 SCOPE

Motorola and Licensee enter into this Agreement in connection with Motorola's delivery of certain proprietary Software or products containing embedded or pre-loaded proprietary Software, or both. This Agreement contains the terms and conditions of the license Motorola is providing to Licensee, and Licensee's use of the Software and Documentation.

#### Section 3 GRANT OF LICENSE

3.1. Subject to the provisions of this Agreement and the payment of applicable license fees, Motorola grants to Licensee a personal, limited, non-transferable (except as permitted in Section 7) and non-exclusive license under Motorola's copyrights and Confidential Information (as defined in the Primary Agreement) embodied in the Software to use the Software, in object code form, and the Documentation solely in connection with Licensee's use of the Designated Products. This Agreement does not grant any rights to source code.

3.2. If the Software licensed under this Agreement contains or is derived from Open Source Software, the terms and conditions governing the use of such Open Source Software are in the Open Source Software Licenses of the copyright owner and not this Agreement. If there is a conflict between the terms and conditions of this Agreement and the terms and conditions of the Open Source Software Licenses governing Licensee's use of the Open Source Software, the terms and conditions of the license grant of the applicable Open Source Software Licenses will take precedence over the license grants in this Agreement. If requested by Licensee, Motorola will



use commercially reasonable efforts to: (i) determine whether any Open Source Software is provided under this Agreement; (ii) identify the Open Source Software and provide Licensee a copy of the applicable Open Source Software License (or specify where that license may be found); and, (iii) provide Licensee a copy of the Open Source Software source code, without charge, if it is publicly available (although distribution fees may be applicable).

#### **Section 4      LIMITATIONS ON USE**

4.1. Licensee may use the Software only for Licensee's internal business purposes and only in accordance with the Documentation. Any other use of the Software is strictly prohibited. Without limiting the general nature of these restrictions, Licensee will not make the Software available for use by third parties on a "time sharing," "application service provider," or "service bureau" basis or for any other similar commercial rental or sharing arrangement.

4.2. Licensee will not, and will not allow or enable any third party to: (i) reverse engineer, disassemble, peel components, decompile, reprogram or otherwise reduce the Software or any portion to a human perceptible form or otherwise attempt to recreate the source code; (ii) modify, adapt, create derivative works of, or merge the Software; (iii) copy, reproduce, distribute, lend, or lease the Software or Documentation to any third party, grant any sublicense or other rights in the Software or Documentation to any third party, or take any action that would cause the Software or Documentation to be placed in the public domain; (iv) remove, or in any way alter or obscure, any copyright notice or other notice of Motorola's proprietary rights; (v) provide, copy, transmit, disclose, divulge or make the Software or Documentation available to, or permit the use of the Software by any third party or on any machine except as expressly authorized by this Agreement; or (vi) use, or permit the use of, the Software in a manner that would result in the production of a copy of the Software solely by activating a machine containing the Software. Licensee may make one copy of Software to be used solely for archival, back-up, or disaster recovery purposes; provided that Licensee may not operate that copy of the Software at the same time as the original Software is being operated. Licensee may make as many copies of the Documentation as it may reasonably require for the internal use of the Software.

4.3. Unless otherwise authorized by Motorola in writing, Licensee will not, and will not enable or allow any third party to: (i) install a licensed copy of the Software on more than one unit of a Designated Product; or (ii) copy onto or transfer Software installed in one unit of a Designated Product onto one other device. Licensee may temporarily transfer Software installed on a Designated Product to another device if the Designated Product is inoperable or malfunctioning, if Licensee provides written notice to Motorola of the temporary transfer and identifies the device on which the Software is transferred. Temporary transfer of the Software to another device must be discontinued when the original Designated Product is returned to operation and the Software must be removed from the other device. Licensee must provide prompt written notice to Motorola at the time temporary transfer is discontinued.

4.4. When using Motorola's Radio Service Software ("RSS"), Licensee must purchase a separate license for each location at which Licensee uses RSS. Licensee's use of RSS at a licensed location does not entitle Licensee to use or access RSS remotely. Licensee may make one copy of RSS for each licensed location. Licensee shall provide Motorola with a list of all locations at which Licensee uses or intends to use RSS upon Motorola's request.

4.5. Licensee will maintain, during the term of this Agreement and for a period of two years thereafter, accurate records relating to this license grant to verify compliance with this Agreement. Motorola or an independent third party ("Auditor") may inspect Licensee's premises, books and records, upon reasonable prior notice to Licensee, during Licensee's normal business hours and subject to Licensee's facility and security regulations. Motorola is responsible for the payment of all expenses and costs of the Auditor. Any information obtained by Motorola and the Auditor will be kept in strict confidence by Motorola and the Auditor and used solely for the purpose of verifying Licensee's compliance with the terms of this Agreement.

#### **Section 5      OWNERSHIP AND TITLE**

Motorola, its licensors, and its suppliers retain all of their proprietary rights in any form in and to the Software and Documentation, including, but not limited to, all rights in patents, patent applications, inventions, copyrights,



trademarks, trade secrets, trade names, and other proprietary rights in or relating to the Software and Documentation (including any corrections, bug fixes, enhancements, updates, modifications, adaptations, translations, de-compilations, disassemblies, emulations to or derivative works from the Software or Documentation, whether made by Motorola or another party, or any improvements that result from Motorola's processes or, provision of information services). No rights are granted to Licensee under this Agreement by implication, estoppel or otherwise, except for those rights which are expressly granted to Licensee in this Agreement. All intellectual property developed, originated, or prepared by Motorola in connection with providing the Software, Designated Products, Documentation or related services, remains vested exclusively in Motorola, and Licensee will not have any shared development or other intellectual property rights.

## **Section 6 LIMITED WARRANTY; DISCLAIMER OF WARRANTY**

6.1. The commencement date and the term of the Software warranty will be a period of ninety (90) days from Motorola's shipment of the Software (the "Warranty Period"). If Licensee is not in breach of any of its obligations under this Agreement, Motorola warrants that the unmodified Software, when used properly and in accordance with the Documentation and this Agreement, will be free from a reproducible defect that eliminates the functionality or successful operation of a feature critical to the primary functionality or successful operation of the Software. Whether a defect occurs will be determined by Motorola solely with reference to the Documentation. Motorola does not warrant that Licensee's use of the Software or the Designated Products will be uninterrupted, error-free, completely free of Security Vulnerabilities, or that the Software or the Designated Products will meet Licensee's particular requirements. Motorola makes no representations or warranties with respect to any third party software included in the Software.

6.2 Motorola's sole obligation to Licensee and Licensee's exclusive remedy under this warranty is to use reasonable efforts to remedy any material Software defect covered by this warranty. These efforts will involve either replacing the media or attempting to correct significant, demonstrable program or documentation errors or Security Vulnerabilities. If Motorola cannot correct the defect within a reasonable time, then at Motorola's option, Motorola will replace the defective Software with functionally-equivalent Software, license to Licensee substitute Software which will accomplish the same objective, or terminate the license and refund the Licensee's paid license fee.

6.3. Warranty claims are described in the Primary Agreement.

6.4. The express warranties set forth in this Section 6 are in lieu of, and Motorola disclaims, any and all other warranties (express or implied, oral or written) with respect to the Software or Documentation, including, without limitation, any and all implied warranties of condition, title, non-infringement, merchantability, or fitness for a particular purpose or use by Licensee (whether or not Motorola knows, has reason to know, has been advised, or is otherwise aware of any such purpose or use), whether arising by law, by reason of custom or usage of trade, or by course of dealing. In addition, Motorola disclaims any warranty to any person other than Licensee with respect to the Software or Documentation.

## **Section 7 TRANSFERS**

Licensee will not transfer the Software or Documentation to any third party without Motorola's prior written consent. Motorola's consent may be withheld at its discretion and may be conditioned upon transferee paying all applicable license fees and agreeing to be bound by this Agreement. If the Designated Products are Motorola's radio products and Licensee transfers ownership of the Motorola radio products to a third party, Licensee may assign its right to use the Software (other than RSS and Motorola's FLASHport® software) which is embedded in or furnished for use with the radio products and the related Documentation; provided that Licensee transfers all copies of the Software and Documentation to the transferee, and Licensee and the transferee sign a transfer form to be provided by Motorola upon request, obligating the transferee to be bound by this Agreement.

## **Section 8 TERM AND TERMINATION**

8.1 Licensee's right to use the Software and Documentation will begin when the Primary Agreement is signed by both parties and will continue for the life of the Designated Products with which or for which the Software and Documentation have been provided by Motorola, unless Licensee breaches this Agreement, in which case this



Agreement and Licensee's right to use the Software and Documentation may be terminated immediately upon notice by Motorola.

8.2 Within thirty (30) days after termination of this Agreement, Licensee must certify in writing to Motorola that all copies of the Software have been removed or deleted from the Designated Products and that all copies of the Software and Documentation have been returned to Motorola or destroyed by Licensee and are no longer in use by Licensee.

8.3 Licensee acknowledges that Motorola made a considerable investment of resources in the development, marketing, and distribution of the Software and Documentation and that Licensee's breach of this Agreement will result in irreparable harm to Motorola for which monetary damages would be inadequate. If Licensee breaches this Agreement, Motorola may terminate this Agreement and be entitled to all available remedies at law or in equity (including immediate injunctive relief and repossession of all non-embedded Software and associated Documentation unless Licensee is a Federal agency of the United States Government).

## **Section 9 UNITED STATES GOVERNMENT LICENSING PROVISIONS**

This Section applies if Licensee is the United States Government or a United States Government agency. Licensee's use, duplication or disclosure of the Software and Documentation under Motorola's copyrights or trade secret rights is subject to the restrictions set forth in subparagraphs (c)(1) and (2) of the Commercial Computer Software-Restricted Rights clause at FAR 52.227-19 (JUNE 1987), if applicable, unless they are being provided to the Department of Defense. If the Software and Documentation are being provided to the Department of Defense, Licensee's use, duplication, or disclosure of the Software and Documentation is subject to the restricted rights set forth in subparagraph (c)(1)(ii) of the Rights in Technical Data and Computer Software clause at DFARS 252.227-7013 (OCT 1988), if applicable. The Software and Documentation may or may not include a Restricted Rights notice, or other notice referring to this Agreement. The provisions of this Agreement will continue to apply, but only to the extent that they are consistent with the rights provided to the Licensee under the provisions of the FAR or DFARS mentioned above, as applicable to the particular procuring agency and procurement transaction.

## **Section 10 CONFIDENTIALITY**

Licensee acknowledges that the Software and Documentation contain Motorola's valuable proprietary and Confidential Information and are Motorola's trade secrets, and that the provisions in the Primary Agreement concerning Confidential Information apply.

## **Section 11 LIMITATION OF LIABILITY**

The Limitation of Liability provision is described in the Primary Agreement.

## **Section 12 NOTICES**

Notices are described in the Primary Agreement.

## **Section 13 GENERAL**

13.1. COPYRIGHT NOTICES. The existence of a copyright notice on the Software will not be construed as an admission or presumption of publication of the Software or public disclosure of any trade secrets associated with the Software.

13.2. COMPLIANCE WITH LAWS. Licensee acknowledges that the Software is subject to the laws and regulations of the United States and Licensee will comply with all applicable laws and regulations, including export laws and regulations of the United States. Licensee will not, without the prior authorization of Motorola and the appropriate governmental authority of the United States, in any form export or re-export, sell or resell, ship or reship, or divert, through direct or indirect means, any item or technical data or direct or indirect products sold or otherwise furnished to any person within any territory for which the United States Government or any of its agencies at the time of the action, requires an export license or other governmental approval. Violation of this provision is a material breach of this Agreement.



13.3. **ASSIGNMENTS AND SUBCONTRACTING.** Motorola may assign its rights or subcontract its obligations under this Agreement, or encumber or sell its rights in any Software, without prior notice to or consent of Licensee.

13.4. **GOVERNING LAW.** This Agreement is governed by the laws of the United States to the extent that they apply and otherwise by the internal substantive laws of the State to which the Software is shipped if Licensee is a sovereign government entity, or the internal substantive laws of the State of Illinois if Licensee is not a sovereign government entity. The terms of the U.N. Convention on Contracts for the International Sale of Goods do not apply. In the event that the Uniform Computer Information Transaction Act, any version of this Act, or a substantially similar law (collectively "UCITA") becomes applicable to a party's performance under this Agreement, UCITA does not govern any aspect of this Agreement or any license granted under this Agreement, or any of the parties' rights or obligations under this Agreement. The governing law will be that in effect prior to the applicability of UCITA.

13.5. **THIRD PARTY BENEFICIARIES.** This Agreement is entered into solely for the benefit of Motorola and Licensee. No third party has the right to make any claim or assert any right under this Agreement, and no third party is deemed a beneficiary of this Agreement. Notwithstanding the foregoing, any licensor or supplier of third party software included in the Software will be a direct and intended third party beneficiary of this Agreement.

13.6. **SURVIVAL.** Sections 4, 5, 6.4, 7, 8, 9, 10, 11 and 13 survive the termination of this Agreement.

13.7. **ORDER OF PRECEDENCE.** In the event of inconsistencies between this Exhibit and the Primary Agreement, the parties agree that this Exhibit prevails, only with respect to the specific subject matter of this Exhibit, and not the Primary Agreement or any other exhibit as it applies to any other subject matter.

13.8. **SECURITY.** Motorola uses reasonable means in the design and writing of its own Software and the acquisition of third party Software to limit Security Vulnerabilities. While no software can be guaranteed to be free from Security Vulnerabilities, if a Security Vulnerability is discovered, Motorola will take the steps set forth in Section 6 of this Agreement.



# SYSTEM ACCEPTANCE CERTIFICATE

**Customer Name:** \_\_\_\_\_

**Project Name:** \_\_\_\_\_

This System Acceptance Certificate memorializes the occurrence of System Acceptance. Motorola and Customer acknowledge that:

1. The Acceptance Tests set forth in the Acceptance Test Plan for Olmsted County, Minnesota have been successfully completed.
2. The System is accepted.

Customer Representative:

Motorola Representative:

Signature: \_\_\_\_\_

Signature: \_\_\_\_\_

Print Name: \_\_\_\_\_

Print Name: \_\_\_\_\_

Title: \_\_\_\_\_

Title: \_\_\_\_\_

Date: \_\_\_\_\_

Date: \_\_\_\_\_

**FINAL PROJECT ACCEPTANCE:**

Motorola has provided and Customer has received all deliverables, and Motorola has performed all other work required for Final Project Acceptance.

Customer Representative:

Motorola Representative:

Signature: \_\_\_\_\_

Signature: \_\_\_\_\_

Print Name: \_\_\_\_\_

Print Name: \_\_\_\_\_

Title: \_\_\_\_\_

Title: \_\_\_\_\_

Date: \_\_\_\_\_

Date: \_\_\_\_\_



# Statement of Work

## Infrastructure Repair with Advanced Replacement

### 1.0 Description of Services

Infrastructure Repair with Advanced Replacement is a repair service for Motorola and select third party Infrastructure as set forth in the applicable attached Exhibit(s), all of which are hereby incorporated into this Statement of Work (SOW) by this reference. Infrastructure may be repaired down to the Component level, as applicable, at the Motorola Infrastructure Depot Operations (IDO). At Motorola's discretion, select third party Infrastructure may be sent to the original equipment manufacturer or third party vendor for repair. If Infrastructure is no longer supported by the original equipment manufacturer or third party vendor, Motorola may replace Infrastructure with similar Infrastructure, when possible.

When available, Motorola will provide Customer with an Advanced Replacement unit(s) or FRU(s) in exchange for Customer's malfunctioning FRU(s). Non-standard configurations, Customer-modified Infrastructure and certain third party Infrastructure are excluded from Advanced Replacement service. Malfunctioning FRU (s) will be evaluated and repaired by IDO and returned to IDO FRU inventory upon completion of repair.

The terms and conditions of this SOW are an integral part of Motorola's Service Terms and Conditions or other applicable agreement to which it is attached and made a part thereof by this reference.

### 2.0 Motorola has the following responsibilities:

- 2.1. Use commercially reasonable efforts to maintain an inventory of FRU.
- 2.2. Provide new or reconditioned units as FRU to Customer or Servicer, upon request and subject to availability. The FRU will be of similar kit and version, and will contain like boards and chips, as the Customer's malfunctioning Infrastructure.
- 2.3. Program FRU to original operating parameters based on templates provided by Customer as required in Section 3.5. If Customer template is not provided or is not reasonably usable, a standard default template will be used.
- 2.4. Properly package and ship Advanced Replacement FRU from IDO or select third party FRU inventory to Customer specified address.
  - 2.4.1. During normal operating hours of Monday through Friday 7:00am to 7:00pm CST, excluding holidays, FRU will be sent next day air via Federal Express Priority Overnight or UPS Red, unless otherwise requested. Select third party FRU may ship second day air via Federal Express Priority Overnight or UPS red as noted in the attached exhibit(s). Motorola will pay for such shipping, unless Customer requests shipments outside of the above mentioned standard business hours and/or carrier programs, such as NFO (next flight out). In such cases, Customer will be subject to shipping and handling charges.
  - 2.4.2. When sending the Advanced Replacement FRU to Customer, provide a return air bill in order for Customer to return the Customer's malfunctioning FRU. The Customer's malfunctioning FRU will become property of IDO or select third party and the Customer will own the Advanced Replacement FRU.
  - 2.4.3. When sending a Loaner FRU to Customer, IDO will not provide a return air bill for the malfunctioning Infrastructure. The Customer is responsible to arrange and pay for shipping the malfunctioning Infrastructure to IDO. IDO will repair and return the Customer's Infrastructure and will provide a return air bill for the customer to return IDO's Loaner FRU.
- 2.5. Provide repair return authorization number upon Customer request for Infrastructure that is not classified as an Advanced Replacement or Loaner FRU.
- 2.6. Receive malfunctioning Infrastructure from Customer and document its arrival, repair and return.
- 2.7. Perform the following service on Motorola Infrastructure:
  - 2.7.1. Perform an operational check on the Infrastructure to determine the nature of the problem.

- 2.7.2. Replace malfunctioning FRU or Components.
  - 2.7.3. Verify that Motorola Infrastructure is returned to Motorola manufactured specifications, as applicable
  - 2.7.4. Perform a Box Unit Test on all serviced Infrastructure.
  - 2.7.5. Perform a System Test on select Infrastructure.
  - 2.8. Provide the following service on select third party Infrastructure:
    - 2.8.1. Perform pre-diagnostic and repair services to confirm Infrastructure malfunction and eliminate sending Infrastructure with no trouble found (NTF) to third party vendor for repair, when applicable.
    - 2.8.2. Ship malfunctioning Infrastructure to the original equipment manufacturer or third party vendor for repair service, when applicable.
    - 2.8.3. Track Infrastructure sent to the original equipment manufacturer or third party vendor for service.
    - 2.8.4. Perform a post-test after repair by Motorola, original equipment manufacturer, or third party vendor to confirm malfunctioning Infrastructure has been repaired and functions properly in a Motorola System configuration, when applicable.
  - 2.9. Re-program repaired Infrastructure to original operating parameters based on templates provided by Customer as required by Section 3.5. If Customer template is not provided or is not reasonably usable, a standard default template will be used. If IDO determines that the malfunctioning Infrastructure is due to Software defect, IDO reserves the right to reload Infrastructure with a similar Software version. Enhancement Release(s), if needed, are subject to additional charges to be paid by Customer unless the Customer has a Motorola Software Subscription agreement.
  - 2.10. Properly package repaired Infrastructure unless Customer's malfunctioning FRU was exchanged with an IDO FRU. Motorola will return Customer's FRU(s) to IDO's FRU inventory, upon completion of repair.
  - 2.11. Ship repaired Infrastructure to the Customer specified address during normal operating hours set forth in 2.4.1. FRU will be sent two-day air unless otherwise requested. Motorola will pay for such shipping, unless Customer requests shipments outside of the above mentioned standard business hours and/or carrier programs, such as NFO (next flight out). In such cases, Customer will be subject to shipping and handling charges.
- 3.0 Customer has the following responsibilities:
- 3.1. Contact or instruct Servicer to contact the Motorola System Support Center (SSC) and request an Advanced Replacement, or Loaner FRU and a return authorization number (necessary for all non-Advanced Replacement repairs) prior to shipping malfunctioning Infrastructure or third party Infrastructure named in the applicable attached Exhibit.
    - 3.1.1. Provide model description, model number, serial number, type of System and Firmware version, symptom of problem and address of site location for FRU or Infrastructure.
    - 3.1.2. Indicate if Infrastructure or third party Infrastructure being sent in for service was subjected to physical damage or lightning damage.
    - 3.1.3. Follow Motorola instructions regarding inclusion or removal of Firmware and Software applications from Infrastructure being sent in for service.
    - 3.1.4. Provide Customer purchase order number to secure payment for any costs described herein.
  - 3.2 Pay for shipping of Advanced Replacement or Loaner FRU from IDO if Customer requested shipping outside of standard business hours or carrier programs set forth in section 2.4.1.
  - 3.3 Within five (5) days of receipt of the Advanced Replacement FRU from IDO's FRU inventory, properly package Customer's malfunctioning Infrastructure and ship the malfunctioning Infrastructure to IDO for evaluation and repair as set forth in 2.7. Customer must send the return air bill, referenced in 2.4.2 above back to IDO in order to ensure proper tracking of the returned Infrastructure. Customer will be subject to a replacement fee for malfunctioning Infrastructure not properly returned. For Infrastructure and/or third party Infrastructure repairs that are not exchanged in advance, properly package Infrastructure and ship the malfunctioning FRU, at Customer's expense and risk of loss to Motorola. Customer is responsible for properly packaging the Customer malfunctioning Infrastructure FRU to ensure that the shipped Infrastructure arrives un-damaged and in repairable condition. Clearly print the return authorization number on the outside of the packaging.



- 3.4 If received, Customer must properly package and ship Loaner FRU back to IDO within five (5) days of receipt of Customer's repaired FRU.
- 3.5 Maintain templates of Software/applications and Firmware for reloading of Infrastructure as set forth in paragraph 2.3 and 2.9.
- 3.6 For Digital In-Car Video Infrastructure, remove video from equipment prior to sending Infrastructure in for repair. Video retrieval is a separate service and is not included as part of this SOW. Additional services and fee applies.
- 3.7 Cooperate with Motorola and perform all acts that are reasonable or necessary to enable Motorola to provide the Infrastructure Repair with Advanced Replacement services to Customer.
  
- 4.0 In addition to any exclusions named in Section 5 of the Service Terms and Conditions or in any other underlying Agreement to which this SOW is attached, the following items are excluded from Infrastructure Repair with Advanced Replacement:
  1. All Infrastructure over seven (7) years from product cancellation date.
  2. All Broadband/WiNS Infrastructure three (3) years from product cancellation date.
  3. Physically damaged Infrastructure.
  4. Third party Equipment not shipped by Motorola.
  5. Consumable items including, but not limited to, batteries, connectors, cables, tone/ink cartridges.
  6. Video retrieval from Digital In-Car Video equipment.
  7. Test equipment.
  8. Racks, furniture and cabinets.
  9. Firmware and/or Software upgrades.

<b>ASTRO® 25 Infrastructure Exhibit</b>	<b>Inclusions, Exclusions, Exceptions and Notes</b>
Antenna Systems	Excludes all Equipment such as bi-directional amplifiers, multicouplers, combiners, tower top pre-amplifiers, antennas, cables, towers, tower lighting, and transmission lines
Backhaul	Includes PTP (Point-to-Point Wireless) PTP 49600 and PTP 800 licensed series Excludes all other PTP technologies
Base Station(s) and Repeater(s)	Includes Quantar, MTR3000, STR3000, GTR8000, GTR8000 HPD, IntelliRepeater, Network Management (Please refer to the SOW for details) is not available on all stations. Quantar high power booster power amplifier, power supply and control board Excludes Fan Modules, Dual Circulator Tray, Site RMC Tray
Central Electronics Bank(s)	Includes Logging Recorder Interface and Network Hub Excludes all other technologies see SOW specifically for NICE logging recorders
Channel Bank(s)	Includes Premisys , Telco, IMACS models 600, 800 . Excludes Siemens
Comparator(s)	Includes Spectratrac, Digitac, and ASTRO-tac 9600, ASTRO-tac 3000, GMC8000, Comparators.
Computer(s)/Workstations/Modems	Includes computers (Pentium I, II, III, IV) directly interface with or control the communications System, including Systemwatch II, PT800 tablet HP x1100, HPx2100, HP xw4000-4600, HPz400, HP VL600, HP VL800, HPz400, ML850 laptop, MW810, ML900 laptop, ML910 laptop, Compaq XW4000. Includes keyboards, mice, trackballs. Excludes all other laptop and desktop computer technologies and all 286, 386, 486 computers; defective or phosphor-burned cathode ray tubes CRT(s) and burned-in flat panel display image retention,
Console(s)	Includes Centracom Gold Elite, MCC7500, MCC5500, MIP5000, VPM, as part of complete communication System – including headset jacks, dual footswitches, and gooseneck microphones. Excludes cables
Controller - trunking	Includes SmartNet II prime and remote controllers, MTC3600, GCP8000, Site Controller PSC9600, CSC7000, MTC9600, MZC3600, MZC5000 (Includes Netra240 & T5220). Excludes SSMT and SCMS controllers. CD ROM Drive, Fan Tray
Dictaphones and Recording Equipment	Excludes all types and models.
Digital Interface Unit(s)	Included
Digital Signaling Modem(s)	Included upon modem model availability
Digital Voice Modem(s)	Included upon modem model availability
Embassy Switch	Includes AEB, AIMI, ZAMBI, AMB
Firewalls	Includes Nortel Alteon ASF5105, 5106, Juniper SS520, ISSG140, SSG5, ISG1000C, ISG2000
Intrusion Detector	Includes Proventia 201 Linux IDSS, Proventia CX4002C
ISSI Gateway	Includes T5220 Sun server Solaris 10 OS
Links	Includes PTP 49600 and 800 licensed series
Logging Recorder	Excludes all technologies see SOW specifically for NICE logging recorders
Management Terminals	Includes computers (Pentium I, II, III, IV) that directly interface with or control the communications System, including Systemwatch II. Excludes laptop computers and all 286, 386, 486 computers.
MBEX(s) or NOVA Interconnect	Included
Microwave Equipment.	Excluded from service agreement but may be repaired on an above contract, time and material basis. All Equipment must be shipped to IDO. Excludes any on-site services.
Monitor(s)	Includes all Motorola certified monitors connected to computers that directly interface with or control the communications System. Excludes defective or phosphor-burned cathode ray tubes CRT(s) and burned-in flat panel displays image retention, as well as monitors that were not shipped by Motorola and/or cannot be confirmed by a Motorola factory order number.
Motobridge	Included
Moscad	Includes NFM (Network Fault Management), as part of communication System only, RTU, SDM Site Manager RTU. Standalone MOSCAD and System Control and Data Acquisition (SCADA) must be quoted separately. Includes FSA4000. Excludes all other fire alarming systems.

<b>ASTRO 25 Infrastructure Repair cont.</b>	<b>Inclusions, Exclusions, Exceptions and Notes</b>
Network Fault Management	Includes Full Vision, Unified Event Manager Excludes NMC
Gateway	Includes PDG:CPX8216, IVD & HPD PDG on HP DL360, MOTOBRIDGE
Printer(s)	Includes printers that directly interface with the communications system.
RAS(s)	Excludes RAS 1100, 1101 and 1102
Receiver(s)	Includes Quantar, MTR2000 and ASTRO-TAC, GPW8000, GTR8000, GTR8000 HPD Receivers. Excludes Fan Modules, Dual Circulator Tray, Site RMC Tray
Routers	Includes GGM8000, ST5500, ST5598, S2500-S6000
Servers	Includes Netra 240, Netra T5220, cPCI, HP DL360, HP ML370, HP ML110, HP ML530, HP TC2110, 2120 HP InfoVista Server, IR8000 series, LX4000 series, Intel Server TSRL-T2, TIGPR2U, Proventia 201 Linux IDSS, Proventia GX4002C, Trak9100. Network Management Server includes cPCI Chassis, Power Supply, Fan Tray, Controller Hard Drive, CD ROM Drive, Tape Drive, CPU, Client PC's, Core Security Management Server, Firewall Servers, Intrusion Detection Sensor Server. Excludes Dell Servers, Monitors, Memory Module 0182915Y02, Rear Fan RLN5352, Central Process Card 0182915Y01
Simulcast Distribution Amplifier(s)	Included
Site Frequency Standard(s)	Includes Rubidium, GPS and Netlocks systems sold with the Motorola System.
Secure	Includes KMF crypto card, end to end Cryptor for IVD PDEG Cryptor
SMARTX	Includes VPM
Switch	Includes Nortel Passport PBX, Cisco Catalyst 6509, HP 5308 LAN switch, HP ProCurve Switch 2524, 2650, 2626, HP3500, HP2610, 3Com PS40, SS1100
Telco PBX	Includes Avaya Dfinity PBX, S8300, S8500, Intel Server (ACSS), TSRLT2, TIGPR2U
Terminal Servers	Includes IR8000, LX4000S, LX4000T, Paradyne
Universal Simulcast Controller Interface(s)	Included
UPS Systems	Excluded from service agreements but may be repaired on an above contract, time and material basis. All UPS Systems must be shipped to IDO for repair. Excludes batteries and any on-site services.
Workstation	Included

<b>SmartZone System Infrastructure Exhibit</b>	<b>Inclusions, Exclusions, Exceptions and Notes</b>
Antenna Systems	Excludes all Equipment such as bi-directional amplifiers, multicouplers, combiners, tower top pre-amplifiers, antennas, cables, towers, tower lighting, and transmission lines.
Base Station(s) and Repeater(s)	Includes: Quantar, Quantro, Digital, MTR2000 ONLY.
Central Electronics Bank(s)	Includes Logging Recorder, Interface and Network Hub Excludes all other technologies see SOW specifically for NICE logging recorders
Channel Bank(s)	Includes Premisys and Telco Excludes Siemens
Comparator(s)	Includes Spectratrac, Digitac, and ASTRO-tac Comparators
Computer(s)	Includes computers (Pentium I, II, III, IV) that directly interface with or control the communications System, including Systemwatch II, keyboards, mice and trackballs. Excludes laptop computers and all 286, 386, 486 computers, defective or phosphor-bumed cathode ray tubes CRT(s) and bumed-in flat panel display image retention.
Console(s)	Includes Centracom Gold Elite, MCC7500, MCC5500, MIP5000 as part of complete communication System – including headset jacks, dual footswitches, and gooseneck microphones. Excludes cables
Controller(s) -Trunking	Includes SmartNet II prime and remote controllers. Excludes SSMT and SCMS controllers.
Dictaphones, Logging Recorders and Recording Equipment	Excludes all technologies see SOW specifically for NICE logging recorders
Digital Interface Unit(s)	Included
Digital Signaling Modem(s)	Included upon modem model availability
Digital Voice Modem(s)	Included upon modem model availability
Embassy Switch	Includes AEB, AIMI, ZAMBI, AMB
Management Terminals	Includes computers (Pentium I, II, III, IV) that directly interface with or control the communications System, including Systemwatch II. Excludes laptop computers and all 286, 386, 486 computers.
MBEX(s) or NOVA Interconnect	Included
Microwave Equipment.	Excluded from service agreement but may be repaired on an above contract, time and material basis. All Equipment must be shipped to IDO. Excludes any on-site services.
Monitor(s)	Includes all Motorola certified monitors connected to computers that directly interface with or control the communications System. Excludes defective or phosphor-burned cathode ray tubes CRT(s) and burned-in flat panel displays image retention as well as monitors that were not shipped by Motorola and/or cannot be confirmed by a Motorola factory order number.
Moscad	Includes NFM (Network Fault Management), as part of communication System only. Standalone MOSCAD and System Control and Data Acquisition (SCADA) must be quoted separately. Includes FSA4000. Excludes all other fire alarming systems.
Motobridge	Included
Network Fault Management	Includes Full Vision Excludes NMC
Printer(s)	Includes printers that directly interface with the communications System.
RAS(s)	Excludes RAS 1100, 1101 and 1102
Receiver(s)	Includes Quantar and MTR2000, ASTRO-TAC Receivers
Simulcast Distribution Amplifier(s)	Included
Site Frequency Standard(s)	Includes Rubidium, GPS and Netlocks systems sold with the Motorola System. Excludes MFS -Rubidium Standard Network Time and Frequency devices
Universal Simulcast Controller Interface(s)	Included
UPS Systems.	Excluded from service agreements but may be repaired on an above contract, time and material basis. All UPS Systems must be shipped to IDO for repair. Excludes batteries and any on-site services.

<b>SmartZone System Infrastructure cont.</b>	<b>Inclusions, Exclusions, Exceptions and Notes</b>
Zone Manager	Excludes HP715/33, HP 715/50 servers. Excludes x-terminals NDS14C and NDS17C
Zone Controller(s)	Includes console terminals. Excludes all Sun/IMP hard drives <u>except</u> TLN3495A 0820 1 GB drive as well as the following SUN/IMP CPUSET's: TLN3278B 0406, TLN3343A 0424 and TLN3278A 0181/0389.

<b>SmartNet System Infrastructure Exhibit</b>	<b>Inclusions, Exclusions, Exceptions and Notes</b>
Antenna Systems	Excludes all Equipment such as bi-directional amplifiers, multicouplers, combiners, tower top pre-amplifiers, antennas, cables, towers, tower lighting, and transmission lines
Base Station(s) and Repeater(s)	Includes Quantar, Quantro, Digital MSF5000, MTR2000, and Desktrac L35SUM7000-T Repeaters ONLY. Network Management (please refer to the SOW for details) is not available on all stations.
Central Electronics Bank(s)	Includes Logging Recorder Interface and Network Hub Excludes all other technologies see SOW specifically for NICE logging recorders
Channel Bank(s)	Includes Premisys and Telco. Excludes Siemens
Comparator(s)	Includes Spectratrac, Digitac, and ASTRO-tac Comparators.
Computer(s)	Includes computers (Pentium I, II, III, IV) directly interface with or control the communications System, including Systemwatch II, keyboards, mice and trackballs, Excludes defective or phosphor-burned cathode ray tubes CRT(s) and burned-in flat panel display image retention.
Console(s)	Includes Centracom Gold Elite, MCC7500, MCC5500, MIP5000 as part of complete communication System – including headset jacks, dual footswitches, and gooseneck microphones. Excludes cables
Controller - trunking	Includes SmartNet II prime and remote controllers. Excludes SSMT and SCMS controllers.
Dictaphones, Logging Recorders and Recording Equipment	Excludes all technologies see SOW specifically for NICE logging recorders
Digital Interface Unit(s)	Included
Digital Signaling Modem(s)	Included upon modem model availability
Digital Voice Modem(s)	Included upon modem model availability
Embassy Switch	Includes AEB, AIMI, ZAMBI, AMB
Management Terminals	Includes computers (Pentium I, II, III, IV) directly interface with or control the communications System, including Systemwatch II. Excludes laptop computers and all 286, 386, 486 computers.
MBEX(s) or NOVA Interconnect	Included
Microwave Equipment.	Excluded from service agreement but may be repaired on an above contract, time and material basis. All Equipment must be shipped to IDO. Excludes any on-site services.
Monitor(s)	Includes all Motorola certified monitors connected to computers that directly interface with or control the communications System. Excludes defective or phosphor-burned cathode ray tubes CRT(s) and burned-in flat panel displays image retention as well as monitors not shipped by Motorola and/or cannot be confirmed by a Motorola factory order number.
Moscad	INFM (Network Fault Management), as part of communication System only. Standalone MOSCAD and System Control and Data Acquisition (SCADA) must be quoted separately. Includes FSA4000. Excludes all other fire alarming systems.
Motobridge	Included
Network Fault Management	Includes Full Vision. Excludes NMC
Printer(s)	Includes printers that directly interface with the communications System.
RAS(s)	Excludes RAS 1100, 1101 and 1102
Receiver(s)	Includes Quantar, MTR2000 and ASTRO-TAC Receivers.

<b>SmartNet System Infrastructure cont.</b>	<b>Inclusions, Exclusions, Exceptions and Notes</b>
Simulcast Distribution Amplifier(s)	Included
Site Frequency Standard(s)	Includes Rubidium, GPS and Netlocks systems sold with the Motorola System. Excludes MFS -Rubidium Standard Network Time and Frequency devices
Universal Simulcast Controller Interface(s)	Included
UPS Systems.	Excluded from service agreements but may be repaired on an above contract, time and material basis. All UPS Systems must be shipped to IDO for repair. Excludes batteries and any on-site services.

<b>Broadband Infrastructure Exhibit</b>	<b>Inclusions, Exclusions, Exceptions and Notes</b>
Access Points	Includes PMP (Canopy), Motomesh Duo, Motomesh Quattro, Meshcam, Motomesh Solo, Motomesh AP7181 intelligent access points. Excludes all other technologies
Backhaul	Includes PMP (Canopy) and PTP (Point-to-Point Wireless) PTP 49600 and 800 licensed series Excludes all other technologies
Cables, connectors and testers	Excluded
Cameras	Includes Meshcam Excludes all other technologies, fixed black & white, color, pan tilt zoom analog, pan tilt zoom IP, fixed hybrid (IP and Analog) cameras
Cluster Management Modules (CMM)	Includes PMP (Canopy). Excludes all other technologies
Digital Video Recorder	Includes Mobile Video Enforcer Excludes all other technologies
Docking Station	Includes Mobile Video Enforcer Excludes all other technologies
GPS Synch Box	Excluded
Links	Includes PTP 49600 and 800 licensed series
Mobile Internet Switching Controller(MISC)	Excluded
Modems	Includes Mobile Video Enforcer Excludes all other technologies
Monitors	Includes Mesh,MotoMesh Excludes all other technologies
Mounting Bracket	Excluded
Multiplexers	Excluded
Network Interface Card	Excludes RAD data multiplexers
Network Switches	Includes Mesh, MotoMesh, Meshcam Excludes all other technologies
Networking Enablers	Included
Personal Tracking Device	Excludes Asymmetric DSL Broadband Gateway, Asymmetric Customer Premise Equipment, Symmetric DSL Broadband Gateway, Symmetric DSL-CPE's and accessories
Power Supply	Includes MeshTrack Excludes all other technologies
Reflector Hardware Kit	Included
Server	Excluded
Software	Included HP DL360, Mobile Video Enforcer system server Excludes all other technologies
Subscriber Modules	Excluded
Surge Suppressor/LPU	Includes, PMP (Canopy) Excludes all other technologies
UPS	Excluded
Video Recording System	Excluded from service agreements but may be repaired on an above contract, time and material basis. All UPS Systems must be shipped to IDO for repair. Excludes batteries and any one-site services.
Wireless Router AC and DC Input	Includes Mobile Video Enforcer Excludes all other technologies

<b>Conventional System Infrastructure Exhibit</b>	<b>Inclusions, Exclusions, Exceptions and Notes</b>
Antenna Systems	Excludes all Equipment such as bi-directional amplifiers, multicouplers, combiners, tower top pre-amplifiers, antennas, cables, towers, tower lighting, and transmission lines
Base Station(s) and Repeater(s)	Quantar, Quantro, MTR2000, MTR3000, GTR8000 including IPCCGW. Excludes MICOR and MSF5000
Central Electronics Bank(s)	Includes logging recorder interface and network hub Excludes all other technologies see SOW specifically for NICE logging recorders
Channel Bank(s)	Includes Premisys and Telco. Excludes Siemens
Comparator(s)	Includes Spectratac, Digitac, ASTRO-tac, GMC8000.
Computer(s)	Includes computers (Pentium I, II, III, IV) directly interface with or control the communications System, including Systemwatch II, keyboards, mice and trackballs. Excludes laptop computers and all 286, 386, 486 computers. Excludes defective or phosphor-burned cathode ray tubes CRT(s) and burned-in flat panel display image retention.
Console(s)	Includes Centracom Gold Elite, MCC7500, MCC5500, MIP5000 as part of complete communication System – including headset jacks, dual footswitches, and gooseneck microphones. Excludes cables and Commandstar mother board CDN6271. Commandstar and Commandstar Lite are also excluded as a conventional system operator position but can be covered when services are purchased separately.
Dictaphones, Logging Recorders and Recording Equipment	Excludes all technologies see SOW specifically for NICE logging recorders
Digital Interface Unit(s) (DIU)	Included
Digital Signaling Modem(s)	Included upon modem model availability
Embassy Switch	Includes AEB, AIMI, ZAMBI, AMB
Microwave Equipment.	Excluded from service agreement but may be repaired on an above contract, time and material basis. All equipment must be shipped to IDO. Excludes any on-site services.
Monitor(s)	Includes all Motorola certified monitors connected to computers that directly interface with or control the communications System. Excludes defective or phosphor-burned cathode ray tubes CRT(s) and burned-in flat panel displays image retention as well as monitors not shipped by Motorola and/or cannot be confirmed by a Motorola factory order number.
Moscad	Includes NFM (Network Fault Management), as part of communication System only. Standalone MOSCAD and System Control and Data Acquisition (SCADA) must be quoted separately. Includes FSA4000 Excludes all other fire alarming systems.
Motobridge	Included
Printer(s)	Includes printers that directly interface with the communications System.
Receiver(s)	Includes Quantar , MTR2000, ASTRO-TAC, GPW8000 receivers.
Simulcast Distribution Amplifier(s)	Included
Site Frequency Standard(s)	Includes Rubidium, GPS and Netlocks systems sold with the Motorola System. Excludes MFS -Rubidium Standard Network Time and Frequency devices
Universal Simulcast Controller Interface(s)	Included
UPS Systems.	Excluded from service agreements but may be repaired on an above contract, time and material basis. All UPS Systems must be shipped to IDO for repair. Excludes batteries and any on-site services.

<b>Data System Infrastructure Exhibit</b>	<b>Inclusions, Exclusions, Exceptions and Notes</b>
Base Station(s) and Repeater(s)	Includes Quantar (DSS3, DBS), GTR8000.
Computer(s)	Includes computers (Pentium I, II, III, IV) that directly interface with or control the communications System. Includes keyboards, mice and trackballs. Excludes laptop computers and all 286, 386, 486 computers. Excludes defective or phosphor-burned cathode ray tubes CRT(s) and burned-in flat panel display image retention.
Dictaphones , Logging Recorders and Recording Equipment	Excludes all technologies see SOW specifically for NICE logging recorders
Microwave Equipment.	Excluded from service agreement but may be repaired on an above contract, time and material basis. All equipment must be shipped to IDO. Excludes any on-site services.
Monitor(s)	Includes all Motorola certified monitors connected to computers that directly interface with or control the communications System. Excludes defective or phosphor-burned cathode ray tubes CRT(s) and burned-in flat panel displays image retention as well as monitors not shipped by Motorola and/or cannot be confirmed by a Motorola factory order number.
Printer(s)	Includes printers that directly interface with the communications System.
Radio Network Controller	Includes One (1) RNC and One (1) RNC Console. Redundant RNC's must be quoted separately. Excludes RNC1000, NCP500, NCP2000, NCP2500 and NCP3000.
Site Data Link Modem(s)	Included
UPS Systems.	Excluded from service agreements but may be repaired on an above contract, time and material basis. All UPS Systems must be shipped to IDO for repair. Excludes batteries and any on-site services.
Wireless Network Gateway	Excluded from the prime/remote site or system agreement but can be covered when services are purchased separately.

<b>Cassidian Communications Infrastructure Repair w Advanced Replacement Vesta Pallas, Vesta Standard (Maars/ComCentrex), Vesta Meridian and Sentinel Patriot Systems</b>	<b>Inclusions, Exclusions, Exceptions and Notes</b>
ACU (Auto Control Unit)	Includes Vesta systems only Excludes Sentinel Patriot
ARU (Alarm Reporting Unit)	Included
ALI (Automatic Location Identification) Controller	Includes Analog Station Card(s), Called ID Board(s), Conference Board(s), DTMF Tone Receiver Board(s), Digital Station Card(s), E&M Card(s), Ground Loop Start Card(s), MF Receiver Board(s), 911 Line Card(s)
ANI (Asynchronous Network Interface) Controller	Included
BCM (Business Communication Manager)	Includes Vesta Pallas only Excludes all other technologies
Cable(s)	Excluded
CIM (Console Interface Module)	Includes Sentinel Patriot Excludes all other technologies
CRU (Call Record Unit)	Included
CIU (CAD Interface Unit)	Included
Computer(s)/Workstation	Includes computers sourced by Cassidian Communications and sold by Motorola that directly interface with or control the Cassidian Communications Systems, monitor, sound card, keyboards, mice and trackballs. Excludes defective or phosphor-burned cathode ray tubes (CRT) and burned-in flat panel display image retention.
Controllers	Includes Vesta Standard Excludes all other technologies
DBU (Data Base Unit)	Includes Vesta Standard Excludes all other technologies
Digital Logging Recorders, Logging Recorders and Recording Equipment	Includes Pyxis, Cassidian Communications sourced and sold by Motorola Excludes all other technologies see SOW specifically for NICE logging recorders
Herbie	Includes Vesta systems only Excludes Sentinel Patriot
Line Boosters/Amplifier/Short haul modems	Excluded
Modified Network LAN Switch	Included
Modem(s)	Includes ALI modem sources and sold by Motorola Excludes all other technologies
Monitor(s)	Includes all Motorola certified monitors connected to computers that directly interface with or control the communications Systems. Excludes Non-Certified monitors, defective or phosphor-burned cathode ray tubes (CRT), flat panel monitors with burned in image retention and monitors not shipped by Motorola and/or cannot be confirmed by a Motorola factory order number.
MTU (Multi-line Trunk Unit)	Includes Vesta Pallas only Excludes All other technologies
Printer(s)	Includes Cassidian Communications sourced and sold by Motorola that directly interface with the communications System
Power Supplies, PSU (Power Supply Unit)	Includes Vesta Pallas, Vesta Standard Excludes all other technologies
RMU (Remote Maintenance Unit)	Includes Vesta Standard only Excludes all other technologies
Ring Generator(s)	Included
Routers	Included
RIS (Radio Interface Subset)	Included (note, only works with the Herbie)
Server(s) ALI	Includes Vesta servers, Sentinel Patriot Excludes all other technologies
Telephone(s)	Includes 911 and KEM administrator telephone sourced with the 911 System and sold by Motorola. Excludes Nortel (Avaya) telephone sets
TIU (Trunk Interface Unit)	Includes Vesta Standard Excludes all other technologies

<b>Console Only Infrastructure Exhibit</b>	<b>Inclusions, Exclusions, Exceptions and Notes</b>
Card Cages	Included
Central Electronics Bank(s) (CEB)	Includes Logging Recorder Interface and Network Hub, Base Interface Module (BIM), Console Operator Interface Module (COIM), Operator Interface Module (OMI). Excludes all other technologies see SOW specifically for NICE logging recorders
Central Electronic Shelf (CES)	Included
Computer(s)	Includes computers that directly interface with CEB. Includes keyboards, mice and trackballs. Excludes laptop computers and all 286, 386, 486 computers. Defective or phosphor-burned cathode ray tubes CRT(s) and burned-in flat panel display image retention.
Console(s)	Includes consoles (CommandSTAR, CommandSTAR lite, Centracom Gold Elite MCC7500, MCC7500 w/ VPM, MCC5500, MIP5000, MC1000, MC2000, MC2500, MC3000) as part of complete communication System – Including headset jacks, dual footswitches, and gooseneck microphones and Console Interface Electronics. Excludes cables
Console Audio Box (CAB)	Included
Dictaphones, Logging Recorders and Recording Equipment	Excludes all technologies see SOW specifically for NICE logging recorders
Junction Box	Included
Microwave Equipment.	Excluded from service agreement but may be repaired on an above contract, time and material basis. All Equipment must be shipped to IDO. Excludes any on-site services.
Monitor(s)	Includes all Motorola certified monitors connected to computers that directly interface with or control the communications System. Excludes defective or phosphor-burned cathode ray tubes CRT(s) and burned-in flat panel displays image retention as well as monitors not shipped by Motorola and/or cannot be confirmed by a Motorola factory order number.
Site Frequency Standard(s)	Includes Netclocks systems Excludes MFS -Rubidium Standard Network Time and Frequency devices
UPS Systems.	Excluded from service agreements but may be repaired on an above contract, time and material basis. All UPS Systems must be shipped to IDO for repair. Excludes batteries and any on-site services.

<b>Digital In-Car Video Infrastructure Exhibit</b>	<b>Inclusions, Exclusions, Exceptions and Notes</b>
Cables, connectors and testers	Excluded
Cameras	Includes 22X Front Camera. Excludes rear cameras
Data Talker Wireless Transmitters	Excluded
Digital Video Recorder	Includes Base unit running DP-2 software
Data Storage Module	Included
LCD Monitor	Includes DP-1 & DP-2 versions only
Video Retrieval	It is the customer's responsibility to remove the video before sending the DSM into the Motorola Repair Depot for repair. Video retrieval is a separate service and is excluded from this SOW.

<b>MOTOTRBO Infrastructure Exhibit</b>	<b>Inclusions, Exclusions, Exceptions and Notes</b>
XRC9000 Controller	Included TT2213* single site; TT2215* multi site *Next day (24 hour) delivery if request is received before 1:00 p m. CST; Second day (48 hour) delivery if request is received after 1:00 p m. CST
MTR3000	Includes T3000
MIP5000 MOTOTRBO Gateway	Includes L3598
XRT9000 Gateway	Includes TT2386A

# Statement of Work

## Network Preventative Maintenance

### 1.0 Description of Service

Network Preventative Maintenance will provide an operational test and alignment, on the Customer's Infrastructure Equipment (infrastructure or fixed network equipment only) to ensure the Infrastructure meets original manufacturer's specifications, as set forth in the applicable attached Exhibit(s), all of which are hereby incorporated by this reference. Customer's System type determines which Exhibit is applicable (i.e. SmartZone system exhibit, SmartNet system exhibit). Network Preventative Maintenance will be performed during Standard Business Days. If the System or Customer requirements dictate this service must occur outside of Standard Business Days, Motorola will provide an additional quotation. Customer is responsible for any charges associated with helicopter or other unusual access requirements or expenses.

The terms and conditions of this SOW are an integral part of Motorola's Service Terms and Conditions or other applicable agreement to which it is attached and made a part thereof by this reference.

### 2.0 Motorola has the following responsibilities:

- 2.1 Notify the Customer of any possible System downtime needed to perform this service.
- 2.2 Physically inspect the Infrastructure Equipment in the system (equipment cabinets, general circuitry, fault indicators, cables, and connections).
- 2.3 Remove any dust, and/or foreign substances from the Infrastructure.
- 2.4 Clean filters, if applicable.
- 2.5 Measure, record, align, adjust the Infrastructure Equipment parameters in accordance with the manufacturer's service manuals and the Rules and Regulations of the Federal Communications Commission (FCC), where applicable.

### 3.0 Customer has the following responsibilities:

- 3.1 Provide preferred schedule for Network Preventative Maintenance to Motorola.
- 3.2 Authorize and acknowledge any scheduled System downtime.
- 3.3 Maintain periodic backup of databases, Software applications and Firmware.
- 3.4 Establish and maintain a suitable environment (heat, light, and power) for the Equipment location and provide the Servicer full, free, and safe access to the Equipment so that the Servicer may provide services. All sites shall be accessible by standard service vehicles.
- 3.5 Cooperate with Motorola and perform all acts that are reasonable or necessary to enable Motorola to provide the Network Preventative Maintenance services to Customer.



## Conventional Network Preventative Maintenance Checklist

Conventional Infrastructure	Operational Check (where applicable)
Base Station(s), Repeater(s), Control Station(s)	Transmitter modulation,
	RF power output/reflected
	RF Frequency Measured/adjusted
	Receiver Sensitivity Measured/Adjusted
	Audio Input & Output Levels
	Combiner & Circulator Loss
	Receiver Desense (Full Duplex Only)
Consoles Positions/Remotes	Check Power Supply Voltages
	Audio Input & Output Levels
	Ethernet Operation
	Controller Power Supply Voltage, and AC Ripple
	Switches, Lights, CRT
	CEB Signal Levels
	Wiring and Grounding for each Position
	Check and Clean keyboards, CPU. CRT's
Comparators (Voting) and /or Satellite Receivers	CEB diagnostics
	Audio Input & Output Levels
	Receiver Sensitivity Measured/Adjusted
	Comparator power supply voltage
Power UPS  Generator  AC to DC Power Unit (RF equipment)  All Equipment	Check for proper signal voting
	Check Diagnostics/Alarms
	AC/DC Voltages/Batteries
	Switch-Over Operations
	Switch to Generator Power
Other Equipment	
	Switch to Battery Power
Other Equipment	Check Diagnostics/Alarms
	Check all system printers
	Check all modems for proper levels & synchronization
Other Equipment	MBX/Other telco interface common equipment



## Data – Network Preventative Maintenance Checklist

<b>Data Infrastructure</b>	<b>Operational Check (where applicable)</b>
Data Base Station (Quantar)	RSSI Calibration Check (-90)
	Transmit Frequency Adjustments
	Transmitter Deviation Adjustments
	Transmitter modulation Compensation
	Transmitter Power out and Adjustments
	Reflect Power Measurement
	Receiver Sensitivity Test
	Receive Antenna De-sense Test
MSF 5000 Base Stations	RSSI Calibration Check
	VCO Calibration Check (.38Micro Volt)
	Injection Filter Adjustments
	Pre-selector/Image Filter Adjustments
	Transmit Frequency Adjustments
	RF Power out Measurements
	RF Forward and Reflect Trip adjust
	Transmit Deviation Adjustments
	Receiver Sensitivity Test
	Transmitter modulation Compensation
Gemini Base Station	RSSI Calibration Check
	Transmit Frequency Adjustments
	RF Power out Measurements
	RF Forward and Reflect Trip adjust
	Transmit Deviation Adjustments
	Receiver Sensitivity Test
	Transmitter modulation Compensation
	Power Supply Voltage Check
	Power Supply Ripple Voltage Check
Radio Network Controllers	Power Supply In-take Fan
	Host connection check
	Message buffering
	RF Interface
	Base Interface
Wireless Network Gateway	Visually check system status and fault LEDs.
	Check SMIT for any module errors.
	Check each major modules
	Power Supply Voltage Check
	Visually check all cabling
	Capture all log and error reports
UDS/Paradyne Modems	Check for received line level
	Perform remote modem digital loopback test
	Check telco/microwave circuit
UPS	Check Batteries
	Switch-Over Operations
	AC/DC Voltages



## SMARTNET Network Preventative Maintenance Checklist

<b>SMARTNET Infrastructure</b>	<b>Operational Check (where applicable)</b>
Repeater(s), Control Station(s)	Transmitter modulation,
	RF power output/reflected
	RF Frequency Measured/adjusted
	Receiver Sensitivity Measured/Adjusted
	Power Supplies
	Audio Input & Output Levels
	Combiner & Circulator Loss
	Receiver Desense (Full Duplex Only)
Consoles Positions/Remotes	Check Power Supply Voltages
	Audio Input & Output Levels
	Ethernet Operation
	CEB Power Supply Voltage, and AC Ripple
	Switches, Lights, CRT
	CEB Signal Levels
	Wiring and Grounding for each Position
	Check and Clean keyboards, CPU. CRT's
Central Controllers, DIGITAC Comparators	CEB Diagnostics
	Central Controller and Power Supplies
	T Bar Switched
	Simulcast Controller
	Simulcast Remote Controller
	Distribution Amp
	DIGITAC Comparator
	Receiver Multi-Couplers
	Check for receiver to Comparator audio path. Check to see if equalization is required.
	Check for proper audio to Status Tone ratio
Confirm that all Receiver RX Notch Filters are either IN or OUT	
GPS	Roll to Redundant Receive Reference Module
	Frequency Standards (check 1 PPS, 5 MPPS, composite)
	Check Power Supply Voltages
Site Equipment	Audio Network Analyzer
	Baseline Database Server
	System Manager Terminal
	Site Test/System Calibration Equipment
POWER UPS	Check Diagnostics/Alarms
	AC/DC Voltages/Batteries
	Switch-Over Operations
Generator	Switch to Generator Power
AC to DC Power Unit (RF equipment)	Switch to Battery Power
All Equipment	Check Diagnostics/Alarms
Other Equipment	Check all system printers
	Check all modems for proper levels & synchronization
	MBX/Other telco interface common equipment



## SmartZone -Network Preventative Maintenance Checklist

SmartZone Infrastructure	Operational Check (where applicable)
Repeater(s), Control Station(s)	Transmitter modulation
	RF power output/reflected
	RF Frequency Measured/adjusted
	Receiver Sensitivity Measured/Adjusted
	Audio Input & Output Level
	Check Low Speed Data
	Combiners & Circulator Loss
	Receiver Desense (Full Duplex Only)
	Power Supply voltages
Consoles Positions/Remotes	Audio Input & Output Level
	Ethernet Operation
	CEB Power Supply Voltage, and AC Ripple
	Switches, Lights, CRT
	CEB Signal Levels
	Wiring and Grounding for each Position
	Check and Clean keyboards, CPU. CRT's
	CEB Diagnostics
Central Controllers, DIGITAC Comparators	Central Controller and Power Supplies
	T Bar Switched
	Simulcast Controller
	Simulcast Remote Controller
	Distribution Amp
	DIGITAC Comparator
	Receiver Multi-Couplers and Tower Mounted Amplifier
	Check for receiver to Comparator audio path.
	Check for proper audio to Status Tone ratio
	Confirm that all Receiver RX Notch Filters are either IN or OUT
GPS	Roll to Redundant Receive Reference Module
	Check Frequency Standards
	Check Power Supply Voltages
Site Equipment	Audio Network Analyzer
	Baseline Database Server
	System Manager Terminal
	Site Test/System Calibration Equipment
Power UPS	Check Diagnostics/Alarms
	AC/DC Voltages/Batteries
	Switch-Over Operations
Generator	Switch to Generator Power
AC to DC Power Unit (RF equipment)	Switch to Battery Power
All Equipment	Check Diagnostics/Alarms
Other Equipment	Check all system printers
	Check all modems for proper levels & synchronization
	MBX/Other telco interface common equipment



## ASTRO® LE -Network Preventative Maintenance Checklist

Astro LE Infrastructure	Operational Check (where applicable)
<b>CO-LOCATED/REMOTE SITE</b> Repeater(s), Control Station(s)  Site Controllers  Router/Switches  All Equipment	
	TX Frequency in Hz
	TX Power Output of Station (Forward/Reflected)
	TX Power Output out of Combiner (Forward/Reflected)
	TX Low Speed Deviation
	TX Test Pattern Deviation
	TX BER
	RX Tower/Rack Mounted Amplifier
	RX RF Level at 5% BER at Receiver and Through Multi-Coupler
	Receiver Desense/ Degradation do to Site Noise and TX Desense
	Wireline Audio Input & Output Levels
	Check Lights/Fan Operation
	Check/Align Frequency Standard
	Roll to Redundant Controller (pre-approved by customer)
Test Site Trunking/Failsoft Modes (pre-approved by customer)	
Multiple Control Channel Switching (pre-approved by customer)	
Check Lights/Fan Operation	
Check Diagnostics/Alarms	
Power Supply Voltages	
<b>MASTER/PRIME SITE (RF Equipment)</b> Master/Prime Site Controllers  Router/Switches  ASTRO-TAC Comparators  Channel Bank	
	Check Lights/Fan Operation
	Roll to Redundant Controller (pre-approved by customer)
	Check Lights/Fan Operation
	Check for receiver to Comparator audio path
ACTAC 9600 Comparator All sites on line? V.24 link health-link delays	
Channel Bank/ transport health for all sites (diagnostics/alarms)	
Roll to Redundant Power Supply (pre-approved by customer)	
<b>MASTER/PRIME SITE (Servers)</b>	Site Control Manager/Site Command Server (Clients)
	Backup Databases
	Terminal Server
	Remote Access Test
<b>GPS</b>	Roll to Redundant Receive Reference Module (pre-approved by customer)
	Frequency Standards (check 1 PPS, 5 MPPS, composite)
	Check Power Supply Voltages
<b>POWER</b> UPS  Generator	Check Diagnostics/Alarms
	AC/DC Voltages/Batteries
	Switch-Over Operations
	Switch to Generator Power (pre-approved by customer)



AC to DC Power Unit (RF equipment)	Switch to Battery Power (pre-approved by customer)
All Equipment	Check Diagnostics/Alarms
<b>TRUNKING TEST (Completed at all Sites)</b>	Talkgroup Call
	Multigroup Call
	Private Call
	Secure Call



## ASTRO® 25 ARC4000, 6.x, & 7.x Network Preventative Maintenance Checklist

ASTRO® 25 ARC4000, 6 x, & 7x	Operational Check (where applicable) Reference existing site PM documents for exact measurements	
<b>CO-LOCATED/REMOTE SITE</b> Repeater(s), Control Station(s)	TX Frequency in Hz	
	TX Power Output of Station (Forward/Reflected)	
	TX Power Output out of Combiner (Forward/Reflected)	
	TX Low Speed Deviation	
	TX Test Pattern Deviation	
	TX BER	
	RX Tower/Rack Mounted Amplifier	
	RX RF Level at 5% BER at Receiver and Through Multi-Coupler	
	Receiver Desense/ Degradation do to Site Noise and TX Desense	
	Wireline Audio Input & Output Levels	
	Site Controllers	Check Lights/Fan Operation
		Check/Align Frequency Standard
Roll to Redundant Controller (pre-approved by customer)		
Test Site Trunking/Failsoft Modes (pre-approved by customer)		
Multiple Control Channel Switching (pre-approved by customer)		
Router/Switches	Check Lights/Fan Operation	
All Equipment	Check Diagnostics/Alarms Power Supply Voltages	
<b>MASTER/PRIME SITE (RF Equipment)</b>		
Master/Prime Site Controllers	Check Lights/Fan Operation	
	Roll to Redundant Controller (pre-approved by customer)	
Router/Switches	Check Lights/Fan Operation	
ASTRO-TAC Comparators	Check for receiver to Comparator audio path ACTAC 9600 Comparator All sites on line? V.24 link health- link delays	
Channel Bank	Channel Bank/ transport health for all sites (diagnostics/alarms)	
	Roll to Redundant Power Supply (pre-approved by customer)	
<b>MASTER/PRIME SITE (Servers)</b>		
Misc Equipment	Master Site Servers health (diagnostics/alarms)	
	Complete backup of databases	
	Roll to Redundant Zone Controller (pre-approved by customer)	
	Remote Access Test	
	Check all modems for proper levels & synchronization	
	MBX/Other telco interface common equipment	
<b>GPS</b>		
	Roll to Redundant Receive Reference Module (pre-approved by customer)	
	Frequency Standards (check 1 PPS, 5 MPPS, composite)	
	Check Power Supply Voltages	
<b>POWER</b>		
UPS	Check Diagnostics/Alarms	
	AC/DC Voltages/Batteries	
	Switch-Over Operations	
Generator	Switch to Generator Power (pre-approved by customer)	
AC to DC Power Unit (RF equipment)	Switch to Battery Power (pre-approved by customer)	
All Equipment	Check Diagnostics/Alarms	



<b>CONSOLES POSITIONS/REMOTES</b>	Audio Input & Output Level
	Ethernet Operation
	CEB/MCC Power Supply Voltage, and AC Ripple
	Switches, Lights, CRT
	CEB/MCC Signal Levels
	Wiring and Grounding for each Position
	Check and Clean keyboards, CPU. CRT's
	CEB/AEB/MCC diagnostics
<b>TRUNKING TEST (Completed at all sites)</b>	Talkgroup Test
	Multigroup Call
	Private Call
	Secure Call



## E911 System Exhibit

Infrastructure Type	Operational Check (when applicable)
ANI Controller	Power supply check -DC Voltage
	Processor card battery test
	Review of advisory log
	Inspect phone, handsets, cords, touch tone pads, lights, and telephone instruments at main PSAP and remote location.
	Test operation of each 911 trunk and administrative phone line
	Check ANI cable routing and verify all connections (tighten cable/connector strain relief devices, review punch block wiring)
	Verify dial-up access
	Verify any spare circuit boards are operational
	Inspect ANI cabinets (ventilation/cooling, secure covers)
ALI Controller	Verify no alarm status on call screen. Check alarm/event log
	Check size of call detail records, purge if necessary
	Size of hard space remaining and advise customer. Purge if necessary.
	Test operation of all servers, terminals/clients printers, at main PSAP and remote locations
	Make test 911 calls to verify ALI information is properly displayed on all terminals/clients at main PSAP and remote locations
	Verify any spare ALI equipment or devices are operational
	If system uses local ALI or TSL, verify system properly receives Telco subscriber updates as required
	Check ALI cable routing and verify all connections (tighten cable/connector strain relief devices where necessary)
	Inspect all computer and terminal equipment (fans, vents, keyboards, CRTs, etc) .
	Verify ALI components are receiving proper ventilation/cooling
	Other
Verify inbound remote maintenance access of both ANI and ALI functions through all remote access devices (SEB or maintenance modems)	
Check and verify proper installation of all grounding cables and connectors.	
Verify operational status of surge suppression equipment	
Verify operational status of standby power systems (UPS equipment, AC generators)	

## Statement of Work

### OnSite Infrastructure Response With Local Dispatch

#### 1.0 Description of Service

OnSite Infrastructure Response provides for on-site technician Response by a Servicer. A Servicer will respond to the Customer location based on pre-defined Severity Levels set forth in the Severity Definitions Table and Response times set forth in the Response Time Table in order to Restore the System.

The terms and conditions of this Statement of Work (SOW) are an integral part of Motorola's Service Terms and Conditions or other applicable Agreement to which it is attached and made a part thereof by this reference.

#### 2.0 Motorola Servicer has the following responsibilities:

- 2.1 Continuously receive service requests.
- 2.2 Assign and dispatch technical resources and provide estimated time of arrival (ETA) to Customer.
- 2.3 Servicer will perform the following on-site:
  - 2.3.1 Run diagnostics on the Infrastructure or FRU.
  - 2.3.2 Replace defective Infrastructure or FRU, as applicable. Customer, Servicer or Motorola may provide Infrastructure or FRU.
  - 2.3.3 Provide materials, tools, documentation, physical planning manuals, diagnostic/test equipment and any other requirements necessary to perform the Maintenance service.
  - 2.3.4 If a third party Vendor is needed to Restore the System, the Servicer may accompany that Vendor onto the Customer's premises.
- 2.4 Verify with Customer that Restoration is complete or System is functional. If Customer cannot be contacted within twenty (20) minutes of Restoration, the Servicer will leave the Customer site.
- 2.5 Provide the service ticket document to Customer, when requested. Service ticket document should include the following:
  - 2.5.1 Resolution action.
  - 2.5.2 Provide defective FRU or part number (model #) used.

#### 3.0 Customer has the following responsibilities:

- 3.1 Contact Servicer, as necessary, to request service Continuously.
- 3.2 Allow Servicers access to Equipment.
- 3.3 Supply Infrastructure or FRU as needed in order for Motorola to Restore the System as set forth in paragraph 2.3.2.
- 3.4 Maintain and store in an easily accessible location any and all Software needed to Restore the System.
- 3.5 Maintain and store in an easily accessible location proper System backups.
- 3.6 For E911 systems, test the secondary/backup PSAP connection to be prepared in the event of a catastrophic failure of a system. Train appropriate personnel on the procedures to perform the function of switching to the backup PSAP.
- 3.7 Contact the Servicer upon expiration of Response time goal.
- 3.8 Upon being contacted by the Servicer requesting Verification of a Restoration as described above in Section 2.4, respond to that request within twenty (20) minutes.
- 3.9 Cooperate with Motorola and perform all acts that are reasonable or necessary to enable Motorola to provide this service to Customer.

**Severity Definitions Table**

Severity Level	Problem Types
Severity 1	<ul style="list-style-type: none"> <li>▪ Response is provided Continuously</li> <li>▪ Major System failure</li> <li>▪ 33% of System down</li> <li>▪ 33% of Site channels down</li> <li>▪ This level is meant to represent a major issue that results in an unusable system, sub-system, Product, or critical features from the Customer's perspective. No Work-around or immediate solution is available.</li> </ul>
Severity 2	<ul style="list-style-type: none"> <li>▪ Response during Standard Business Day</li> <li>▪ Significant System Impairment not to exceed 33% of system down</li> <li>▪ System problems presently being monitored</li> <li>▪ This level is meant to represent a moderate issue that limits a Customer's normal use of the system, sub-system, product, or major non-critical features from a Customer's perspective</li> </ul>
Severity 3	<ul style="list-style-type: none"> <li>▪ Response during Standard Business Day</li> <li>▪ Intermittent system issues</li> <li>▪ Information questions</li> <li>▪ Upgrades/preventative maintenance</li> <li>▪ This level is meant to represent a minor issue that does not preclude use of the system, sub-system, product, or critical features from a Customer's perspective. It may also represent a cosmetic issue, including documentation errors, general usage questions, recommendations for product enhancements or modifications, and scheduled events such as preventative maintenance or product/system upgrades.</li> </ul>

**Response Time Table** (Customer's Response Time Classification is designated in the Service Agreement)

Severity Level	Regular Response Time	Premier Response Time	Limited Response Time
Severity 1	Within 4 hours from receipt of Notification Continuously	Within 2 hours from receipt of Notification Continuously	Within 4 hours from receipt of Notification Standard Business Day
Severity 2	Within 4 hours from receipt of Notification Standard Business Day	Within 4 hours from receipt of Notification Standard Business Day	Within 4 hours from receipt of Notification Standard Business Day
Severity 3	Within 24 hours from receipt of Notification Standard Business Day	Within 24 hours from receipt of Notification Standard Business Day	Within 24 hours from receipt of Notification Standard Business Day



## DODGE COUNTY

22 6<sup>th</sup> STREET EAST + DEPT. 281

MANTORVILLE, MN 55955 – 2200

PHONE - 507.635.6132 + FAX - 507.635.6265

Emergency Management Department

E-MAIL + matt.maas@co.dodge.mn.us

# Memorandum

To: Chairman Glaccum and members of the Operational and Technical Committee

From: Matt Maas/Dodge County Emergency Management Director

CC:

Date: 6/16/15

Re: Participation Plan Amendment for Counsel Upgrade

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Chairman and Members of the Committee,

As Dodge County continues to enhance our radio communications on the ARMER system we are upgrading our counsels from the Gold Elite units to the MCC7500. Currently with the Gold Elite Counsels there are no ECCGW's in use. With our upgrade, we will be utilizing two 4-port ECCGW's providing support to a total of 8 conventional base stations.

Dodge County currently has authorization for 978 radio ID's and we are currently utilizing 624 of them. With the upgrade of counsels, we will be freeing up approximately 120 radio ID's. Dodge County will release those 120 radio ID's back to the state. This allows for 234 radios ID's for Dodge County's growth in the next 3-5 years.

There will be no change in connectivity to the ARMER system with this upgrade.

Respectfully Submitted,

Matthew Maas  
Emergency Management Director  
Dodge County



# Clay County, Minnesota

## ARMER Radio System Participation Plan

May 2015

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# ARMER Participation Plan

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## I. Introduction

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### A. ARMER System Application – Clay County, Minnesota

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

Clay County and associated agencies have been considering a migration to ARMER system use over the past few years, and have now developed a plan that incorporates the somewhat unique needs of the agencies and operations in the county (as outlined in the next section of this report).

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

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

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

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

### B. Project Summary

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

Clay County operations are somewhat unique in that the county is located on the state border with North Dakota, 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

---

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

services for Minnesota agencies (Clay County, City of Moorhead, and other cities in the county) as well as 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 Clay County, but includes the RRRDC facility and operations in the plan.

Prior to 2009, and in the years immediately following, the county and associated agencies had made a significant financial investment in the deployment of VHF P25 digital equipment, and wanted to ensure that a significant return on this investment was realized before moving away from VHF to the 800 MHz ARMER system.

The primary goals of a new radio communications system are:

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

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

The primary points of contact for this project are:

Lieutenant Bryan Green  
Clay County Sheriff's Office  
915 – 9<sup>th</sup> Ave No.  
Moorhead, MN 56560  
218-299-5151 Phone  
[bryan.green@co.clay.mn.us](mailto:bryan.green@co.clay.mn.us)

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

### C. Jurisdictional Coverage of System

The radio system is intended to provide radio communications throughout the geographic area of Clay County, Minnesota. Clay County is located in the northwest area of Minnesota, covering 1,045 square miles, with a population of approximately 59,000 people. The county seat is located in Moorhead, MN. The terrain of Clay County is relatively flat, with ground elevations ranging from 900 feet in the western areas along the river, to 1,200 feet in the eastern areas, and a rise up to 1,500 feet in the southeast corner near Rollag.

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

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

Law Agencies (6)	Fire/EMS Agencies (13)	Fire/EMS Agencies
Clay County Sheriff	Barnesville Fire Dept.	Hawley H.E.R.T.
Moorhead Police Dept.	Barnesville Ambulance	Hitterdal Fire Dept.
Barnesville Police Dept.	Dilworth Fire Dept.	Moorhead Fire Dept.
Dilworth Police Dept.	Felton Fire and Rescue	Sabin Rescue Squad
Glyndon Police Dept.	FM Ambulance (?)	Sabin-Elmwood Fire Dept
Hawley Police Dept.	Glyndon Fire and Rescue	Ulen Fire and Rescue
	Hawley Fire Dept.	
Participating Public Works and School Departments (3)		
Clay County Highway Department	Clay County School District	
Moorhead Public Works		

### E. Existing VHF System Configuration

The existing Clay County voice radio systems operate on VHF (150-160 MHz) frequencies, incorporating both P25 digital and analog modulation, providing radio channels for law enforcement, fire, and Emergency Medical Service (EMS)/ambulance operations.

As noted, the joint RRRDC dispatch center is located in downtown Fargo, ND, and provides dispatch services for both Minnesota and North Dakota agencies. The dispatch center is equipped with an 8-position Motorola Gold Elite console system, with 4 backup operator positions, which are connected to and control VHF radio systems in both counties and states.

The existing Clay County (Minnesota) radio system consists of multiple VHF base and repeater stations located at tower sites around the county. All radio equipment located at the tower or other remote sites is controlled from the dispatch center via leased telephone circuits, microwave radio or VHF radio links. The primary VHF radio system infrastructure equipment used by the county is a variety of Motorola base and repeater stations. All equipment is in good operating condition, and are operating on narrowband (12.5 kHz) analog and P25 digital radio frequencies.

The radio system consists of separate VHF channels and base/repeater stations for Sheriff/law, and fire/EMS operations, which are located at the tower sites as noted above, as well as at various fire halls throughout the county. The radio network consists of multiple repeater channels and sites, along with Minnesota Statewide Emergency Frequency (MNSEF/VLaw31) and other law, fire/EMS and regional interoperability channels. The Fire/EMS system also provides tone-and-voice paging capabilities.

## 2. ARMER System Technical Review

### A. System Design

During the local ARMER system implementation planning process, a review was done to assess whether the existing configuration of the ARMER system, as implemented in the Clay County area, would be appropriate for the Clay County radio system. It was determined that the basic structure of the ARMER system as a multicast digital trunked radio system will meet the needs of Clay County agencies, they plan to utilize the system in this planned multicast configuration.

Primary planning factors:

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

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

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

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

Moorhead	Felton	Hawley
----------	--------	--------

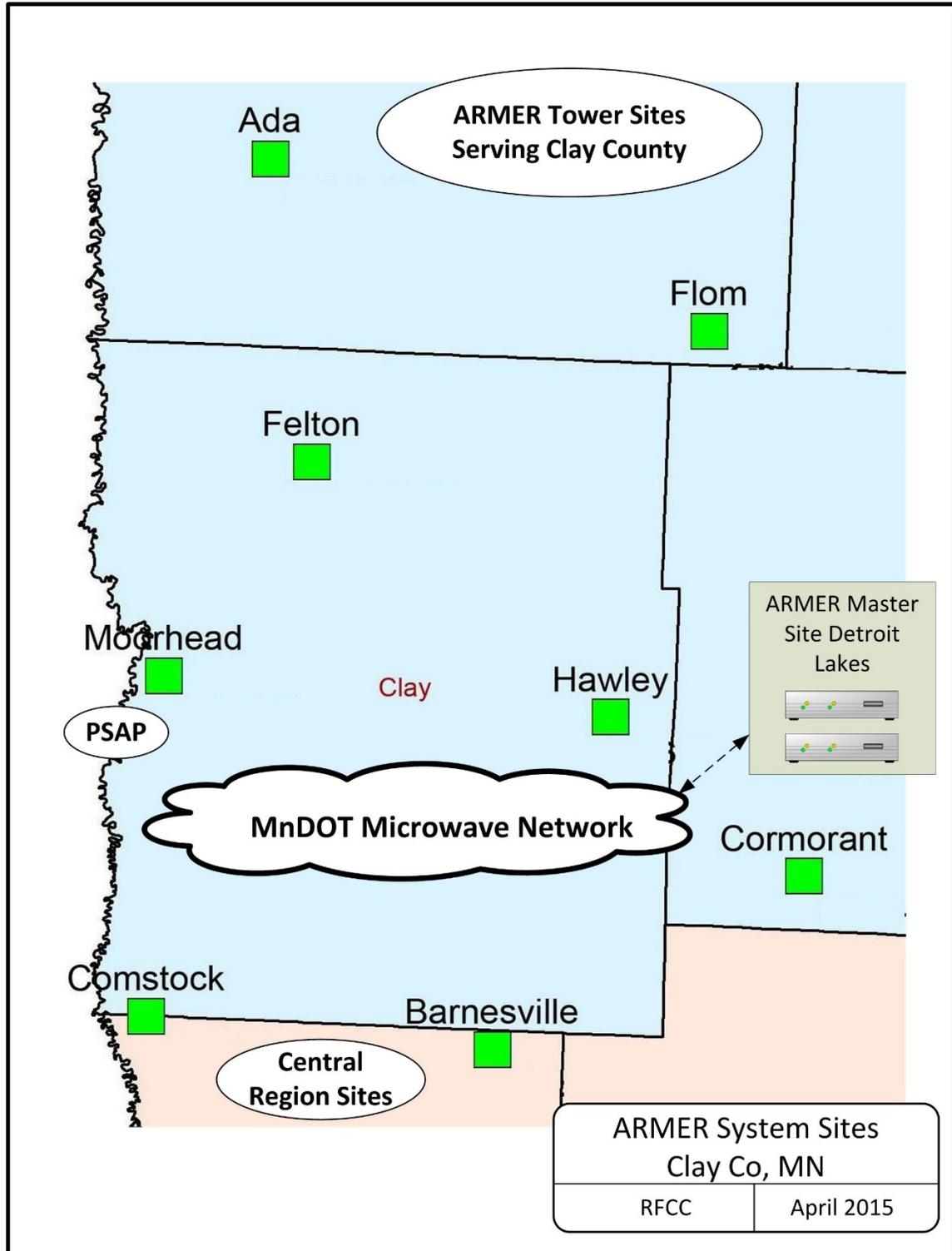
The following five tower sites are located outside of but on or near the county border and will provide coverage within Clay County:

Ada	Flom	Barnesville
Comstock	Cormorant	

Please note that the Comstock and Barnesville tower sites are part of the Central ARMER Region network.

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

### Clay County ARMER System Tower Site Architecture



## ii) Local Equipment Additions and Enhancements

The ARMER planning study conducted for Clay County concluded that no additional local enhancement tower sites (for improved coverage) would be required, and none are included in this plan. The ARMER tower sites in Clay County and surrounding areas have demonstrated a high level of reliable coverage for the county's agencies, based on use over the past year, and no additional tower sites are planned. Refer to Section B of this plan for a review of 800 MHz coverage.

However, there are some concerns with traffic capacity at the Moorhead tower site, where a large number of the county and city radios are expected to be implemented, as well as an expectation of greater radio system usage. The Moorhead ARMER tower site is currently operating with six (6) 800 MHz RF channels. A review of the number of radios planned for use in Clay County, along with the number of talk groups, in conjunction with current and expected radio traffic levels was conducted to determine if additional 800 MHz channel capacity will be needed at the Moorhead site.

Based on the traffic loading calculations (as shown in Section A. vii) of this document), the county has included in this plan an expansion of two (2) additional channels, for a total capacity of eight channels at the site. No channel expansion is anticipated or planned at any of the other tower sites.

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

The Clay County Red River Regional Dispatch Center currently utilizes a Motorola Centracom Gold Elite PC-based radio console control system, with a total of 12 operator positions (8 primary, 4 backup). This console system is now connected to multiple VHF law, fire and EMS systems, including:

- Clay County Minnesota
- City of Moorhead Minnesota
- Cass County North Dakota
- City of Fargo North Dakota
- 800 MHz RF control stations for interoperability with ARMER system users

Clay County is planning for the replacement of the existing console system with a new Motorola MCC7500 console system, with one additional dispatcher workstation than is now used with the current Gold Elite system (13 total).

- *CCGW Ports: The existing Gold Elite console is connected to forty (40) conventional channel resources. At such time the new MCC7500 console is implemented, and 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. As a result, a total of 40 Conventional Channel Gateway (CCGWs) ports are being planned for the MCC7500 implementation.*

- One existing Gold Elite workstation has been established with a CAD/Paging system interface, to allow direct access to the County's VHF tone-and-voice paging system. This feature and function will be retained with the new MCC7500 consoles.
- System Administration: Clay County is planning to implement an ARMER System Management workstation to allow access to the ARMER database, for management of the Clay County radios and technical parameters.

High-level system connectivity diagrams are provided on a following page.

Voice Logging: The dispatch center will continue to use its existing local voice logging recorder for the recording of ARMER and conventional channel radio traffic, 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.

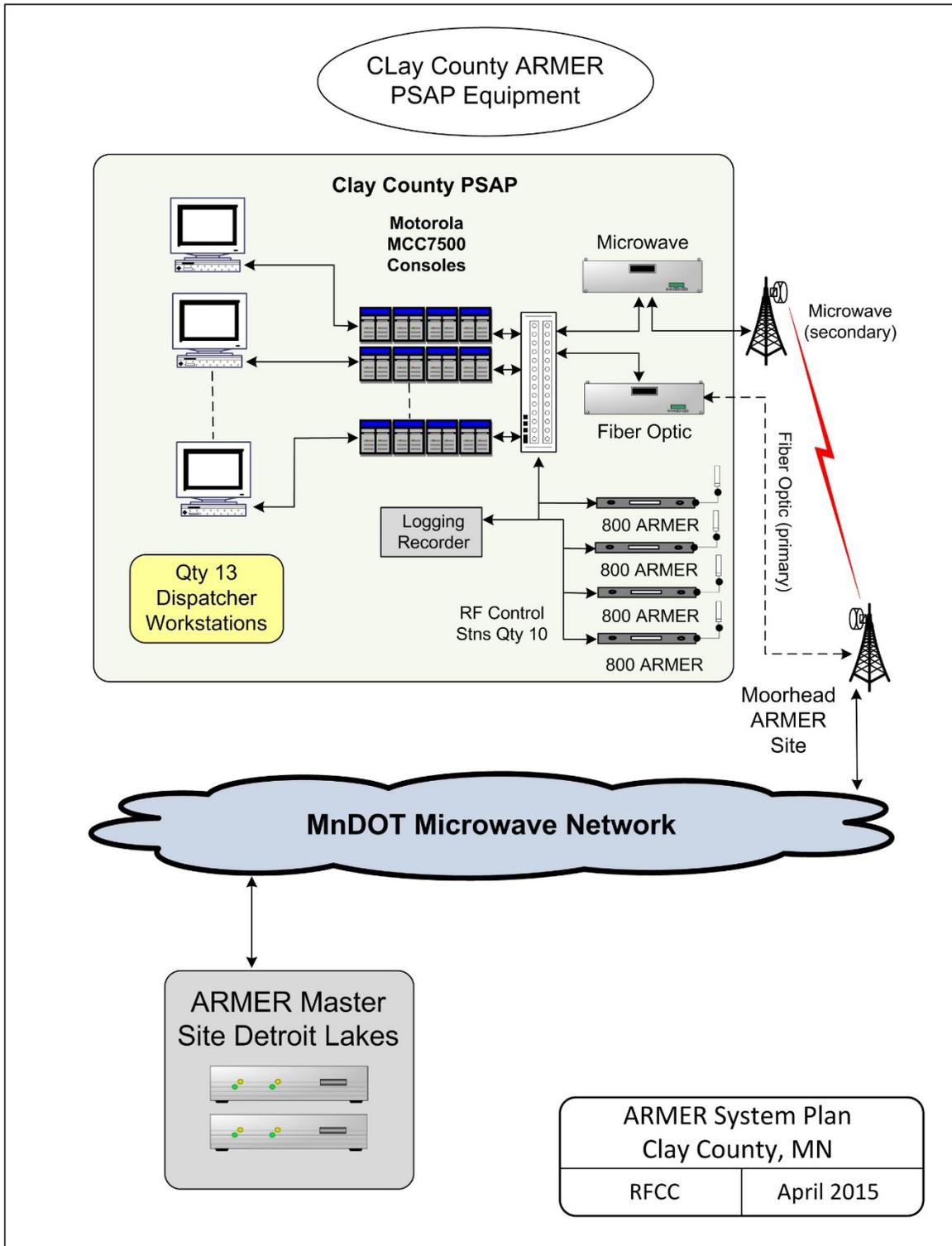
#### **iv) PSAP Connectivity**

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

The primary connectivity for the new MCC7500 consoles will be a local fiber optic link connected to the Moorhead ARMER tower site; microwave radio will also be included as a secondary link, to be used in the event of problems or outage with the fiber optic link.

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 Clay and other ARMER tower sites, and can be used for Site Trunking as well.

### Clay County PSAP ARMER Architecture



**v) Subscriber Radios**

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

<b>Agency Type</b>	<b>Mobile</b>	<b>Portable</b>	<b>Base</b>
Law Enforcement	102	188	30
Law – Future	3	8	0
Fire/EMS	82	235	14
Public Works	30	5	6
Schools/Other	0	0	0
<b>Totals</b>	<b>217</b>	<b>436</b>	<b>50</b>

A total of 703 mobile, portable and control base radios would be implemented in the system, if all agencies purchase or obtain the radios identified within this plan. This includes the total potential for three year growth for the agencies within the county. Agencies throughout the county will be able to use this opportunity to purchase and implement standard radio types for use within the system, which will promote user commonality and interoperability between the various agencies. A detailed breakdown of Clay County’s mobile and portable radio inventory requirements and cost estimates is provided on the next page.

**Clay County MN  
 800 Mhz Radio Inventory and Cost Data**

Total of 800 MHz Mobile and Portable Radio Equipment Required for System Implementation											Totals
Agency	Dual Band Mobile @ \$6,500	Apex 6500 Mobile Radios w/DES @ \$4,820	Apex 6500 Mobile Radios no DES @ \$4123	Apex 6500 Mob Radios Dual Control @ \$5250	Apex 6000 Port Radio w/DES @ \$4456	Apex 4500 Mobile Rem Mount @ \$3177	Apex 4500 Mobile Dash Mount @ \$3048	Apex 4000 Port Radios @ \$2717	Apex 1000 Portable Radios @ \$2070	800 Mhz RF Control Stations @ \$6,000	Total Agency Radio Equipment Costs
Clay County Sheriff's Office		40			60					10	\$ 520,160
Clay County Jail Operations									20	1	\$ 47,400
Moorhead Police Dept		47			80					15	\$ 673,020
Barnesville Police Dept		3			5					1	\$ 42,740
Dilworth Police Dept		4			9					1	\$ 65,384
Glyndon Police Dept		3			6					1	\$ 47,196
Hawley Police Dept		5			8					1	\$ 65,748
<b>Law Agency Totals</b>	<b>0</b>	<b>102</b>	<b>0</b>	<b>0</b>	<b>168</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>20</b>	<b>30</b>	<b>\$ 1,461,648</b>
Moorhead Fire Dept (see Note 6)						19		36		5	\$ 188,175
Barnesville Fire Dept						6		9		1	\$ 49,515
Barnesville Ambulance				2				20			\$ 64,840
Dilworth Fire Dept						6		18		1	\$ 73,968
Felton Fire and Rescue						6		15		1	\$ 65,817
F-M Ambulance											\$ -
Glyndon Fire and Rescue						7		39		1	\$ 134,202
Hawley Fire Dept						7		13		1	\$ 63,560
Hawley HERT						5		15		1	\$ 62,640
Hitterdal Fire Dept						6		10		1	\$ 52,232
Sabin Rescue Squad				2				15			\$ 51,255
Sabin-Elmwood Fire Dept						8		15		1	\$ 72,171
Ulen Fire and Rescue						8		30		1	\$ 112,926
<b>Fire/EMS Agency Totals</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>0</b>	<b>78</b>	<b>0</b>	<b>235</b>	<b>0</b>	<b>14</b>	<b>\$ 991,301</b>
Clay County Highway Dept							30		5	5	\$ 131,790
Moorhead Public Works										1	\$ 6,000
<b>Public Works Agency Ttl's</b>		<b>0</b>	<b>0</b>	<b>0</b>		<b>0</b>	<b>30</b>	<b>0</b>	<b>5</b>	<b>6</b>	<b>\$ 137,790</b>
<b>Grand Totals</b>	<b>0</b>	<b>102</b>	<b>0</b>	<b>4</b>	<b>168</b>	<b>78</b>	<b>30</b>	<b>235</b>	<b>25</b>	<b>50</b>	<b>\$ 2,590,739</b>
<b>TOTAL RADIOS:</b>	<b>692</b>										

## vi) System Talk Group Planning and ID Requirements

The Fleetmap for Clay County has been updated based on the revised needs of Clay County agencies, and will have a total of 63 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 I for a copy of the preliminary Clay County fleet map.

A total of 716 ARMER system IDs are expected for the Clay County implementation, which includes three year estimated totals:

- 692 for mobile and portable subscriber units total expected on the system for all agencies
- 11 for future law enforcement expansion
- 13 for PSAP operations

*The existing ARMER Interoperability Plan for Clay County included a total of 140 radio ID's; these ID's are now incorporated into this new Full plan.*

## vii) 800 MHz Traffic Loading and Frequency Planning

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

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

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

As noted in Section A. ii) of this plan document, it is expected that the planned five channels will be sufficient at the Clay County ARMER sites, with the exception of the Moorhead tower site, where additional radios and traffic are expected to require greater channel capacity. The Moorhead site currently operates with six channels, and the county is including a plan to expand this to a total of 8 RF channels.

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

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

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

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

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

- Quantity 703 Clay County radios (three year maximum)
- Quantity 150 neighboring county radios (interoperability use in Clay 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 length of time (in seconds)
- .51 average expected number of transmissions from the radios (per hour)
- 1.5 seconds average busy time (in seconds)

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

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

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

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

Site and GOS	Number of Voice Channels Normal Conditions				
	1	2	3	4	5
Moorhead	61.5%	12.8%	2.1%	0.3%	0.0%
Felton	30.5%	3.7%	0.3%	0.0%	0.0%
Hawley	32.5%	4.2%	0.4%	0.0%	0.0%
Barnesville	35.0%	4.9%	0.5%	0.0%	0.0%
Comstock	32.5%	4.2%	0.4%	0.0%	0.0%

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

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

for the Clay 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 Clay County**

Site and GOS	Number of Voice Channels Emergency Conditions				
	1	2	3	4	5
Moorhead	103.1%	30.1%	7.2%	1.4%	0.2%
Felton	53.1%	10.1%	1.5%	0.2%	0.1%
Hawley	58.7%	12.2%	2.0%	0.3%	0.0%
Barnesville	67.8%	15.3%	2.7%	0.4%	0.0%
Comstock	56.6%	11.4%	1.8%	0.2%	0.0%

As shown, four voice channels are now required to maintain the minimum recommended GOS during emergency traffic periods at all sites other than Felton and Comstock. The State of Minnesota will be implementing four voice channels at all sites, so no additional channels are necessarily needed at the ARMER sites, however Clay County remains concerned about future traffic levels at the Moorhead site. This is also based on the number of talk groups and interoperability and VHF-800 patching needed between the Fargo/Cass County VHF and Moorhead/Clay County ARMER operations.

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

**800 MHz Frequency Assignments for ARMER Sites in Clay County**

Site	Chan 1	Chan 2	Chan 3	Chan 4	Chan 5	Chan 6
Clay County	13	42	57	178	208	NA
Moorhead	33	111	187	PS	PS	PS
Felton	91	107	185	PS	PS	NA
Hawley	37	69	189	PS	PS	NA
Barnesville	110	148	186	PS	PS	NA
Comstock	76	114	PS	PS	PS	NA

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

### viii) Legacy VHF Equipment

The county will continue to operate and control a number of existing or updated VHF radio system channels, for local paging and interoperability. Emergency paging for fire and EMS operations is currently conducted via county-owned VHF system(s). These existing systems will be retained and modified or expanded as needed for improved paging coverage. This expansion 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. ARMER Radio System Coverage Review

### i) Design Parameters

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

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

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

### ii) Coverage Propagation Mapping

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

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

Provided below are the parameters used for the coverage modeling:

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

Preliminary coverage maps for portable radio talk-in and talk-out are shown on the following pages.

The color coding for these maps is:

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

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

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

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

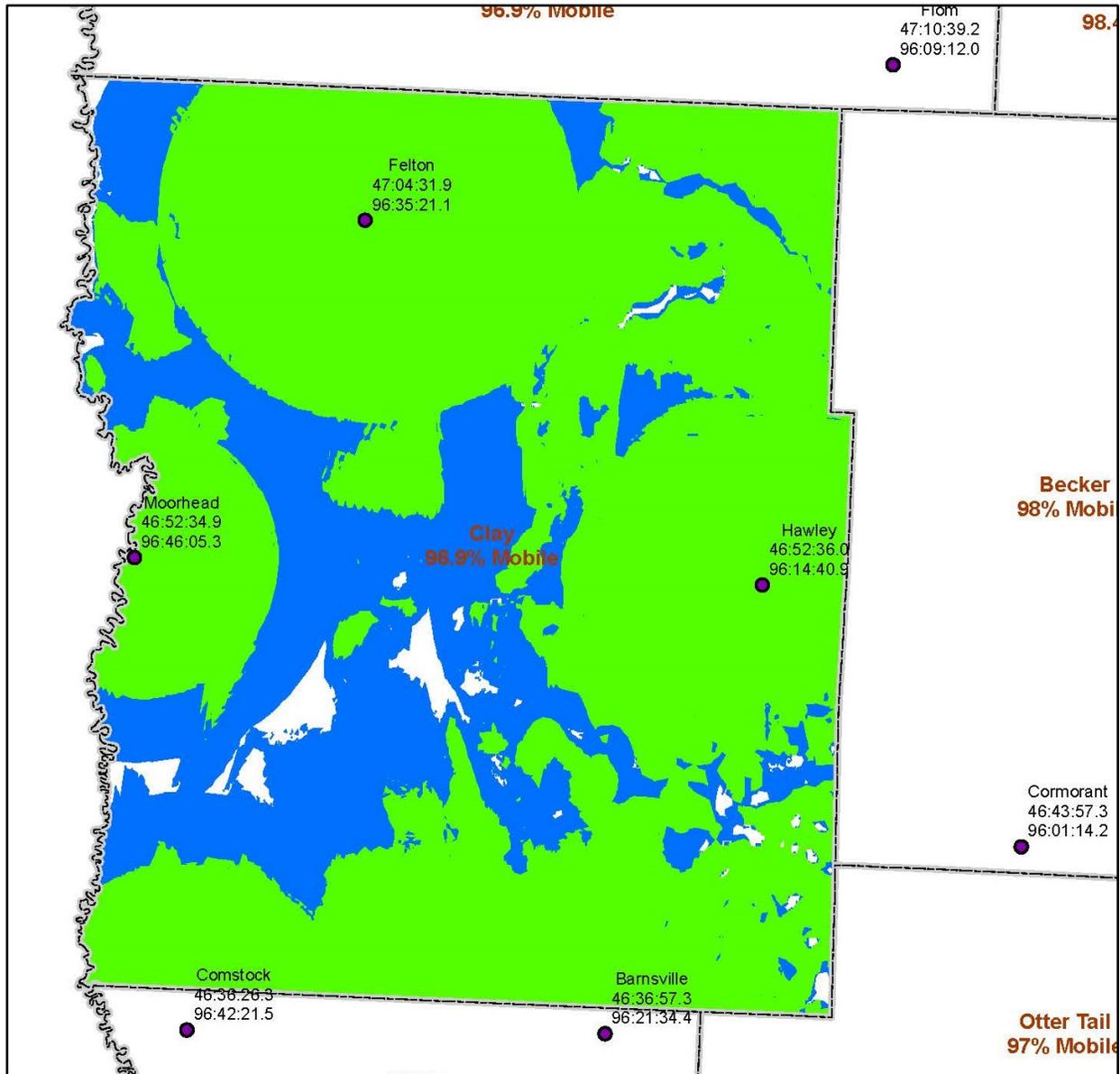
The first map presented in this plan is the predicted coverage map provided by the State of Minnesota for the Clay County geographical area.

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

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

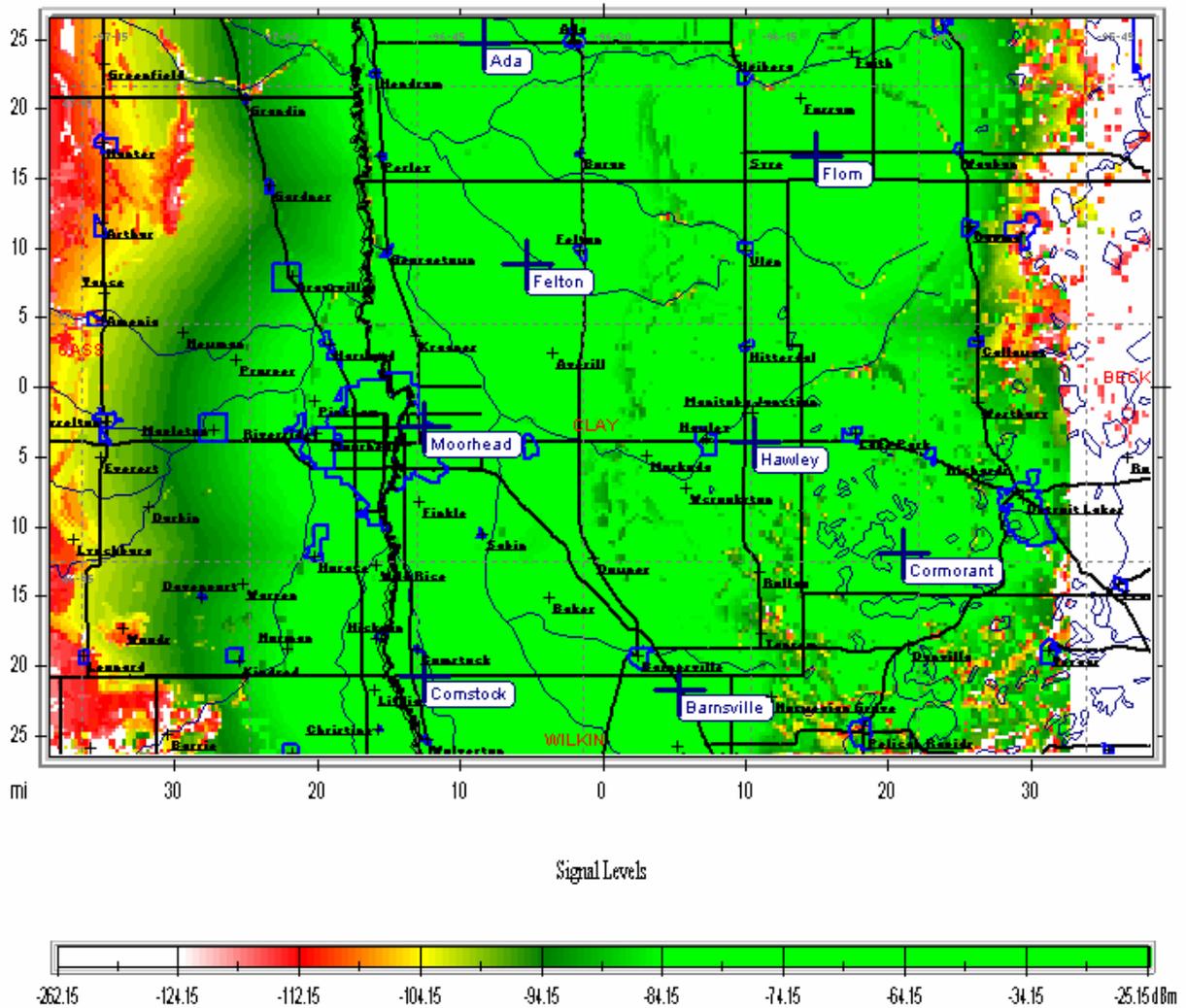
**Map I: Clay County Predicted ARMER Coverage**

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



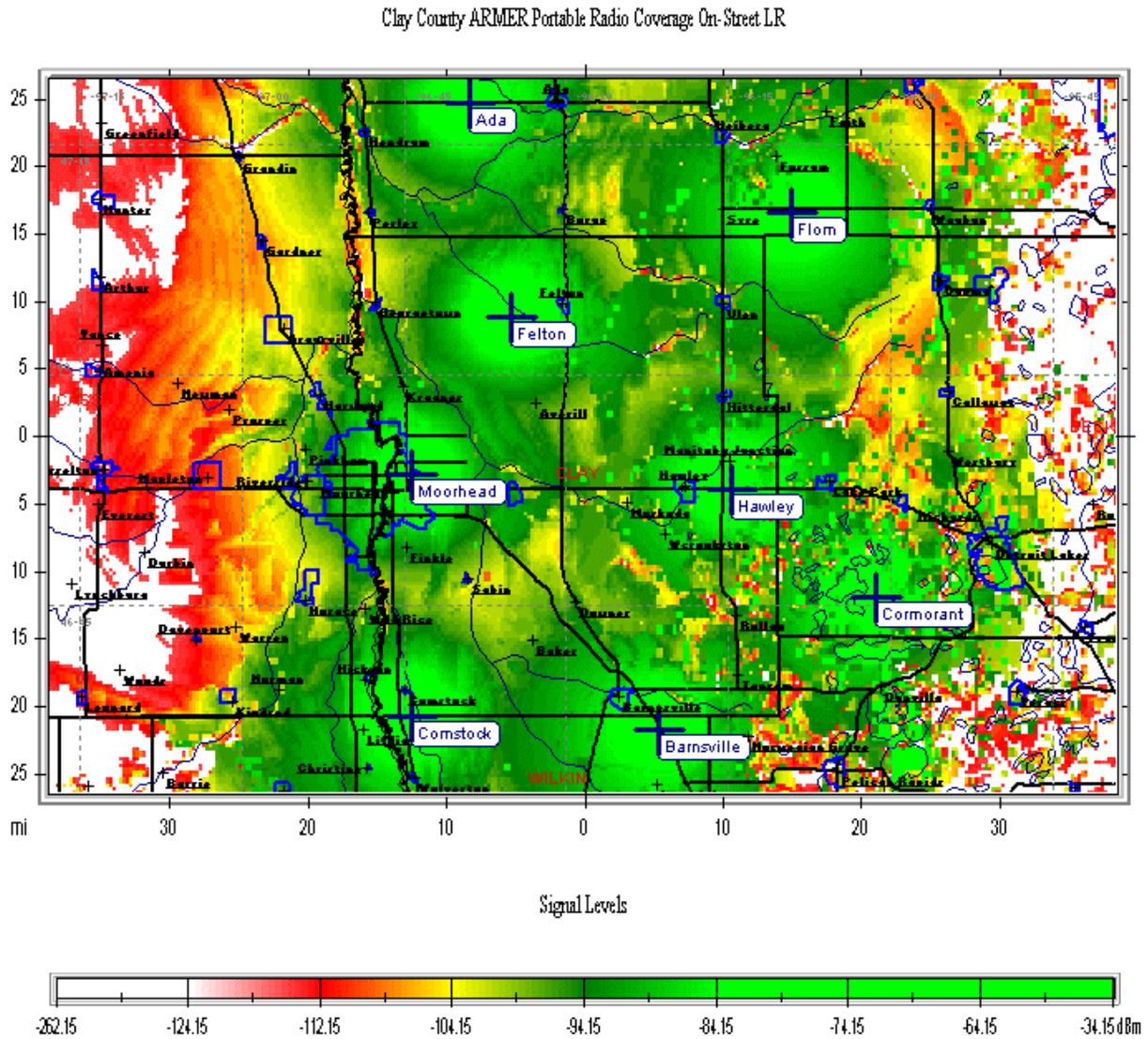
**Map 2:** The map shown below, prepared by RFCC for the county's ARMER planning process, demonstrates the predicted coverage to be expected for Mobile (vehicle-mounted) radios from the ARMER tower sites to be located within Clay County, including the first-tier sites outside the county borders.

Clay County ARMER Mobile Radio Coverage



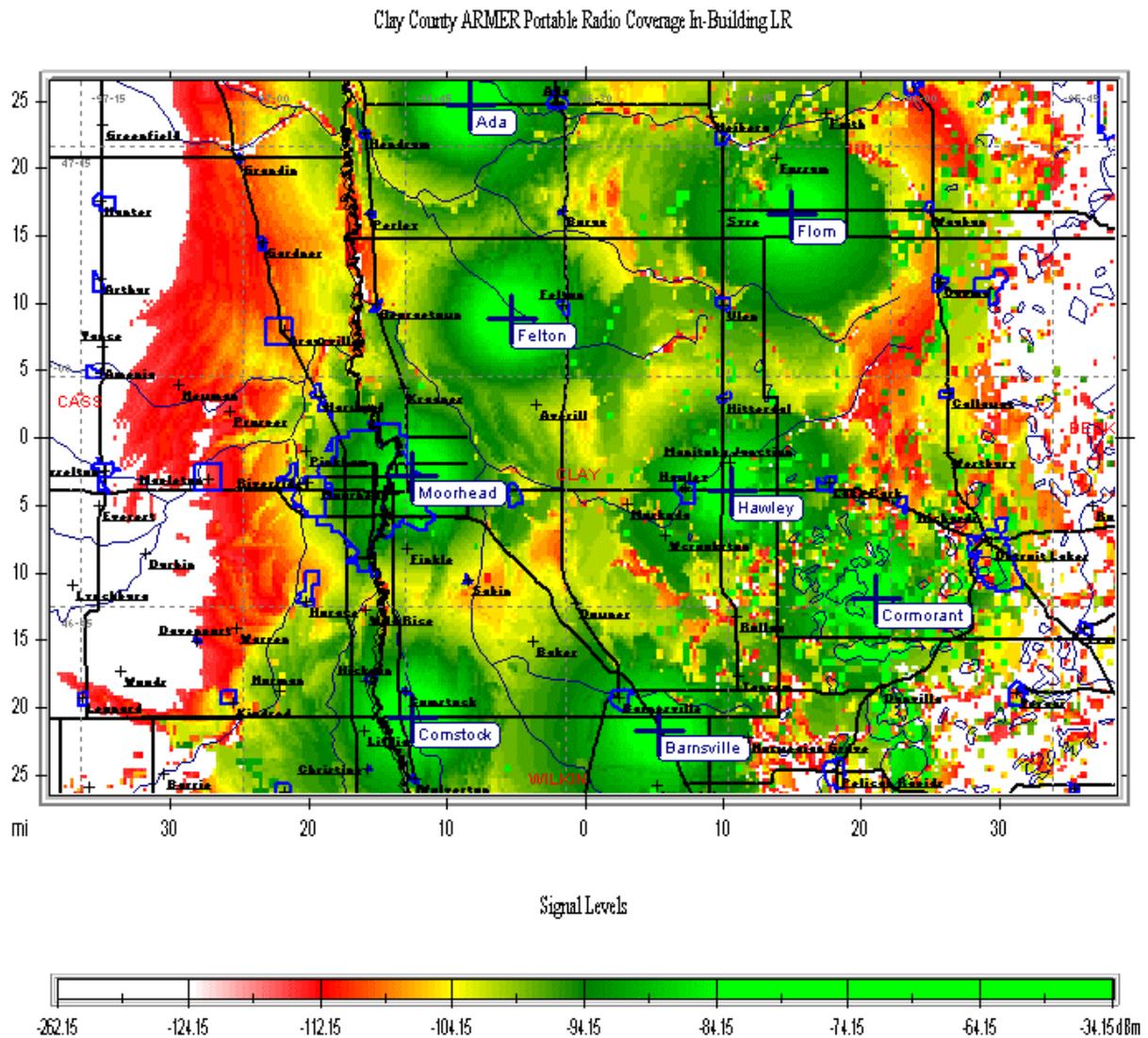
The predicted mobile radio coverage throughout the county is excellent with the planned tower sites, and coverage within the county is enhanced by tower sites outside of the county borders.

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



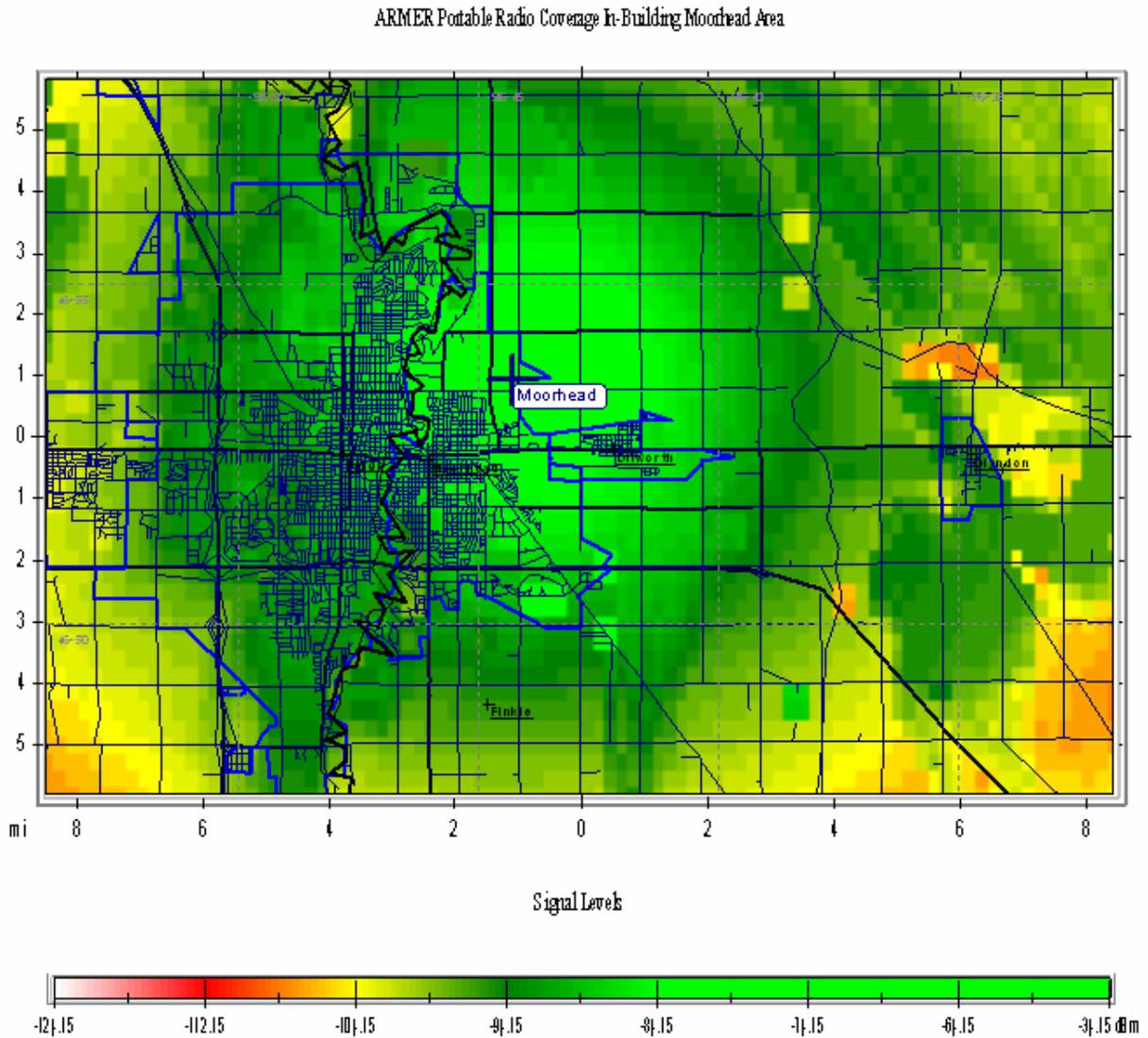
The predicted portable radio coverage throughout most of the county is very good with the planned tower sites, and coverage within the county is enhanced by tower sites outside of the county borders. The only areas of potentially weak coverage appear to be in the southeast area of the county, south of Hawley.

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



The predicted 6db in-building coverage for Clay County is good in many areas, including the cities of Moorhead and Barnesville. Refer to the map on the next page for more detail of the predicted coverage in the Moorhead area.

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



The blue lines on the map indicate the city limits of the Fargo/Moorhead, and the dark blue lines indicate highways and roads. The predicted in-building coverage should be good within the city, although this will depend on the type of building involved. Testing has been conducted in many buildings, with good results in many areas, although in-building boosters (BDAs) will be needed for reliable coverage in some structures.

## C. Contingency Planning

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

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

The primary method of redundancy for Clay County operations will be the implementation of redundant links between the RRRDC PSAP 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 are planned for the Clay County PSAP.

## D. Training

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

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

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

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

## E. Interoperability

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

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

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

- City of Fargo/Cass County North Dakota agencies
- Becker County agencies
- Mahnomon County agencies
- Wilkin County agencies
- Norman County agencies
- Minnesota State Patrol, Mn/DOT, Department of Natural Resources (DNR) enforcement, and fire agencies
- Border Patrol and other Federal law enforcement and fire agencies

Three of the four Minnesota county agencies bordering Clay County are now ARMER system users (Becker, Wilkin, and Otter Tail), which greatly improves and simplifies communications interoperability for those agencies. However, interoperability with North Dakota agencies will be a high priority, and these agencies will continue to operate on VHF systems for the foreseeable future. Clay County and RRRDC intend to establish up to four (4) permanent patches between the selected ARMER talk groups and Fargo/Cass County 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 Clay 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 Clay County to continue operation of their VLaw3 I 155.4750 MHz base station. This can be patched to an 800 MHz talk group via the PSAP console system when required.
- Clay County Fire and EMS agencies will maintain the use of VHF radios in their vehicles, in conjunction with new ARMER/800 MHz radios.
- Clay County repeater channels will be retained, and will become local “interoperability” channel resources, capable of being patched to the ARMER system, to allow local VHF radio users a simple and effective link to county agencies operating on the ARMER system.

## F. Standards

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

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

## G. Alarms and Monitoring

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

## H. Maintenance

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

## **I. System Administration**

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

## **J. Other Local Enhancements**

The primary local enhancements to the planned system implementation are:

- 800 MHz channel expansion at the Moorhead ARMER tower site
- VHF interoperability systems for Fargo/North Dakota agencies

### 3. Project Costs and Budget

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

- Local bonding
- Local levy
- Grant opportunities

The RRRDC, in conjunction with Clay County, has been establishing a long-term funding plan for the replacement of the Gold Elite consoles in the dispatch center. Other funding options are being considered for the purchase and implementation of the other system equipment, and 800 MHz mobile and portable radios needed for public safety agencies in the county. Funding for the remaining system infrastructure equipment has not yet been finalized, but is being reviewed by the county and considered for year 2016.

#### Project Cost Estimates:

Item/Category	Estimated Costs
MCC7500 Consoles and other PSAP Equipment	\$1,230,000
800 RF Control Stations – PSAP	\$ 65,000
800 MHz Channel Expansion – Moorhead ARMER Tower Site	\$ 100,000
Microwave/Fiber Connectivity	\$ 80,000
Radio User Training	\$ 10,000
Network Management Terminal	\$ 20,000
Project Management	\$ 25,000
Project Contingency	\$ 75,000
<b>Subtotal – System Equipment</b>	<b>\$1,605,000</b>
800 MHz Subscriber Radios (Law Enforcement)	\$ 1,461,648
800 MHz Subscriber Radios (Fire & EMS agencies)	\$ 991,301
800 MHz Subscriber Radio (Other)	\$ 137,790
<b>Subtotal – 800 MHz Radios</b>	<b>\$2,590,739</b>
<b>Grand Total Estimated Costs</b>	<b>\$4,195,739</b>

## 4. Project Implementation

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### A. Schedule

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

The county and associated agencies will continue to seek the funding needed to obtain the ARMER-capable mobile and portable radios needed for public safety agencies. The RRRDC is planning and budgeting for the replacement of its existing Centracom Gold Elite radio dispatch console with a new Motorola MCC7500 console, and direct connectivity into the ARMER network. This is expected to be accomplished in 2016.

The County will continue to utilize their existing VHF radio systems over the next year, and will retain such equipment as needed for Interoperability purposes. The new PSAP console equipment will be configured to control both ARMER system resources as well as the North Dakota VHF system resources.

Refer to Attachment 2 for a draft schedule for Clay County's ARMER system implementation.

### Attachment I: Clay County Fleet Map

	<b>Law Enforcement Operations</b>	<b>TG Alias</b>
1	Clay County Law Announce	CY LAW ANN
2	Clay County Sheriff Primary	CY SO1
3	Clay County Sheriff Alternate 2 Encrypted	CY SO2E
4	Clay County Sheriff Alternate 3	CY SO3
5	Clay County Law Car-Car	CY SO C2C
6	Clay County Sheriff Investigations 1 Encrypted	CY INV1E
7	Clay County Sheriff Investigations 2 Encrypted	CY INV2E
8	Clay County Jail	CY JAIL 1
9	Clay County Red River Valley Swat 1	NW RRVSWAT 1E
10	Moorhead Police Primary 1	CY MHD PD1
11	Moorhead Police Alternate 1 Encrypted	CY MHD PD 2E
12	Moorhead Police Alternate 2	CY MHD PD 3
13	Moorhead Police Car to Car	CY MHD PD C2C
14	Moorhead Police Investigations 1 Encrypted	CY MHD PD INV1E
15	Moorhead Police Investigations 2 Encrypted	CY MHD PD INV2E
16	Dilworth Police Dept.	CY DPD 1
17	Hawley Police Dept.	CY HPD 1
18	Barnesville Police Dept.	CY BPD 1
19	Glyndon Police Dept.	CY GPD 1
	<b>Fire and EMS Operations</b>	<b>TG Alias</b>
20	Clay County Fire/EMS Announcement Group	CY FIRE ANN
21	Clay County Fire/EMS Primary	CY F/E 1
22	Clay County Fire/EMS Alternate 2	CY F/E 2
23	Clay County Fire/EMS Alternate 3/Paging	CY F/E 3
24	Clay County FM Ambulance Primary	CY FMA 1
25	Clay County FM Ambulance Alternate	CY FMA 2
26	Clay County Public Health	CY PH 1
27	Moorhead Fire Department Primary	CY MFD 1
28	Moorhead Fire Department Alternate	CY MFD 2
29	Clay/Moorhead Fire/EMS Truck-to Truck	CY FR C2C
30	Clay County Fire Admin	CY FR Admin
	<b>Local Interoperability</b>	<b>TG Alias</b>
30	Clay County Announcement Group	CY ANN ALL
31	Clay County Emergency Call	CY CALL
32	Clay County Emergency Button	CY EMER PS

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

	<b>Local Interoperability</b>	<b>TG Alias</b>
33	Clay County Public Safety Statewide Roam	CY PS ROAM
34	Clay County Public Safety 1	CY 1
35	Clay County Public Safety 2	CY 2
36	Clay County Public Safety 3	CY 3
37	Clay County Public Safety 4	CY 4
38	Clay County Public Safety 5	CY 5
39	Clay County Public Safety 6	CY 6
40	Clay County Public Safety 7	CY 7
41	Clay County Public Safety 8	CY 8
42	Clay County Public Safety 9	CY 9
43	Clay County Public Safety 10	CY 10
44	Clay County – Fargo Police VHF Patch	CY FPD 1
45	Clay County – Cass County ND Sheriff Patch	CY CASS SO 1
46	Clay County – Fargo Fire Dept. VHF Patch	CY FFD 1
47	Clay County Sheriff VHF Patch	CY SO Patch
48	Moorhead Police Dept. VHF Patch	CY MPD Patch
	<b>Public Works and Schools</b>	<b>TG Alias</b>
49	Clay County PW Announcement Group	CY PW ANN
50	Clay County Highway Operations 1	CY HWY 1
51	Clay County Landfill	CY HWY 2
52	Moorhead Public Works	CY MHD PW 1 1
53	Moorhead Schools Emergency	CY MHD SCH 9 1 1
54	Moorhead Schools Security	CY MHD SCH SEC
55	Clay County Schools – Future 1	CY SCH 1
56	Clay County Schools – Future 2	CY SCH 2
57	Clay County Public Works All – Future	CY PW ALL
58	Barnesville Street Dept	CY BPW
59	Dilworth Street Dept.	CY DPW
60	Hawley Street Dept.	CY HPW
61	Matbus – Metro Transit	CY MATBUS
62	Concordia College Security	CY COLL SEC 1
63	Moorhead State University Security	CY MSU SEC 1

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



### Attachment 3: References

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



**Bureau of Indian Affairs (BIA)**

**LIMITED INTEROPERABILITY PARTICIPATION PLAN**

**Overview**

The Bureau of Indian Affairs Drug Enforcement Division currently has one agent assigned to the Paul Bunyan Task Force. Radio communication is used for joint operations with the task force and its member law enforcement personnel, who include tribal, county, and city entities. The purpose of the task force is drug-related law enforcement operations.

**Agency ARMER Infrastructure Elements**

None

**Agency ARMER Subscriber Equipment**

A. Motorola mobile and portable

<b>Quantity</b>	<b>Equipment</b>	<b>Area of Operation</b>
1	Mobile APX7500 radio	Statewide
1	Portable APX7000 radio	Statewide

This equipment will be maintained in accordance with SRB Standard 3.33.1 and with a fleetmap consistent with that standard.

**Other Equipment**

None

**Radio User IDs Requested:**

The following number of radio user IDs are requested:

<b>Purpose</b>	<b>Number</b>
BIA Drug Enforcement agent	2
3 year growth	2

## Additions to ARMER Interop Infrastructure:

None

## Agency Talkgroup

None, as agents shall use Paul Bunyan Task Force and other member agency talk groups for communications.

## Interoperability Talkgroups

The following general purpose interoperability talk groups will be programmed into all subscriber radios:

TG	Discipline	Note
STAC1	Enforcement	PER ARMER STANDARD 3.16.6 SECTION 4
STAC2	Enforcement	PER ARMER STANDARD 3.16.6 SECTION 4
STAC3	Enforcement	PER ARMER STANDARD 3.16.6 SECTION 4
STAC4	Enforcement	PER ARMER STANDARD 3.16.6 SECTION 4
STAC6	Enforcement	PER ARMER STANDARD 3.16.6 SECTION 4
STAC7	Enforcement	PER ARMER STANDARD 3.16.6 SECTION 4
STAC8	Enforcement	PER ARMER STANDARD 3.16.6 SECTION 4
STAC9	Enforcement	PER ARMER STANDARD 3.16.6 SECTION 4
STAC10	Enforcement	PER ARMER STANDARD 3.16.6 SECTION 4
STAC11	Enforcement	PER ARMER STANDARD 3.16.6 SECTION 4
STAC12	Enforcement	PER ARMER STANDARD 3.16.6 SECTION 4
STAC13E	Enforcement	PER ARMER STANDARD 3.16.6 SECTION 4
STAC14E	Enforcement	PER ARMER STANDARD 3.16.6 SECTION 4
8CALL90	Enforcement	PER ARMER STANDARD 3.16.6 SECTION 4
8TAC91	Enforcement	PER ARMER STANDARD 3.16.6 SECTION 4
8TAC92	Enforcement	PER ARMER STANDARD 3.16.6 SECTION 4
8TAC93	Enforcement	PER ARMER STANDARD 3.16.6 SECTION 4
8TAC94	Enforcement	PER ARMER STANDARD 3.16.6 SECTION 4
8CALL90D	Enforcement	PER ARMER STANDARD 3.16.6 SECTION 4
8TAC91D	Enforcement	PER ARMER STANDARD 3.16.6 SECTION 4
8TAC92D	Enforcement	PER ARMER STANDARD 3.16.6 SECTION 4
8TAC93D	Enforcement	PER ARMER STANDARD 3.16.6 SECTION 4
8TAC94D	Enforcement	PER ARMER STANDARD 3.16.6 SECTION 4
8SOA1	Enforcement	PER ARMER STANDARD 3.16.6 SECTION 4
8SOA2	Enforcement	PER ARMER STANDARD 3.16.6 SECTION 4
8SOA3	Enforcement	PER ARMER STANDARD 3.16.6 SECTION 4
8SOA4	Enforcement	PER ARMER STANDARD 3.16.6 SECTION 4

## **Special Purpose Interoperability Talkgroups**

None

## **Training**

Training shall be performed by personnel who have successfully completed train-the-trainer training. All users of ARMER radios shall have this training prior to usage.

Public safety personnel will not be allowed to use ARMER subscriber equipment until such time as they have been provided appropriate training as required by SRB Standard 1.11.4.

## **Designated Local Administrator**

The following person is designated as the agency administrative contact for any issues related to operation, deployment, and maintenance of the regional resources described herein:

Algin Young, Regional Agent in Charge  
Bureau of Indian Affairs Drug Enforcement Division  
2026 Samco Road  
Rapid City, SD 57702  
Telephone: 605-341-3142  
[Algin.young@bia.gov](mailto:Algin.young@bia.gov)

## **Designated System Administrator**

The following people are designated as the agency technical contacts and system administrators for any issues related to operation, deployment, and maintenance of the regional resources described herein:

Shannon Bell, Sr. Radio Communications Technician  
Tribalco  
1 Denver Federal Center  
Bldg 41, Dock E-19 or PO Box 25406  
Denver, CO 80225  
Telephone: 888-801-8984 x0  
[Shannon.bell@tribalco.com](mailto:Shannon.bell@tribalco.com)

Jeremy Vogel, Service Manager  
Roger's Two Way Radio  
102 Lincoln Ave. SE  
Bemidji, MN 56601  
Telephone: 218-751-3077  
[jvogel@rogerstwoway.com](mailto:jvogel@rogerstwoway.com)

May 12, 2015

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(Agency Contact, signature)

(date)

## **Bureau of Indian Affairs (BIA) Forestry & Fire**

### **LIMITED INTEROPERABILITY PARTICIPATION PLAN**

#### **Overview**

#### **National Indian Forestry and Wildland Fire Management Program**

The National Indian Forestry Program is a cooperative effort of the United States Department of the Interior, Bureau of Indian Affairs, Office of the Deputy Director - Trust Services, Division of Forestry and Wildland Fire Management, Intertribal Timber Council and individual Tribal governments on reservations that contain forest resources. Nationally, this accounts for approximately 18 million acres of forested land within approximately 60 million acres of total land with wildland fire management responsibility.

About 2,500 BIA & Tribal employees work together in Indian Country to protect and manage this federal land held in trust for client Tribes located on reservations. Our organization is recognized for its leadership and innovation in the management of forested land in North America. We strive to continually improve and enhanced landscapes held in trust in order to meet the needs of Indian people now, and for generations to come. Timber, waterways, fish & wildlife populations, livestock, cultural resources, traditional medicine, spiritual practices, recreation, firewood usage, renewable energy and many other resources & activities benefit from good strategic management developed and implemented on a reservation.

#### **Branch of Forestry**

Depending on a Tribe's management objectives, wise stewardship of these resources and activities may also produce significant economic benefits for Tribal enterprises, Tribal governments and individual Tribal members (per capital dividends). Timber production is our flagship program and we are recognized as the leading expert on sustainable forestry through uneven-aged management.

#### **Branch of Wildland Fire Management**

Our organization also plays a critical role in management of wildland fire throughout North America on all land: federal, state, county and private. Indian fire crews are the backbone of the national fire suppression force and are known for their firefighting skill, bravery and dedication to excellence.

BIA Forestry & Fire interoperates primarily with tribal forestry agencies, Minnesota Department of Natural Resources and other federal partners for wild land fire suppression throughout Minnesota. As many of these agencies are now using the ARMER system for their primary communications, BIA requests permission to add interoperability radios to the system.

**Agency ARMER Infrastructure Elements**

None

**Agency ARMER Subscriber Equipment**

A. (Type)

Quantity	Equipment	Area of Operation
10	Relm KNG P800 PORTABLE RADIOS	TRIBAL LANDS IN NW AND NE REGIONS

This equipment will be maintained in accordance with SRB Standard 3.33.1 and with a fleetmap consistent with that standard.

**Other Equipment**

None

**Radio User IDs Requested:**

The following number of radio user IDs are requested:

Purpose	Number
Current radio fleet	10
3 year growth	30

**Additions to ARMER Interop Infrastructure:**

None

**Interoperability Talkgroups**

*General Purpose Interoperability Talkgroups*

The following interoperability talkgroups will be programmed into all subscriber radios:

TG	Discipline	Note
STAC1	Fire/Forestry	PER ARMER STANDARD 3.16.6 SECTION 4
STAC2	Fire/Forestry	PER ARMER STANDARD 3.16.6 SECTION 4
STAC3	Fire/Forestry	PER ARMER STANDARD 3.16.6 SECTION 4
STAC4	Fire/Forestry	PER ARMER STANDARD 3.16.6 SECTION 4
STAC6	Fire/Forestry	PER ARMER STANDARD 3.16.6 SECTION 4
STAC7	Fire/Forestry	PER ARMER STANDARD 3.16.6 SECTION 4
STAC8	Fire/Forestry	PER ARMER STANDARD 3.16.6 SECTION 4
STAC9	Fire/Forestry	PER ARMER STANDARD 3.16.6 SECTION 4

STAC10	Fire/Forestry	PER ARMER STANDARD 3.16.6 SECTION 4
STAC11	Fire/Forestry	PER ARMER STANDARD 3.16.6 SECTION 4
STAC12	Fire/Forestry	PER ARMER STANDARD 3.16.6 SECTION 4
STAC13E	Fire/Forestry	PER ARMER STANDARD 3.16.6 SECTION 4
STAC14E	Fire/Forestry	PER ARMER STANDARD 3.16.6 SECTION 4
8CALL90	Fire/Forestry	PER ARMER STANDARD 3.16.6 SECTION 4
8TAC91	Fire/Forestry	PER ARMER STANDARD 3.16.6 SECTION 4
8TAC92	Fire/Forestry	PER ARMER STANDARD 3.16.6 SECTION 4
8TAC93	Fire/Forestry	PER ARMER STANDARD 3.16.6 SECTION 4
8TAC94	Fire/Forestry	PER ARMER STANDARD 3.16.6 SECTION 4
8CALL90D	Fire/Forestry	PER ARMER STANDARD 3.16.6 SECTION 4
8TAC91D	Fire/Forestry	PER ARMER STANDARD 3.16.6 SECTION 4
8TAC92D	Fire/Forestry	PER ARMER STANDARD 3.16.6 SECTION 4
8TAC93D	Fire/Forestry	PER ARMER STANDARD 3.16.6 SECTION 4
8TAC94D	Fire/Forestry	PER ARMER STANDARD 3.16.6 SECTION 4
8SOA1	Fire/Forestry	PER ARMER STANDARD 3.16.6 SECTION 4
8SOA2	Fire/Forestry	PER ARMER STANDARD 3.16.6 SECTION 4
8SOA3	Fire/Forestry	PER ARMER STANDARD 3.16.6 SECTION 4
8SOA4	Fire/Forestry	PER ARMER STANDARD 3.16.6 SECTION 4

*Special Purpose Interoperability Talkgroups*

None

**Training**

End users shall receive training from an individual who has received train-the-trainer training.

Public safety personnel will not be allowed to use ARMER subscriber equipment until such time as they have been provided appropriate training as required by SRB Standard 1.11.4.

**Designated Local Administrator**

The following person is designated as the agency **administrative** contact for any issues related to operation, deployment, and maintenance of the regional resources described herein:

Robert Lintelmann, Agency Forester  
 BIA Forestry  
 522 Minnesota Avenue NW  
 Bemidji, MN 56601  
 Telephone: 218-751-2011  
[Robert.Lintelmann@bia.gov](mailto:Robert.Lintelmann@bia.gov)

Designated System Administrator

The following person is designated as the agency **technical** contact and system administrator for any issues related to operation, deployment, and maintenance of the regional resources described herein:

Tom Schackman, BIA Forestry Radio Technician  
BIA Forestry  
522 Minnesota Avenue NW  
Bemidji, MN 56601  
Telephone: 218-751-2011 x452  
[Thomas.Shackman@bia.gov](mailto:Thomas.Shackman@bia.gov)

Jeremy Vogel, Service Manager  
Roger's Two Way Radio  
102 Lincoln Ave. SE  
Bemidji, MN 56601  
Telephone: 218-751-3077  
[jvogel@rogerstwoway.com](mailto:jvogel@rogerstwoway.com)

  
\_\_\_\_\_  
(Agency Contact, signature)

  
\_\_\_\_\_  
(date)

**Yellow** – workgroup changes 6-23-2015  
**Blue** – changes made by Cathy 6-18-2015

## Allied Radio Matrix for Emergency Response (ARMER) Standards, Protocols, Procedures

Document Section 3	<b>Interoperability Standards</b>	<b>Status:</b> Complete
State Standard Number	<b>3.31.0</b>	
Standard Title	<b>StatusBoard</b>	
Date Established	<b>8/6/2008</b>	<b>SECB Approval:</b> 11/20/2014
Replaces Document Dated	<b>9/16/2014</b>	
Date Revised	<b>11/20/20146/23/2015</b>	

### **1. Purpose and Objective**

The purpose of this standard is to establish guidelines for the StatusBoard application.

### **2. Technical Background**

#### **▪ Capabilities**

The StatusBoard Application, maintained by the Minnesota Department of Public Safety (DPS), Emergency Communication Networks (ECN), is a statewide, web-based dispatch tool accessible through the public Internet. It is intended to help coordinate use of interoperable communications resources (e.g., talkgroups or channels) **that** are available for urgent, emergent, or preplanned events.

#### **▪ Constraints**

StatusBoard is accessed via the public Internet. If a user has no Internet access, then he or she cannot access StatusBoard.

### **3. Operational Context**

The StatusBoard Application is to be used for all emergent or pre-planned emergency situations and planned exercises **that utilize interoperability resources.** It is a tool to advise all dispatch centers with Internet access which mutual aid resources may be available at any given time.

#### **There are two kinds of reservations on StatusBoard:**

**Quick Reservation:** A Quick Reservation is a reservation made by pressing the “quick reservation” button in the StatusBoard application. This reservation will last for a set period of time that is determined in the global application settings.

**Calendar Reservation:** A Calendar Reservation is a reservation made in advance by entering an event time into the StatusBoard calendar.

A talkgroup can be assigned to only one reservation during any given time period, at a time. I.E., if a quick reservation is made which overlaps with an existing quick reservation or an existing calendar reservation, then the old reservation will be deleted and the new reservation will take precedence. Users of StatusBoard are able to override other users' reservations according to the SOPs that assign priority for those resources.

### **There are two kinds of users on StatusBoard:**

**Users:** End-users, such as dispatchers or field users.

**Administrators:** Technical Staff who are able to create resources, profiles, and user accounts.

User accounts may be set with a "read" or a "write" status flag, enabling agencies to assign the appropriate level of access to a user account. "Read" accounts cannot reserve resources and can only view current resource status. "Write" accounts may reserve resources and enter notes.

### **4. Recommended Protocol/Standard**

#### **Required resources for all StatusBoard user accounts:**

All user accounts are required to have access to the "MN" zone (See State Standard 3.16.6). Local StatusBoard administrators are responsible for determining whether each user account has "read" or "write" access.

All user accounts are strongly encouraged to have access to the appropriate regional zones (e.g., Central Minnesota counties' user accounts are encouraged to have access to the Central Minnesota mutual aid interoperability pool, per applicable regional standards.)

#### **User accounts policy:**

ECN maintains the "super" administrator account.

Each agency using StatusBoard ARMER participant is required to designate at least one local administrator and to keep that administrator's contact information up-to-date with ECN's Standards and Training Coordinator. ~~Local administrators may create additional local administrators for StatusBoard, if required.~~

Non-ARMER participating agencies can access StatusBoard but must designate a local StatusBoard administrator before being provided access, and their access must be approved by ECN.

Each Regional Radio Board (RRB), Emergency Communications Board (ECB), (RRB), or their equivalent, ~~shall is strongly encouraged to~~ designate a regional StatusBoard administrator and ~~to~~ keep that administrator's contact information up-to-date with ECN's Standards and Training Coordinator.

The Regional StatusBoard Administrator will be responsible for regional consensus on problem reporting and feature requirements or enhancements.

No language in this standard shall be construed to prohibit multiple agencies from sharing a single StatusBoard administrator; i.e., a single administrator is allowed to provide administrative support for neighboring counties or for an entire region.

Each user agency will create and maintain its own user accounts and resources. The regional StatusBoard Administrator will create and maintain regional resources. ECN will maintain statewide resources and will maintain a single administrator user account for each ARMER participant or non-ARMER participating agency using StatusBoard. ECN will **not** maintain region wide resources or region wide user accounts.

Upon employee termination, that employee's user account shall be immediately removed by the terminating agency, from the system.

Upon employee disciplinary or administrative suspension, the employing agency shall lock the user's account that employee's user account shall be locked in the system until the employee returns to duty.

At least once a month, StatusBoard Administrators shall review their agency StatusBoard accounts for accuracy.

By December 31 of every year, a StatusBoard Administrator shall provide the ECN Standards & Training Coordinator with a list of all designated StatusBoard administrators for their agency.

### **Access Levels:**

Write access to StatusBoard is available **only** to the following categories of personnel:

- Dispatchers and Public Safety Answering Point (PSAP) personnel
- Incident command staff (e.g., Communications Unit Leaders, or COMLs, and Communications Technicians, or COMTs)
- Agency supervisors
- Technical staff
- Local administrators

Write access is **not** intended to be available to field personnel, unless an individual falls into one of the categories above.

COMLs and COMTs shall have access to all regional tabs on the StatusBoard when creating their profile.

Read access is available to **all** Federal Communications Commission (FCC) Part 90 eligible users and support staff at the discretion of regional and local administrators.

### **Training:**

All users shall be appropriately trained to use StatusBoard before being provided access.

Each user is required to complete the online training module for StatusBoard prior to getting an individual log on and password.

The StatusBoard training module was created on behalf of the Statewide Emergency Communications Board (SECB) and is hosted through the Alexandria Technical & Community College online network. This module and others can be accessed from the Emergency Communication Networks (ECN) website under ARMER Standards.

### **Information Security Policy for StatusBoard:**

Generic accounts are **not allowed**. Each user account in StatusBoard shall be assigned to an **individual** and not to a user role (e.g., "911 Dispatch Seat 4" is **not allowed**).

Each user account will contain, at a minimum, the user's unique, individual email address.

## **5. Recommended Procedure**

### **For EMERGENT INCIDENTS:**

Any time a mutual aid resource is used for an emergent event, a quick reservation shall be made on StatusBoard.

As soon as it is practical to do so, the user shall enter a brief description of the event, and an estimated end time should be entered in the description field.

When the mutual aid resource is no longer required and as soon as it is practical to do so, the dispatcher should release the resource on StatusBoard.

### **For PRE-PLANNED INCIDENTS and EXERCISES:**

Any time a mutual aid talkgroup or channel is used for a pre-planned incident, a calendar reservation shall be made on StatusBoard at least one week in advance of the event, if it is practical to do so.

The user shall enter a brief description of the event, and an estimated end time should be entered in the description field.

When the mutual aid resource is no longer required and as soon as it is practical to do so, the dispatcher should release the resource on StatusBoard.

During **UNPLANNED** outages:

If an agency experiences an unplanned outage, they shall contact two other agencies to verify whether those agencies are having the same problem with StatusBoard.

After verifying the outage, agencies shall report the outage on the StatusBoard Hotline number.

ECN will verify the report, contact MN.IT, and send out notification to affected agencies.

When StatusBoard has come back online, ECN shall notify affected agencies that the service is back up.

If no response has been received by the reporting agency within ten minutes, they shall then notify the ARMER Radio Operations Center (ROC). The ROC shall notify affected agencies via ARMER-sys-notify mailing list of the outage.

When StatusBoard has come back online, the ROC shall notify affected agencies that the service is back up.

If an agency experiences any StatusBoard issues other than outages, they shall contact the ECN Standards & Training Coordinator, who will attempt to determine the cause and correct the issue, if possible. If the issue cannot be corrected, all information will be sent to MN.IT for further investigation.

If an agency requires a mutual aid resource during an outage, they shall monitor the resource for existing traffic. An agency shall announce that it is securing control of the resource before commencing tactical communications on the resource.

The ROC is **not** required to monitor StatusBoard or take action to address any interruption in service. It is the responsibility of user agencies to report outages.

For **PLANNED** outages:

ECN shall notify affected agencies prior to a planned outage via ARMER-sys-notify, preferably at least 48 hours in advance, or as soon as ECN is made aware there will be a planned outage. The notice shall provide date, time, and expected duration of the outage. When work is completed, ECN may provide notice that the service is back online.

## **6. Management**

The dispatch center managers for all ARMER and non-ARMER participants shall ensure there is an internal procedure for use of StatusBoard in the dispatch center or on any mobile user's application for which they are responsible.

Local StatusBoard Administrators will be responsible to ensure that:

- Only qualified personnel are granted StatusBoard accounts.

- All users are properly trained on the use of StatusBoard.
- All users remain in compliance with the StatusBoard Standard.
- StatusBoard Administrators shall manage only their agency profile and user accounts unless otherwise designated for another agency.

Dispatch center supervisors may receive initial training from ECN on the use of StatusBoard. Ongoing training shall be conducted internally by agencies and by ECN whenever necessary.

The StatusBoard Administrator workgroup, which is comprised of regional StatusBoard Administrators, will bring identified forward identified -issues and system enhancement recommendations issues and concerns to the Operations and Technical Committee (OTC). will be brought to the Interoperability Committee (IC) for resolution.

# MnFCP Weekly Status Report

Minnesota Department of Public Safety – MnFCP

## EXECUTIVE SUMMARY Status Meeting

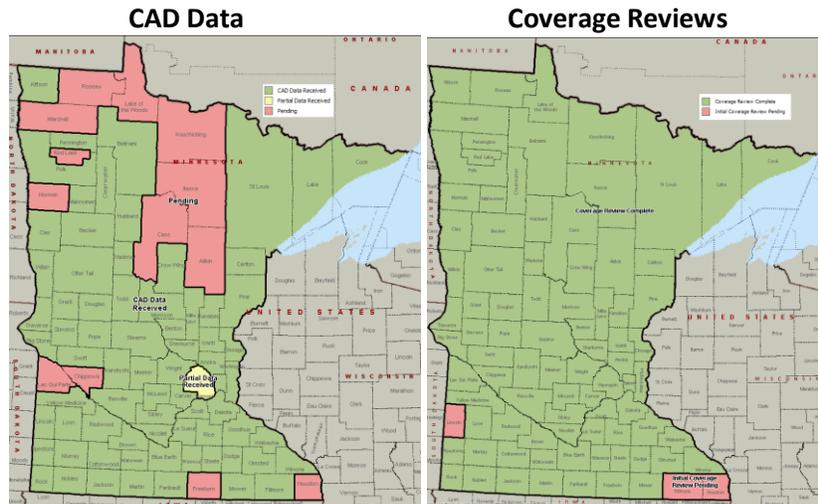
Status on 13 July 2015	Prior Status	Green	Current Status	Green
Green	The project is within 20% variance of the currently approved baseline for budget and schedule, and is expected to substantially meet all of the business objectives established in the startup report.			
Yellow	The project has exceeded 20% variance of the currently approved baseline for budget and/or schedule and is expected to substantially meet all of the business objectives established in the startup report.			
Red	The project is at risk of termination, or at risk of not substantially meeting the business objectives established in the startup report.			
<p><b>Attendees/Invitees:</b></p> <ul style="list-style-type: none"> <li>• DPS: Jackie Mines, Rubin Walker, Dana Wahlberg, Marcus Bruning, Randy Donahue, Rick Juth, Adam Iten, Dan Ross</li> <li>• Televate/IG: Mark Navolio, Rick Burke, Ken Boley, Brandon Abley, Elizabeth Herring</li> </ul> <p><b>UPDATE: User Population Survey</b></p> <p>The User Population Survey is now closed. Thank you to everyone who filled out a survey!</p> <p>For those counties that have not yet participated in a Coverage Review, we will work with you to collect any user population data you are able to provide during and after your Coverage Review.</p> <ul style="list-style-type: none"> <li>• <b>Task 18.01 – Response to 3<sup>rd</sup> Public Notice:</b> <ul style="list-style-type: none"> <li>○ Comments to FirstNet Third (3<sup>rd</sup>) Public Notice has been posted. The Third Notice focuses on the definition of "public safety entity," which determines the extent of FirstNet's legal authority to serve an entity as a primary network subscriber (as opposed to a secondary user under a "covered leasing agreement").</li> </ul> </li> <li>• <b>Task 20 – Minnesota State Plan Decision Process</b> <ul style="list-style-type: none"> <li>○ Review of Ken's outline and comment relevant to the scope of work</li> <li>○ To discuss potential changes</li> </ul> </li> <li>• <b>Task 6 – MOA, Standardize Templates:</b> <ul style="list-style-type: none"> <li>○ Legal Document Report is in process and shall provide a rationale for the MOAs. It will also describe any legal/policy barriers or concerns raised by the MOAs.</li> <li>○ Team would like to coordinate a small group from OAG, MnIT, and MnDOT to further progress on the report</li> <li>○ Update is that I have now spoken with St Louis Co. (Hegrenes), St Cloud (Myers) and Rochester (Thomson). St Louis and St Cloud will be involved in the MOA development process, connecting me with their attorneys and sent or sending me lease samples. Rochester probably not so much (owns few assets, doesn't share today), but I will keep them on the email list so they can monitor content as it develops <ul style="list-style-type: none"> <li>▪ MnDOT: Tim Lee, Shane</li> <li>▪ MNIT: Jim Johnson</li> <li>▪ OAG:</li> <li>▪ Central: Micah Myers</li> <li>▪ NE: Bruce Hegrenes</li> <li>▪ Rochester PD: Dave Thomson</li> </ul> </li> </ul> </li> </ul>				

# Minnesota Public Safety Wireless Data Network Requirements Project

<b>Status on 13 July 2015</b>	<b>Prior Status</b>	<b>Green</b>	<b>Current Status</b>	<b>Green</b>
<b>Green</b>	The project is within 20% variance of the currently approved baseline for budget and schedule, and is expected to substantially meet all of the business objectives established in the startup report.			
<b>Yellow</b>	The project has exceeded 20% variance of the currently approved baseline for budget and/or schedule and is expected to substantially meet all of the business objectives established in the startup report.			
<b>Red</b>	The project is at risk of termination, or at risk of not substantially meeting the business objectives established in the startup report.			

- **Task 4 – Education and Outreach:**
  - Q6 Newsletter: Strategic Build-Out Strategy and introduction into the regional consultation process has been released.
  - Publication: CAD data & Coverage Review document shall be drafted and will be submitted to the counties upon completion of the Coverage Reviews.
  - Pending Items:
    - *Public Safety Broadband for the PSAP* – delivered to Alex Tech
    - Network Requirements (just before Phase 2) – Pending
  - Delivered Items:
    - Training Modules:
      - *What is Wireless Broadband* – Delivered & Posted
      - *LTE Technical Review (Deep Dive)* – Delivered and additional edits provided
- **Task 5 – Stakeholder Entities**
  - User Population Survey will be closing soon (upon completion of the Coverage Reviews). The MnFCP Team to provide personnel counts to MN.IT for inclusion in the development of the Operational Response areas through the PSAP outreach.
- **Task 5 – Public-Private Partner (RFI)**
  - Formal RFI text has been finalized
  - Posting of the RFI was on June 30 and Response by July 30
- **Task 8 – Coverage Reviews**
  - Upcoming Reviews: Lincoln County

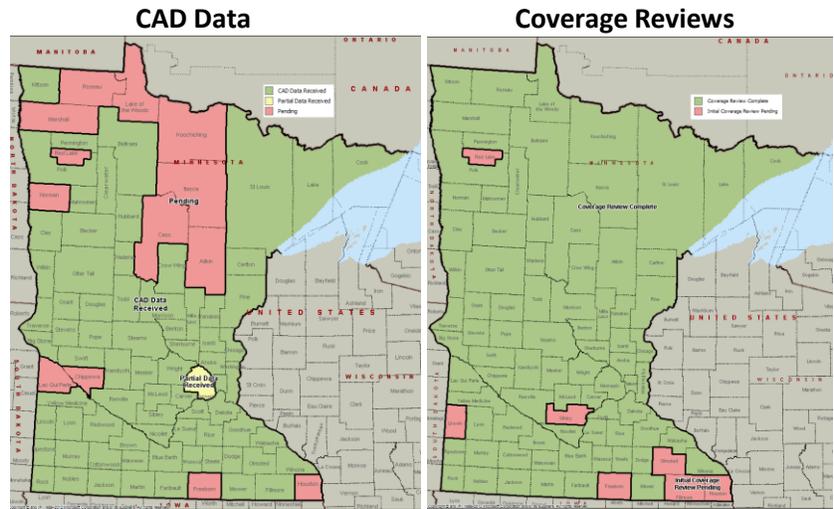
**Status MAPS as of this week:**



# Minnesota Public Safety Wireless Data Network Requirements Project

<b>Status on 13 July 2015</b>	<b>Prior Status</b>	<b>Green</b>	<b>Current Status</b>	<b>Green</b>
<b>Green</b>	The project is within 20% variance of the currently approved baseline for budget and schedule, and is expected to substantially meet all of the business objectives established in the startup report.			
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**Status MAPS as of LAST week:**



**Coverage Review and Work Group Participation**

Quarter	Start Date	End Date	# Agencies	# Individuals	Meetings
3 <sup>rd</sup> Quarter, 2014	7/1/2014	9/30/2014	61	85	13
4 <sup>th</sup> Quarter, 2014	10/1/2014	12/31/2014	85	128	36
1 <sup>st</sup> Quarter, 2015	1/1/2015	3/31/2015	66	99	23
2 <sup>nd</sup> Quarter, 2015	4/1/2015	6/30/2015	38	134	22
3 <sup>rd</sup> Quarter, 2015	7/1/2015	9/30/2015	4	37	4

- **Task 8 – Subcommittees (Work Group)**
  - Final recommendations to be included in report.
  - Regular meetings are complete end of July
- **Task 13 – FirstNet Baseline Review**
  - Data has been uploaded and is ready to proceed.
  - Statistical Analysis is underway; outline to be provided.
- **Task 14 – Phased Build-Out Strategy**
  - 4<sup>th</sup> workgroup session complete; team reviewed strategy in terms of the 5 phases
  - Agenda and description of the Regional meetings sent to all RICs.
    - Presentations, to the Regional RAC, to be held in July-August; estimated dates:
      - South Central date: COMPLETED 8 July, 10am central
      - Southeast date: 16 July, 11am central
      - Southwest date: 22 July, 10am central

Minnesota Public Safety Wireless Data Network Requirements Project

Status on 13 July 2015	Prior Status	Green	Current Status	Green
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Yellow	The project has exceeded 20% variance of the currently approved baseline for budget and/or schedule and is expected to substantially meet all of the business objectives established in the startup report.			
Red	<p>The project is at risk of termination, or at risk of not substantially meeting the business objectives established in the startup report.</p> <ul style="list-style-type: none"> <li>• Northeast date: 23 July, 10am central</li> <li>• Metro date: 28 July, 10am central</li> <li>• Northwest date: 12 August 9am central</li> <li>• Central date: 14 August, 10 am central</li> </ul> <ul style="list-style-type: none"> <li>• <b>Task 15 – Utilization Survey</b> <ul style="list-style-type: none"> <li>○ Utilization survey to be conducted during the regional build out strategy meetings in July / August</li> </ul> </li> <li>• <b>Task 16 – Public Safety Entity Operational Areas</b> <ul style="list-style-type: none"> <li>○ Data format has been defined</li> <li>○ Geocomm: Team to send format to Geocomm</li> <li>○ Need to follow up with the two other GIS services companies:                             <ul style="list-style-type: none"> <li>▪ Pro-West (meeting pending) &amp; BulBerry (no direct contacts yet)</li> </ul> </li> </ul> </li> <li>• <b>Task 17 – Data Usage/Traffic Profiles – CAD Data Manipulation</b> <ul style="list-style-type: none"> <li>○ Methodology is pending</li> </ul> </li> <li>• <b>Task 18.02 – FirstNet Draft RFP Evaluation:</b> <ul style="list-style-type: none"> <li>○ First overview of the RFP has been completed. Televate has send a draft of questions for comment by the team</li> </ul> </li> <li>• Televate IG to provide <b>Invoices and Deliverables</b> <ul style="list-style-type: none"> <li>○ No new milestone completions to report</li> </ul> </li> <li>• <b>Upcoming Events, Travel, New Business:</b> <ul style="list-style-type: none"> <li>○ No events pending</li> </ul> </li> </ul>			

## 1 Notes

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

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

**Allied Radio Matrix for Emergency Response**



# ARMER

## Project Status Report

Reporting Period June 1, 2015 through July 1, 2015

**Executive Summary**

**Overall Status:**

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

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

**Controls**

**Issue Status:**

**Change Status:**

- No pending plan changes

**Accomplishments**

**Accomplishments during this Reporting Period:**

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

**Budget**

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

Project Funding	Original Budget	Spent to Date	Unspent Balance Remaining	Encumbered	Available Balance
Phase 3	\$45,000,000	\$44,952,397.19	\$47,602.82	\$0.00	*COMPLETE
SRB Funds (FY 09)	\$1,902,831.00	\$1,902,831.00	\$0	\$0	COMPLETE
Phase 456 (FY 09)	61,996,957.89	\$61,981,069.99	\$15,887.90	\$15,887.90	\$ 0.00
Phase 456 (FY 10)	\$62,015,407.77	\$61,890,432.09	\$124,975.68	\$124,975.68	\$ 0.00
Phase 456 (FY 11, 12, 13)	\$61,987,634.34	\$48,147,368.51	\$13,840,265.83	\$2,615,305.92	\$ 11,224,959.91
<b>Total Phase 456</b>	<b>\$186,000,000.00</b>	<b>\$172,018,870.59</b>	<b>\$13,981,129.41</b>	<b>\$2,756,169.50</b>	<b>\$ 11,224,959.91</b>
<b>Projected Contingency as of July 1, 2015</b>					<b>\$54,959.91</b>

**Comments:**

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**Scheduled Milestones / Deliverables**

Status updated July 1, 2015

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

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

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

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

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

Completion Targets

ARMER all Phases:

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

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

- 7.15 upgrade scheduled to begin May 2016. Lock down for any system changes prior to the 7.15 upgrade will be around the beginning of April 2016.

**Site improvements**

- We also have 2 sites that need shelter upgrades to get air handlers and generators upgraded. One of these sites currently under construction.
- Still working on the addition of card key reader to the equipment shelters. Parts are in. Working on installs, 80% of the sites completed.
- We are also still working on replacing a number of towers that are on the air, but are not structurally up to standards and need to be replaced. This has limited some of the county requests for other antenna system and microwave additions.
- We are also reviewing some of our leased sites. Plans had always been to build towers in these areas, but to get the project moving we leased site to get on the air. In review of some of the land and lease cost it would make sense to find land in these areas and build towers. Also looking at long term land lease from private parties, would prefer to have towers on state, County or City owned land.

**Microwave improvements**

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

**VHF interop layer**

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

**System improvements**

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

**Old towers that need replacement**

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

## ARMER Construction Budget (Remaining Work)

Unencumbered Fund Balance ( As of July 1, 2015)					<b>\$11,224,959.91</b>
Site Name <small>(Green - site on air)</small>	County	Description	Land/ Construction	Estimate to Complete	Balance
Russell	Lyon	Replace Tower	Spec on street	\$250,000.00	\$10,974,959.91
Island Lake	Beltrami	New tower	Spec on street	\$505,000.00	\$10,469,959.91
Lutsen	Cook	Replace Shelter	Spec on street	\$175,000.00	\$10,294,959.91
Tower	St Louis	Add Shelter/site work	Spec on street	\$150,000.00	\$10,144,959.91
Cascade River	Cook	New tower	DNR	\$840,000.00	\$9,304,959.91
Berner	Clearwater	New tower	Ready - On Hold	\$505,000.00	\$8,799,959.91
Cromwell	Carlton	New tower	Purc	\$605,000.00	\$8,194,959.91
Duluth South	St Louis	New tower	Lease	\$280,000.00	\$7,914,959.91
Finland	Lake	Replace Tower	DNR/Envir	\$440,000.00	\$7,474,959.91
NE Lake County	Lake	New tower	DNR/Envir	\$1,210,000.00	\$6,264,959.91
Lima Mt	Cook	New tower	DNR/Envir	\$960,000.00	\$5,304,959.91
Sawbill	Cook	New tower	Envir/Lease	\$1,310,000.00	\$3,994,959.91
Devil Fish	Cook	New tower	Envir/Lease	\$1,210,000.00	\$2,784,959.91
Red Lake	Beltrami	New tower	Indent Land	\$505,000.00	\$2,279,959.91
Eden Valley	Meeker	New tower	Envir/Lease	\$500,000.00	\$1,779,959.91
Lake Crystal	Blue Earth	New tower	Indent Land	\$575,000.00	\$1,204,959.91
Madelia	Watonwan	New tower	DOT/Envir	\$430,000.00	\$774,959.91
Molde	St Louis	Replace fire tower	DNR/Envir	\$320,000.00	\$454,959.91
<b>PENDING WORK</b>					
Card Key				\$50,000.00	\$404,959.91
Site clean up, shelter and tower removals				\$300,000.00	\$104,959.91
MSO - Backup equipment				\$50,000.00	\$54,959.91
Microwave DC power - Upgrades to meet run time required				\$0.00	\$54,959.91
<b>TOWER REPLACEMENTS (This work being held until above projects completed)</b>					
Hawley	Replace tower			\$600,000.00	
Freedhem	Replace tower			\$600,000.00	
Middle River	Replace tower			\$600,000.00	
Theif River Falls	Replace tower			\$600,000.00	
Windom	Replace tower			\$600,000.00	
Virginia	Replace tower			\$600,000.00	
Cass Lake	Replace tower			\$600,000.00	
Viola	Replace tower			\$600,000.00	
Kimball	Replace tower			\$600,000.00	
Hoffman	Replace tower			\$600,000.00	
New London	Replace tower			\$600,000.00	
Woodland	Replace tower			\$600,000.00	
Littlefork	Replace tower			\$600,000.00	
Roosevelt	Replace tower			\$600,000.00	
Hewit: Land Purchase, replace tower.				\$500,000.00	
Scandia: Need to look at land purchase.				\$100,000.00	
Geneva: Need to look at land purchase, new tower ?				\$500,000.00	
Mapleton: Find land and build new tower				\$500,000.00	
Red Wing: Land purchase				\$100,000.00	

\$10,100,000.00