

# Minnesota





# Minnesota Department of Public Safety

## ARMER

*A resource public safety officials  
need to do their job*

**Presented by: Scott Wiggins, Director  
Division of Emergency Communication Networks**





# Overview

- History of Communications Planning
- System Performance – Major Events
- ARMER at Present
- State Governance Structure
- Lessons Learned





# *History of Communications Planning*





# Initial Exploration

- 1970's – Virtually all of the VHF and UHF channels were gone
- 1980's – Realization that the fewer than 100 800 MHz frequencies for metro would not support the implementation of multiple individual systems
- 1988 – Presentation of shared trunk radio concept was coordinated and funded by a committee originally created to coordinate the implementation of Enhanced 911 in the metro area





# Initial Exploration

- 1989 – Hennepin county began exploring countywide 800 MHz trunked system; the concept was expanded to a metro wide approach

## Original Vision

- A radio system that a dog catcher in Stillwater, MN could talk to a dump truck driver in Golden Valley, MN





# Gorbachev Visit

- June 2, 1990 – Russian Premiere Mikhail Gorbachev and his wife visited Minnesota
- The event required broad coordination of motorcades across multiple jurisdictions with separate itineraries for each
- KGB require multiple dump trucks filled with sand to surround presidential vehicle (trucks came from many different agencies)
- Follow up reviews of the event noted communications difficulties as an issues





# Initial Studies

- 1990 – The Metropolitan Council (a regional planning entity) initiated an examination of the technical, financial and political feasibility of a shared system
- Two studies conducted over next three years
  - 1<sup>st</sup> – Can it be done and what will it cost to within 20%
  - 2<sup>nd</sup> – Different vendor, can it be done and what will it cost to within 10%
- 1993 – RFP was developed for the construction of a 800 MHz trunked backbone in the metro area





# 1995 Legislation

- Initial Support
  - Strong support Hennepin County, Minneapolis, Mn/DOT, Metro Transit, State Patrol
  - Luke warm support from Ramsey County and St. Paul
  - Strong opposition from county and local governments in five other metro counties
- 1995 Legislation
  - Created the Metro Radio Board
  - Provided authority to build, own and operate a shared metro wide trunked radio system for state and local users
  - Required Mn/DOT and Metro Transit buses to operate on the system





# 1995/1997 Legislation

- Additional Issues (1995 Legislation)
  - Legislature specified local participation could not be mandated
  - Require counties in metro area to conduct radio communications needs analysis and develop plans to meet those needs
  - Required Mn/DOT to apply for and hold all available 800 MHz frequencies from the FCC
- 1997 Legislation
  - 911 fee increased 4¢ with funds allocated to MRB for debt service on 911 revenue bonds to construct the system the metro system
  - People started paying attention





# Statewide Plan

- 2001 – Mn/DOT presents plan to the legislature for statewide communication system
- 2002 – Legislature created Statewide Public Safety Shared Communication System Planning Committee
- 2004 – Statewide Radio Board established by legislature
  - 21 members(1/3 State; 1/3 Local Metro; 1/3 Local Greater MN)
  - Created concept of Regional Radio Boards
  - MRB transitions to regional board called Metropolitan Emergency Services Board (MESB)
  - SRB authorized to establish operational and technical standards of ARMER and plan implementation





# Statewide Funding

- 2005 – Phase 3 (23 counties in Greater MN) and partially funded local enhancements in metro (\$62.5 million)
- 2007 – Phases 4, 5, and 6 funded with 30¢ increase in the 911 fee (\$186 million in revenue bonds authorized)
  - Funded backbone operating costs
  - Answered the two biggest questions:
    - Would it ever be built?
    - What would it cost to operate on the system?





# ***System Performance – Major Events***





# I-35W Bridge Collapse

- Over 100 different agencies responded
- System use doubled
- Over 16,000 radios operating on the system during peak hour
- 114,000 individual Push to Talks in first six hours
- System Redundancy tested





# I-35W System Analysis

- 96% - ARMER system performed well during the incident
- 95% - Digital audio clarity (including signal Coverage) of ARMER system was good
- 83% - ARMER provided them with appropriate capacity and access to the network for their needs
- 12% - Training in the use the ARMER system was inadequate





# I-35W Focus Groups

**“Without ARMER this incident would have been a catastrophe.”**

**“We have removed communications as an element of failure in disasters. Now we can only blame our use of the system, not the technology.”**





# FEMA I-35W Report

- In the “Best Practices: Notable Successes in the Response to Bridge Collapse

3. The new 800 MHz radio system streamlined communications and enabled successful connections among a variety of organizations and agencies. The City of Minneapolis made a substantial downpayment on public protection when it purchased the new radios and system. Emergency responders stated that the system “saved our lives,” was “fantastic” and “incredible.”

U.S. Fire Administration/Technical Report Series, I-35W Bridge Collapse and Response

[http://www.usfa.dhs.gov/downloads/pdf/publications/tr\\_166.pdf](http://www.usfa.dhs.gov/downloads/pdf/publications/tr_166.pdf)





# Republican National Convention

- Over 3500 law enforcement from across the country
- 18 Tactical talkgroups in use (plus regular system use)
- From August 31<sup>st</sup> to September 6<sup>th</sup> total wait time for all talkgroups 105 seconds
- Longest wait 20 seconds, most were a second





# Communication Events

- Radio system is intended for day-to-day use
  - School bus crashes
  - Pipeline ruptures
  - Chemical leak at schools
  - Prisoner transports
  - Multi-jurisdictional chases
  - Multi-alarm fires





# ***ARMER at Present***





# ARMER Vision

- All agencies supporting public safety in the State of Minnesota (local, regional, tribal and non-governmental)
- Will have routine access to a communication infrastructure (voice and data)
- And participate in a governance structure supporting that infrastructure that is able to provide seamless communication interoperability between jurisdictions, across public safety disciplines
- Necessary to support day-to-day operations, regional operations, statewide operations
- And across state and national borders, when necessary, that is capable of supporting National Incident Management System





# Statewide Public Safety Interoperability Program

- Program established in 2007
- Program Manager's Role:
  - Maximize the development of public safety interoperability among all public safety agencies within the state (including tribal and non-governmental agencies) by
    - Coordinating the development of technical and operational standards for interoperability (legacy systems, neighboring states, Canada and ARMER irrespective of spectrum)
    - Coordinating the Statewide Radio Board's Interoperability Committee
  - Manage 3 Regional Interoperability Coordinators (RIC)
    - Provide direct support to regional radio boards





# Statewide Public Safety Interoperability Program

## Program Manager

Tom Johnson

## Regional Interoperability Coordinators

### Northern Region

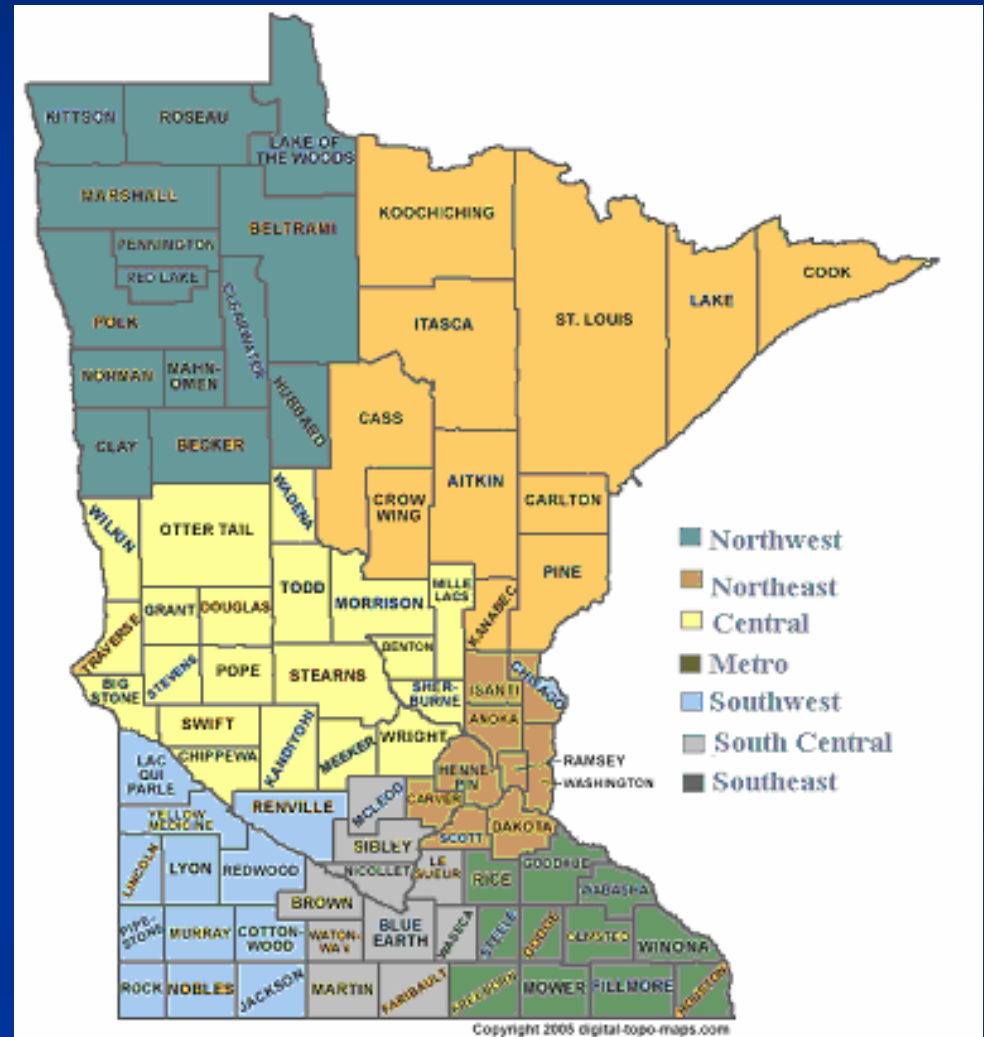
Bill Bernhjelm

### Central Region

Tom Justin

### Southern Region

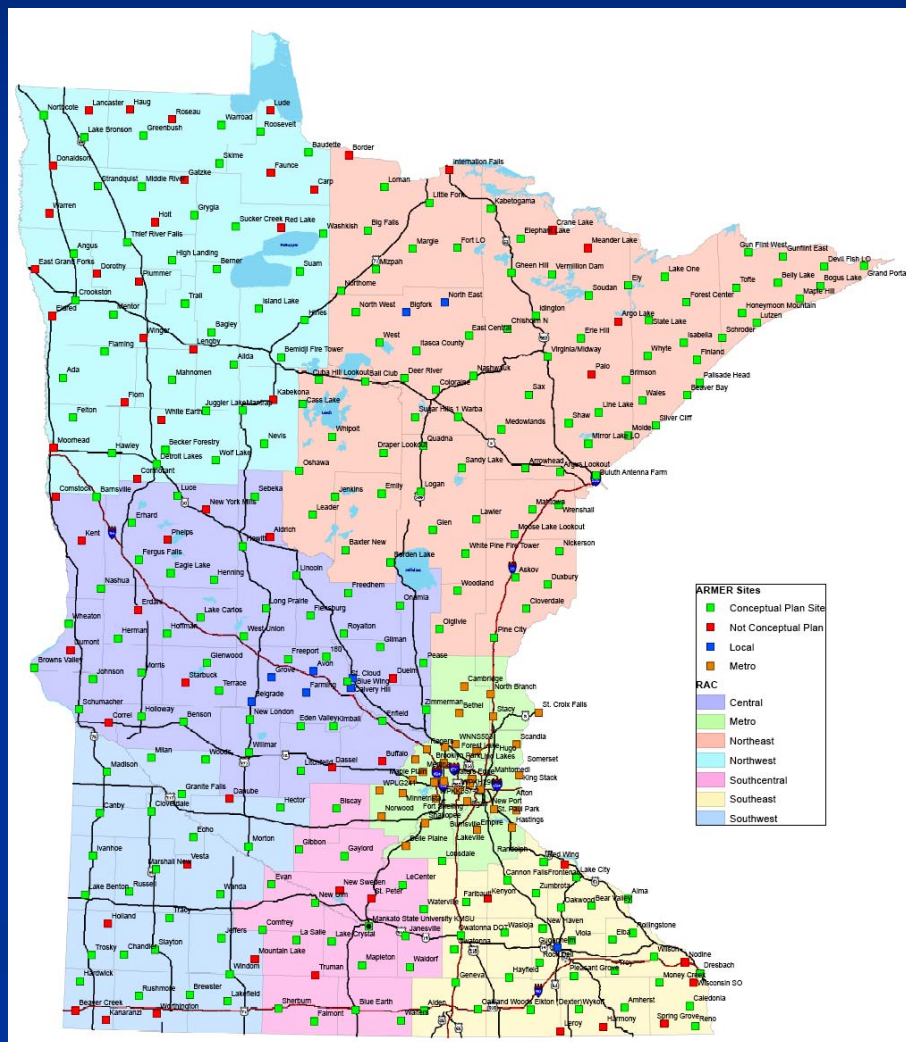
Steve Borchardt





# ARMER Backbone

- Statewide infrastructure of towers, microwave and RF equipment necessary to provide coverage and interoperability throughout the state
- P25 trunked 700/800 MHz system capable of meeting the needs of public safety agencies (city, county, state agency, NGA and tribal) throughout the state
- State of the art system that is scalable and robust
- Capable of linking legacy systems together through regional and statewide talkgroups (system of system approach)





# ARMER Timeline

- Phase Two (local enhancements metro area) – Full integration of all public safety in seven metro counties completed by end of 2008
- Phase Three – Substantial completion of Phase Three by end of 2008
- Phase 456
  - Equip existing radio sites with 700/800 MHz radio equipment to provide 75% mobile coverage statewide by the end of 2009 or 1<sup>st</sup> quarter of 2010
  - Substantially complete (95% of base radio sites operational) construction of the ARMER backbone by December 31, 2012





# Pending Studies

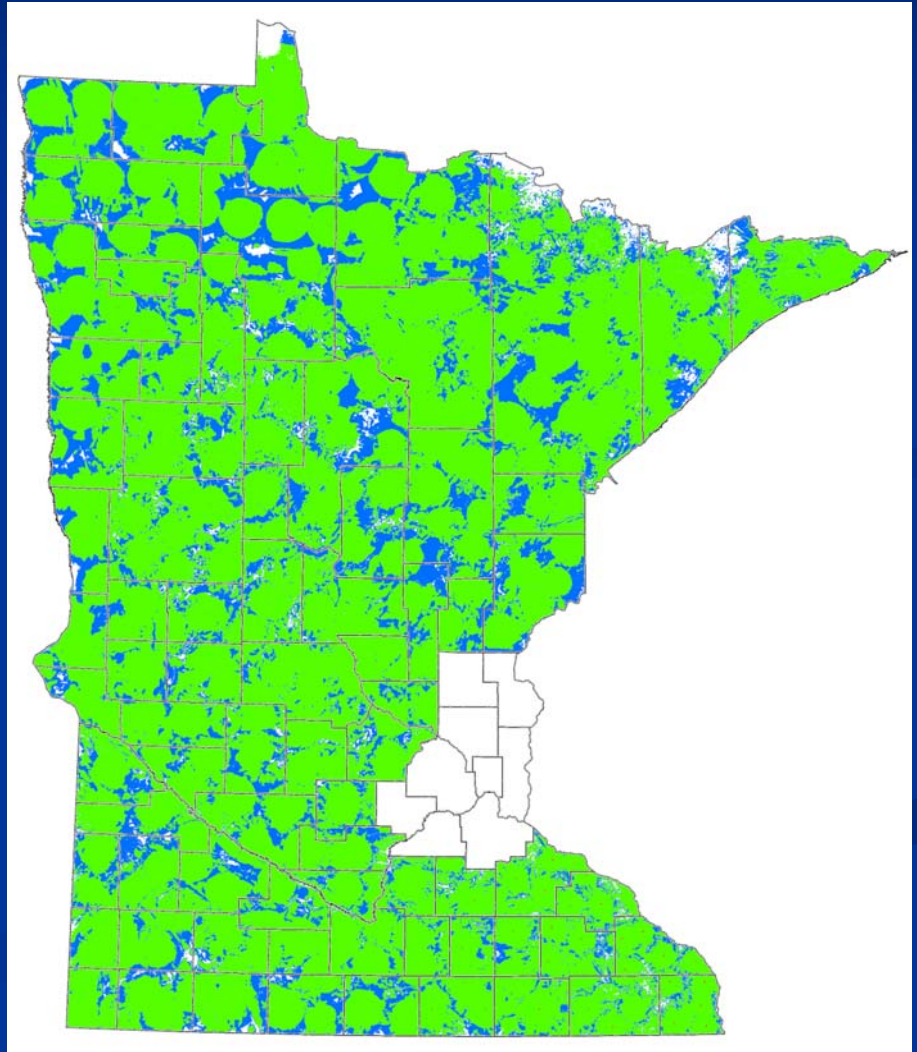
- Regional and Local Assessments
  - Assessment of current communication infrastructure
  - Assessment of needs
  - Identify cost of alternatives (VHF and ARMER) – 47 Counties costing \$1.8 million
- State Agency Integration Assessment
- UHF/VHF resources
- Data integration





# 95% County-by-County Statewide Coverage

- Green indicates 40dbu of signal strength
- Blue indicates 33dbu of signal strength
- White is less than 33dbu, but radios still may work
- 20dbu loss factored in
- Propagation analysis done using both the Longley-Rice and Bullington software programs





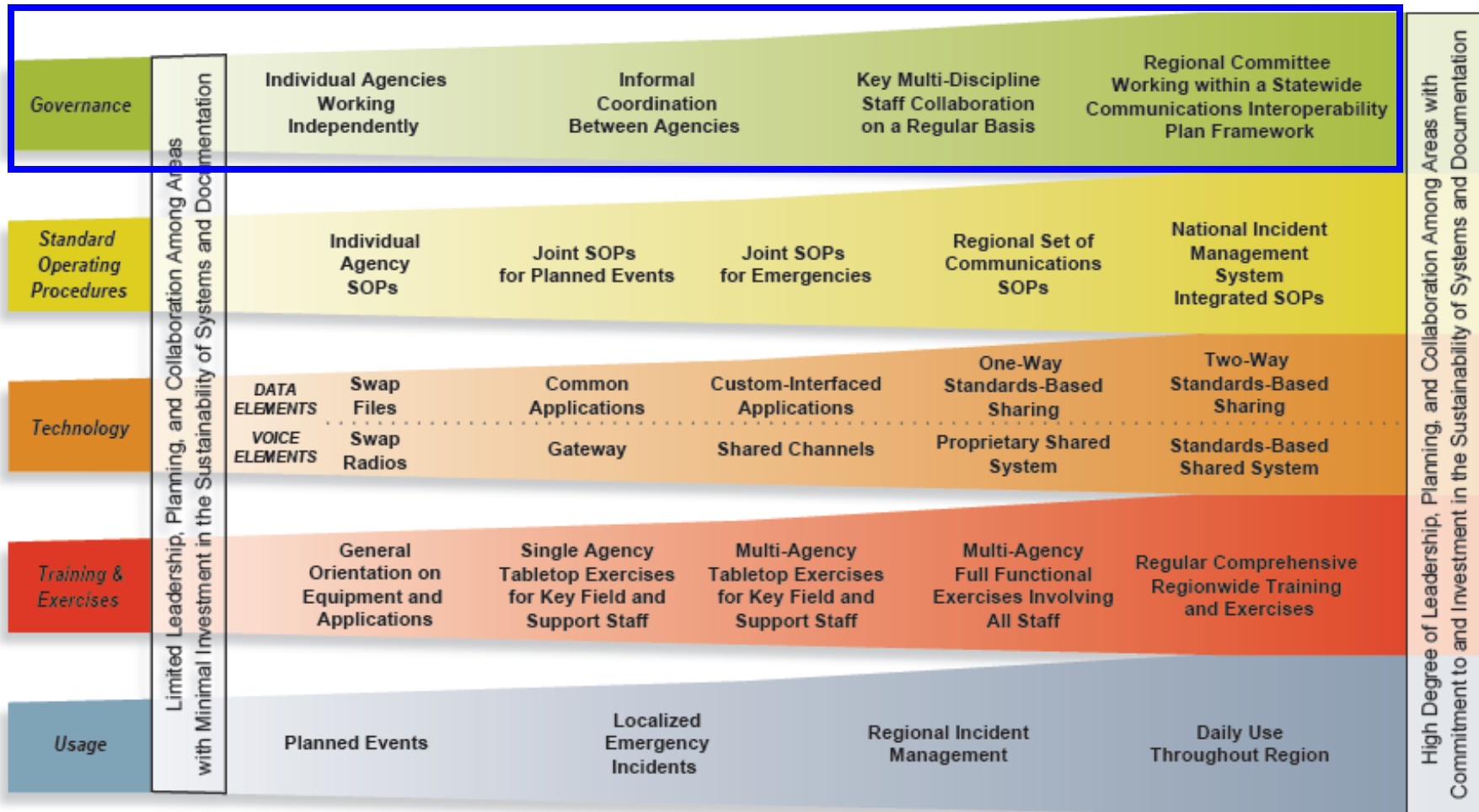
# ***State Governance Structure***





# SAFECOM Continuum

## Interoperability Continuum





# Governance Structure

- Regional Radio Boards are made up of elected officials (County Commissioners and City Council members)
  - Establish subject matter expert at elected level
  - Involve the people who must fund the renewal of communication systems
- Legally recognized entity allows for access to grants; can enter into contracts; manage funds; create policies





# Governance Structure

- Local Control – regions may establish regional technical and operational standards
- Encourages expanded view of public safety users eligible to operate on system
- Emphasize interoperability with all public safety users

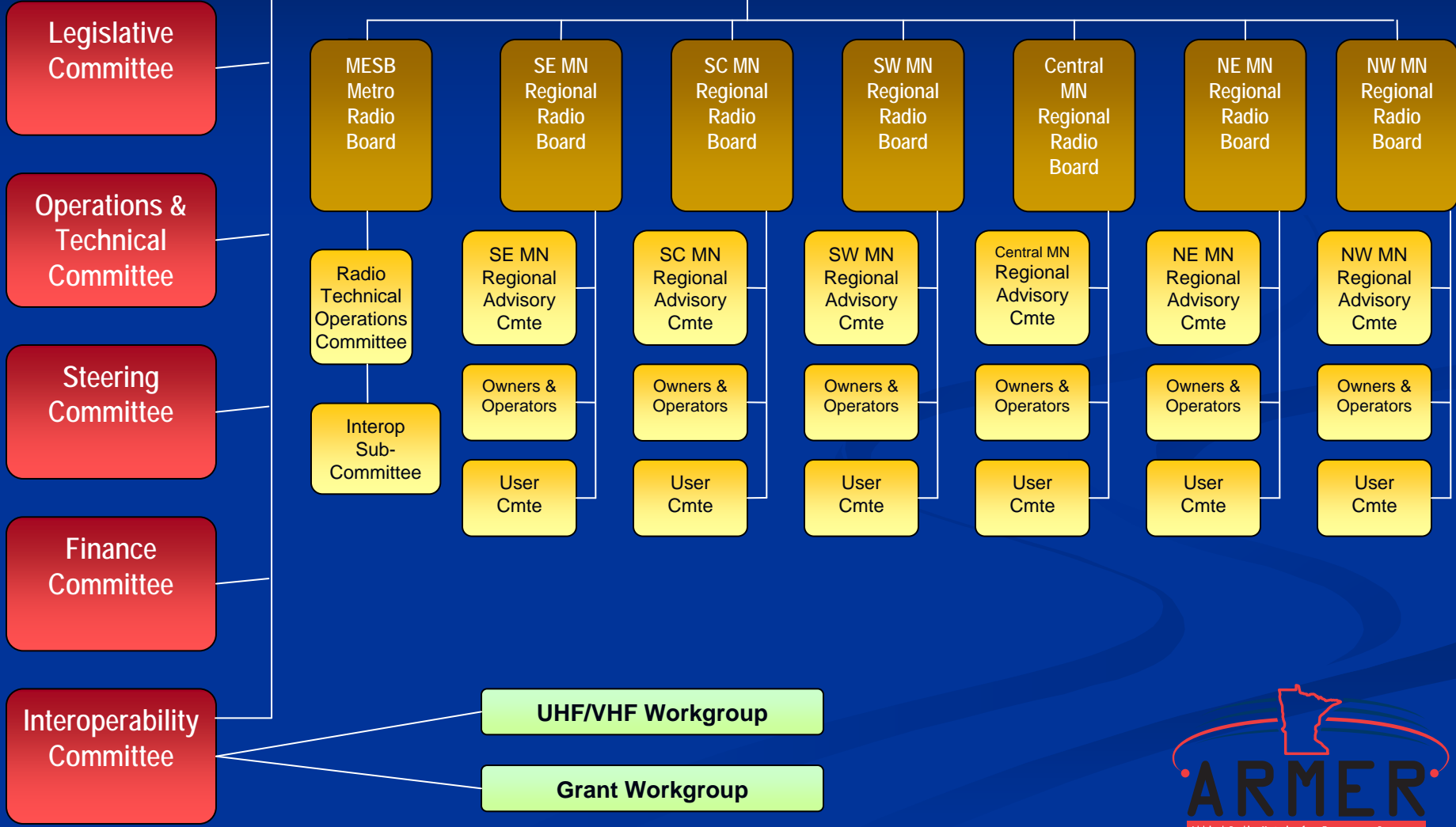




# Statewide Radio Board

(Statewide Interoperability Executive Committee)

Chair: Assistant Commissioner Tim Leslie





# *Lessons Learned*





# ARMER Outreach

- ARMER Brochure
- Changed Division name
- Hired three RICs
- Developed joint ARMER/911 newsletter
- Purchased new display booth
- Redoing website
- Presenting everywhere

## What You Should Do

The FCC 2012 narrow-banding requirement is a lot closer than you think. It will take two to three years to study, design, construct and implement a new radio system.

### Beginning today, here's what you can do:

- Start evaluating your communications needs.
- Get involved in your Regional Advisory Committee (RAC) or Regional Radio Board (RRB).
- Encourage partnerships by working with local leaders who can help break down barriers that keep communities from working together.
- Develop multi-jurisdiction, cross discipline strategies and plans for a coordinated response to disasters.
- Study the communications alternatives for your county: VHF analog, VHF digital or ARMER. Make an informed business decision based on your county needs.
- Spread the word. Everyone needs to understand the benefits of interoperability, and the risks without it.
- Embrace standardized equipment (P25) and operational practices – it's critical to statewide interoperability success.
- Make funding interoperability a top priority. Federal grants are available to get started. Other funding must be secured for local system upgrades and operations needed.

Find out how to get involved in the RAC or RRB in your area by contacting one of the following agencies:

Central Minnesota RAC and RRB  
at [www.cmnradio.org](http://www.cmnradio.org)

South Central Minnesota RAC  
at [www.scmradio.org](http://www.scmradio.org)\*

Southeast Minnesota RAC  
at [www.semradio.org](http://www.semradio.org)

Southwest Minnesota RAC  
at [www.swmradio.org](http://www.swmradio.org)\*

Northwest Minnesota RAC  
at [www.nwmradio.org](http://www.nwmradio.org)

Northeast Minnesota RAC  
at [www.nemradio.org](http://www.nemradio.org)\*

Metropolitan RRB  
at [www.mn-mesb.org](http://www.mn-mesb.org)

*\* These Web sites may still be under construction.*

To learn more about the history of ARMER and the Statewide Radio Board, logon to [www.srb.state.mn.us](http://www.srb.state.mn.us).

Any questions about ARMER or assistance in developing interoperability can be directed to Scott Wiggins at 651-201-7546, [scott.wiggins@state.mn.us](mailto:scott.wiggins@state.mn.us) or Tom Johnson at 651-201-7552, [tom.m.johnson@state.mn.us](mailto:tom.m.johnson@state.mn.us).



Minnesota Department of Public Safety  
ARMER Program  
444 Cedar Street, Suite 137  
St. Paul, MN 55101-5100  
651-201-7000  
[www.dps.state.mn.us](http://www.dps.state.mn.us)

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## Minnesota ARMER Program





# Naysayer

- Constant Education
- May be politically or financially motivated
- Are afraid of change and loss of control
- Will be one over one heart and one mind at a time





# Summary

- Develop a vision, but be able to adjust the vision to a reality (keep your eye on that vision)
- Not everyone will agree with the vision, but your strongest opponents are frequently your strongest advocates once they turn the corner (if you have treated them respectfully)
- Initial metro area needed key anchor tenants (Hennepin County and City of Minneapolis)





# Summary

- Engagement of elected officials into the process
- Dedicated source of funding
- Broadly define public safety, EMS have been some of the strongest advocates
- This is a legacy issue that will fundamentally change the way emergency services are delivered





**How did you get here?**

# Relationships





# The End – Thank You

Scott Wiggins, Director  
Division of Emergency Communication Networks  
*(ARMER/9-1-1 Programs)*  
444 Cedar Street, Suite 137  
St. Paul, MN 55101  
Office: 651-201-7546  
Cell: 651-983-9306  
E-mail: [scott.wiggins@state.mn.us](mailto:scott.wiggins@state.mn.us)

