



**DEPARTMENT OF
TRANSPORTATION**



**OFFICE OF STATEWIDE
RADIO COMMUNICATIONS**

Agenda

Why ARMER?

History of system development and Project Plan

Minnesota Public Safety Events

Public Safety Statewide Radio Communications Plan adopted according to Mn Statute 403

Governance Roles and Responsibilities Mn Statute 403

MnDOT Office of Statewide Radio Communications

ARMER backbone system elements

ARMER Historical Funding

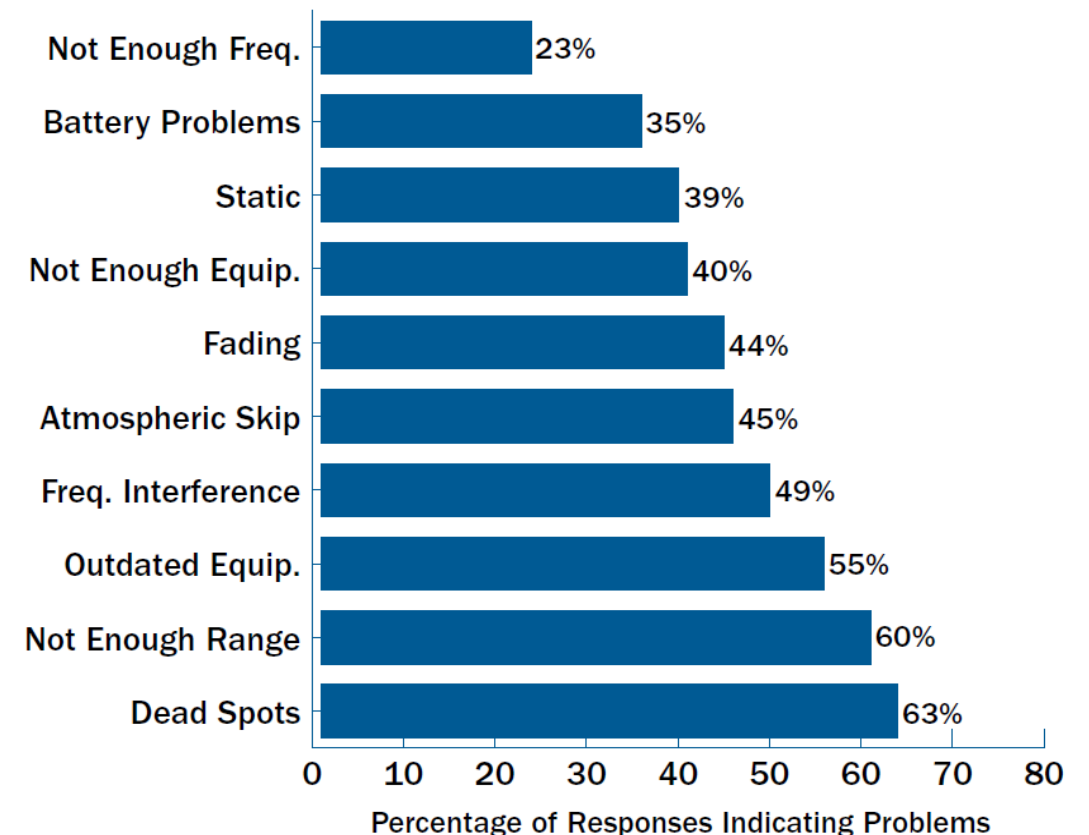
Statistics

Why ARMER?

Public Safety Survey Responses

- Interoperable communications, ability to communicate simultaneously between multiple public safety agencies. Each jurisdiction (city, county, tribal, etc..) was responsible for their own radio system, very challenging to communicate with partner agencies for daily operations and during a public safety event.
- Federal Communications Commission (FCC) mandate required substantial replacement of old communication systems used by local governments and state agencies prior to 2013.
- Legacy systems were lacking in geographical coverage and capacity.
- Opportunities for partnerships and sharing of sites.

Problems with Existing Radio Systems



Why ARMER?

- The continued critical need for emergency responders to communicate with each other at emergency events nationally and locally here in Minnesota.
- Some examples nationally of these challenges:
 - 1995 Oklahoma City bombing, firefighters and police used runners to carry messages from one command center to another.
 - 9/11 World Trade Center attack, police received radio message to evacuate; firefighters did not.
 - 2005, Hurricane Katrina, responders were limited to a handful of CB-like “mutual aid” radio channels that were inadequate and overwhelmed by radio traffic.



Why ARMER?

- Locally we experienced an event that exposed the Metro's lack of interoperable communications and kick started the outreach and initial discussions with the Legislature to create a public safety interoperable communications system within the Metro area.
- 1994 Police Officer Timothy Jones and his canine, Laser:

[Police Officer Timothy James Jones, St. Paul Police Department, Minnesota \(odmp.org\)](http://odmp.org)



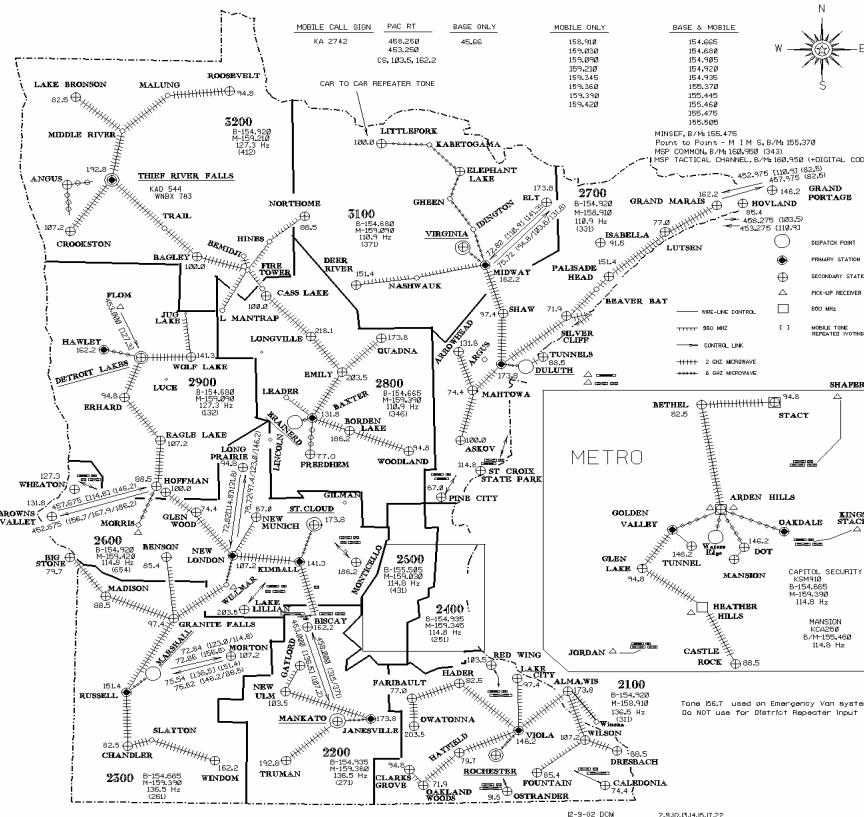
Why ARMER?

1959 – 2000: MnDOT constructed towers and maintained the State's original radio system which supported MnDOT, State Patrol and DNR.

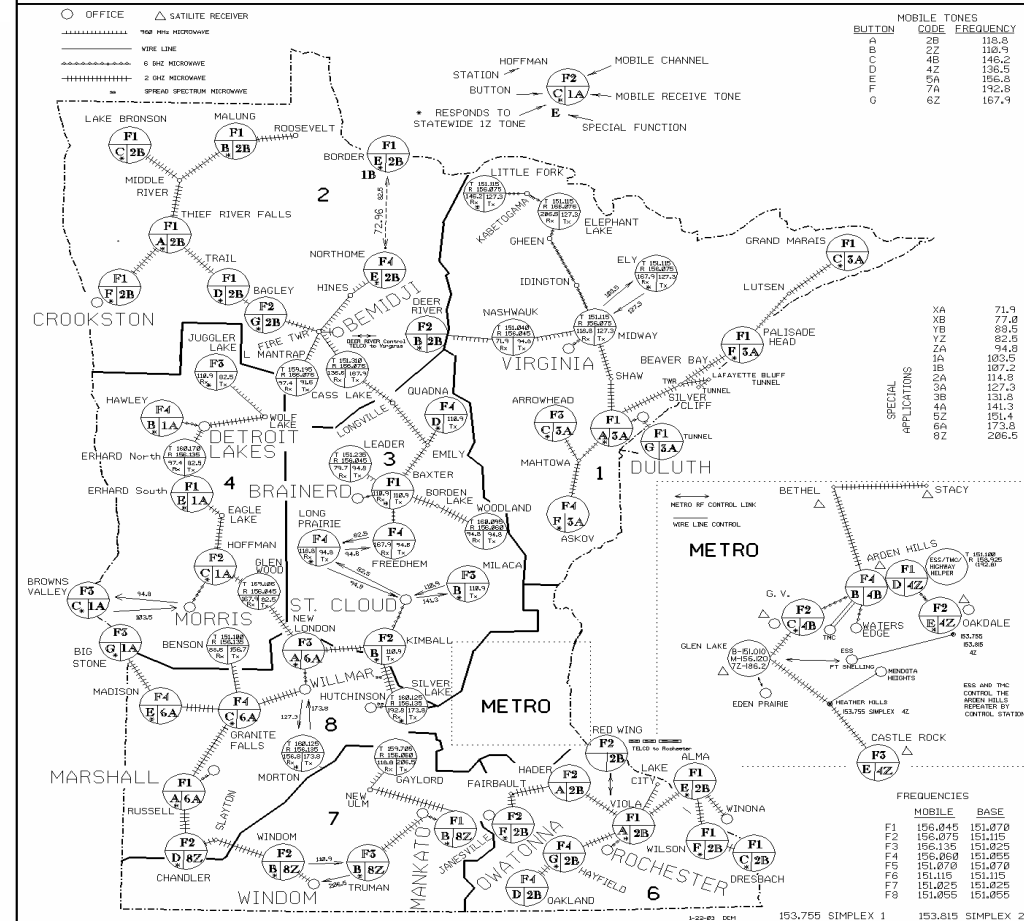
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Dec 9, 2002

MINNESOTA STATE PATROL RADIO SYSTEM



Mn / DOT Radio System



History of System Development



- 1994:** Metropolitan Council proposed construction of a region-wide shared radio system in the metro area to be constructed in phases.
- 1995:** Planning and Development began with formation of Metropolitan Radio Board which is currently named the Metropolitan Emergency Services Board (MESB). Proposed legislation that MnDOT would own, operate and maintain the radio system.
- 2001:** Department of Public Safety, Department of Administration, and MnDOT propose a statewide shared radio system to the Legislature

History of System Development

**A Conceptual
And
Logical Architecture
For A
Statewide Wireless
Communications Plan**

PREPARED BY:

Michael Hogan, Communications Planning Director
Roger Kochevar, P.E., Electrical Engineer
James Mohn, P.E. Radio Engineer II
Robert Prudhomme, Radio Engineer
Tim Lee, P.E., Metro 800 MHz Project Manager

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF ELECTRONIC COMMUNICATIONS
395 John Ireland Boulevard
St. Paul, Minnesota 55155-1899

(Revised Sept. 2002)

2002: Statewide Public Safety Radio System Planning Committee comprised of state and local governments, both from the metro area and greater Mn, developed a plan based on requirements set forth in Mn legislation passed in the 2002 session. (Chapter 401, Art.1, Sec. 12; and Chapter 401, Art. 2, Sec. 1)

MnDOT Office of Electronic Communications (Office of Statewide Radio Communications) prepared and submitted a technical conceptual plan to the Legislature.

History of System Development – Project Plan

State of Minnesota

Department of Public Safety
Department of Transportation
Department of Administration
Department of Natural Resources

Public Safety Statewide Radio Project

Project Plan and Scope Statement

Revised

December 2002

Submitted by: *Mancel Mitchell*
Acting Commissioner, Department of Public Safety
The Public Safety Statewide Radio System
Planning Committee

2002: Public Safety Statewide Radio Project Plan was presented to the Governor of Minnesota, Chair of the Senate Crime Prevention Committee, Chair of the Senate State Government Budget Division, Chair of the Senate Capital Investment Committee, Chair of the House Judiciary Finance and Policy Committee, Chair of the House Capital Investment Committee.

Project Plan was completed by Department of Public Safety, Department of Transportation, Department of Administration and Department of Natural Resources.

Recommendations to provide a reliable communication system to meet the needs of state agencies and their local government partners, and to improve the safety, security and mobility of the public.

Create partnerships with other units of government and public service organizations to improve interoperability and share resources to build a statewide communication infrastructure that is integrated, practical and strategic.

History of System Development – Project Plan

State of Minnesota

Department of Public Safety
Department of Transportation
Department of Administration
Department of Natural Resources

Public Safety Statewide Radio Project

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2002 Project Plan Scope:

State managed, owned and operated statewide “Backbone” infrastructure.

Offering the option of state, local public and private public safety entities as defined by FCC Rules & Regulations to purchase compatible radio equipment and use the system.

The Minnesota Department of Transportation’s Office of Electronic Communications has the experience, skills, abilities, and resources to manage and implement the statewide technical infrastructure over the next several years.

The system will be deployed first to serve the public safety and public services communications needs and secondarily will support local jurisdictions and other public/private interests allowed under the FCC Rules & Regulations.

History of System Development- Project Plan

2002 Project Plan Recommendations:

- Establish a project team to deploy the project.
- The development and application of statewide standards and guidelines for the infrastructure.
- Initiation of an education program on radio usage and optimization of benefits.
- Exploration of various funding mechanisms that maybe available to support the implementation of the system, including but not limited to 911 fee increase.
- Department of Public Safety to provide statewide leadership in the design, implementation and maintenance of a statewide system, according to current processes and practices of the MnDOT Office of Statewide Radio Communications.
- Governance: Establish the Public Safety Radio System Planning Committee to develop a project plan to implement statewide.
- Six project phases to facilitate budget, management and resources.
- 95% coverage for mobile radios by county across Minnesota excluding BWCA
- Estimated capital costs \$201 Million

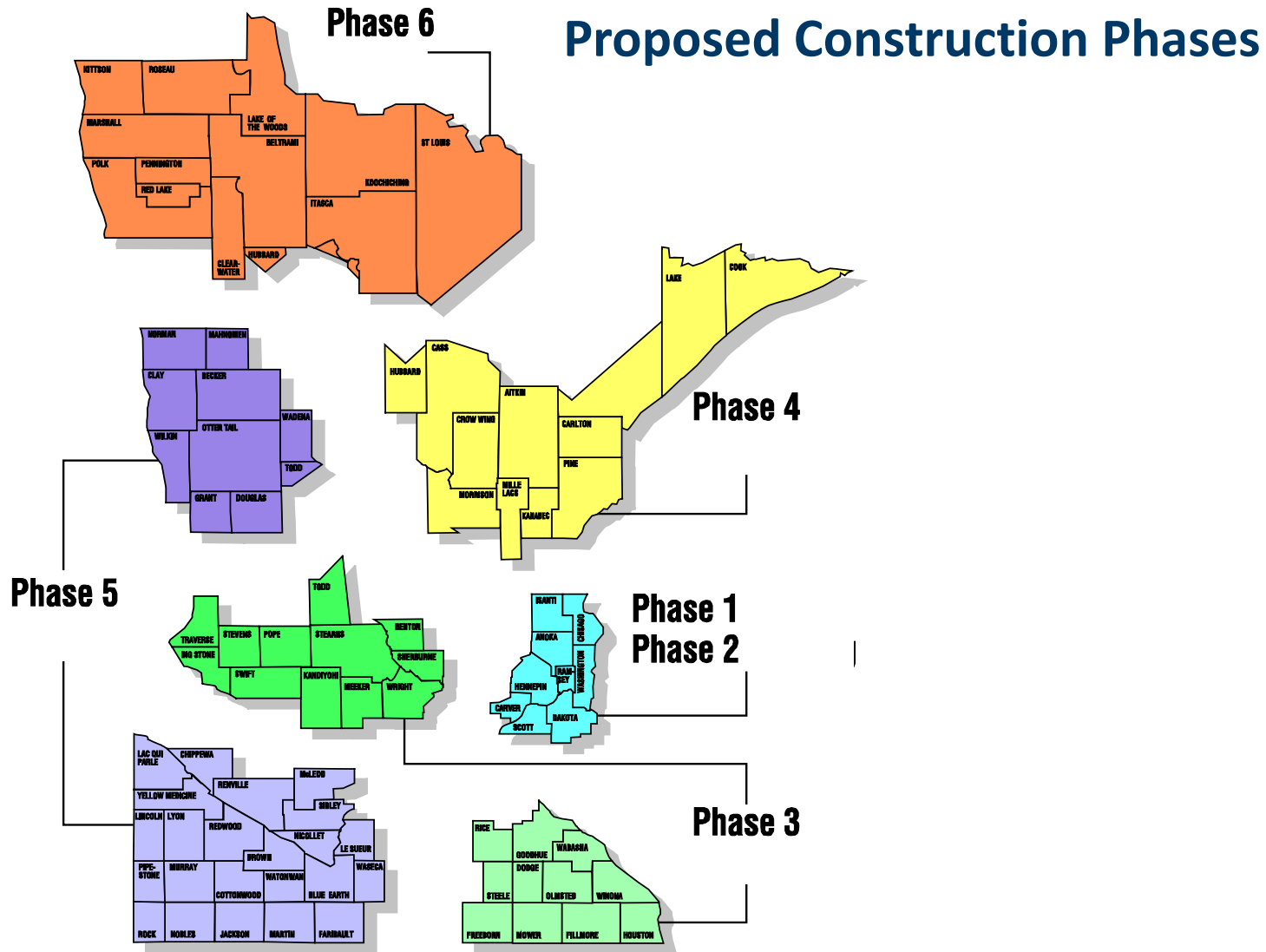
History of System Development- Project Plan

2002 Project Plan Recommendations:

Local Agency Involvement:

- Voluntary basis
- Enhancements will be the fiscal responsibility of the affected local unit of government
- Locals will be responsible for purchasing and maintaining their subscriber units (mobiles and portables)

Project Plan



Minnesota Public Safety Events

2007:

Worst public safety catastrophe in State's history.

35W Bridge Collapse

Cellular networks were crippled while ARMER provided seamless communications during search and rescue efforts.



Minnesota Public Safety Events

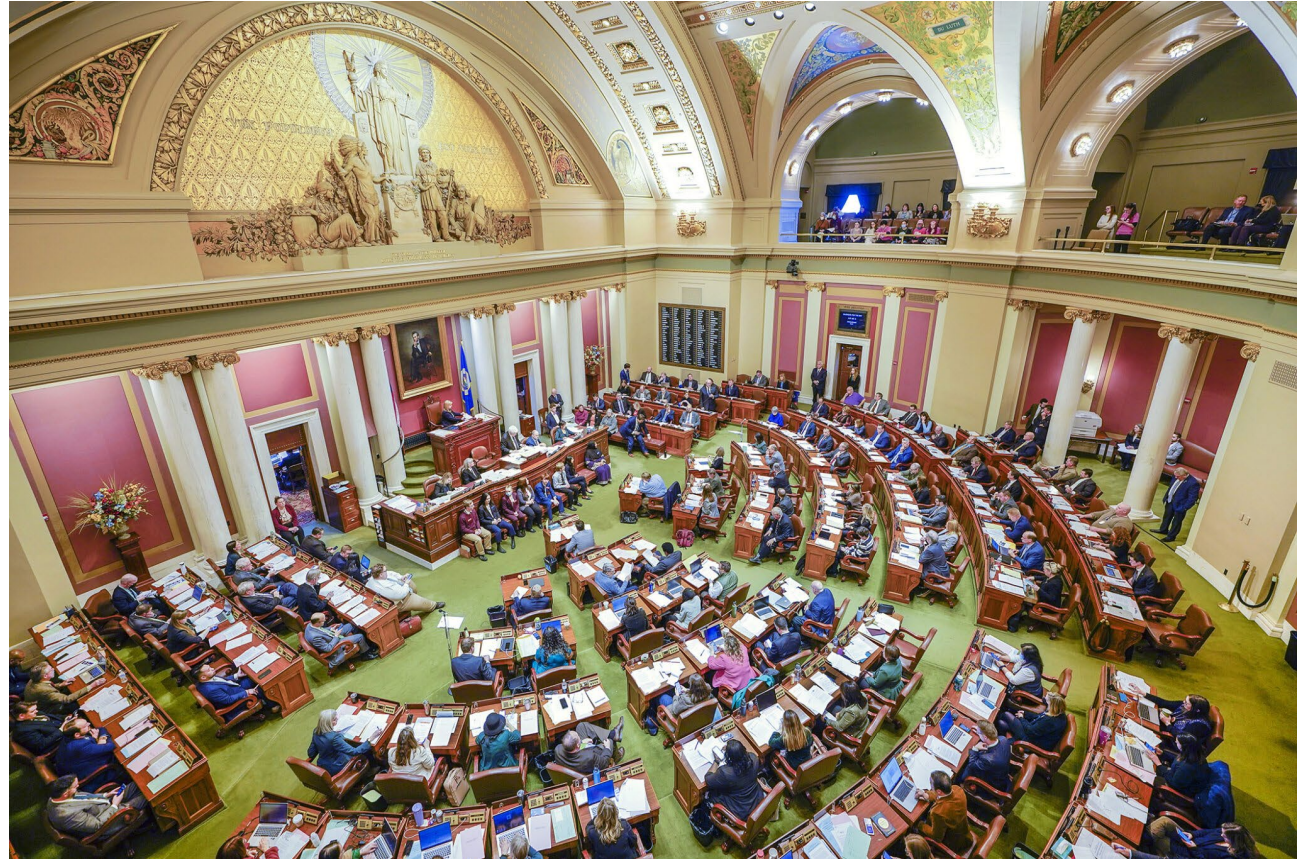
2008:

Republican National Convention
Xcel Energy Center, St. Paul



Governance - Roles and Responsibilities

- **Minnesota State Statute 403.36:** Is adopted by the Legislature which appoints the Commissioner of Public Safety as the chair of the Statewide Radio Board and implementation of the Statewide ARMER Plan. The Statewide Radio Board has overall authority for the ARMER system. The commissioner of public safety shall contract with the commissioner of transportation to construct, own, operate, and maintain the backbone system. The commissioner of transportation shall contract for the construction as needed to build, operate, and maintain the ARMER system backbone. The Department of Transportation shall own, operate, and maintain the system backbone, including, but not limited to, radio towers and associated structures and equipment related to the system backbone.



Governance – Roles and Responsibilities

- **Minnesota State Statute 174.70 PUBLIC SAFETY RADIO COMMUNICATIONS.**
- §Subd. 2.State communications system implementation; towers and other facilities. (a) In order to facilitate construction and maintenance of the state's communications systems and to reduce the proliferation of communications towers, the commissioner of Transportation may, by purchase, lease, gift, exchange, or other means, obtain sites for the erection of towers and the location of equipment and may construct buildings and structures needed for developing the state's communications systems.



OSRC Introduction

Main Office in Roseville

16 radio shops located across the state

Thief River Falls	Detroit Lakes	Bemidji
Baxter	Crookston	Duluth
Virginia	Grand Rapids	St. Cloud
Willmar	Marshall	Rochester
Mankato	Owatonna	
Golden Valley	Oakdale	

Current staff of 87:

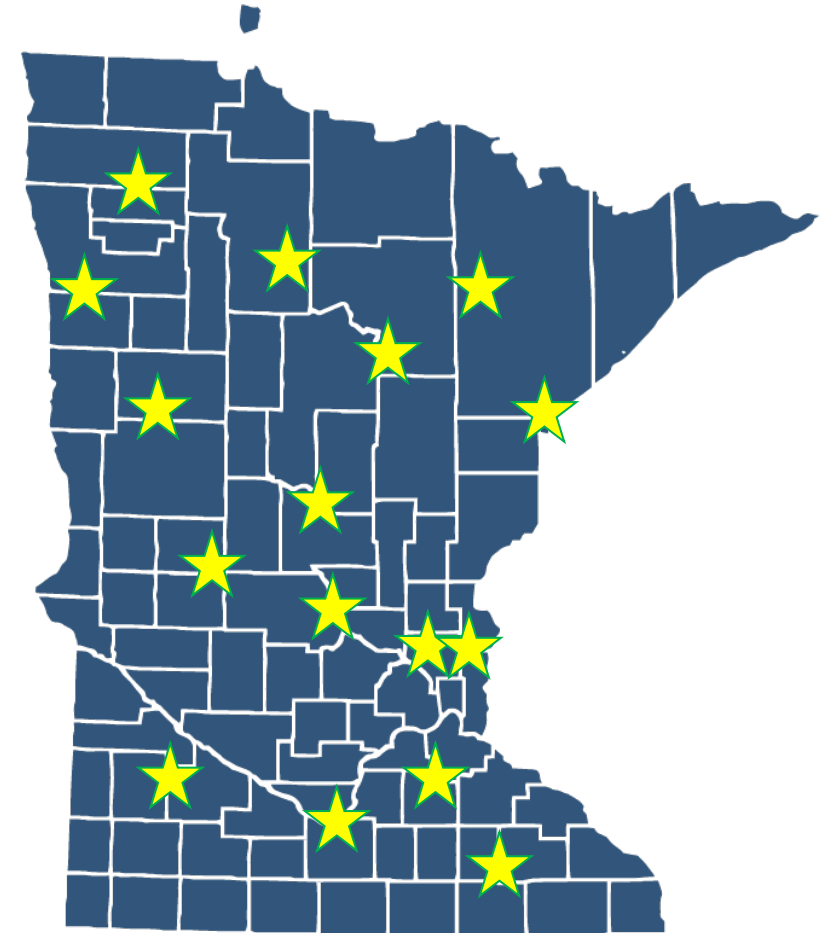
- 9 Office Management/Support
- 16 Electrical/Radio Engineers
- 5 Radio Maintenance Supervisors
- 51 Radio Technicians
- 4 Refrigeration Mechanics
- 2 Tower Technicians
- 2 MnIT ITS Support

Radio Operations Center

Monitoring ARMER 24x7x365

On-Call Rotation

- 1 – Radio Engineer
- 5 – Radio Technicians

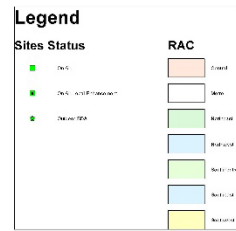


- MnDOT is responsible for the operations and maintenance of the State's public safety two-way radio communications system known as ARMER. ARMER is the daily radio communications system utilized by all public safety responders within the state of Minnesota.
- Includes the continuous uninterrupted operations of the ARMER system backbone, towers, antennas, microwave, HVAC systems, standby generators, and radio equipment.
- Engineering services and project management of system construction, capacity, lifecycle planning and upgrades.
- Provides statewide coordination and compliance for FCC regulated 800MHz public safety spectrum and licensing.
- Management of MnDOT, State Patrol, Capital Security and DNR radio fleets.



Funding

Revenue Sources for MnDOT ARMER Backbone Maintenance and Operations				
Source	Estimated Carryover to FY27	FY 2027 Appropriated	FY 2027 Available	
911 Fee Legislative Appropriation		\$ 10,384,000.00	\$ 10,384,000.00	
Trunk Highway Funds (MnDOT Appropriation) *		\$ 4,587,613.82	\$ 4,587,613.82	
Lease Receipts (Estimated)	\$ 500,000.00	\$ 1,900,000.00	\$ 2,400,000.00	
Total	\$ 500,000.00	\$ 16,871,613.82	\$ 17,371,613.82	



- **Minnesota State Statute 403.36** The Department of Transportation shall own, operate, and maintain the system backbone, including, but not limited to, radio towers and associated structures and equipment related to the system backbone.

ARMER Backbone Infrastructure

335 Communications Tower Sites



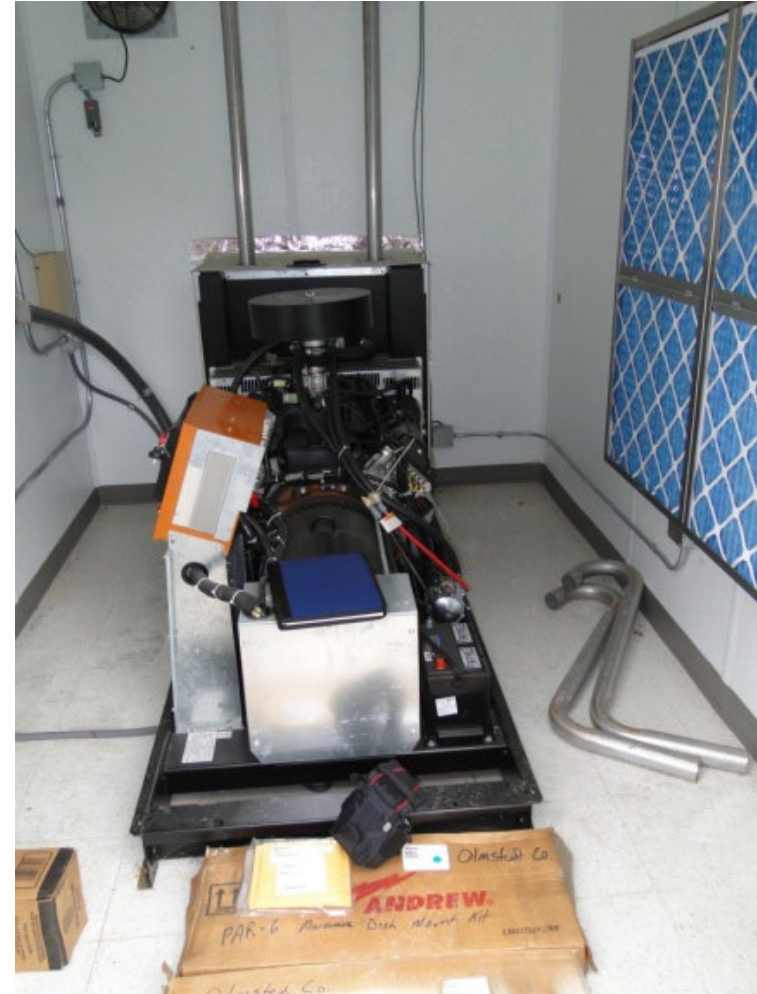
332 Pre-Fabricated Shelter Buildings
630 HVAC Systems

ARMER Backbone Infrastructure



ARMER Backbone Infrastructure

315 Standby Generators



ARMER Backbone Infrastructure

335 DC Power Plants 2820 Backup Batteries



ARMER Backbone Infrastructure

670 Transmit/Receive Antennas



ARMER Backbone Infrastructure

419 microwave paths for site connectivity.



ARMER Backbone Infrastructure

232 FAA required tower lighting systems



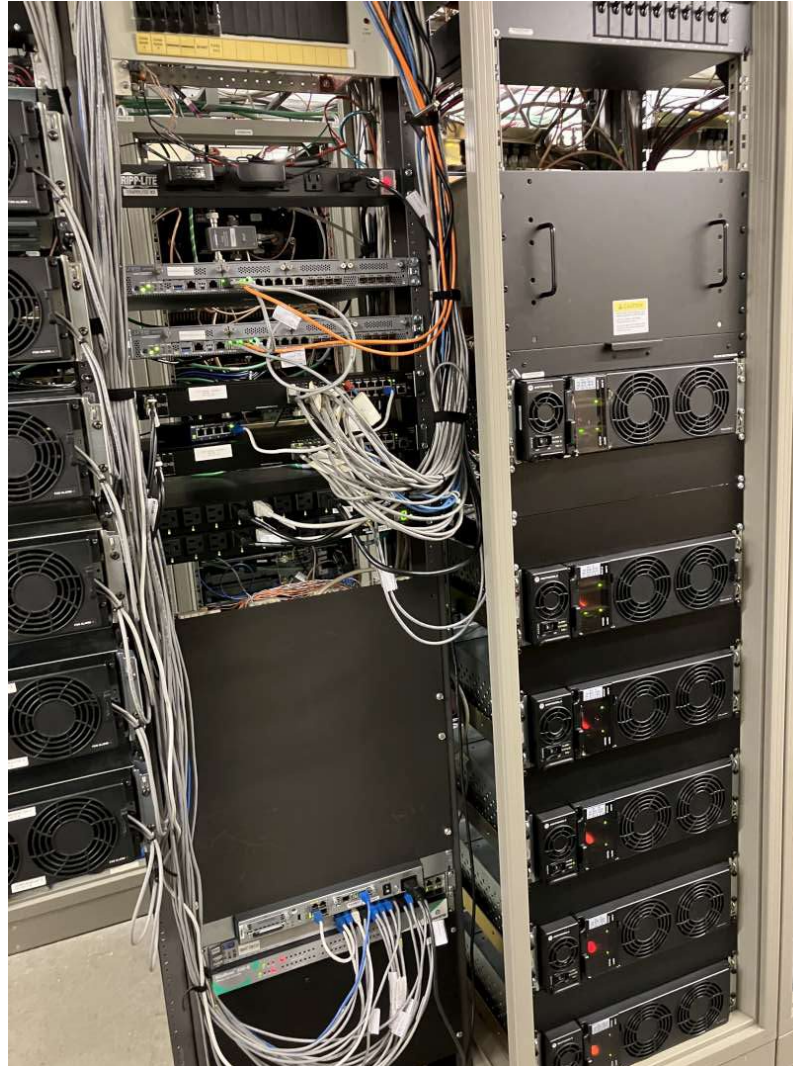
ARMER Backbone Infrastructure

Motorola ASTRO 25 Equipment

2,120 Base Radios



25 Site Controllers



6 Zone Controllers



Local Enhancement Ecosystem

403.34 OPTIONAL LOCAL USE OF STATEWIDE SYSTEM.

Subdivision 1. **Options.** Use of the statewide public safety radio system by local governments, quasi-public service organizations, and private entities eligible to use the system shall be optional and no local government or other eligible user of the system shall be required to abandon or modify current public safety radio communication systems or purchase new equipment until the local government or other eligible user elects to join the system. Public safety radio communication service to local governments and other eligible users who do not initially join the system shall not be interrupted. No local government or other eligible users who do not join the system shall be charged a user fee for the use of the system.

Subd. 2. **Requirements to join.** Local governments and other entities eligible to join the statewide public safety radio system which elect to join the system must do so in accordance with and meet the requirements of the provisions of the plan adopted by the board as provided in section 403.36.

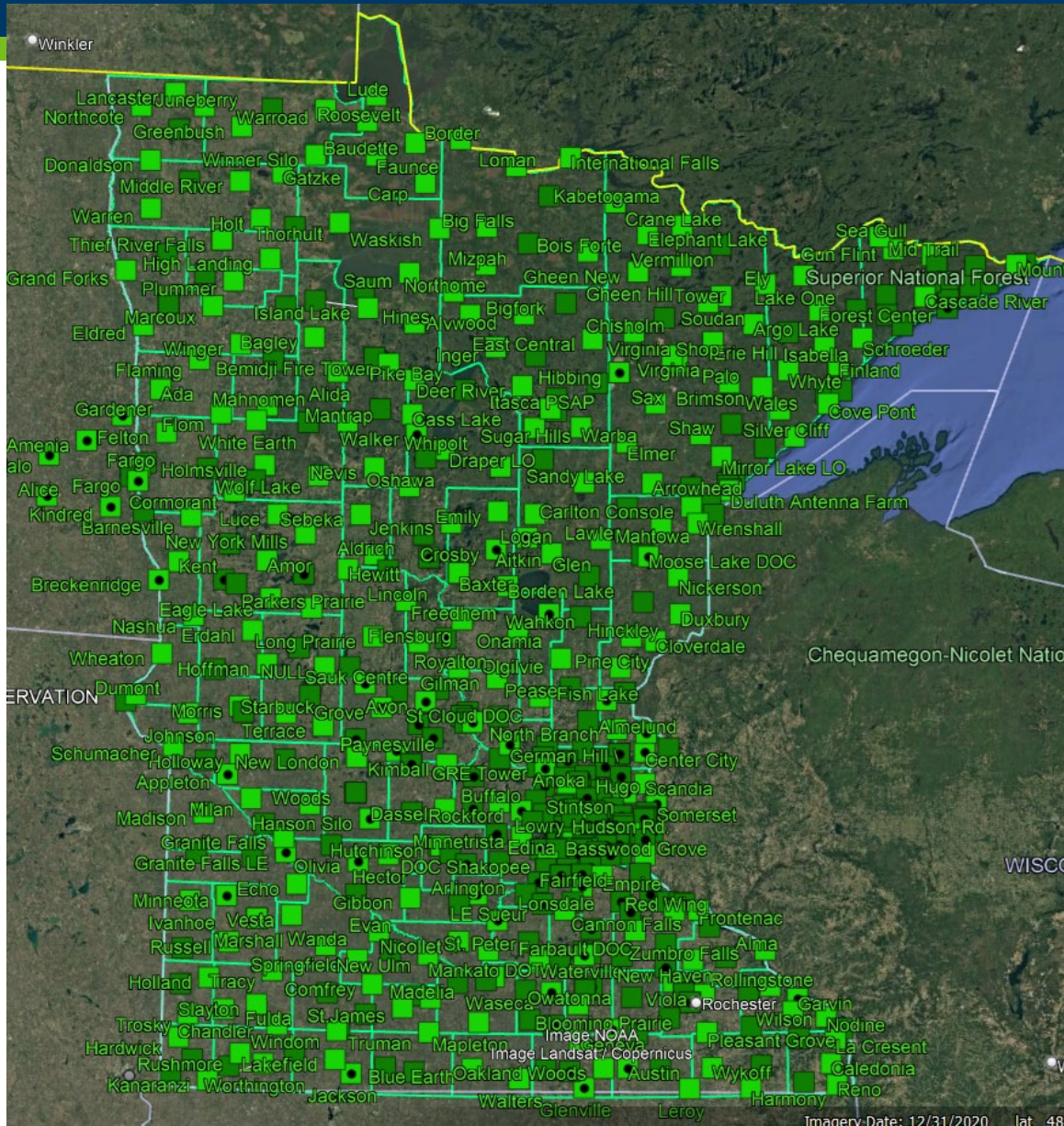
- 137 Local Enhancement sites.
- 1,938 Motorola base radios.
- 758 Dispatch consoles.

Shared Resources



- Local Agencies
- State Partners
- Federal Partners
- Fire Partners
- EMS Partners
- Law Enforcement Partners
- Roaming Sheriff Departments
- Other Agency Partners

Statewide ARMER Resources



- Magnitude of System
- Federal, State, Local, Tribal and Private Partnerships
- Site Challenges;
 - Terrain
 - Natural disasters, severe storms, forest fires, ice storms
 - Location & Access, road maintenance
 - Developments, wind and power lines.
- Local Enhancement sites



Microwave.kml

Historical Capital Funding

1995-2002: Phase 1 (Metro Region Buildout)

- Trunk Highway Funds (THF) \$ 7,500,000
- GO Bonds \$ 7,500,000
- Metro Council \$ 3,000,000
- 911 Special Revenue Account Backed Bonds \$ 16,000,000
- Local Funding Sources and Grant Funding \$ 42,000,000

2002: Phase 2 (Metro Region Buildout)

- Local Funding Sources \$ 50,000,000

2005: Phase 3 (St. Cloud and Rochester Regional Expansion)

- 911 Special Revenue Account Backed Bonds \$ 45,000,000

Historical Capital Funding

2007: Phase 456 Legislature authorizes \$186 million in revenue bond sales for expansion of the ARMER backbone to greater Minnesota. 911 Special Revenue account provided funds for the debt service and retired the bonds early in 2021.

- 911 cash/bonds \$186,000,000
- Land pre-work 911 cash/bonds \$3,000,000

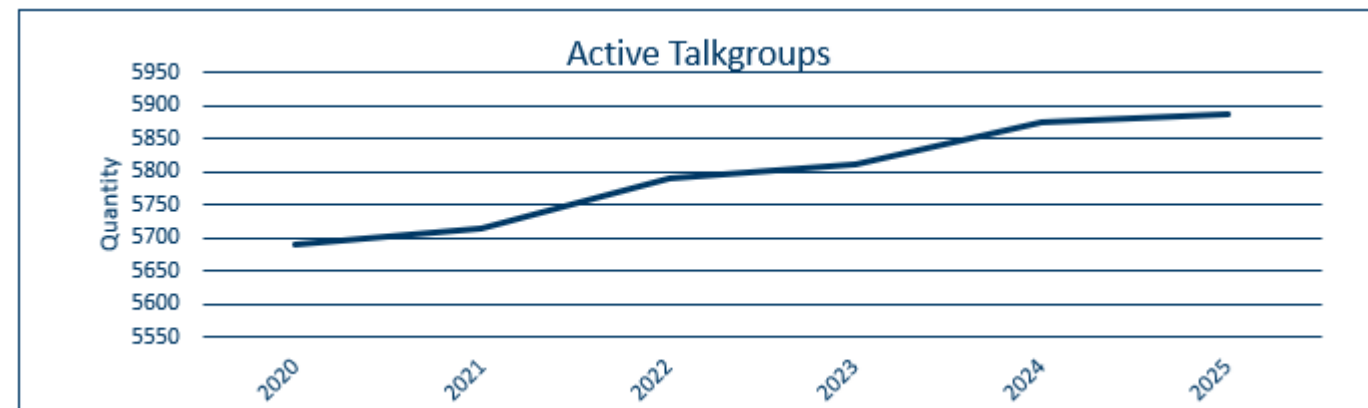
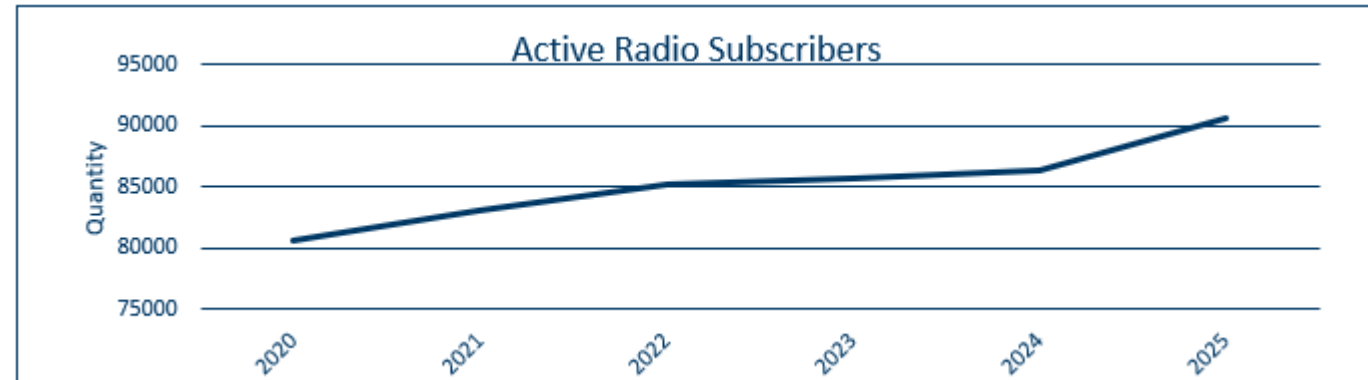
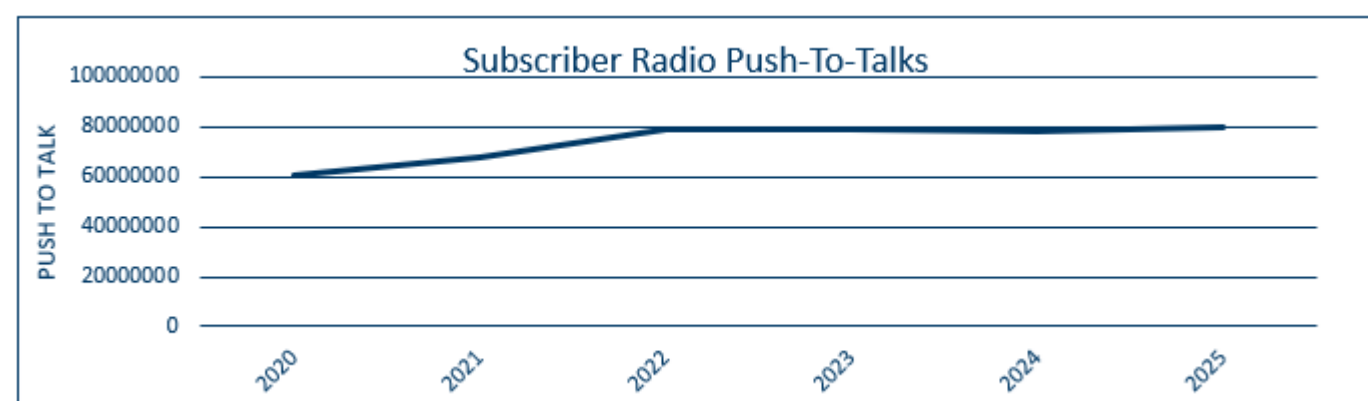
Total Initial Construction Cost - \$360,000,000

*Local partner investments

Statistics

2025 Statistics

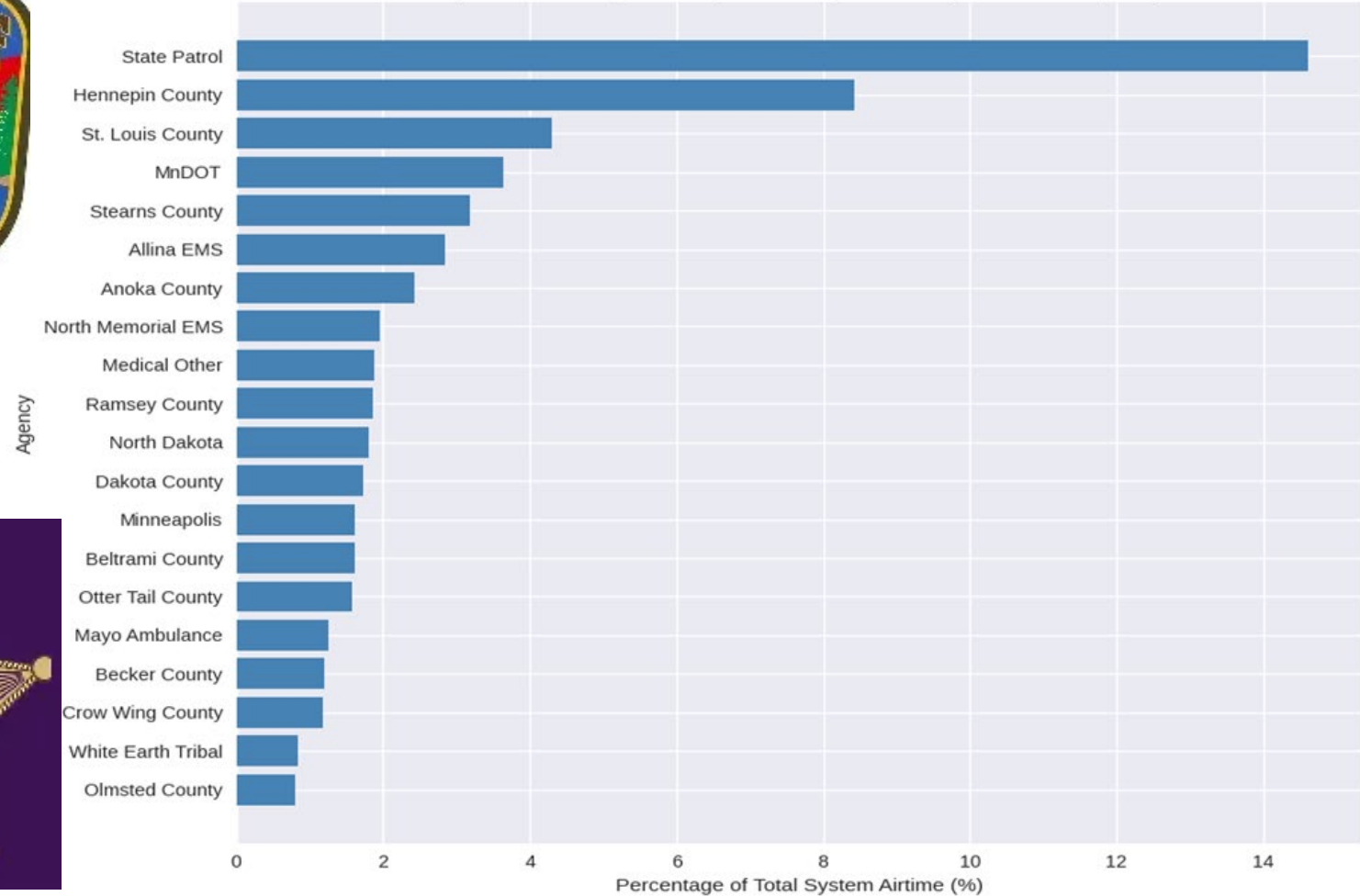
- 80 Million Push to Talks
- 90,000+ Active Subscribers
- Approximately 5,900 Active Talkgroups
- Nearly 250 active participating public safety entities



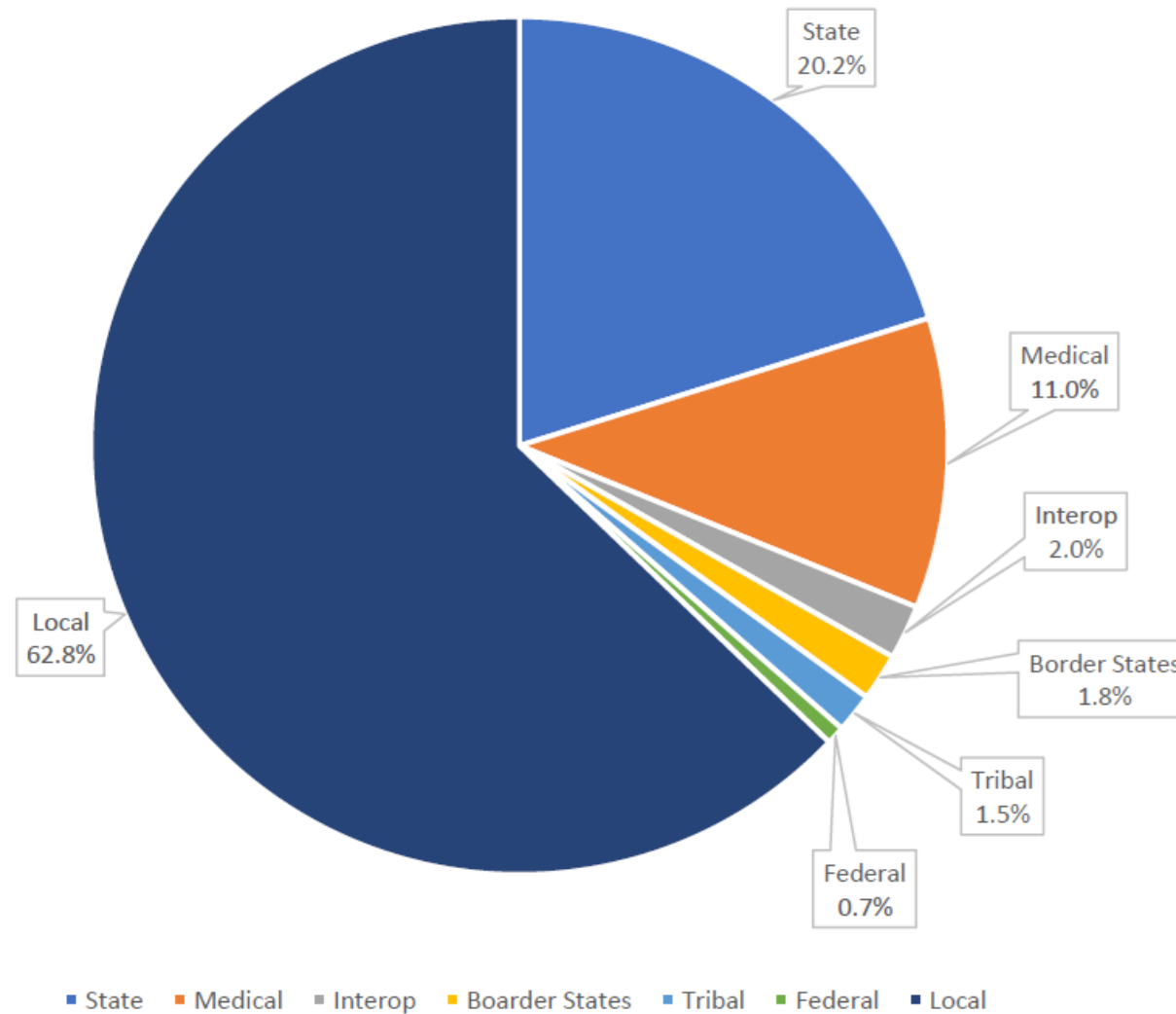
Statistics



Top 20 ARMER Agencies by Percentage of Total System Airtime (2025)



2025 ARMER SYSTEM TALKGROUP AIR TIME USAGE



Questions?

